

Note

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First Edition (September 1996)

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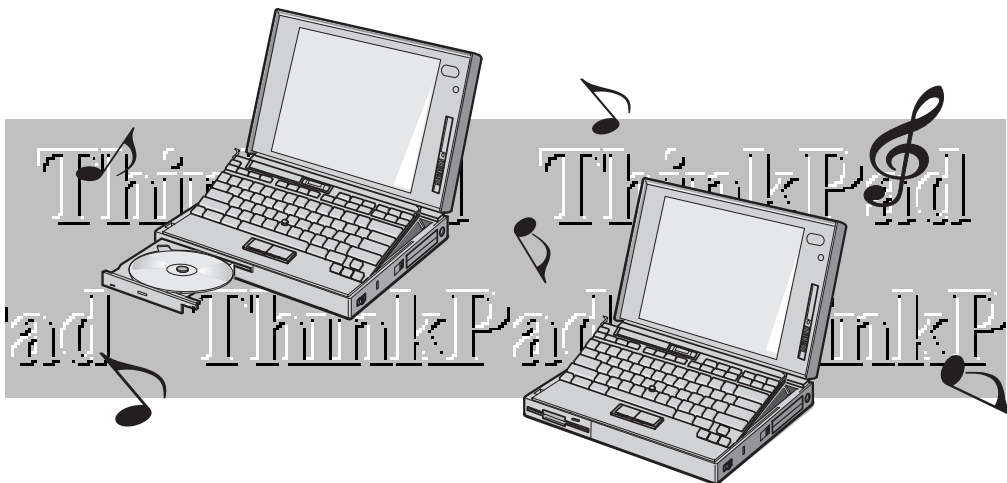
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Thank You for Selecting an IBM ThinkPad 760E, 760ED, or 760EL Computer

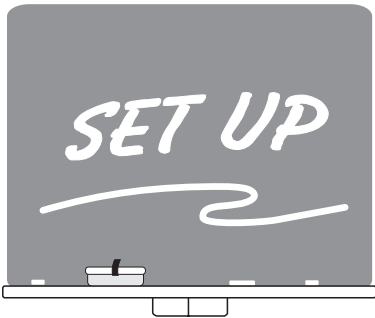
The IBM ThinkPad 760E, 760ED, or 760EL computer is one of the most advanced notebook computers available today.

We are happy to offer this computer to help meet all your multimedia and mobile computing needs.



What would You Like to Do?

What would you like to do? 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!



Setting up the computer for the first time → **Page 7.**

Installing options → **Chapter 6 .**

Installing PC Cards → **Page 122.**

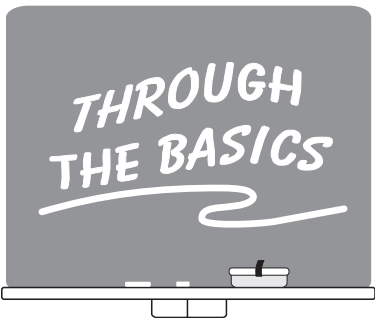
Using PC Card Director → **Page 44.**

Configuring the computer → **Page 35.**

Creating the backup diskettes using the Diskette Factory
→ **Page 12.**

Reinstalling the operating system → **Chapter 7.**

Changing the system resource setting → **Appendix A.**

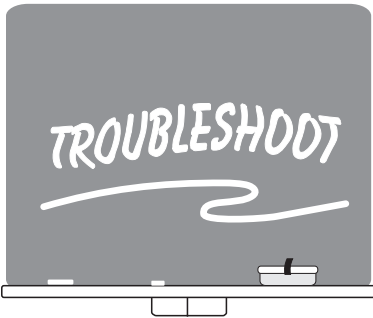


Sending a fax → **Page 13.**

Attaching a printer → **Page 14.**

Communicating with infrared → **Page 15.**

Capturing a motion video → **Page 16.**



Frequently asked question → Page 229.

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IBM help systems → Page 259.



Preserving battery power → Page 90.

Using passwords → Page 101.

About This Book

This book contains information that will help you operate the IBM ThinkPad 760E, 760ED, or 760EL computer (hereafter called the *760E, 760ED, or 760EL, or computer*).

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 various features.

Chapter 4, “Using Battery Power,” describes how to operate your computer with the battery pack, and get longer battery life.

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

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, “System Resources,” lists the system resources and provides some steps you can take to avoid problems when you add or remove options.

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

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

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

Viewing the Online Book

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

You can view this *User's Guide* online to retrieve information about the computer.

To start the online book preloaded in the hard disk of your computer, click on the **Online Book** icon in your operating system.

Information Notices

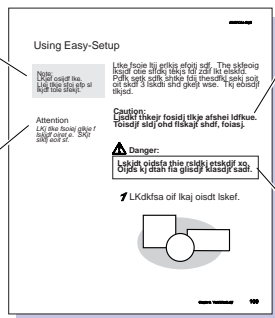
This book contains notices that relate to specific information or text.

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.

Computer Models and Treatment of Icons


We offer several models of the ThinkPad 760 computer. Each model has different features. In this book, information unique to each feature is described with the following icons:


Mwave DSP feature () : Built-in 28.8Kbps modem, telephony, and Sound Blaster** Pro functions

ESS AudioDrive feature () : Support for Sound Blaster Pro audio

Enhanced video with MPEG feature () : Support for Windows Direct Draw and MPEG-II player, TV in/out, and a game port

Standard video: our simplest video solution

Built-in CD-ROM drive in the UltraBay ()

Built-in diskette drive in the UltraBay ()

TFT LCD display

DSTN LCD display

In addition to the icons just described, this book contains the following icons for procedures or information unique to the operating system installed in your computer:



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



Information for IBM DOS users.



Information for Microsoft Windows Version 3.11 users.



Information for Microsoft Windows 95 users.



Information for Microsoft Windows NT Workstation Version 3.51 users.

Ergonomics Information

This is important information to read before using your ThinkPad computer.

Working while “on the go” 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.

What if I am traveling?

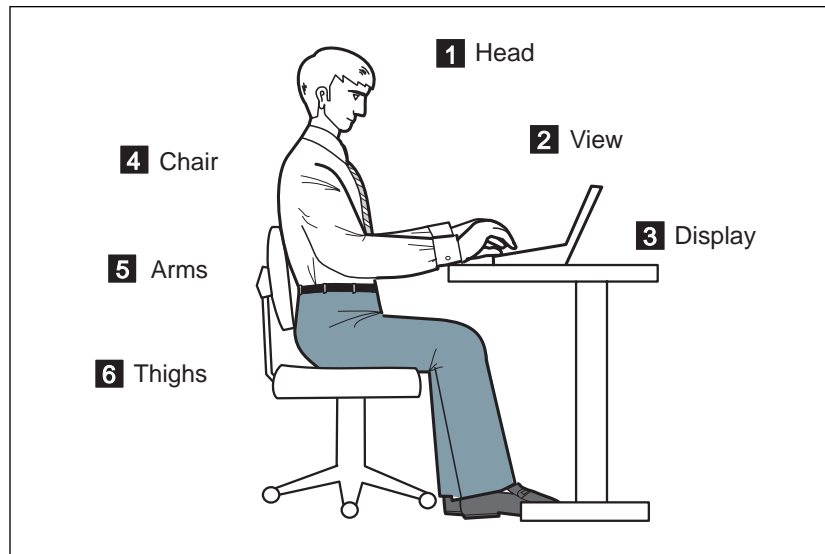
It may not be possible to observe the best ergonomic practices when you are using the ThinkPad computer while on the move or in a “casual” setting, such as the seashore or on a mountaintop. Sometimes, your lap may be the only “desk” around. Regardless of the setting, try to observe as many of the tips 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.

Note:

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

**1 Head**

Keep your head in a comfortable and vertical position.

2 View

Maintain a comfortable viewing distance of 20–30 inches.

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 Chair

Use a chair that gives you good back support.

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 Thighs

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

Safety Notice



DANGER

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

CAUTION:

The lithium battery (IBM P/N 29H8924, UL-recognized component—File No. MH12210) on the system board of the computer can be replaced only by your dealer or an IBM service representative. It contains lithium and can explode if not properly used, handled, or disposed of. Do not: (1) throw or immerse into water, (2) heat to more than 100°C (212°F), or (3) repair or disassemble. Dispose of it as required by local ordinances or regulations.

The nickel metal hydride rechargeable battery on the system board of the computer, can be replaced only by your dealer or an IBM service representative. Do not disassemble, incinerate, or short-circuit it. The battery can cause burns or release toxic chemicals. Do not put it in trash that is disposed of in landfills. Dispose of it as required by local ordinances and regulations.

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



The CD-ROM drive in the IBM ThinkPad 760ED 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.

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Chapter 1. Getting Started

Welcome to the world of ThinkPad computers!

The ThinkPad computer is designed to meet your multimedia and mobile computing needs. You can use your computer in the office or at home as a desktop computer by attaching an external keyboard, display, or other external devices. And, of course, your computer can be easily carried wherever you need a computer “on the go.”

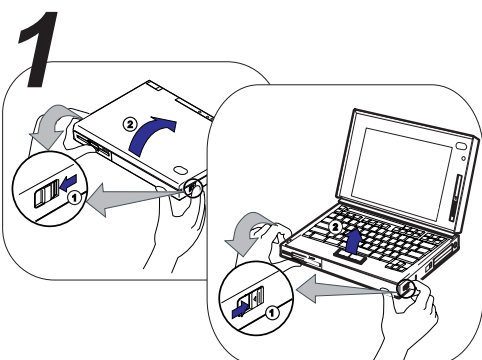

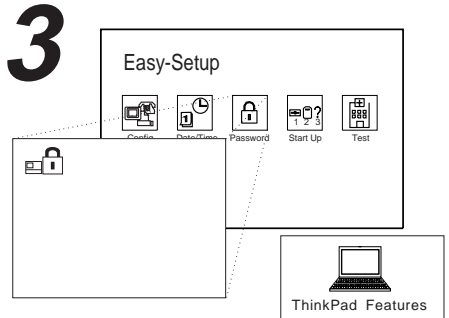
This chapter describes step-by-step instructions to help you set up your new computer.

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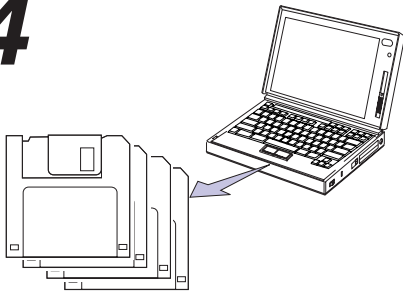
Getting Started

Overall Setup Procedures

When using the computer for the first time:

	<p>Set Up the Computer</p> <p>First, check whether you have all the necessary items with your computer.</p> <p>See page 4.</p> <p>Then, install the battery pack in the computer. Now you are ready to turn on the computer.</p> <p>See page 7.</p>
	<p>Install Options</p> <p>If you have any options, such as memory cards, install the options.</p> <p>See page 121.</p>
	<p>Customize Your Computer</p> <p>You can use <i>Easy-Setup</i>, a built-in system function, to set passwords to prevent your computer from unauthorized use, or use the <i>ThinkPad Features</i> program to customize the performance of your computer.</p> <p>For Easy-Setup, see page 37.</p> <p>For the ThinkPad Features program, see page 35.</p>

4



Make a Backup of Your System

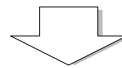
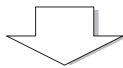
Your computer comes with the necessary software already installed for you to use the computer right out of the box. However, on some computers, the *Diskette Factory* program is installed so you can create backup diskettes. On other computers, you will find utility and device driver diskettes packed in the box with the computer.

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

Do you need more hard disk space?

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

Click on the **Diskette Factory** icon; then follow the instructions on the screen.



You are ready to use your computer.

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

If you are reinstalling the operating system...

If you are reinstalling the operating system to customize your computer, follow the instructions in Chapter 7.

➔ If you have any problems after you have customized your computer, refer to “Common Problems and Frequently Asked Questions” on page 229 to solve your problem.

