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Note

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First Edition (May 1996)

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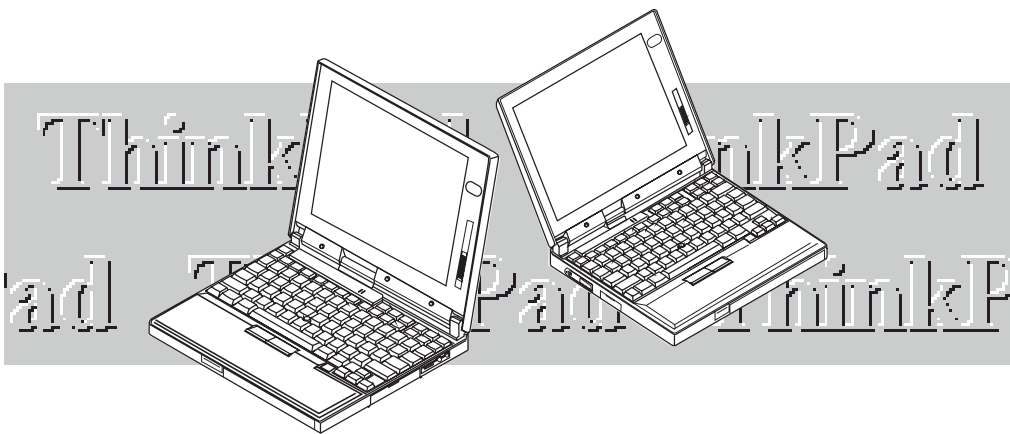
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Thank You for Selecting an IBM ThinkPad 560 Computer

The thin and light IBM ThinkPad 560 computer
is designed to be convenient
for your mobile computing needs.

We hope you enjoy its fast processing power,
brilliant and colorful DSTN or TFT LCD display,
audio capabilities, and infrared communication.



Distinctive System Features

The following are the distinctive system features of the IBM ThinkPad 560 computer:



Note: This figure shows a 560 computer with a thin film transistor (TFT) display. However, the preceding information applies to any type of 560 computer.

1 **Lithium-Ion Battery Pack:** **Page 55.**

The operating time of the computer is extended with the lithium-ion battery pack.

2 **SVGA Color LCD:** **Page 45.**

The DSTN (dual-scan super-twisted nematic) display models offer 256 colors at 800-by-600 resolution.

The TFT (thin-film transistor) display models offer 65,536 colors at 800-by-600 resolution.

3 **Infrared Communication:** **Page 52.**

An infrared port for wireless serial communication is supplied with your computer.

4 **ThinkPad Features Program:** **Page 29.**

The ThinkPad Features program allows you to set various parameters by using a graphical user interface or commands.

5 **Power Management:** **Page 66.**

The computer comes with software that allows you to extend battery life by reducing power usage throughout the computer system. It also provides a resume function, which quickly returns you to where you left off.

6 **Security Features:** **Page 77.**

There is a security password for your computer. Lock security also is provided for your computer, and the Personalization Utilities can help you identify your computer.

7 **Pentium Processor:** **Page 219.**

The fast Intel Pentium processor gives your computer optimal speed and performance.

8 **PCMCIA Support:** **Page 47.**

The computer provides two Personal Computer Memory Card International Association (PCMCIA**) slots that accept a 16-bit PC Card.

9 **TrackPoint III:** **Page 18.**

Pointing, selecting, and dragging all become part of a single process without your needing to lift your hands from the keyboard.

1 **Fn Key Function:** **Page 20.**

The combination of the **Fn** key with a function key is used to control display output type or battery power-saving modes.

11 **ESS** AudioDrive** Sound Support Features:** **Page 54.**

The ESS AudioDrive sound support features provide various audio features for your entertainment.

About This Book

Note:

The illustrations in this book might be slightly different from your computer.

This book contains information that will help you operate the IBM ThinkPad 560 computer (hereafter called the *560* or *computer*). Be sure to read Chapter 1 and Chapter 2 before using the computer. Read from Chapter 3 on whenever you need to.

Chapter 1, “Getting Started,” provides information about how to set up your computer.

Chapter 2, “Getting Familiar with Your Computer,” acquaints you with the basic features of your computer.

Chapter 3, “Operating Your Computer,” provides information on using your computer's different features.

Chapter 4, “Using Battery Power,” provides power management information and describes how to operate your computer with the battery pack.

Chapter 5, “Protecting Your Computer,” provides information for protecting your computer.

Chapter 6, “Installing and Removing Options,” describes how to install or remove IBM options.

Chapter 7, “Installing Software,” provides procedures for installing operating systems and device drivers in your computer.

Chapter 8, “Solving Computer Problems,” describes what to do when you have a computer problem.

Appendix A, “Avoiding Hardware Conflicts,” lists some steps you can take to avoid problems when you add or remove options.

Appendix B, “Advanced Information for PC Cards,” provides additional information when using PC Cards.

Appendix C, “Using PS2 Commands,” provides the PS2 commands for the ThinkPad Features program.

Appendix D, “Features and Specifications,” describes the features and specifications associated with your computer.

Appendix E, “Product Warranties and Notices,” contains the warranty statements for your computer and notices for this book.

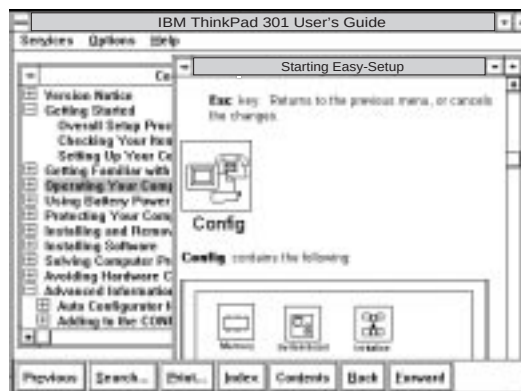
The **glossary** defines terms appearing in this book.

Viewing the Online Book

You can view this book online to easily retrieve information about the computer when you are traveling.

Note: The online book is not available in all countries.

To start the online book, click on the **Online Book** icon in OS/2 Warp, Microsoft® Windows® Version 3.11, or Microsoft Windows 95.



Information Notices

This book contains notices that relate to specific information or text.

Note

Provides important hints, tips, guidance, or advice.

Attention

Indicates possible damage to programs, devices, system, or data. It appears next to the related instruction or situation in which possible damage could occur.

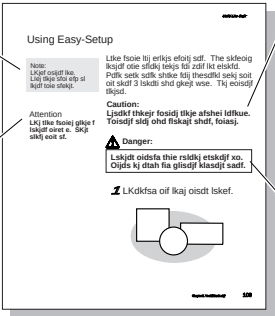
Caution

Indicates situations that are potentially hazardous to you. It appears in text before the instruction or situation that could be hazardous.

Danger

Indicates situations that are potentially lethal or extremely hazardous to you. It is indicated

by the symbol  and appears in text before the instruction or situation that could be dangerous.



Treatment of Icons

This book contains the following icons (symbols):

For procedures or information unique to the operating system installed in your computer:



Information for IBM Operating System/2 (OS/2) users.



Information for IBM DOS users.



Information for Microsoft Windows Version 3.11 users.



Information for Microsoft Windows 95 users.

For information referred to:



Where to go for more information.

Safety Notice



DANGER

Do not disassemble, incinerate, or short-circuit the rechargeable battery pack. Do not put it in trash that is disposed of in landfills. Dispose of it as required by local ordinances or regulations. In the United States, call IBM at 1-800-IBM-4333 for information on disposal.

CAUTION:

The lithium battery (IBM P/N 40H6424, UL-recognized component—File No. MH12560), can be replaced only by your dealer or an IBM service representative. It contains lithium and can explode if not properly used, handled, or disposed of. Do not: (1) throw or immerse into water, (2) heat to more than 100°C (212°F), or (3) repair or disassemble. Dispose of it as required by local ordinances or regulations.

CAUTION:

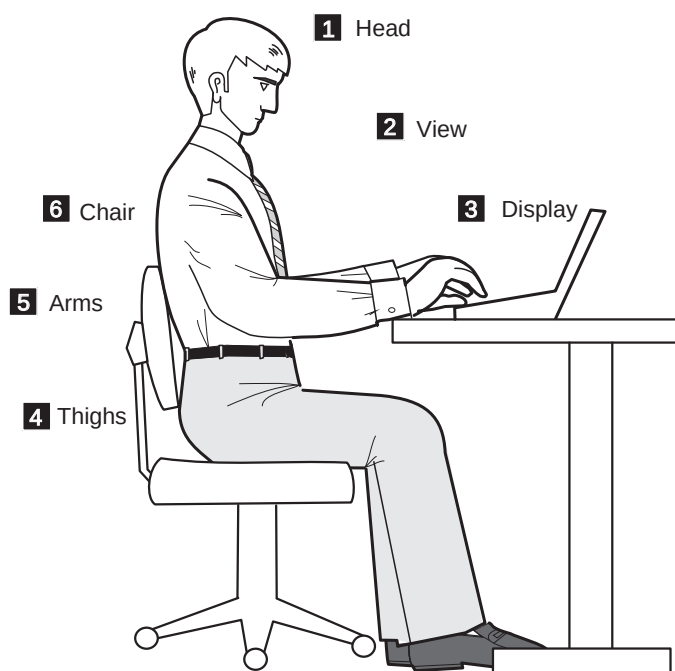
The fluorescent lamp in the liquid crystal display (LCD) contains mercury. Do not put it in trash that is disposed of in landfills. Dispose of it as required by local ordinances or regulations.

The LCD is made of glass, and rough handling or dropping the computer can cause the LCD to break. If the LCD breaks and the internal fluid gets into your eyes or on your hands, immediately wash the affected areas with water for at least 15 minutes; then get medical care if any symptoms are present after washing.

Ergonomics Information

This is important information to read before using your ThinkPad computer in the virtual office.

Working in the virtual office may mean adapting to frequent changes in your environment. Following some simple “rules of the road” will make things easier and bring you the maximum benefits of your ThinkPad computer. Keeping in mind such basics as good lighting and proper seating, for example, can go a long way in helping you enhance your performance and achieve greater comfort wherever you are.



Note: The example shown here of someone in a traditional setting. Even when not in such a setting, you can follow many of these tips. Develop good habits, and they will serve you well.

- | | |
|--|--|
| <p>1 Head
Keep your head in a comfortable and vertical position.</p> <p>2 View
Maintain a comfortable viewing distance of 510–760 mm (20–30 in.).</p> <p>3 Display
Position the display to avoid glare or reflections from overhead lighting or outside sources of light.

Keep the display screen clean and set the contrast and brightness to levels that allow you to see the screen clearly.</p> | <p>4 Thighs
Keep your thighs parallel to the floor and your feet flat on the floor or on a footrest.</p> <p>5 Arms
Keep your forearms, wrists, and hands in a relaxed and neutral position. Don't pound the keys; type with a soft touch.</p> <p>6 Chair
Use a chair that gives you good back support.</p> |
|--|--|

What if I am traveling?

It may not be possible to observe the best ergonomic practices when you are using the ThinkPad computer while on the move or in a “casual” setting, such as the seashore or on a mountaintop. Sometimes, your lap may be the only “desk” around. Regardless of the setting, try to observe as many of the tips for proper usage as possible. Sitting properly and using adequate lighting, for example, will help you maintain desirable comfort and performance levels.

Questions about vision?

IBM's visual display screens are designed to meet the highest standards and to provide you with clear, crisp images and large, bright displays that are easy to see, yet easy on the eyes. Of course, any concentrated and sustained visual activity can be tiring. If you have questions on eye fatigue or visual discomfort, consult a vision care specialist for advice.

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Chapter 1. Getting Started

Welcome to the world of ThinkPad computers!

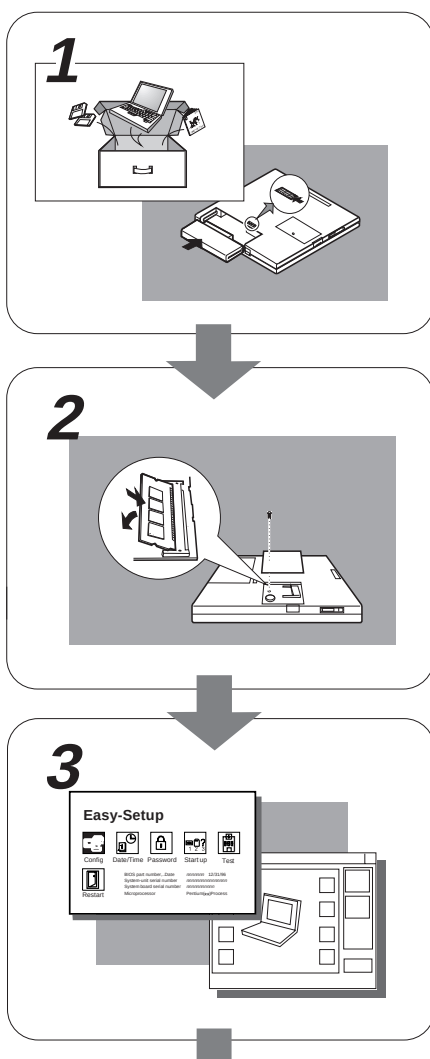
The ThinkPad 560 computer is designed to meet your everyday and mobile computing needs. It provides you with various features, unique to IBM products, which help your everyday work proceed easily and smoothly. You can use your ThinkPad 560 computer in the office or at home as a desktop computer by attaching an external keyboard, display, or other external devices. And, of course, you can easily carry your computer wherever you need a computer “on the go.”

This chapter describes step-by-step instructions to help you set up your new computer.

Overall Setup Procedures	2
Checking Your Items	4
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Overall Setup Procedures

The following is a general outline of the overall procedure to take when using the computer for the first time. For details and actual procedures, refer to the pages indicated.



1 Set Up the Computer

First, check whether your computer came with all the necessary items.

See page 4.

Then, install the battery pack in the computer. Now you are ready to turn on the computer.

See page 5.

2 Install Options

If you have any options, such as memory cards, install the options.

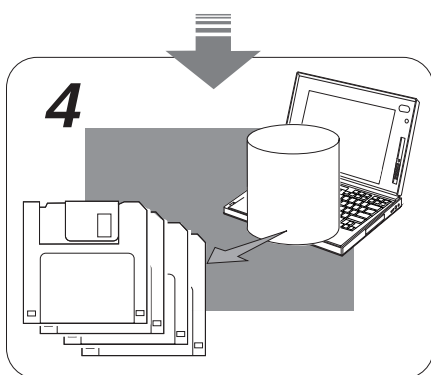
See page 89.

3 Customize Your Computer

You can use the *ThinkPad Features* program to customize the performance of your computer. You can use *Easy-Setup*, a built-in system function, to set (for example) the password to prevent your computer from unauthorized use.

For the ThinkPad Features program, see page 29.

For Easy-Setup, see page 34.



4 Make a Backup of Your System

Your computer comes with the necessary software already installed for you to use the computer right out of the box. Some computers either have the *Diskette Factory* program installed on your computer so you can create backup diskettes, or have the utility and device driver diskettes supplied in the box with the computer.

If your computer did not come with the utility and device driver diskettes, make a backup copy of all necessary files using the *Diskette Factory* program. This way, if you ever need to reinstall the operating system, you will have all the necessary software you need to restore your computer to the way it was at the time of purchase.

Getting Started

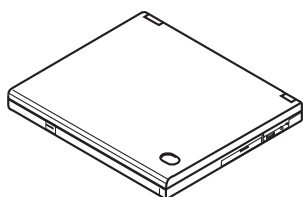
Checking Your Items

Remove the items from the shipping box and check that all necessary items are shipped with your computer.

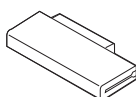
1 Match the items, one by one, with the following figures.

If any item is missing or damaged, contact your place of purchase.

Computer



Battery Pack

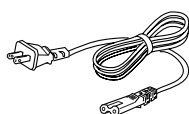


External Diskette Drive

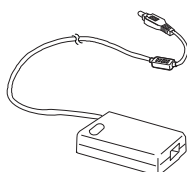


The external diskette drive is attached to the external-diskette-drive connector.

Power Cord

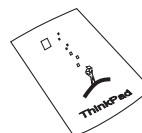


AC Adapter



In some countries, your AC Adapter is a 3-pin AC Adapter (different from the one shown). In this case, make sure you read the safety notices on page 224.

Miscellaneous Items Envelope



This envelope contains spare caps for the TrackPoint III.

Utility Diskettes

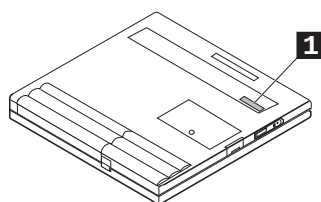
Driver Diskettes

These diskettes contain various system programs and device drivers.

Note: In some countries, you can create backup diskettes using the *Diskette Factory* program. Do so *before* reinstalling the operating system.

- 2** Turn the computer upside down and record the identification numbers **1** on page 167.

The machine type has a prefix of **Type**.
The serial number has a prefix of **S/N**.

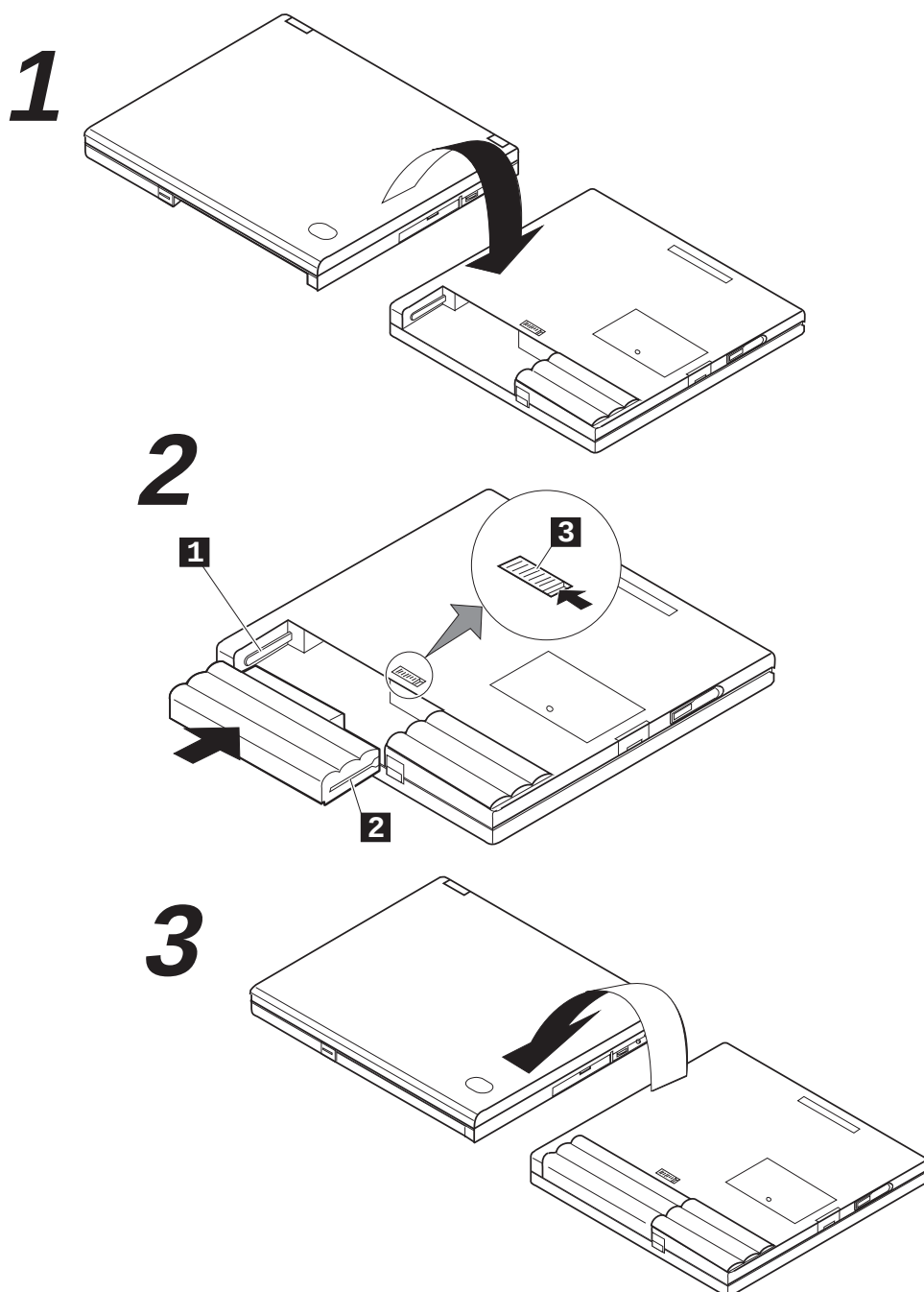


Setting Up Your Computer

You are now ready to assemble and start your computer. The steps on the next few pages guide you through the process. The following conventions are used in the steps and illustrations that appear in this chapter.

- 1** Indicates the main sequence of actions. This number in a step corresponds to the same number in a figure.
- ① Indicates subsequent actions that follow a main action. An arrow accompanying a circled number shows the direction of movement.

Getting Started



Install the battery pack:

- 1** Turn the computer upside down.



DANGER

The battery pack provided with your computer contains a small amount of harmful substances. To avoid possible injury:

Keep the battery pack away from fire.

Do not expose the battery pack to water or rain.

Do not attempt to disassemble the battery pack.

Avoid mechanical shocks to the battery.

Always use battery packs recommended by IBM.

Keep the battery pack away from children.

When disposing of the battery, comply with local ordinances or regulations or your company's safety standards.

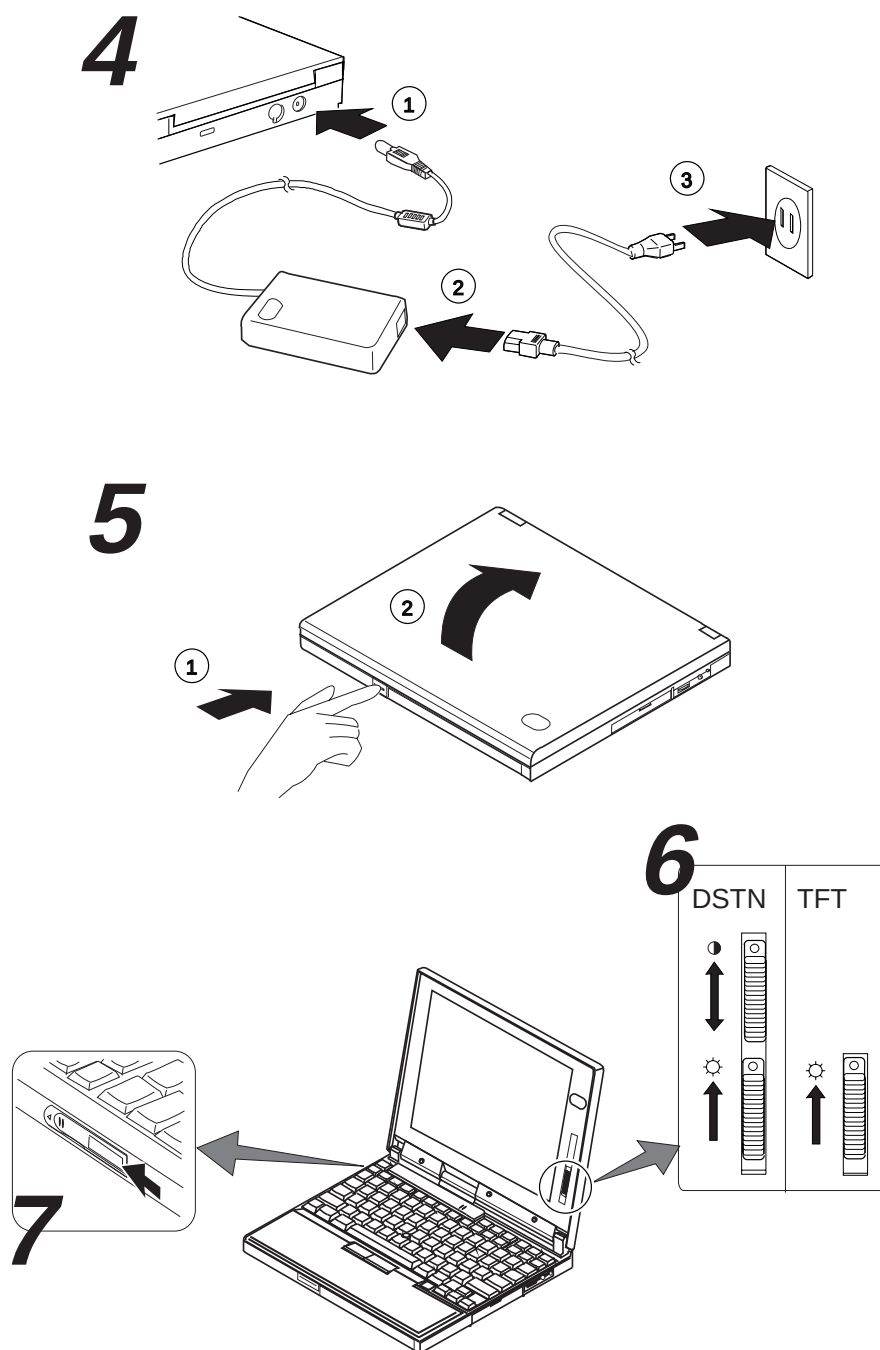
- 2** Install the battery pack.

- a) Align the guide on the battery pack 2 with the guides on the computer 1 .
- b) Slide; then press the battery pack fully into the computer.

When the battery pack is fully into the computer, the battery pack latch 3 automatically locks into place.

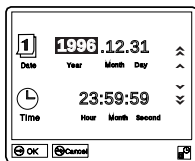
- 3** Turn the computer over again.

Getting Started

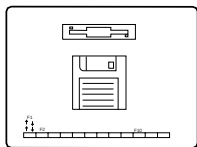


Turn on the computer:

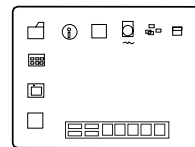
- 4** Connect the AC Adapter to the computer as shown.
(Connect ①, ②, and then ③.)
- 5** Press the liquid crystal display (LCD) latch (①) and open the LCD (②).
Position the LCD so that it is convenient for viewing.
Note: The LCD opens up to 135°. Do **not** force the LCD to open flat (180°).
- 6** Position the contrast (☐) (for a DSTN display only) and the brightness control (☀) according to the figure.
- 7** Press the power switch to turn on the computer.
- 8** After a single beep, one of the following screens appears, confirming that the system is operating correctly.



Date and Time menu



Diskette and F1 prompts



Startup screen

This screen instructs you to set the initial date and time. To set the date and time, see "Using Easy-Setup" on page 34.

No operating system is installed in your computer. To install an operating system, see Chapter 7.

The preinstalled operating system (startup screen) appears. (The screen shown is an example of an operating system screen.)

If one of the above screen does not appear, a failure might have occurred in the computer. See Chapter 8.

Congratulations! You have successfully completed the basic setup of your computer.

Going from Here

After you have completed setting up your computer, you can now start using your computer:

Do you want to know more about your computer?

If you like to know more about your 560 computer, read Chapter 2, which provides you with the basic features of your computer.

Are you ready to use your computer?

If you have any application programs to install, follow the instructions in the documentation that came with those programs.

Do you need to reinstall the operating system?

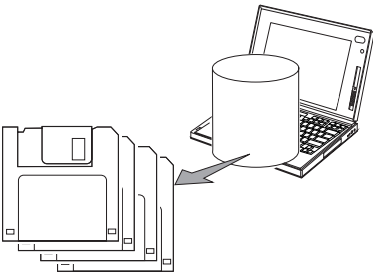
Note: If your computer did not come with the utility and device driver diskettes, make a backup copy of all necessary files using the Diskette Factory program.

If you are reinstalling the operating system to customize your computer, follow the instructions on page 103.

Do you need more hard disk space?

If your computer did not come with the utility and device driver diskettes, and *you have already made a backup copy of all necessary software using the Diskette Factory program*, you can obtain more free hard disk space by deleting any preinstalled software you do not want to use.

Click on the **Diskette Factory** icon; then follow the instructions on the screen to delete any preinstalled software.



You should make a backup copy of the files on the hard disk drive, in case you accidentally erase preinstalled software or intentionally modify the hard disk drive. You can use the backup copy to restore your computer to the way it was at the time of purchase.

In some countries, you can create the device driver diskettes you need to install all necessary software, using the *Diskette Factory* program.

 If you have any problems after you have customized your computer, refer to “Common Problems and Frequently Asked Questions” on page 143 to solve your problem.

Chapter 2. Getting Familiar with Your Computer

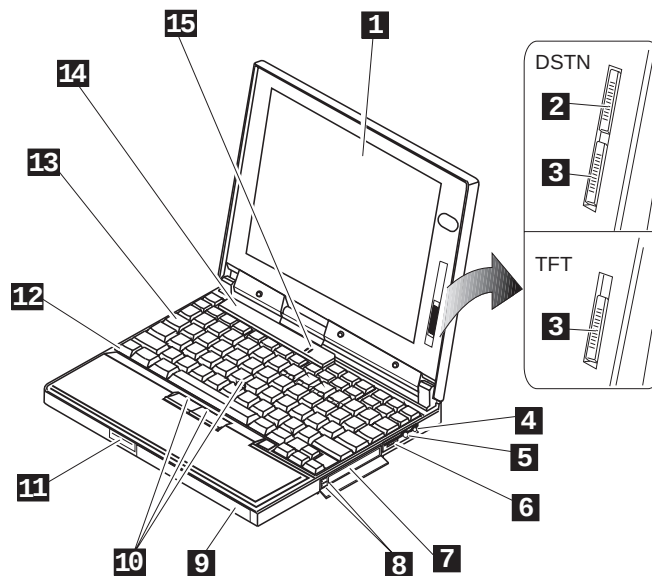
This chapter provides basic information about your computer.

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Identifying the Hardware Features

In this section, you can review the hardware features of your computer. The figures next to the numbers are what you can see on the computer.

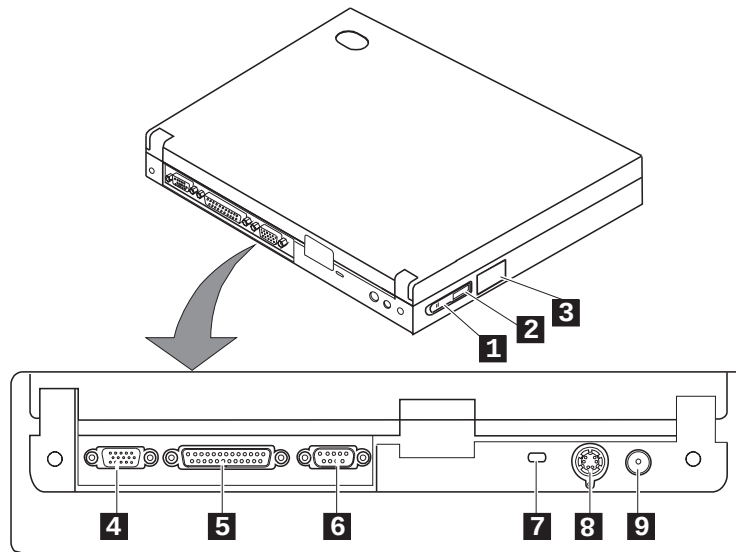
Front View



- | | | |
|---|---|--|
| 1 The color LCD screen displays computer output. (See page 40.) | external audio device is connected. (See page 54.) | 11 The LCD latch opens the LCD when pressed. |
| 2  The contrast control moves up or down to adjust the clarity of the picture. (For the 560 DSTN LCD model only.) | 6 The volume control adjusts the sound level for the built-in speakers. | 12 The Fn key is used with the function keys to activate the Fn key functions. (See page 20.) |
| 3  The brightness control moves up or down to adjust the brightness of the display. | 7 The PC Card slots accept PC Cards. (To use a PC Card, see page 47. To insert a PC Card, see page 90.) | 13 The keyboard is used to enter data into the computer. (To use the numeric keypad on the keyboard, see page 22.) |
| 4 The headphone jack , a 1/8-inch (3.5-mm) diameter jack, is where you connect a stereo headphone or external speakers. (See page 54.) | 8 The PC Card eject buttons eject the PC Card from the PC Card slot. (See page 92.) | 14 The indicator panel consists of the system-status indicators and their associated symbols. (See page 15.) |
| 5 The microphone/line-in jack , a 1/8-inch (3.5-mm) diameter jack, is where a stereo microphone or | 9 The battery pack is a built-in power source for the computer. (See page 17.) | 15 The built-in microphone captures sound and voice when it is used with an application program capable of handling an audio. |
| | 1 The TrackPoint III is a built-in pointing device that provides a function similar to that of a mouse. (See page 18.) | |

Identifying the Hardware Features

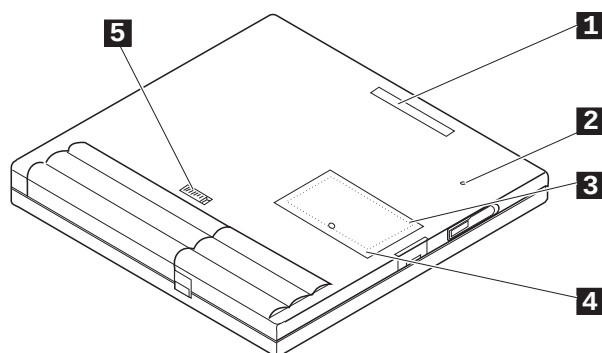
Rear View



- | | | | | | |
|---|--|---|--|---|---|
| 1 | The power switch turns the computer on and off. | 4 |  The external-monitor connector is where you attach the external monitor. (See page 43.) | 7 |  The security keyhole is used with a Kensington** MicroSaver** Security System lock (hereafter called a <i>Kensington lock</i>) or a compatible lock. (See page 88.) |
| 2 |  The infrared port on the power switch allows the computer to communicate with other devices that have infrared data-transfer capability. (See page 52.) | 5 |  The parallel connector is where you usually connect a parallel-printer signal cable. | 8 |  The external-input-device connector is used to attach a mouse, external keyboard, or external numeric keypad to the computer. (See pages 99–101.) |
| 3 | The external-diskette-drive connector is where you connect the cable of the external diskette drive. | 6 |  The serial connector is where you connect a 9-pin, serial-device cable. | 9 |  The power jack is where the AC Adapter cable is connected. |

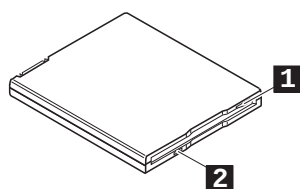
Identifying the Hardware Features

Bottom View



- | | | | | | |
|---|---|---|--|---|---|
| 1 | The expansion connector is where you attach a port replicator (available as an option). | | | | |
| 2 | The power shutdown switch is used to turn the computer off when an application locks up or | 3 | The memory slot accepts a dual inline memory module (DIMM) option. (See page 93.) | 4 | The memory-slot cover covers the memory slot. |
| | | | | 5 | The battery-pack latch locks or releases the battery pack. |

External Diskette Drive

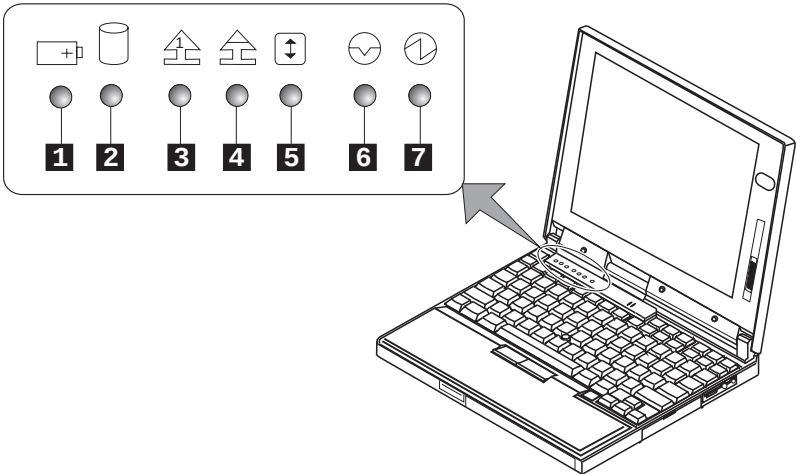


- | | | | |
|---|---|---|---|
| 1 | The diskette-eject button ejects the diskette from the diskette drive. | 2 | The diskette drive in use indicator appears when data is read from or written to a diskette. |
|---|---|---|---|

Do not enter suspend mode or eject the diskette when this indicator is on.

