> **Note**
>
> Before using this information and the product it supports, be sure to read the general information under "Notices" on page 213.

First Edition (March 1997)

Thank You for Selecting
an IBM ThinkPad 385 or 385D Computer

We hope the powerful
IBM ThinkPad 385 or 385D computer
will fulfill your mobile computing needs.

Distinctive System Features of the IBM ThinkPad 385 or 385D computer

SVGA Color LCD: ➡ **Page 44.**
Both the DSTN (dual-scan super-twisted nematic) and TFT (thin-film transistor) display models offer 65,536 colors at 800-by-600 resolution, for a colorful and clear picture.

Infrared Communication: ➡ **Page 49.**
An infrared port is supplied with your computer for wireless serial communication.

ThinkPad Features Program: ➡ **Page 28.**
The ThinkPad Features program is a graphical user interface (or set of commands) that allows you to easily set various parameters.

Power Management: ➡ **Page 63.**
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 is faster than computer power-on, quickly returning you to where you left off.
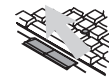
Security Features: ➡ **Page 73.**
You can set passwords or use locks to secure your computer. The Personalization Utilities are also provided, which is a program that allows you to identify your computer.

PC Card Support: ➡ **Page 46.**

The computer provides two PC Card slots that accept a 16-bit PC Card and a software that makes using PC Cards easy.

TrackPoint III: ➡ **Page 20.**
Pointing, selecting, and dragging all become part of a single process without your needing to lift your hands from the keyboard.

Fn Key Function: ➡ **Page 22.**
Controlling display output type or saving battery power is easily set with the combination of the **Fn** key with a function key (**F1**–**F12**).

Audio Support Features: ➡ **Page 51.**
The audio support is compatible with Sound Blaster** with various audio features for your entertainment.

Where to Find Information

What would you like to do with your computer? The following gives you a shortcut to where you can find information in this book. Find the topic that interests you; then follow the arrow!

About This Book

This book contains information that will help you operate the IBM ThinkPad 385 or 385D computer (hereafter called the *385*, *385D*, 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 for OS/2 Warp," 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.

To start the online book, select the **Online Book** icon in 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.
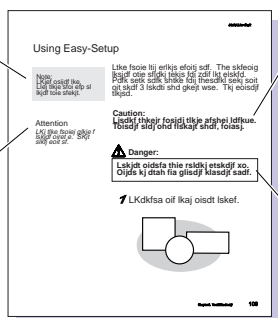
Caution

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 Microsoft Windows 95 users.

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

Information for Microsoft Windows Version 3.11 users.

Information for IBM DOS users.

Information for Microsoft Windows NT Workstation users.

For procedures or information unique to the computer model or type:

Information only for the 385D.

For information referred to:

Where to go for more information.

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.
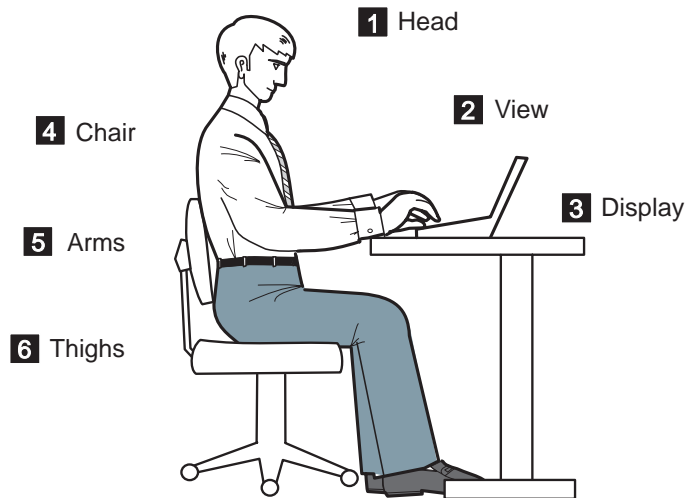
1 Head

2 View

4 Chair

3 Display

5 Arms

6 Thighs

1 **Head**
   Keep your head in a comfortable and vertical position.

2 **View**
   Maintain a comfortable viewing distance of 510–760 mm (20–30 in.).

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.

4 **Thighs**
   Keep your thighs parallel to the floor and your feet flat on the floor or on a footrest.

5 **Arms**
   Keep your forearms, wrists, and hands in a relaxed and neutral position. Don't pound the keys; type with a soft touch.

6 **Chair**
   Use a chair that gives you good back support.

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.

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 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.

Laser Compliance Statement

385CD The CD-ROM drive in the IBM ThinkPad 385D is a laser product. The CD-ROM drive's classification label (shown below) is located on the top of the drive.

CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
APPAREIL A LASER DE CLASSE 1
KLASS 1 LASER APPARAT

The CD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class I laser products.

In other countries, the drive is certified to conform to the requirements of EN60825.

⚠CAUTION:
Do not open the CD-ROM drive; no user adjustments or serviceable parts are inside.

Use of controls, adjustments, or the performance of procedures other than those specified may result in hazardous radiation exposure.

Class I (1) laser products are not considered to be hazardous. The CD-ROM drive has an internal, Class I (1), 0.5-milliwatt, aluminum gallium-arsenide laser that operates at a wavelength of 760 to 810 nanometers. The design of the laser system and the CD-ROM drive ensures that there is no exposure to laser radiation above a Class I (1) level during normal operation, user maintenance, or servicing conditions.

Contents

Chapter 1. Getting Started

Welcome to the world of ThinkPad computers!

The ThinkPad 385 or 385D computer is designed to meet your everyday 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 385 or 385D 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

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.
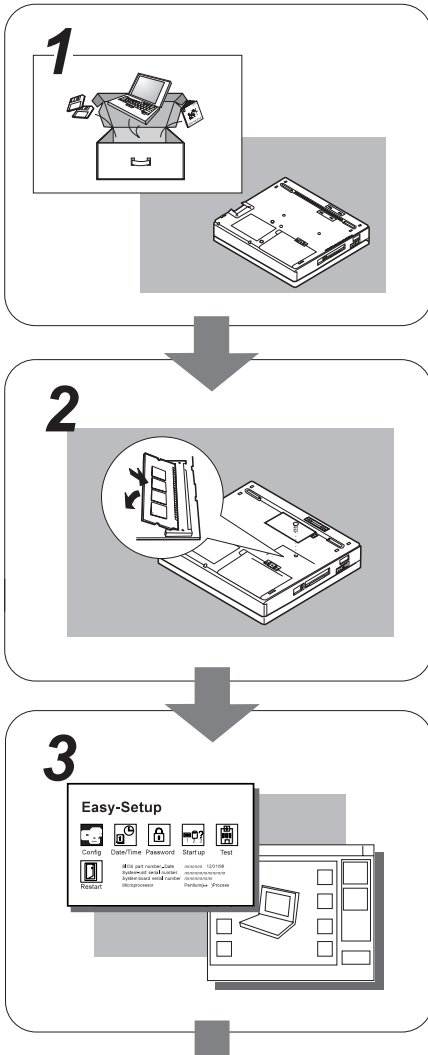
1 Set Up the Computer

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

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

2 Install Options

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

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.
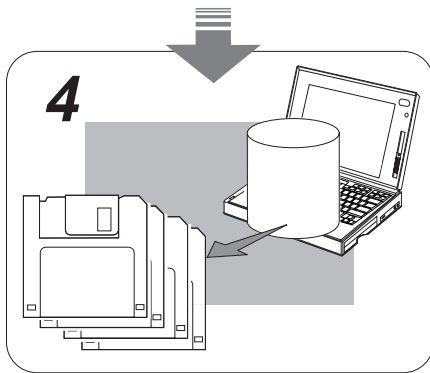
4 Make a Backup of Your System

Your computer comes with the necessary software already installed for you to use the computer right out of the box.
You can make a backup copy of preloaded applications and system support software. You can also know how many diskette you need for the backup at the *Diskette Factory* program.

You can also make a backup copy of Windows 95 using *Create System Disk*. It tells you how many diskette you need.

For your information

Do you need more hard disk space?

If *you have already made a backup copy of all necessary software using the Diskette Factory program*, you can delete any preloaded software you do not want for more free hard disk space.

Click on the **Diskette Factory** icon; then follow the instruction on the sreen.

Checking Your Items

```
┌─ Important ──────────────────────────────────────────────────────────────┐
│                                                                          │
│  Be very careful not to drop or place heavy objects on this computer, because damage to the │
│  screen will occur.  A broken or cracked screen will not be replaced under IBM's Limited │
│  Warranty.                                                                │
│                                                                          │
└──────────────────────────────────────────────────────────────────────────┘
```

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
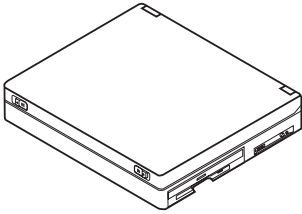
Battery Pack
Supplies power to the computer for mobile operation.
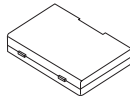
AC Adapter
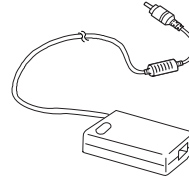
Power Cord
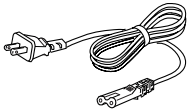
Windows 95 User's guide with the Certificate of Authenticity
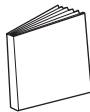
Miscellaneous Items Envelope

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 208.

In some countries, the Certificate of Authenticity of Windows 95 is on the front cover of the Windows 95 user's guide. **The product ID number (ten digits) is in the Certificate. Keep it in safe place in case of you reinstall Windows 95.**

This envelope contains spare caps for the TrackPoint III and other items or certificates.

2 Turn the computer upside down and record the identification numbers 1 on page 165.

The machine type has a prefix of **Type**.
The serial number has a prefix of **S/N**.
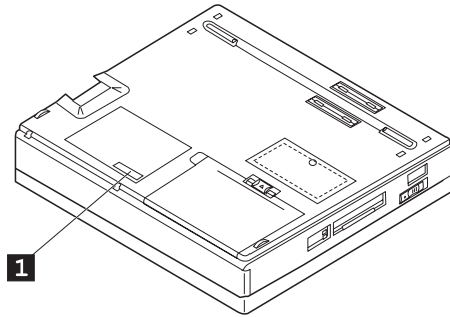
These numbers are required when you order service. After recording the numbers, place the computer as it was (so that the side marked *IBM ThinkPad* faces upward).

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.

1 Turn the computer upside down.

2 Make sure the battery pack lock is upper position.

If not, pull the battery pack lock upward.
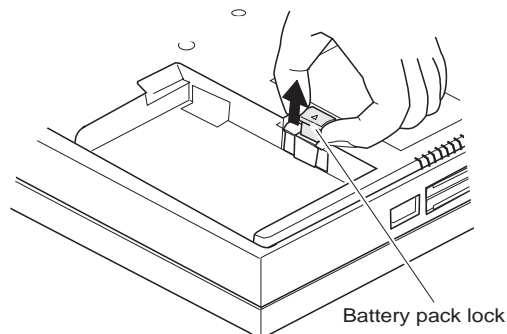
Battery pack lock

3 Install the battery pack as shown (①), slide the battery pack lock toward the rear of the computer (②).

⚠️**DANGER**
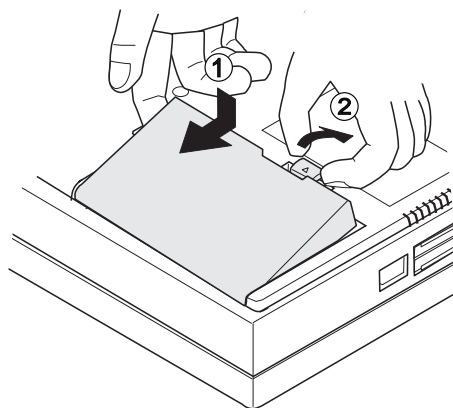
> **The battery pack provided with your computer contains a small amount of harmful substances. To avoid possible injury:**
>
> > **Keep the battery pack away from fire.**
> >
> > **Do not expose the battery pack to water or rain.**
> >
> > **Do not attempt to disassemble the battery pack.**
> >
> > **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.**

4 Press the battery pack lock downward.
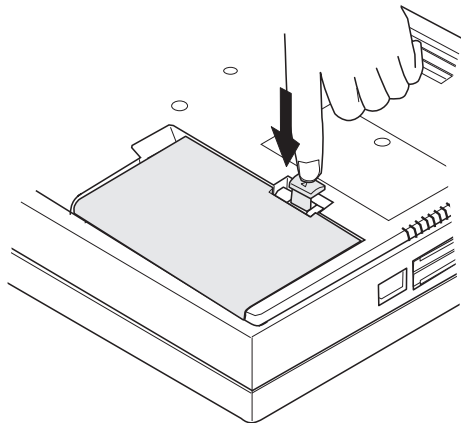
5 Place the computer right side up. Make sure it is not turned on.

6 Connect the AC Adapter to the rear of the computer as shown.

(Connect ①, ②, and then ③.)

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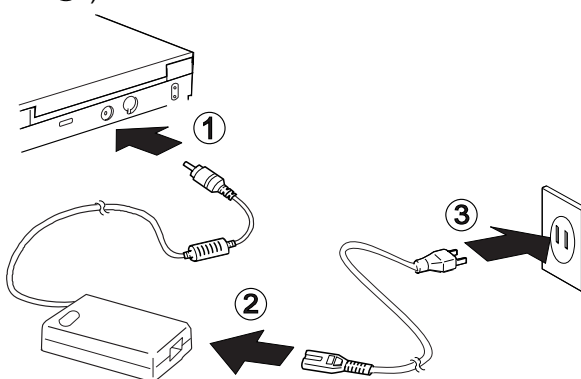
> **Do not attempt to open the AC Adapter case. The AC Adapter is permanently
> sealed and cannot be repaired.**

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.*

┌─ **For Your Information** ───

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. See page 207.

└──

7 Slide the latches on both sides of the liquid crystal display (LCD) outward ((1)) and open the LCD ((2)). Position the LCD so that it is convenient for viewing.

> **Note:** The LCD opens up to 150°. *Do **not** force the LCD to open flat (180°).*
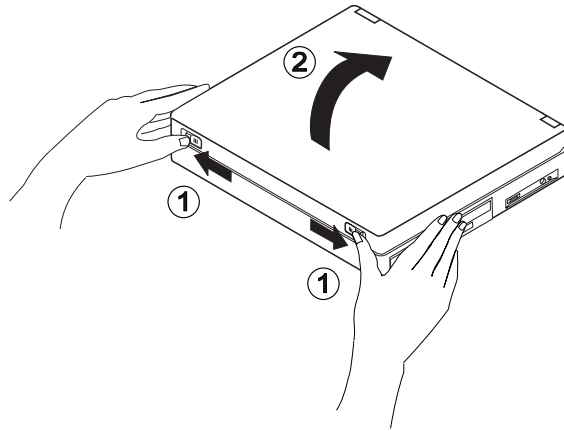
8 Press the power switch to turn on the computer ((1)).

Position the contrast (◖ (2)) for a DSTN display and the brightness control (☼ (2)) for a TFT display according to the figure.
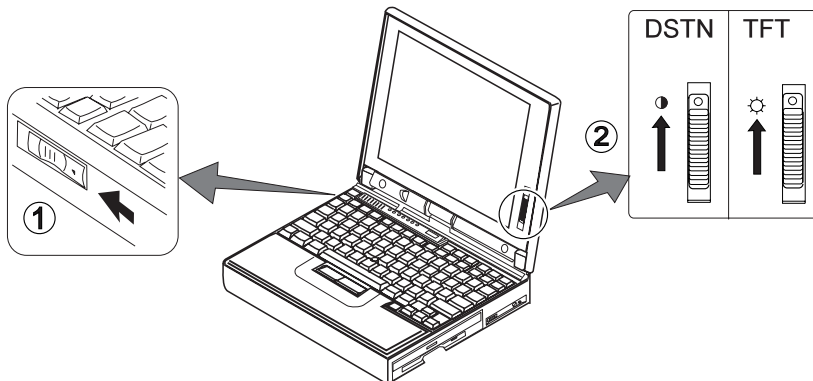
9 After a single beep, one of the following panels appears, confirming that the system is operating correctly.
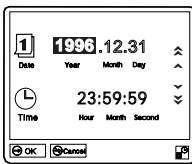
Date and Time menu panel

Startup panel

This menu instructs you to set the initial date and time. To set the date and time, see "Using Easy-Setup" on page 33.

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

If one of these panels do 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 385 or 385D 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: Make a backup copy of all necessary files using the Diskette Factory and the Create System Disk utility program of Windows 95.

If you are reinstalling the operating system to customize your computer, follow the instructions on page 99.

Do you need more hard disk space?

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.

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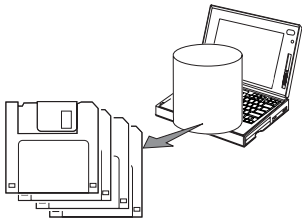
You should make a backup copy of the files on the hard disk drive, in case you accidentally erase preinstalled software or intentionally modify the hard disk drive. You can use the backup copy to restore your computer to the way it was at the time of purchase.

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

You can also create the Windows 95 operating system using **Create System Disk**.

To use the Diskette Factory:

1. Click on the **Diskette Factory** icon ( ) in your operating system. (The list of diskette names is shown with the number of necessary diskettes needed.)
2. Click on the diskette names you want to create; then click on **Build**.
3. Follow the instructions on the screen.