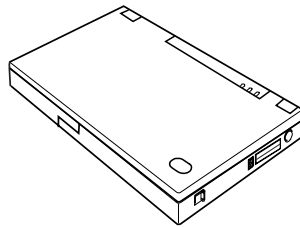
Checking Your Items

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

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

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

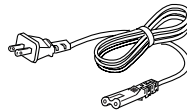
 **Computer**



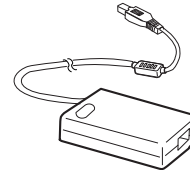
 **Battery Pack**



 **Power Cord**

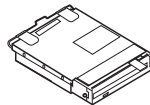


 **AC Adapter**



 **Internal Diskette Drive**

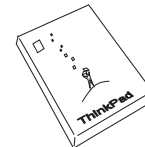
Internal Diskette Drive



The internal diskette drive is installed in the UltraBay when the CD-ROM drive is removed.

 **ThinkPad Media Library**

ThinkPad Media Library





This is a sample CD-ROM that includes audio and video clips (available in some countries).

Getting Started

Miscellaneous Items Envelope

This envelope contains:

- Telephone cable (available in some countries)
- Spare caps for TrackPoint III
- Spacer
- PC (PCMCIA**) Card lock
-  MIDI/joystick cable
-  Video in/out cable
- Other items

Utility Diskettes

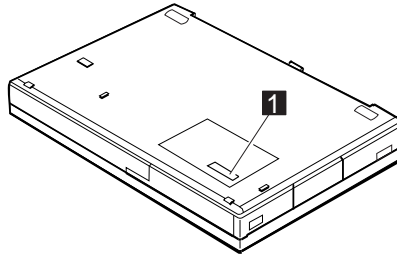
Driver Diskettes

These diskettes contain various system programs and device drivers.

Note: In some countries, you should create backup diskettes using the *Diskette Factory* program when the computer power is turned on for the first time. (See page 12.)

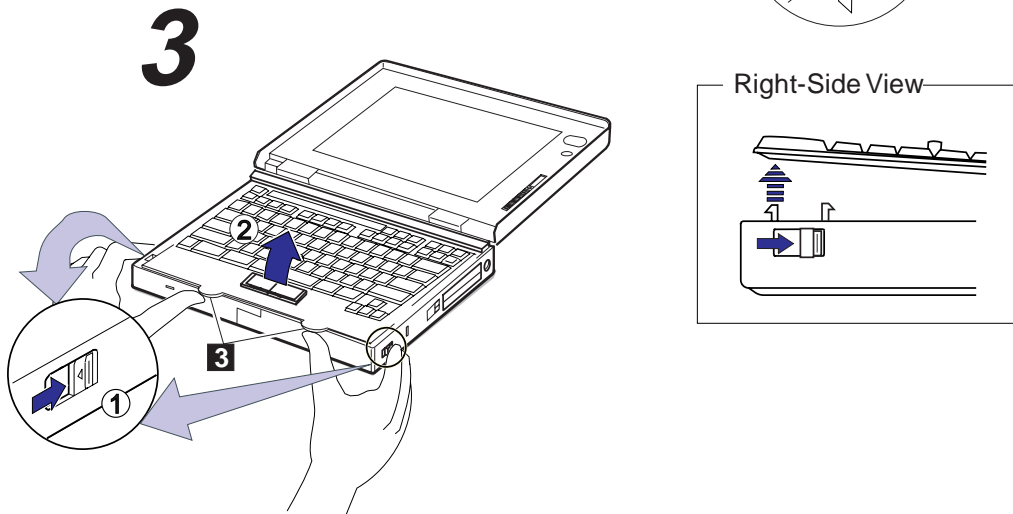
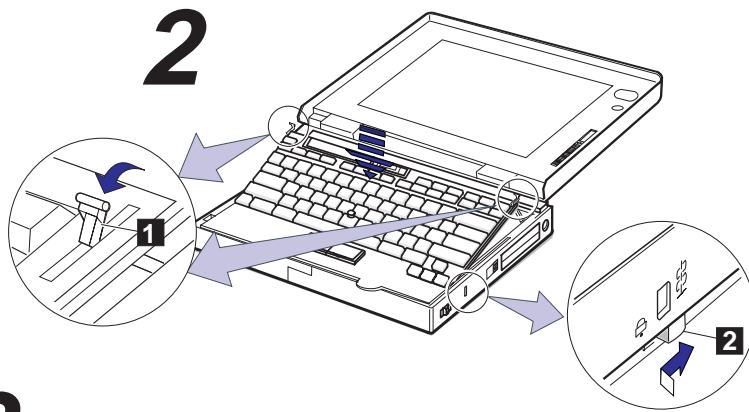
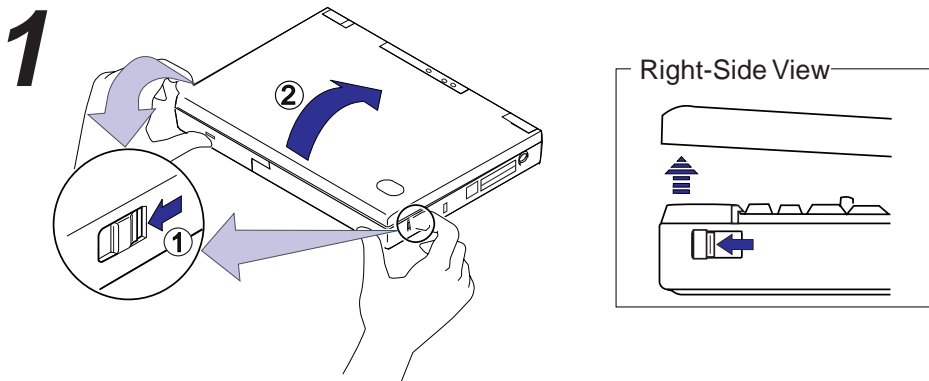
- 2** Turn the computer upside down and record the identification numbers **1** on page 258 of this manual.

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



After recording the numbers, place the computer as it was (so that the side marked *IBM ThinkPad* faces up).

Getting Started




Setting Up Your Computer

You are now ready to configure and start your computer. First, install the battery pack.

- 1** Slide and hold the latches on both sides of the computer *toward* you, and push up the liquid crystal display (LCD). Open the LCD all the way.

When the LCD opens, the keyboard is slanted slightly at an easy typing angle.

- 2** Slide the keyboard raisers **1** on both sides of the keyboard toward you, so the keyboard lies flat on the computer.

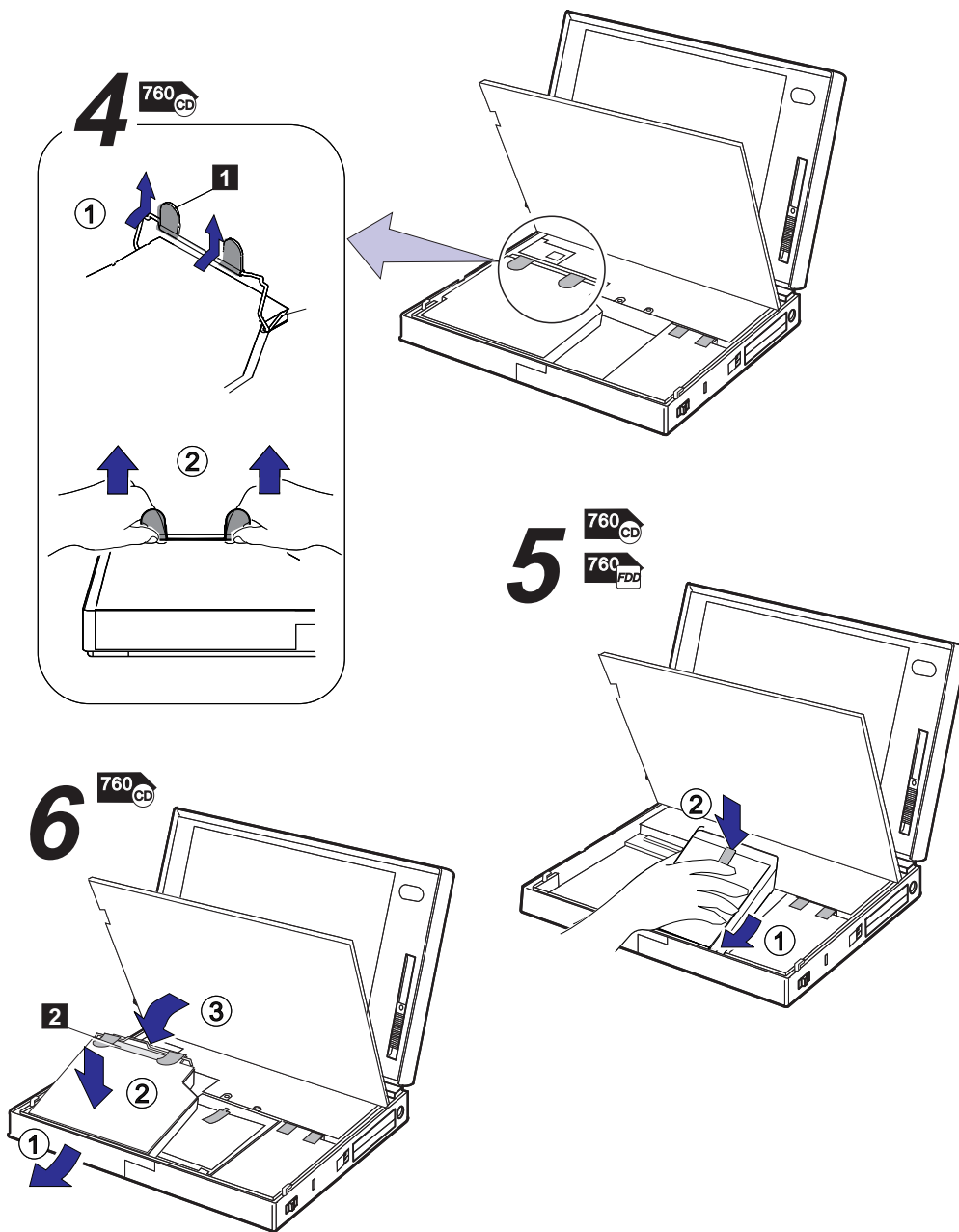
Make sure the security latch **2** is at the right position (unlocked). If it is at the left position , push and slide it to the right.


Note:

Always push the keyboard down flat on the computer whenever you open the keyboard.

- 3** Hook your thumbs on the tabs **3** on the front of the keyboard, and your index fingers on the same latches used in step 1. Push and hold the latches *away* from you; then raise the keyboard. Some pressure might be needed to unlock these latches if they are tight.

Getting Started



- 4  Lift the CD-ROM handle with the plastic tape 1 and remove the CD-ROM drive from the computer.

Some pressure might be needed to remove the CD-ROM drive if it is tight.

- 5  




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.

Install the battery pack with the blue-strap side up into the middle (empty) bay, and press it firmly into the connector.