System-Status Indicators

The system-status indicators on the computer show the current status of your computer by their on or off states and colors (green, yellow, and orange). Each indicator is identified with a symbol. The following shows the location and the meaning of each icon:



Symbol	Color	Meaning
1 Battery 	Green	Enough battery power remains for operation.
	Orange	The battery pack is being charged.
	Blinking orange	The battery pack needs charging. When the lamp starts blinking orange, the computer beeps three times.
2 Hard disk in use 	Orange	Appears when data is read from or written to the hard disk. <i>Do not enter suspend mode or turn off the computer when this indicator is on.</i>
3 Numeric lock 	Green	Indicates that the numeric keypad on the keyboard is enabled. The keypad is enabled and disabled by pressing and holding the Shift key, and pressing the NumLk key. For details, see “Operating the Numeric Keypad” on page 22.
4 Caps lock 	Green	Indicates that the Caps Lock mode is enabled. All alphabetic characters (A–Z) are entered in capital letters without using the Shift key. The Caps Lock mode is enabled and disabled by pressing the Caps Lock key.

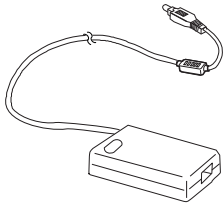
System-Status Indicators

Symbol	Color	Meaning
5 Scroll lock 	Green	Alternately turns on and off each time the ScrLk key is pressed. While this indicator is on, the Arrow keys are used as screen-scroll function keys. In this state, the cursor cannot be moved with the Arrow keys. <i>Not all application programs support this function.</i>
6 Suspend mode 	Green	Indicates that the computer is in suspend mode. (See page 66 for details about suspend mode.)
	Blinking green	Indicates that the computer is entering suspend mode or hibernation mode, or is resuming normal operation.
7 Power on 	Green	Indicates that the computer is operational. This indicator is on when the computer is on and not in suspend mode.

Providing Power

Your computer can be operated with the AC Adapter or battery pack.

AC Adapter



The AC Adapter supplies power for the computer. The AC Adapter also charges the battery pack when the battery pack is installed in the computer. The input rating for the AC Adapter is 100–240 V ac, 50/60 Hz.



DANGER

Do not attempt to open the AC Adapter case. The AC Adapter is permanently sealed and cannot be repaired.

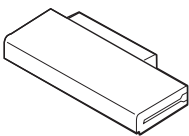
Attention:

Always use an AC Adapter certified by IBM in the country where you will be using the computer. Operating the computer with an incorrect AC Adapter can cause damage to the battery pack and to the computer.

If you turn on the computer with the battery pack installed, you will hear a short beep when you connect or disconnect the AC Adapter from the computer. This short beep means that the power source has been changed.

When the AC Adapter cable is disconnected from the computer with a battery pack installed, the LCD brightness decreases slightly to conserve battery power.

Battery Pack



The battery pack is an internal power source for the computer. The battery pack can be recharged with the AC Adapter or the battery charger (available as an option).

Battery packs are shipped from the factory in an almost discharged state, so you *must charge* them before use. To operate your computer with the battery pack, see Chapter 4.

To charge the battery pack:

 Page 56.

Using the TrackPoint III

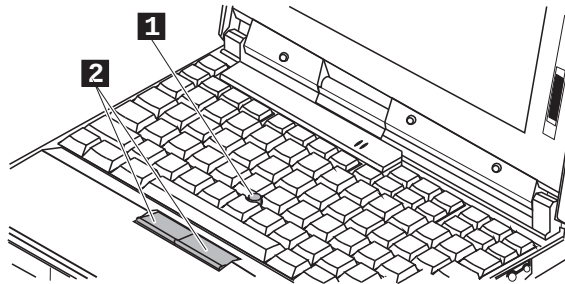
Operating with the TrackPoint III

Note:

No other software is required for the TrackPoint III; it works with the PS/2 mouse driver.

The keyboard contains a unique cursor-pointing device called the *TrackPoint III*. Pointing, selecting, and dragging all become part of a single process you can perform without moving your fingers from their typing position.

The TrackPoint III consists of a stick **1** on the keyboard and a pair of click buttons **2** below the keyboard. The motion of the pointer on the screen is controlled by the amount of pressure applied to the nonslip cap on the stick in any direction parallel to the keyboard; the stick does *not* move. The speed at which the pointer moves corresponds to the amount of pressure on the stick. The function of the click buttons depends on the software that is used.



If you are not familiar with using the TrackPoint III, these instructions will help you get started:

Note:

Remember that the stick does not move, and your finger should not move on it.

Note:

The mouse pointer may drift. This is not a defect. Do not use the TrackPoint III until the pointer stops moving.

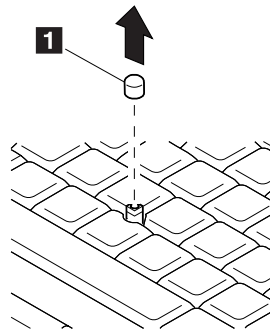
- 1** Place your hands in the typing position and press gently on the stick with either index finger in the direction in which you want the pointer to move.

Pressing the stick away from you moves the pointer up the screen; pressing it toward you moves the pointer down the screen. You can also move the pointer side to side by pressing sideways.

- 2** Press the click buttons with either thumb to select and drag as required by your software, as with any other pointing device.

Changing the Cap

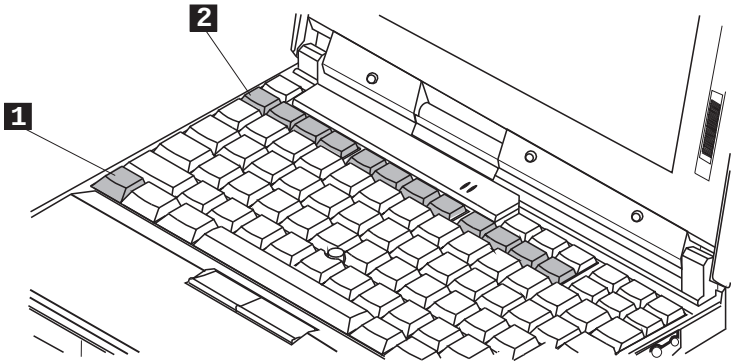
The cap 1 on the end of the TrackPoint III is removable. You can replace it with one of the spares shipped with your computer.



Using the Fn Key Function

Using the Fn Key Function

The **Fn** key function allows you to change operational features instantly. When you use the following functions, press and hold the **Fn** key 1 ; then press the appropriate function key 2 (**F1** to **F12**).



Note:
To use the Fn Key Lock function, select the **TrackPoint** () icon in the ThinkPad Features program window, or type PS2 FNS E at the command prompt.

Hints and Tips

Using the Fn Key Lock Function: You need to press **Fn** only once to get the same effect as when you press and hold the **Fn** key. After you press a function key in the top row, **Fn** returns to its normal state.

Function keys not shown in the following table have no function.

Key Combination	Feature	Meaning
 +  (Only for OS/2 or Windows users)	Fuel-Gauge display on or off 	The Fuel-Gauge program must be activated before you can use this key combination. When this key combination is pressed, the window for the battery power status appears or disappears. Parameters for power status can be set in the window.
 + 	Standby mode 	Places the computer in standby mode. For more information about this mode, see page 68.
 + 	Suspend mode 	Places the computer in suspend mode. For more information about this mode, see page 68.

Using the Fn Key Function

Key Combination	Feature	Meaning
 + 	LCD/external monitor switching 	Displays the computer output in the following order when an external monitor is attached. External Both Display LCD
 + 	Power mode switching 	When this key combination is pressed during battery-power operation, the power-management (power-saving) mode changes as follows. High Auto Customize AC mode is used when the AC Adapter is attached.
 + 	Hibernation mode 	Places the computer in hibernation mode. See “Hibernation Mode” on page 73 for more information.

Operating the Numeric Keypad

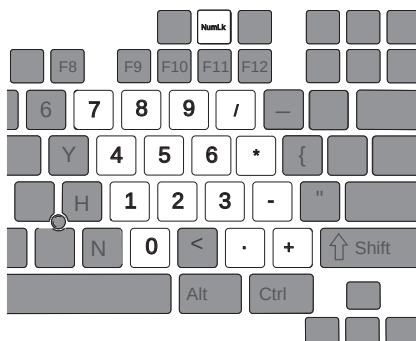
Operating the Numeric Keypad

The keyboard has some keys that, when enabled, work as if they were a 10-key numeric keypad. (The numeric keypad on the keyboard is not active when the external keyboard or the external numeric keypad is attached to the computer.)

Note:

The functions of the numeric keypad are printed on the front of the keys.

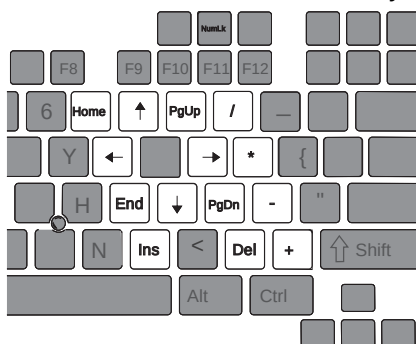
To enable the numeric keypad, press and hold **Shift** and then press **NumLk**.



Note:

The functions of the cursor- and screen-control keys are not printed on the keys.

When the numeric keypad is enabled, press and hold **Shift** to temporarily use the cursor- and screen-control keys.



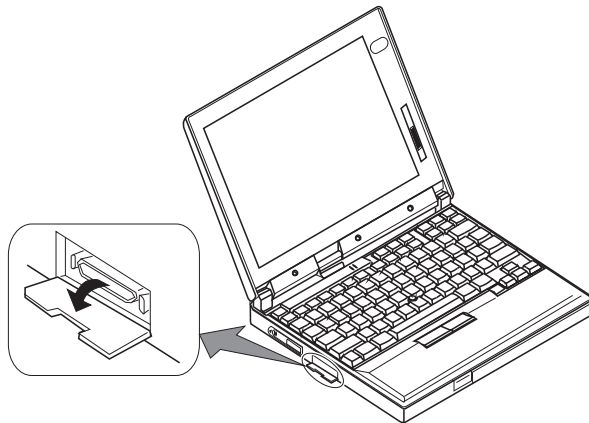
To disable the numeric keypad, press and hold **Shift**; then press **NumLk** again.

Using the External Diskette Drive

1 Turn off the computer.

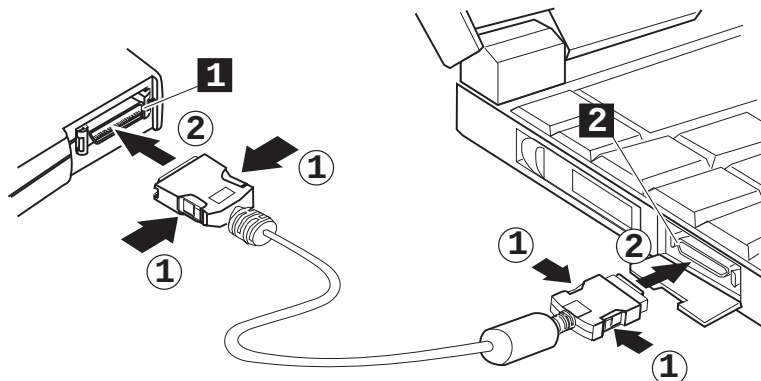
Make sure you turn off the computer. Otherwise, the computer will not recognize the external diskette drive when computer power is turned on.

2 Open the cover on the external-diskette-drive connector.



3 Attach the cable to the external diskette drive 1 ; then to the external-diskette-drive connector on the side of the computer 2 .

Press the sides of the connector ((1)) as you connect it to the devices ((2)).



Using the External Diskette Drive

4 Turn on the computer.

Formatting 1MB diskettes under OS/2

When you format a 1MB (2DD) diskette using the external diskette drive under OS/2, use the following parameter on the FORMAT command for it to format correctly:

```
C:>FORMAT A: /F:72
```

Keeping the Computer from Being Damaged

Your computer is a delicate device that requires careful handling. To keep it from being damaged, keep these precautions in mind:

- Do not allow your computer to be subject to any physical shock.
- Do not place anything heavy on your computer.
- Do not pour liquid onto your computer.
- Keep the computer at least 13 cm (5 in.) away from any electrical appliance that generates a strong magnetic field such as a motor, magnet, TV, refrigerator, or large audio speakers.
- Use your computer when temperatures are between 5°C to 35°C (41°F to 95°F), between 10°C to 35°C (50°F to 95°F) when operating with diskettes.
- Do not disassemble the computer.
- Do not scratch, twist, hit, or push the surface of the LCD.
- Remove the battery pack and keep it in a cool place if you will not be using the computer for a long period of time.
- Insert a diskette straight into the external diskette drive. Inserting it at an angle can damage the front of the external diskette drive.
- Do not place more than one diskette label on a diskette. Two or more labels can cause a label to tear apart inside the drive and cause damage to the external diskette drive.

Occasionally clean your computer as follows:

- Use a soft cloth moistened with nonalkaline detergent to wipe the exterior of the computer.
- Gently wipe the LCD with a dry, soft cloth. Do not use alcohol or detergent.

Carrying the Computer

When carrying your computer, follow these instructions to prevent possible damage to your computer and data:

- 1** Remove any media from the external diskette drive.
- 2** Turn off all attached devices.
- 3** Turn off the computer and close the LCD.
- 4** Unplug all external cables and cords connected to the computer.
- 5** Make sure all covers on the computer are closed.

For Your Information

- 1.** You should occasionally back up data from the hard disk to diskettes or tapes.
- 2.** To use the AC Adapter outside your home country, you need an ac power cord that is certified for the country you are visiting. You can purchase one through IBM authorized reseller or IBM marketing representative in that country. For information about power cords, see "IBM Power Cords" on page 222.
- 3.** A carrying case is available from your IBM authorized reseller or IBM marketing representative.

Chapter 3. Operating Your Computer

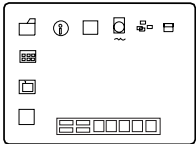
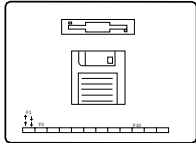
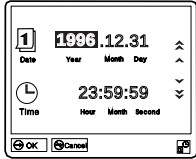
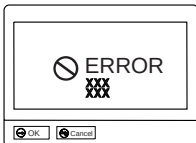
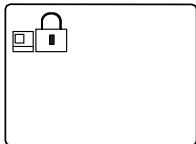
This chapter provides information about the use of your computer.

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What Happens after Power-On?

What Happens When Power Is Turned On?

You see one of the following prompts when the computer is turned on:

 An operating system screen	An operating system screen appears when the computer is operating correctly. The screen you see may differ depending on your operating system.
	This screen appears when an operating system is not found. It instructs you to insert a self-starting diskette into the diskette drive and press F1 to start the diskette. The order in which the computer checks the drives for an operating system is set in the drive-startup sequence. See “Using the Selectable Drive-Startup Sequence” on page 38 for more information.
	This screen instructs you to set the date and time for the first time. Enter the date and time (see page 36); then press Enter .
	This screen indicates that a failure occurred during the power-on self-test (POST). See page 154 for the necessary actions.
	This icon appears when a power-on password is set. To start the computer, enter the correct password.

Using the ThinkPad Features Program

Note:

When installing an operating system, you must also install the ThinkPad Features program.

To install the ThinkPad Features program:

 Chapter 7.

ThinkPad Features is a control program that allows you to configure your computer. Using the ThinkPad Features program, you can easily set up and customize the built-in devices, such as the parallel port or infrared port.

It also provides the Device Configuration Management System, which automatically detects a system resource (such as IRQ, DMA, I/O address, or memory) conflict, so that you can easily set up your computer configuration for the new device or software. For more detail about each device's resource, see Appendix A.

ThinkPad Features also provides various features for your computer such as:

Power management detail settings

Screen resolution and color depth for both LCD and external monitor

Fuel-Gauge program

- Remaining power percentage
- Current power mode

Fuel-Gauge program:

 Page 60.

Personalization editor program:

 Page 83.

Personalization editor

Alarm

Starting the ThinkPad Features Program

The way you start the ThinkPad Features program depends on the operating system.



Starting the Program for OS/2 and Windows

The ThinkPad Features program is a user-friendly graphical user interface. You can select or change any option in the ThinkPad Features program by simply clicking on the buttons on the screen with a pointing device. You can also specify features by entering the appropriate PS2 commands at the command prompt (see Appendix C).

To start the ThinkPad Features program:

For OS/2 or Windows 3.11: double-click on the **ThinkPad Features** icon.

For Windows 95: click on **Start**, select **Programs**; then select **ThinkPad**.

In the ThinkPad Features window, you can:

Customize the settings for the one-touch setup buttons.

View or set the configuration for the built-in devices. This allows you to detect or resolve system resource conflicts.

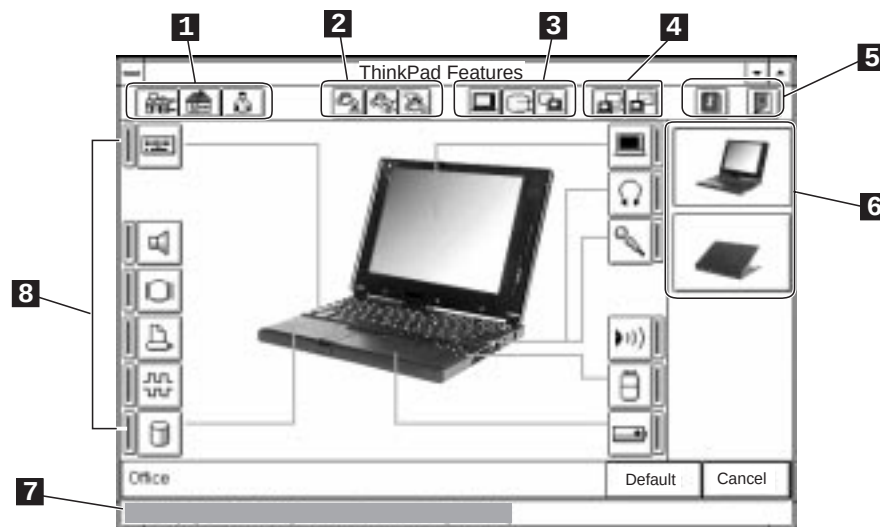
For your information

A *Help* button is available on the screen. For additional information on each menu item, click on the help button.

Using the ThinkPad Features Program

Note:

Any buttons on the screen that appear in gray are options that cannot be set.



1 One-touch setup buttons.

Click on one of the buttons to set the system configuration automatically to fit your office (), or your home (), or to customize it ().

2 Power mode buttons for battery operation.

Click on one of the buttons to set the power mode for battery operation to high performance mode (), automatic mode (), or customized mode ().

3 Display device buttons.

Click on one of the buttons to set the display output type to the LCD (), external monitor (), or both ().

4 When making a presentation, you can click on the presentation button () to disable any system timers, such as turning the LCD off or entering a power-saving mode.

5 Click on the left button for help. Click on the right button to save the changes made and to exit the ThinkPad Features window.

Using the ThinkPad Features Program

6 View angle buttons

Click on the buttons representing the front or rear view to display the choices and options from that computer view.

7 Status bar

When you place the cursor on a device button, the device name and its status appear in this status bar.

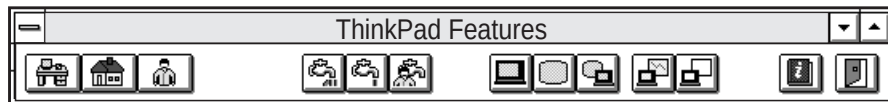
8 Device buttons

Click on the button of your choice from the screen; then set the options for that device in the window that appears.

When the device is enabled, the red indicator next to the icon is lit. Otherwise, it is disabled.

Click on the **Cancel** button to exit the ThinkPad Features program without saving the changes. Click on the **Default** button to set the default values for each option and cancel the changes you have made.

When you press the minimize button in the top-right corner (▼), the following Tool Bar view is displayed.



Using the ThinkPad Features Program

DOS

Starting the Program in DOS

The ThinkPad Features program for DOS is a command line interface, so you can specify features by entering appropriate commands. Type PS2 ? at the DOS prompt to display the ThinkPad Features online help.

Notes:

1. You can use the PS2 commands from the command prompt in OS/2.
2. This menu screen might look different on your system.

```
C:\>PS2 ?

(C) Copyright IBM Corp. 1993,1996. All rights reserved.
US Government Users Restricted Rights - Use, duplication
or disclosure restricted by GSA ADP Schedule Contract
with IBM Corp.

Command Syntax: PS2  [Parameter1] [Parameter2] [Parameter3]

Following are available [Parameter1].
For the complete command syntax, type 'PS2 ? [Parameter]'.

1.Power Management related
```

You can select an item from the menu and follow the instructions on the screen to set any of the features. For details on the commands, see Appendix C.

You can create a batch file to set your unique operating environment quickly and easily.

Note:

Refer to the manuals supplied with the operating system for more information on batch files.

The following example batch file allows you to set up an operational environment that is suitable for traveling and can result in longer battery operation time.

```
@Echo Off

Rem SAMPLE: Set the parameters to provide maximum power utilization.
Rem =====

PS2 PMode Auto           > Nul
PS2 LCd 3                > Nul
PS2 DISK 3               > Nul
PS2 P0wer 5              > Nul
PS2 SPeed Fixed MIN      > Nul
PS2 STandby 3            > Nul
PS2 IR Off               > Nul
PS2 CARD Off             > Nul
PS2 SERial Off           > Nul
```

Using Easy-Setup

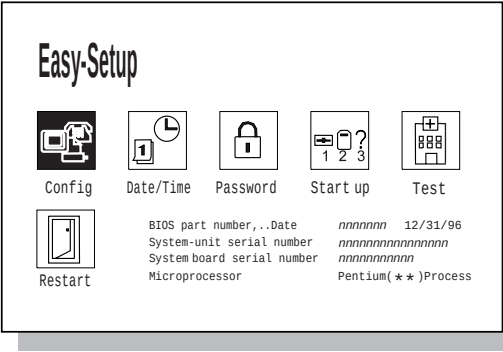
The computer has a built-in system setup function called *Easy-Setup*. Easy-Setup allows you to set the date and time, password, the startup sequence of the drives, and shows hardware configurations. Easy-Setup also runs the diagnostics.

Starting Easy-Setup

To start Easy-Setup:

- 1 Turn off the computer.
- 2 Remove any diskette from the external diskette drive.
- 3 Press and hold **F1**; then turn on the computer. Hold **F1** until the Easy-Setup menu appears.

Note:
You can change the screen color of the Easy-Setup menu with the key combinations of **Ctrl+PgUp** or **Ctrl+PgDn**. Use **Ctrl+Home** to restore the original screen color.



Using Easy-Setup

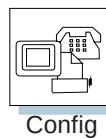
To select an item from the Easy-Setup menu, move the pointer with a pointing device to the item and click on the item or use the keyboard as follows:

Arrow keys (↑↓←→): Highlights the item from the menu.

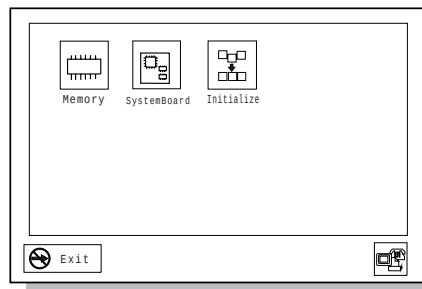
Spacebar: Selects the item.

Enter key: Enters the next menu, or saves the changes and exits the menu.

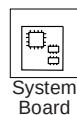
Esc key: Returns to the previous menu, or cancels the changes.



Config contains the following:



Memory shows the amount of installed memory and available memory.



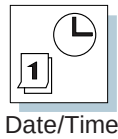
SystemBoard provides information about the installed system board.



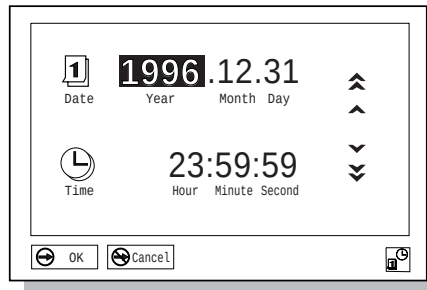
Initialize sets all items that have been changed back to their default values.

After verifying your selections, click on **OK** or press **Enter**. To cancel the selections, press **Esc**.

Using Easy-Setup

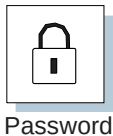


Date/Time is used to set the current date and time.



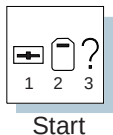
Select any field (Year, Month, Date, Hour, Minute, or Second) with the **Arrow** keys or pointing device; then type or click on the **▲** or **▼** icon to change the setting. Clicking on the **▲** or **▼** icon changes the setting more quickly.

After verifying the selection, click on **OK** or press **Enter**. To cancel the setting, click on **Cancel** or press **Esc**.

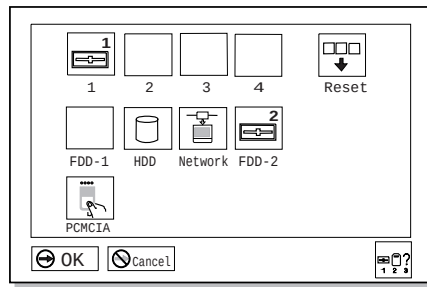


Password is used to set the power-on password.

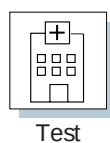
For more information about the power-on password, see Chapter 5.



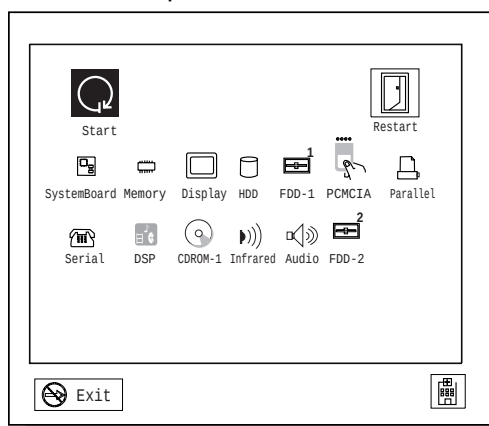
Start up is used to change the startup sequence of your computer.



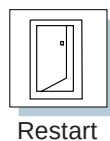
For more information about the startup sequence, see “Using the Selectable Drive-Startup Sequence” on page 38.



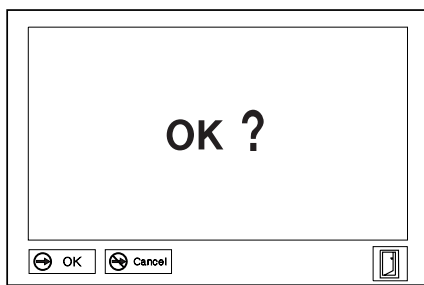
Select **Test** to test the computer hardware.



For more information, see “Testing the Computer” on page 146.



Click on **Restart** to restart the computer after you have made your selections. Then press **Enter** or click on **OK**.



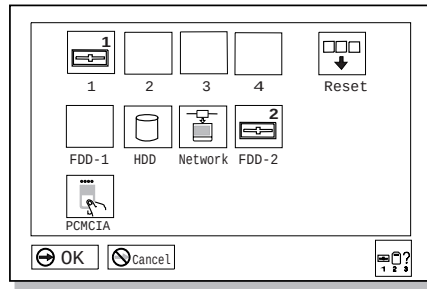
Using Easy-Setup

Using the Selectable Drive-Startup Sequence

Attention:

If you change your startup sequence, you must be extremely careful when you do write operations (such as copying, saving, or formatting). Your data or programs can be overwritten if you select the wrong drive.

Selectable drive startup (*selectable boot*) allows you to control the startup sequence of the drives in your computer. The order in which the computer searches the drives for your operating system is the *drive-startup sequence*. If you are working with multiple operating systems, you might want to change the drive-startup sequence to load an operating system from the hard disk or a PC Card without checking the diskette drive, or to do a remote program load (RPL).



Changing the Startup Sequence

To change the startup sequence:

To start Easy-Setup:



Page 34.

1 Start Easy-Setup and select the **Start up** icon.

2 Move the cursor to the **Reset** icon; then press the **Spacebar**.

The sequence is reset, and all available device icons appear at the bottom of the screen. For the meaning of the icons, see page 36.

3 Move the cursor to the icon for the first device in the startup sequence; then press the **Spacebar**.

Repeat this step to set the other devices for the startup sequence. You can set up to four devices.

4 Click on **OK** or press **Enter** to save the change.

Note:

You cannot set a hard disk drive (HDD) before a PC Card (PCMCIA) in the startup sequence.

Selecting the Network RPL Speed

When you use a remote program load through a token-ring card or other network card, the RPL speed can be selected.

1 Start Easy-Setup and select the **Start up** icon.

2 Move the cursor to the **Network** icon; then press the **Spacebar**.

The window to select the token-ring RPL speed appears.

3 Move the cursor to the **4** icon or the **16** icon; then press the **Spacebar** and press **Enter**.

If you are using another card, such as an Ethernet card, press **Esc** to exit this window.

Using the Computer LCD or the External Monitor

This section provides information about using the computer display and an external monitor. It also provides considerations when using DOS applications.

The LCD of your computer uses thin-film transistor (*TFT*) technology or dual-scan super twisted nematic (*DSTN*) technology. The TFT displays computer output with SVGA (800-by-600 resolution) video mode and 65,536 colors. In contrast, the DSTN displays computer output with SVGA video mode and 256 colors.

Display Output Type

To attach an external monitor:

 Page 43.

When you attach an external monitor that supports resolution higher than VGA mode, you can get a maximum of 1024-by-768 video resolution.

To display your computer output on an external monitor, you need to set the appropriate *display output type* (where to display the computer output). You can select one of the following display output types:

LCD (): The computer output is displayed only on the LCD of the computer.

CRT (): The computer output is displayed only on the attached external monitor.

If no external monitor is attached to the computer and the display output type is set to *CRT*, the output is displayed on the LCD.

Both (): The computer output is displayed on both the LCD and the external monitor.

You can select where to display computer output among the LCD, the external monitor, or both by using the following commands:

Using the Computer LCD or the External Monitor

Using the **Fn** key function:

Press and hold the **Fn** key; then press the **F7** key. The output is displayed sequentially as follows:

External Both
Display

LCD



Using the ThinkPad Features program:

1. Start the ThinkPad Features program.
2. Click on the following icons from the tools bar:
 - The **CRT** () icon to display information on the external monitor.
 - The **LCD** () icon to display information on the LCD.
 - The **Both** () icon to display information on both the LCD and external monitor.

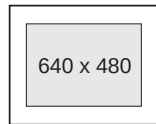


Entering a PS2 command from the command prompt:

- Type PS2 SC BOTH to display information on both the LCD and external monitor.
- Type PS2 SC CRT to display information on the external monitor.
- Type PS2 SC LCD to display information on the LCD.

Considerations for DOS Screen on the LCD

When you use a DOS application that supports only VGA mode (640-by-480 resolution) with your computer, the screen image might appear smaller than the display size, as shown:



This is to maintain compatibility with DOS applications.

PS2 command for screen expansion:



Page 215.

ThinkPad Features program:



Page 29.

To expand the screen image to the same size as the actual screen, you can use the *screen expansion* function. You can expand the screen image by clicking on the **Display** button () in the ThinkPad Features program or by entering the PS2 HVEXP ON command. However, the image may look slightly distorted.

Attaching a Monitor

Note:

When installing an operating system, you must install the display driver before you can use an SVGA external monitor.