To use the Create System Disk utility of Windows 95:

1. Click on **Start**.
2. Click on **Programs**.
3. Click on **Accessory**.
4. Click on **System tool**.
5. Click on **Create System Disk**.
6. Follow the instructions on the screen.

Chapter 2. Getting Familiar with Your Computer

This chapter provides basic information about your computer.

Identifying the Hardware Features

In this section, you can review the hardware features of your computer.

Front View
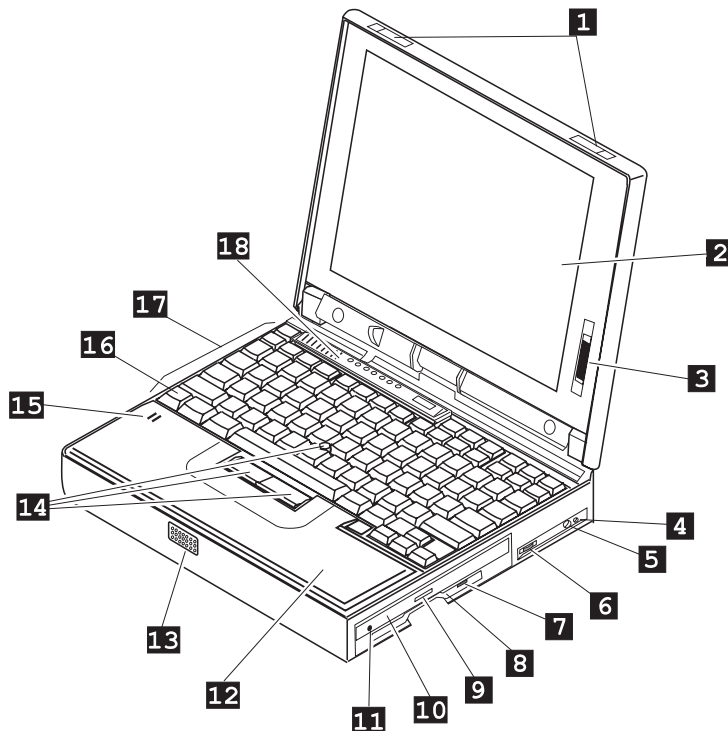
1   The **LCD latches** open the LCD when they are slid outward.

2   The **color LCD screen** displays computer output. (See page 39.)

3   The **contrast control** moves up or down to adjust the clarity of the picture. (For DSTN models only.)

   The **brightness control** moves up or down to adjust the brightness of the display. (For TFT models only.)

4   The **headphone jack**, a 1/8-inch (3.5-mm) diameter jack, is where you connect a stereo headphone or external speakers. This jack can be used concurrently with the microphone/line-in jack. (See page 51.)

5   The **microphone/line-in jack**, a 1/8-inch (3.5-mm) diameter jack, is where a stereo microphone or external audio device is connected. This jack can be used concurrently with the headphone jack. (See page 51.)

6   The **volume control** adjusts the sound level for the built-in speakers.

7   The **diskette-eject button** ejects the diskette from the diskette drive.

8   The **diskette drive** reads data from or writes data to a diskette.

9   385CD The **CD-ROM eject button** ejects the CD-ROM tray from the CD-ROM drive. This button is functional only when the computer power is turned on.

1   `385CD` The **CD-ROM drive** reads data from a CD-ROM.

11   `385CD` The **CD-ROM emergency eject hole** ejects the CD-ROM tray when it does not open with the CD-ROM eject button. Insert a pin into this hole to eject the tray.

12   The **palm rest** is where you rest the palms of your hands when using the keyboard.

13   The **built-in speaker** reproduces sound for your application programs.

14   The **TrackPoint III** is a built-in pointing device that provides a function similar to that of a mouse. (See page 20.)

15   The **built-in microphone** captures sound and voice when it is used with an application program.

16   The **Fn key** is used with the function keys to activate the **Fn** key functions. (See page 22.)

17   The **keyboard** is used to enter data into the computer. (To use the **numeric keypad** on the keyboard, see page 24.)

18   The **indicator panel** consists of the system-status indicators and their associated symbols. (See page 18.)

Rear and Side View

1. The **external-monitor connector** is where you attach an external monitor. (See page 42.)

2. The **parallel connector** is where you usually connect a parallel-printer signal cable.

3. The **serial connector** is where you connect a 9-pin, serial-device cable.

4. The **power jack** is where the AC Adapter cable is connected.

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

5. The **external-input-device connector** is used to attach a mouse, external keyboard, or external numeric keypad to the computer. (See pages 95–97.)

6. The **fan louver** is used to cool the inside of the computer. **Do not place anything in front of the louver, that might block air flow**.

   The cooling fan starts at power-on then stops and starts alternately depending on the tempreture inside the computer.

7. The **suspend mode** indicator shows the condition of the suspend state.

8. The **battery** indicator shows the condition of the battery.

9. The **infrared port** allows the computer to communicate with other devices that have infrared data-transfer capability. (See page 49.)

1. The **power switch** turns the computer on and off.

11. The **PC Card slots** accept one or two PC Cards, or one Zoomed Video port card only in the lower slot. (To use a PC Card, see page 46. To insert a PC Card, see page 86.)

12. The **PC Card eject buttons** eject PC Cards from the PC Card slots. (See page 88.)

13. The **security keyhole** is used with a Kensington** MicroSaver** Security System lock (hereafter called a *security system lock*) or a compatible lock. (See page 83.)

Bottom View

1 The **expansion connector** is where you attach a port replicator (available as an option).

2 The **memory-slot cover** covers the memory slot.

3 The **memory slot** accepts a dual inline memory module (DIMM) option. (See page 89.)

4 The **battery-pack lock** locks or releases the battery pack.

5 The **battery pack** is a built-in power source for the computer.

6 The **power shutdown switch** is used to turn the computer off when an application locks up or

the computer will not accept any input. Use the tip of a pen to press this switch.

7 The **serial number** (S/N) identifies your computer. Write it down on page 165.

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.
2 Drive in use	Orange	Data is being read from or written to the hard disk, the diskette drive, and the CD-ROM drive (385D). *Do not enter suspend mode or turn off the computer when this indicator is on.*
3 Numeric lock	Green	The numeric keypad on the keyboard is enabled. You enable or disable the keypad by pressing and holding the **Shift** key, and pressing the **NumLk** key. For details, see "Operating the Numeric Keypad" on page 24.
4 Caps lock	Green	The Caps Lock mode is enabled. In that mode you can enter all alphabetic characters (*A–Z*) in capital letters without using the **Shift** key, the Caps Lock mode by pressing the **Caps Lock** key.

Symbol	Color	Meaning
5 Scroll lock $\updownarrow$	Green	You enable or disable this function by pressing the **ScrLK** key. The **Arrow** keys can be used as screen-scroll function keys, and the cursor cannot be moved with the **Arrow** keys. *Not all application programs support this function.*
6 Suspend mode	Green	The computer is in suspend mode. (See page 63 for details about suspend mode.)
	Blinking green	The computer is entering suspend mode or hibernation mode, or is resuming normal operation.
7 Power on	Green	The computer is operational. This indicator is on when the computer is on and not in suspend mode.
8 385CD CD-ROM drive in use	Orange	Data is being read from a CD-ROM in the CD-ROM drive. *Do not enter suspend mode or turn off the computer when this indicator is on.*

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.

Note:
The cap 1 on the end of the TrackPoint III is removable. You can pull the cap off the stick, and replace it with one of the spares shipped with your computer.

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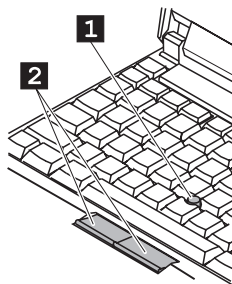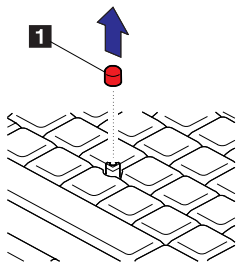
If you are not familiar with using the TrackPoint III, these instructions will help you get started:

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.

Mouse pointer

Stick

Left click button
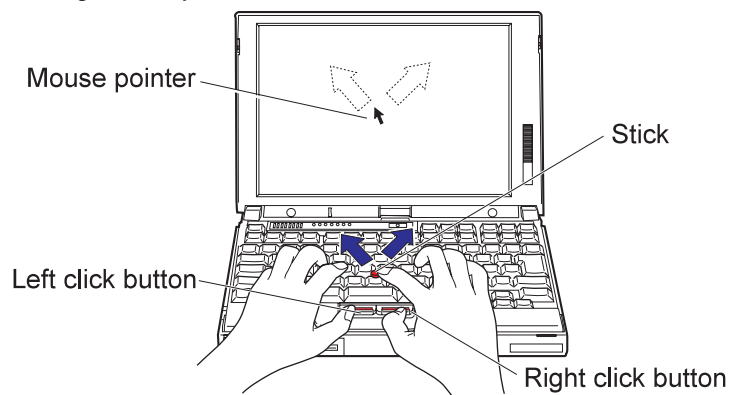
Right click button

2 Press the click buttons with either thumb to select as required by your software.

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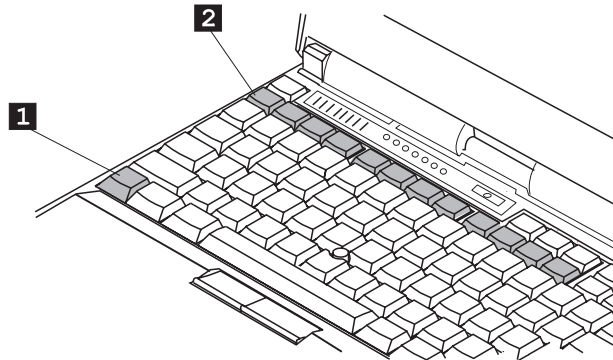
Note:
To use the Fn Key Lock function, select the **TrackPoint** ( ) icon in the ThinkPad Features program window, or enter PS2 FNS E at the command prompt.

Hints and Tips

Using the Fn Key Lock Function: You need to press the **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
Fn + F2 (OS/2 or Windows 3.1, Windows 95, or Windows NT users)	Fuel-Gauge display on or off	The Fuel-Gauge program must be activated before you can use this key combination. When you press this key combination, the window for the battery power status appears or disappears. You can set parameters for power status in the window.
Fn + F 3	Standby mode	The computer enters standby mode. For more information about this mode, see page 65.

Key Combination	Feature	Meaning
Fn + F4	Suspend mode	The computer enters suspend mode. For more information about this mode, see page 65.

Fn + F7	LCD/external monitor switching	Computer output is displayed in the following order when an external monitor is attached.
		
		`    External      Both`
		`    Display`
		
		`              LCD`

Fn + F11	Power mode switching	When you press this key combination 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.

Fn + F12	Hibernation mode	The computer enters hibernation mode. See "Hibernation Mode" on page 69 for more information.

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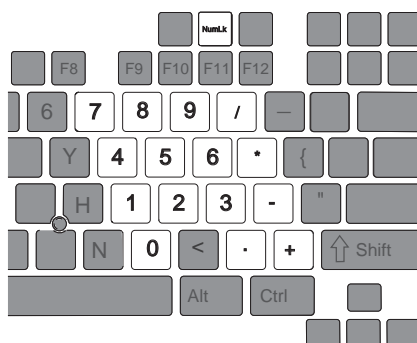
Note:
The functions of the cursor- and screen-control keys are not printed on the keys.

When the numeric keypad is enabled, press and hold **Shift** to temporarily use the cursor- and screen-control keys.
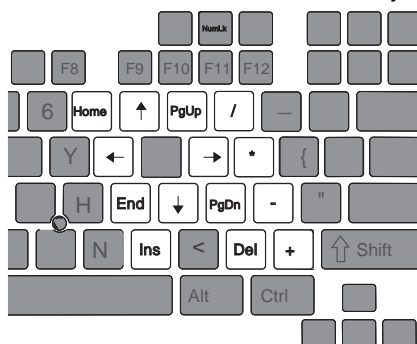
To disable the numeric keypad, press and hold **Shift**; then press **NumLk** again.

Protecting the Computer from Damage

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

Do not subject your computer 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 speaker.
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 diskette drive. Inserting it at an angle can damage the front of the 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 damage the 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.

Chapter 3. Operating Your Computer

This chapter provides information about the use of your computer.

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 a parallel port or an 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 the color depth for both the LCD and an external monitor

Fuel-Gauge program:
➡ Page 59.

Fuel-Gauge program

  – Remaining power
  – Current power mode

Personalization editor program:
➡ Page 82.

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 (except for Windows NT) at the command prompt (see Appendix C).

To start the ThinkPad Features program:

> *For OS/2 or Windows 3.11 or Windows NT 3.51 :*
> Double-click on **ThinkPad Features**.

> *For Windows 95 or Windows NT 4.0 :*
>
> *1.* Click on **Start**.
> *2.* Click on **Programs**.
> *3.* Click on **ThinkPad**.
> *4.* Click on **ThinkPad Features**.

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.
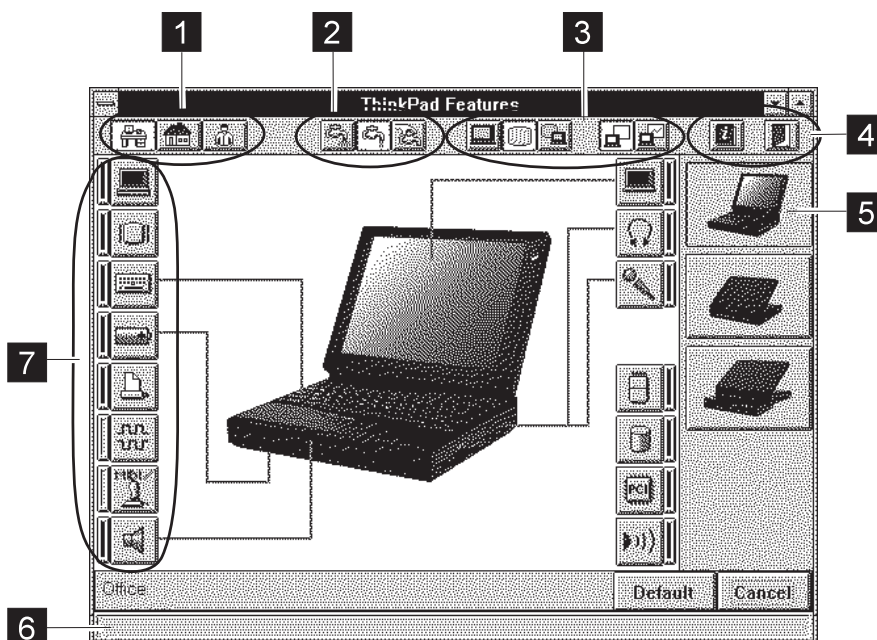
1 **One-touch setup buttons**.

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 the battery operation to the high performance mode ( ), the automatic mode ( ), or the customized mode ( ).

3 **Display device buttons**.

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

4 **Help or save button**.

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

5 **View angle buttons**.

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

6 **Status bar**.

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

7 **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:
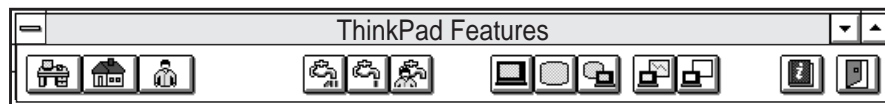
DOS

Starting the Program for 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 POwer 5                     > Nul
        PS2 SPeed Fixed MIN             > Nul
        PS2 STandby 3                   > Nul
        PS2 IR 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 diskette drive.

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. Enter your password if you are using passwords.

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

Easy-Setup

Config	Date/Time	Password	Start up	Test

Restart

BIOS part number,..Date   nnnnnn   12/31/96
System-unit serial number   nnnnnnnnnnnnnnnn
System board serial number   nnnnnnnnnn
Microprocessor   Pentium(∗∗)Process
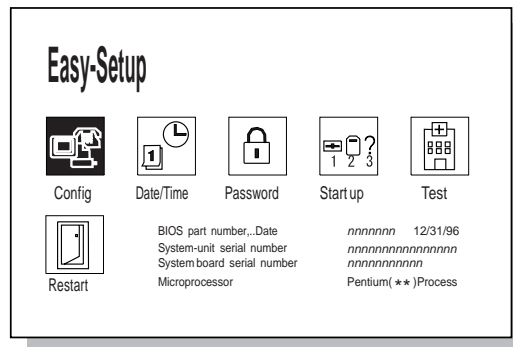
To select an item from the Easy-Setup menu, move the pointer with a pointing device to the item and click on the item or use the keyboard as follows:

The **arrow** keys (↑↓←→) highlights the item from the menu.

The **spacebar** selects the item.

The **enter** key enters the next menu, or saves the changes and exits the menu.

The **Esc** key returns to the previous menu, or cancels the changes.
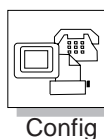
Config

Config contains the following:
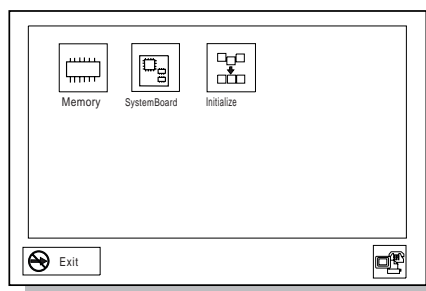
Memory

Memory shows the amount of installed memory and available memory.