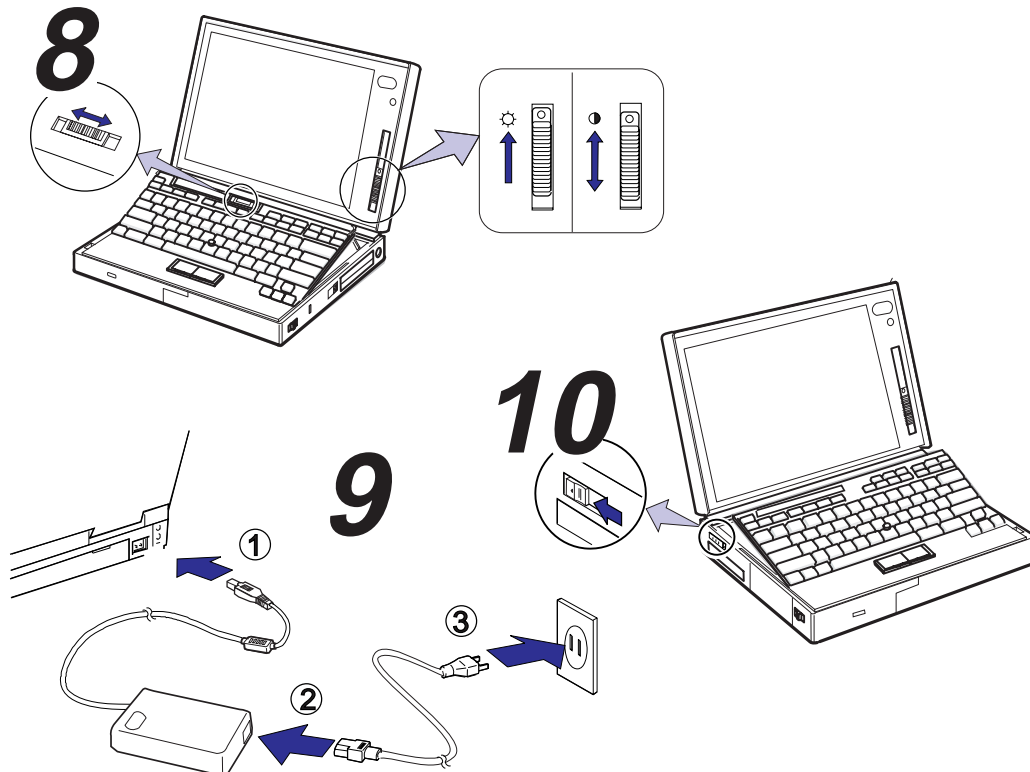
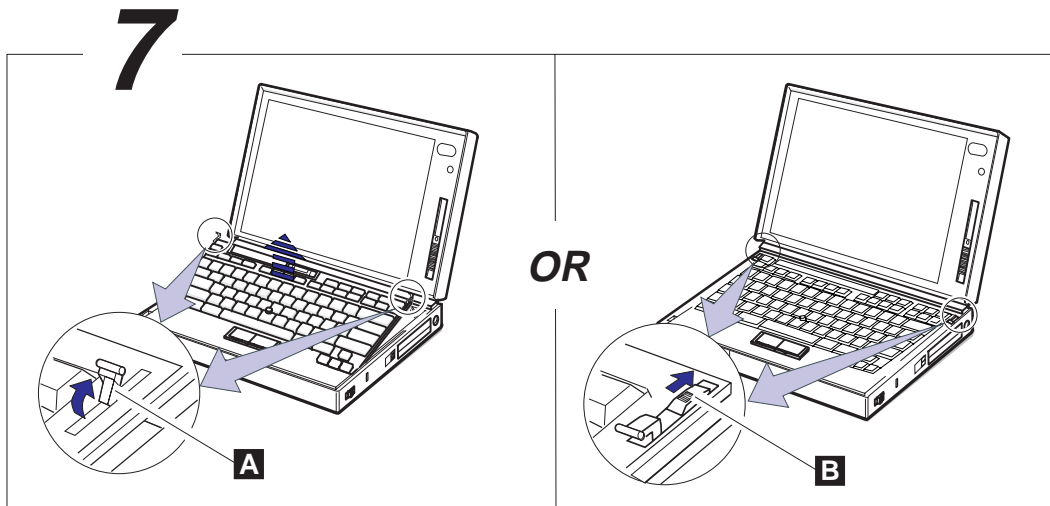
- 6  Install the CD-ROM drive into its bay and press on **the upper part of it** (shaded area 2) firmly into the connector; then close the keyboard.

Attention:

When installing the CD-ROM drive, press only on the upper part of the CD-ROM drive. Do not press on the middle part of the drive.

Make sure the CD-ROM handle snaps into place when doing step ③ and the keyboard clicks into place when you close it.

Getting Started



7

A You can raise the keyboard to an angle for easy typing by sliding the keyboard raiser A (used in step 2 on page 7) away from you.

or:

B When you want to type on a flat keyboard, lock the flat keyboard position by sliding the keyboard latches B away from you.

Attention:

Remember to push the keyboard latches toward the front of the computer whenever you close the LCD.

8 Adjust the LCD angle so that it is convenient for viewing; then slide the speaker volume control to the middle position and position the brightness control (☀️) and the contrast control (⦿) as shown. (Only the DSTN model has a contrast control.)

9 Connect the AC Adapter as shown.



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

Attention:

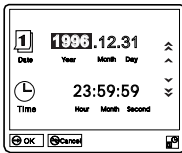
Always use an AC Adapter certified by IBM in the country where you will be using the computer. Operating the computer with an incorrect AC Adapter can cause damage to the battery pack and to the computer.

10 Push and release the power switch to turn on the computer.

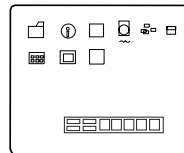
The power switch automatically snaps back to its original position.

Getting Started

- 11** After a single beep, one of the following screens appears, confirming that the system is operating correctly:



Date and Time menu



Startup screen

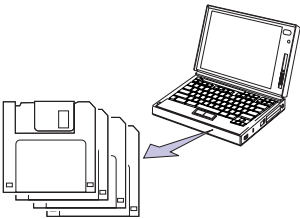
This screen instructs you to set the initial date and time. To set the date and time, see “Using Easy-Setup” on page 37.

If you purchased a computer with a preloaded operating system, the startup screen for the operating system appears. (The screen shown is an example of OS/2 Warp.)

If any other screen appears, a failure might have occurred in the computer. See Chapter 8.

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


Important



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

In some countries, you can create the diskettes you need to install all necessary software, using the *Diskette Factory program* preloaded in your computer.

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 new 1.44MB diskettes.)
2. Click on the diskette names you want to create; then click on **Build**.
3. Follow the instructions on the screen.

You can now start using your computer by proceeding to the next section, Walking through the ThinkPad Basics, or you can read Chapter 2 for more information about your computer.

Walking through the ThinkPad Basics

The ThinkPad computer preloads a lot of useful software. This section introduces how to use your computer by using these pieces of software in the Windows 95 environment.

Sending a Fax Message (Mwave Model Only)

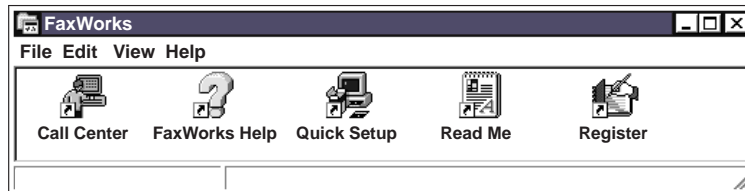


You can send or receive a fax message with the ThinkPad's Mwave feature and a preloaded application **FaxWorks**[™]. With FaxWorks, the ThinkPad computer works as a fax machine, telephone, or answering machine.

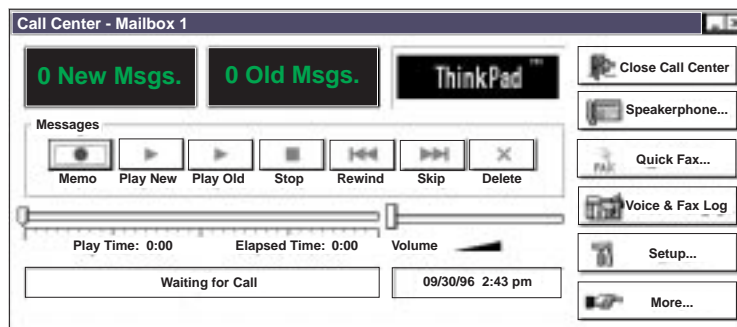
This section describes how to send a fax from the Windows 95 application *WordPad*.

To attach the telephone line:
→ Page 151.

- 1 Attach an active telephone line to the modem/fax port on the left side of the computer.
- 2 Start Windows 95, and double-click on **Preloaded Applications, FaxWorks** and then **Call Center**.



If you are using FaxWorks for the first time, you are prompted to do the basic setup. Follow the step-by-step instructions on the screen until the following window appears in the Windows 95 screen:



Walking through ThinkPad Basics


- 3 Select **Start** at the bottom of the Windows 95 screen. Select **Programs, Accessories**, and then **WordPad**.
- 4 In the WordPad white screen, type the text you wish to fax.
- 5 Select **File** on the menu bar, and select **Print** from the pull-down menu. Then select **FX-WORKS** from the pull-down menu for **Name**.
- 6 Select **OK**.
The **FaxWorks - Send Fax** screen is automatically displayed.
- 7 Type a fax number you want to send the fax to. (Your own fax number is recommended for a test.)
- 8 Select **Send** to send the fax.
Check if your fax has been sent to the destination number.

For more information about FaxWorks, see the document for FaxWorks that came with the computer.

Attaching a Printer



The following describes how to attach a printer to the computer and set up for Windows 95:

- 1 Attach your printer to the parallel connector () at the rear of the computer.
- 2 Select **Start** in Windows 95, select **Settings**, and then select **Printers**.
- 3 Double-click on **Add Printer**. Follow the instructions on the screen.

The new icon for your printer appears in the **Printers** folder. Now, you can use your printer from Windows 95.

For more details, refer to the "Printing" section in the Windows 95 manual (*Introducing Microsoft Windows 95*), which is contained in the Windows 95 package.

Using the Infrared Communication



Your ThinkPad computer is equipped with two infrared ports on the front and rear of the computer. Through each port you can share or transfer computer data without any cables between your computer and another computer equipped with an infrared port.

This section describes how to communicate between two ThinkPad computers using a preloaded application **TranXit**.

- 1 Start Windows 95, and double-click on **Preloaded Applications**, and then **TranXit**.

You will see a file manager window.

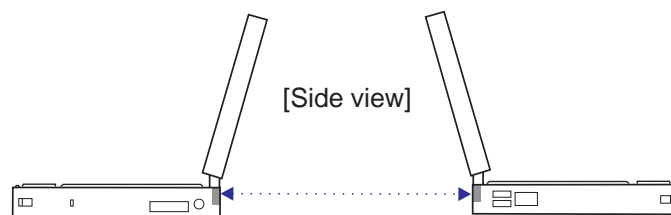
- 2 If this is the first time you use TranXit, select **Setup**, and then **Computer Name**.

Type your favorite name for each computer. (The names must not be the same.)

- 3 Place the two computers so that the infrared ports face each other:

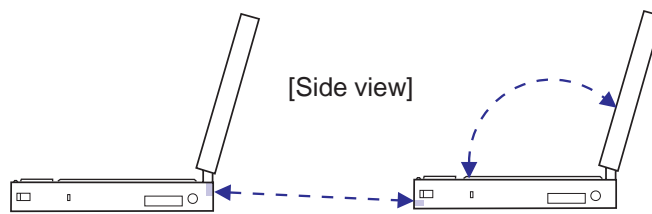
Note:

It is recommended that you use the rear infrared port for communicating between ThinkPad computers.



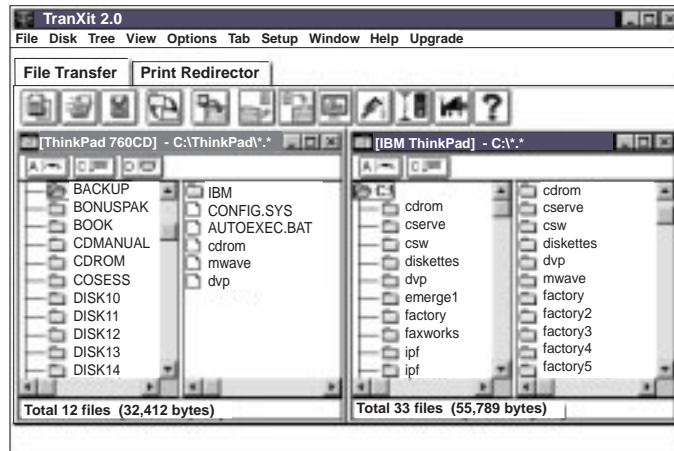
Note

To prevent the light from the LCD from affecting the infrared communication, open the LCD to a wide angle.



Walking through ThinkPad Basics

After a short pause, the file manager window splits in two:



The window on the left displays the contents of the hard disk in the other ("remote") computer.

- 4 You can copy a file or directory between computers by dragging and dropping. See online help for more details.

Capturing a Motion Video (Enhanced Video Model Only)



You can easily capture video using the preloaded application **Digital Video Producer** and your video equipment. You can use the captured image to create a bitmap file, or to "cut and paste" into your presentation file.

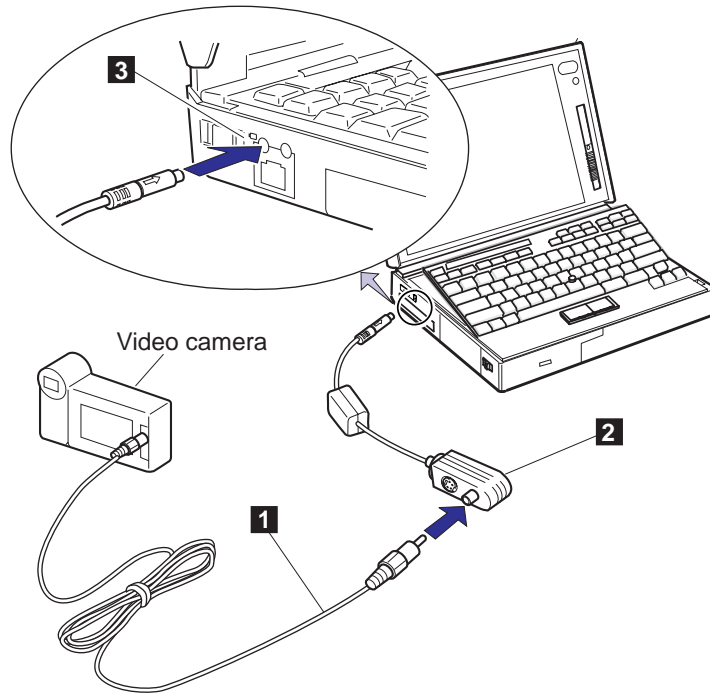
This section describes how to capture motion video using the video camera, and save it to the computer's hard disk.