To install the display driver:



Chapter 7.

Attention:

When you select **Both**, do not attach an external monitor that supports only VGA mode (640-by-480 resolution). Otherwise, the external monitor screen is scrambled and the output is not displayed, or the screen might be damaged. Use **CRT** instead.

The following is a summary of how to attach an external monitor:

- 1** Attach the external monitor to the computer.
(See “Connecting an External Monitor to the Computer.”)
- 2** Change the display output type to **Both** ().
(See “Display Output Type” on page 40.)
- 3** Set your monitor type and display device driver.
(See “Setting the Monitor Type and the Display Driver” on page 44.)

If you are attaching an SVGA monitor, refer to “Using SVGA Video Mode” on page 45 for information on the supported color depth or resolution.

Connecting an External Monitor to the Computer

Attention:

Do not disconnect the external monitor while the computer is in suspend mode or hibernation mode. If no external monitor is attached when the computer resumes, the LCD remains blank and the output is not displayed. This does not depend on the resolution value.

To attach an external monitor to the computer:

- 1** Turn off the computer.
- 2** Attach the external monitor to the external monitor connector on the rear of the computer; then to the electrical outlet.
- 3** Turn on the external monitor and the computer.

Attaching a Monitor

Setting the Monitor Type and the Display Driver

Before attaching the external monitor to your computer, set the appropriate monitor type and device driver type as follows:



Note:

Refer to the specifications for your external monitor to determine its supported resolutions and refresh rates.

1 Start the ThinkPad Features program.

2 Click on the **Display** ( or ) icon.

3 Click on the **Advanced...** button.

You can select your display type from the monitor list, or click on a new resolution or refresh rate.

4 Restart the computer to make the changes effective.

Important

When you are using OS/2 Warp, do not use **System** in the System Setup folder to change the resolution or color depth. Use the ThinkPad Features program to configure the display.

Hints and Tips

When you are using OS/2 or Windows, the *virtual screen* function is available with the ThinkPad Features program. It is used to display a part of the high-resolution screen image that is produced by the computer. Other parts can be seen by moving the screen with the TrackPoint III or other pointing device.

Using SVGA Video Mode

Note:

When installing an operating system, you must install the display driver supplied with the computer to use SVGA mode.

The ThinkPad 560 computer has an LCD that supports an SVGA video mode with 800x600 resolution. You can also display information in higher resolutions by attaching to your computer an external monitor that supports higher resolutions. The following table shows the various display modes (resolution and color depth) available with your computer or external monitor. Use this table to set the display output (LCD, CRT, or both).

Displaying output on the LCD or both on the LCD and monitor
(**LCD** or **Both**)

Resolution	Supported Color Depth	
	TFT models	DSTN models
640x480	256 and 65,536	256
800x600	256 and 65,536	256
1024x768 (virtual screen)	256 and 65,536	256

Displaying output on the monitor (**CRT**)

Resolution	Frame Rate	Supported Color Depth	
		TFT models	DSTN models
640x480	60Hz	256, 65 536, and 16 777 216	256, 65 536, and 16 777 216
	72Hz		
	75Hz		
	85Hz	256 and 65,536	256 and 65,536
800x600	60Hz		
	75Hz		
	85Hz		
1024x768	60Hz	256	256
	75Hz		
	85Hz		
	85Hz		
	43.5Hz (interlace)		

Motion Video Playback

When the ThinkPad display device driver is installed in the computer, the computer is equipped with the motion video playback acceleration function. This function is automatically enabled and is ready to play back motion video driven by an application.

However, the acceleration function is available only in the following display settings:

On a monitor		On TFT models		On DSTN models	
Color	Resolution	Color	Resolution	Color	Resolution
256	64 x48	256	64 x48	256	64 x48
	8 x6		8 x6		8 x6
	1 24x768		1 24x768		1 24x768
65,536	64 x48				

* Virtual screen enabled.

Hints and Tips

If you have changed the display setting and the playback video quality is unsatisfactory, check whether your current display setting is supported in the preceding table. If the it is supported, try using 800-by-600 resolution and 256 colors.

If you are using the TFT display with 800-by-600 resolution, select 256 colors instead of 65,536 colors for better screen image. Use the display function in the ThinkPad Features program.

If you are playing back video in a WIN-OS/2 full screen, stop the video before you switch back to an OS/2 session.

The performance to playback motion video depends on the speed to transfer data, other concurrently running applications, and the playback application. For best playback results, make sure the motion video data has a fast data transfer speed and that other applications are closed.

Using PC Cards

To insert a PC Card:

 Page 90.

PC Card standard:

 Page 191.

Your computer has two slots that allow you to install 68-pin, 85.6mm × 54.0mm (credit-card-size) PC Cards. With a PC Card, you can send and receive faxes, communicate through a network, or store data.

The PC Card slots of the computer conform to the PCMCIA Standard Release 2.1 which is defined as the hardware layer of the PC Card standard. Your computer also comes with the following basic set of drivers:

- Socket Services
- Card Services
- PC Card Director and common enablers

PC Card Director:

 Page 48.

The PC Card slots operate at 5V and support the following:

- Type I, Type II, and Type III PC Cards
- 16-bit PC Card (PCMCIA 2.0,2.1/ JEIDA 4.1,4.2)

The PC Card slots do not support 8-bit or 16-bit slave DMA PC Cards. Ask IBM or an IBM authorized reseller for more information about the different types of PC Cards.

For more information about PC Cards, see Appendix B.

PC Card Limitations under Power Management

Although some PC Cards can be inserted or removed without turning off the computer (refer to the instructions that came with the PC Card), you *cannot* remove or install PC Cards during suspend mode.

If you are using one of the IBM communication PC Cards listed on page 76, the computer cannot enter hibernation mode.

Using the PC Card Director Program

Using the PC Card Director Program

Note:

When installing an operating system, install the PCMCIA device driver with the PCMCIA Installation Diskette to use PC Card Director.

To install the PCMCIA device driver:



Chapter 7.

Note:

The PCMCIA.CRD file does not always list the latest PC Cards. If your PC Card is not listed, try using it with PC Card Director anyway.

The **Supported PC Cards** icon:



Page 50.

Your computer comes with an advanced IBM program for PCMCIA called **PC Card Director**, which makes using PC Cards with your computer easier by:

Turning on and setting up a PC Card when you insert it in a PC Card slot (common enablers).

Showing what type of PC Card is in your computer.

Notifying you with a message, sound, and icons whenever a card is inserted or removed.

Allowing you to register an application program for a particular PC Card and starting the program automatically when the card is inserted.

Some PC Cards come with their own device driver that will set them up just like PC Card Director does. However, if these cards are supported by PC Card Director, you do not need their device drivers. The PC Cards that PC Card Director supports are listed in the **PCMCIA.CRD** file.

To see the **PCMCIA.CRD** file, click on the **Supported PC Cards** icon in the PC Card Director window. (The PCMCIA.CRD file can be accessed from OS/2 Warp and Windows 3.11.)

If your PC Card is not supported by PC Card Director, you must install the driver that came with your card. The card driver must be compatible with the PCMCIA Card Services Standard Release 2.1. Follow the instructions in your PC Card manual to install the driver.

Using the PC Card Director Program



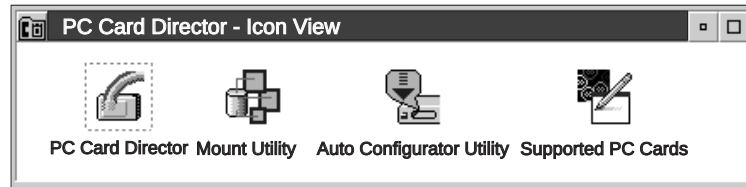
Starting PC Card Director for OS/2 or Windows

Notes:

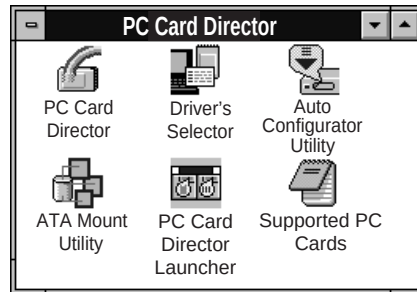
1. The screens in this section might look different depending on your operating system.
2. Supported icons and functions by PC Card Director are different depending on each operating system.

To start PC Card Director, select the PC Card Director folder or window; then select the **PC Card Director** icon.

For OS/2:



For Windows 3.11:



For Windows 95:



Using the PC Card Director Program

The PC Card Director program includes the following:



PC Card Director

PC Card Director. The main program in the PC Card Director folder or window.



Mount Utility

Mount Utility. This program controls partitions of ATA PC Cards.



Auto Configurator

Auto Configurator. The Auto Configurator has prepared a script file for configuring each PC Card. These script files contain steps for enabling the PC Card and the resource information for its I/O interrupt level or memory. The Auto Configurator Utility is a utility that edits these script files, transforms them into binary data, and records them in Auto Configurator. Then Auto Configurator enables each PC Card, based on the data in the card's script file.

Note:

Refer to the PCMCIA.CRD file for a list of PC Cards that Auto Configurator can enable.

For more information on how to use the Auto Configurator, see Appendix B.



Supported
PC Cards

Supported PC Cards. This shows the **PCMCIA.CRD** file that lists all PC Cards supported by PC Card Director.



Drivers Selector

Drivers Selector. This program helps you modify the CONFIG.SYS file when you add or remove some PC Card device drivers.



PC Card Director
Launcher

PC Card Director Launcher. You can register up to 15 application programs in this launcher.

DOS

Starting PC Card Director for DOS

To start PC Card Director for DOS:

- 1** Go to the DOS command prompt.

```
C:\>
```

Note:

C:\THINKPAD is the directory where PC Card Director is installed. If you have installed it in a different directory, type that directory name instead.

- 2** Type C:\THINKPAD\EZPLAY at the command prompt; then press **Enter**.

Communicating with the Infrared Port

Using the Infrared Communication Feature

Note:

When installing an operating system, you must install the infrared device driver.

To install the infrared device driver:



Chapter 7.

Note:

Kbps: Kilobits per second

Your computer is equipped with an infrared (IR) communication feature that allows point-to-point communication with other ThinkPad computers or systems equipped with an infrared port. The infrared port is on the power switch of the computer.

The infrared feature supports the generic IrDA** 1.0 mode at a data transfer speed of up to 115 Kbps. Your computer can communicate with a device that has a compatible infrared port, such as another ThinkPad, a Hewlett-Packard** 100LX**, 200LX**, Omnibook**, or other IrDA-compliant systems.

To enable the infrared port, use the ThinkPad Features program:

If you are using OS/2 or Windows, click on the

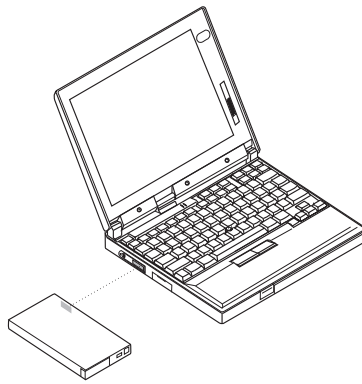
Infrared () icon in the ThinkPad Features window.

*If you are using DOS, type PS2 ? IR at the command prompt; then press **Enter** for more information.*

Considerations for Communication

Consider the following when communicating with the infrared port:

When communicating between the infrared port and an infrared port on another computer, the infrared ports on the computers must face each other directly at a communicating distance.



You need to run the same communication application on both computers to communicate between your computer and another computer device. Refer to the application manuals for more information.

Run only one communication application for the infrared port at a time.

The communicating distance might need to be less if:

- The other system is not the same model as your computer.
- There is interference from ambient light. It is recommended that you do not use infrared communication in bright sunshine. Light from a certain type of fluorescent lamps can also interfere with communication.
- The infrared port is not directly facing the other communicating port.

Headphones or audio-visual devices that use infrared may interfere with your communication. You might hear noise through the headphones, or the computer might not be able to communicate with other devices through the infrared port.

Using Audio Features

Note:
When installing an operating system, install the ESS AudioDrive support software to use the ESS AudioDrive feature.

To install the ESS AudioDrive support software:
 Chapter 7.

The computer provides the *ESS AudioDrive Sound* feature, which is based on the AudioDrive sound chip installed in your computer. The ESS AudioDrive sound feature gives you high performance for audio functions with the following features:

- Stereo business audio (8- to 16-bit) with Sound Blaster Pro** compatibility
- Playback of recorded sound or prerecorded sound files, such as .WAV files
- A -inch (3.5-mm) diameter external stereo line-in or monaural microphone-in jack
- A -inch (3.5-mm) diameter stereo headphone-out jack

Use the ESS AudioDrive feature according to your operating system.



Note:
Do not enter suspend mode when using the audio functions.

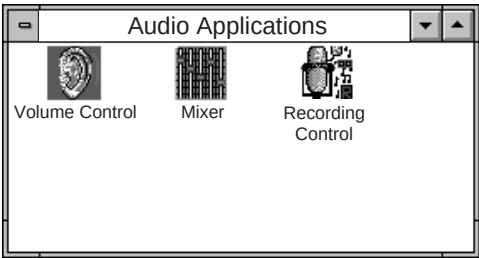
Using the Audio Function for OS/2

The ESS AudioDrive feature supports audio in the OS/2 environment through the Multimedia Presentation Manager/2 (MMPM/2). To use the ESS AudioDrive functions with OS/2, open the **Multimedia** folder from the OS/2 desktop.



Using the Audio Function for Windows

To use ESS AudioDrive in Windows, click on the **Audio Applications** icon in the Main Program group. The following screen appears:



Chapter 4. Using Battery Power

This chapter describes battery pack operations.

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Charging with the AC Adapter	56
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Using the Battery Status Indicator	59
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Battery-Powered Operation

Charging the Battery Pack

Note:

When you charge the lithium-ion battery pack, the battery pack temperature must be at least 10°C (50°F).

You can charge the battery pack when the AC Adapter is connected to the computer and the battery pack is installed. You must charge the battery pack in any of the following conditions:

When a new battery pack is purchased.

When the battery status indicator starts blinking (.

Charging with the AC Adapter

Note:

When carrying your computer without the AC Adapter, carry with you a fully charged battery pack for maximum operating time.

If the battery pack is new or has not been used for a long time, it will not be fully charged with only a single charging. You will have to completely use it; then recharge it three to six times to maximize battery operating time.

The following describes how to recharge the battery pack with the AC Adapter when the computer is turned off:

- 1** Make sure the computer is turned off, and a new or discharged battery pack is installed in the computer.
- 2** Connect the AC Adapter to the computer, and then to the electrical outlet.

The battery pack charges after approximately **1.5 hours**. (It takes approximately **2.5—3.5 hours** when charging under operating the computer.)

Replacing the Battery Pack

When the AC Adapter is connected, you can replace the battery pack anytime when it is low in power. Without the AC Adapter, the battery pack can be replaced when the computer power is off, or when the computer is in hibernation mode. To replace the battery pack during hibernation mode and without turning off the computer, follow these instructions.

Important

If you are using PC Cards, either connect the AC Adapter or stop the PC Card application and remove the PC Card before doing the following procedure.

When you use an IBM PC Card that is listed on page 76, the computer does not enter hibernation mode. When replacing the battery pack, turn off the computer.

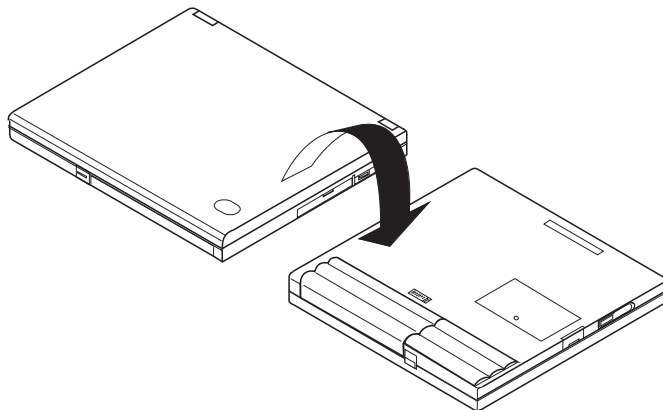
Make sure you have created the hibernation file before doing the following steps. Otherwise, you cannot enter hibernation mode. (See page 73.)

To create the hibernation file:



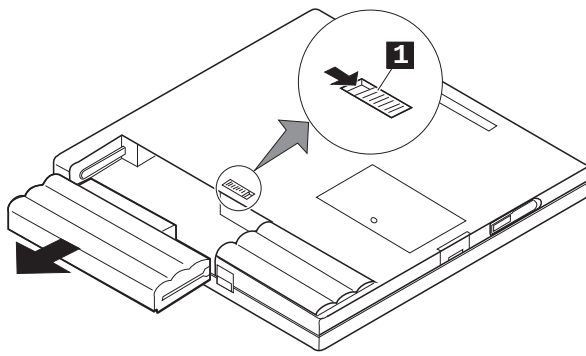
Page 73.

- 1** Enter the hibernation mode by pressing the **Fn+F12** key combination.
- 2** Close the LCD and turn the computer over.



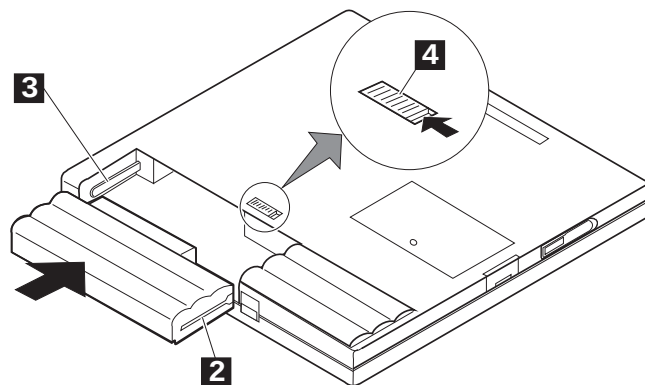
Replacing the Battery Pack

- 3** Slide the battery pack latch **1** ; then slide the battery pack toward the front of the computer and remove the battery pack.



- 4** Align the guides on the fully charged spare **2** with the ones on the computer **3** ; then slide the battery pack into the computer.

Fully press the battery pack into the computer. When it is fully installed, the battery pack latch **4** automatically locks into place.



- 5** Turn the computer over again; then open the LCD.
- 6** Press on the power switch.

The computer resumes normal operation from hibernation mode.

Monitoring the Battery Status

Battery power conditions can be determined through the battery status indicator and the Fuel-Gauge program.

Using the Battery Status Indicator

The battery status indicator shows the current status of the battery pack (only when the battery is installed).

Observe the battery status indicator () and compare it with the status list below to determine the battery condition.

Status	Condition	Action Required
Green	Enough power remains for operation.	—
Orange	The battery pack is being charged. (Only when the AC Adapter is connected.)	—
Blinking orange	Almost discharged (low battery). See "Low-Battery Condition" on page 60.	Do either of the following actions within 1 minute: Connect the AC Adapter to the computer; leave the battery pack installed. Replace the battery pack with a fully charged spare. (See "Replacing the Battery Pack" on page 57.)
Off	The battery pack is not installed. The computer is turned off or is in suspend mode when the AC Adapter is not connected.	You should take the necessary actions when the <i>blinking orange</i> condition occurs, before the computer enters suspend mode because of a low-battery condition. If suspend mode is caused by a low-battery condition, data in the memory can be lost. Do either of the following actions immediately: To continue your work with the AC Adapter: 1. Connect the AC Adapter to the computer. 2. Press the Fn key. To continue your work with a fully charged battery pack: 1. Connect the AC Adapter to the computer. 2. Replace the battery pack with a fully charged one. 3. Press the Fn key. 4. Disconnect the AC Adapter from the computer.

Using the Fuel-Gauge Program

Low-Battery Condition

Attention:

Do not leave the computer in this condition for an extended time. Data in memory will be lost.

When the battery pack is low in power, the computer sounds three consecutive beeps and the battery status indicator () starts blinking. Connect the AC Adapter to the computer, or replace the battery pack with a fully charged spare. If you do not take the corrective actions within about 30 seconds, the computer will enter suspend mode.



Using the Fuel-Gauge Program

Note:

When you install an operating system, you must also install the ThinkPad Features program with the Utility Diskette before the Fuel-Gauge program can be used.

The Fuel-Gauge program displays the following battery-pack conditions on the screen:

- Power mode
- Battery status
- Suspend or hibernation options

To install the ThinkPad Features program:

 Chapter 7.

The Fuel-Gauge program is available in OS/2 or Windows. When you click on the **Fuel-Gauge** icon in the ThinkPad Features window, the Fuel-Gauge program appears. When you minimize the program to an icon, every time you press the **Fn+F2** key combination, the **Fuel-Gauge** icon appears or disappears alternately from the screen.

Using the Fuel-Gauge Program

Refer to the following descriptions and illustrations, depending on the power source, for the Fuel-Gauge program.

Maximized Fuel-Gauge program:

- The “Duration of Remaining Power” does not appear when the AC Adapter is connected.

AC Adapter Connected	Battery Operation

Minimized (to an icon) Fuel-Gauge program:

- The power source (AC Adapter or battery) and power mode alternately appear:

Power source

AC AC Adapter
BT Battery

Power mode

HI High Performance
AU Automatic
CU Customized

AC Adapter connected	Battery operation

Maximizing Battery-Powered Operation

Preserving Battery-Pack Life

To preserve the life of the battery pack:

Turn off the computer whenever it is not in use.

Keep the battery fully charged.

Maximizing Battery-Powered Operation

To save battery power:

Use Advanced Power Management (APM)

Decrease the LCD brightness

Use the Battery Power-Management function

Using Advanced Power Management

Note:

If you have purchased the computer with a preinstalled operating system, Advanced Power Management (APM) is already installed correctly.

The computer has power-management functions built in. No special power-management drivers have to be installed before you use the computer. However, the computer is able to conserve more power when APM is used.

APM allows you to reduce power consumption when your applications and devices are idle. Each operating system comes with its own APM.



If you are using OS/2, APM is automatically installed on your computer.



*If you are using DOS, APM is automatically installed on your computer. To verify that the computer has APM installed correctly, type `power` at the command prompt and press **Enter**. If a screen similar to the following appears, APM is successfully installed.*

```
Power Management Status
-----
Setting =  ADV: REG
CPU: idle 32% of time.
```

```
AC Line Status : OFFLINE
```

```
Battery status : High
```

If not, add the following line to your CONFIG.SYS file, using a text editor such as the DOS Editor:

```
DEVICE=C:\DOS\POWER.EXE
```

Maximizing Battery-Powered Operation



If you are using Windows 3.11, follow these instructions to check and install APM for Windows:

1. Start the computer. Make sure that the current directory is Windows (usually C:\WINDOWS>).
2. Type **SETUP** at the command prompt and press **Enter**. The following screen appears.

```
Windows Setup
=====

If your computer or network appears on the Hardware Compatibility List
with an asterisk next to it, press F1 before continuing.

System Information
Computer:      MS-DOS System
Display:      Cyberxxx 8  x6  256 small font
Mouse:        Microsoft, or IBM PS/2
```

If **MS-DOS System with APM** appears for the item **Computer:**, APM is already installed. Press **F3** to exit the setup.

3. Using the Arrow keys (↑, ↓), position the highlighted cursor over **MS-DOS System** and press **Enter**.
4. Position the highlighted cursor over **MS-DOS System with APM** and press **Enter**.
5. Verify that the item **Computer** has changed to **MS-DOS System with APM** on the screen. If not, return to step 3.

```
Windows Setup
=====

If your computer or network appears on the Hardware Compatibility List
with an asterisk next to it, press F1 before continuing.

System Information
Computer:      MS-DOS System with APM
Display:      Cyberxxx 8  x6  256 small font
Mouse:        Microsoft, or IBM PS/2
```

6. Press **Enter** to install APM.
7. Restart the system to make APM effective.

Maximizing Battery-Powered Operation



If you are using Windows 95, APM is automatically installed on your computer. To verify that the computer has APM installed correctly, do the following:

- 1.** Start Windows 95.
- 2.** Open **My Computer**.
- 3.** Open **Control Panel**.
- 4.** Open **Power**.
- 5.** Verify that the item **Power management** is set to **Advanced**.

If not, select **Advanced** from the pull-down menu.

Decreasing LCD Brightness

Adjust the brightness control () on the LCD to the lowest level possible that allows you to comfortably view the screen. This is an effective way of conserving battery power.

Using the Battery Power-Management Function

Note:

When you install an operating system, you must install the ThinkPad Features program using the Utility Diskette.

To install the ThinkPad Features program:

 Chapter 7.

Your computer has the following built-in battery power-saving functions to save power when you use the battery pack or the AC Adapter:

Operation modes. The operation modes control the processor speed or set timers for saving power. For more information about the operation modes, see 2 on page 31.

Power-saving modes. The power-saving modes stop all tasks when the computer is not used for a specified time.

When resuming normal operation from one of the modes, use the **resume function** to return to where you were when you entered that mode. Because the operating system is already loaded, the resume function is faster than turning the power on.

The following are the three power-saving modes:

Standby mode. You can enter standby mode for short idle times, such as when you are having a short conversation.

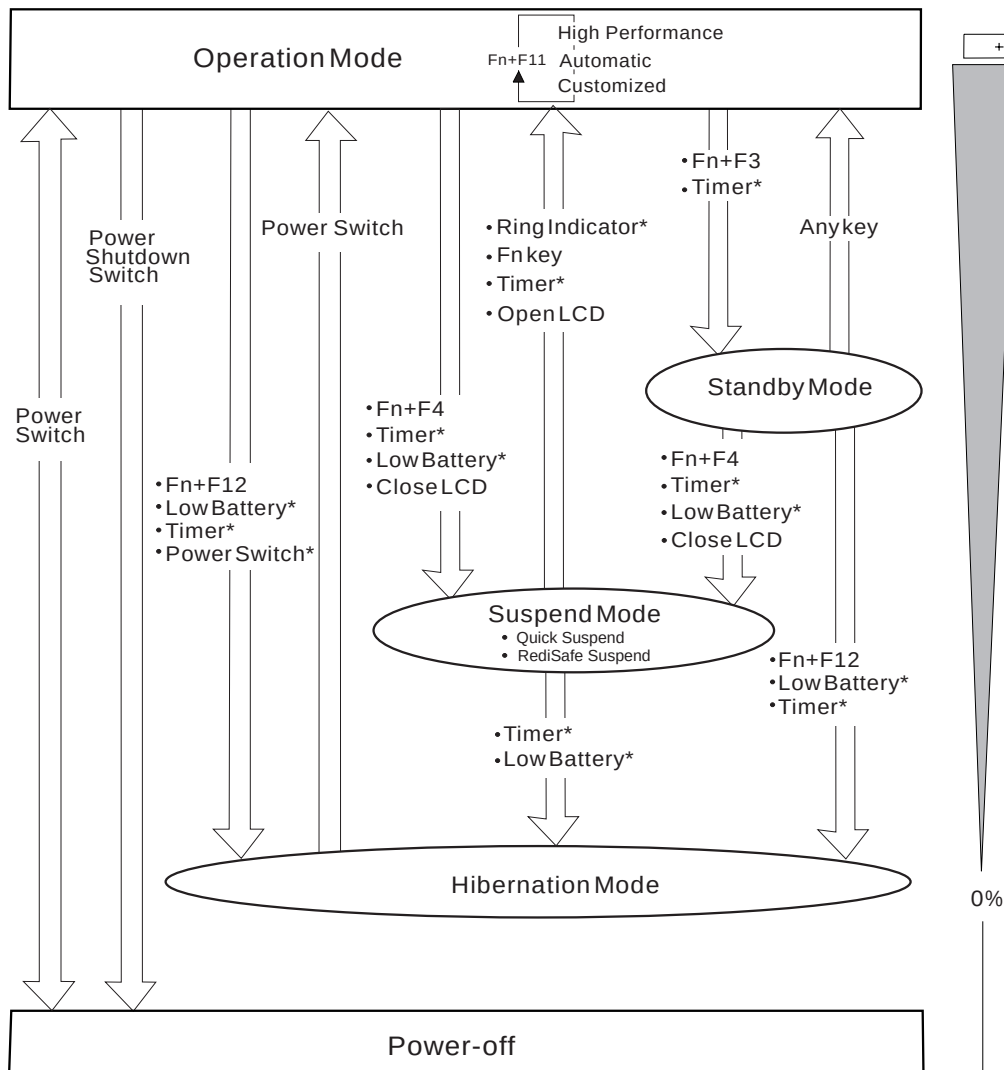
Suspend mode. You can enter suspend mode for somewhat longer times when you are away from your computer.

Hibernation mode. You can enter hibernation mode when you leave your office for the day.

It takes more time to return to normal operation from suspend mode than to return from standby mode, but the computer does not use as much power.

Using Power Management

The following figure shows the operations required when the computer moves from a power-off condition to operation mode, and vice versa. The battery shows the amount of battery power used in each stage.



* These options are set using the ThinkPad Features program.

Using Power Management

Standby Mode

In standby mode, the hard disk drive stops and the LCD turns off. The computer immediately resumes normal operation when you press any key or use any pointing device. Also, if a power-saving monitor (Energy Star Monitor) is in use when the computer enters standby mode, the computer activates the monitor's low-power mode.

Suspend Modes

The computer provides the following two types of suspend modes for you to save power:

- Suspend mode
- RediSafe suspend mode

The following indicators change status when using suspend mode:

Current Status	Indicator Lamps	
	 Suspend Mode	 Power-On
In Suspend Mode	Green	Off
Entering or Resuming Suspend	Blinking green	Off
Normal Operation	Off	Green

Suspend mode. In suspend mode, all tasks are stopped and stored in memory to save power. When the computer resumes normal operation, the tasks are automatically restored.

Using Power Management

To create hibernation file:



Page 73.

RediSafe suspend mode.

Create the hibernation file before using this mode.

In RediSafe suspend mode, all tasks are stopped, and memory data and the status of the computer are stored on the hard disk drive. This prevents accidental loss of data during suspend mode. Resuming normal operation is faster in RediSafe suspend mode than it is in Hibernation mode; the computer resumes normal operation when you press the **Fn** key in RediSafe suspend mode.

If all battery power is used and the computer turns off during RediSafe suspend mode, install a fully charged battery pack or connect the AC Adapter; then press the power switch to resume operation. All tasks are restored.

Using Power Management

To enable RediSafe suspend mode, do the following:



If you are using OS/2 or Windows:

1. Start the ThinkPad Features program.
2. Click on the **Battery** () icon; then click on the **Suspend/Hibernation/Resume options** () icon.
3. If a hibernation file has not been created, click on **Enable hibernation and create the file on the hard disk drive**.
4. Click on the check box next to **RediSafe suspend**. (A mark appears in the check box when RediSafe suspend is selected.)
5. Click on the **OK** button.



If you are using DOS:

1. Type PS2 HFILE C at the command prompt; then press **Enter** to create the hibernation file on drive C (type the drive letter of your choice).
2. Type PS2 SA E at the command prompt; then press **Enter** to enable suspend mode.

Considerations for Suspend Mode

Consider the following before using suspend mode.

The computer can enter suspend mode when used with the following operating systems:

- DOS Version 7.0
- OS/2 Warp Version 3
- Microsoft Windows Version 3.11 with DOS Version 7.0
- Microsoft Windows 95

Important

When you use Windows Version 3.11, ensure that Advanced Power Management (APM) is installed according to the instructions in “Installing Windows 3.11” on page 120.

Attached devices, such as a printer or serial device, stop running when the computer enters suspend mode. When you resume normal operation, the output might differ from what you expect, because the device might be reset or lose its configuration settings.

Sometimes you might want to use the computer with the LCD closed, for example, when an external monitor and keyboard are used. In such a case, turn on the computer with the LCD closed or use the ThinkPad Features program to set the computer to not enter suspend mode when the LCD is closed.

When a power-on password is set and the computer resumes normal operation by the ThinkPad Features timer or an incoming call, only a blank screen is displayed. To display a power-on password prompt, press any key or move your pointing device.

Using Power Management

Standby mode:



Page 68.

When the computer is powered with ac power and is using one of the following IBM PC Cards, it enters *standby mode*:

- IBM 3270 Emulation Credit Card Adapter
- IBM Token-Ring 16/4 Credit Card Adapter
- IBM Credit Card Adapter for Ethernet
- IBM 5250 Emulation Credit Card Adapter

When other PC Cards are used and the computer enters suspend mode, all application programs stop. Communication also stops for communication PC Cards not listed above. For some PC Cards, power to the PC Cards might also turn off.

When the computer is powered with battery power, the computer turns power off to the PC Card, and communication stops for communication PC Cards, so the duration of suspend mode is longer.

If communication for a PC Card is not reestablished after resuming normal operation, remove and then reinstall the PC Card before restarting the system or application program. For other kinds of PC Cards, if the PC Card or computer does not operate, restart the application or computer.

When the computer is using one of the following IBM modem cards and detects an incoming call while in suspend mode, the computer automatically resumes normal operation:

- IBM 28.8/14.4 Data/FAX Modem
- IBM PCMCIA Data/FAX Modem
- IBM High Speed PCMCIA Data/FAX Modem
- IBM Microelectronics 2.4/9.6 Data/FAX Modem
- IBM Microelectronics 14.4/14.4 Data/FAX Modem
- IBM Wireless Modem for ARDIS
- IBM Wireless Modem for Mobitex
- IBM Wireless Modem for Cellular/CDPD

While a communication link is active, the computer does not enter suspend mode.

Note:

You must set the **Resume on incoming call** option in the ThinkPad Features program so the computer automatically resumes normal operation.

For OS/2 or Windows:

1. Click on the **Battery** () icon.
 2. Click on the **Suspend/Hibernation/Resume** option () icon; then select the **Resume on incoming call** option.
- For DOS: Enter PS2 RI E

Hibernation Mode

Notes:

1. Before using hibernation mode, you must create a hibernation file.
2. Using a particular PC Card can disable the hibernation mode. (See page 76.)
3. With a base memory of 8MB, it takes approximately 10 seconds to enter hibernation mode and 18 seconds to resume normal operation. (The time to enter or exit hibernation mode depends on the computer memory size.)