SystemBoard

SystemBoard provides information about the installed system board.

Initialize

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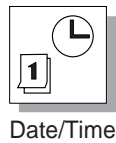
Date/Time is used to set the current date and time.

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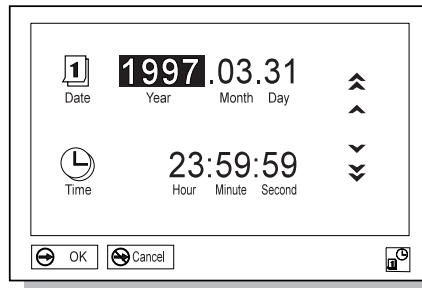
Select any field (Year, Month, Date, Hour, Minute, or Second) with the **Arrow** keys or pointing device; then type or click on the ▲ or ▼ icon to change the setting. Clicking on the ⯅ or ⯆ icon changes the setting more quickly.

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 and the hard disk password.

Password

For more information about the power-on password and the hard disk password, see Chapter 5.
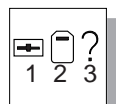
Start up is used to change the startup sequence of your computer. Following panel shows default start up.
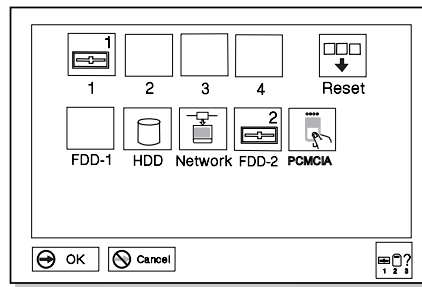
Start up

For more information about the startup sequence, see "Using the Selectable Drive-Startup Sequence" on page 37.

Using Easy-Setup
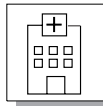
Test

Select **Test** to test the computer hardware. For more information, see "Testing the Computer" on page 145.
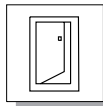
Restart

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

OK?

OK   Cancel
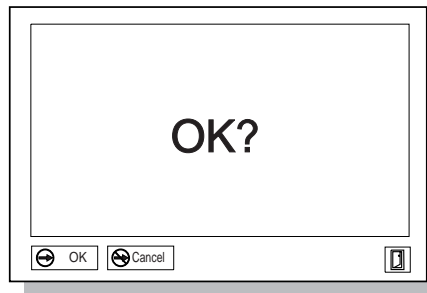
Using the Selectable Drive-Startup Sequence

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).
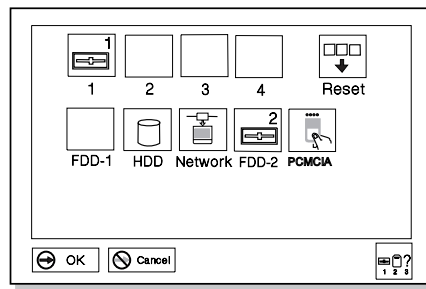
Changing the Startup Sequence

To change the startup sequence:

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

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 35.

Note:
Set a PC Card (PCMCIA) before a hard disk drive if you want to boot from the PC Card.

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.

Selecting the Network RPL Speed

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

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

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

Attention:
Do not attach an overhead projector or an office equipment other than a monitor.
Otherwise, the computer might be damaged.

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

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

Display Output Type

To attach an external monitor:

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.

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

Using the Computer LCD or the External Monitor

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

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
```
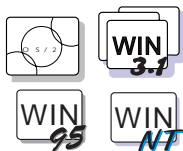
Using the ThinkPad Features program:

1. Start the ThinkPad Features program.

2. Click on the following icons from the tools bar:

– The **LCD** (⊟) icon to display information on the LCD.

– The **CRT** (▢) icon to display information on the external monitor.

– The **Both** (⊡) icon to display information on both the LCD and external monitor.

Entering a PS2 command from the command prompt:

– Type `PS2 SC LCD` to display information on the LCD.

– Type `PS2 SC CRT` to display information on the external monitor.

– Type `PS2 SC BOTH` to display information on both the LCD and the external monitor.

Considerations for the 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:

640 x 480
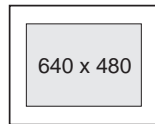
This is to maintain compatibility with DOS applications.

PS2 command for screen expansion: ➡ Page 199.

To expand the screen image to the same size as the actual screen, you can use the *screen expansion* function.

Attaching an External Monitor

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 the* **CRT** *instead.*

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

1. Set your monitor type and the display device driver.
   (See "Setting the Monitor Type and the Display Driver.")

2. Change the display output type to **Both** ( ).
   (See "Display Output Type" on page 39.)

3. Attach the external monitor to the computer.
   (See "Connecting an External Monitor to the Computer" on page 43.)

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

If you are attaching an SVGA monitor, refer to "Using SVGA Video Mode" on page 44 for information on the supported color depth or resolution.

To install the display driver:
➡ Chapter 7.

Setting the Monitor Type and the Display Driver

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

1. Start the ThinkPad Features program.

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

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

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.

Hints and Tips

The virtual screen function is available in all operating systems. 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 devices. The virtual screen can be disabled on Windows 3.11 or Windows 95 with using ThinkPad Features program.

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.

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 385 or 385D computer has an LCD that supports an SVGA video mode with 800x600 resolution. You can also display information in higher resolutions by attaching an external monitor to your computer 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 (for both 385 and 385D)
640x480	256, 65,536, 262,144 (LCD), and 16,777,216 (monitor)
800x600	256 and 65,536
1024x768 (virtual screen)	256

Note:
Only a portion of the 1024x768 screen is displayed on the LCD (800x600). You can use the pointer to scroll up or down or left to right to see information outside the displayed area.

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

Resolution	Frame Rate	Supported Color Depth (for both 385 and 385D)
640x480	60Hz	256, 65,536, and 16,777,216
	75Hz	
	85Hz	
800x600	60Hz	256 and 65,536
	75Hz	
	85Hz	
1024x768	60Hz	256
	70Hz	
	75Hz	

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 the motion video driven by an application.

Hints and Tips

If you have changed the display setting and the playback video quality is unsatisfactory, try using the 800-by-600 resolution and 256 colors.

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

Using PC Cards

PC Card standard:
➡ Page 181.

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 lower PC Card slot also supports a Zoomed Video port card for your video needs.

The PC Card slots of the computer conform to the PC Card Standard (Version: February 1995) 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 support software and common enablers.

PC Card support program:
➡ Page 48.

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

> Type I, Type II, and Type III PC Cards.
> 16-bit PC Card.
> Zoomed Video port card.

The PC Card slots do not support the following PC Cards:

> PC Cards operating at 3.3 V dc.
> 8-bit or 16-bit slave DMA PC Cards.

The ThinkPad 380/385 port replicator does not support the following PC Cards:

> Integral** Peripherals Model 1841PA (40MB).
> IBM 105MB PCMCIA hard disk drive (P/N 74G8694).

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.

About the Zoomed Video Port Card

The Zoomed Video port connects a PC Card and a video controller. It allows the PC Card to write video data directly to an input port of a graphics controller such as the VGA:

> **Insert the Zoomed Video port card in the lower PC Card slot**.

> **Note:** The computer does not support the Zoomed Video port card in the upper PC Card slot.

> Windows 3.1 and Windows 95 support the Zoomed Video port cards.

> The Zoomed Video port card cannot be used without a PC Card device driver and a display device driver.

> The Zoomed Video port card device driver must correspond to Video Port Manager Version 1.10 or later.

> The SVGA Video mode (800 x 600 and 256 colors).

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 72, the computer cannot enter hibernation mode.

Using the PC Card Support Software

To install PC Card support software:
➡ Chapter 7.

Your computer comes with advanced PC Card support software, 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.

A PC Card might come with its own device driver that will set it up just as the support software does. However, if this card is supported by the computer, you do not need its device driver.

If your PC Card is not supported, you must install the device driver that came with your card. The device driver must be compatible with the PC Card Standard (Version: February 1995). Follow the instructions in your PC Card manual to install the driver.

Using the Infrared Communication Feature

To install the infrared device driver:
➡ Chapter 7.

Note:
Mbps: Megabits 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 feature supports the IrDA** mode at a data transfer speed of up to 4 Mbps. 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.
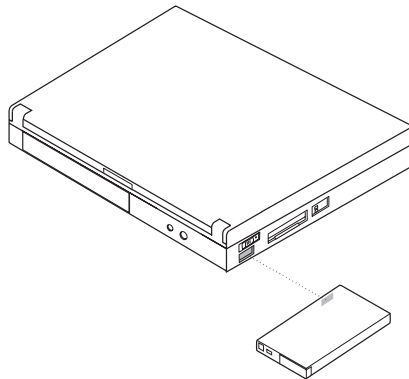
You need to run the same communication application on both computers to communicate between your computer and another

Communicating with the Infrared Port

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. Do not use infrared communication under 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:
The microphone-in jack and headphone-out jack can be used concurrently, at the same time.

Note:
Do not enter suspend mode when using the audio functions.
(Affect Win-OS/2 and DOS.)

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

A ¹⁄₈-inch (3.5-mm) diameter external stereo line-in or monaural microphone-in jack.

A ¹⁄₈-inch (3.5-mm) diameter stereo headphone-out jack.

Stereo PCM file, WAV file, and recording playback in 8-bit or 16-bit format.

Various sampling rates from 8 KHz to 44 KHz for the WAV file.

MIDI and MIDI file playback through an FM synthesizer.

Capacity to record from various sound sources, such as an integrated microphone, an external microphone, and an audio device attached to a line-in jack or an integrated CD-ROM drive.

DOS game compatibility. Chose Sound Blaster Pro** for the audio adapter in the sound setup of the game.

A MIDI serial port connector available when the computer is attached to the ThinkPad 380/385 port replicator. The computer can be connected to an external MIDI device through a MIDI port, an MPU401 interface. The MIDI port capability is disabled as a default, so you need to enable the functions in the ThinkPad Features program.

Use the audio feature according to your operating system.

Chapter 4. Using Battery Power

This chapter describes battery pack operations.

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 a fully charged battery pack with you for maximum operating time.

Important

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 up, 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 the 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 **2.5—3.5 hours**. (It takes approximately **3.5—9.0 hours** when charging while operating the computer.)

Replacing the Battery Pack

When the AC Adapter is connected, you can replace the battery pack anytime 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.

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 72, the computer does not enter hibernation mode. When replacing the battery pack, turn off the computer.

Make sure you have created a hibernation file before doing the following steps. Otherwise, you cannot enter hibernation mode.

---

1 Close the LCD and turn the computer over.
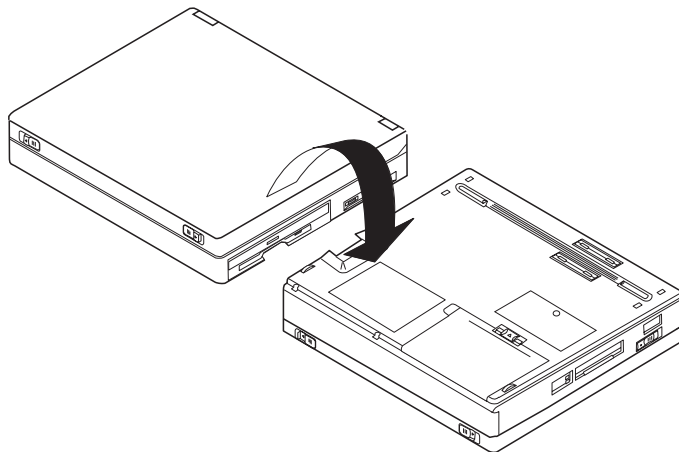
Replacing the Battery Pack

2 Pull the battery pack lock upward ▮1▮ and slides it toward the rear of the computer ▮2▮. Using the notch ▮3▮ beside the battery pack, lift the battery pack ▮4▮ from the computer.
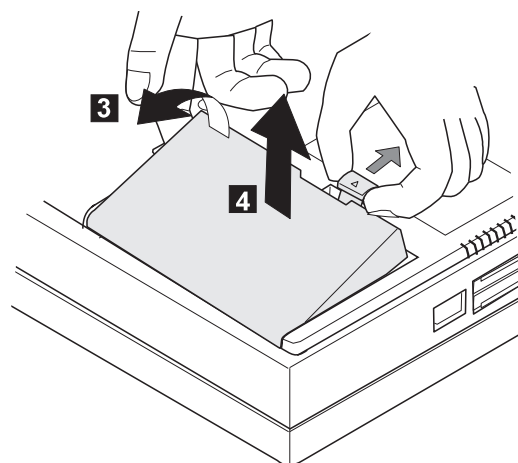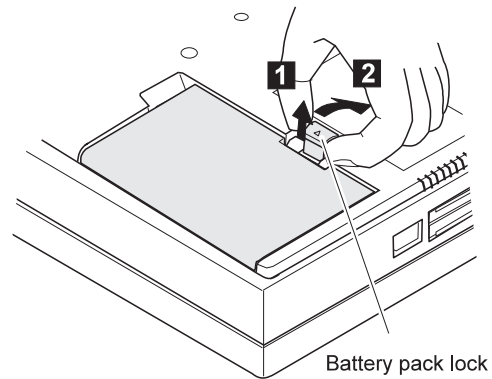
Battery pack lock

3 Install the fully charged spare battery pack as shown 1 , and slide the battery pack lock toward the rear 2 .
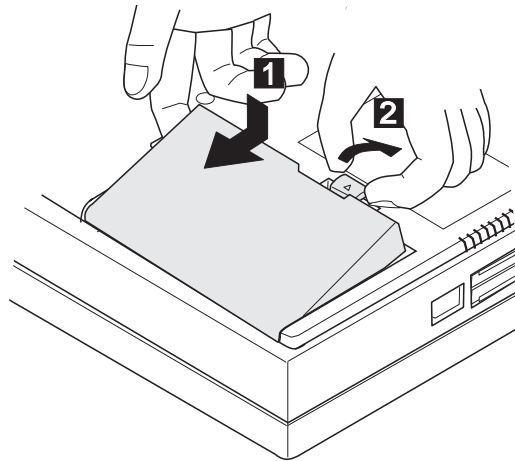
4 Push the battery pack lock downward.
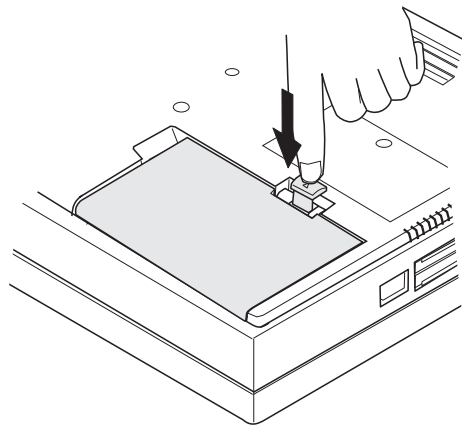
5 Turn the computer over again; then open the LCD.

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 following status list 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	The battery pack is almost discharged (low battery). See "Low-Battery Condition" on page 59.	Do either of the following actions within 5 to 10 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 55.) Save the current data.
Off	The battery pack is not installed. **or** 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 *blinking orange* 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.

Low-Battery Condition

Attention:
If you leave the computer in this condition for a long time, data in memory will be lost.

When the battery pack is low in power, 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.

When the battery pack is low in power, the computer makes three short beeps and then three long beeps **if the alarm is enabled**. The computer enters suspend mode within 30 to 60 seconds.

Using the Fuel-Gauge Program

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

> Power mode.
> Battery status.
> Suspend or hibernation options.

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 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.

To install the ThinkPad Features program:
➡ Chapter 7.

Preserving Battery-Pack Life

To preserve the life of the battery pack:

Do not charge the battery pack until all of its power is used.
Once you have started charging the battery pack, do not use it
until it is fully charged.
Turn off the computer whenever it is not use.

Maximizing Battery-Powered Operation

To save the battery power:

Use Advanced Power Management (APM).
Decrease the LCD brightness.
Use the Battery Power-Management function.

Using Advanced Power Management

Note:
Windows NT does not support APM, but the computer provides a device driver for the Windows NT power management.

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

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

WIN 95

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. Click on **Start**.

2. Click on **My Computer**.

3. Click on **Control Panel**.

4. Click on **Power**.

5. Verify that the item **Power management** is set to **Advanced**.

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

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, enter `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
```

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. Enter`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:       Neo Magic. 8  ×6   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 on page 62.

```
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:       Neo Magic 8  ×6   256 small font
   Mouse:         Microsoft, or IBM PS/2
```

6. Press **Enter** to install APM.

7. Restart the system to make APM effective.

Decreasing LCD Brightness (TFT Model Only)

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 30.

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.

Operation Mode

Press
Fn+F3

Press
Any key

Press
the
Fn key

Open
the
LCD

Press
the
Power
Shutdown
Switch

Press
Fn+F4

Close
the
LCD

Standby Mode

Press
the
Power
Switch

Press
Fn+F12

Suspend Mode

Press
the
Power
Switch

Automatically enters by the
timer or by a low battery
value, set in the ThinkPad
Features program.