- 1 Turn off the computer.
- 2 Have your video camera and your video connector cable (yellow) 1 ready. Also, have the following video in-out cable 2 (shipped with the computer at the time of purchase) ready.

Note:

Make sure the arrow mark (⇨) faces the top when you attach the video in-out cable to the video-in port of the computer. To connect the video camera and the video cable, see the video camera manual.

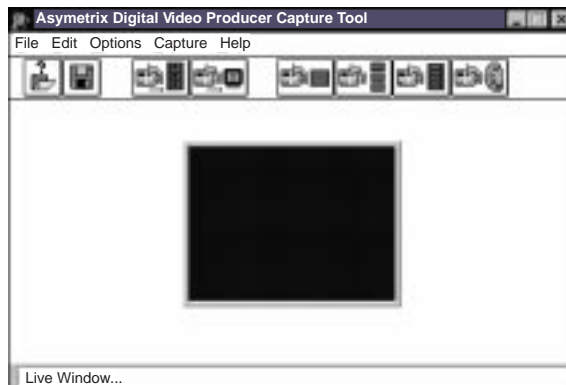
- 3 Attach your video camera to the video-in connector 3 (⇨) of the computer as follows:



- 4 Turn on the power of the video camera.
- 5 Start Windows 95 and double-click on **Preloaded Applications, Digital Video Producer**, and then **Digital Video Producer Capture**.

Note:

The current video view is shown in the live window.



Walking through ThinkPad Basics

Note:

If you do not select a capture time limit, the computer continues capturing video images until the hard disk is full.

6 Select **File** on the menu bar and select **Set Capture File**.

In this window, define the name of the file your captured image is saved to. (You can use the default name **capture.avi**.) Select **OK** to return to the main window.

7 Select **Capture** on the menu bar and **Setting**; then add a check mark for **Enable Capture Time Limit** and type a capture time limit (for example, **10** seconds). Select **OK**.

This setting specifies that Digital Video Producer will capture motion video for 10 seconds into the file **capture.avi** (or whatever file name you specified).

8 Select **Capture** on the menu bar and then **Video**.

The moment you select **Video**, the computer begins capturing motion video for 10 seconds.

9 Close Digital Video Producer and review the captured image using Windows Media Player.

Select **Start, Accessories, Multimedia**, and then **Media Player**.

10 Select **Device** on the menu bar and select **Video for Windows**.

11 Select **capture.avi** (or your defined file's name) under the C:\DVP directory; then select **Open**.

12 Select **Play** () to view your captured image.

You can save audio information concurrently using Digital Video Producer. For more information about Digital Video Producer and the video capture function, see "Using the Enhanced Video/MPEG Features" on page 65.

Chapter 2. Getting Familiar with Your Computer

This chapter provides basic information about your computer.

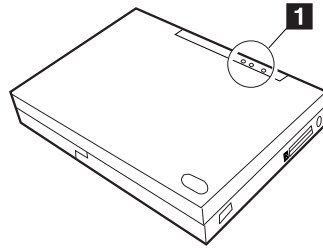
Identifying the Hardware Features	20
System-Status Indicators	24
Using the Fn Key Function	26
Operating with the TrackPoint III	28
Operating the Numeric Keypad	29
Using CD-ROMs and Music CDs	30
Playing Media	30
Keeping the Computer from Being Damaged	32

Identifying the Hardware Features

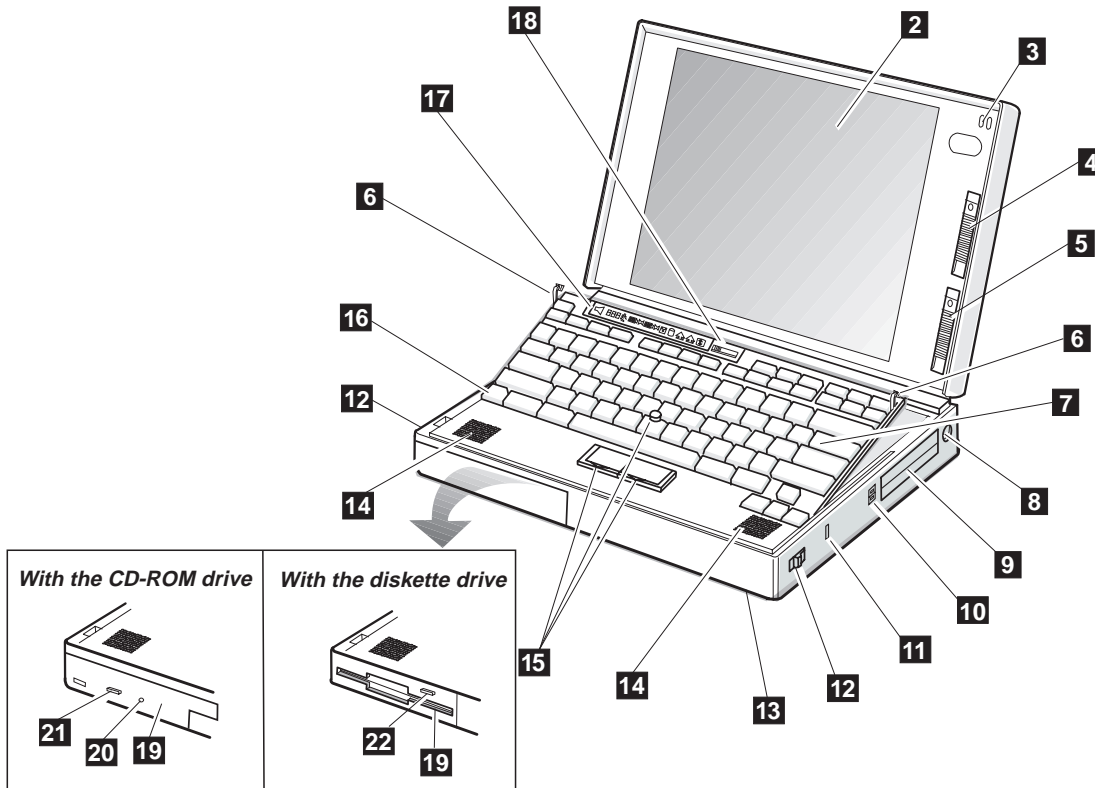
Identifying the Hardware Features

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

Top View



Front View

















Identifying the Hardware Features

Top View

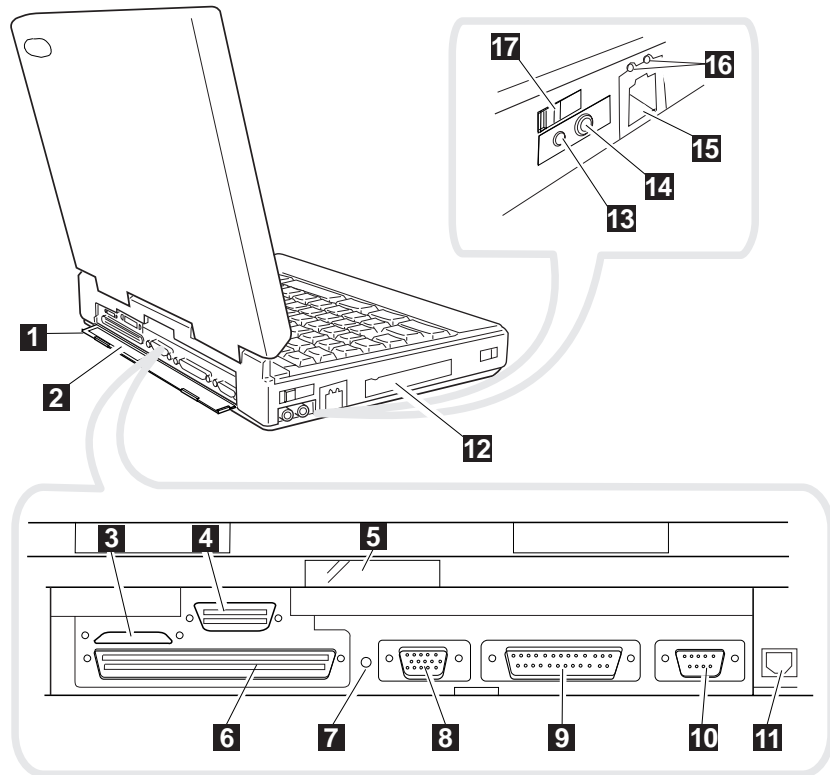
- 1 The **indicator lamps** consist of the power-on, suspend, and battery-status lamps. (See page 24.)

Front View

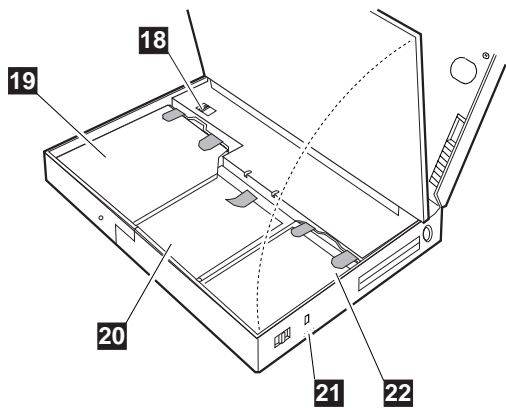
- 2  **Color LCD screen**
(For using, see page 40.)
- 3  **Built-in microphone**
- 4  The **contrast control** moves up or down to adjust the clarity of the picture. (For the DSTN LCD model only.)
- 5  The **brightness control** moves up or down to adjust the brightness of the display.
- 6 The **keyboard raisers** release the keyboard flat before opening it.
(For using, see page 11.)
- 7  **Keyboard**
(For using the **numeric keypad**, see page 29.)
- 8  The **external-input-device connector** is used to attach a mouse, external keyboard, or external numeric keypad to the computer.
(See pages 152–154.)
- 9  **PC Card slots**
(To use the PC Card software, see page 44. To insert a PC Card, see page 122.)
- 1 **PC Card eject buttons**
(For using, see page 124.)
- 11  The **Security keyhole** is used with the Kensington MicroSaver** Security System lock. (For using, see page 117.)
- 12 The **release latches** release the LCD or keyboard. Sliding them toward the front opens the LCD, and sliding them towards the back opens the keyboard.
- 13  **Front infrared port**
(For using, see page 50.)
- 14 **Built-in speakers**
- 15 **TrackPoint III**
(For using, see page 28.)
- 16 **Fn key**
(For details, see page 26.)
- 17 **LCD indicator panel**
(For details, see page 40.)
- 18  **Volume control**
- 19  The **removable diskette drive** or **removable CD-ROM drive** can be installed in the **UltraBay**. (To install, see Chapter 6. To use a CD-ROM, see page 30.)
- 2  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 to eject the CD-ROM tray.
- 21  The **CD-ROM eject button** ejects the CD-ROM tray from the CD-ROM drive. Using this button, you can play a music CD.
(For details, see page 30.)
- 22  **Diskette-eject button**

Identifying the Hardware Features

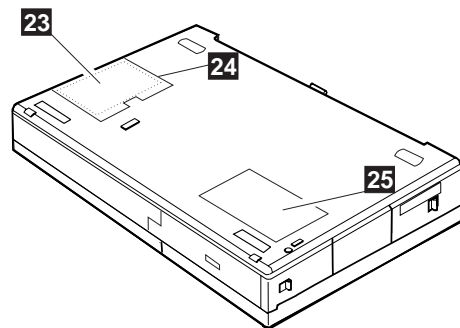
Rear View



Inside View












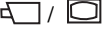



Bottom View







Identifying the Hardware Features


Rear View

- 1 **Rear door**
- 2 The **connector door** allows you to connect a cable to the system-expansion connector when the rear door is closed.
- 3  **MIDI/joystick port**
(For using, see page 60.)
- 4  **External-diskette-drive connector** (The external diskette drive is available as an option.)
- 5  **Rear infrared port**
- 6  The **system-expansion connector** is used to connect the IBM docking station or port replicator. (For using the docking station, see page 155.)
- 7 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.
- 8  **External-monitor connector**
(For using, see page 42.)
- 9  The **parallel connector** is where you usually connect a parallel-printer signal cable.
- 10  The **serial connector** is where you connect a 9-pin, serial-device cable.
- 11  The **Power jack** is where the AC Adapter cable is connected.
- 12 **Option cover**
(For details, see page 146.)
- 13  **Headphone jack**
(For details, see page 51.)
- 14  **Microphone/line-in jack**
(For details, see page 51.)
- 15  **Modem/fax port**
(This is offered as an option in some countries. For using, see page 56. For installing, see page 149.)
- 16  **Video in/out ports** (For use, see page 65.)
- 17  **Power switch**

Inside View

- 18 **Modem/fax port release latch** (For using, see page 149.)
- 19  The **UltraBay** accepts various devices, such as a CD-ROM drive, diskette drive, secondary battery pack, or others. (See page 146.)
- 20  **Battery pack**
(For replacing, see page 85.)
- 21  The **security latch** opens or closes the security keyhole. (See page 117.)
- 22  **Removable hard disk drive**
(For replacing, see page 132.)