In hibernation mode, all tasks are stopped and memory data and the current status of the computer are stored on the hard disk drive; *then power is turned off*. No battery power is used. When power is turned on again, the computer automatically restores the tasks and resumes normal operation. When the computer enters hibernation mode, you hear one short beep. A graphical message appears and the suspend mode indicator lamp blinks; then a short beep sounds again to inform you that the computer has entered hibernation mode.

Creating the Hibernation File

Attention:

The hibernation file must not be created in a compressed data area of the hard disk.

When installing an operating system or installing additional computer memory, you must create a hibernation file on the hard disk drive to use the hibernation mode. (You need to create the hibernation file only once after installing an operating system or additional memory.)

The size of the hibernation file will be approximately 1MB greater than total memory. For example, if you have installed an optional 16MB memory module (DIMM) and since the base memory is 8MB, the hibernation file is 25MB:

$$(16\text{MB} + 8\text{MB}) + 1\text{MB} = 25\text{MB}$$

The following describes how to create a hibernation file for your operating system.

Using Power Management



If you are using OS/2 or Windows:

- 1** Turn on the computer and start the ThinkPad Features program.
- 2** Click on the **Battery** () icon.
- 3** Click on the **Suspend/Hibernation/Resume options** () icon.
- 4** Click on the **Enable Hibernation** button in the menu.
- 5** Make sure the hard disk drive in the computer is selected; then select **OK** to create the hibernation file.

The computer can now enter hibernation mode.



If you are using DOS:

Type `PS2 HFILE C` at the command prompt; then press **Enter**.

The hibernation file is created on drive C.

Considerations for Hibernation Mode

Consider the following before using hibernation mode:

Do not run any tasks while the hibernation file is being created.

Create the hibernation file only on the hard disk drive installed in the computer. The hibernation file is hidden and cannot be accessed.

The computer uses battery power to enter hibernation mode. Therefore, it reserves some battery power when it is set to enter hibernation mode when a low-battery condition occurs. This can cause the battery operating time to be shorter than the time publicly stated.

Do not add or remove memory during hibernation mode. If you do, the computer resumes from hibernation mode without recognizing the changed memory size. To ensure that the computer recognizes the correct memory size, shut down; then restart your operating system.

Note:

If the communication links are still not reestablished, remove and then reinstall the PC Card before restarting the system or application program.

When the computer is powered with battery power, the computer turns power off to the PC Card when entering hibernation mode. When resuming normal operation, if the PC Card or computer does not operate, restart the application or computer.

When the computer is powered with ac power, it does not enter hibernation mode if it is using one of the following IBM PC Cards:

- IBM 28.8/14.4 Data/FAX Modem
- IBM PCMCIA Data/FAX Modem
- IBM High Speed PCMCIA Data/FAX Modem
- IBM 3270 Emulation Credit Card Adapter
- IBM Token-Ring 16/4 Credit Card Adapter
- IBM Credit Card Adapter for Ethernet
- IBM 5250 Emulation Credit Card Adapter
- IBM Microelectronics 2.4/9.6 Data/FAX Modem
- IBM Microelectronics 14.4/14.4 Data/FAX Modem
- IBM Wireless Modem for ARDIS
- IBM Wireless Modem for Mobitex
- IBM Wireless Modem for Cellular/CDPD

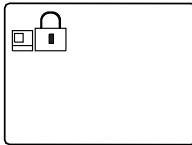
This prevents possible problems from occurring with communication application programs after the computer returns to normal operation.

Chapter 5. Protecting Your Computer

This chapter provides information about how to protect your computer from theft or unauthorized use. It also describes how to display your personal information, such as your name or address, on the password prompt screen.

Using the Power-On Password	78
Setting a Power-On Password	78
Entering a Power-On Password	80
Changing a Power-On Password	81
Removing a Power-On Password	82
Using the Personalization Feature	83
Entering the Personal Information	84
Deleting a Personalized Screen	87
Using Locks	88

Using a Password



Using the Power-On Password

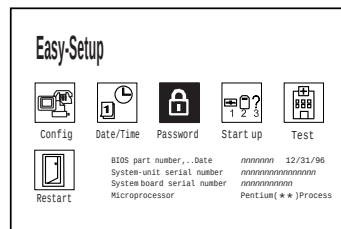
The computer provides you with a **power-on password** to protect it from being used by unauthorized persons. If a power-on password is set, the password prompt () appears on the screen whenever you turn on the computer and reminds you to enter the password.

Setting a Power-On Password

To set a power-on password:

- 1 Start Easy-Setup and select the **Password** icon.

To start Easy-Setup, press and hold **F1** and turn on the computer.



- 2 Select the **Power-On** icon () .
- 3 Type your desired power-on password; then press **Enter**.
You can use any combination of up to 7 characters. Use a combination of any letters or numbers (A to Z, 0 to 9) in uppercase (A) or lowercase (a). Uppercase and lowercase letters (for example, A and a) are treated the same.
- 4 Type your power-on password again to verify it; then press **Enter**.

Note:

When you type a wrong key, use the **Backspace** key to erase it and then type the correct key.

Using a Password

Do Not Forget Your Power-On Password!

If you forget your power-on password, you cannot reset it. You have to take the computer to an IBM authorized reseller or IBM marketing representative to have the password canceled. Proof of purchase is required, and an additional charge might be required for the service.

Once you set the password, you cannot change or remove it in Easy-Setup; you must change or remove a password at the password prompt screen that appears when you turn on the computer. See “Changing a Power-On Password” on page 81 or “Removing a Power-On Password” on page 82.

Using a Password

Entering a Power-On Password

Note:

If the return to normal operation is caused by a preset timer or an incoming call through the modem, the password prompt does not appear. To display a power-on password prompt, press any key or move your pointing device.

If a power-on password is set, the password prompt reminds you to enter the password when:

Turning on the computer.

Returning to normal operation from suspend mode.

When the password prompt appears at the top left corner on the screen, do the following:

1 Type your power-on password.

Each time you press a key, the symbol appears.

When typing your password, release each key quickly. If you hold a key down too long, the same letter can be entered repeatedly.

2 Press the **Enter** key.

*When the password is entered correctly, **OK** appears and the computer starts normal operation.*

*When you enter the password incorrectly, **X** appears. Enter the correct password.*

If you fail to enter the correct password after three tries, you must turn the computer off, wait at least 5 seconds, and turn it on to try again.

Changing a Power-On Password

You must change your power-on password at the password prompt screen that appears when you turn on the computer. You cannot change it after normal operation is resumed. To change a power-on password:

Important

Do *not* press **Enter** until you have finished all the steps to change the power-on password.

- 1** Turn off the computer and wait at least 5 seconds; then turn it on.
- 2** When the password prompt (🔒) appears, type your *current* power-on password; then press the **Spacebar**.
- 3** Type the *new* password; then press the **Spacebar**.
Use no more than 7 characters.
- 4** Type the *new* password again to verify it; then press **Enter**.

The new password will be available when you turn on the computer the next time.

All the steps can be summarized as follows:

Current(space)New(space)New(Enter)

Do Not Forget Your Power-On Password!

If you forget your power-on password, you cannot reset it. You have to take the computer to an IBM authorized reseller or IBM marketing representative to have the password canceled. Proof of purchase is required, and an additional charge might be required for the service.

Removing a Power-On Password

You must remove your power-on password at the password prompt that appears when you turn on the computer. You cannot remove it after normal operation is resumed. To remove a power-on password:

- 1** Turn off the computer and wait at least 5 seconds; then turn it on.
- 2** When the password prompt () appears, type your current password; then press the **Spacebar**.
- 3** Press **Enter**.

The power-on password is removed.

All the steps can be summarized as follows:

Current(space)(Enter)

Using the Personalization Feature



To set a password:

 Page 78.

You can display personal information, such as your name or address, every time the computer is turned on and a power-on password is set. This can help you when you misplace your computer. Because the password is set, your data is secured and cannot be accessed, but your personal information is displayed and identifies the owner of the computer.

The personalization feature includes a personalization editor program to create your own image to be displayed with the text information you create, and a personalization update utility to store your personal data in the nonvolatile memory of your system.

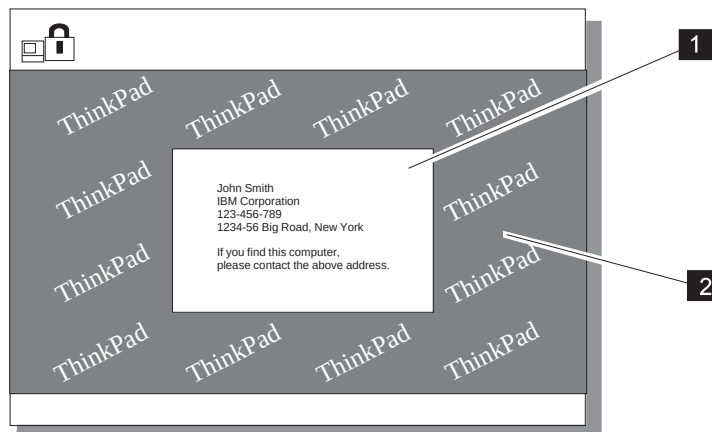
Note:

For details about bitmap graphics, see page 235.

A personalized password-prompt screen consists of two parts: the personal data area and the background bitmap area.

The *personal data area* 1 is the box in the center of the screen that has a black-and-white bitmap.

The *background bitmap area* 2 surrounds the personal data area.



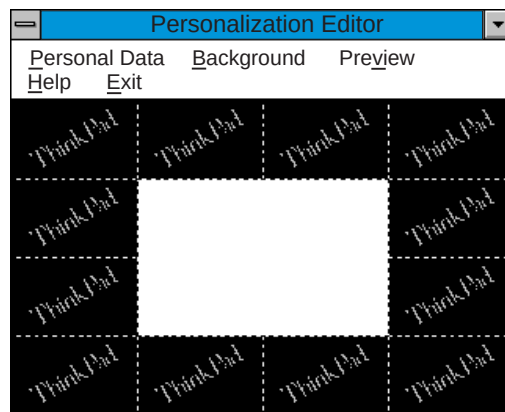
Entering the Personal Information

To enter personal information for the password-prompt screen:



- 1** Turn on the computer and start OS/2 or Windows.
- 2** Make a backup copy of Utility Diskette 2 using your operating system's diskcopy command.
- 3** Insert the backup copy of the Utility Diskette 2 into the diskette drive.
- 4** Start the ThinkPad Features program by double-clicking on the **ThinkPad** icon on the screen.
- 5** Click on the **Personalization Editor** () icon.

The personalization editor window appears.



- 6** Select **Personal Data**.

Using the Personalization Feature

Notes:

Press **Tab** to move the cursor to the next field.

You can change the color of the text background from black to white using the **Black background** option.

Note:

A sample bitmap file (BACKSAMP.BMP) is available on Utility Diskette 2.

7 Fill in each field with your own information at the Personal Data Entry window.

8 Select **OK**.

Next, create the background bitmap as follows:

9 Select **Background** in the Personalization Editor window.

Windows Paintbrush automatically opens.

10 Draw an image or color the background.

Your bitmap size must be *160 by 100 pels*. To change the size, select **Options** and then **Image Attributes**. Specify **Width** as 160, **Height** as 100, and **Units** as pels.

11 Select **File** and **Save As** to save and name your drawing as a *16-color bitmap* file on the backup copy of Utility Diskette 2.

12 Close Paintbrush.

13 When the opening file window appears, enter the name of your bitmap file that you have just created on Utility Diskette 2.

14 Select **Preview** to preview the actual full-screen size of the personal information screen.

To return to the previous screen, press **Enter**.

To save your personalized screen in the nonvolatile memory in the computer:

15 Close all applications; then turn off the computer.

16 Insert the backup copy of the Utility Diskette 2 into the diskette drive; then turn on the computer.

Using the Personalization Feature

- 17** Select **Update personalization data** at the menu screen; then follow the instructions on the screen.

Your data is copied from Utility Diskette 2 and stored in the nonvolatile memory in the computer.

- 18** After the data is stored, turn off the computer.

- 19** Set your password if you have not set it.

You have created your own personalized password-prompt screen. It will appear each time the computer is turned on.

To set a password:



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Deleting a Personalized Screen

To delete a personalized screen from the password-prompt screen:

- 1** Close all applications; then turn off the computer.
- 2** Insert the backup copy of the Utility Diskette 2 into the diskette drive; then turn on the computer.
- 3** Select **Delete personalization data** from the menu; then follow the instructions on the screen.
- 4** After the data is updated, turn off the computer.

Your data has been deleted from the nonvolatile memory in the computer.

Using Locks

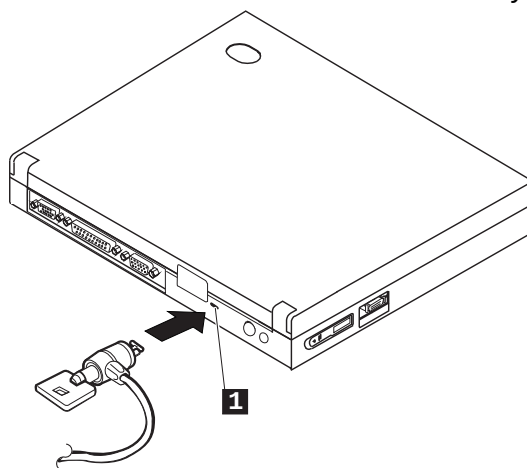
Note:

You are responsible for evaluating, selecting, and implementing the locking devices and security features. IBM makes no comments, judgments, or warranties about the function, quality, or performance of locking devices and security features.

You can attach a Kensington lock or a compatible lock to your computer, to prevent it from being removed without your permission.

To attach a lock, do the following:

Attach a Kensington lock or a compatible lock to the keyhole **1** on the rear of the computer; then secure the chain on the lock to a secure stationary object.



Chapter 6. Installing and Removing Options

This chapter provides information about how to install or remove external or internal devices and IBM options.

Installing and Removing PC Cards	90
Inserting the PC Card	90
Removing the PC Card	92
Increasing Memory Capacity	93
Installing and Removing the DIMM	94
Attaching an External Numeric Keypad or a Mouse	99
Using the Mouse and Other Pointing Devices	100
Attaching an External Keyboard	101

Installing and Removing PC Cards

Note:

When installing an operating system, install the PCMCIA device driver that is on the PCMCIA Installation Diskette before using PC Cards.

To install the PCMCIA device driver:

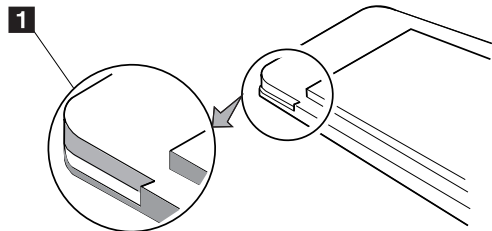
 Chapter 7.

This section explains how to install and remove a PC Card. For information about operating the computer with PC Cards, refer to “Using PC Cards” on page 47.

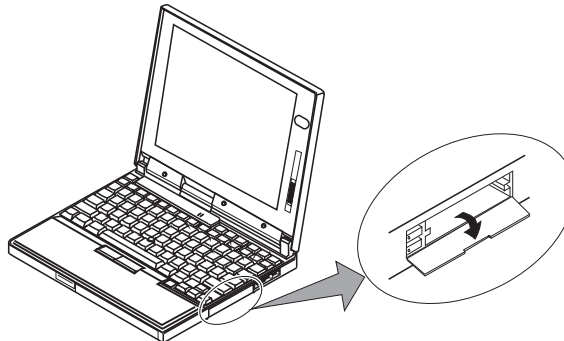
The computer has two PC Card slots (upper slot and lower slot) to install two *Type I* or *Type II* PC Cards (one in each slot), or a single *Type III* PC Card (in the lower slot).

Inserting the PC Card

- 1** Find the notched edge **1** of the PC Card as shown.



- 2** Open the cover on the PC Card slot.



Installing and Removing PC Cards

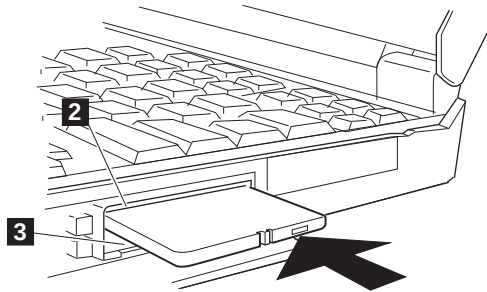
Note:

If you are using a PC Card with a XJACK** connector, insert it into the *upper* slot.

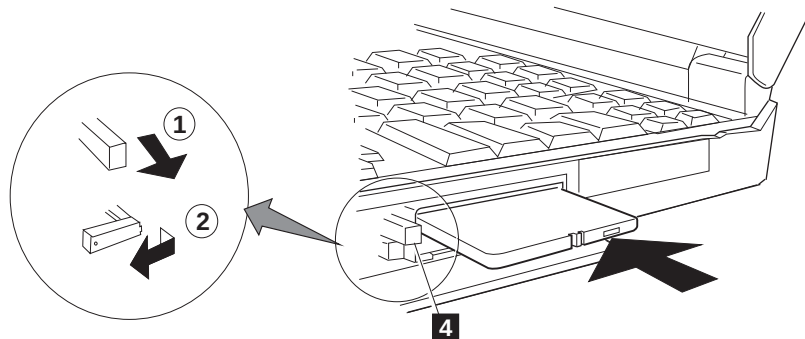
- 3 Insert the PC Card into an appropriate slot according to your PC Card type.

If you are using a Type I or Type II PC Card, insert it into either the upper slot 2 or the lower slot 3.

If you are using a Type III PC Card, insert the card into the *lower* slot 3.



- 4 Press the PC Card firmly into the connector until the eject button 4 pops out. Then, pull the eject button out slightly and fold it to the left.



You have completed the installation of the PC Card. Refer to the following sections:

To use PC Cards, see “Using PC Cards” on page 47.

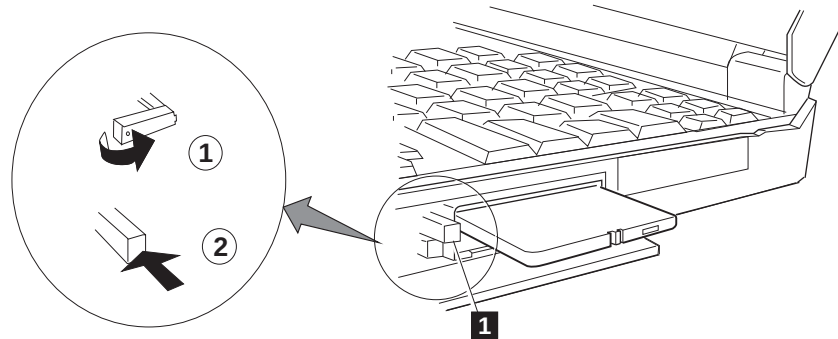
To use PC Cards with power-saving functions, see:

- “Considerations for Suspend Mode” on page 71.
- “Considerations for Hibernation Mode” on page 75.

Removing the PC Card

Raise the PC Card eject button 1 for the PC Card you want to remove. Then, press the PC Card eject button until the PC Card pops out.

Remove the PC Card and save it for future use.

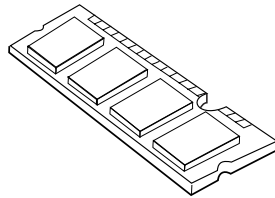


Increasing Memory Capacity

Note:

IC DRAM cards cannot be used with 560 computers.

Increasing memory capacity is an effective way to make programs run faster. You can increase the amount of memory in your computer by installing a dual inline memory module (*DIMM*), available as an option.

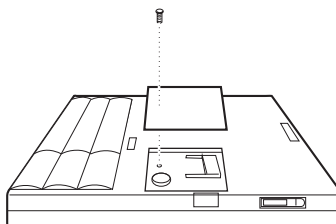


Two different capacities of DIMM (8MB and 16MB) are available. You can insert a DIMM directly in the memory slot on the bottom of the computer. Your computer memory capacity can be expanded up to 24MB (8MB base memory and a 16MB DIMM option).

Increasing Memory Capacity

Installing and Removing the DIMM

- 1** Turn off the computer; then disconnect the AC Adapter and all cables from the computer.
- 2** Turn the computer over.
- 3** Remove the screw on the memory slot cover.



Attention:

To avoid damaging the DIMM, do not touch its contact edge.

- 4** Which are you going to do?

Install a DIMM

Go to the next step.

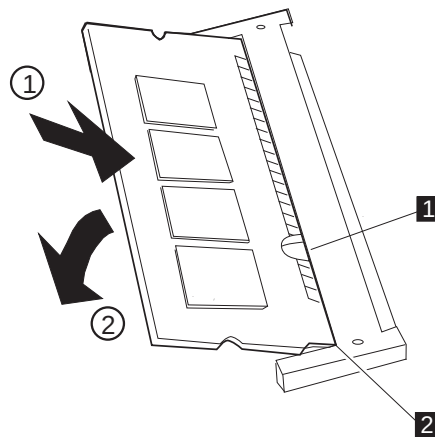
Remove a DIMM

Go to step 6 on page 96.

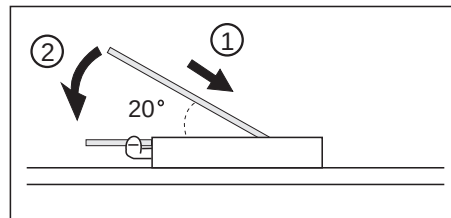
Increasing Memory Capacity

5 Install the DIMM into the memory slot.

- a) Find the notch 1 on the side of the DIMM.
- b) With the notched end of the DIMM toward the right side of the socket 2, insert the DIMM, at an angle of approximately 20°, into the socket; then press it firmly.
- c) Pivot the DIMM until it snaps into place.



Side View



- d) Go to step 7 on page 97.

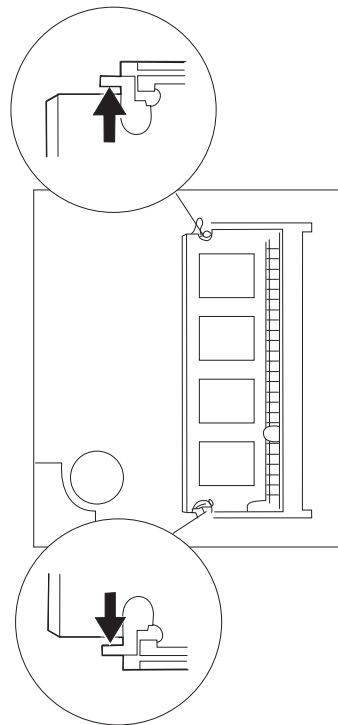
Increasing Memory Capacity

Attention:

To avoid damaging the DIMM, do not touch its contact edge.

6 Remove the DIMM from the memory slot.

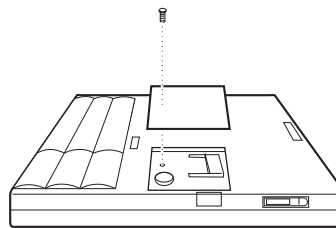
- a) Press out on the latches on both edges of the socket at the same time.



- b) Remove the DIMM.
Be sure to save the DIMM for future use.
- c) Go to the next step.

Increasing Memory Capacity

- 7** Place the memory slot cover over the memory slot; then install the screw back into its place.



- 8** Turn the computer over again.

- 9** To confirm that the DIMM is correctly attached to the computer, do the following:

Note:
1MB=1024KB

- a)** Calculate your total memory size in kilo bits (KB) by adding the DIMM memory size to the base memory size (7808KB).

For example, if you installed a 16MB DIMM, calculate the total memory size as follows:

$$16(\text{MB}) \times 1024(\text{KB}) + 7808(\text{KB}) = 24192(\text{KB})$$

- b)** Start Easy-Setup and confirm the memory size count at the upper left corner of the screen as shown:

24192 KB OK

If a 2 1 error code appears under the memory count, turn off the computer and go to page 94 to reinstall the DIMM.

24192 KB OK

2 1

Note:
To start Easy-Setup, press and hold **F1**; then turn on the computer.

Increasing Memory Capacity

Note:
It may take some time to complete the memory test.

c) Is the total memory size the same as the value you calculated in step 9a?

Yes Go to the next step.

No Turn off the computer and go to page 94 to reinstall the DIMM.

d) Select **Test** from the main menu of Easy-Setup; then select **Memory**.

The memory test starts.

e) Does an OK message now appear under the **Memory** icon?

Yes You have installed the DIMM correctly. Exit Easy-Setup and go to the next step.

No You need to reinstall the DIMM. Go to page 94 and reinstall the DIMM.

10 Reconnect all cables.

You have completed the installation or removal of the DIMM.

Note:
If you changed the memory installed in the computer, you need to create a new hibernation file.

If you plan to use hibernation mode, see “Creating the Hibernation File” on page 73.

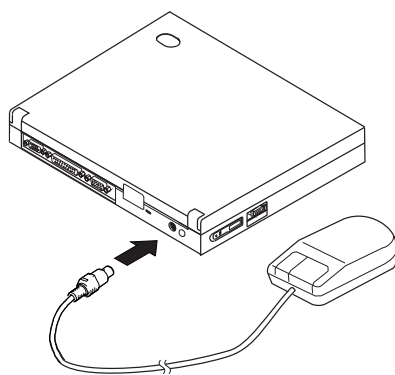
Attaching an External Numeric Keypad or a Mouse

Attaching an External Numeric Keypad or a Mouse

Attention:

When you connect a mouse other than an IBM PS/2 Miniature Mouse, turn off the computer.

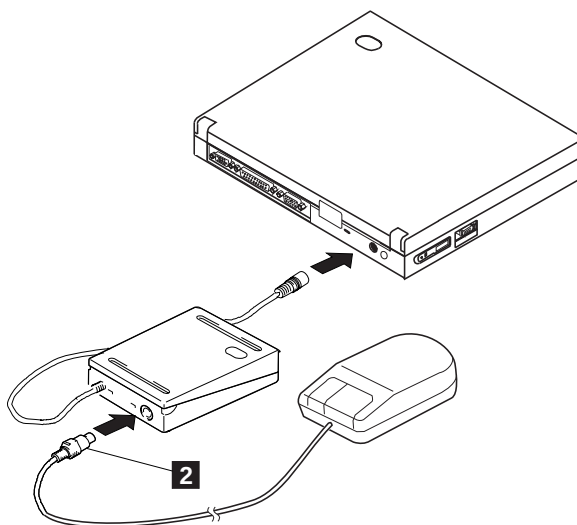
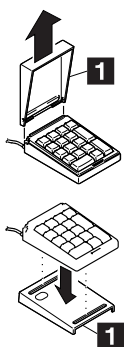
An external numeric keypad or a mouse can be attached directly to the connector on the rear of the computer. You can use both the IBM PS/2 Miniature Mouse and TrackPoint III as the pointing device.



Note:

You can remove the keypad cover 1 and use it as a stand for the keypad.

If you want to use the external numeric keypad and mouse at the same time, first connect the keypad cable to the computer; then connect the mouse cable 2 to the connector at the rear of the keypad.



Attaching an External Numeric Keypad or a Mouse

Using the Mouse and Other Pointing Devices

Note:

The appropriate software must have already been installed.

A serial mouse connected to the serial port or a device that is not compatible with the PS/2 Mouse can be connected to the external input-device connector. Some mouse types require the TrackPoint III to be disabled before you can use them. To disable the TrackPoint III:



With OS/2 or Windows:

- 1** Start the ThinkPad Features program.
- 2** Click on the **Keyboard/Pointing-Device** () icon.
- 3** Click on **Disable** for the TrackPoint.

These changes become effective when computer power is turned off and then on again.

Using the IBM ThinkPad Space Saver Keyboard

When using the IBM ThinkPad Space Saver Keyboard, **do not** install the device driver supplied with the Space Saver Keyboard. When the Space Saver Keyboard is used, the device driver on the computer's Utility Diskette automatically enables or disables the TrackPoint III of the computer when power is turned on.

Attaching an External Keyboard

You can connect an external keyboard to your computer through the keyboard/mouse connector 1 (available separately as an option).

Note:

The computer enters suspend mode when the LCD is closed. If you want to use the computer with the LCD closed, set the suspend option in the ThinkPad Features program so the computer does not enter suspend mode when the LCD is closed.

The external keyboard must be connected through the keyboard/mouse connector. ***It will not work if it is connected directly to the computer.***

When the external keyboard is attached, the following keys are not available:

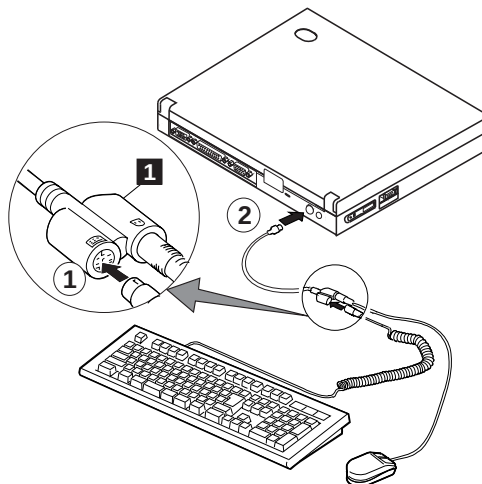
Numeric keypad on the computer keyboard
External numeric keypad

You should use the numeric keypad on the external keyboard.

When you attach the external keyboard, turn off the computer, attach the keyboard to the keyboard/mouse connector (1), and then attach the keyboard/mouse connector to the computer (2).

ThinkPad Features program:

 Page 29.



Chapter 7. Installing Software

This chapter provides information about the software installed in your computer and the procedures for installing the necessary device drivers when reinstalling an operating system.

What You Need for Your Computer	104
Installing the Operating System and Device Drivers	105
Installing Software for OS/2 Warp Version 3	106
Installing IBM OS/2 Warp	107
Installing the ThinkPad Features Program for OS/2 Warp	107
Installing the PC Card Director for OS/2 Warp	109
Installing the ESS AudioDrive Support Software for OS/2 Warp	110
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Installing Software for IBM PC DOS Version 7.0	115
Installing DOS 7.0	116
Installing the ThinkPad Features Program for DOS 7.0	116
Installing the PC Card Director for DOS 7.0	117
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Installing the ThinkPad Display Driver for Windows 3.11	128
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Installing the ThinkPad Display Driver for Windows 95	130
Installing the ThinkPad Features Program for Windows 95	132
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Disabling the PC Card Director for DOS and Windows	133
Installing the Socket Services Device Driver	134
Installing the ESS AudioDrive Support Software for Windows 95	137
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What You Need for Your Computer

Your computer comes with the following software already installed:

- Operating system
- ESS AudioDrive support software
- Infrared device driver
- PC Card Director program
- ThinkPad Features program
- ThinkPad display driver
- Online book

Note:

Before reinstalling the operating system and device drivers, you need to create all installation diskettes using the Diskette Factory (diskette backup program), which is preinstalled on your computer.

When reinstalling an operating system, you must also reinstall the software in this list for your computer to operate as it did at the time of purchase. The online book, however, is available only at the time of purchase and no diskettes are available for reinstallation.

Important

You should make a backup copy of the online book before beginning the reinstallation process.

The PC Card client device driver is not part of the preinstalled software. Refer to the manual that came with the PC Card to install the device driver.

Important

Before you begin installing software from diskettes, attach the external diskette drive to the computer. See "Using the External Diskette Drive" on page 23.

Installing the Operating System and Device Drivers

The operating systems supported by your computer are:

IBM Operating System/2 (OS/2) Warp Version 3
IBM PC DOS Version 7.0
Microsoft Windows 3.11
Microsoft Windows 95

Important

If you will be installing Windows 3.11, you **must** first do the following for Windows to operate correctly:

- Install the ThinkPad display driver instead of the default device drivers that came with Windows.
- When the Windows Setup program asks you to select either **Express Setup** or **Custom Setup**, select **C** for Custom Setup.

If the device driver diskettes were not supplied with your computer, you need to create the diskettes using the Diskette Factory program (diskette backup program), which is preinstalled on your computer.

Refer to the appropriate section to install your operating system and its device drivers:



If you are installing OS/2: go to “Installing Software for OS/2 Warp Version 3” on page 106.



If you are installing DOS: go to “Installing Software for IBM PC DOS Version 7.0” on page 115.



If you are installing Windows 3.11: go to “Installing Software for Microsoft Windows Version 3.11” on page 118.



If you are installing Windows 95: go to “Installing Software for Microsoft Windows 95” on page 129.

Installing Software for OS/2 Warp Version 3



This section describes how to install OS/2 Warp Version 3 in your computer with DOS and Windows. You also need to install the device drivers for OS/2 Warp in your computer.

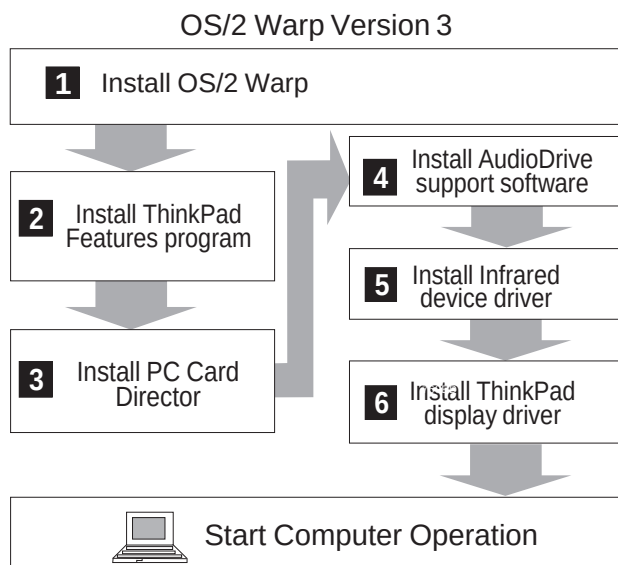
Important

If the device driver diskettes were not supplied with your computer, you need to create the diskettes using the Diskette Factory program (diskette backup program), which is preinstalled on your computer.