Hibernation Mode

Power-off
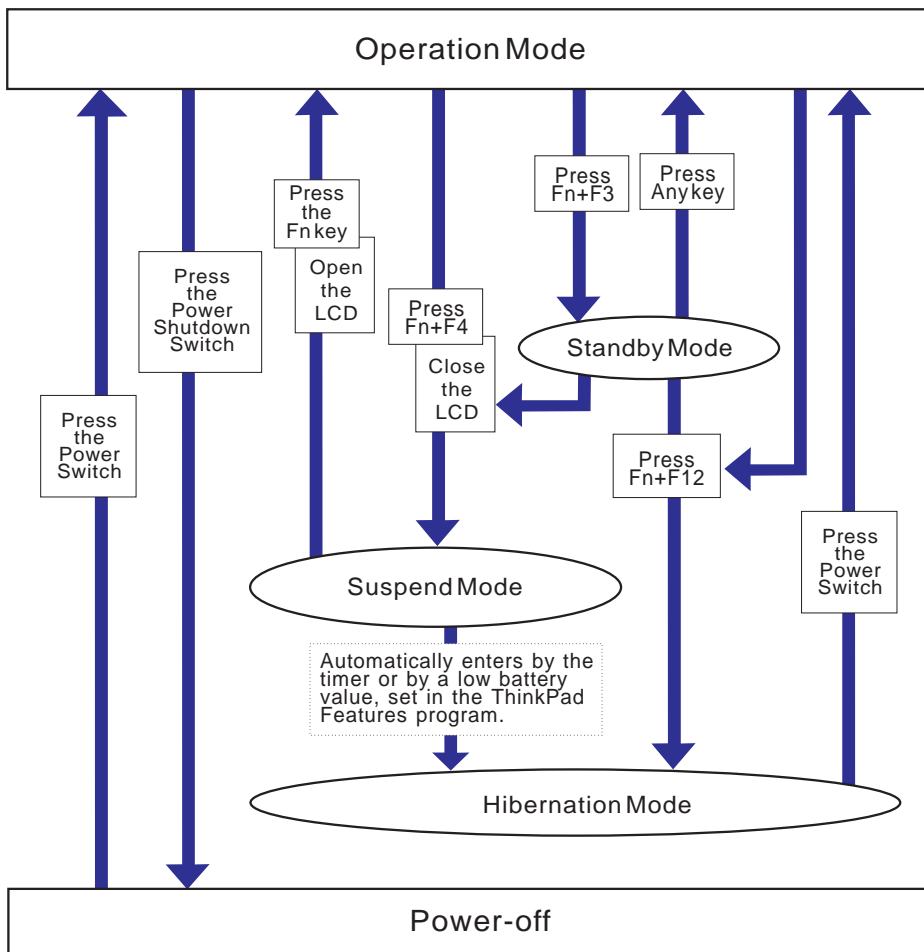
Standby Mode

In standby mode, 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 Mode

The following indicators change status when you use suspend mode:

Current Status	Indicator Lamps	
	Suspend Mode	Power-On
In suspend mode	Green	Off
Entering suspend mode or resuming from suspend mode	Blinking green	Off
Normal operation	Off	Green

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

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.

To create hibernation file:

RediSafe suspend mode.
Create a hibernation file before using this mode.
In RediSafe suspend mode, all tasks are stopped, and the memory data and the status of the computer are stored on the hard disk drive. This prevents accidental loss of the data during suspend mode. Resuming normal operation is faster from RediSafe suspend mode than it is from 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 **Battery** (⊟) then click on
   Suspend/Hibernation/Resume options (⬚).

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 **OK**.

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:

– OS/2 Warp.
– DOS Version 7.0.
– Microsoft Windows Version 3.11 with DOS Version 7.0.
– Microsoft Windows 95.
– Microsoft Windows NT.

Important

When you use Windows Version 3.11, ensure that Advanced Power Management (APM) is installed according to the instructions in "Installing Microsoft Windows Version 3.11" on page 123.

Attached devices, such as a printer or a 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 a 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

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 in the preceding list. 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 normal operation is resumed, remove and then reinstall the PC Card before restarting the system or an application program. For other kinds of PC Cards, if the PC Card or computer does not operate, restart the application or the computer.

Note:
For DOS or Windows 3.11, you must ensure the Ring indicator option is set in the program so the computer automatically resumes normal operation. (The default is for the option to be set.)

When the computer is using one of the following IBM modem cards and detects an incoming call while in suspend mode, it 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.

Hibernation Mode

In hibernation mode, all tasks are stopped and the 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.

To enter hibernation mode, press **Fn**+ **F12**. When the computer enters hibernation mode, you hear one short beep. A graphical message appears and suspend mode indicator lamp blinks; then a short beep sounds again to inform you that the computer has entered hibernation mode.

To return to normal operation, press the power switch.

Before you can use hibernation mode, you must first create a hibernation file. See the next section.

Creating the Hibernation File

When installing an operating system or installing additional computer memory, you must create a hibernation file on the hard disk drive to use 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 16MB, the hibernation file is 33MB:

```
(16MB + 16MB) + 1MB = 33MB
```

Using Power Management

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

If you are using OS/2 or Windows:

1. Turn on the computer and start the ThinkPad Features program.

2. Click on **Battery** ( ).

3. Click on **Suspend/Hibernation/Resume options** ( ).

4. Click on **Enable Hibernation** 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:

Note:
The file system supported by the computer one of the following:

    FAT (16—bit Fat or Fat16)
    FAT32
    HPFS

The computer does not support NT File System (NTFS).
Use one of the listed file systems when you make multiple partitions, and format the hard disk using the disk utility program.

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 the 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. If you do, the computer resumes from hibernation without recognizing the changed the memory size. To ensure that the computer recognizes the correct memory size, shut down; then restart your operating system.

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 explains 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 to identify your computer.

Using Passwords

There are two types of passwords you can use to protect your computer.

The *power-on password* protects your computer from being used by unauthorized persons.
The *hard disk password* protects the data on your hard disk drive from being accessed by unauthorized persons.

Hints

You can display your personal information, such as your name or address, on the password prompt screen. For details, see page 82.
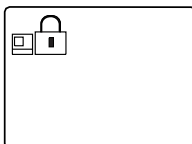
Power-On Password

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.

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. An additional charge will be required for disassembly and erasing the password.

Setting a Power-On Password

To set a power-on password:

1. Start Easy-Setup and click on **Password**.

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

2. Click on **Power-On** (🔒).

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

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**.

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 76 or "Removing a Power-On Password" on page 77.

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.

After turning off the computer, wait at least 5 seconds Otherwise, the computer might malfunction.

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.
An additional charge will be required for disassembly and
erasing the password.**

└───┘

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**)
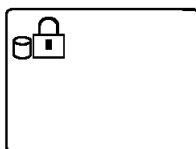
Hard Disk Password

The hard disk password helps you protect the information stored on the hard disk drive. If the hard disk password is set, the information stored in your hard disk cannot be accessed without the hard disk password.

When you turn on the computer, the hard disk password prompt appears on the screen and reminds you to enter your password.

When a hard disk password is set, a preset timer or an incoming call does not activate the resume function. To use the resume function with a hard disk password, set the same password for both the power-on password and the hard disk password.

Do Not Forget Your Hard Disk Password!

Note the password and keep it in a safe place. If you forget your hard disk password, there is no way to reset your password or recover data from the hard disk.
The only solution is for an IBM authorized reseller or IBM marketing representative to replace the hard disk drive with a new one, charging an additional fee.

Note

Using a hard disk password with a power-on password:

You can use the hard disk password with the power-on password at the same time. When you turn on the computer, the power-on password prompt appears first, followed by the hard disk password prompt. Enter the correct passwords.

When you set the hard disk password the same as the power-on password, only the power-on password prompt appears on the screen. Enter the correct power-on password. (The hard disk password screen does not appear.)

Setting a Hard Disk Password

To set a hard disk password:

1. Start Easy-Setup by pressing and holding **F1** and then turning on the computer.

2. Select the **Password** icon and then select **HDD** (🔒).

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

3. Type your desired hard disk 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 hard disk password again to verify it; then press **Enter**.

Entering a Hard Disk Password

If a hard disk password is set, the hard disk password prompt appears when:

You turn on the computer.

When the computer returns to normal operation from suspend or hibernation mode.

Note:
Do *not* press the **Spacebar** after you enter the password; this action removes the password.

When the password prompt appears at the top left corner on the screen, type the hard disk password; then press **Enter**.

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 Hard Disk Password

The procedure to change a hard disk password depends on whether it is set to the same password as the power-on password.

When the hard disk password is set the same as the power-on password:

1. Remove the passwords by following the steps in "Removing a Power-On Password" on page 77.

   This operation removes both the hard disk password and the power-on password.

2. In Easy-Setup, set a new hard disk password.

   See the steps on page 79.

3. If you need a power-on password, set it in Easy-Setup.

When the hard disk password and the power-on password are different, or the power-on password has not been set:

1. Turn off the computer and wait at least 5 seconds; then turn it on.

2. If you have set a power-on password, type it; then press **Enter**.

3. When the hard disk password prompt (⊟🔒) appears, type your *current* hard disk password; then press the **Spacebar**.

4. Type the *new* password; then press the **Spacebar**.

   Use no more than 7 characters.

5. Type the *new* password again to verify it; then press **Enter**.

Do Not Forget Your Hard Disk Password!

Note the password and keep it in a safe place. If you forget your hard disk password, there is no way to reset your password or recover data from the hard disk.
The only solution is for an IBM authorized reseller or IBM marketing representative to replace the hard disk drive with a new one, charging an additional fee.

Removing a Hard Disk Password

The procedure to remove a hard disk password depends on whether it is set to the same password as the power-on password.

When the hard disk password is set the same as the power-on password:

1. Remove the password by following the steps in "Removing a Power-On Password" on page 77.

   This operation removes both the hard disk password and the power-on password.

2. If you need a power-on password, reset it in Easy-Setup.

When the hard disk password and the power-on password are different, or a power-on password has not been set:

1. Turn off the computer and wait at least 5 seconds; then turn it on.

2. If you have set the power-on password, type it; then press **Enter**.

3. When the hard disk password prompt (🔒) appears, type your current password, press the **Spacebar**, and then press **Enter**.

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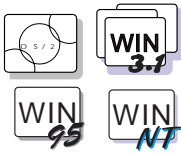
You can display personal information, such as your name or address, every time the computer is turned on and a power-on password is set. This can help you when you misplace your computer. Because the password is set, your data is secured and cannot be accessed, but your personal information is displayed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

To set a password:
➡ Page 74.

Note:
To use the personalization editor in OS/2 Warp, you need to install the WIN-OS/2 environment in 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.

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.
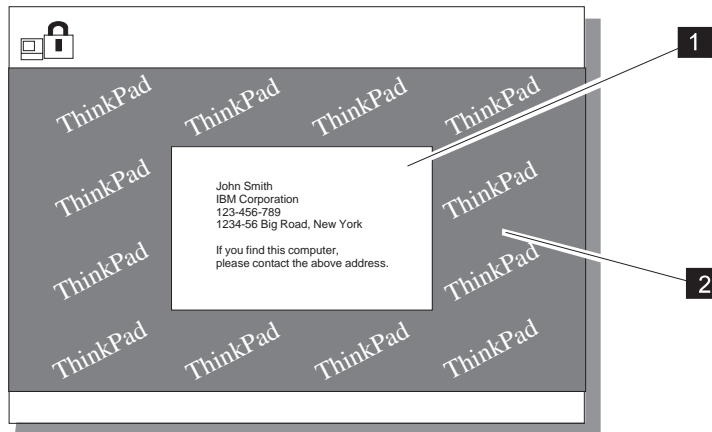
To use the personalization editor, click on the **Personalization** icon in the ThinkPad Features utility; then refer to the online help for details.

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 security system lock to your computer to prevent it from being removed without your permission.

To attach a lock, do the following:

Attach a security system lock to the keyhole 1 on the rear of the computer; then secure the chain on the lock to a secure stationary object.
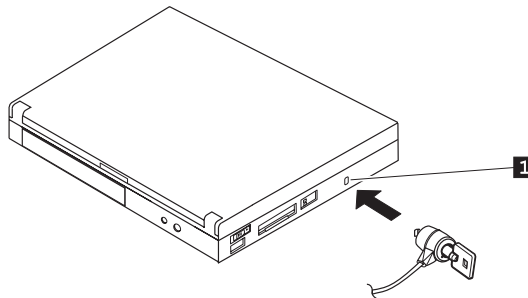
Chapter 6. Installing and Removing Options

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

Using the PC Card Slot

Note:
When installing an operating system, install the PC Card support software that is on the PC Card Installation Diskette before using the PC Card slots.

To install the PC Card support software:

➡ Chapter 7.

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

This section explains how to install and remove a card from the PC Card slot. For information about operating the computer with PC Cards, refer to "Using PC Cards" on page 46.

Installing a PC Card

1 Find the notched edge 1 of the card as shown.
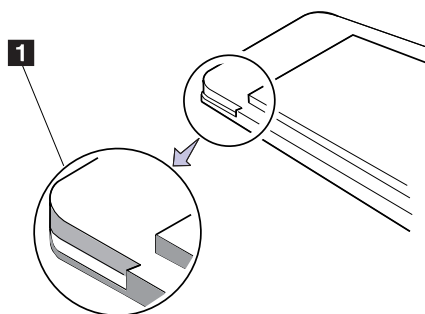
Note:
If you are using a PC Card with an XJACK** connector, insert it into the *upper* slot.

If you are using a Zoomed Video port card, insert the card into the *lower* slot.

2 Insert the card into an appropriate slot according to your card type. Slot covers fold to the inside when you insert the cards:

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

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

Eject button

(Left side view)
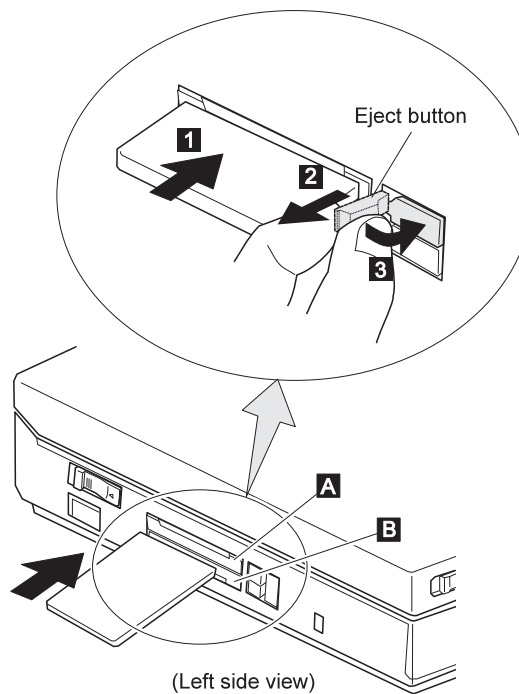
Press the card firmly into the connector `1` until the eject button pops out `2`. Then, pull the eject button out slightly and fold it to the right `3`.

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

To use PC Cards, see "Using PC Cards" on page 46.
To use PC Cards with power-saving functions, see:
– "Considerations for Suspend Mode" on page 67.
– "Considerations for Hibernation Mode" on page 71.

Removing a PC Card

Raise the PC Card eject button 1 for the card you want to remove.
Then, press the PC Card eject button 2 until the card pops out.

Remove the card 3 and save it for future use.

(Left side view)
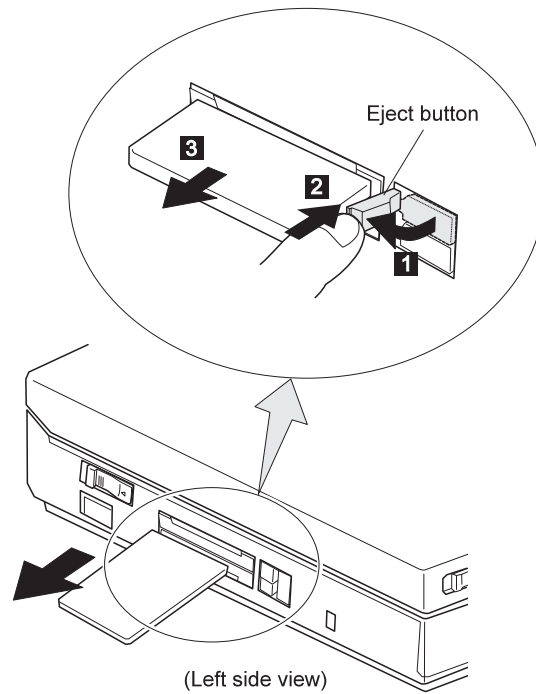
Increasing the Memory Capacity

Note:
IC DRAM cards cannot be used with 385 or 385D computers.

Increasing the 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.
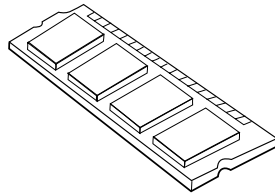
You can insert a DIMM directly in the memory slot on the bottom of the computer and expand your computer memory capacity.

Important

Changing memory while your computer is in suspend mode or hibernation mode may cause permanent damage to the equipment. Make sure you turn off the computer power when changing memory.