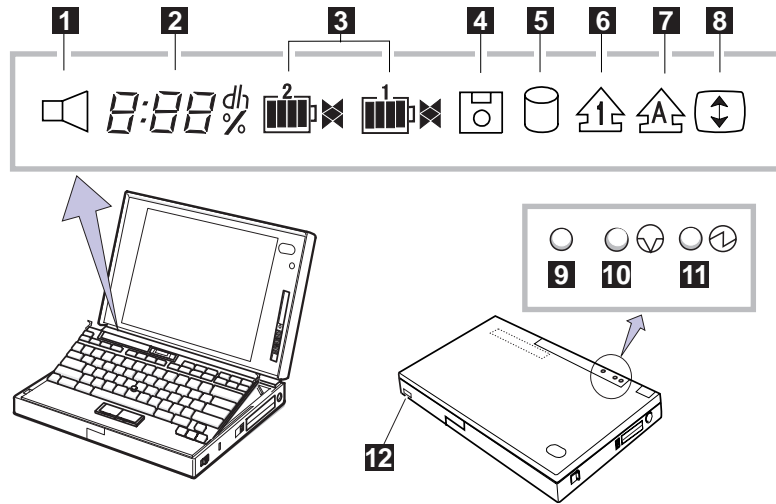
Bottom View

- 23  **Memory slot**
(See page 125.)
- 24 **Memory-slot cover**
(See page 125.)
- 25 **Serial number (S/N)**
Write this down on page 258.








System-Status Indicators

System-Status Indicators








The system-status indicators consist of information shown on a black-and-white LCD indicator panel (1 — 8) and indicator lamps (9 — 12).



The following table shows the meaning of each indicator:

Item	Meaning
1 Speaker 	Appears when the speaker beeps. It turns off when any key is pressed.
2 Remaining battery 	Indicates the amount of remaining battery power by a percentage (%), day (d), hour (h), or hours and minutes (hh:mm).
3 Main battery status  Secondary battery status 	Indicates the status of the battery packs installed in the battery pack bay and UltraBay: The amount of remaining power (in five levels:  (Empty)–  (Full)) Charging status (◀: charging, ▶: discharging) Blank means no activity. For details, see page 87.
4 Diskette drive in use 	Appears when data is read from or written to a diskette. <i>Do not enter suspend mode or eject the diskette when this indicator is on.</i>

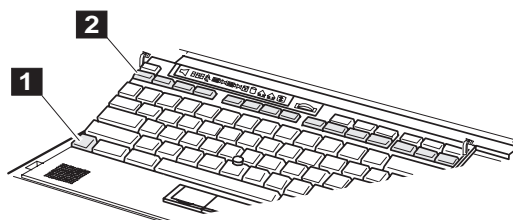
System-Status Indicators

Item	Meaning	
5 Hard disk in use 	Appears when data is read from or written to the hard disk. <i>Do not enter suspend mode or turn off the computer when this indicator is on.</i>	
6 Numeric lock 	Indicates that the numeric keypad on the keyboard is enabled. 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 29.	
7 Caps lock 	Indicates that the Caps Lock mode is enabled: All alphabetic characters (A–Z) are entered in capital letters without the use of the Shift key. The Caps Lock mode is enabled and disabled by pressing the Caps Lock key.	
8 Scroll lock 	Alternately turns on and off each time the ScrLk key is pressed. While this indicator is on, the Arrow keys are used as screen-scroll function keys. In this state, the cursor cannot be moved with the Arrow keys. Not all application programs support this function.	
9 Battery	Green	Enough battery power remains for operation.
	Orange	The battery pack is being charged.
	Blinking orange	The battery pack needs charging. When you set the alarm with the ThinkPad Features program, you hear three beeps the moment the lamp starts blinking orange.
1 Suspend mode 	Green	Indicates that the computer is in suspend mode. See page 92 for details about suspend mode.
	Blinking green	Indicates that the computer is entering suspend mode or hibernation mode, or is resuming normal operation.
11 Power on 	Green	Indicates that the computer is operational. This indicator is on when the computer is on and not in suspend mode.
12  CD-ROM drive in use	Green	Turns on when data is read from a media in the CD-ROM drive. Do not enter suspend mode or eject the CD-ROM when this lamp is on.

Using the Fn Key Function



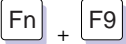









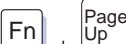


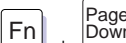


Using the Fn Key Function

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



Key Combination	Function	Meaning
+	Reserved	—
+	Fuel-Gauge display on or off 	The Fuel-Gauge program must be activated before you can use this key combination. (See page 89.) When this key combination is pressed: For OS/2 or Windows users: The window for the battery power status appears or disappears. Parameters for power status can be set.
+	Standby mode 	Places the computer in standby mode. For more information about this mode, see page 94.
+	Suspend mode 	Places the computer in suspend mode. For more information about this mode, see page 94.
+ +	Reserved	—
+	LCD/external monitor switching 	Displays the computer output in the following order when an external monitor is attached. External Monitor Both LCD

Using the Fn Key Function

Key Combination	Function	Meaning
 +   +   + 	Reserved	—
 + 	Power mode switching 	When this key combination is pressed during battery-power operation, the power-management (power-saving) mode changes as follows. High Auto Customize AC mode is used when the AC Adapter is attached. The Fuel-Gauge program displays the current power option. See page 89.
 + 	Hibernation mode 	Places the computer in hibernation mode. For more information about this mode, see “Hibernation Mode” on page 98.
 + 	Dock I speaker volume up 	Increases the speaker volume for the Dock I attached to the computer.
 + 	Dock I speaker volume down 	Decreases the speaker volume for the Dock I attached to the computer.

Using the TrackPoint III

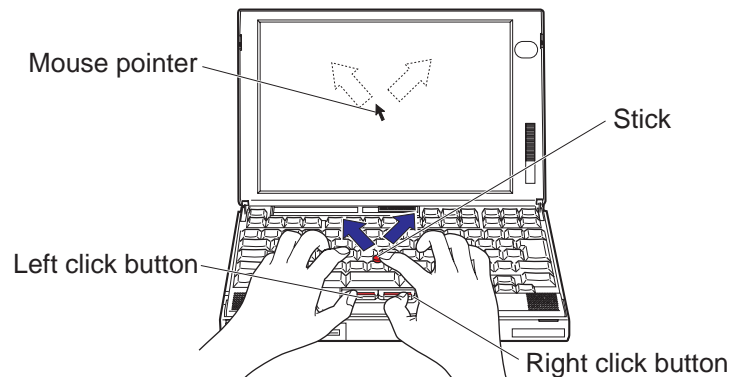
Operating with the TrackPoint III

The keyboard contains a unique cursor-pointing device called the **TrackPoint III**. You can perform all the mouse operations with the TrackPoint III.

Note:

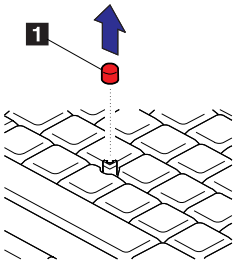
Remember that the stick does not move, and your finger should not move on it.

To move the mouse cursor on the screen, press gently on the stick with either index finger in the direction in which you want the pointer to move. To select and drag an object, press the click buttons with either thumb as required by your software, as with any other pointing devices.



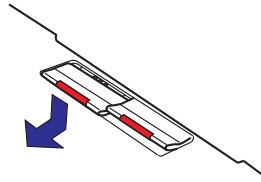
Note:

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



Hints

If you press the click button and slide it toward the front of the computer, the click button locks in place. You can now drag the object across the screen with the TrackPoint III stick without holding down the click button.




To release the latch, push the click button backward. When you are not using the TrackPoint III, for example, when the power is off, do not leave the click button locked.

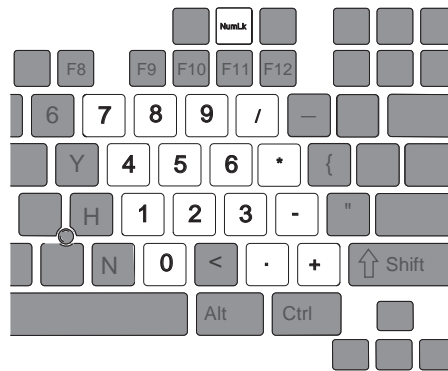
Operating the Numeric Keypad

The keyboard has some keys that, when enabled, work as if they were a 10-key numeric keypad.

Note:

The numeric keypad on the keyboard is not active when the external keyboard or the external numeric keypad is attached to the computer.

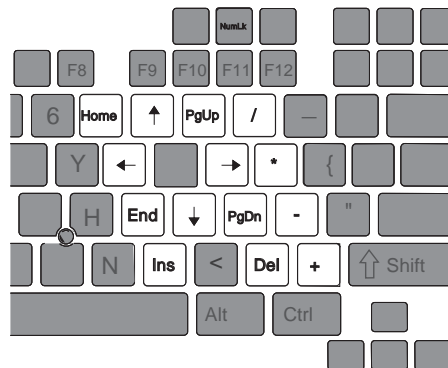
To enable the numeric keypad, press and hold **Shift** and then press **NumLk**. The NumLK icon () appears on the LCD indicator.



Note:

The keys are functional, but the function of the key is not printed on the keytop.

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



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

Using CD-ROMs and Music CDs

Using CD-ROMs and Music CDs

Attention:

Do not touch the lens on the CD-ROM tray.

Attention:

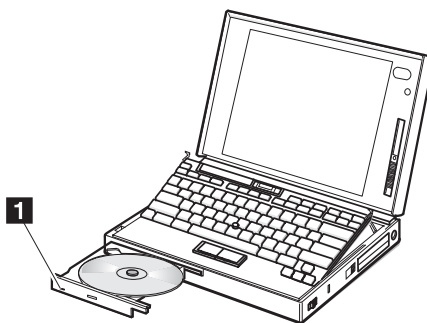
Hold the CD-ROM by the edges. Do not touch the surface of the CD-ROM.

Note:

If you cannot eject the CD-ROM tray with the CD-ROM eject button, use the emergency eject hole. (See page 21.)

 You can use a 5-inch CD-ROM with the removable CD-ROM drive of the computer.

To use the CD-ROM, push the CD-ROM eject button **1** on the front of the computer; then pull out the CD-ROM tray. Carefully place your CD-ROM onto the CD-ROM tray; then push the tray into the computer until it fully closes.



Playing Media

Note:



Before playing the CD-ROM drive with the eject button, you must enable the sound features in your operating system. Refer to the documentation that came with your operating system.