The software shown in the following figure is already installed at the time of purchase. When reinstalling OS/2 Warp, reinstall this software for your computer to work as it did at the time of purchase:

Page numbers:

- 1 Page 107.
- 2 Page 107.
- 3 Page 109.
- 4 Page 110.
- 5 Page 112.
- 6 Page 114.



Installing the ThinkPad Features Program for OS/2 Warp

Installing IBM OS/2 Warp

Follow the instructions in the operating-system documentation. After OS/2 has been successfully installed, go to “Installing the ThinkPad Features Program for OS/2 Warp.”

Important

When installing the operating system, enable support of PCMCIA. PCMCIA will *not* be supported if you select **Install Preselected Features**.

Installing the ThinkPad Features Program for OS/2 Warp

Note:

When installing an operating system, you need to install the ThinkPad Features program.

To install the ThinkPad Features program:

- 1** Start OS/2.
- 2** Insert the Utility Diskette 2 into the diskette drive.
- 3** Install the ThinkPad System Management device driver:
 - a)** Open **OS/2 System** and then **System Setup**.
 - b)** Select **Device Driver Install**.
 - c)** Click on the **Install...** button.
 - d)** Click on **ThinkPad System Management Device Driver**; then click on **OK**.

Installing the ThinkPad Features Program for OS/2 Warp

- 4** Open the OS/2 screen command prompt.
- 5** Remove the Utility Diskette 2 from the diskette drive; then insert the Utility Diskette 1.
- 6** Go to the A: prompt and type INSTALL2; then press **Enter**.
Follow the instructions on the screen.
- 7** Install the Windows ThinkPad Features program for the WIN-OS/2 session:
 - a)** Exit the OS/2 screen; then open the WIN-OS/2 full screen.
 - b)** Follow the instructions in "Installing the ThinkPad Features Program for Windows 3.11" on page 124.
- 8** Install the DOS ThinkPad Features program to use the PS2 commands.
 - a)** Exit the WIN-OS/2 full screen; then open the DOS full screen.
 - b)** Follow the instructions in "Installing the ThinkPad Features Program for DOS 7.0" on page 116.

You have completed the installation of the ThinkPad Features program.

If you want to continue to install all device drivers, continue with "Installing the PC Card Director for OS/2 Warp" on page 109.

Installing the PC Card Director for OS/2 Warp

PC Card Director:



Page 48.

When installing an operating system, you need to install the following device drivers and software associated with PCMCIA before you can use the PC Cards:

PC Card device drivers:

- Card Services device driver
- Socket Services device driver
- PC Card Power Management device driver
- PC Card Director utility

PC Card client device drivers (only when PC Card Director does not support the PC Card)

To install the PC Card Director:

- 1** Turn on the computer and start the operating system.
- 2** Insert the PCMCIA Installation Diskette for OS/2, Windows 95 into the diskette drive.
- 3** Open the OS/2 full screen command prompt.
- 4** Type `A:\PCMINST2` at the OS/2 command prompt then press **Enter**.
- 5** Follow the instructions on the screen.
- 6** Click on **OK** when you have completed the installation.
- 7** After the installation is complete, close all applications, remove any diskette from the diskette drive, and restart the system.

Note:

Whenever you update the CONFIG.SYS file, refer to “Adding to the CONFIG.SYS File” on page 195.

You have completed the installation of the PC Card Director for OS/2.

If you want to continue to install all device drivers, continue with “Installing the ESS AudioDrive Support Software for OS/2 Warp” on page 110.

Installing the ESS AudioDrive Support Software for OS/2 Warp

Installing the ESS AudioDrive Support Software for OS/2 Warp

Note:

When installing an operating system, you need to install the ESS AudioDrive support software.

When installing OS/2 Warp, the software might detect the AudioDrive chip installed in your computer, and automatically install the required software in your hard disk drive.

However, the version of the AudioDrive support software supplied with OS/2 Warp might be a version different from the one needed for your computer. It is recommended that you reinstall the AudioDrive support software.

Have ready the AudioDrive Features Diskette; then install the AudioDrive support software as follows:

Note:

To open the OS/2 full screen:

1. Select **OS/2 System**.
2. Select **Command Prompts**; then select **OS/2 Full Screen**.

- 1** Turn on the computer and start OS/2.
- 2** Open the OS/2 full screen command prompt.
- 3** Insert the AudioDrive Features Diskette for OS/2 into the diskette drive.
- 4** Type A:ESUNINST at the command prompt; then press **Enter**.
Necessary backups are created.
- 5** Type A:MINSTALL at the command prompt; then press **Enter**.
- 6** Select **AudioDrive ES1688** from the list.
Make sure the source drive is A: .
If you have Win-OS/2 installed on your computer, also select **ES1688 WinOS2/Windows Audio**.
- 7** Click on **Install**; then follow the instructions on the screen.
- 8** When you have completed the installation, remove any diskette from the diskette drive, shut down OS/2; then restart the computer.

Installing the ESS AudioDrive Support Software for OS/2 Warp

You have completed the installation of the ESS AudioDrive support software for OS/2.

If you want to continue to install all device drivers, continue with "Installing the Infrared Device Driver for OS/2 Warp" on page 112.

Installing the Infrared Device Driver for OS/2 Warp

Installing the Infrared Device Driver for OS/2 Warp

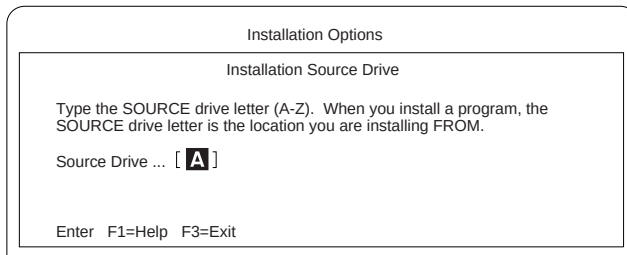
Note:

When installing an operating system, you need to install the Infrared device driver.

To install the infrared device driver:

- 1** Turn on the computer and start OS/2.
- 2** If you have not installed DOS and WIN-OS/2 support for OS/2, install it by referring to your operating-system documentation.
- 3** Go to the DOS command prompt.
- 4** Insert the Infrared Features Diskette into the diskette drive.
- 5** Type **A:UINSTALL** and press **Enter**.

The following screen appears:



- 6** Press **Enter**; then follow the instructions on the screen.
Select **Install Win-OS2 ThinkPad Infrared Driver** when you are prompted.

You have completed the installation of the infrared device driver.

Installing the Infrared Device Driver for OS/2 Warp

Starting TranXit or Other Infrared Applications

You can start TranXit or any other infrared applications that use the ThinkPad infrared device driver from the Program Manager window or from a separate object that you have created for the infrared application.

From Program Manager window:

1. With the right mouse button, click on the Program Manager object in the **Windows Programs** folder or the **WIN-OS2** (full screen or window) object in the **Command Prompts** folder.
2. Select **Settings, Session**, and then **WIN-OS/2 Settings**.
3. Modify the following setting as shown:

COM_DIRECT_ACCESS ON

From a separate object that you have created:

1. With the right mouse button, click on the object.
2. Select **Settings, Session**, and then check **Separate Session**.
3. Select **WIN-OS/2 Settings** and modify the following setting as shown:

COM_DIRECT_ACCESS ON

If you want to continue to install all device drivers, continue installation with "Installing the ThinkPad Display Device Driver for OS/2 Warp" on page 114.

Installing the ThinkPad Display Device Driver for OS/2 Warp

Note:

When installing an operating system, you need to install the ThinkPad display device driver.

The display driver enables you to use various screen resolutions and colors for the LCD and external monitor. (See page 45 for possible combinations of resolution and color.) The display driver also takes advantage of the computer's video capability.

ThinkPad Features:

 Page 29.

Before Installation

Before you begin installing the display driver, set the display device mode to *LCD*: open the ThinkPad Features program and select the **LCD** () icon, or at the command prompt, type `PS2 SC LCD` and press **Enter**.

To install the ThinkPad display device driver:

- 1** Start OS/2.
- 2** Insert the ThinkPad Video Features Diskette for OS/2 into the diskette drive.
- 3** Open the OS/2 full screen or OS/2 window.
- 4** Go to the A: prompt; then type `INSTALL` and press **Enter**.
- 5** Follow the instructions on the screen.
- 6** After the installation is complete, remove any diskette from the diskette drive, shut down OS/2, and restart the system.

You have completed the installation of the display driver for OS/2.

Installing Software for IBM PC DOS Version 7.0



This section describes the installation procedures for DOS Version 7.0 and its device drivers for your computer.

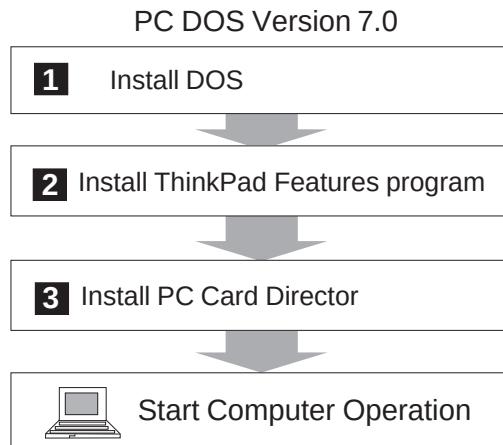
Important

If the device driver diskettes were not supplied with your computer, you need to create the diskettes using the Diskette Factory program (diskette backup program), which is preinstalled on your computer.

The software shown in the following figure is already installed at the time of purchase. When reinstalling DOS Version 7.0, reinstall this software for your computer to work as it did at the time of purchase:

Page numbers:

- 1 Page 116.
- 2 Page 116.
- 3 Page 117.



Installing the ThinkPad Features Program for DOS 7.0

Installing DOS 7.0

Follow the instructions in the operating-system documentation. If you also are installing Microsoft Windows 3.11, go to “Installing Windows 3.11” on page 120. Otherwise, if you want to continue to install all device drivers, continue with “Installing the ThinkPad Features Program for DOS 7.0.”

Installing the ThinkPad Features Program for DOS 7.0

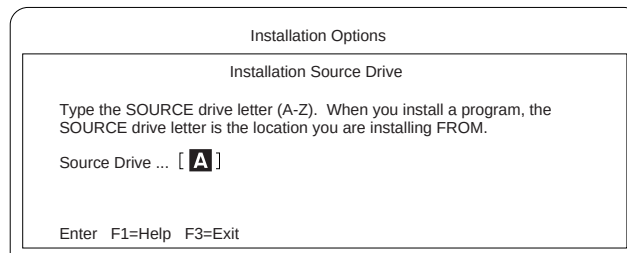
Note:

When installing an operating system, you need to install the ThinkPad Features program.

To install the ThinkPad Features program:

- 1** Start DOS.
- 2** Insert the Utility Diskette 1 into the diskette drive.
- 3** Type A:UINSTALL at the DOS prompt and press **Enter**.

The following screen appears:



- 4** Press **Enter**.
- 5** Select **Install DOS ThinkPad Features** at the Installation Options screen; then follow the instructions on the screen.

You have completed the installation of the ThinkPad Features program.

If you want to continue to install all device drivers, continue with the PC Card Director.

Installing the PC Card Director for DOS 7.0

Note:

Do not install the Phoenix PCMCIA support in IBM PC DOS 7.0.

PC Card Director:



Page 48.

Note:

The PC Card client device driver is not part of the preinstalled software. Refer to the manual that came with the PC Card to install the device driver.

When installing DOS, you need to install the following software to use the PC Cards:

PC Card device drivers:

- Card Services device driver
- Socket Services device driver
- Resource Map Utility device driver
- PC Card Power Management device driver
- PC Card Director utility

PC Card client device drivers (only when PC Card Director does not support the PC Card)

To install the PC Card Director:

- 1** Start DOS.
- 2** Insert the PCMCIA Installation Diskette for DOS/Windows into the diskette drive.
- 3** Type **A:** at the DOS command prompt and press **Enter** to go to the A: prompt.
- 4** Type PCMINSTD; then press **Enter**.
- 5** Follow the instructions on the screen.
Default choices are already highlighted at the Selector screens.
- 6** After the installation is complete, remove any diskette from the diskette drive and restart the computer.

Note:

Whenever you update the CONFIG.SYS file, see page 195.

You have completed the installation of the PC Card Director for DOS.

Installing Windows 3.11 Software



Installing Software for Microsoft Windows Version 3.11

Note:
If you are installing Windows 95, go to "Installing Software for Microsoft Windows 95" on page 129.

This section describes the installation procedures for Windows Version 3.11 and its device drivers for your ThinkPad.

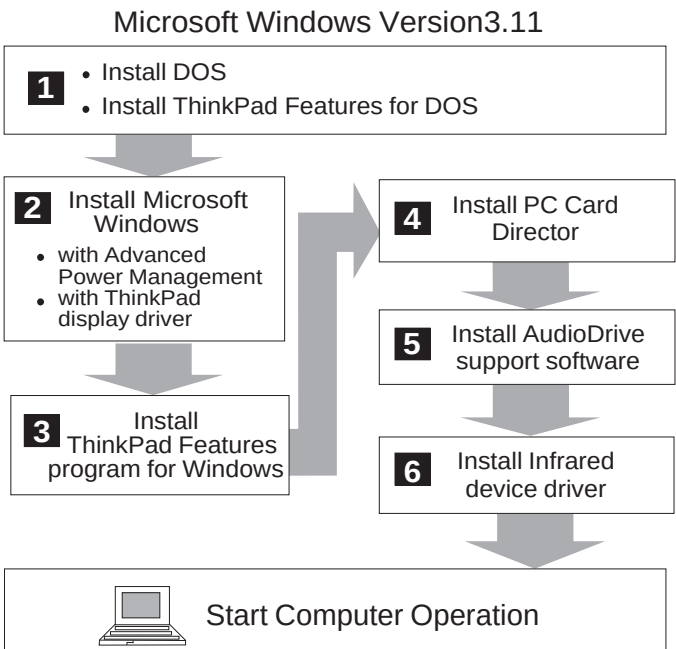
Important

If the device driver diskettes were not supplied with your computer, you need to create the diskettes using the Diskette Factory program (diskette backup program), which is preinstalled on your computer.

The software shown in the following figure is already installed at the time of purchase. When reinstalling Windows Version 3.11, reinstall this software for your computer to work as it did at the time of purchase:

Page numbers:

- 1 Page 116 and 116.
- 2 Page 120.
- 3 Page 124.
- 4 Page 125.
- 5 Page 126.
- 6 Page 127.



Installing Windows 3.11 Software

Important

If you will be installing Windows 3.11, you ***must*** first do the following for Windows 3.11 to operate correctly:

When the Windows Setup program asks you to select either **Express Setup** or **Custom Setup**, select **C** for Custom Setup.

Install the ThinkPad display driver instead of the default device drivers that came with Windows.

Installing Windows 3.11

Windows 3.11 operates in a DOS environment. Install the following before installing Windows:

DOS Version 7.0 (see your DOS manuals)

ThinkPad Features program for DOS (see page 116)

Important

Before you install Windows Version 3.11, you **must** do the following for Windows to operate correctly:

When the Windows Setup program asks you to select either **Express Setup** or **Custom Setup**, select **C** for Custom Setup.

Install the ThinkPad display driver instead of the default device drivers that came with Windows.

Do the following to install Windows Version 3.11 with Advanced Power Management (APM) and the ThinkPad display driver.

1 Turn on the computer.

2 Install Windows Version 3.11 *with* the APM option:

Important

When the Windows Setup program asks you to select **Express Setup** or **Custom Setup**, type **C** for **Custom Setup**.

a) Start the installation as specified in the Windows manual.

Installing Windows 3.11

Note:

If you have installed OS/2, the path to install Windows may have changed to C:\OS2\MDOS\WINOS2 (C is the drive on which you installed OS/2). If so, change the path to:

C:\WINDOWS

- b)** When the Windows Setup program asks you to select **Express Setup** or **Custom Setup**, type **C** for **Custom Setup**.
- c)** Continue installing Windows Version 3.11 until the following screen appears:

```
Windows Setup
=====

Setup has determined that your system includes the following hardware
and software components. If your computer or network appears on the
Hardware Compatibility List with an asterisk, press F1 for Help.

Computer:      MS-DOS System
Display:       VGA
Mouse:         Microsoft, or IBM PS/2
```

- d)** Using the Up Arrow (↑), highlight **MS-DOS System** and press **Enter**.
- e)** Select **MS-DOS System with APM** from the list and press **Enter**.

Verify that **Computer** has changed to **MS-DOS System with APM**. If the item has not changed, return to step 2d.

Installing Windows 3.11

Note:

After installing Windows, you should check the creation date of the following drivers in the DOS subdirectory and the Windows subdirectory:

EMM386.EXE (loaded by
CONFIG.SYS)
HIMEM.SYS (loaded by
CONFIG.SYS)
SMARTDRV.EXE (loaded by
AUTOEXEC.BAT)

Then use the newest program between the one for DOS and the one for Windows for each drivers.

You can easily use the newer one by changing the subdirectory name in the CONFIG.SYS or AUTOEXEC.BAT as follows:

```
C:\DOS\SMARTDRV.EXE
↓
C:\WINDOWS\SMARTDRV.EXE
```

Note:

You can change the display resolution type by using the ThinkPad Features program after completing the installation of the ThinkPad Features program for Windows.

- 3** When you have completed the installation of Windows, edit the AUTOEXEC.BAT file so that the computer will use the correct mouse driver.

When Windows Version 3.11 is installed, the computer is automatically configured to use the MOUSE.COM driver provided by Windows Version 3.11. However, for correct operation, your computer must use the MOUSE.COM driver that came with DOS.

- a)** At the DOS command prompt (usually C:\>), type
E \AUTOEXEC.BAT and press **Enter**.
- b)** Find the line: C:\WINDOWS\MOUSE.COM /Y
- c)** Change it to: C:\DOS\MOUSE.COM /Y
- d)** Find the line that includes SHARE.EXE and delete that line.
- e)** Save the file and restart the computer.

- 4** Select your display resolution type:

- a)** Start DOS and go to the WINDOWS subdirectory.
- b)** Type SETUP to start Windows setup program.
- c)** Using the Up Arrow (↑), highlight **Display** and press **Enter**.
- d)** Select **Other (Requires disk...)** from the list.
- e)** Insert the Video Features Diskette for Windows 3.1 into the diskette drive; then type A: and press **Enter**.
- f)** Select your desired resolution from the menu and press **Enter**.

Verify that **Display** has changed to your desired resolution type (an example is shown in the following screen). If the item has not changed, return to step 4c.

Installing Windows 3.11

Note:

If you do not know what to choose, it is recommended that you choose **256 Color** for the color palette, **800 by 600 pixels** for the Desktop area, and **Small Fonts** for the font size.

```
Windows Setup
=====
```

```
Setup has determined that your system includes the following hardware
and software components. If your computer or network appears on the
Hardware Compatibility List with an asterisk, press F1 for Help.
```

```
Computer:      MS-DOS System with APM
Display:       Cyber9385/82 8  x6  256 small font
Mouse:         Microsoft, or IBM PS/2
```

g) Press **Enter** to continue the installation.

h) After the installation is complete, remove any diskette from the diskette drive and restart the computer.

When you start Windows from the DOS prompt, do not close the LCD while the program is loading; if you do, the computer will stop running.

If you want to continue to install all device drivers, continue with “Installing the ThinkPad Features Program for Windows 3.11” on page 124.

Installing the ThinkPad Features Program for Windows 3.11

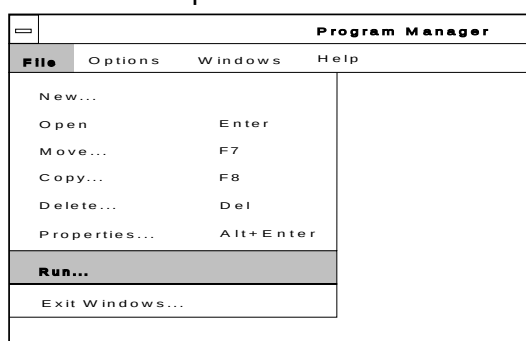
Installing the ThinkPad Features Program for Windows 3.11

Note:

When installing an operating system, you need to install the ThinkPad Features program.

If you are going to use Windows, install the ThinkPad Features program for DOS first (see page 116); then do the following to install the ThinkPad Features program for Windows 3.11:

- 1** Turn on the computer and start Windows.
- 2** Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.



- 3** Insert the Utility Diskette 1 into the diskette drive.
- 4** Type A:\INSTALLW and press **Enter**.
- 5** Follow the instructions on the screen.

Default choices are already highlighted at the Installation Options screen.

You have completed the installation of the ThinkPad Features program.

If you want to continue to install all device drivers, continue with "Installing the PC Card Director for Windows 3.11" on page 125.

Installing the PC Card Director for Windows 3.11

Note:

The PC Card Director for Windows 3.11 must be installed with Windows 3.11 or a later version with enhanced mode. Otherwise, it cannot be installed.

To use PC Card Director:



Page 48.

When installing an operating system, you need to install the PC Card Director. You must install the following device drivers and software associated with PCMCIA before you can use the PC Cards:

- Card Services device driver
- Socket Services device driver
- Resource Map Utility device driver
- PC Card Power Management device driver
- PC Card Director Utility
- PC Card client device drivers (only when PC Card Director does not support the PC Card)

To install the PC Card Director:

- 1** Turn on the computer and start Windows.
- 2** Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.
- 3** Insert the PCMCIA Installation Diskette for DOS/Windows into the diskette drive.
- 4** Type A:PCMINSTW and press **Enter**.
- 5** Follow the instructions on the screen to complete the installation.
Default choices are already highlighted at the choice screens.
- 6** After the installation is complete, remove any diskette from the diskette drive and restart the computer.

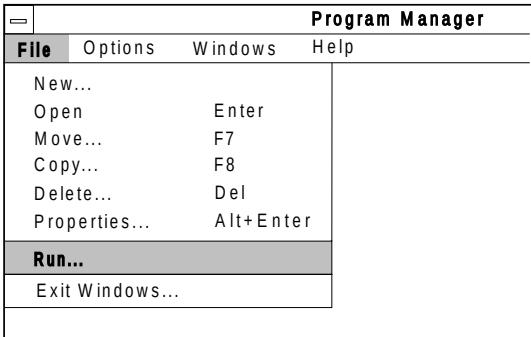
You have completed the installation of the PCMCIA device driver for Windows 3.11.

If you want to continue to install all device drivers, continue with "Installing the ESS AudioDrive Support Software for Windows 3.11" on page 126.

Installing the ESS AudioDrive Support Software for Windows 3.11

Note:
When installing an operating system, you need to install the ESS AudioDrive support software.

- 1 Turn on the computer and start Windows.
- 2 Select **File...** from the Program Manager window; then select **Run...** from the pull-down menu.



- 3 Insert the AudioDrive Features Diskette for Windows into the diskette drive of your computer.
- 4 Type A:\SETUP; then press **Enter**.
- 5 Follow the instructions on the screen to complete the installation.

You have completed the installation of the ESS AudioDrive support software.

If you want to continue to install all device drivers, continue with “Installing the Infrared Device Driver for Windows 3.11” on page 127.

Installing the Infrared Device Driver for Windows 3.11

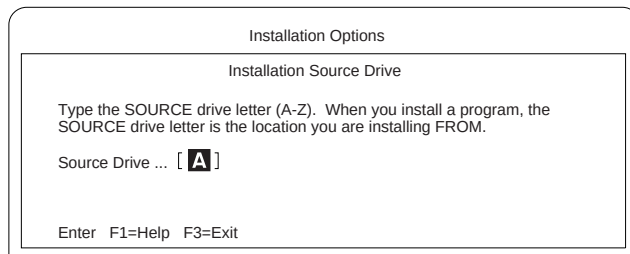
Installing the Infrared Device Driver for Windows 3.11

Note:

When installing an operating system, you need to install the Infrared device driver.

- 1** Turn on the computer; then go to the DOS command prompt.
- 2** Insert the Infrared Features Diskette into the diskette drive.
- 3** Type **A:UINSTALL** and press **Enter**.

The following screen appears:



- 4** Press **Enter**; then follow the instructions on the screen.
Select **Install Windows ThinkPad Infrared Driver** when you are asked.

You have completed the installation of the infrared device driver for Windows 3.11.

Installing the ThinkPad Display Driver for Windows 3.11

If you did not install the display driver when Windows was installed (by following the procedures on page 120), you must install the ThinkPad display device driver. The display driver enables you to use various screen resolutions and colors for the LCD and external monitor. (See page 45 for possible combinations of resolution and color.)

The display driver also takes advantage of the computer's video capability.

To install the ThinkPad device driver:

- 1** Turn on the computer.
- 2** If Windows is running on your computer, exit Windows and switch to the DOS prompt.
- 3** Go to the Windows subdirectory and type **SETUP**; then press **Enter**.
- 4** Select **Display** from the Windows Setup menu; then select **Other (Requires disk...)**.
- 5** Insert the Video Features Diskette for Windows 3.1 into the diskette drive; then type **A:** and press **Enter**.
- 6** Select your desired resolution from the menu and press **Enter**. Follow the instructions on the screen.

You have completed the installation of the display driver for Windows 3.11.

Installing Software for Microsoft Windows 95



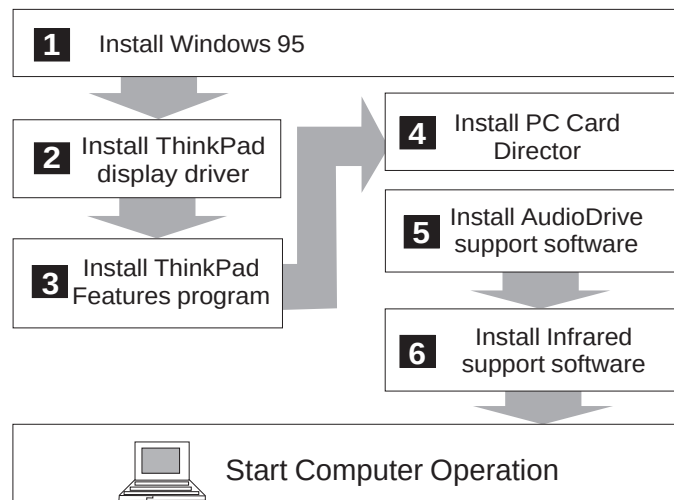
This section describes the installation procedures for Windows 95 and its device drivers for your ThinkPad.

Important

If the device driver diskettes were not supplied with the computer, you need to create the diskettes using the Diskette Factory program (diskette backup program), which is preinstalled on your computer.

The software shown in the following figure is already installed at the time of purchase. When reinstalling Windows 95, reinstall this software for your computer to work as it did at the time of purchase:

Microsoft Windows 95



Page numbers:

- 1 Page 129.
- 2 Page 130.
- 3 Page 132.
- 4 Page 133.
- 5 Page 137.
- 6 Page 139.

Installing Windows 95

Install Windows 95 as described in its documentation.

Installing the ThinkPad Display Driver for Windows 95

Note:

When installing an operating system, you need to install the ThinkPad display driver.

To install the ThinkPad display driver for Windows 95, do the following:

- 1** Make sure that Windows 95 has been installed in your computer.
- 2** Start Windows 95.
- 3** Open **My Computer**.
- 4** Open **Control Panel** and open **Display**; then click on the **Settings** tab.
- 5** Click on the **Change Display Type...** button.
- 6** Make sure that **Trident SuperVGA** is set to "Adapter Type" (as a default value); then click on **Change....**
- 7** Insert the ThinkPad Video Feature Diskette for Windows 95 into the diskette drive.
- 8** Click on **Have disk...** and click on **OK**.
- 9** Make sure **IBM ThinkPad (Cyber9385/82) PCI** is shown as the selection; then click on **OK**.
- 10** Click on **Close**.
- 11** Select your screen parameters from the color palette, Desktop area, and font size; then click on **OK**.

If you do not know what to choose, it is recommended that you choose **256 Color** for the color palette, **800 by 600 pixels** for the Desktop area, and **Small Fonts** for the font size.

Installing the ThinkPad Display Driver for Windows 95

12 Click on **Close**; then click on **Close** again.

13 Follow the instructions on the screen.

Windows 95 prompts you to restart the computer to make the display driver change effective.

You have completed the installation of the ThinkPad display driver.

If you want to continue to install all the device drivers, go to “Installing the ThinkPad Features Program for Windows 95” on page 132.

Installing the ThinkPad Features Program for Windows 95

Installing the ThinkPad Features Program for Windows 95

Note:

When installing an operating system, you need to install the ThinkPad Features program.

The ThinkPad Features program *for Windows* works on Windows 95.

If you installed Windows 95 on a computer in which DOS/Windows and its ThinkPad Features program were already installed, the ThinkPad Features program is migrated into the “Start Menu” of Windows 95 automatically.

To start the ThinkPad Features program:

- 1** Click on **Start**.
- 2** Select **Programs**; then select **ThinkPad**.
- 3** Select **ThinkPad Features**.

If you have not installed the ThinkPad Features program:

Install the ThinkPad Features program using the Utility Diskette supplied with the computer:

- 1** Insert ThinkPad Utility Diskette 1 into the diskette drive.
- 2** Click on **Start**.
- 3** Click on **Run....**
- 4** Type A: INSTALLW; then click on **OK**.
- 5** Follow the instructions on the screen.

You have completed the installation of the ThinkPad Features program.

If you want to continue to install all the device drivers, go to “Installing the PC Card Director for Windows 95” on page 133.

Installing the PC Card Director for Windows 95

Note:

The ThinkPad computer has three different sets of PCMCIA Feature software: one for DOS/Windows, one for OS/2 Warp, and one for Windows 95.

To use the PCMCIA features in the Windows 95 environment, you need to do the following. Each step is explained in detail following this summarized procedure.

1. If you have already installed the PC Card Director for DOS and Windows, disable it (enable the Windows 95 Integrated PCMCIA support software).
2. Install the Socket Services device driver.
3. Install the PC Card Director for Windows 95.

Disabling the PC Card Director for DOS and Windows

If the PC Card Director for DOS and Windows has been already installed on your computer, you must remove the PC Card Director for DOS and Windows before installing the PCMCIA support software for Windows 95. This is because the Windows 95 installation program does not automatically remove the PC Card Director for DOS and Windows.

To remove the PC Card Director for DOS and Windows, do the following (this procedure also enables the Windows 95 Integrated PCMCIA support software):

- 1 Start Windows 95.
- 2 Select **My Computer**, **Control Panel**, and **PC Card**.
- 3 Select **No** for the question "Are you using a PC card to install Windows?" and click on **Next**.
- 4 Select **No** for the question "Do you want to review your system files and select real-mode PC card drivers so Windows can disable them?"
- 5 Click on **Finish** to complete the Windows 95 PCMCIA support setup.
- 6 Restart your computer.

Installing the PC Card Director for Windows 95

You have removed the PC Card Director for DOS and Windows. To install the ThinkPad PC Card Director for Windows 95, continue to the following section.

Installing the Socket Services Device Driver

Prepare your Windows 95 product diskettes if you do not already have the Windows 95 integrated PCMCIA support software installed on your computer.

To install the ThinkPad Socket Services device driver for Windows 95:

- 1** Start Windows 95.
- 2** Select **My Computer.**, **Control Panel**, and **System**.
- 3** Click on the **Device Manager** tab.
- 4** Click on the + mark for **PCMCIA socket**.
- 5** Double-click on **PCIC or compatible PCMCIA controller**.
- 6** Click on the **Driver** tab to see the **Driver files:** list.
- 7** Click on the **Change Driver...** button.
- 8** Click on the **Have Disk...** button.
- 9** Insert the PCMCIA Installation Diskette for OS/2, Windows 95 into the diskette drive.

Installing the PC Card Director for Windows 95

- 10** Click on the **OK** button; then you will see the “PCIC or compatible PCMCIA controller on IBM system” item in the “Models:” list.
- 11** Click on the **OK** button.
IBMCS01.VXD and IBMPCDIF.VXD will be listed in the “Driver files:” list.
- 12** Click on the **OK** button.
Windows 95 now starts copying files. The Insert Disk panel asks for one of the Windows 95 installation diskettes.
- 13** Change the source for “Copying files from:” to A:\ when Windows 95 tries to copy IBMCS01.VXD or IBMPCDIF.VXD.
- 14** Insert the PCMCIA Installation Diskette for OS/2, Windows 95 into the diskette drive.
- 15** Click on **OK**.
IBMCS01.VXD and IBMPCDIF.VXD are copied from the diskette.
- 16** Click on the **OK** button at the Insert Disk panel.
- 17** Click on the **Skip File** button at the Copying Files... panel when Windows 95 tries to copy the following files:
 - CARDDRV.EXE
 - CSMAPPER.SYS
 - FLS1MTD.VXD
 - FLS2MTD.VXD
 - PCCARD.VXD
 - SRAMMTD.VXD
- 18** Restart the computer.

Note:

These files were copied when you installed the Windows 95 integrated PCMCIA support software.

You have completed the installation of the ThinkPad Socket Services device driver. Continue to the following section.

Installing the PC Card Director for Windows 95

Installing the PC Card Director for Windows 95

To install the PC Card Director for Windows 95, do the following:

- 1** Start Windows 95.
- 2** Open **My Computer**.
- 3** Open **Control Panel**.
- 4** Open **Add/Remove Programs**.
- 5** Click on the **Install...** button.
- 6** Insert the PCMCIA Installation Diskette for OS/2, Windows 95 into the diskette drive.
- 7** Click on the **Next>** button.
- 8** When you see "A:\INSTALLP.EXE" on the screen, click on the **Finish** button.
- 9** Click on the **Continue** button when the opening panel of the installation program appears on the screen.
- 10** Follow the instructions on the screen.
- 11** Remove the diskette from the diskette drive.

You have completed the installation of the PC Card Director for Windows 95.

If you want to continue to install all the device drivers, go to "Installing the ESS AudioDrive Support Software for Windows 95" on page 137.