Installing or Removing the DIMM

1 Turn off the computer; then disconnect the AC Adapter and all cables from the computer.

2 Touch any metal object with your hand to release any static electricity.

3 Turn the computer over.

4 Loosen the screw on the memory slot cover and remove the cover.
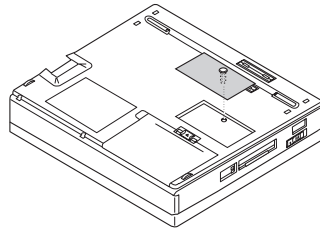
Attention:
To avoid damaging the DIMM, do not touch its contact edge.

5 Which are you going to do?

Install a DIMM   Go to the next step.
Remove a DIMM   Go to step 7 on page 92.

6 Install the DIMM into the memory slot:

    a) Find the notches `A` and `B` on the edge of the DIMM.

    b) With the notched end of the DIMM toward the right side of the socket `B`, 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.
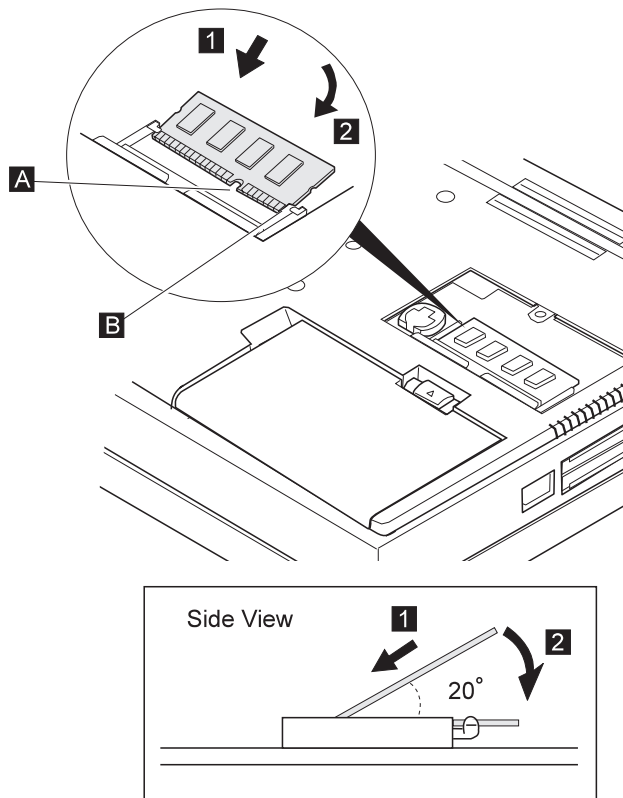
    d) Go to step 8 on page 93.

Installing or Removing the DIMM

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

7 Remove the DIMM from the memory slot:

a) Press out on the latches on both edges of the socket at the same time.
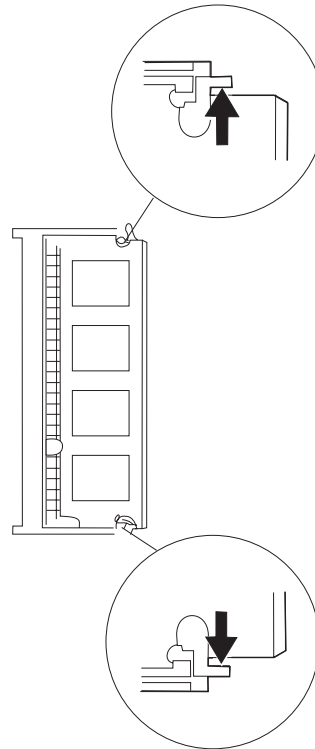
b) Remove the DIMM.

Be sure to save the DIMM for future use.

c) Go to the next step.

8 Place the memory slot cover over the memory slot; then install the screen back into its place.
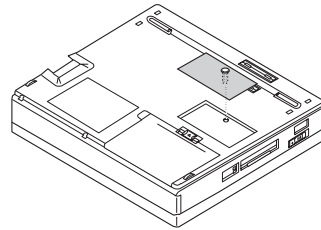
9 Turn the computer over again.

10 Open the LCD and power on the computer.

11 To confirm that the DIMM is correctly attached to the computer, do the following:

Note:
1Megabytes=1024Kilobytes

a) Calculate your total memory size in kilobytes (KB) by adding the DIMM memory size to the base memory size (16,384KB).

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

```
16(Megabytes) x 1 24(Kilobytes) + 16   (Kb) = 32384(KB)
```

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

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

```
32384 KB OK
```

If a 2 1 error code appears under the memory count, turn off the computer and go to page 90 to reinstall the DIMM.

```
32384 KB OK

2 1
```

Installing or Removing the DIMM

c) Is the total memory size the same as the value you calculated in step 11a?

Yes   Go to the next step.
No   Turn off the computer and go to page 90 to reinstall the DIMM.

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

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 90 and reinstall the DIMM.

12 Reconnect all cables.

You have completed the installation or removal of the DIMM.

Important

If you changed the memory installed in the computer and were using hibernation mode, you need to create a new hibernation file. See "Creating the Hibernation File" on page 69.

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. Be careful not to insert the connector upside down

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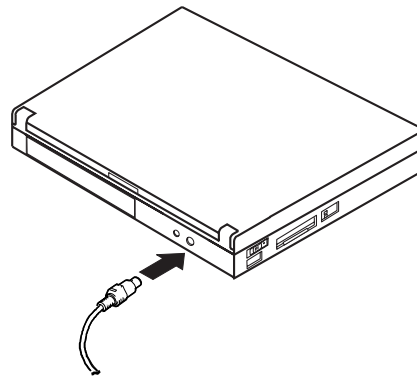
Note:
You can remove the keypad cover 1 and use it as a stand for the keypad.

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.
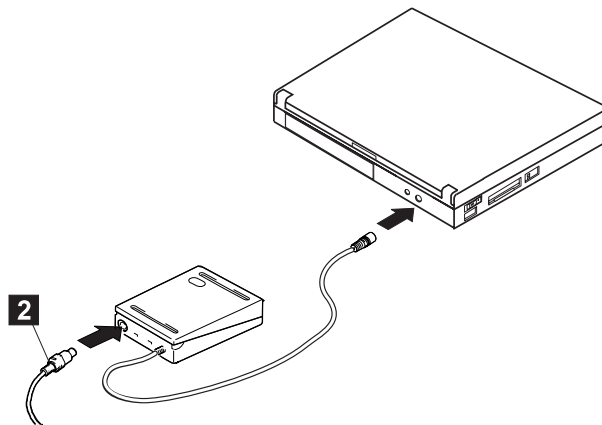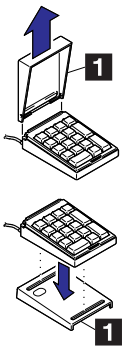
Using the Mouse and Other Pointing Devices

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.

Attaching an External Keyboard

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

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).
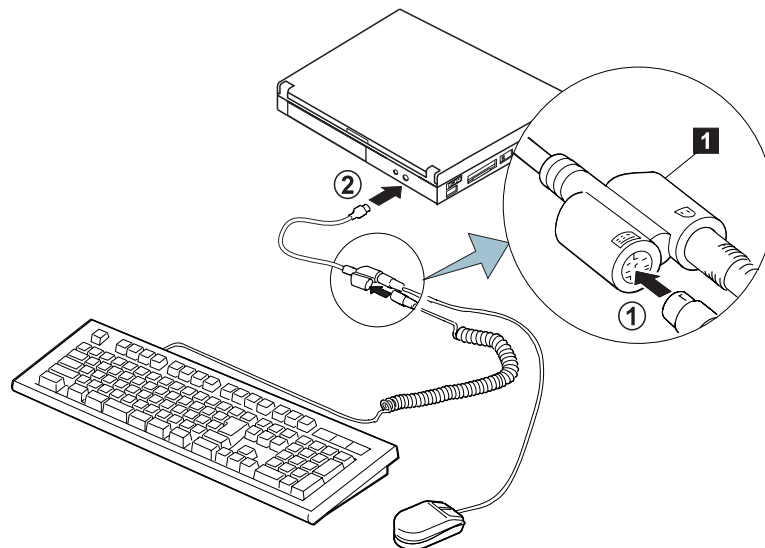
Chapter 7. Installing Software

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

Your computer comes with the following software already installed:

Operating system (Windows 95 preloaded).
Audio support software.
Infrared device driver.
PC Card Support software program.
ThinkPad Features program.
ThinkPad display driver.
Online book.
385CD CD-ROM device driver.

Note:
Before reinstalling the operating system and device drivers, you need to create all installation diskettes using the Diskette Factory and Create System Disk for Windows 95 (diskette backup program), which are 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 enabler is not a part of the preinstalled software. Refer to the manual that came with the PC Card to install the device driver.

Installing the Operating System and Device Drivers

The operating systems supported by your computer are:

WIN 95   Microsoft Windows 95
Go to "Installing Software for Windows 95" on page 104.

OS/2   IBM Operating System/2 (OS/2) Warp
Go to "Installing Software for OS/2 Warp" on page 109.

DOS   IBM PC DOS Version 7.0
Go to "Installing Software for DOS" on page 119.

WIN 3.1   Microsoft Windows 3.11
Go to "Installing Software for Windows Version 3.11" on page 123.

WIN NT   Microsoft Windows NT
Go to "Installing Software for Windows NT Version 3.51 or 4.0" on page 129.

Accessing Remote Software Services

Before you install these softwares in your computer, you may need to get some update software from IBM as follows:

How to Get the Updated Software

IBM PC Company is providing the updated software through several channels so that you can obtain your software on your computer with the information described here:

WWW server on the Internet:

http://www.pc.ibm.com/support.html

FTP site:

ftp://ftp.pc.ibm.com/pub/pccbbs/mobiles

CompuServe** ThinkPad Forum:

Join the CompuServe ThinkPad Forum (by entering at the command prompt GO THINKPAD) and download the necessary software from the library.

IBM PC Company BBS:

Phone: 1-919-517-0001

If you cannot get the updated software from any of the preceding channels, contact your IBM representative or the IBM HelpCenter (1-800-772-2227 in the U.S.) for more information.

Installing Software for Windows 95

WIN 95 This section describes the installation procedures the device drivers for Windows 95 for your ThinkPad computer.

> **Important**
>
> Before reinstalling the operating system and device drivers, you need to create all installation diskettes using the Diskette Factory program and the Create System Disk utility for Windows 95 (diskette backup programs preloaded on your computer).
>
> See Getting Started.

This section describes the software already installed at the time of purchase. For your computer to work as it did at the time of purchase, install all this software:

Install Windows 95 ➡ See the manuals supplied with the machine.

385CD Install the CD-ROM device driver ➡ This page.

Install the ThinkPad Features program ➡ Page 106.

Install the PC Card support software ➡ Page 106.

Install the audio support software ➡ Page 106.

Install the Infrared support software ➡ Page 107.

Install the ThinkPad display driver ➡ Page 108.

Installing the CD-ROM Device Driver for Windows 95

385CD *If you installed Windows 95 on a blank hard disk drive without DOS and Windows 3.1,* Windows 95 has automatically installed a generic ATAPI CD-ROM device driver for your ThinkPad's CD-ROM drive. You do not need to do the following procedure.

If you installed Windows 95 in a computer on which DOS and Windows 3.1 had been already installed, you need to disable the DOS/Windows 3.1 CD-ROM device driver to use the correct Windows 95 generic ATAPI CD-ROM device driver.

To disable the DOS and Windows 3.1 CD-ROM device drivers:

1. Start Windows 95 and go to the MS-DOS command prompt.
2. Open the CONFIG.SYS file; then find the following line:

```
DEVICE=C:\xxxxxx\IBMTPCD.SYS /R
```

xxxxxx is the subdirectory where you have installed the CD-ROM device driver. If you cannot find the line, quit the file and go to step 4.

3. Comment out the line to change it as follows:

```
REM DEVICE=C:\xxxxxx\IBMTPCD.SYS /R
```

If the line is already commented out, quit the file and go to the next step.

4. Open the AUTOEXEC.BAT file; then find the following line:

```
C:\xxxxxx\MSCDEX.EXE /D:TPCD  1 /M:15
```

xxxxxx is the subdirectory where you have installed the CD-ROM device driver. If you cannot find the line, quit the file and go to step 6.

5. Comment out the line to change it as follows:

```
REM C:\xxxxxx\MSCDEX.EXE /D:TPCD  1 /M:15
```

If the line is already commented out, quit the file and go to the next step.

6. Exit the DOS command prompt; then reboot the system.

Note:
The default subdirectory for C:*xxxxxx* is C:\CDROM.

Note:
The default subdirectory for C:*xxxxxx* is C:\CDROM.

Installing the ThinkPad Features Program for Windows 95

To install the ThinkPad Features Program for Windows 95, do the following:

1. Start Windows 95.

2. Insert the ThinkPad Utility Diskette for Windows 3.1/Windows 95, or ThinkPad Utility Diskette 1 into the diskette drive.

3. Click on **Start**.

4. Click on **Run...**.

5. Type `a:installw` and click on **OK**.

6. Follow the instructions on the screen.

Installing the PC Card Support Software for Windows 95

To use PC Cards in Windows 95, install the CardWorks** software:

```
┌─ Important ──────────────────────────────────────────┐
│                                                       │
│  If your system is connected to a network, log off before starting │
│  installation.                                        │
│                                                       │
└───────────────────────────────────────────────────────┘
```

1. Start Windows 95.

2. Remove any PC Cards from the computer.

3. Insert the diskette containing the CardWorks software.

4. Click on **Start**.

5. Click on **Run...**.

6. Make sure the dialog box shows **a:setup**; then click on **OK**.

7. Follow the instructions on the screen.

Installing the Audio Support Software for Windows 95

To install the audio support software, do the following:

1. Start Windows 95.

2. Insert the Audio Features Diskette for Windows 95 into the diskette drive.

3. Click on **Start**.

4. Click on **Run...**.

5. Type a:setup and click on **OK**.

6. Click on the **Install Driver** button at the pop-up window.

7. Follow the instructions on the screen.

8. When you are prompted to restart the computer, remove any diskette from the diskette drive and restart the computer.

9. When the computer prompts you to install the manufacturer's diskette during the startup of Windows 95, insert the Audio Features Diskette for Windows 95 into the diskette drive.

10. Follow the instructions on the screen to complete the installation.

The MIDI serial port connector is available when the computer is attached to the ThinkPad 380/385 port replicator. The MIDI port capability is **disabled** as a default, so you need to **enable** the function in the ThinkPad Features.

After you enable MIDI port capability, you are prompted to insert the manufacturer's disk to install support software for the function. Insert the Audio Support Diskette for Windows 95 into the **A** drive.

Installing the Infrared Device Driver for Windows 95

The infrared device driver for Windows 95 to support the application **TranXit for Windows**, is included in the application.

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

1. Start Windows 95.

2. Insert the ThinkPad Infrared Features Diskette into the diskette drive.

3. Go to the MS-DOS command prompt.

4. Type A:UINSTALL and press **Enter**. Follow the instructions.

5. At the Installation Option screen, select **Install Windows ThinkPad Infrared Driver** and press **Enter**.

Note: You may need to enable the infrared device before using it. The infrared device may be disabled by a default system

setting. You may also need to make sure that no resource conflict exists after enabling the infrared device.

Installing the ThinkPad Display Device Driver for Windows 95

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

1. Start Windows 95.

2. Open **My Computer**.

3. Open **Control Panel** and open **Display**; then click on the **Settings** tab.

4. Click on the **Advanced Properties** button.

5. Click on the **Change...** button on the **Adapter** tab.

6. Click on **Have Disk...** and click on **OK**.

7. Insert the ThinkPad Video Feature Diskette for Windows 95 into the diskette drive.

8. Make sure **IBM ThinkPad/NeoMagic MagicGraph 128ZV** is shown as the selection; then click on **OK**.

9. Click on **Close**.

10. Select your screen parameters from the Color palette, Desktop area, and Font size; then click on **Close**.
    Recommend **256** color at the color palette, **800 x 600** resolution at the Desktop area, and **Small** at the Font size.

11. Follow the instructions on the screen.

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

Installing Software for OS/2 Warp

This section describes how to install in your computer OS/2 Warp with DOS and Windows 3.1 as well as the OS/2 ThinkPad device drivers.

Important

Before reinstalling the operating system and device drivers, create the installation diskettes using the Diskette Factory program (a diskette backup program that is preloaded on your computer).

Install OS/2 ➡ This page.

385CD Install the CD-ROM device driver for OS/2
➡ Page 113.

Install the ThinkPad Features program ➡ Page 113.

Install the PC Card support software ➡ Page 115.

Install the audio support software ➡ Page 116.

Install the Infrared device driver ➡ Page 117.

Install the ThinkPad display driver ➡ Page 118.

Installing IBM OS/2 Warp

Your installation of OS/2 will differ, depending on whether you use the *Dual Boot* or the *Boot Manager* for switching between OS/2 and DOS/Windows.

Which type are you going to use?

Dual Boot   This page.

Boot Manager   Go to page 111.

Installing OS/2 Warp with Dual Boot

To install the DOS ThinkPad Features program:

➡ Page 121.

To install the Windows ThinkPad Features program:

➡ Page 126.

Note:
If you have the OS/2 Warp FixPak 10 (XR0010) or later, install it after you complete the installation of OS/2. Follow the instructions in the README.1ST file in diskette 1 of that FixPak.