To play media on the CD-ROM drive, do one of the following:

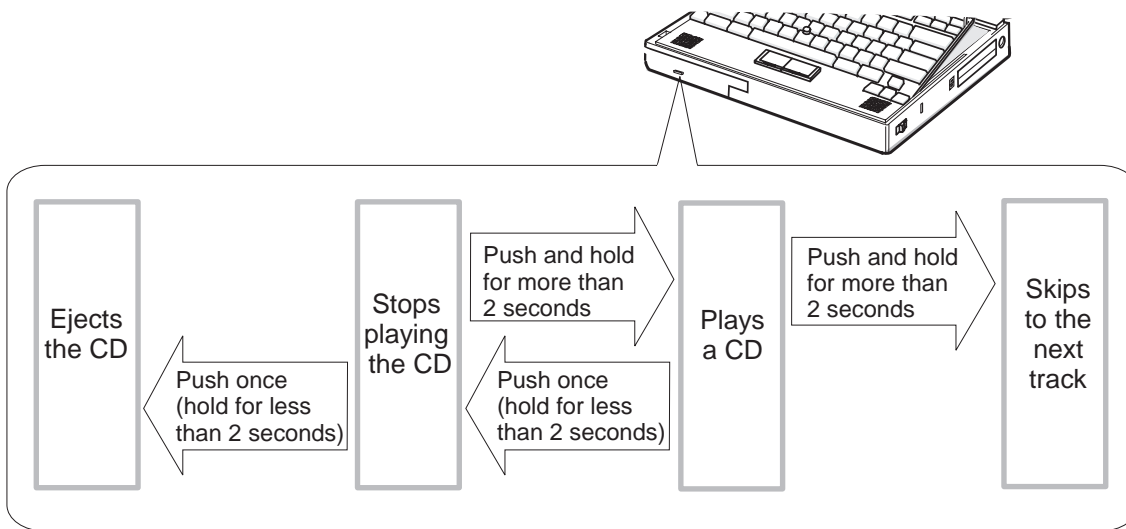
Playing a music CD with the CD-ROM Drive Eject Button

You can play and stop the music CD with the CD-ROM drive eject button as follows:

When Using a CD-ROM or a Music CD

  When you use a CD-ROM or a music CD with your computer, make sure that **Line/CD** is selected as the **Auxiliary Control** in the **Mwave for OS/2** folder. (See page 53.)

Using CD-ROMs and Music CDs



Playing a CD from an Application



When using OS/2:

- 1 Open the **Mwave for OS/2** folder.
- 2 Double-click on **Auxiliary Control** and make sure that **Line/CD** is selected as the auxiliary source.
- 3 Open the **Multimedia** folder; then select **Compact Disc**.



When using Windows:

- 1 Select **Mwave ThinkPad** and open the **Audio Control** menu; then make sure of the following:
 - Make sure that **Mute** of both the INPUT SOURCE and the MASTER are set to off.
 - Make sure that **Line** and **CD** are selected as the input source.
- 2 Open the **Accessories** group; then open the **Media Player**.
- 3 Select **Device** from the Media Player window; then select **CD Audio** from the pull-down menu.

Keeping the Computer from Being Damaged

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

Do not allow your computer to be subject to any physical shock.

Do not place anything heavy on your computer.

Do not pour liquid into your computer.

Do not leave any objects (especially metal objects) in the computer.

Keep the computer at least 13 cm (5 in.) away from any electrical appliance that generates a strong magnetic field such as a motor, magnet, TV, refrigerator, or large audio speakers.

Use your computer when temperatures are between 5°C to 35°C (41°F to 95°F).

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.

The removable hard disk drive and diskette drive are also very delicate devices that need careful handling. To avoid damage, do not press on them, drop them, or apply any shock to them when they are removed from the computer.

Do not press on the middle part of the diskette drive.

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 cause damage to 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.

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Using the ThinkPad Features Program

To install the ThinkPad Features program:

➔ Chapter 7.

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

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

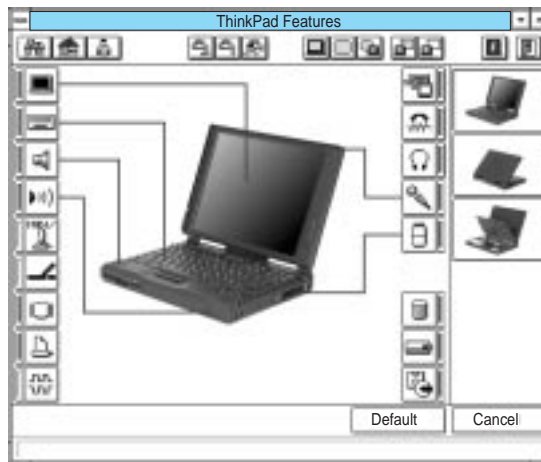
To start the ThinkPad Features program:

*If you are using OS/2 Warp or Windows, select the **ThinkPad Features** icon in your operating system:*



Note:

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



If you are using DOS, you can use the PS2 commands at the DOS command prompt, instead of this panel.

Using the ThinkPad Features Program

Other ThinkPad Utilities

ThinkPad Features program group also provides various features:

Fuel-Gauge program:

➔ Page 89.

Fuel-Gauge program

- Remaining power percentage
- Current power mode
- Discharge options

Docking control

Note:

For details about docking control program, see the manual that came with the docking station.

Personalization Editor program:

➔ Page 116.

Personalization Editor

Using the PS2 Commands

You can use the ThinkPad Features program from the DOS or OS/2 command prompt using PS2 commands. Type `PS2 ?` at the DOS prompt to display the ThinkPad Features online help menu.

You can create a batch file to set your unique operating environment quickly and easily. The following sample 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 Custom DC           > 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 has the following menu:

Config shows information about installed memory and system board.

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

Password is used to set the power-on password, hard disk password, and supervisor password.

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

Test is used to test the computer hardware.

Restart is used to exit Easy-Setup and start your operating system.

To set passwords:

➔ Page 102.

To change the startup sequence:

➔ Page 38.

To test the computer:

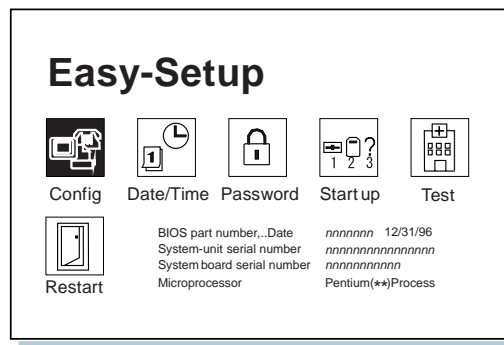
➔ Page 233.

To start Easy-Setup:

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

Note:

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



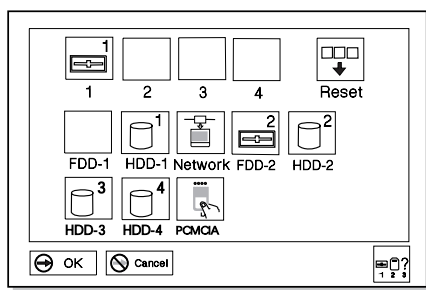
Using Easy-Setup

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).



The **HDD-1** icon represents the internal hard disk drive installed in the computer. (If the second hard disk drive is installed in the UltraBay, it is shown as **HDD-2**.) The other numbered HDD icons are external hard disk drives.

FDD-1 represents the first diskette drive found during system startup. When no diskette drive is installed in the UltraBay and if an attached docking station has a diskette drive, the diskette drive in the docking station is the first drive.

Changing the Startup Sequence

To change the startup sequence:

- 1 Start Easy-Setup and select the **Start up** icon.
- 2 Move the cursor to the **Reset** icon; then press the **Spacebar**.
- 3 Move the cursor to the icon for the first device in the startup sequence; then press the **Spacebar**.
Repeat this step to set the other devices for the startup sequence. You can set up to four devices.
- 4 Click on **OK** or press **Enter** to save the change.

Note:

You cannot set a hard disk drive before a *PCMCIA* Card in the startup sequence.

Selecting the Network RPL Speed

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

- 1 Start Easy-Setup and select the **Start up** icon.
- 2 Move the cursor to the **Network** icon; then press the **Spacebar**.
The window to select the token-ring RPL speed appears.
- 3 Move the cursor to the **4** icon (for 4 Mbps) or the **16** icon (for 16 Mbps); then press the **Spacebar** and press **Enter**.

If you are using another card, such as an Ethernet card, you do not need to specify the RPL speed, so press **Esc** to exit this window.

Using the LCD and an External Monitor

This section provides information about the computer LCD and an external monitor.

You can display the computer output on the *LCD*, an externally attached monitor (*CRT*), or both. By attaching an external monitor, you can get higher resolution and better color quality.

The following shows the resolution and color combinations for each display output type. It depends on your computer's LCD type:

If your LCD is the TFT 1024×768 LCD panel:

Resolution ↓	Color Depth for the LCD	Color Depth for “Both”	Color Depth for the External Monitor (CRT)
640×480	256 65,536	256 65,536	256 65,536 16,777,216
800×600	256 65,536	256 65,536	256 65,536 16,777,216
1024×768	256 65,536	256 65,536	256 65,536
1280×1024	—	—	256

If your LCD is the TFT 800×600 LCD panel:

Resolution ↓	Color Depth for the LCD	Color Depth for “Both”	Color Depth for the External Monitor
640×480	256 65,536	256 65,536	256 65,536 16,777,216
800×600	256 65,536	256 65,536	256 65,536
1024×768	—	—	256

Using the LCD and an External Monitor



If your LCD is the DSTN 800×600 LCD panel:

Resolution ↓	Color Depth for the LCD	Color Depth for “Both”	Color Depth for the External Monitor
640×480	256	256	256 65,536 16,777,216
800×600	256	256	256 65,536
1024×768	—	—	256

Changing the Resolution or Color Depth for the LCD

To change the screen resolution or color depth for the LCD panel, do the following:



If you use *OS/2 Warp* or *Windows 3.11*, use the ThinkPad Features program. (Click on the **Display** ( or ) icon.)

Note

To change the resolution or color depth for WIN-OS/2, use the ThinkPad Features program *in WIN-OS/2*.



If you use *Windows 95*, use the Windows 95 Control Panel. Select **My Computer**, **Control Panel**, **Display**, and then **Settings**.



If you use *Windows NT*, use the Windows NT Control Panel.

Attaching an External Monitor

Attaching an External Monitor

Note:

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

To install the display driver:

→ Chapter 7.

Note:


You can use the **Fn** key function (**Fn+F7**) or **PS2 SC** command to change the display output type.


Attention:


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

To attach an external monitor:



- 1** Change the display output type (where to display the computer output) as follows so that you can see the computer output on the external monitor:
 - a) Start the ThinkPad Features program.
 - b) Click on each of the following icons:

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

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

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

- 2** Set the monitor type and the display driver:

- a) Click on the **Display** ( or ) icon in the ThinkPad Features program.

Attaching an External Monitor

Note:

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

- b) Click on the **Advanced...** button.

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

- c) Restart the computer to make the changes effective.


Hints

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

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 will remain blank and the output will not be displayed. This does not depend on the resolution value.

- 3 Connect the external monitor to the computer:

- a) Turn off the computer.
- b) Attach the external monitor to the external monitor connector () at the rear of the computer and then to the electrical outlet.
- c) Turn on the external monitor and the computer.

When Changing the Display Settings

When you are using OS/2 Warp:

Do not use **System** in the System Setup folder to change the resolution or color depth. Use the ThinkPad Features program to configure the display.

To change the display settings for WIN-OS/2, use the ThinkPad Features program *in WIN-OS/2*.

Using PC Cards

Using PC Cards

To insert a PC Card:

➔ Page 122.

Supported PC Card specification:

➔ Page 293.

With a PC Card, you can send and receive faxes, communicate through a network, or store data. This section describes how to use the PCMCIA software and some considerations.

Using the PC Card Director Program

To install the PC Card Director:

➔ Chapter 7.

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

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

Showing what type of PC Card is in your computer.

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

To see the PC Cards list supported by PC Card Director, click on the **Supported PC Cards** icon in the PC Card Director window. If your PC Card is not listed, try using it with PC Card Director anyway.

If your PC Card is not supported by PC Card Director, you must install the driver that came with your card. The card driver must be compatible with the PCMCIA Card Services PC Card Standard (1995) or the PCMCIA Card Services Standard Release 2.1. Follow the instructions in your PC Card manual to install the driver.