Installing the ESS AudioDrive Support Software for Windows 95

Note:

When installing an operating system, you need to install the ESS AudioDrive support software.

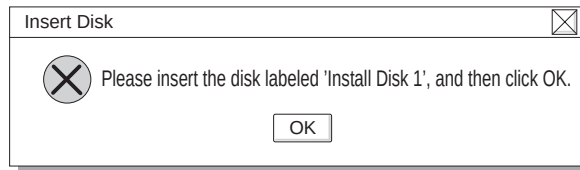
When installing Windows 95, the software might detect the AudioDrive chip installed in your computer, and automatically install the required software in your hard disk drive.

However, the version of the AudioDrive support software supplied with Windows 95 might be a version different from the one needed for your computer.

It is recommended that you reinstall the AudioDrive support software as follows:

- 1** Turn on the computer and start Windows 95.
- 2** Open **My Computer**.
- 3** Open **Control Panel** and open **System** to open the System Properties window.
- 4** Click on the **Device Manager** tab; then double-click on **Sound, video, and game controllers** from the list.
- 5** Double-click on **ESS AudioDrive**.
- 6** Click on the **Driver** tab.
- 7** Click on the **Change Driver** button.
- 8** Click on the **Have Disk...** button.
- 9** Insert the Audio Features Diskette for Windows 95 into the diskette drive; then type A:\ and click on **OK**.
- 10** Click on **OK** until you see the following error message:

Installing the ESS AudioDrive Support Software for Windows 95



11 Make sure the Audio Features Diskette for Windows 95 is inserted in the diskette drive; then click on **OK**.

12 Type A:\ at the Copy Files From window; then click on **OK**.

The installation begins.

13 After the installation is complete, click on the **Close** button.

You have completed the installation of the AudioDrive Support Software for Windows 95.

If you want to continue to install all the device drivers, go to "Installing the Infrared Device Driver for Windows 95" on page 139.

Installing the Infrared Device Driver for Windows 95

Note:

When installing an operating system, you need to install the infrared device driver.

To install the infrared device driver for Windows 95, do the following:

- 1** Start Windows 95; then go to the MS-DOS command prompt.
- 2** Insert the Infrared Features Diskette into the diskette drive.
- 3** Type `A:UINSTALL` and press **Enter**.
- 4** At the “Installation Options” screen, press **Enter** to accept the default source drive.
- 5** Follow the instructions on the screen.
- 6** Select **Install Windows ThinkPad Infrared Driver** when you are asked.
Make sure you specify the directory where you have installed Windows 95 when asked.

You have completed the installation of the infrared device driver.

Chapter 8. Solving Computer Problems

Computer problems can be caused by software, hardware, or both. You can diagnose and solve many problems with the assistance of the self-tests and system programs contained in Easy-Setup. If a hardware problem is detected by the self-tests, an error message is displayed.

The system programs can identify a problem or provide information for the service representative. Make a note of all error codes and give them to the service representative when you call for service. If the system programs cannot be loaded, the troubleshooting charts and other information will help you determine what corrective action to take.

Important

Use this chapter to test only *IBM* products. Non-IBM products can cause misleading error information or incorrect computer responses. When testing non-IBM products, refer to the instructions supplied with those products.

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Common Problems and Frequently Asked Questions

This section provides:

- Common problems and their corresponding actions.
- Frequently asked questions and their answers.

Common Problems and Actions

Problems	Actions
I cannot use PC Cards other than IBM ones in the OS/2 Warp environment.	If you do not have the PC Card device driver for OS/2 but you have one for DOS, your PC Card may run in the VDM (virtual DOS machine) environment. Refer to "Virtual Card Services for OS/2" on page 209 for setting the VDM and the sample configuration files on the PCMCIA Installation Diskette for OS/2, Windows 95. (If the PCMCIA Installation Diskette for OS/2, Windows 95 did not come with the computer, create it using the Diskette Factory program.)
My computer does not show as good performance as I expected.	Performance varies depending on your hardware and software configurations such as memory size, swapper file size, or smart drive settings.
Error 2xx appears (memory error).	Make sure your memory card is correctly installed. (See page 93.)
A memory shortage or memory error occurs.	<i>When you are using DOS</i>, it is recommended that you use the DOS command MEM /C to review your DOS memory usage occasionally. And then: – Unload any unnecessary drivers from the CONFIG.SYS file. (For example, unload printer drivers if you do not use a printer.) – Reconfigure the UMB (upper memory block) using the DEVICEHIGH statement. – Use the multiple configuration setup for DOS (refer to the documents supplied with DOS). <i>When you are using Windows Version 3.11:</i> – Try the same actions as described for DOS. – Unload any unnecessary programs from the WIN.INI file (for example, FUELWIN for ac operations or LRGPTR for large pointer.)

Troubleshooting

Problems	Actions
The external monitor screen is blank.	Do the following: Make sure the display output type parameter of the ThinkPad Features program is set to CRT () or Both () . In the ThinkPad Features program, set the computer not to enter suspend mode when the LCD is closed.
The computer does not resume from suspend mode , or the suspend indicator stays on and the computer does not work.	The computer automatically enters suspend or hibernation mode when the battery pack is empty. Do one of the following: 1. Connect the AC Adapter to the computer. 2. Replace the battery pack with a fully charged one and then press the power switch. If the computer was in suspend mode, the data before entering suspend mode might not be saved.
The computer does not enter suspend or hibernation mode .	Verify that: If you are using the AC Adapter and the computer is communicating, suspend and hibernation modes are disabled. (See page 71.) If using the hibernation mode, make sure you have created the hibernation file. (See page 73.)
When using Windows, the pointer does not move after normal operation is resumed from one of the power-saving modes.	Make sure you have installed Windows with the APM option by following the procedures on page 120.

Frequently Asked Questions and Answers

Questions	Answers
How can I expand my hard disk space?	You can uninstall most of the preloaded applications and obtain free hard disk space. Check whether the application you want to delete has its own delete icon.
How can I expand my memory?	See answers to memory questions on page 143.

Troubleshooting

Questions	Answers
How can I get diskettes for operating systems or device drivers?	You can create the operating systems diskettes or device driver diskettes by using the Diskette Factory program or any other backup programs. If you cannot use the Diskette Factory program, do the following: In the U.S., access the IBM PC Company BBS to get the latest versions of device driver diskettes. Purchase the operating system diskettes or device driver diskettes. Contact your IBM reseller or IBM marketing representative. (See page 168 for IBM HelpWare information.)
How can I resolve any resource conflicts (for IRQ, COM port, and other settings) that have occurred after installing a new option or a new application?	See Appendix A to get information about any hardware resources already used by devices in the computer.

Testing the Computer

The following shows a basic way to test the computer:

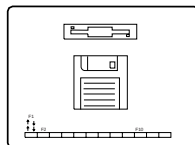
1 Turn on the computer.

The power-on self-test (POST) runs automatically. If the test ends without detecting an error, one of the following occurs:

The operating system or application screen appears.

A password prompt appears on the screen, if a password has been set. Type the correct password and press **Enter**.

The **Diskette** and **F1** prompts (shown below) appear.



This means no operating system is installed in your computer. Install it now.

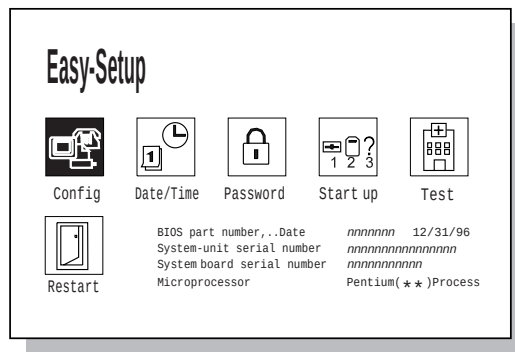
Did one of these screens appear?

Yes Turn off the computer and continue with step 2.

No Go to page 149.

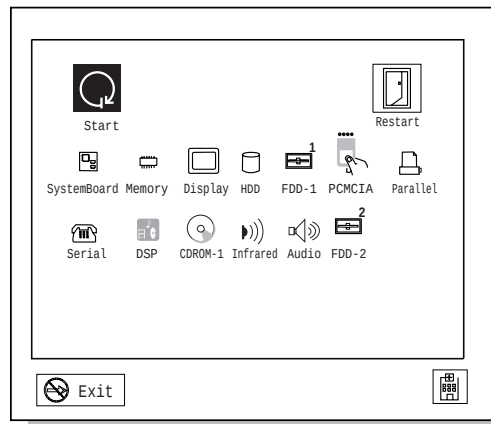
2 Make sure the speaker volume control is in its middle position.

3 Press and hold **F1**; then turn on the computer to start Easy-Setup. Hold **F1** until the following Easy-Setup menu appears.



4 Did the Easy-Setup menu appear on the screen?

Yes The computer has successfully completed the POST (internal tests), and the system programs have been loaded. To start the test programs, select the **Test** icon; then select the **Start** icon or press **Enter**.



If the computer did not beep, the speaker is not working correctly. Check that the speaker volume control (see page 12 for the location) is in its middle position. If you are not sure about the beep, turn off the computer; then turn it on again and repeat step 3 on page 146. If a problem still exists, have the computer serviced.

If you cannot go beyond the first screen, have the computer serviced.

Troubleshooting

If an error is detected, the character X appears at the left of the affected device, and an error code appears below it. Record the error code and have the computer serviced.

If the test does not find a problem but one still exists, find the problem in the troubleshooting charts on page 149.

No Return to step 3 on page 146 and start Easy-Setup again. If you still cannot start Easy-Setup, find the problem in the troubleshooting charts starting on page 149.

Troubleshooting Charts

In the charts, x can be any character.

Error Codes

Screen Message and Its Meaning	Action
I9990301 (Hard disk drive error) I9990305 (Startup error)	For I9990301, there is an error in the hard disk drive or it cannot be found. For I9990305, the computer cannot find the startup drive. Note: If you have upgraded your hard disk drive or have a new one, install an operating system first before proceeding. Do the following: 1. Turn off the computer. 2. Press and hold F1; then turn on the computer to start Easy-Setup. Hold F1 until the Easy-Setup menu appears. 3. Select the Start up icon. If you are unable to set the startup sequence, have the computer serviced. 4. Check the list of devices on the startup sequence box. Is the default drive listed in the startup sequence box? Yes Exit this screen, and turn off the computer. No Select the Reset icon. 5. Is an operating system installed? Yes Go to step 7. No Install operating system in your computer. 6. After the operating system is installed, turn off the computer. 7. Turn on the computer. If the same screen message appears, have the computer serviced.
I9990302 (No operating system found)	An operating system is not found in the hard disk drive. Install an operating system following the instructions in Chapter 7.
I99xxxxx (Except the above I999030x errors)	Have the computer serviced.

Troubleshooting

Screen Message and Its Meaning	Action
16x or 17x (Undefined date or configuration error)	Follow the instructions on the screen.
174 (Device configuration error)	There is a device configuration error. Have the computer serviced.
184 (Invalid password error)	The entered password is invalid. Turn off the computer and wait at least 5 seconds; then turn it on again and type the correct password.
190 (Critical low-battery error)	The computer has turned off because of a critical low-battery condition. Connect the AC Adapter to the computer and charge the battery pack, or replace the battery pack with the fully charged one.
195 (Hibernation error)	The system configuration before and after hibernation mode differs, and the computer cannot resume normal operation. If the memory size is changed, re-create the hibernation file (see page 73).
196 (Hibernation error)	The computer cannot read the hibernation file. Have the computer serviced.
2xx (Memory error)	Verify that the DIMM option is correctly installed.

Troubleshooting

Screen Message and Its Meaning	Action
30x (Keyboard error)	Verify that nothing is put on the system keyboard or the external keyboard. Turn off the computer and all attached devices. Turn on the computer first; then turn on the attached devices. If there is still a problem, do the following: If the computer has an external keyboard connected, do the following: – Turn off the computer and disconnect the external keyboard; then turn on the computer. If no error occurred, your external keyboard might be damaged. Have the external keyboard serviced. – Verify that the external keyboard is connected to the correct side of the keyboard/mouse connector (see page 101). – Verify that the keyboard/mouse connector is correctly connected to the computer. If the preceding items are correct, disconnect the keyboard/mouse connector from the computer and verify that the operation of the system keyboard is correct. If the system keyboard works correctly, have the keyboard/mouse connector or the external keyboard serviced. Test the computer by selecting the Start icon in the Test menu of Easy-Setup. – If the computer stops during testing and does not continue, have the computer serviced.

Troubleshooting

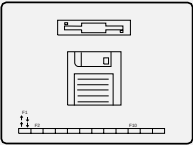
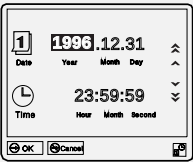
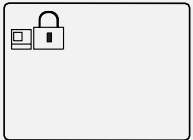
LCD Blank or Power-On Problems

Problem	Action
The screen is blank and there are no beeps. Note: If you are not sure about the beeps, turn the computer off; then turn it on again, and listen for the beeps.	Verify that: The battery pack is correctly installed. The AC Adapter is connected to the computer and the power cord is plugged into a working electrical outlet. The computer power switch is turned on. If the preceding items are correct and the screen remains blank, have the computer serviced.
The screen is blank and there is one beep. Note: If you are using an external monitor, go to "External Monitor Problems" on page 157.	If a power-on password is set, press any key to display the power-on password prompt and then type the correct password and press Enter (see page 78). If a power-on password is not set, verify that the brightness control on the computer is correctly adjusted. If the preceding items are correct and the screen remains blank, have the computer serviced.
The screen is blank and there is a continuous beep, or two or more beeps.	Have the computer serviced.
Only the cursor appears.	Reinstall your operating system and turn on the computer. If there is still a problem, have the computer serviced.
xxxxx KB OK appears and the computer halts.	Have the computer serviced.
The screen is unreadable or distorted.	Verify that: The ThinkPad display driver is installed correctly (refer to the Chapter 7 for installation instructions). The refresh rate settings in the ThinkPad Features program's display setup screen (under the Advanced... button) are set to your display resolution and color type.
Incorrect characters appear on the screen.	Verify that operating systems and application programs have been installed and configured correctly. If so, have the computer serviced.
The screen stays on although the power switch is turned off.	Press the Power Shutdown switch on the bottom of the computer with the tip of a pen or, disconnect the AC Adapter and remove the battery pack to turn off the computer. Then turn the computer on again.

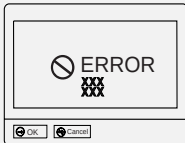
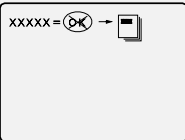
Troubleshooting

Problem	Action
The computer goes into suspend mode immediately after the POST. (The suspend lamp turns on.)	Verify that: - The battery pack is charged. - The environmental temperature is within the acceptable range. Refer to "Specifications" on page 221. If the preceding items are correct, have the computer serviced.
Error 190 appears and the computer immediately turns off.	The battery pack is low in power. Connect the AC Adapter to the computer, or replace the battery pack with a fully charged one.
Missing, discolored, or bright dots appear on the screen at all times. (TFT color display model only.)	The computer LCD contains more than 1,440,000 thin-film transistors (TFTs). A small number of missing, discolored, or bright dots on the screen is an intrinsic characteristic of TFT LCD technology and is not an LCD defect.

Screen Messages

Message	Action
Diskette and F1 prompts. 	Make sure that you have installed an operating system in your computer. Or, verify that the self-starting diskette is inserted correctly (with the label up and metal-shutter end first) in the diskette drive. If so, press F1. If both prompts remain, have the computer serviced.
Error 163 appears with the date and time screen. 	The date and time screen appears when neither the date nor the time is set in the computer. Set the date and time by typing or clicking on the ▲ or ▼ to set the numbers; then click on the OK button.
Power-on password prompt. 	A power-on password was set. To use the computer, type the correct password and press Enter (see page 78). If there is still a problem, have the computer serviced.

Troubleshooting

Message	Action
Test menu. 	Select the Start icon and follow the instructions to test your system. If you cannot go beyond the Test screen, have the computer serviced. If the computer stops during testing and does not continue, have the computer serviced. If testing does not find a problem but one still exists, find the problem in "What If Testing Cannot Find the Problem?" on page 156. If the test ends with an error, make a note of the error code and have the computer serviced.
POST error prompt. 	An error was found during the POST. Press Enter; then select Start from the test menu to run the test. If the test ends with an error, make a note of the error code and have the computer serviced.
Error prompt. 	Turn off the computer and start Easy-Setup; then select Test to test the computer. If the test ends with an error, make a note of the error code and have the computer serviced. You can start the operating system by pressing F1 instead and ignore the error.
A screen or message that is not listed.	Turn off the computer and start Easy-Setup; then select Test to test the computer. If the test ends with an error, make a note of the error code and have the computer serviced. If you cannot start Easy-Setup, have the computer serviced.

Other Problems

Problem	Cause or Action
The computer locks up or does not accept any input.	Press the Power Shutdown switch on the bottom of the computer with the tip of a pen to turn off the computer; then turn the computer on again. If there is still a problem, have the computer serviced.
The computer enters suspend mode automatically.	The computer enters suspend mode automatically when the processor temperature is higher than a certain degree. This is not a defect.
The computer performance is getting worse in an environment where the temperature is higher than the product specifications. (See "Specifications" on page 221.)	Processor speed may decrease if the computer is used in a high-temperature environment. This is not a defect.
The computer has problems such as a broken keylock or a defective indicator lamp.	Have the computer serviced.
The computer does not turn off with the power switch.	If the suspend lamp is turned on, connect the AC Adapter or install a fully charged battery pack in the computer; then resume operations. If there is still a problem, press the Power Shutdown switch on the bottom of the computer with the tip of a pen to turn off the computer.
The computer does not start from a diskette.	Check that the startup sequence in Easy-Setup is set to start the computer from the diskette drive (see page 38).

Troubleshooting

What If Testing Cannot Find the Problem?

If the test programs do not find the problem, use these troubleshooting charts:

Battery Power Problems

Problem	Action
The battery status indicator has turned off although a battery pack is installed in the computer.	The over-current protection device inside the battery pack has been activated. Wait for several hours and try to use it again. If there is still a problem, replace the battery pack or have the computer serviced.
The battery pack cannot be fully charged in 3 hours by the power-off charging method.	The battery pack might be overdischarged. 1. Turn off the computer. 2. Make sure that the battery pack is in the computer. 3. Connect the AC Adapter to the computer and let it charge. If the battery pack cannot be fully charged in 24 hours, use a new battery pack.
The battery operating time indicated by the Fuel-Gauge program or the battery status indicator is much longer or shorter than the actual operating time.	Repeat discharging and charging of the battery pack at least three times.
The operating time for a fully charged battery pack becomes shorter.	Repeat discharging and charging of the battery pack three to six times. If there is still a problem, use a new battery pack.
The computer does not operate with a fully charged battery pack installed.	The over-current protective function in the battery pack might be activated. Turn the computer off for 1 hour to reset the over-current protective function, and then turn it back on again.

External Diskette Drive Problems

Problem	Action
The diskette drive in-use icon on the external diskette drive stays on.	If there is a diskette in the drive, verify that: – The external-diskette-drive connector is firmly attached to the computer. – The diskette contains the necessary files to start the system. – There is nothing wrong with your application program. – There is nothing wrong with the diskette. Try a backup copy if you have one. – The diskette is inserted correctly (label up and metal-shutter end first) in the diskette drive. If the preceding items are correct, have the computer serviced. If there is no diskette in the drive, have the computer serviced.

External Monitor Problems

Problem	Action
The screen is blank.	Verify that: The power cord for the external monitor is plugged into a working electrical outlet and into the external monitor. The external monitor is turned on and the brightness and contrast controls are adjusted. The signal cable for the external monitor is plugged into the external-monitor connector on the computer. Some signal cables might not fit into the external-monitor connector because of the connector type. The external monitor (CRT  or Both ) is selected as the display device using the Fn key function (see page 20) or the ThinkPad Features program (see page 29). After verifying the preceding items, turn off the computer; then turn it on. If the external monitor remains blank, run the display tests described in the instructions supplied with the external monitor. If the tests show the external display is OK, have the computer serviced.

Troubleshooting

Problem	Action
The screen is unreadable or distorted.	Verify that: - The ThinkPad display driver is installed correctly (see Chapter 7). - The device setup parameters in the display setting screen (click on the Display ) icon in the ThinkPad Features program) are set to your display resolution and color type (see page 44). To change or set up the external monitor, see “Attaching a Monitor” on page 43. If these are correct, run the tests described in the instructions supplied with the external monitor. If the tests show the external display is OK, have the computer serviced.
Wrong characters appear on the screen.	Verify that the operating systems and application programs have been installed and configured correctly. If so, have the computer serviced.

Hibernation Problems

Problem	Action
The computer does not enter hibernation mode with the Fn+F12 key combination.	Did you create the hibernation file? You must create the hibernation file before entering hibernation mode (see page 73). Are you using PC Cards? If you are using one of the IBM communication PC Cards listed in the “Considerations for Hibernation Mode” on page 75, the computer cannot enter hibernation mode. To enter hibernation mode, stop the communication program, and then remove the PC Card or turn off the power to the PC Card slot using the PC Card Director.

Infrared Communication Problems

Problem	Action
The computer cannot communicate with other devices using the infrared port on the computer.	Verify that: - Power is supplied to the infrared port by the ThinkPad Features program (click on the Infrared () icon). - The infrared function is enabled and other choices are set correctly in the ThinkPad Features program (click on the Infrared () icon in the ThinkPad Features program). - The communicating device is using an equivalent communication speed (see page 52). - The infrared port is clean and does not have any spots. - No cable or electrical device is between the computer and the communicating device. - The distance and angle between the computer and the communicating device are correct.
Incorrect data is sent between the computer and the device.	Verify that: - The distance and angle between the devices are correct. - The communicating device is using an equivalent communication speed. - There is no device radiating infrared rays, such as remote-controlled devices or wireless headphones, near the computer or device. - Direct sunlight or fluorescent lamps are not near the computer or device.

Troubleshooting

Keyboard, External Numeric Keypad, and Pointing Device Problems

Problem	Action
All or some keys on the system keyboard do not work.	If the problem occurs immediately after the computer returns to normal operation from suspend mode, enter the power-on password. If a power-on password is set, you must enter the password. If the external keyboard is connected, the numeric keypad on the system keyboard will not work. If the external numeric keypad or the mouse is connected: 1. Turn off the computer. 2. Remove the external numeric keypad or the mouse. 3. Turn on the computer and try using the keyboard again. If the keyboard problem is resolved, check the connection of the external numeric keypad, external keyboard, or the mouse. If there is still a problem, have the computer serviced.
The pointer drifts when the computer is turned on or after resuming normal operation. —or— During computer operation, the pointer drifts when not using the TrackPoint III.	Drifting is a characteristic of the TrackPoint III and is not a defect. The drifting occurs for several seconds under the following conditions: - When the computer is turned on. - When resuming normal operation. - When the TrackPoint III is pressed for a long period of time. - When the environmental temperature changes.
The mouse or pointing device does not work.	Verify that the mouse or pointing-device cable is securely connected to the computer. Try using the TrackPoint III. If the TrackPoint III works, suspect the externally attached pointing device. If you are using Windows 3.11, make sure Computer is set as MS-DOS System with APM. See page 120. If you are using a mouse that is not compatible with the IBM PS/2 Mouse, disable the TrackPoint III using the ThinkPad Features program. 1. For OS/2 and Windows, see page 100 to disable the TrackPoint III. 2. For DOS, see page 33 or page 216.
All or some keys on the external numeric keypad do not work.	Verify that the external numeric keypad is correctly connected to the computer.

Troubleshooting

Problem	Action
All or some keys on the external keyboard do not work.	To use an external keyboard, you need to attach the keyboard/mouse connector to the computer. Verify that: - The keyboard/mouse connector is correctly connected to the computer. - The keyboard connector is connected to the correct side of the keyboard/mouse connector. If the preceding items are correct, disconnect the keyboard/mouse connector from the computer and verify that the operation of the system keyboard is correct. If the system keyboard works, have the keyboard/mouse connector or the external keyboard serviced.
A number appears when you type an alphabetic character.	The numeric lock function is on. To disable it, press and hold Shift; then press NumLk.

Troubleshooting

Option Problems

Problem	Action
An IBM option that was just installed does not work.	Verify that: - The option is designed an IBM ThinkPad 560 computer. - The option has been installed correctly by following the instructions supplied with the option or this book. - Other installed options or cables are not loose. - No I/O address or interrupt level (IRQ) conflict has occurred. To see the system resource status, start the ThinkPad Features program and click on each device icon. (For some devices, the I/O address or IRQ can be seen when you click on the Advanced.. button.) If the test programs for the option did not find the problem, have the computer and option serviced, or see Appendix A.
An IBM option that used to work no longer works.	Verify that: - All the option hardware and cable connections are securely connected. - If the option came with its own test instructions, use those instructions to test the option. - System resource conflicts do not occur (see Appendix A). If the preceding items are correct and the test programs did not find the problem, have the computer and option serviced.
The serial port does not work.	Ensure that serial port is enabled and set to COM1, COM2, COM3, or COM4 in the ThinkPad Features program (click on the Serial Port  icon).

PC Card Problems

Problem	Action
PC Card Director does not recognize your PC Card.	Verify that: If you are using the EMS driver under DOS: – You have set the correct value for the /MA=mmm-nnnn parameter in the Resource Map Utility. In the EMS driver, check the UMB area used for PCMCIA under the X=mmm-nnnn parameter; then use that range to set the /MA parameter in the Resource Map Utility. Your PC Card supports PCMCIA Release 2.0 and 2.01. Refer to the manual that came with your PC Card. If your PC Card does not support PCMCIA Release 2.0 and 2.01, you cannot use PC Card Director. Contact your PC Card supplier. Your PC Card is working by following the diagnostic instructions for your PC Card, if any.
The PC Card is recognized by PC Card Director, but the “Not Ready” message is shown.	Verify that: The PC Card enabler is installed. Refer to the manuals supplied with your PC Card. If you are using the EMS driver under DOS: You have set the correct value for the /MA=mmm-nnnn parameter in the Resource Map Utility. In the EMS driver, check the UMB area used for PCMCIA under the X=mmm-nnnn parameter; then use that range to set the /MA parameter in the Resource Map Utility. If you are using Windows, also set the value for the EMMECLUDE= parameter in the SYSTEM.INI file. The resources for the PC Card are correctly reserved. Refer to “Checking the Allocated Resources for the PC Card” on page 206.

Troubleshooting

Problem	Action
The PC Card is shown as "Ready," but it does not work correctly.	Verify that: The resources reserved for the PC Card do not conflict with those for other system devices. Refer to "Avoiding System Resource Conflicts When Using PC Cards" on page 184 or open the ThinkPad Features program to resolve a conflict. The resources reserved for the PC Card match the settings in the application program. If you are using a modem card, check the COM number, I/O port address, and IRQ level. If you are using a network card, check the I/O port address, IRQ level, and memory window address. To check the resources assigned to the PC Card, click on the Status button in the PC Card Director program. If you are using an I/O PC Card, it might work if you add the following in the CONFIG.SYS file: <pre>DEVICE=C:\THINKPAD\IBMDSS 1.SYS /IO =x (or /IO1=x)</pre> Note: x shows the PC Card slot number (1 for upper slot, 2 for lower slot, or 12 for both slots) on the computer and /IO1= shows the slot number for an expansion unit or port replicator that is attached to the computer.
System resource conflicts occurred when using PC Cards.	See "Avoiding System Resource Conflicts When Using PC Cards" on page 184.

Printer Problems

Problem	Action
The printer does not work.	Verify that: The parallel port is enabled. (Click on the Parallel Port  icon.) The printer is turned on and ready to print. The printer signal cable is connected to the correct connector on the computer. (For the location of the printer connector, see "parallel connector" on page 13.) If the preceding items are correct and the printer still does not work, run the tests described in the printer manual. If the tests show that the printer is OK, have the computer serviced.

Software Problems

Problem	Action
An application program does not work correctly.	To determine if a problem is caused by the software, verify that: - Your computer has the minimum memory required to use the software. Refer to the manuals supplied with the software to verify this. - The software is designed to operate with your computer and your operating system. - Other software works correctly with your computer. - Necessary device drivers are installed (see Chapter 7). - The software you are using works correctly with another computer. If you have received any error messages when using the application program, refer to the manuals supplied with the software for a description of the messages and a solution to the problem. If the preceding items are correct and there is still a problem, contact your IBM authorized reseller or IBM marketing representative for help.

Getting Service

If you need further assistance, call your IBM authorized reseller or IBM marketing representative.

When requesting service, describe the error message or problem to the service representative. Error messages can help identify what service action is required and help the service representative provide quick and efficient service.

Important

During the warranty period, you may be responsible for repair costs if the product damage was due to misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by you.

For your convenience, write the service phone numbers here.



Listing Installed Options

When requesting repair service, you might need to know which options you have in your system. Check or write the names of your options below.

DIMM
(8MB or 16MB)
_____MB Hard Disk Drive
External Diskette Drive

Battery Pack

PC Cards

Recording Identification Numbers

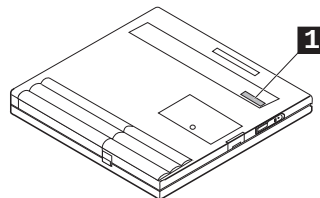
The following information is needed when requesting repair services:

IBM Product Name	ThinkPad 560
Machine Type	_____
Serial Number	_____

The machine type and serial number 1 are located on the bottom of the computer.

The machine type has a prefix of **Type**.

The serial number has a prefix of **S/N**.



Using the HelpWare Support Family

IBM *HelpWare* is the **full-service** solution for IBM PC service and support, wherever IBM products are sold and serviced. Purchasing an IBM PC hardware product entitles you to standard, no-fee help and support during the warranty period. If you need additional support and services, HelpWare provides a wide variety of extended solutions that address almost any need.

Getting Help by Telephone:

During the warranty period, you can get help and information by telephone, at no additional charge, through the IBM HelpWare PC Support Line. Expert technical-support representatives are available to assist you with questions you might have on the following:

- Setting up your computer and IBM display

- Installing and setting up IBM options purchased from IBM or an IBM reseller

- Using the 60-day support for the preinstalled operating system

- Arranging for service

Please have the following information ready when you call:

- Serial numbers of your computer, display, and other components or your proof of purchase

- Description of the problem

- Exact wording of any error messages

- Hardware and software configuration information for your system

If possible, be at your computer when you call.

- In the U.S. 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. See page 178.

These services are available 24 hours a day, 7 days a week (excluding some holidays).

Using HelpWare Support Family

Your HelpWare 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

ThinkPad EasyServ:

ThinkPad *EasyServ* is a courier repair service for IBM mobile products in which your ThinkPad computer will be picked up, sent to IBM for repair, and then returned back to the location of your choice. This service is available at no additional charge during the warranty period. Most repairs can be made the same day the system is received at the IBM repair location.

You can arrange this service by calling the PC Support Line for service. Telephone problem determination will be performed in the event the issue may be resolved over the telephone. If the problem is not able to be resolved over the telephone, a support representative will arrange for ThinkPad EasyServ.

You should keep your original ThinkPad shipping materials to send the computer to the repair location. If the original shipping carton is not available, the courier will deliver a shipping carton and return to pick up the system for delivery to IBM. This service is available only in the U.S. and Canada.

Getting Help around the World:

If you travel with your computer or need to move it to another country, you can register for International Warranty Service. When you register with the International Warranty Service Office, you will receive an International Warranty Service Certificate that is honored worldwide, wherever IBM or IBM resellers sell and service IBM PC products.

For more information or to register for International Warranty Service in the U.S. or Canada, call 1-800-497-7426.

Using HelpWare Support Family

Online Housecall:

Online Housecall is a remote communication tool, available in the U.S. and Canada only, that allows an IBM HelpWare technical-support representative to access your PC by modem. Many problems can be diagnosed remotely and corrected quickly and easily. To use this tool, a modem and a remote access application program are required.

For more information about configuring your PC for Online Housecall:

In the U.S., call 1-800-772-2227.

In Canada, call 1-800-565-3344.

Getting Information by Fax:

If you have a touch-tone telephone and access to a fax machine, in the U.S. and Canada you can receive by fax free marketing and technical information on many topics, including hardware, operating systems, and local area networks (LANs). You can call the IBM PC Company Automated Fax System 24 hours a day, 7 days a week. Follow the recorded instructions, and the requested information will be sent to your fax machine.

To access the IBM PC Company Automated Fax System, do the following:

In the U.S., call 1-800-426-3395.

In Canada, call 1-800-465-3299.

Using Electronic Support Services:

If you have a modem, you can access public electronic bulletin boards and public messaging areas, electronic conferences, and searchable databases available in several of the most popular online information services.

Using HelpWare Support Family

Bulletin boards and online services contain information on many topics, such as:

- PC user groups
- PC questions and answers
- OS/2 topics
- Solving problems
- Technical information
- Hardware and software configurations
- Networking

The IBM PC Company Bulletin Board System (BBS) can be reached 24 hours a day, 7 days a week. Modem speeds of up to 14,400 baud are supported. Long-distance telephone charges might apply.

To access the PC Company BBS:

- In the U.S., call 1-919-517-0001.
- In Canada, call the center closest to you:
 - Markham: call 905-316-4255.
 - Montreal: call 514-938-3022.
 - Toronto: call 416-492-1823.
 - Vancouver: call 604-664-6466.

Commercial online services that contain information about IBM products include:

CompuServe

Use the following GO word: ThinkPad.

Prodigy

Use the **Jump** command; type IBM and select **PC Product Support**.

America Online

Use the **Go to** keyword **IBM**.

Purchasing Additional HelpWare Services

During and after the warranty period, you can purchase additional HelpWare services, such as support for IBM and non-IBM hardware, operating systems, and application programs; network setup and configuration; upgraded or extended hardware repair services; and custom installations. Service availability and name might vary by country.