Install DOS, Windows, and their ThinkPad Features program before installing OS/2.

To install OS/2:

To install the diskette version of OS/2, refer to the OS/2 documentation; however, pay attention to the following during installation:

– Remove any supported devices under **Multimedia device support** at the **System configuration** screen.
  Choose the following at the System configuration screen:

   - Display —**VGA**.
   - PCMCIA —**No**.
   - Multimedia —**No**.
   - 385CD At the **System Configuration** screen, ensure that **ThinkPad 755CD TEAC CD-40E** is selected for the CD-ROM drive. If not, Select **Non-Listed IDE CD-ROM** or **IDE CD-ROM** for the CD-ROM drive.

After OS/2 has been successfully installed, make sure you restart the computer.

To use the CD-ROM version of OS/2, go to page 112.

Installing OS/2 Warp with the Boot Manager

To install the DOS ThinkPad
Features program:

➡ Page 121.

To install the Windows ThinkPad
Features program:

➡ Page 126.

Note:
If you have the OS/2 Warp FixPak
10 (XR0010) or later, install it after
you complete the installation of OS/2.
Follow the instructions in the
README.1ST file in diskette 1 of
that FixPak.

1. Install the Boot Manager, referring to the OS/2 documentation.

2. Install DOS and Windows, and the ThinkPad Features programs
for both DOS and Windows.

3. Install OS/2:

If you are installing the diskette version, refer to the OS/2
documentation; however, pay attention to the following:

– Remove any supported devices under **Multimedia
Device Support** at the **System Configuration** screen.

– **385CD** At the **System Configuration** screen, ensure
that **ThinkPad 755CD TEAC CD-40E** is selected for the
CD-ROM drive. If not, Select **Non-Listed IDE CD-ROM**
or **IDE CD-ROM** for the CD-ROM drive.

After OS/2 has been successfully installed, restart the
computer.

385CD If you are installing the CD-ROM version of OS/2
using the CD-ROM drive, go to page 112.

Installing OS/2 Warp Using a Diskette Drive and CD-ROM Drive

1. Ensure that DOS and Windows are installed in the computer.

2. Insert the OS/2 Warp CD-ROM into the CD-ROM drive.

3. Open the DOS command prompt and change the current drive to the CD-ROM drive.

4. Type CDINST and press **Enter**.

   Make copies of the OS/2 Warp diskettes according to the instructions on the screen and label the diskettes.

5. Shut down OS/2 and turn off the computer.

6. Insert the OS/2 Warp Installation Diskette into the diskette drive and turn on the computer.

7. When you are prompted to insert OS/2 Warp Diskette 1, insert it into the diskette drive and insert the OS/2 Warp CD-ROM into the CD-ROM drive.

Note:
If you have the OS/2 Warp FixPak 10 (XR0010) or later, install it after you complete the installation of OS/2. Follow the instructions in the README.1ST file in diskette 1 of that FixPak.

8. Follow the instructions on the screen until the installation is complete.

   Pay attention to the following during installation:

   At the **System Configuration** screen, ensure that **ThinkPad 755CD TEAC CD-40E** is selected for the CD-ROM Drive. If not, select **Non-Listed IDE CD-ROM** or **IDE CD-ROM** for the CD-ROM drive.

   Remove any supported devices under **Multimedia Device Support** at the **System Configuration** screen.

9. Shut down OS/2 and restart the computer.

Installing the CD-ROM Device Driver for OS/2

`385CD` If you installed a CD-ROM device driver (**ThinkPad 755CD TEAC CD-40E** or **Non-listed IDE CD-ROM** or **IDE CD-ROM** on the System Configuration screen) when installing OS/2, you do not need to install the CD-ROM device driver. Continue with "Installing the ThinkPad Features Program for OS/2."

If you have not installed a CD-ROM device driver when installing OS/2, have the diskettes that came with OS/2; then install the CD-ROM device driver for OS/2 as follows:

1. Start OS/2.

2. Open **OS/2 System**; then open **System Setup**.

3. Select **Install**/**Remove** (for version 4.0).

4. Select **Selective Install**; then click on the **CD-ROM Device Support**.

5. If **ThinkPad 755CD TEAC CD-40E** is present in the list, select this and click on **OK**. If not, select **Non-Listed IDE CD-ROM** or **IDE CD-ROM** and click on **OK**.

6. Click on **OK** at the System Configuration screen.

7. At the OS/2 Setup and Configuration screen, select **Install**; then follow the instructions on the screen.

For information about the software parameter in the CONFIG.SYS file, refer to the README file in the CD-ROM Diskette.

Installing the ThinkPad Features Program for OS/2

To install the ThinkPad Features program:

1. Start OS/2; then insert the Utility Diskette for OS/2 into the diskette drive.

2. Install the ThinkPad System Management device driver:

   a) Open **OS/2 System** and then **System Setup**.
   b) Select **Install**/**Remove** (for Version 4.0).
   c) Select **Device Driver Install** and click on the **Install...** button.

      d) Click on **ThinkPad System Management Device Driver**; then click on **OK**.

3. Open the OS/2 screen command prompt.

4. Go to the A: prompt and type `INSTALL2`; then press **Enter**.

   Follow the instructions on the screen.

5. Install the Windows ThinkPad Features program for the WIN-OS/2 session:

   a) Exit the OS/2 screen; then open a WIN-OS/2 full screen.

   b) Follow the instructions in "Installing the ThinkPad Features Program for Windows Version 3.11" on page 126.

6. Install the DOS ThinkPad Features program to use the `PS2` commands:

   a) Exit the WIN-OS/2 full screen; then open a DOS full screen.

   b) Follow the instructions in "Installing the ThinkPad Features Program for DOS" on page 121.

Installing the PC Card Support Software for OS/2

To use PC Card Director:

➡ Page 48.

Note:
CardBus PC Cards cannot be used in OS/2.

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. Start OS/2; then open the OS/2 full screen command prompt.

2. Insert the PCMCIA Installation Diskette for OS/2 into the diskette drive; then type `A:\PCMINST2` and press **Enter**.

   Follow the instructions on the screen.

3. Click on **OK** when you have completed the installation.

4. After the installation is complete, close all applications, remove the diskette from the diskette drive, and restart the computer.

Installing the Audio Support Software for OS/2

To install the audio support software:

Note:

Make sure you have selected **Multimedia Software Support** in the OS/2 Setup and Installation window when you have installed OS/2. Make sure you have not selected any audio hardware during the OS/2 installation, otherwise OS/2 might detect your audio hardware as SoundBlaster Pro by mistake and install the wrong software into your hard disk drive.

If you had error messages during OS/2 boot and you need to uninstall multimedia software using the **Selective Uninstall** program. When you reinstall the multimedia software supported by **Selective install** program, make sure to remove the **SoundBlaster Pro** from the **Multimedia Device support** in the system configuration window.

1. Start OS/2.

2. Insert the ThinkPad Audio Features Diskette for OS/2 into the diskette drive.

3. Open the OS/2 command prompt and Type `MINSTALL`; then press **ENTER**.

4. Select the source drive as A: (the drive name for the diskette drive of your computer).

5. Select **CS4236 Crystal Audio** and **IBM OPL3 FM Synthesis MIDI** from the list.

A checkmark appears next to the selected items.

6. Click on **Install**; then follow the instructions on the screen.

7. When you have completed the installation, restart the computer.

Installing the Infrared Device Driver for OS/2

The infrared device driver for OS/2 is included in the application **TranXit for OS/2**.

There are two types of infrared device drivers for OS/2:

Infrared device driver to support simple file transfer with the application **TranXit for OS/2**.

Infrared device driver to support networking over an infrared link with the IBM Multi-Protocol Transport Service (MPTS) software.

The two drivers cannot work together, so you must install only the one you use.

The former is included in **TranXit for OS/2**, and is installed when you install the application. You need not install it separately. The latter is included in the Infrared Features Diskette II, and is installed as a Network Device Interface Specification Version 2 (NDIS2) compliant network adapter driver, when you install and configure the MPTS networking software that comes with OS/2 Warp Connect, OS/2 Warp Server, or TCP/IP for OS/2. Refer to the respective networking software publication for installation procedures. The README file on the Infrared Features Diskette II also contains additional information.

Modify the config.sys as follows:

```
C:/OS2/DLL/IRDD.SYS
          to
C:/OS2/DLL/IRDD.SYS 3F8 4
```

Where:

3F8 is I/O port address.
   4 is IRQ.

Installing the ThinkPad Display Device Driver for OS/2

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

The display device driver enables you to use various screen resolutions and colors for the LCD and external monitor. It also takes advantage of the computer's video capability.

To install the ThinkPad display device driver:

1. Start OS/2.

2. Insert the Video Featres Diskette for OS/2 into the diskette drive and open the OS/2 full screen or OS/2 window.

3. Go to the A: prompt; then type SET UP X (X=boot drive) and press **Enter**.

4. Select **Primary Display** on the display driver install panel and click on **OK**.

5. Select **NeoMagic...MAGICGRAPH128Z/ZV** on the primary display driver list panel and click on **OK**.

6. Make sure the source directory is A:\ and click on **Install**.

7. Follow the instructions on the screen.

8. After the installation is complete, remove the diskette, shut down OS/2, and restart the computer.

Installing Software for DOS

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

> ┌─ **Important** ─────────────────────────────────┐
>
> Before reinstalling the operating system and device drivers, you need to create all installation diskettes using the Diskette Factory program (a diskette backup program that is preloaded on your computer).
>
> └───┘

Install DOS. ➡ This page.

385CD Install the CD-ROM device driver ➡ Page 120.

Install the ThinkPad Features program ➡ Page 121.

Install the PC Card support software ➡ Page 122.

Install the Audio support software ➡ Page 122.

Installing IBM PC DOS Version 7.0

To install DOS, follow the instructions in the operating-system documentation. If you also are installing Microsoft Windows Version 3.11, go to "Installing Microsoft Windows Version 3.11" on page 123.

Installing the CD-ROM Device Driver for DOS

`385CD` To install the CD-ROM device driver:

Note:
When installing an operating system, you need to install the CD-ROM device driver.

Note:
The default subdirectory is C:\CDROM\.

1. Start DOS.

2. Insert the CD-ROM device driver diskette into the diskette drive; then type `A:UINSTALL` and press **Enter**.

3. Follow the screen instruction.

4. Select **Install IBM ThinkPad CD-ROM Driver for DOS/Windows** at the Installation Options screen, then follow the instructions on the screen.

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

Software Parameters in the CONFIG.SYS

When the CD-ROM device driver is installed in your computer, the installation program (UINSTALL.EXE) automatically modifies the CONFIG.SYS file and AUTOEXEC.BAT file. The following are the parameters for the CD-ROM device driver for CONFIG.SYS:

```
DEVICE=[drive:][path]IBMTPCD.SYS [/C] [/S]
```

The CD-ROM device driver is IBMTPCD.SYS. Make sure this line is inserted after the `EMM386` statement.

[/C] Sets the cache size in the XMS memory. When this parameter is set, the cache size in the XMS memory is 512 sectors. When it is not set, the default is 0.

[/S] Sets the power-saving mode to OFF. When using DOS with another operating system (for example, when using it with OS/2 in dual boot), set the power-saving mode to OFF using this parameter.

```
┌─ Note ──────────────────────────────────────────────┐
│                                                       │
│   For the software parameter in the AUTOEXEC.BAT file, refer  │
│   to the README file in the CD-ROM diskette.          │
│                                                       │
│   If you are using DOS SMARTDRV caches and planning to │
│   use a photo CD or multisession discs, you have to add the │
│   /U parameter to the SMARTDRV line in the AUTOEXEC.BAT │
│   file.  This is because photo CDs or multisession discs are not │
│   compatible with the SMARTDRV caches.                │
│                                                       │
│   To be able to play CD-i movies in Windows Version 3.11, do │
│   not cache the CD-ROM drive by the SMARTDRV Version 5.0 │
│   or 5.1, which is supplied with PC DOS Version 7.0.  │
│                                                       │
└───────────────────────────────────────────────────────┘
```

Installing the ThinkPad Features Program for DOS

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 for DOS into the diskette drive; then type A:UINSTALL and press **Enter**.

   The following screen appears:

   ```
   ┌─────────────────────────────────────────────────────┐
   │                Installation Options                   │
   │  ┌───────────────────────────────────────────────┐  │
   │  │           Installation Source Drive             │  │
   │  │                                                 │  │
   │  │  Type the SOURCE drive letter (A-Z).  When you install a program, the │  │
   │  │  SOURCE drive letter is the location you are installing FROM.  │  │
   │  │                                                 │  │
   │  │  Source Drive ... [ A ]                          │  │
   │  │                                                 │  │
   │  │                                                 │  │
   │  │  Enter  F1=Help  F3=Exit                         │  │
   │  └───────────────────────────────────────────────┘  │
   └─────────────────────────────────────────────────────┘
   ```
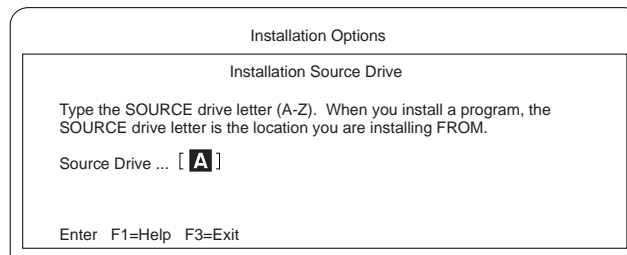
3. Press **Enter**.

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

Installing the PC Card Support Software for DOS

To use the PC Cards in DOS, install the CardSoft** software:

1. Insert the diskette containing the CardSoft software.

2. At the DOS command prompt, type `a:` and press **Enter**.

3. At the A:\> prompt, type `install` and press **Enter**.

   The installation panel appears.

4. Follow the instructions on the screen.

   During installation, use the **Arrow** keys (↓ or ↑) to highlight your selection; then press **Enter**.

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

Installing the Audio Support Software for DOS

To install the audio device driver:

1. Start DOS.

2. Insert the Audio Support diskette for Windows 3.1 into the diskette drive.

3. Type `A:` and press **Enter**.

4. Type `Install` and press **Enter**.

Installing Software for Windows Version 3.11

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

> **Important**
>
> Before reinstalling the operating system and device drivers, you need to create all installation diskettes using the Diskette Factory program (a diskette backup program that is preloaded on your computer).

Install DOS → Page 119.

– 385CD Install the CD-ROM device driver for DOS → Page 120.

– Install the ThinkPad Features program for DOS → Page 121.

Install Windows Version 3.11 (with Advanced Power Management) → This page.

Install the ThinkPad Features program for Windows → Page 126.

Install the PC Card support software → Page 126.

Install the audio support software → Page 127.

Install the Infrared device driver → Page 127.

Install the ThinkPad display driver → Page 128.

Installing Microsoft Windows Version 3.11

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

DOS Version 7.0 (see your DOS manuals)

385CD CD-ROM Device Driver for DOS (see page 120)
ThinkPad Features program for DOS (see page 121)

Installing Windows Version 3.11 Software

Important

During installation, 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 Windows Version 3.11 with the default VGA display driver that came with Windows. After you complete the installation of Windows, install the ThinkPad display driver.

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

Do the following to install Windows Version 3.11 with Advanced Power Management (APM):

1. Install Windows Version 3.11 *with* the APM option:

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

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 d.

2. Make sure the **Display** choice is set to **VGA**. (Do not change this choice.)

Note:

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.

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

     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. 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).
     385CD MSCDEX.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:\WINDOWS\SMARTDRV.EXE
           ↓
C:\DOS\SMARTDRV.EXE
```

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.

Installing the ThinkPad Features Program for Windows Version 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 121); then do the following to install the ThinkPad Features program for Windows Version 3.11:

1. Start Windows.

2. Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.

3. Insert the Utility Diskette for Windows into the diskette drive; then type `A:\INSTALLW` and press **Enter**.

4. Follow the instructions on the screen.

   Default choices are already highlighted at the Installation Options screen.

Installing the PC Card Support Software for Windows Version 3.11

To use PC Cards in Windows Version 3.11, install the CardWizard** software:

1. Insert the diskette containing the CardWizard software into the diskette drive.

2. Start Windows.

Note:
The files on the diskette are in a compressed format. The installation program decompresses the files that are copied to the destination drive.

3. From Windows Program Manager, select **File** from the pull-down menu and click on **Run**.

4. Type `a:\setup` in the Run dialog box that appears on the screen.

5. Click on **OK**.

6. Follow the instructions on the screen.

Installing the Audio Support Software for Windows Version 3.11

To install the audio support software:

1. Start Windows.

2. Select **File...** from the Program Manager window; then select **Run...** from the pull-down menu.

3. Insert the Audio Features Diskette for Windows 3.11 into the diskette drive of your computer; then type A:\SETUP and press **Enter**.

4. Follow the instructions on the screen to complete the installation.

The MIDI serial port connector is available when the computer is attached to the ThinkPad 380/385 port replicator.
The MIDI port capability is disabled as a default, so you need to enable the function in the ThinkPad Features program.
You need to install **MPU401 Support Software** from the Windows 3.1 installation disk. Select and install the **Roland MPU401** device driver in the control panel.

Installing the Infrared Device Driver for Windows Version 3.11

The infrared device driver for Windows 3.11 is included in the application **TranXit for Windows**.

There are two types of infrared device drivers for Windows 3.11:

Infrared device driver to support simple file transfer with the application **TranXit for Windows**.

Infrared device driver to support networking with networking software such as IBM Internet Connection for Windows, Windows for Workgroups 3.11, or Netware DOS client.

The two drivers cannot work together, so you must install only the one that you use.

The former is included in **TranXit for Windows**, and is installed when you install the application. You need not install it separately.

The latter is included in the Infrared Features Diskette II, and is installed as an NDIS2-compliant network adapter driver or as an ODI-compliant network adapter driver when you install the respective networking software. Refer to the respective networking software publication for installation procedures. The README file on the Infrared Features Diskette II also contains additional information.

Installing the ThinkPad Display Device Driver for Windows Version 3.11

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

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.

Do the following to install the ThinkPad display device driver for Windows Version 3.11 so that you can get a correct display setting and better performance:

1. Start DOS; then go to the WINDOWS subdirectory.

2. Type SETUP to start the Windows setup program.

3. Using the Up Arrow (↑), highlight **Display** and press **Enter**.

4. Select **Other (Requires disk...)** from the list.

5. Insert the Video Features Diskette for Windows into the diskette drive; then type A: and press **Enter**.

6. 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 3.