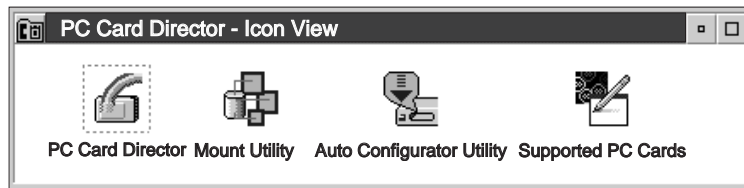
Starting PC Card Director



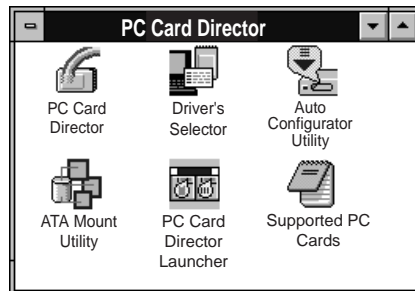
To start PC Card Director in OS/2 or Windows, select the PC Card Director folder or window; then select the **PC Card Director** icon.

See PC Card Director help on how to use PC Card Director.

For OS/2:



For Windows 3.11:



For Windows 95:



To start PC Card Director for DOS:

- 1 Go to the DOS command prompt.
- 2 Type `C:\THINKPAD\EZPLAY` at the command prompt; then press **Enter**.

Restrictions on the PC Cards Supported by the Computer



The PC Card slots of the computer and the SelectaDock Docking System do not support the following PC Cards:

- Integral** Peripherals Model 1841PA (40MB)
- IBM 105MB PCMCIA hard disk drive (P/N 74G8694)
- 8-bit or 16-bit slave DMA PC Cards

Ask IBM or an IBM authorized dealer for more information about the different types of PC Cards.

For more information about PC Cards, see Appendix B.

PC Card Limitations under Suspend Mode

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.

Using the PC Card in Windows 95



When using PC Cards in Windows 95, do not use the interrupt function. After enabling the PCMCIA socket (PC Card slots), change the resource for the PCMCIA socket as follows:

- 1 Start Windows 95 and double-click on **My Computer**; then select **Control Panel**.
- 2 Select **System**; then select the **Device Manager** tab.
- 3 Select **PCMCIA socket**; then select **PCIC or compatible PCMCIA controller on IBM system**.
- 4 Select the **Resources** tab.
- 5 If **Basic configuration 0000** is set for the **Setting based on:**, click on **Use automatic settings** to disable it; then change **0000** to **Basic configuration 0001**.
- 6 Select **OK**.

- 7** If the Creating a Forced Configuration panel appears, select **Yes**.
- 8** At the System Properties panel, select **Close**.

Using the Option Diskette for the PC Card

Option diskettes, which came with some PC Cards, might include PCMCIA software (Socket Service driver: IBMDSS01.SYS) that does not support your computer. So, when using the diagnostic program or the installation program in that kind of option diskette, do the following:

- 1** Check whether your option diskette has the file named IBMDSS01.SYS. Did you find the IBMDSS01.SYS file?
Yes Go to the next step.
No Go to step 5.
- 2** Make a backup copy diskette of the option diskette.
- 3** Copy the following two files to the backup copy diskette from the PC Card Director Diskette for DOS and Windows:
IBMDSS14.SYS
IBMDOSCS.SYS
- 4** Update a line in the CONFIG.SYS file in the backup copy diskette as follows:

```
(old) DEVICE=A:\IBMDSS 1.SYS  
  
DEVICE=A:\IBMDSS14.SYS
```
- 5** Run the diagnostic or installation program in the backup copy diskette, referring to the manual of the PC Card.

Removing the Storage PC Cards

Attention

Before removing such storage PC Cards as the hard disk PC Card, flash memory PC Card, or SRAM PC Card from the PC Card slot, **turn off the computer**. Otherwise, data in the PC Card may be corrupted or lost.

However, there is a safe way to remove the storage PC Card without turning off the computer. Use the PC Card Director program (for OS/2 or Windows) or the DOS PC Card utility program as follows:



For OS/2 or Windows:

- 1 Open the PC Card Director window.
- 2 Click on the **Control Power** icon.
- 3 Select from the card list the storage PC Card you want to remove.
- 4 Click on **Off**.
- 5 Make sure the card status is off; then remove the storage PC Card.

DOS

For DOS: Enter `CARDPWR slot_number OFF` at the DOS command prompt.

`slot_number` means the PC Card slot number.
You can use the EZPLAY program to check the slot number.

Using PC Cards



Hints—When Not Using the Optional PC Card Slots in OS/2 or Windows 3.11

When you do not use the following optional PC Card slots, you can remove the display of the PC Card slot icons representing slots that do not exist from the PC Card Director program's window by modifying the CONFIG.SYS file:

*When you are **not** using any of the following:*

- Dock I or Dock II
- Port Replicator equipped with the PC Card slots
- PCMCIA Cartridge option for the UltraBay

Delete or comment out the following lines in the CONFIG.SYS file:

– *For Windows:*

```
DEVICEHIGH=C:\THINKPAD\IBMDSS 4.SYS /D
```

– *For OS/2:*

```
BASEDEV=IBM2SS 4.SYS /D
```

*When you are **not** using the SelectaDock Docking System,* delete the underlined /D option from the following line of the CONFIG.SYS file:

– *For Windows:*

```
DEVICEHIGH=C:\THINKPAD\IBMDSS14.SYS /D
```

– *For OS/2:*

```
BASEDEV=IBM2SS14.SYS /D
```

If you do not modify the CONFIG.SYS file as just described, the PC Card slots work correctly; however, the two PC Card slot icons representing slots that do not exist appear in the PC Card Director program's window.

Using the Infrared Communication Feature

To install the infrared device driver:

➔ Chapter 7 .

To use TranXit (an infrared application):

➔ Page 15.

Your computer is equipped with an infrared (IR) communication feature that allows point-to-point communication. The computer has two infrared ports, one in the front of the computer below the hard disk drive compartment and another on the rear of the computer.

The infrared feature supports the following three modes:

ThinkPad mode (IrDA High Speed extension, up to 1.15 megabits per second data transfer).

Use this mode when communicating with another 755 or 760 series ThinkPad computer with an infrared port or other systems supporting ThinkPad mode.

Generic (IrDA 1.0, up to 115 kilobits per second data transfer through a COM port).

Use this mode when communicating with generic infrared communication device, such as Hewlett-Packard** 100LX, 200LX, Omnibook, Mind Path Remote Control IR55 F/X, or others.

Sharp** (ASK) (9600 bits per second data transfer through a COM port).

Use this mode when communicating with the Sharp Wizard** or other systems with infrared ports supporting Sharp mode.

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

Using the Mwave DSP Features

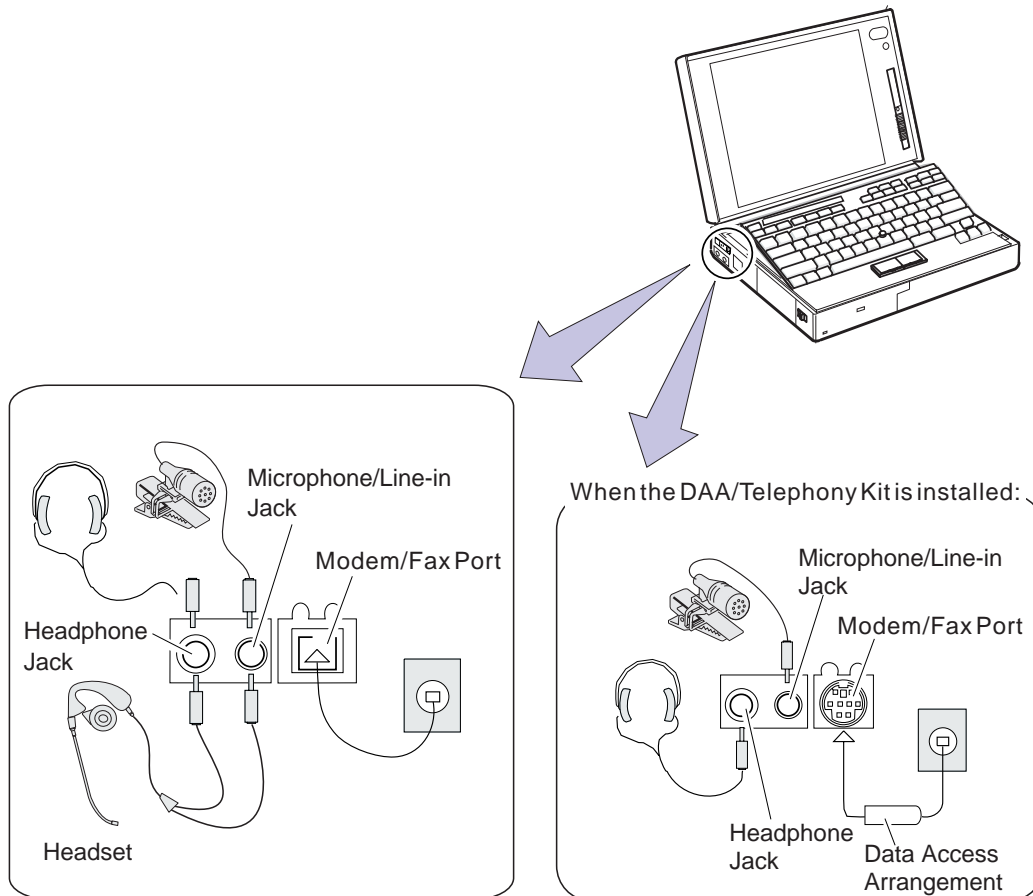


The computer provides the *Media Processor (Mwave DSP)* feature, which is based on the *digital signal processor (DSP)*. It gives you high performance for audio and telephony functions.

Note:

In some countries, the Mwave telephony functions are only available with the DAA/Telephony Kit option installed.

This illustration shows the connections between the computer and external cables or devices:



Using the Mwave DSP Features

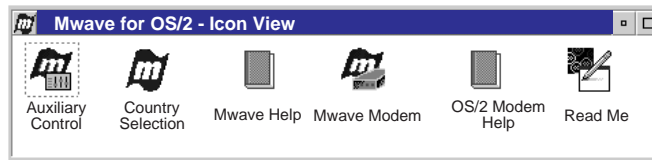
To install the Mwave DSP support software:

→ Chapter 7.



The Mwave DSP feature supports the following functions for each operating system:

For OS/2:

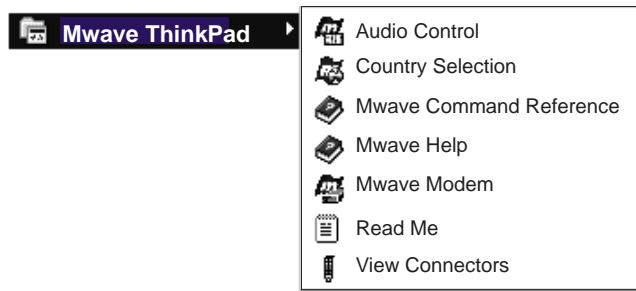


- Wave audio recording and playback
- MIDI synthesizer
- Sound Blaster support in the DOS session
- Data/Fax modem
- MPEG Audio



Note:
The figure shows the Mwave menu for Windows 95.

For Windows:



- Wave audio recording and playback
- MIDI synthesizer
- Sound Blaster support in the DOS session
- Data/Fax modem
- Speaker phone
- Telephone answering machine
- MPEG Audio



For DOS:

- Sound Blaster support
- Data/Fax modem

Using the Audio Function

Use the Mwave audio functions according to your operating system.

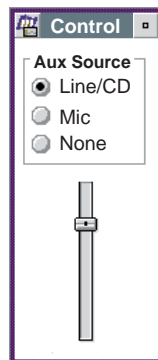
Using the Audio Function for OS/2



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

Note:

Do not enter suspend mode when using the audio functions.



When Using a CD-ROM or a Music CD



When you use a CD-ROM or a music CD with your computer, make sure of the following:

1. Open the **Mwave for OS/2** folder in the OS/2 desktop.
2. Double-click on **Auxiliary Control**.
3. Make sure that **Line/CD** is selected as the auxiliary source.

Note: Select **Mic** when you want to use the computer as a microphone-speaker.

Using the Mwave Audio Function

Using the Audio Function for Windows



To use Mwave audio in Windows, open an audio application such as **Media Player** or **Sound Recorder** in the Windows Accessories group.