Enhanced PC Support Line:

Enhanced PC Support is available for desktop and mobile IBM computers that are not connected to a network. Technical support is provided for IBM computers and IBM or non-IBM options, operating systems, and application programs on the Supported Products list.

This service includes technical support for:

- Installing and configuring your out-of-warranty IBM computer
- Installing and configuring non-IBM options in IBM computers
- Using the operating system or application programs
- Tuning performance
- Installing device drivers remotely
- Setting up and using multimedia devices
- Identifying system problems
- Interpreting documentation

You can purchase this service for a single incident, for multiple incidents, or through a 900 number (billing will be by the telephone company). For more information about purchasing Enhanced PC Support, see "Ordering Support Line Services" on page 173.

Network and Server Support Line:

Network and Server Support is available for simple or complex networks made up of IBM workstations and servers using major network operating systems. In addition, many popular non-IBM adapters and network interface cards are supported.

This service includes technical support for:

Using HelpWare Support Family

Installing and configuring client workstations and servers
Identifying system problems and correcting problems on the client or the server
Using IBM and non-IBM network operating systems
Interpreting documentation

You can purchase this service for a single incident or for multiple incidents. For more information about purchasing Network and Server Support, see “Ordering Support Line Services.”

PC Software Assistance Support Line:

This service is an individual year-long subscription for assistance with desktop application programs installed in IBM and IBM-compatible computers. In Canada, this service is called PC Professional. Product experts will provide telephone assistance, 24 hours a day, 7 days a week, for application programs on the Supported Products list.

For more information about purchasing this service, see “Ordering Support Line Services.”

Ordering Support Line Services:

Enhanced PC Support Line, Network and Server Support Line, and PC Software Assistance Support Line services are available for products on the Supported Products list. To receive a Supported Products list:

In the U.S.,

- Call 1-800-772-2227.
- Select the automated fax system option.
- Select the service for which you would like a Supported Products list:
 - For Enhanced PC Support Line, select document 11682.
 - For Network and Server Support Line, select document 11683.
 - For PC Software Assistance Support Line, select document 11684.

Using HelpWare Support Family

In Canada, contact IBM Direct at 1-800-465-7999, or:

- Call 1-800-465-3299.
- Select the HelpWare catalog.

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

For more information or to purchase these services:

In the U.S., call 1-800-772-2227.

In Canada, call 1-800-465-7999.

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

Warranty and Repair Services:

You can upgrade your ThinkPad EasyServ/Customer Carry-In warranty service or extend the service beyond the warranty period.

Warranty upgrades in the U.S. include:

Overnight service option

Your warranty provides ThinkPad EasyServ/Carry-in repair service.

You can also extend your warranty. HelpWare Warranty and Repair Services offers a ThinkPad EasyServ Maintenance Agreement.

For more information about warranty upgrades and extensions:

In the U.S., call 1-800-426-7697.

In Canada, call 1-800-465-7999.

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

Using HelpWare Support Family

Consulting:

If you want to better understand and more effectively use IBM PC Servers and other Personal Computer products, in the U.S. you can purchase HelpWare Consult Line support. This service offers telephone access to experts for consultation on agreed-to topics. The experts provide recommendations and corrective actions, as appropriate.

For more information about HelpWare Consult Line, call 1-800-772-2227.

Custom Services

If you are setting up a network and need help installing the network or the application programs, in the U.S. you can purchase assistance from HelpWare Custom Services.

The following services are available:

LAN Startup Services

This service provides assistance with setting up and customizing your network, including:

- Unpacking equipment
- Setting up and testing the hardware
- Connecting systems to LAN cabling
- Customizing the network operating system
- Customizing the network printer server

Connectivity Services

This service provides hardware installation and connection to support a server and five or more workstations, using token-ring or 10BaseT Ethernet cabling.

For more information about LAN Startup and Connectivity Services, call 1-800-772-2227.

Obtaining IBM Operating System Updates

IBM provides update diskettes, called ServicePaks or corrective service diskettes (CSDs), to customers who report a DOS or OS/2 problem for which there is or will be a corrective program.

You can obtain update diskettes from the following sources:

IBM PC Company BBS.

IBM Software Solutions Center. In the U.S. or Canada, call 1-800-992-4777.

IBM authorized reseller or IBM marketing representative.

Using HelpWare Support Family

Ordering Publications:

Additional publications are available for purchase from IBM. For a list of publications available in your country:

In the U.S. and Puerto Rico, call IBM PC Books at
1-800-426-7282.

In Canada, call 1-800-465-1234.

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

About Your Warranty

During the warranty period, you may be responsible for repair costs if the product damage was due to misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance.

For complete details about the product warranty, see Appendix E.

Service outside North America

Service outside North America

Notes:

The number in parentheses () is the country code.

Toll-free numbers do not work outside the appropriate country.

Caribbean:

Bahamas	(1)-323-7350
Barbados	(1)-426-0670
Jamaica	(1)-926-3170
Netherlands-Antilles (Curaçao)	(599)-77-000
Trinidad	(1)-624-5111

North America:

Canada	Toll-free 800-565-3344 416-443-1681
Mexico (Mexico City-5)	(52)-557-8588
U.S.A.	Toll-free 800-772-2227 919-517-2477

Central and South America

Argentina (Buenos Aires-1)	(54)-1-313-0014
Chile (Santiago-2)	(56)-2-334-400
Colombia (Bogota-1)	(57)-1-236-1672
Costa Rica	(506)-236-222
Ecuador (Quito-2)	(593)-2-565-100
Panama	(507)-693-977
Peru (Lima-14)	(51)-14-836-1263
Venezuela (Caracas-2)	(58)-2-908-8738

Africa

Angola	(244)-337-591 Sociedade Informatica
(Luanda-2)	(244)-337-598
Botswana	(267)-312-425 Business Computer Ltd
Burundi	(257)-2-25-005 Centre National DeL'Inf
	(257)-2-22-813 Computel S.A.R.L SOFT Informatica
Djibouti	(253)-353-444

Service outside North America

	Dankal Centre Pharma (253)-354-347
Egypt (Cairo-2)	(20)-349-2533
Ethiopia (Addis Ababa-1)	(251)-518-444 AFCOR Ethiopia
Gambia	(22)-27577 Techn. & Office Equipm.
Ghana (Accra-21)	(233)-777-703 Masai Developers Ltd
	(233)-772-762
	(233)-666-201
	(233)-666-204
Kenya	(254)-2-230-261/2 Trans Business Mach
	(254)-2-556-913 Modern Business Mach
	(254)-2-742-574/5 Genop (BCS Division)
	(254)-2-742-400/4
	(254)-2-750-475
Liberia	(231)-223-648 Liberia Business Mach.
Malawi	(265)-671-755 Comp. Sales & Services
Malta	(356)-234-175 Computer Solutions
	(356)-234-176
	(356)-234-177
	(356)-233-121
Mozambique	(258)-424-036 Systems & Computadores
Nigeria (Lagos-1)	(234)-1-633-194
	(234)-1-634-473
	(234)-1-634-453
	(234)-1-630-371
	(234)-1-632-739
Rwanda	(250)-72-931 Compulec Rwanda
Sierra Leone	(232)-22-224-275 Continental Comm. & Service
	(232)-22-223-833
South Africa	(27)-011-331-8111
	Toll-free 0800-110756
Sudan	(249)-40-296 Computer Ltd
	(249)-42-277
Tanzania	(255)-51-37-183 Intern. Comm. Syst.
(Dar Es Salaam-51)	(255)-51-32-810

Service outside North America

Uganda (Kampala-41)	(256)-41-230-823 Business Systems Ltd
Zaire	(243)-12-24-029 Zaire Business Mach.
(Kinshasa-12)	(243)-12-23-359
Zambia (Lusaka-1)	(260)-1-229-323 Woodgate Computer Sys.
	(260)-1-229-325
	(260)-1-221-182
Zimbabwe (Harare-4)	(263)-4-794-631 Infotech Ltd
Europe and Middle East	
Abu Dhabi	971-2-337-173 Alpha Data Proc. Ser.
Austria	(43)-222-21145-7500
Bahrain	973-2-531-585 Mohammed Jalal & Sons
Belgium	(32)-2-718 4333
Bosnia-Herzegovina	(38)-71-219388
Bulgaria	(359)-2-730235
Croatia	(30)-41-624500
Czech Republic	(42)-2-7106111
Denmark	(45)-43-43-43-43
Dubai	971-4-521-000 Al-Abbas Trad. Co.
Finland	(358)-0-9800 4260
France	(33)-1-4039-9798
Germany	(49)-(0)-130-4567
Germany (Hanover)	(49)-(0)-511-5164567
Greece	(30)-1-995-3403
Hungary	(36)-1-1654422
Iceland	Toll-free 354-1-996977
Iran	982-1-893-251 Data Processing Iran
	982-1-680-644 Data Proc. Field Eng.
	982-1-850-504 Daya Systems Co.
	982-1-858-947 Taradis Iran Comp.
	982-1-651-319 Iran Microsyste
Ireland	(353)-1-515-811
Israel (Tel Aviv-3)	(972)-3-618-681
Italy	(39)-2-28100327
	(39)-2-28100370
Jordan	962-6-603-879 General Comp. & Elec.

Service outside North America

	962-6-605-365
	962-6-664-221 Special Systems Co.
Kuwait	965-2-451-915 Al Khorafi
Lebanon	961-1-324-122 Commercial & Tech. Sup.
	961-1-336-719
	961-1-372-860/1 El-Haceb S.A.L.
	961-1-389-814
Macedonia	(38)-91-117022
Netherlands	(31)-20-513-4275
Norway (Oslo)	(47)-66 99 93 00
Oman	968-793-741 Suhail & Saud Bahwan
Pakistan	(92)-21-525-181
Poland (Warsaw)	(48)-2-6582991
Portugal (Lisbon-1)	(351)-1-795-5546
Qatar	974-435-395 Almana Company
Romania	(40)-1-6158267
Russia	(7)-095-2356602
Saudi Arabia	(966)-2-660-0007 Saudi Business Mach.
	(966)-2-669-4605 S.B.M. Inf. Products
	(966)-2-761-7285 Tayseer Al Sheikh
	(966)-2-665-3470 Saudi Soft
Serbia	(38)-11-34622211
Slovak Republic	(42)-7-330175
Slovenia	(38)-61-15215
Spain (Madrid-1)	(34)-1-397-6503
Sweden	(46)-8-793 30 00
Switzerland	(41)-155-46-46
Syria	963-11-249-911 Attar Brothers Trad.
Turkey (Istanbul-1)	(90)-1-800-900
United Kingdom	(44)-81-940-6001
Yemen	967-2-272-401 Khirbash & Majid Trad.
Middle East	973-2-10880 Gulf Business Mach.
	Abu Dhabi Dubai Kuwait Oman (Bahrain)
	Bahrain Jordan Lebanon Qatar

Asia and Pacific Countries

Service outside North America

Australia (Sydney-2)	(61)-2-951-9716
Bangladesh	(880)-2-863532
Brunei	(673)-3-35204
Burma	See Myanmar
Hong Kong	(852)-825-6345
India	(91)-812-562645
Indonesia	(62)-21-571-1455 (62)-21-571-1485 (62)-21-571-1555 (62)-21-571-1575 (62)-21-520-9500
Japan	Toll-free 0120-20-5550 03-3450-7744 (fax)
(Tokyo)	(81)-3-3586-1111
Korea	Toll-free 080-023-5050 (82)-2-781-7367
Malaysia	(60)-3-735-5727 (60)-3-735-5728
Myanmar (Burma)	(95)-01-78354 (95)-01-73951
New Zealand	Toll-free 0800-733-222 (64)-4-576-5555
Philippines	(63)-2-819-3679 (63)-2-819-3774 (63)-2-816-3578
Singapore	(65)-289-8973 (65)-289-8975 (65)-289-2101(fax)
Sri Lanka	(94)-1-448442 (94)-1-440810-203
Taiwan	Toll-free 080-21-1212 (886)-02-776-7676
Thailand	(66)-2-2734069-70 (66)-2-27344010

For other countries, contact your local IBM office for service information.

Appendix A. Avoiding Hardware Conflicts

This appendix, listing the default and optional hardware settings, describes how to avoid system resource conflicts. It also describes how to do a network remote program load and how to start the computer from an ATA PC Card.

Avoiding System Resource Conflicts

When a new option such as an adapter card is installed, the computer might not operate correctly because of conflicting settings for IRQ (interrupt) levels, I/O addresses, DMA channels, and memory addresses.

To avoid these resource conflicts, you must know the hardware requirements, such as IRQ level and I/O addresses, for each option and program as shown in their manuals.

ThinkPad Features program:
 Page 29.

Then you must check the current resource allocations for the computer and your expansion unit, and select the available resource values by using the ThinkPad Features program.

When you want to install a new Ethernet PC Card in the computer, you need to assign an IRQ for the PC Card. An Ethernet PC Card generally requires IRQ5 as a default interrupt level; however, IRQ5 has already been occupied by the ESS AudioDrive in the computer.

You need to disable the ESS AudioDrive when you use the Ethernet PC Card as follows:

- 1** Install the Ethernet PC Card in the PC Card slot.
- 2** Open the ThinkPad Features program and click on the **PC Card** () icon.
- 3** Click on the **Auto Config** button.

Avoiding Hardware Conflicts

The ESS AudioDrive has been automatically disabled by the ThinkPad Features program, and the Ethernet PC Card is ready to use.

When you want to disable the Ethernet PC Card and enable the ESS AudioDrive, open the ThinkPad Features program, click on the **Audio** ( or ) icon. You can enable the ESS AudioDrive at the Audio/Alarm Advanced Setup screen.

List of system resources:

 Page 188.

You can see from the list of default settings on page 188 which system resources are already used by the devices in the computer.

Avoiding System Resource Conflicts When Using PC Cards

When you do a network remote program load (RPL) or start the computer from a PC Card, you must make sure that the system resources used by the PC Card do not conflict with the resources used by other devices.



Using the ThinkPad Features Program

When PC Card resources conflict with a built-in device, you can resolve the conflict using the ThinkPad Features program:

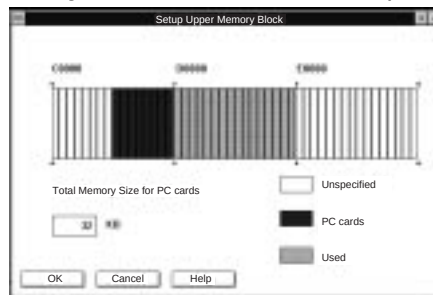
- 1** Insert the PC Card into the PC Card slot.
- 2** Start Windows or OS/2.
- 3** Start the ThinkPad Features program.
- 4** Click on the **PC Card** () icon.
- 5** Click on the **Auto Config** button.
- 6** Exit the ThinkPad Features program and restart your computer.

The built-in device in conflict may have been disabled to resolve the resource conflict.

Avoiding Hardware Conflicts

If you are using Windows, you can set the memory area used by the PC Card as follows:

- 1** Start the PC Card Director.
- 2** Select **Set Memory Area...** from the Actions pull-down menu.



- 3** Plan carefully which memory area to use for the PC Card and Card Services from the displayed information.
- 4** Using the mouse pointer, click on the desired memory area for the PC Card.
- 5** Click on the **OK** button.
- 6** Restart the computer.

Avoiding Hardware Conflicts

Doing a Network Remote Program Load

To do a network remote program load (RPL):

- 1** Using the PS2 command or ThinkPad Features program, check that there is no conflict between the system resources used by the PC Card and by other devices.

The following are the resources for a token-ring PC Card and an Ethernet PC Card:

Token-Ring PC Card

IRQ	9
I/O Address (HEX)	0A20–0A23
Memory Address (HEX)	CC000–CDFFF, D8000–DBFFF

Ethernet PC Card

IRQ	5
I/O Address (HEX)	0300–031F
Memory Address (HEX)	D0000–D1FFF, D4000–D7FFF

IRQ5 is the default setting used by the Sound Blaster emulation. To do an Ethernet PC Card RPL, change the IRQ for the Sound Blaster emulation, or disable it with the ThinkPad Features program or the SB PS2 command.

- 2** Start Easy-Setup and select the **Start Up** icon.
- 3** Select the **Network** icon.

A window appears at the bottom of the screen for you to select the RPL speed.
- 4** If you are using a token-ring card, select **4** (4Mbps) or **16** (16Mbps) for the RPL speed.
- 5** Click on **OK** or press **Enter**; then restart the computer.

Avoiding Hardware Conflicts

Starting the Computer from an ATA PC Card

To start the computer from an ATA PC Card:

- 1** Using the PS2 command or ThinkPad Features program, check that there is no conflict between the system resources used by the PC Card and by other devices.

The following are the resources for an ATA PC Card:

IRQ	15
I/O Address (HEX)	0170–0177

- 2** Start Easy-Setup and select the **Start Up** icon.

- 3** Select the **PCMCIA** icon.

The PC Card (PCMCIA icon) should not be set to follow the computer hard disk drive (HDD-1 icon) in the list. If the **HDD-1** icon is already in the drive-startup sequence, click on the **Reset** icon; then set the sequence so that the **PC Card** icon is before the **HDD-1** icon.

- 4** Click on **OK** or press **Enter**; then restart the computer.

Avoiding Hardware Conflicts

List of System Resources

The following table summarizes the available system resources for the computer and expansion units. Values in parentheses are alternative values that are selectable in the ThinkPad Features program or application programs. The default values are highlighted.

System Resources	IRQ	I/O Address (Hex)	Memory Address (Hex)	DMA Channel
Timer	0	0040–0043	None	None
Keyboard	1	0060 and 0064	None	None
Serial port	Disabled	Disabled	None	None
	4	03F8–03FF		
	3	02F8–02FF		
	4	03E8–03EF		
	3	02E8–02EF		
Parallel port	7	03BC–03BE (and 07BC–07BE)	None	0, 1, 3, or disabled
	7	0378–037F (and 0778–077A)		
	5	0278–027F (and 0678–067A)		
	Disabled	Disabled		
Infrared port	3 , 4, disabled	02F8–02FF , 03F8–03FF, 02E8–02EF, or 03E8–03EF	None	None
Diskette controller	6	03F0–03F7	None	2
Video controller	None	03BA, 03B4–03B5, 03C0–03CF, 03D4–03D5, 03D8–03D9, 03DA, 2100–21FF, 43C6–43C9, 46E8, and 83C6–83C9	A0000–BFFFF and C0000–C7FFF	None
ESS AudioDrive device	5 , 7, 10, 11, or disabled	0220–022F or 0240–024F	None	1 or 0
ESS AudioDrive device (FM synthesizer)	None	388–38B	None	None

System Resources	IRQ	I/O Address (Hex)	Memory Address (Hex)	DMA Channel
PCMCIA controller	None	03E0–03E1	None	None
PC Card	Depends on the type of PC Card	Depends on the type of PC Card	Depends on the type of PC Card	None
Real time clock	8	0070–0071	None	None
TrackPoint III or mouse	12	0060 and 0064	None	None
Math coprocessor exception	13	None	None	None
Notes: Addresses in the parentheses are also used when Extended Capability Port (ECP) is enabled by the ThinkPad Features program as the printer operating mode. When you enable ECP as the printer operating mode by the ThinkPad Features program, one of the choices (including “disabled”) must be selected.				

Appendix B. Advanced Information for PC Cards

This appendix describes advanced information related to using PC Cards.

Auto Configurator for PC Card Director

Note:

When installing an operating system, install the PCMCIA device driver that is on the PCMCIA Installation Diskette to use the Auto Configurator.

To install the PCMCIA device driver:

 Chapter 7.

The ThinkPad 560 computer provides the *Auto Configurator*, a program for some PC Cards, so that you do not have to install the device driver supplied with the card to use it.

The resource and configuration information for the PC Cards are written in the script files. Once the information is written, you can use the *Auto Configurator Utility* to edit these script files.

When Auto Configurator is installed, the following line is added to the CONFIG.SYS file according to your operating system:

For OS/2:

BASEDEV=AUTODRV2.SYS

For DOS and Windows:

DEVICE=[drive:] [directory] AUTODRV.SYS



Starting the Auto Configurator Utility for OS/2 or Windows

This section describes the Auto Configurator Utility for OS/2 or Windows.

To start Auto Configurator Utility for OS/2 or Windows, select the **Auto Configurator Utility** icon from the PC Card Director window.

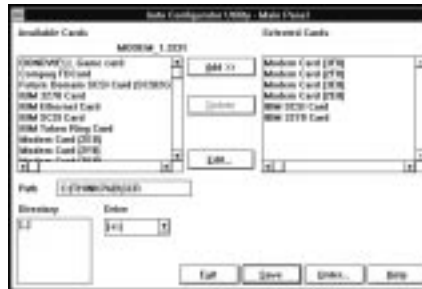


The operation for OS/2 and for Windows is the same.

Advanced Information for PC Cards

Registering a PC Card in Auto Configurator

- 1 Select a card from the Available Cards list in the Auto Configurator Utility main panel.



Select the card for which you want to assign the resources first. For example, when you want to assign COM3 to a modem card, and not COM2, select the setting for COM3 first.

- 2 Click on the **Add>>** button.
- 3 Click on the **Save** button.

The names in the left list box (**Available Cards**) are the cards that can be registered. The names in the right list box (**Selected Cards**) are the cards that are already registered in Auto Configurator. When a PC Card is installed, Auto Configurator starts from the top of the list to assign the resources to the card.

Deleting a Registered Card

- 1 Select the PC Card you want to delete from **Selected Cards** in the Auto Configurator Utility main panel.
- 2 Click on the **Delete** button.
- 3 Click on the **Save** button.

Advanced Information for PC Cards

Changing the Registered Order for PC Cards

To change the order of the registered PC Cards, do the following:

- 1** Click on the **Order...** button in the Auto Configurator Utility main panel.



The operation for OS/2 and for Windows is the same.

- 2** Refer to the following to change the order of the PC Cards in the list:

Moving a card toward the bottom

- a)** Select the PC Card you want to move.
- b)** Click on the **Down** button.

Every time you click on the **Down** button, the PC Card is moved toward the bottom of the list.

Moving a card toward the top

- a)** Select the PC Card you want to move.
- b)** Click on the **Up** button.

Every time you click on the **Up** button, the PC Card is moved toward the top of the list.

- 3** Click on the **OK** button to save the changes.

The changes are saved. To cancel the changes, click on the **Cancel** button.

Advanced Information for PC Cards

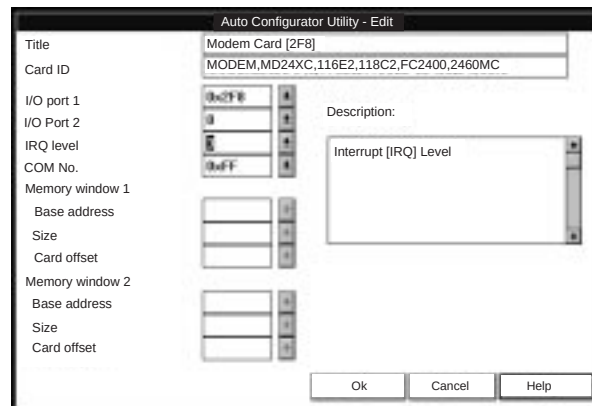
Changing the Resource Information for the PC Card

- 1** Select the PC Card you want to change from the left list box in the Auto Configurator Utility main panel.
- 2** Click on the **Edit...** button.

The following screen is displayed:

Note:

The current resource information is set as the default and appears in the input field of each item. The number that can be set is displayed in the pull-down list box.



- 3** You can change the following registered information for the PC Card:

The items that can be changed differ among PC Cards:

- Card ID
- I/O port address
- IRQ level
- COM number of the serial port
- Memory window address
- Memory window size
- Card offset address

- 4** Click on the **OK** button, and save the changes.
To cancel the changes, click on the **Cancel** button.

Adding to the CONFIG.SYS File

For PC Card Director to work correctly, the PC Card device drivers (which make up the structured file of PC Card Director) must be registered in the CONFIG.SYS file. These drivers are automatically registered in the CONFIG.SYS file when you install PC Card Director following the instructions in Chapter 7. The following shows each driver registered in the CONFIG.SYS file and the standard rules.



Registered Drivers and Standard Rules for OS/2

The following is a sample of the CONFIG.SYS file for OS/2:

```

:
BASEDEV=PCMCIA.SYS                (Card Services)
BASEDEV=ICRMU 1.SYS              (Resource Map Utility)
BASEDEV=IBM2SS 1.SYS             (Socket Services)
BASEDEV=AUTODRV2.SYS             (Auto Configurator)
DEVICE=C:\THINKPAD\VPCMCIA.SYS    (Virtual Card Services)
:
DEVICE=C:\THINKPAD\xxxxxxx.SYS
:    (↑Storage card device driver)
REM PC_Card_Client_Device_Driver
:
DEVICE=C:\THINKPAD\ICPMOS2.SYS
    (↑Power Management Support driver)

```

Advanced Information for PC Cards

- Rule 1** Card Services, Resource Map Utility, and Socket Services must be listed before any other PCMCIA drivers.
- Rule 2** The Resource Map Utility is necessary only for OS/2 Version 2.1x.
- Rule 3** The PCMCIA Power Management Support driver must be listed after all drivers, at the end of the CONFIG.SYS file.
- Rule 4** When using storage cards, the device drivers must be installed according to the card type:

Using only an ATA card:

```
:
BASEDEV=PCM2ATA.ADD /!DM (ATA card device driver)
DEVICE=C:\THINKPAD\PCMSSDIF.SYS
: (↑Storage API device driver)
BASEDEV=OS2PCARD.DMD (Storage Card Device Manager)
```

Using an ATA card and an SRAM card:

```
:
BASEDEV=PCM2ATA.ADD /!DM (ATA card device driver)
DEVICE=C:\THINKPAD\PCMSSDIF.SYS
: (↑Storage API device driver)
DEVICE=C:\THINKPAD\PCM2SRAM.SYS
: (↑SRAM card device driver)
BASEDEV=OS2PCARD.DMD (Storage Card Device Manager)
```

Advanced Information for PC Cards

Using an ATA card and a Flash card:

```
:
BASEDEV=PCM2ATA.ADD /!DM (ATA card device driver)
DEVICE=C:\THINKPAD\FLSH2MTD.SYS
        (↑Flash Card Memory Technology driver)
DEVICE=C:\THINKPAD\PCMSSDIF.SYS
        (↑Storage API device driver)
DEVICE=C:\THINKPAD\PCM2FLSH.SYS
        : (↑Flash card device driver)
BASEDEV=OS2PCARD.DMD (Storage Card Device Manager)
```

Using an ATA card, an SRAM card, and a Flash card:

```
:
BASEDEV=PCM2ATA.ADD /!DM (ATA card device driver)
DEVICE=C:\THINKPAD\FLSH2MTD.SYS
        (↑Flash Card Memory Technology driver)
DEVICE=C:\THINKPAD\PCMSSDIF.SYS
        (↑Storage API device driver)
DEVICE=C:\THINKPAD\PCM2SRAM.SYS
        (↑SRAM card device driver)
DEVICE=C:\THINKPAD\PCM2FLSH.SYS
        : (↑Flash card device driver)
BASEDEV=OS2PCARD.DMD (Storage Card Device Manager)
```

Rule 5 The Storage Card Device Manager (OS2PCARD.DMD) must be added after the Power Management Support driver (\$ICPMOS2.SYS) in the CONFIG.SYS file. If you don't have the Power Management Support driver, the Storage Card Device Manager must be added at the end of the CONFIG.SYS file.



Registered Drivers and Standard Rules for DOS and Windows

The following is a sample of the CONFIG.SYS file for DOS and Windows:

```
:
DEVICE=C:\DOS\EMM386.EXE FRAME=D      X=C8  -CFFF
:
DEVICEHIGH=C:\THINKPAD\IBMDSS 1.SYS      (Socket Services)
DEVICEHIGH=C:\THINKPAD\IBMDOSCS.SYS      (Card Services)
DEVICEHIGH=C:\THINKPAD\DICRMU 1.SYS /MA=C8  -CFFF
              (↑Resource Map Utility)
DEVICEHIGH=C:\THINKPAD\$ICPMDOS.EXE
              (↑Power Management Support driver)
REM PC_Card_Client_Device_Driver
:
DEVICEHIGH=C:\THINKPAD\xxxxxxx.SYS
              (↑Storage card device driver)
DEVICEHIGH=C:\THINKPAD\AUTODRV.SYS
              (↑Auto Configurator)
```

- Rule 1** When using the PCMCIA drivers with the Software EMS driver (EMM386.EXE), you must specify the X= parameter for EMM386.EXE. This is to avoid conflict in the memory area used by the PCMCIA drivers and the Software EMS driver.
- Rule 2** Socket Services, Card Services, and Resource Map Utility must be listed in this order.
- Rule 3** The Power Management Support driver must be listed after the Resource Map Utility.
- Rule 4** The PC Card Client device driver must be listed before the Auto Configurator.
- Rule 5** When using storage cards, you must install the device driver according to the card type, as listed below.

Using only an ATA card:

```
DEVICEHIGH=C:\THINKPAD\PAWATA.SYS
```

Using an ATA card and an SRAM card:

Advanced Information for PC Cards

DEVICEHIGH=C:\THINKPAD\PAWATAS.SYS

Using an ATA card, an SRAM card, and a Flash card:

DEVICEHIGH=C:\THINKPAD\FLSHDMTD.SYS
(↑Flash card Memory Technology driver)
DEVICEHIGH=C:\THINKPAD\PAWATASF.SYS
(↑ATA SRAM Flash card driver)

Note:

When the total storage of the Flash cards used at the same time exceeds 10MB, you must do one of the following:

Assign the /TSIZE:*n* parameter in the PAWATASF.SYS file.

For example:

1. If the maximum total storage is 20MB, specify:

DEVICE=PAWATASF.SYS /TSIZE:6

2. If the maximum total storage is 40MB, specify:

DEVICE=PAWATASF.SYS /TSIZE:1

See the /TSIZE parameter on page 203.

This increases the memory resident area for PAWATASF.SYS.

Assign the /EMS parameter in the PAWATASF.SYS file, and the /NE parameter in the IBMDOSCS.SYS file. This sets IBMDOSCS.SYS not to use the EMS page frame and allows PAWATASF.SYS to use it instead. (The EMS memory must be enabled.)

For example:

DEVICE=IBMDOSCS.SYS /NE /FLASH
:
DEVICE=PAWATASF.SYS /EMS

Storage Card Device Driver

ATA cards, SRAM cards, and Flash cards are PCMCIA storage cards. The following section describes the device drivers for these storage cards, available in PC Card Director.



PCMCIA Storage Card Device Driver for OS/2

Note:

Install PCM2ATA.ADD for all storage cards, even when you are using SRAM or Flash cards.

PCM2ATA.ADD supports ATA cards, PCM2SRAM.SYS supports SRAM cards, and PCM2FLSH.SYS supports Flash cards.

Any PC Card installed in the slot is recognized by its device driver, so regardless of its type, you can access the card by the drive name assigned to the slot. When using the PCMCIA ATA Card Mount Utility, install the PCMCIA Storage API device driver (PCMSSDIF.SYS) for OS/2.



PCMCIA Storage Card Device Driver for DOS and Windows

PAWATA.SYS supports ATA cards; PAWATAS.SYS supports ATA cards and SRAM cards; and PAWATASF.SYS supports ATA cards, SRAM cards, and Flash cards.

These device drivers assign a drive letter for each usable PC Card slot. These drive letters are displayed when the device drivers are initialized; then you can use the drive letter to access the installed PCMCIA storage card. When you run FORMAT.COM against the drive letter, the SRAM card is formatted as a diskette and the ATA or Flash card is formatted as a nonremovable disk. In the File Manager under Windows, the drive letters are represented and treated as a diskette drive, regardless of the storage card type.

Before Using PCMCIA Storage Cards

Format new PCMCIA storage cards before use. For Flash cards, run the Flash Format Utility (FFORMAT.EXE/FFORMAT2.EXE); then format the Flash card. For ATA cards and SRAM cards, there is no

need to run any programs before formatting the card. Format using the FORMAT.COM program, by displaying the File Manager (for Windows), or by choosing the drive icon (for OS/2).

Using PCMCIA ATA Cards with Multiple Partitions

The device driver assigns a drive letter only to the active (bootable) partition of the ATA card if it holds multiple partitions. For other primary partitions or logical drives in an extended partition, use the PCMCIA ATA Card Mount Utility to assign the drive letter to it.



Parameters for the OS/2 PCMCIA ATA Card Device Driver

The following are the parameters in the OS/2 PCMCIA ATA card device driver and their explanations:

BASEDEV=PCM2ATA.ADD [/S:n] [/P:hhhh] [/EXIRQ:n]
[/NOBEEP] [/B] [/STBTIME:n] [/MDRV:n] [/!DM]

/S:n	Specifies the number of PC Card slots. /S:1 shows that there is only one PC Card slot. When this parameter is not set, the number of PC Card slots is set to 2.
/P:hhhh	Specifies the lower limit for the I/O address of the ATA card. The device driver assigns the next usable I/O address from this lower limit to the card. When this parameter is not set, the device driver looks for a usable address and assigns it to the card.
/EXIRQ:n	Specifies the IRQ level that <i>is not</i> assigned to the card. You can set more than one IRQ level.
/NOBEEP	Specifies not to beep when a storage card is installed. When this parameter is not set, you will hear a beep every time a storage card is installed into the PC Card slot.
/B	Specifies that OS/2 has started from an ATA card. When this parameter is set, there will be no redundancy in assigning the logical drive to the slot

Advanced Information for PC Cards

where OS/2 was booted. It depends on the ATA card whether you can start OS/2 from it.

- /STBTIME:*n*** Specifies the time (from 1 to 21 minutes) until entering standby mode. When the ATA card is not accessed for the time specified by this parameter, the ATA card enters standby mode (only when your ATA card supports standby mode). When this parameter is not specified, standby mode for the ATA card is disabled.
- /MDRV:*n*** Specifies the number of extra drives that can be used in addition to the number of PC Card slots available for the PCMCIA storage devices. When this parameter is not specified, no extra drive is given to the device driver. The extra drives can be activated by the PCMCIA ATA Card Mount Utility.
- /!DM** Specifies not to use OS2DASD.DMD as the device manager. When this parameter is set, OS2PCARD.DMD is used instead.