```
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:       MagicGraph128ZV 8  x6   64K small fonts
      Mouse:         Microsoft, or IBM PS/2
```

7. Press **Enter** to continue the installation.

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

Installing Software for Windows NT Version 3.51 or 4.0

WIN
NT
This section describes the installation procedures for Windows NT Version 3.51 or 4.0 (hereafter called *Windows NT*) and its device drivers for your computer.

Before you install Windows NT in your computer, you may need to get some updated software from IBM as follows:

How to Get the Updated Software

IBM PC Company is providing the updated software through several channels so that you can set up Windows NT on your computer with the information described here:

   WWW server on the Internet:

      http://www.pc.ibm.com/support/tps/winnt.html

   FTP site:

      ftp://ftp.pc.ibm.com/pub/pccbbs/mobiles

   CompuServe** ThinkPad Forum:

      Join the CompuServe ThinkPad Forum (by entering at the command prompt GO THINKPAD) and download the necessary software from the library.

   IBM PC Company BBS:

      Phone: 1-919-517-0001

If you cannot get the updated software from any of the preceding channel, contact your IBM representative or the IBM HelpCenter (1-800-772-2227 in the U.S.) for more information.

Installing Windows NT Software

Install the following diskettes to use Windows NT on your ThinkPad computer:

Install Microsoft Windows NT

➡ See the manuals supplied with Windows NT.

Install the Windows NT ThinkPad Features Program ➡ Page 131.

Install the PC Card support software ➡ Page 131.

The Windows NT Audio support software ➡ Page 131.

Install the Video Features Diskette for Windows NT V3.51 or V4.0 ➡ Page 133.

Install the Windows NT PCMCIA Token Ring Device Driver for IBM PCMCIA Token Ring User, if using Windows NT V3.51 ➡ Page 135.

Installing the ThinkPad Features Program for Windows NT

Note:
If you have already installed an old version of the ThinkPad Features program and are running the Fuel-Gauge program, close the Fuel-Gauge program before the installation.

To install the ThinkPad Features program:

1. Start Windows NT, and insert the ThinkPad Features Program Diskette for Windows NT into the diskette drive; then open **Windows NT File Manager**. Select **Drive A** on the File Manager menu.

2. Double-click on **INSTALLN.EXE**. Follow the instructions on the screen.

Installing the PC Card Support Software for Window NT

Important

If your system is connected to a network, log off before starting installation.

---

1. You <u>must</u> be logged on to Windows NT as Administrator.

2. Remove any PC cards that are in the slot.

3. Insert the *CardWizard for Windows NT* diskette in the diskette drive.

4. Be sure to read the README.TXT file before you start installation. Apply any relevant information from this file.

5. Select **Run** from the Windows NT Start button.
   Enter `a:\setup` and click on **OK**.

6. Follow the instructions on the screen.

Installing the Audio Support Software for Windows NT 3.51

Check the **current I/O resources for audio**, such as the IRQ, DMA, and I/O address using ThinkPad Features before installing the audio support software.

With the audio support software, you can play back or record the WAV/MIDI audio function in Windows NT.

Installing Windows NT Software

To install the audio support software, do the following:

1. Start Windows NT 3.51.

2. Insert the Audio Support Diskette to Windows NT into the diskette drive of the computer.

3. Go to **Main**.

4. Click on **Control Panel** and then **Drivers**.

5. At the Install Driver menu, click on **Add...** and select **Unlisted or Updated Driver**.

6. Specify the drive and path name as A: and select **OK**.

7. Select **CrystalWare Audio driver** and select **OK**.

   A warning message appears on the screen and prompting you to restart Windows NT.

8. Click on the **Do not Restart Now** button.

9. Click on **CrystalWare Audio driver**. Then click on **Setup** button in the **Drivers** window.

10. Set the current **I/O Resources** setting for audio in your computer.

11. When the installation program prompts you, restart Windows NT to make the change effective.

Installing the Audio Support Software for Windows NT 4.0

1. Double-click on the **Multimedia** in the **Control panel**. The **Multimedia Properties** window appears.

2. Click on the **Driver tab** and then on the **Add** button.

3. Select **Unlisted** or **Updated Drivers**.

4. Insert the Audio Support Diskette for Windows NT into the diskette drive. A dialog box appears and prompting for the path of the drivers to be installed.

5. Enter `A:\`. The audio driver is displayed on the dialog box.

6. Select it and click on **OK**. When installation program prompt you, restart Windows NT to make the change effective.

Installing the Video Features Diskette for Windows NT

To display more than 16 colors, you need to install the Video Features Diskette.

If you are using Windows NT Version 3.51:

1. Start Windows NT, and log on with the user ID authorized as an administrator.

2. Click on **Control Panel** and then **Display**.

3. At the Display Setting menu screen, click on **Change Display Type...**, and at the Display Type menu, click on **Change**.

4. Click on **Other...** at the Select Device menu.

5. Insert the Video Features Diskette for Windows NT into the diskette drive.

6. From the display devices in the selection list, select **NeoMagic MagicGraph 128/Z/ZV** and click on **Install**.

7. Follow the instructions on the screen.

8. Restart Windows NT to make the change effective.

After you restart Windows NT, the display resolution is set to 640x480 with 256 colors as the default. If necessary, change the resolution and refresh rate using ThinkPad Features program.

If you are using Windows NT Version 4.0:

1. Start Windows NT Workstation and log on to the system.

2. Click on **My Computer**.

3. Click on **Control Panel**; then click on **Display**.

4. At the Display Properties menu, click on the **Settings tab**; then click on **Display Type...**.

5. Click on **Change...** at the Display Type menu.

6. Click on **Have Disk...** at the Change Display panel.

7. Insert the Video Features Diskette for Windows NT into the diskette drive; then click on **OK**.

   A selection list appears listing the display device.

8. Select **NeoMagic MagicGraph 128/Z/ZV** from the list; then click on **OK**.

   The message "You are about to install a third-party driver" appears on the screen.

9. Click on **Yes**; then follow the instructions on the screen.

10. Restart Windows NT after the installation is complete.

After you restart Windows NT, the display resolution is set to 640x480 with 256 colors as a default. If necessary, change the resolution and refresh rate to another value using ThinkPad Features program.

Using the Video Features Diskette for the External Monitor

After you have installed the display device driver for Windows NT, do the following to use an external monitor with your computer:

1. Start Windows NT.

2. When the OS Loader V4.00 panel appears, prompting you to select the operating system, change the screen to CRT-only mode by pressing the **Fn+F7** key combination.

3. Continue by logging on Windows NT.

   Windows NT starts on the CRT screen.

Notes:

1. If you have installed the ThinkPad Features program, you can switch the display mode to CRT only, CRT and LCD simultaneous, or LCD only using the Display menu of the ThinkPad Features program.

2. If your CRT displays noise or if the screen image is unstable, you can adjust the refresh rate as follows:

   a) Start the ThinkPad Features program; then open the Display menu.

   b) Specify your CRT type and select the appropriate refresh rate.

   c) Click on **OK**.

3. If you use an external display with 1024x768 resolution and display information on the LCD, a part of the 1024x768 screen is shown on the 800x600 LCD. This is called the *virtual screen*. Under the virtual screen mode, you can use the pointer to scroll up or down or left to right to see information outside the displayed area.

4. Reboot is required when switching color depth of 16,777,216 colors to (256 or 65,536) colors on windows NT 4.0.

Installing the Device Driver for PC Card

The installation instructions for the PC Card device driver differ depending on the Windows NT version. Follow the instructions according to your Windows NT version.

Installing the PCMCIA Token Ring Device Driver for Windows NT Version 3.51

Windows NT comes with integrated PCMCIA support for some PC Cards. The PCMCIA device driver included in Windows NT does not support the following PC Cards:

IBM PCMCIA 16/4 Token Ring Credit Card adapter,
IBM PCMCIA 16/4 Token Ring Credit Card adapter II, and
IBM PCMCIA Token Ring Auto 16/4 Credit Card adapter.

When you use these token-ring cards, you need to install the IBM
PCMCIA Token Ring Device Driver. Use the Windows NT PCMCIA
Token Ring Device Driver files in NTTRCC.ZIP for your Windows NT.

To install the device driver:

Note

Before you install this driver, you must first install Windows NT
Service Pack #2 or a later release.

---

1. Click on **Main** in the **Program Manager** screen. Then click on
   Control Panel, **Network**, and **Add Adapter**.

   Windows NT prepares a list of the network adapters it supports.

2. Click on the dropdown list icon, and scroll to the bottom of the
   list and click on <**Other**> **Requires disk from manufacturer.**

3. When you are prompted, insert the device driver diskette into the
   diskette drive. Follow the instructions on the screen.

4. When you are finished adding the adapter, click on **OK** and
   follow the instructions on the screen.

Installing the PCMCIA Adapter Card Network Device Driver for Windows NT Version 4.0

Windows NT V4.0 supports integrated network adapter cards for
PCMCIA network adapter, ISA adapter, and PCI network adapter
cards. To install your adapter card's network device driver, do the
following:

1. Click on **My Computer**.

2. Click on **Control Panel**; then click on **Network**.

3. Click on the **Adapters tab** at the Network menu; then click on
   Add.

4. Select your network adapter from the option list.

   The following table shows the adapter driver names for the IBM
   PCMCIA network adapter cards given in the option list:

Adapter Card Type	Adapter Driver Name in the Option List
IBM Token Ring PCMCIA CCA-I	IBM Token Ring (ISA/PCMCIA) Adapter
IBM Token Ring PCMCIA CCA-II	IBM Token Ring (ISA/PCMCIA) Adapter
IBM Auto 16/4 PCMCIA Token Ring	IBM Token Ring (ISA/PCMCIA) Adapter
IBM Ethernet-II PCMCIA Card	IBM Ethernet PCMCIA and Compatible Adapter

5. Click on **OK** to install the files.

   You will be prompted for the drive and path name for the file location.

6. Follow the instructions on the screen.

During the installation of the network device driver, you are prompted to enter the option parameters for the adapter card. The following are the most common recommended parameters:

For IBM Token Ring PCMCIA CCA I, IBM Token Ring PCMCIA CCA-II, IBM Auto 16/4 PCMCIA Token Ring:

I/O address: Primary
Type: PCMCIA
Bus number: 0
IRQ level: 7 or 9
Memory base address: 0xCA000 or a higher value

For IBM Ethernet-II PCMCIA Card:

I/O address: 200, 260, or a higher value
IRQ level: 7 or 9
Memory base address: 0xC8000 or a higher value

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.

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" on page 194 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 2*xx* appears (memory error).	Make sure your memory card is correctly installed. (See page 89.)
A **memory shortage or memory error** occurs.	*When you are using DOS,* 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). *When you are using Windows Version 3.11:* – Try the same actions as described for DOS. – Unload any unnecessary programs from the WIN.INI file (for example, FUELWIN for ac operations.)

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 67.) If using the hibernation mode, make sure you have created the hibernation file. (See page 69.)
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 124.

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 141.

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 166 for IBM Customer Support and Services.)
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.
How can I use DMA channels for both parallel port and infrared port?	When you enable ECP and choose DMA3 (default value) for the parallel port, you may see the panel asking if you want to disable DMA for the infrared port. If you do the following to use DMA channels for both parallel and infrared port: 1. Click on **OK** to disable DMA for the infrared port. 2. Close a parallel port panel. 3. Click on the **Infrared device** button to open the infrared panel. 4. Chose DMA0 or DMA1 for infrared port on the panel. 5. If you see the panel prompting if you want to disable DMA for an audible device, click on **OK**. See Note on page 31.

> **Note**
>
> You must share three DMA channels (0, 1, and 3) with the following four system resources. The default values are also described:
>
> | | |
> |---|---|
> | Audio device (1st DMA) | 1 |
> | Audio device (2nd DMA) | 0 |
> | Infrared port | 3 |
> | Parallel port | Disabled |
>
> When enabling ECP and choosing one DMA channel for a parallel port, you must release the system resource that had been assigned as a DMA channel.

Troubleshooting

Questions	Answers
How can I enable the serial port?	The computer is shipped with the serial port disabled. Enable it as follows: 1. Start **ThinkPad Feature** (see page 29). 2. Click on **Serial port** ( ). 3. Select **Enable**. 4. If a warning message appeared with alarm, click on **OK**. 5. Click on **OK.** 6. Close ThinkPad Features, and ThinkPad windows. 7. Restart 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 appear:
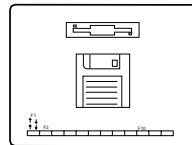
This means no operating system is installed in your computer. Install it now.

Did one of these screens appear?

Yes Turn off the computer and continue with step 2.

No Go to page 147.

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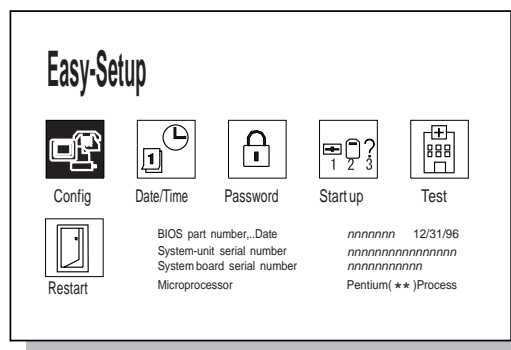
4. Did the Easy-Setup menu appear on the screen?

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**. You can also test the port replicator I/O devices the same way.
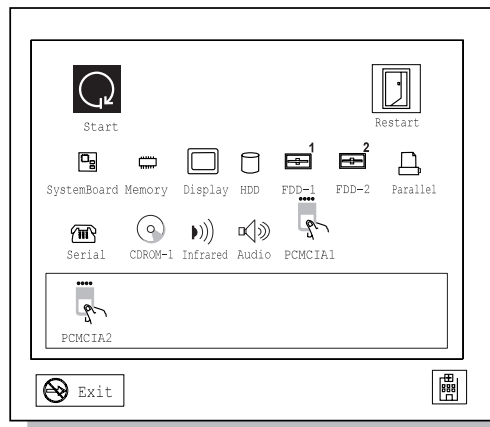
If the computer did not beep, the speaker is not working correctly. Check that the speaker volume control (see page 14 for the location) is in its middle position. If you are not sure about the beep, turn off the computer; then turn it on again and repeat step 3 on page 145. If a problem still exists, have the computer serviced.

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

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 147.

No Return to step 3 on page 145 and start Easy-Setup again. If you still cannot start Easy-Setup, find the problem in the troubleshooting charts starting on page 147.

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.
I99*xxxxx* (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 a 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 69).
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.

Screen Message and Its Meaning	Action

30*x*
 	
(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 97).
	
	    – 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.
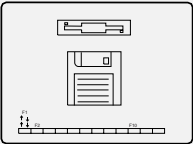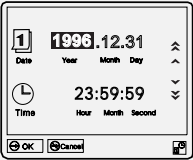
LCD Blank or Power-On Problems

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 155.	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 74). 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 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.
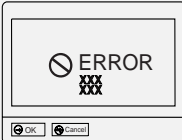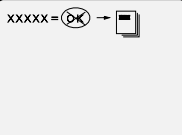
Problem	Action
The computer goes into suspend mode immediately after the POST. (The suspend lamp turns on.)	Verify that: The battery pack is charged. The environmental temperature is within the acceptable range. Refer to "Specifications" on page 205. If the preceding items are correct, have the computer 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 74). 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 154.
	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 205.)	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 37).

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 4 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 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 22) or the ThinkPad Features program (see page 28). 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.
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 42). To change or set up the external monitor, see "Attaching an External Monitor" on page 42. 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 69). 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 71, the computer cannot enter hibernation mode. To enter hibernation mode, stop the communication program, and then remove the PC Card.

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 49). 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.

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 you are 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 123. 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 96 to disable the TrackPoint III. 2. *For DOS,* see page 32 or page 200.
All or some keys on the external numeric keypad do not work.	Verify that the external numeric keypad is correctly connected to the computer.

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**.

ThinkPad 380/385 Port Replicator Problems

Problem	Action
The computer hangs when you power on or resume operation.	Verify that: AC Adapter is connected to the port replicator. The power-on indicator of the port replicator is on. The computer is securely attached to the port replicator. If there is still a problem, have the ThinkPad 380/385 port replicator serviced.
The PC Card slots 3 and 4 are unusable.	Verify that: AC Adapter is connected to the port replicator. The power-on indicator of the port replicator is on. The computer is securely attached to the port replicator. If there is still a problem, have the ThinkPad 380/385 port replicator serviced.

Option Problems

Problem	Action
An IBM option that was just installed does not work.	Verify that: The option is designed an IBM ThinkPad 385 or 385D computer. You installed option 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 support software does not recognize your PC Card.	Verify that: If the PC Card is not a modem, ATA, flash, or SRAM card, you must have the proper client device driver for the card. In Windows 95, the PC Card must have an INF file associated with it. Your PC Card supports PCMCIA Release 2.0, 2.01, and 2.10. Refer to the manual that came with your PC Card. If your PC Card does not support PCMCIA Release 2.0, 2.01, or 2.10, 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 support software, but the "Not Ready" or "Not Configured" message is shown.	Verify that: The PC Card enabler is installed. Refer to the manuals supplied with your PC Card. If the PC Card is not a modem, ATA, flash, or SRAM card, you must have the proper client device driver for the card. In Windows 95, the PC Card must have an INF file associated with it. The resources for the PC Card are correctly reserved. Refer to "Checking the Allocated Resources for the PC Card" on page 191.
The PC Card is shown as "Ready" or "Configured," but it does not work correctly.	Verify that: The resources reserved for the PC Card do not conflict with those for other system devices. 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, check the card information screen or click on the **Status** button in the PC Card Director program.

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 16.) 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:

_____

_____

_____

_____

_____

_____

Use This Sheet for Your Problem Reporting

Computer information:

    Machine type:_____

    Serial number:_____

    Date of purchase:___/___/___

Kind of problem:

    Continuous problem   Intermittent problem

Error code:

    _____

Operating systems and versions if available:

        DOS Version_____   OS/2 Version_____
        Windows 3.1   Windows 95
        Windows NT Version_____

Application programs used at the time of the problem:

    _____

    _____

Problem symptom:

    Describe the problem more specifically:

    _____

    _____

    _____

Reproducibility:

    Yes   No

    Describe how to reproduce it:

    _____

    _____

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 here:

DIMM   Battery pack
 (8MB, 16MB, or 32MB)
_____MB hard disk drive   PC Cards

External diskette drive   <u>   </u>

                  <u>   </u>

Recording Identification Numbers

The following information is needed when requesting repair services:

IBM Product Name	ThinkPad 385 or 385D
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**.
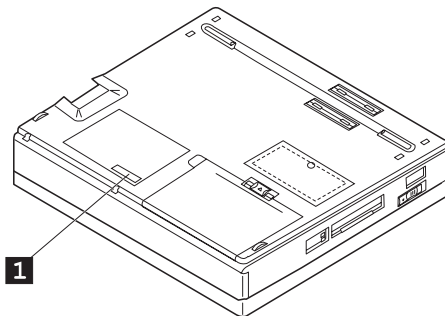
How to receive Customer Support and Service

Purchasing an IBM PC hardware product entitles you to help and support during the warranty period. If you need additional support and services, a wide variety of extended solutions that address almost any need are available for purchase.

Getting Help by Telephone:

During the warranty period, you can get help and information by telephone, at no additional charge, through the IBM 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 30-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.

These services are available 24 hours a day, 7 days a week. Your technical-support representative can also fax or mail additional technical or product information to you, such as:

Sales information.
Product brochures.
Locations of IBM resellers.

Services available through IBM.

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 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 is 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 can 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 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.

Online Housecall:

Online Housecall is a remote communication tool, that allows an IBM 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. IBM may ask you some fees for this service.

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.

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 Services

During and after the warranty period, you can purchase additional 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.
Using selected application software and games.
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 or multiple incidents. For more information about purchasing Enhanced PC Support, see "Ordering Support Line Services" on page 171.

Network and Server Support Line:

Network and Server Support includes all the features of the Enhanced PC Support Line and 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:

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."

Ordering Support Line Services:
Enhanced PC Support Line and the Network and Server 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.

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

– Call 1-800-465-3299.

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:

Customer Support and Services

Overnight service option.

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

You can also extend your warranty. 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.

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.

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.

Customer Support and Services

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 a PC 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:

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 audio device in the computer.

You need to change the IRQ for the audio device 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 **audio** icon.

3. Click on the **Advanced** button.
   Select the appropriate **IRQ** not to conflict to other devices in the **Advanced Setup dialog** and click on **OK**.

List of system resources:

You can see from the list of default settings on page 178 which system resources are already used by the devices in the computer.

Avoiding System Resource 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.

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 icon) in the list. If the **HDD** 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** icon.

4. Click on **OK** or press **Enter**; then restart the computer.

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**, or disabled	02F8–02FF, **03F8–03FF**, 02E8–02EF, or 03E8–03EF	None	0, 1, **3**, or disabled
Diskette controller	6	03F0–03F7	None	2
Hard disk drive and CD-ROM drive	14	01F0–01F7 and 03F6–03F7	None	None
PCI	3, 4, 5, 7, 9, 10, 11, or disabled	0CF8–0CFF	None	None
Video controller	None	03BA, 03B4–03B5, 03C0–03CF, 03D4–03D5, 03D8–03D9, and 03DA	A0000–BFFFF, C0000–C7FFF, and 08000000–08400000	None

System Resources	IRQ	I/O Address (Hex)	Memory Address (Hex)	DMA Channel
Audio device	**5**, 7, 9, 10, 11, 15, or disabled	SoundBlaster Pro **0220–22F**, 0230–23F, 240–24F or 250–25F WSS **534–537**, 608–60B, E84–E87 or F44–F47h CONTROL PORT **538–53Fh**, D38–D3F, E88–E8F or FF0–FF7h	None	**1** or 0
MIDI PORT MPU 401	5, 7, 9, or **disabled**	300–301h, 310–311h, 320–321h, 330h–331h, or **disabled**	None	None
Joystick port	None	201h	None	None
Audio device (FM synthesizer)	None	**388–38B**	None	None
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. When choosing one of DMA channels, you can use only two from audio device (1st DMA), audio device (2nd DMA), and infrared port DMA.

Appendix B. Advanced Information for PC Cards for OS/2

This appendix describes advanced information related to using PC Cards.

Auto Configurator for PC Card Director

The ThinkPad 385 or 385D 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.

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 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:

    BASEDEV=AUTODRV2.SYS

Starting the Auto Configurator Utility

This section describes the Auto Configurator Utility for OS/2.

To start Auto Configurator Utility for OS/2, select the **Auto Configurator Utility** icon from the PC Card Director window.

Advanced Information for PC Card for OS/2

Registering a PC Card in Auto Configurator

1. Select a card from the Available Cards list in the Auto Configurator Utility main panel.
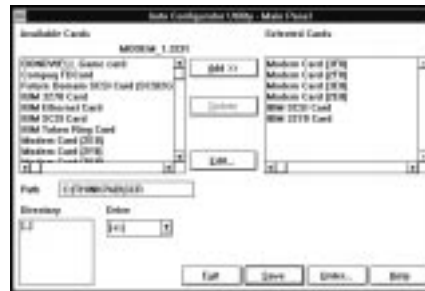
Select the card for which you want to assign the resources first. For example, when you want to assign COM3 to a modem card, and not COM2, select the setting for COM3 first.

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.

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:

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 Card for OS/2

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.
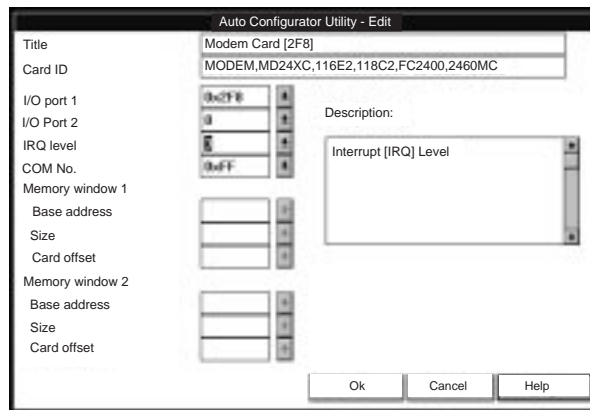
3. You can change the following registered information for the PC Card:

   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

The following is a sample of the CONFIG.SYS file for OS/2:

```
        :
BASEDEV=PCMCIA.SYS           (Card Services)
BASEDEV=IBM2SS 1.SYS              (Socket Services)
BASEDEV=IBM2SS14.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)
```

Adding to the CONFIG.SYS File

Rule 1   Card Services and Socket Services must be listed before any other PCMCIA drivers.

Rule 2   The PCMCIA Power Management Support driver must be listed after all drivers, at the end of the CONFIG.SYS file.

Rule 3   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)
```

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.

Strage 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

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.

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 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 *is not* 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
                    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.

PCMCIA Storage Card Device Manager

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 device driver is used to read and write to a Flash card. It is used by 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)
```

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.

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.

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" on page 181.

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 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, for OS/2, use the ThinkPad Setup Utility in the ThinkPad Features program to disable the devices using COM1 or COM2; then restart the system.

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 or later, you can check the assigned system resources using RMVIEW.EXE.

If there is a conflict:

   If you are using OS/2 Warp Version 3 or later, 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" on page 181.

   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

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 or Property**.

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 OF and PS2 SErial OFf gives the same results.

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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 whether or not to enter suspend mode when the LCD is closed:

Cover	**E**nable	**D**isable	—

Set POwer, LCd, DISK, SPeed, and STandby to their original values:

DEFAULT	—	—

Note:
This command is effective on the current power mode set by the PM command.

Set the hard disk drive power-saving timer for the specified number of minutes (*xx*):

DISK	*xx*	—

Note:
This command is effective on the current power mode set by the PM commands.

Set the features for the ESS AudioDrive chip:

AUdio	**E**nable	**D**isable **ADD**ress **DMA** **IRQ**	— **220**	**240** **0**	**1** **5**	**7**	**10**	**11**

Set the features for the infrared port (IR):

IR	**E**nable	**D**isable **ADD**ress	— **1**	**2**	**3**	**4**

Note:
Use this command before using other hibernation commands.

Create the hibernation file:

HFILE	**C** – **Z**	**DEL**ete	—

Enter hibernation mode when the power switch is pressed:

HSWITCH	**E**nable	**D**isable	

Set the timer to enter hibernation mode after the specified number of
minutes (*xx*):

HTimer	*xx*	[**AC**	**DC**]

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	**S**uspend	**H**ibernation	—

Set the LCD off when there is no computer operation after the specified
number of minutes (*xx*):

LCd	*xx*	—

Set the resume timer:

ON at	[yyyy/MM/DD] HH:MM:SS | **C**lear	—

Set the power mode:

PMode	**H**igh	**A**uto	**C**ustom	[**AC**	**DC**]

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**]

Resume normal operation when detecting an incoming call:

RI	**E**nable	**D**isable	—

Using PS2 Commands

Enter 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]

Set the power management mode to enter by the automatic power-saving timer:

TImer	Suspend | Hibernation	—

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	60 | 75 | 85
	800×600	60 | 75 | 85
	1024×768	60 | 70 | 75

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	1 | 2 | 3
	MOde	Uni | Bi | EPP | ECP
	DMA	0 | 1 | 3 | Disable
	IRQ	Enable | 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	—

Set the features for the infrared port (IR):

IR	Enable | Disable	—
	ADDress	1 | 2 | 3 | 4 |
	DMA	0 | 1 | 3 | Disable

Set the features for the audio:

AUdio	Enable | Disable	—
	ADDress	534 | 608 | E84 | F44
	IRQ	5 | 7 | 9 | 10 | 11 | 15
	SBaddress	220 | 230 | 240 | 250 |
	DMA	0 | 1 | 3

Set the features for the MIDI port:

MIDIport	**E**nable | **D**isable	—
	ADDress	**300** | **310** | **320** | **330** |
	IRQ	**5** | **7** | **9** | **10** | **11** | **15**

Set the features for audio control port:

AUDIOCTRL	**E**nable | **D**isable	—
	ADDress	**538** | **D38** | **E88** | **FF0**

Set the system IRQ for PCI device:

PCIIRQ	**D**isable or (**3** | **4** | **5** | **7** | **9** | **10** | **11** | **15** |)	—

Set the I/O address of PCMCIA controller on Port Replicator:

PCCARD	**EXT**	**3E2** | **3E4**

Other Commands

Display the help menu:

? | **H**elp	—	—

Set the A: drive to the external diskette drive:

FDD	**E**xternal	—

Note:
Create the hibernation file using the `HFILE` command before using this command.

Enter hibernation mode:

HIBernation	—	—

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: 16MB

Storage devices

2.5-inch hard disk drive
3.5-inch diskette drive
`385CD` CD-ROM drive

Display

The color LCD display uses TFT technology or DSTN technology and supports:

DSTN color LCD

- – Width of 12.1 inches (when measured diagonally)
- – Up to 65,536 colors
- – Up to 800-by-600 resolution
- – Up to 1024-by-768 resolution on the external monitor
- – Contrast control

TFT color LCD

- – Width of 12.1 inches (when measured diagonally)
- – Up to 65,536 colors
- – Up to 800-by-600 resolution
- – 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/TIA-232-E)

Parallel connector (Centronics)

External input-device connector

External-monitor 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

Features and Specifications

Specifications

Size

> Width: 300 mm (11.8 in.)
> Depth: 234 mm (9.2 in.)
> Height: 59–62 mm (2.3–2.4 in.)

Weight

Minimum configuration with the battery pack:
> With a DSTN display: 3.0 kg (6.6 lb)
> `385CD` With a DSTN display: 3.2 kg (7.1 lb)
> `385CD` With a TFT display: 3.1 kg (6.9 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 119.4 British thermal units (BTUs) per hour (35.0 watts)

Electrical (AC Adapter)

Sine-wave input, at 50 to 60 Hz, is required
The input rating of the AC Adapter: 100–240 V ac

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Features and Specifications

Lithium-ion battery pack

> Nominal voltage: 10.8 V dc
> Capacity: 2.6 AH

NiMH battery pack

> Nominal voltage: 8.4 V dc
> Capacity: 3.5 AH

PC Card slots power

> Computer only: total 5 w (two slots)
> Computer and ThinkPad 380/385 port replicator: total 7 w (four slots)

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, 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 Zealand, Papua New Guinea, 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
76H3514	Argentina, Australia, Papua New Guinea, New Zealand, Paraguay, Uruguay
76H3516	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
76H3518	Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia
76H3520	Denmark
76H3522	Bangladesh, Pakistan, South Africa, Sri Lanka
76H3524	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
76H3526	Japan
76H3528	Switzerland, Liechtenstein
76H3530	Chile, Italy, Ethiopia, Libia
76H3532	Israel
76H3535	Korea

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.
└──┘

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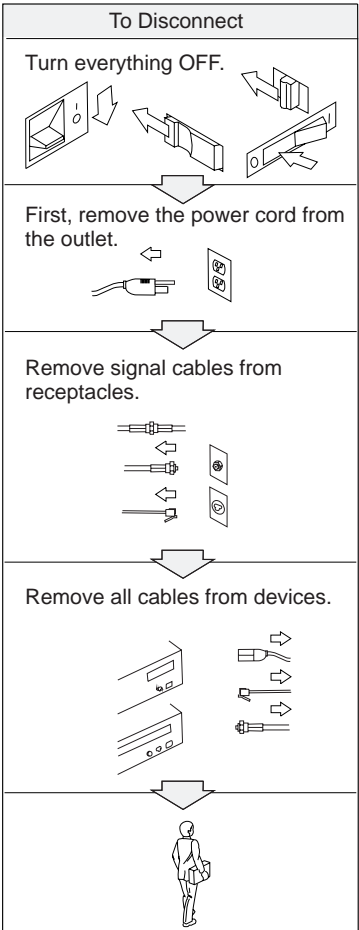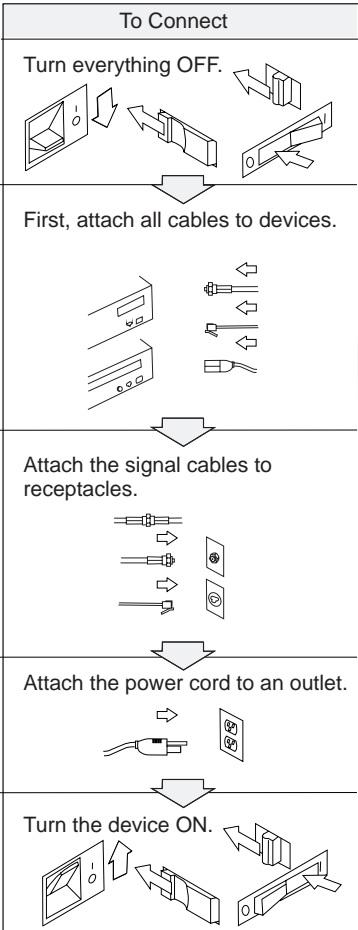
Diskette Standards

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 385 or 385D and 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
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Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
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This product satisfies the Class B limits of EN 55022.

Product Warranties and Notices

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.

APM. Advanced Power Management.

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.

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.

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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