Parameters for DOS PCMCIA Storage Card Device Drivers

The following are the parameters in the DOS PCMCIA storage card device driver and their explanations:

- DEVICE=[drive:] [directory] PAWATA.SYS [/P:hhhh] [/NOBEEP]
[/STBTIME:*n*] [/MDRV:*n*]
- DEVICE=[drive:] [directory] PAWATAS.SYS [/P:hhhh] [/NOBEEP]
[/STBTIME:*n*] [/MDRV:*n*]
- DEVICE=[drive:] [directory] PAWATASF.SYS [/P:hhhh]
[/NOBEEP] [/STBTIME:*n*] [/MDRV:*n*] [/EMS] [/TSIZE:*n*]
- /P:hhhh** Specifies the lower limit for the I/O address of the ATA card. The device driver assigns the next usable I/O address from this lower limit to the card. When this parameter is not set, the device driver looks for a usable address and assigns that address to the card.

Advanced Information for PC Cards

/NOBEEP	Specifies not to beep when a storage card is installed. When this parameter is not set, you will hear a beep every time a storage card is installed into the PC Card slot.
/STBTIME:<i>n</i>	Specifies the time (from 1 to 21 minutes) until entering standby mode. When the ATA card is not accessed for the time specified by this parameter, the ATA card enters standby mode (only when your ATA card supports standby mode). When this parameter is not specified, standby mode for the ATA card is disabled.
/MDRV:<i>n</i>	Specifies the number of extra drives that can be used in addition to the number of PC Card slots available for the PCMCIA storage devices. When this parameter is not specified, no extra drive is given to the device driver. The extra drives can be activated by the PCMCIA ATA Card Mount Utility.
/EMS	When this parameter is specified, the device driver uses the EMS resources if they are usable. When this parameter is not specified, the device driver does not use the EMS resources.
/TSIZE:<i>n</i>	You can specify the size of the table for the device driver data in the resident memory area. When the EMS resources are not usable, the data tables are created in the resident memory area. When the EMS resources are usable, this parameter is ignored. The table size depends on the variable <i>n</i> and is calculated as follows: table size = $n \times 1024$ bytes Specify <i>n</i> in a decimal number. When this parameter is not specified, the device driver creates the table with $n=4$. Select the variable <i>n</i> depending on the total capacity of the Flash card. The following is an example of the relationship between the variable <i>n</i> and the total capacity of the Flash card: Up to 10MB: $n=4$ Up to 20MB: $n=6$ Up to 40MB: $n=10$

Advanced Information for PC Cards



PCMCIA Storage Card Device Manager for OS/2

OS2PCARD.DMD is the device manager for the PCMCIA storage card. Specify the `!DM` parameter in the `PCM2ATA.ADD` line, so OS2PCARD.DMD is used instead of OS2DASD.DMD. If you do not specify `!DM`, PCM2ATA.ADD uses the OS/2 standard Storage Card Device Manager (OS2DASD.DMD); however, under some conditions the format is not correct when you use OS2DASD.DMD.

The following is a line from the CONFIG.SYS file that describes the Storage Card Device Manager:

```
BASEDEV=OS2PCARD.DMD
```



OS/2 PCMCIA Storage API Device Driver

This device driver provides a communication function between PC Card Director or the mount utility and the OS/2 PCMCIA ATA card device driver. As a result, a utility in the upper layer can get the drive letter or partition information for the PCMCIA storage card.

The following is a line from the CONFIG.SYS file that describes the Storage API device driver:

```
DEVICE =[drive:][directory]PCMSSDIF.SYS
```

Flash Card Memory Technology Driver

This driver is used to read and write to a Flash card. It is used by the DOS storage card device driver (PAWATASF.SYS) and OS/2 Flash card driver (PCM2FLSH.SYS).

The following is a line from the CONFIG.SYS file that describes the Flash Card Memory Technology driver, according to the operating system:

For OS/2:

```
DEVICE =[drive:] [directory] FLSH2MTD.SYS  
        (↑Memory Technology driver)  
DEVICE =[drive:] [directory] PCM2FLSH.SYS  
        (↑Storage card device driver)
```

For DOS and Windows:

```
DEVICE=[drive:] [directory] IBMDOSCS.SYS /FLASH  
        (↑Card Services)  
DEVICE=[drive:] [directory] FLSHDMTD.SYS  
        (↑Memory Technology driver)  
DEVICE=[drive:] [directory] PAWATASF.SYS  
        (↑ATA SRAM Flash card device driver)
```


Checking the Allocated Resources for the PC Card

If the resources for the PC Cards are not correctly allocated, you will see error messages. You can check which resources for the PC Card were not correctly allocated by using PC Card Director. To check the resources that could not be allocated, click on the **Status** button in the PC Card Director program.

The following are some reasons why the resources could not be correctly allocated, and corresponding actions you should take to solve the problem.

- The resource was already reserved by another device.

- Resource Map Utility or other configuration files were not set up correctly.

To change the resource settings for the PC Card or other devices, you can do one of the following:

- Refer to the system manual or utility program and check which device is using the resources that you want to use for the PC Card. Then change the settings for the device by using, for example, the setup programs. For more information, refer to the manuals supplied with your computer.

- If your PC Card is enabled by a PC Card enabler, you can change the resources assigned to the PC Card by changing the parameters in the PC Card enabler, or you can change the settings in the configuration file of the PC Card. For more information, refer to the manuals supplied with your PC Card.

Advanced Information for PC Cards

If you are using Auto Configurator to enable your PC Card, you can change the resources assigned to the PC Card by using the Auto Configurator. Make sure the resource is not used by other devices and can be used by the PC Card and its application program. For more information, see "Starting the Auto Configurator Utility for OS/2 or Windows" on page 191.

If you are using modem cards, some modem cards use serial port COM1 or COM2 and do not have the setup information for COM3 and COM4. These modem cards cannot be enabled when other devices are using COM1 and COM2. (For example, as a default, COM1 is used by the infrared device and COM2 is used by the Mwave modem.) Error messages are displayed to tell you that the I/O port address 3F8 or 2F8, or IRQ level 3 or 4, were not allocated.

If this is the case, use the ThinkPad Setup Utility in the ThinkPad Features program to:

- For OS/2, disable the devices using COM1 or COM2; then restart the system.
- For DOS or Windows, reserve COM2 for the PC Card, and use COM1 for other integrated communication devices.

Avoiding PC Card Resource Conflicts

PC Card Director checks the resources for most devices used by the system to avoid resource conflicts, but it does not recognize all option devices used. Especially when you are using the expansion unit, there is a possibility that the I/O port address or IRQ level may conflict with the PC Card.

Check the status of the PC Card by using PC Card Director. When the PC Card is set to "Ready," the resources used for that PC Card are displayed. Refer to the manuals supplied with the system or option adapters to check that the resources for the devices in the system or for the option adapters are not conflicting with the resources for the IRQ level, I/O port address, or memory window of the PC Card. If you are using OS/2 Warp Version 3, you can check the assigned system resources using RMVIEW.EXE.

If there is a conflict:

Use the Resource Map Utility, so that those resources are not assigned to the PC Card. (Change the value for the /MA= parameter, or add the /MX=, /PX=, or /IX= parameter.)

If you are using OS/2 Warp Version 3, use RESERVE.SYS to register those resources in OS/2.

To set RESERVE.SYS, refer to the manuals or online help for OS/2 Warp, or refer to the READ.ME file of PC Card Director.

If you are using Auto Configurator, change the enabling order or resource information using the Auto Configurator Utility.

See "Starting the Auto Configurator Utility for OS/2 or Windows" on page 191.

Change the parameter for the PC Card enabler. Refer to the manuals supplied with the PC Card.

If you are using network cards, change the resource information for the PC Card stated in the PROTOCOL.INI or NET.CFG file.

To change the configuration file for the network cards, refer to the manuals or READ.ME files of the PC Cards or network drivers.



Virtual Card Services for OS/2

Note:

DOS Object includes DOS program, Windows program, DOS full-screen, DOS window, WIN-OS/2 full-screen, and WIN-OS/2 window.

When you use a DOS object in the OS/2 environment, OS/2 Virtual Card Services provides a Card Services interface so that you can use the DOS PC Card device driver for the DOS object.

To use Virtual Card Services in a DOS object, do the following:

- 1** Move the mouse pointer to the DOS object icon; then click on the right mouse button.
- 2** Select **Settings**.
- 3** Select **Session**.
- 4** Select **DOS (WIN-OS/2) Settings**.
- 5** Select **All DOS (DOS and WIN-OS/2) Settings**.
- 6** Set **PCMCIA_CARD_SERVICES** as **On**.
- 7** Set **PCMCIA_RELEASE_LEVEL** as **2.1**.
- 8** Set **MEM_EXCLUDE_REGIONS** as **C8000–CFFFF**.
- 9** Specify the PC Card device driver name to the **DOS_DEVICE**.

Even when a PC Card is enabled in a DOS object, the device driver or the application program may not work, or their performance may not be what you expect.

Appendix C. Using PS2 Commands

Please note that PS2 commands are subject to change without notice. If you enter a command written in this section and receive an error, type PS2 ? and refer to the online help menu.

You can enter the following PS2 commands from the DOS and OS/2 command prompts to set the features for your computer. When entering a command, enter it in the following syntax:

PS2 [*Parameter1*] [*Parameter2*] [*Parameter3*]

Syntax Rules

Refer to these notes when you enter a command.

Syntax	Rule
	Select one of the options on either side of the vertical bar ().
Highlighted	Enter the exact highlighted letters in either uppercase or lowercase.
UPPERCASE	Enter any value for the following: XX: 0–20 HH: 0–23 MM: 0–59 SS: 0–59 The MM (minutes) and SS (seconds) are optional. The default values are 0.
lowercase	Command elements in lowercase are optional. For example, entering PS2 SE 0F and PS2 SErial 0Ff gives the same results.

Using PS2 Commands

The following is a list of commonly used PS2 commands. It is organized as follows:

Description of the command

Parameter1	Parameter2	Parameter3
------------	------------	------------

Power Management Commands

Set power on or off for the PC Card slots:

CARD	ON OFF	—
------	----------	---

Set whether or not to enter suspend mode when the LCD is closed:

Cover	Enable Disable	—
-------	------------------	---

Note:
This command is effective on the current power mode set by the PM command.

Set POver, LcD, DISK, SPeed, and STandby to their original values:

DEFAULT	—	—
---------	---	---

Note:
This command is effective on the current power mode set by the PM commands.

Set the hard disk drive power-saving timer for the specified number of minutes (xx):

DISK	xx	—
------	----	---

Set the features for the ESS AudioDrive chip:

AUdio	Enable Disable	—
	ADDress	220 240
	DMA	0 1
	IRQ	5 7 10 11

Set the features for the infrared port (IR):

IR	Enable Disable	—
	ADDress	1 2 3 4

Using PS2 Commands

Note:

Use this command before using other hibernation commands.

Create the hibernation file:

HFILE	C – Z DElete	—
--------------	-----------------------	---

Note:

Create the hibernation file using the HFILE command before using this command.

Enter hibernation mode when the power switch is pressed:

HSWITCH	Enable Disable	
----------------	-------------------------	--

Set the timer to enter hibernation mode after the specified number of minutes (xx):

HTimer	xx	[AC DC]
---------------	----	------------------

Note:

Create the hibernation file using the HFILE command before using the LB H command.

Set the power management mode to enter when a low-battery condition occurs:

AC: Specifies battery mode when the AC Adapter is connected.

DC: Specifies ac mode when using battery power:

LBattery	Suspend Hibernation	—
-----------------	------------------------------	---

Note:

This command is effective on the current power mode set by the PM command.

Set the LCD off when there is no computer operation after the specified number of minutes (xx):

LCd	xx	—
------------	----	---

Note:

yyyy can be set from 1995 to 2093.

Set the resume timer:

ON at	[yyyy/MM/DD] HH:MM:SS Clear	—
--------------	----------------------------------	---

Set the power mode:

PMode	High Auto Custom	[AC DC]
--------------	-----------------------------	------------------

Note:

When the AC or DC option is not specified, this command is effective on the current power mode set by the PM command.

Set the timer to enter suspend mode after the specified number of minutes (xx):

AC: Specifies battery mode when the AC Adapter is connected.

DC: Specifies ac mode when using battery power.

POwer	xx	[AC DC]
--------------	----	------------------

Using PS2 Commands

Note:
When the AC or DC option is not specified, this command is effective on the current power mode set by the PM commands.

Resume normal operation when detecting an incoming call:

RI	Enable Disable	—
-----------	------------------	---

Enter the RediSafe suspend mode:

SAfe	Enable Disable	—
-------------	------------------	---

Set power on or off for the serial device attached to the serial port:

SErial	ON OFF	—
---------------	----------	---

Set the processor speed:
AC: Specifies battery mode when the AC Adapter is connected.
DC: Specifies ac mode when using battery power.

Parameter1	Parameter2	Parameter3	Parameter4
SPeed	Fixed Auto	MAX Medium Slow MIN	[AC DC]

Set the timer to enter hibernation mode from suspend mode after the specified number of minutes:

Parameter1	Parameter2	Parameter3
S2H	30 60 90 Disable	—

Set the timer to enter standby mode after the specified number of minutes (xx):
AC: Specifies battery mode when the AC Adapter is connected.
DC: Specifies ac mode when using battery power.

STandby	xx	[AC DC]
----------------	----	-----------

Note:
Create the hibernation file using the HFILE command before using the TI H command.

Set the power management mode to enter by the automatic power-saving timer:

TIme	Suspend Hibernation	—
-------------	-----------------------	---

Using PS2 Commands

Display Commands

Set the screen expansion:

HVEXPansion	ON OFF	—
--------------------	-----------------	---

Set where to display information:

SCreen	LCD CRT BOTH	—
---------------	-------------------------	---

Set the frequency for the external monitor:

VSYNC	640×480 800×600 1024×768	60 72 75 85 56 60 75 85 Disable 43I 60 75 Disable
--------------	---	--

Alarm (Sound) Commands

Set the computer to beep in certain conditions:

BEEP	ON OFF	Alarm System Warn
-------------	-----------------	----------------------------------

System Setup Commands

Display the DMA channel assignments:

? DMA	—	—
--------------	---	---

Set the **Fn** key lock function:

FNSticky	Enable Disable	—
-----------------	-------------------------	---

Set the HVEXPansion command to on or off with the **Fn+F8** key combination:

F8	Enable Disable	—
-----------	-------------------------	---

Display the interrupt level assignments:

? IRQ	—	—
--------------	---	---

Using PS2 Commands

Set the keyboard typematic speed:

KRate	Normal Fast	—
--------------	---------------	---

Set the features for the parallel port:

PARallel	Enable Disable ADDress MOde DMA	— LPT1 LPT2 LPT3 Uni Bi EPP ECP 0 1 3 Disable
-----------------	---	---

Set the features for the serial port:

SERA	Enable Disable ADDress	— 1 2 3 4
-------------	------------------------------------	---------------------------

Disable the screen off, standby, and suspend timers for presentations:

PRESEntation	Enable Disable	—
---------------------	------------------	---

Set the startup screen when the computer power is turned on:

STARTup	Enable Disable	—
----------------	------------------	---

Set the TrackPoint III:

TPOint	Enable Disable	—
---------------	------------------	---

Other Commands

Display the help menu:

? Help	—	—
-----------------	---	---

Set the A: drive to the external diskette drive:

FDD	External	—
------------	----------	---

Note:

Create the hibernation file using the HFILE command before using this command.

Enter hibernation mode:

HIB ernation	—	—
---------------------	---	---

Enter suspend mode:

OFF SUS pend	—	—
------------------------------	---	---

Turn off the computer:

TURN	OFF	—
-------------	------------	---

Appendix D. Features and Specifications

This appendix describes features and specifications for the computer. For more information, refer to the *Technical Reference* manual.

Features

Microprocessor

Intel Pentium processor

Memory

Built-in: 8MB

Optional: 8MB and 16MB DIMMs

Storage devices

2.5-inch hard disk drive

Display

The color LCD display uses TFT technology or DSTN technology and supports:

DSTN color LCD

- Width of 11.3 inches (when measured diagonally)
- Up to 256 colors
- Up to 800-by-600 resolution on the LCD and external monitor
- Brightness control and contrast control

TFT color LCD

- Width of 12.1 inches (when measured diagonally)
- Up to 65,536 colors
- Up to 800-by-600 resolution on the LCD
- Up to 1024-by-768 resolution on the external monitor
- Brightness control

Keyboard

84-key, 85-key, or 89-key

TrackPoint III

Fn key function

Features and Specifications

External interface

Serial connector (EIA-RS232D)

Parallel connector (Centronics)

External input-device connector

External-monitor connector

External-diskette-drive connector

Expansion connector

PC Card slots (two Type I or Type II PC Cards, or one Type III PC Card)

Headphone jack

Microphone/line-in jack (supports a dynamic microphone or a self-battery-powered condenser microphone)

Infrared port

Specifications

Size

Width: 297 mm (11.7 in.)
Depth: 222 mm (8.7 in.)
Height: 31.0 mm (1.22 in.)

Weight

Minimum configuration with lithium-ion battery pack:
With a DSTN display: 1.87 kg (4.12 lb)
With a TFT display: 1.86 kg (4.10 lb)

Environment

Note:

When you charge the lithium-ion battery pack, its temperature must be at least 10°C (50°F).

Temperature (at altitudes less than 2438 m [8000 ft]):

- Operating with no diskette: 5° to 35°C (41° to 95°F)
- Operating with a diskette: 10° to 35°C (50° to 95°F)
- Nonoperating: 5° to 43°C (41° to 109°F)

Relative humidity:

- Operating with no diskette in the drive: 8% to 95%
- Operating with a diskette in the drive: 8% to 80%

Maximum altitude: 3048 m (10 000 ft) in unpressurized conditions

- Maximum temperature at 3048 m (10 000 ft): 31.3°C (88° F)

Heat output

Approximately 30 Kcal per hour

Electrical (AC Adapter)

Sine-wave input, at 50 to 60 Hz, is required
The input rating of the AC Adapter: 100–240 V ac, 50/60 Hz

Lithium-ion battery pack

Nominal voltage: 10.8 V dc
Capacity: 2.2 AH

Features and Specifications

IBM Power Cords

IBM power cords for a specific country are usually available only in that country:

For 2-pin power cords:

IBM Power Cord Part Number	Used in These Countries
13H5264	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
13H5267	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malasia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom
13H5270	Austria, Belgium, Bulgaria, Chile, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, former Yugoslavia
13H5273	Japan
13H5276	Argentina, Australia, New Guinea, New Zealand, Papua, Paraguay, Uruguay
13H5279	Bangladesh, Pakistan, South Africa, Sri Lanka

Features and Specifications

For 3-pin power cords:

Note

The grounded adapter is required for full MPRII compliance.

IBM Power Cord Part Number	Used in These Countries
25H2205	Argentina, Australia, New Guinea, New Zealand, Papua, Paraguay, Uruguay
25H2207	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela
25H2209	Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia
25H2211	Denmark
25H2213	Bangladesh, Pakistan, South Africa, Sri Lanka
25H2215	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom
25H2219	Thailand
25H2221	Switzerland
25H2223	Chile, Italy
25H2225	Israel

Features and Specifications

Electrical Safety Notice

Important

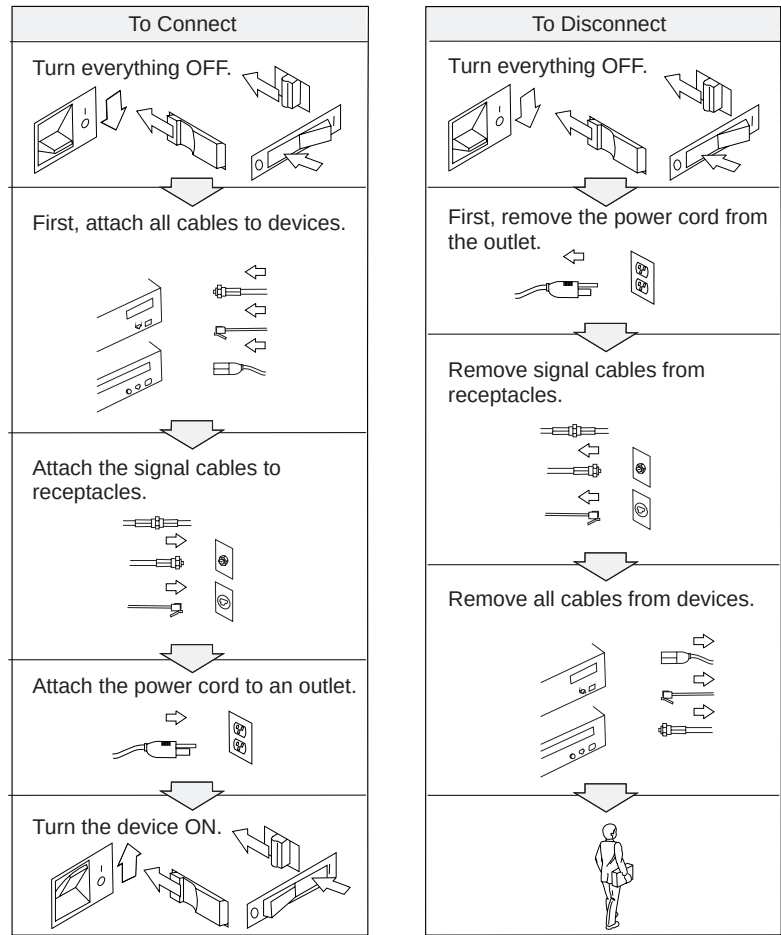
If a 3-pin power cord came with your computer, you must follow the following safety notice.

Note:
In the U.K., by law:

The telephone line cable must be connected after the power cord.
The power cord must be disconnected after the telephone line cable.

**DANGER**

Electrical current from power, telephone, and communication cable is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving, or opening the covers of this product or attached devices. The 3-pin power cord must be used with a properly grounded outlet.



Diskette Standards

To get the best performance from your diskette drives, use high-quality diskettes (such as IBM diskettes) that meet or exceed the following standards:

1MB, 3.5-inch, unformatted diskette:

- ANSI (American National Standards Institute) X3.137
- ISO (International Standards Organization) 8860
- ECMA (European Computer Manufacturers Association) 100

2MB, 3.5-inch, unformatted diskette:

- ANSI X3.171
- ISO 9529
- ECMA 125

Appendix E. Product Warranties and Notices

International Business Machines Corporation

Armonk, New York 10504

Statement of Limited Warranty

The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you originally purchase for your use, and not for resale, from IBM or an IBM authorized reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. Machines are subject to these terms only if purchased in the United States or Puerto Rico, or Canada, and located in the country of purchase. If you have any questions, contact IBM or your reseller.

Machine: IBM ThinkPad 560 except the Battery Pack

Warranty Period*: One Year

**Elements and accessories are warranted for three months. Contact your place of purchase for warranty service information.*

Production Status

Each Machine is manufactured from new parts, or new and serviceable used parts (which perform like new parts). In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

The IBM Warranty

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. IBM calculates the expiration of the warranty period from the Machine's Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period, IBM or your reseller will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine. IBM or your reseller will specify the type of service.

For a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Some of these transactions (called "Net-Priced" transactions) may include additional parts and associated replacement parts that are provided on an exchange basis. All removed parts become the property of IBM and must be returned to IBM.

Replacement parts assume the remaining warranty of the parts they replace.

If a Machine does not function as warranted during the warranty period, IBM or your reseller will repair or replace it (with a Machine that is at least functionally equivalent) without charge. If IBM or your reseller is unable to do so, you may return it to your place of purchase and your money will be refunded.

If you transfer a Machine to another user, warranty service is available to that user for the remainder of the warranty period. You should give your proof of purchase and this Statement to that user.

Warranty Service

To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-772-2227**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

Depending on the Machine, the service may be 1) a "Repair" service at your location (called "On-site") or at one of IBM's or a reseller's service locations (called "Carry-in") or 2) an "Exchange" service, either On-site or Carry-in.

When a type of service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced.

It is your responsibility to:

1. obtain authorization from the owner (for example, your lessor) to have IBM or your reseller service a Machine that you do not own;
2. where applicable, before service is provided —
 - a) follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
 - b) secure all programs, data, and funds contained in a Machine,
 - c) inform IBM or your reseller of changes in a Machine's location, and

Product Warranties and Notices

- d) for a Machine with exchange service, remove all features, parts, options, alterations, and attachments not under warranty service. Also, the Machine must be free of any legal obligations or restrictions that prevent its exchange; and
3. be responsible for loss of, or damage to, a Machine in transit when you are responsible for the transportation charges.

Extent of Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless IBM specifies otherwise, IBM provides non-IBM machines on an "AS IS" basis. However, non-IBM manufacturers may provide their own warranties to you.

Misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, removal of product labels or parts identification labels, or failure caused by a product for which IBM is not responsible may void the warranties.

THESE WARRANTIES REPLACE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. HOWEVER, SOME LAWS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES. IF THESE LAWS APPLY, THEN ALL EXPRESS AND IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

In Canada, warranties include both warranties and conditions.

Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part (including fundamental breach) or other liability (including negligence and misrepresentation), you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages, IBM is liable only for:

1. bodily injury (including death), and damage to real property and tangible personal property; and
2. the amount of any other actual loss or damage, up to the greater of \$100,000 or the charge for the Machine that is the subject of the claim.

Under no circumstances is IBM liable for any of the following:

1. third-party claims against you for losses or damages (other than those under the first item listed above);
2. loss of, or damage to, your records or data; or
3. economic consequential damages (including lost profits or savings) or incidental damages, even if IBM is informed of their possibility.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.

Product Warranties and Notices

International Business Machines Corporation

Armonk, New York 10504

Statement of Limited Warranty

The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you originally purchase for your use, and not for resale, from IBM or an IBM authorized reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. Machines are subject to these terms only if purchased in the United States or Puerto Rico, or Canada, and located in the country of purchase. If you have any questions, contact IBM or your reseller.

Machine: Battery Pack

Warranty Period*: One Year

**Elements and accessories are warranted for three months. Contact your place of purchase for warranty service information.*

Production Status

Each Machine is manufactured from new parts, or new and serviceable used parts (which perform like new parts). In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

The IBM Warranty

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. IBM calculates the expiration of the warranty period from the Machine's Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period, IBM or your reseller will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine. IBM or your reseller will specify the type of service.

For a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Some of these transactions (called "Net-Priced" transactions) may include additional parts and associated replacement parts that are provided on an exchange basis. All removed parts become the property of IBM and must be returned to IBM.

Replacement parts assume the remaining warranty of the parts they replace.

If a Machine does not function as warranted during the warranty period, IBM or your reseller will repair or replace it (with a Machine that is at least functionally equivalent) without charge. If IBM or your reseller is unable to do so, you may return it to your place of purchase and your money will be refunded.

If you transfer a Machine to another user, warranty service is available to that user for the remainder of the warranty period. You should give your proof of purchase and this Statement to that user.

Warranty Service

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- 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.

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Canadian Department of Communications Compliance Statement

This equipment does not exceed Class B limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department of Communications.

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Glossary

This glossary includes terms and definitions from the *IBM Dictionary of Computing* (New York: McGraw-Hill, 1994).

ac. Alternating current.

ac power. Power that is supplied to the computer through an electrical outlet.

Advanced Power Management (APM). A facility consisting of one or more layers of software that support power management in computers with power manageable hardware. The APM software interface allows applications, operating systems, device drivers, and the APM BIOS to work together to reduce power consumption, without reducing system performance.

ANSI. American National Standards Institute.

application program. A program that performs specific tasks on your computer, such as word processing or creating spreadsheets.

ASCII. American National Standard Code for Information Interchange.

APM. Advanced Power Management

ATA PC Card. A PC Card with an AT attachment hard disk drive interface such as a storage device PC Card.

AUTOEXEC.BAT. A file that contains a startup procedure of DOS. Each time you start your system, DOS performs the commands that are stored in this file.

backup copy. A copy, usually of a file or group of files, that is kept in case the original file or files are unintentionally changed or destroyed.

batch. A process method in which a program or programs records with little or no operator action.

BIOS (Basic Input/Output System).

Microcode that contains such basic hardware operations as interactions with diskette drives, hard disk drives, and the keyboard.

bitmap graphics. (1) A form of graphics in which all points on the display are directly addressable. (2) In multimedia applications, a form of graphics in an area of computer memory or storage that can be displayed as an image.

boot. To prepare a computer system for operation by loading an operating system.

bps. Bits per second. In serial transmission, the instantaneous bit speed with which a device or channel transmits a character.

bus. A facility for transferring data between several devices located between two end points, only one device being able to transmit at a given moment.

cache memory. A special memory, smaller and faster than main memory, that is used to hold a copy of instructions and data in main memory that are likely to be needed next by the processor, and that have been obtained automatically from main memory.

CD-I. Compact disc-interactive.

combination keys. Keys that have specific functions when you hold them down at the same time.

CONFIG.SYS. A file that contains a group of commands to load installable device drivers and reserve space in system memory for information processing. This file is referred to by DOS during system startup.

configuration. (1) The manner in which the hardware and software of an

Glossary

information processing system are organized and interconnected. (2) The physical and logical arrangement of devices and programs that make up a data processing system. (3) The devices and programs that make up a system, subsystem, or network.

CRT. Cathode ray tube display.

device driver. A file that contains the code needed to attach and use a device. Operating system loads device drivers for screens, keyboards, printers, diskette drives, hard disk drives, and auxiliary devices. The user can replace these or add other devices by coding and loading a device driver.

DIMM. Dual inline memory module.

DIP switch. In an IBM personal computer, a two-position switch on a circuit board that is preset to control certain functions; the user can change the position of a DIP switch to satisfy special requirements.

directory. A type of file containing the names and controlling information for other files or other directories.

DMA. Direct memory access. The transfer of data between memory and input/output units without processor intervention.

double-click. To press and release a mouse button twice within a time frame defined by the user, without moving the pointer off the choice.

DSP. Digital signal processor.

ECP. Extended Capability Port.

EGA. Enhanced graphics adapter.

EIA. Electronics Industries Association.

EIA-232D. An EIA interface standard that defines the physical, electronic, and functional characteristics of an interface line that connects a communication device and associated workstation. It uses a 25-pin connector and an unbalanced line voltage.

EMS. Expanded memory specification.

FAQ. Frequently asked questions.

fax. (1) Facsimile machine. (2) A transmitted document from a facsimile machine.

fixed disk. In personal computing, *fixed disk* is synonymous with *hard disk*.

flash memory. Electrically rewritable storage.

folder. A file used to store and organize documents.

fuel gauge. An indicator on the screen that constantly shows the current power status of the battery pack.

HHR. Half-horizontal resolution.

hibernation. One of the power-saving methods that stores data and applications running in the computer's memory on the hard disk. During hibernation, the computer is automatically turned off to save power. When power is turned on again, the computer immediately restores the same data and applications as when hibernation started, without restarting the operating system.

high-resolution mode. Video resolutions that are greater than 640 by 480 pels.

icon. A graphic symbol, displayed on a screen, that a user can point to with a pointing device such as a TrackPoint III or mouse to select a particular function or software application.

Glossary

IDE. Integrated device electronics.

IR. Infrared.

ISA. Industry standard architecture.

ISO. International Organization for Standardization.

JEIDA. Japan Electronics Industry Development Association.

kilobyte (KB). 1024 bytes.

LAN. Local area network.

MCI. Media Control Interface.

megabyte (MB). 1024 kilobytes. About 1 million bytes.

memory. Often referred to as random-access memory (RAM), measured in kilobytes (KB) or megabytes (MB) of information.

MHz. Megahertz.

microcode. One or more microinstructions used in a product as an alternative to hard-wired circuitry to implement functions of a processor or other system component.

MIDI. Musical Instrument Digital Interface.

modem. A device that connects your computer to a telephone line, allowing it to communicate with another computer at another location.

MPEG. Moving Pictures Experts Group

parallel port. A port used to attach such devices as dot-matrix printers and input/output units; it transmits data 1 byte at a time.

partial suspend mode. A kind of suspend mode where only a part of the system components uses power.

password. A series of letters or numbers that you designate to restrict access to your computer.

PC Card. A card that is based on the PCMCIA standard.

PCMCIA. Personal Computer Memory Card International Association.

pel. Picture element.

picture element. In computer graphics, the smallest element of a display surface that can be independently assigned color and intensity.

pixel. Picture element.

pointing device. An instrument, such as a mouse, TrackPoint III, or joystick, that is used to move a pointer on the screen.

POST. Power-on self-test.

pop-up menu. On the display screen, a menu that emerges in an upward direction from a particular point or line on a display screen.

prompt. A visual or audible message sent by a program to request the user's response.

pull-down menu. On the display screen, a menu that emerges in a downward direction from a point or line at or near the top of the screen.

reboot. To restart all operations of the computer as if the power had just been turned on.

resume. To begin computer operations again from suspend mode.

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ROM. Read-only memory.

serial port. A port used to attach such devices as display devices, letter-quality printers, modems, plotters, and such pointing devices as light pens and mice; it transmits data 1 bit at a time.

suspend. Stops all operations of the computer to reduce power drain and restrict access to the files.

SVGA. Super video graphics adapter.

TFT. Thin film transistor.

TSRs. Terminate-and-stay-resident programs, memory-resident programs that are loaded into memory and stay

there so you can conveniently access them whenever you need to.

vertical expansion. A video display technique in character-display mode to fit video images on the whole LCD screen by adjusting the number of character dots vertically.

VESA. Video Electronics Standards Association.

VGA. Video graphics adapter, a video mode that produces up to 640-by-480 resolution.

VSYNC. Vertical synchronization frequency.

XMS. Extended memory specification.

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