Note:

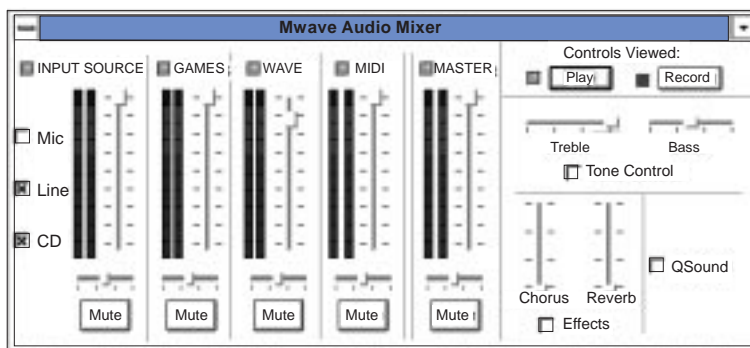
To use the Mwave audio features in WIN-OS/2, install the Mwave DSP support software for Windows in the full screen WIN-OS/2 session.

To install the Mwave DSP support software:

→ Chapter 7.

To control the audio input or output, do the following:

- 1 Select **Mwave ThinkPad** from Windows.
- 2 Select **Audio Control**. The following window appears:



This window allows you to maintain control over volume, balance, tone, and effects for all audio components and input sources. For more information, see **Mwave Help** in the Mwave ThinkPad window.

Using the Audio Function for DOS



The Mwave feature supports audio for DOS games through *Sound Blaster* support.

To enable Sound Blaster support for DOS games:

- 1 Type `FASTCFG` at the command prompt; then press **Enter**.
The `FASTCFG` utility opens.
- 2 Select **Games**; then select **OK**.

Using the Mwave Audio Function

Solving a Memory Shortage Problem for Your Games

If you do not have enough memory for your games, you should make a *boot diskette* before starting the DOS games. To make a boot diskette, do the following:

- 1** Start DOS and insert a blank diskette into the diskette drive.
- 2** Type `MAKEBOOT` at the DOS prompt; then press **Enter**.

A boot diskette is created. Before starting your games, restart the computer with this boot diskette inserted in the diskette drive.

Some sample files, such as the `CONFIG.SYS` file, are created on the boot diskette. You might need to modify these files by referring to the manuals that came with your games.

Default Values for DOS Games Audio

Most games automatically determine the I/O address, interrupt level (IRQ), and DMA channel settings for the audio for DOS games. If the game asks for this information, specify the default settings for Sound Blaster as follows:

I/O Address	220
IRQ	5
DMA Channel	1

ThinkPad Features program:

➔ Page 35.

If you need to change these settings, use the ThinkPad Features program.

Using the Mwave Telephony Function


Using the Telephony Function

Note:

In some countries, the Mwave telephony functions are only available with the DAA/Telephony Kit option installed. To install a DAA/Telephony Kit on the computer, see "Installing the DAA/Telephony Kit" on page 149 and the documentation that came with the option.

The computer is equipped with a modem/fax port on its side that connects a telephone cable. This section describes how to connect the cable to the computer, and it describes the telephony features that can be used for communication.

Note

Non-U.S. users must run the Country Selection program () in the Mwave window after the Mwave installation is complete. (See page 58.)

CAUTION:

Your computer can use only a public-switched telephone network (PSTN). Do not use a PBX (private branch exchange) or other digital telephone extension lines. Use of phone lines other than PSTN can damage your modem. If you are not sure which kind of phone line you are using, contact your telephone company. Many hotels or office buildings use digital telephone extension lines, so check before connecting the telephone cable in such places.

To use the telephony functions, you need to connect a telephone line to your computer.

**DANGER**

To avoid shock hazard, do not connect the cable to or disconnect the cable from the telephone outlet on the wall during electrical storms.

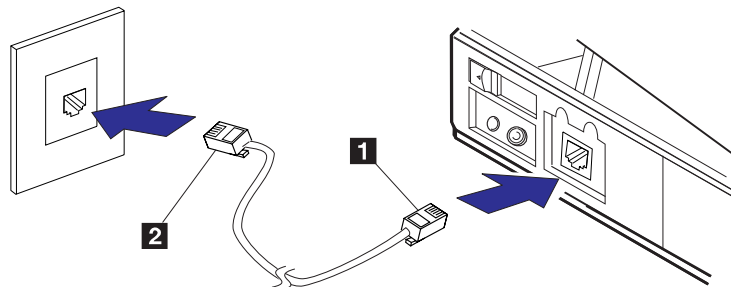
Using the Mwave Telephony Function

Note:

If you use both the computer and a telephone with one telephone cable, use the telephone cable supplied with your computer.

If you use the DAA/Telephony Kit (available as an option), see page 151.

When your computer has a modem/fax port with a square receptacle, first connect the ferrite-core end (connector 1) of the telephone cable to the modem/fax port; then connect the other end (2) to the telephone outlet on the wall.



Important

Make sure you use the correct telephone line so your modem operates correctly. When you are:

At home: Use an *analog* line, a standard household telephone.

In your office: Use a line connected to a fax machine or another modem.

In a hotel: Request a room with a data or normal telephone line.

Your RJ11 jack must be wired for an analog line. If you are not sure what type of line you are connecting, check with the telephone company.

Using the Modem with OS/2



To start the Mwave modem with OS/2 Warp, do the following:

- 1 Open the **Mwave ThinkPad** folder.
- 2 Double-click on the **Mwave Modem** icon.
The Mwave modem starts automatically.
- 3 Start your communication program.

Using the Mwave Telephony Function

Using the Modem with DOS

DOS

To start the Mwave modem with DOS, do the following:

- 1 Type `FASTCFG` at the DOS prompt; then press **Enter**.
The `FASTCFG` utility opens.
- 2 Select **Advanced Modem**; then select **OK**.
- 3 Start your communication program.

Using the Modem with Windows



When you start Windows, the Mwave modem automatically starts and will be ready to use.

Using Country Selection



Important

Each country has restrictions on communication that uses telephone lines. Use this window whenever you travel to other countries.

The Country Selection window allows you to change the country name currently supported by the Mwave telephony features. When you travel to other countries and use the Mwave telephony function, you need to select the country name from the list of countries in this window.

Using the ESS AudioDrive Sound feature



This section provides information about the audio functions supported by the *ESS AudioDrive Sound* feature. The ESS AudioDrive supports for Sound Blaster Pro applications.

Note:

Do not enter suspend mode when using the audio functions.

Using the Audio Function for OS/2

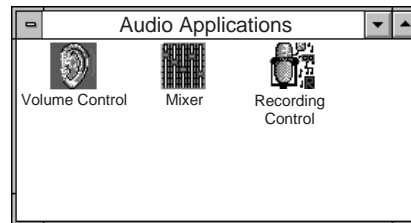


The ESS AudioDrive feature supports audio in the OS/2 environment through the Multimedia Presentation Manager/2 (MMPM/2). To use the ESS AudioDrive functions with OS/2, open the **Multimedia** folder from the OS/2 desktop.

Using the Audio Function for Windows



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



Using the MIDI/Joystick Port

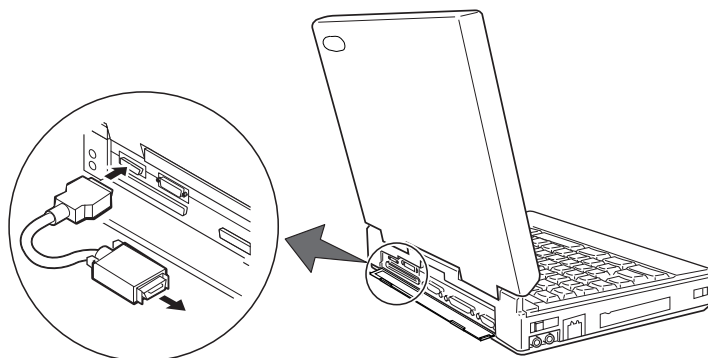
Using the MIDI/Joystick Port




The Enhanced Video model provides a MIDI/joystick port on the rear of the computer for MIDI (musical instrument digital interface) equipment or a joystick for playing games. A MIDI/joystick cable is supplied with the computer to connect a joystick. When connecting MIDI equipment, *you have to purchase a MIDI connector to connect musical instruments with MIDI ports.*

To attach the MIDI/joystick cable to the computer:

- 1 Turn off the computer and connect the MIDI/joystick cable to the computer as shown:



- 2 Connect the other side of the cable to a MINI-DIN cable or a connector that connects to your MIDI equipment or joystick.
- 3 Enable the MIDI/joystick port using the ThinkPad Features program:
 - a) Start the ThinkPad Features program.
 - b) Select the **MIDI/joystick** () icon.
 - c) Click on **Enable** for MIDI or joystick; then click on **OK**.
 - d) Restart the computer.



How to Attach a Television to the Computer

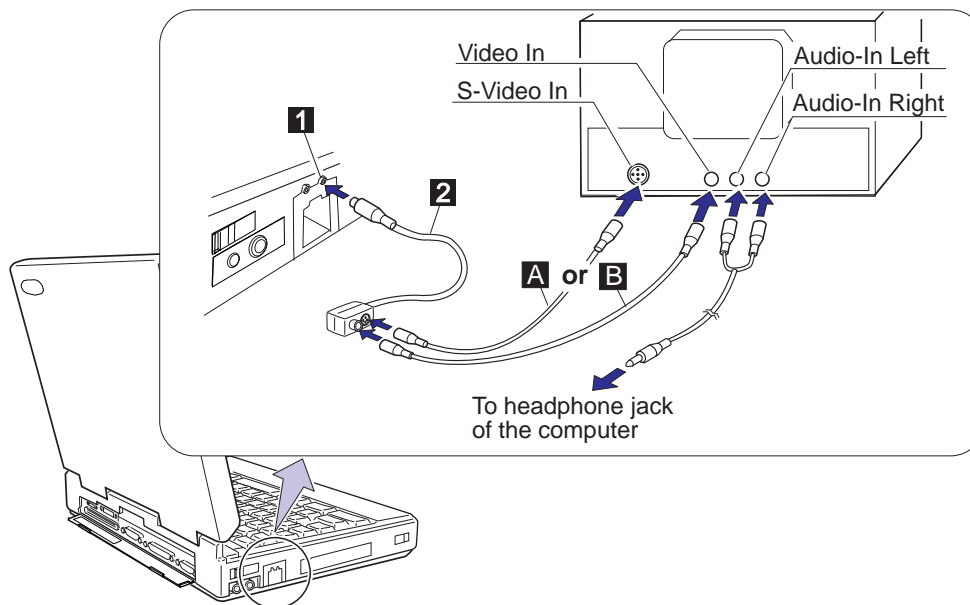
Attaching a Television to the Computer



You can attach a television (NTSC or PAL) to the computer and display the computer output on it.

To display the computer output on the attached television, do the following:

- 1 Attach the television to the computer as follows:
 - a) Turn off the computer and television.
 - b) Connect the video in-out cable 2 to the video-out port (1) at the left side of the computer; then connect your television.



Cables, except for the video in-out cable 2, are not supplied with the computer.


If you are using video equipment with S-video input, connect the S-video port of the video in-out cable to the S-video-in connector of your video equipment (A) for better picture quality.

How to Attach a Television to the Computer


If you are **not** using video equipment with S-video input, connect the composite video port of the video in-out cable and the video-in connector of your video equipment (B).

If your video equipment has only one audio input connector, use the left-audio connector on the audio cable.

2 Enable the video-out port:

- a) Start the ThinkPad Features program. and select the **Enhanced Video** () icon.
- b) Click on **Enable Video-Out**.

Note

Do not select **Enable Video-out** in the ThinkPad Features program's Enhanced video () screen, unless you have attached a television to the computer. Otherwise, the LCD screen becomes blank. In this case, use the **Fn+F7** keys to restore the LCD screen.

3 Select the appropriate television color standard: *NTSC* (default) or *PAL*. To do this, start the ThinkPad Features program and select the **Enhanced video** () icon; then select **NTSC** or **PAL**.

4 Restart the computer to make the change effective, if you switch the color standard between NTSC and PAL.

When you use a PAL television attached to the computer, you can select 800×600 and 640×480 resolution modes. When you use an NTSC television attached to the computer, you can select only 640×480 resolution mode.

How to Attach a Television to the Computer

Switching Output between the LCD and the Television

Note:

Even if you selected television output, whenever you turn on the computer, its output is *always* displayed first on the LCD.



Note:

You cannot display the computer output on the LCD and television at the same time.

When you attached a television to the computer, you can select where to display computer output using:

The **Fn+F7** keys.

The ThinkPad Features program:

- **CRT** () for the television
- **LCD** () for the LCD

Entering a `PS2 SC` command from the command prompt.

For OS/2

When you use OS/2 on a television attached to the computer, do not switch between a full-screen session and an OS/2 Presentation Manager (PM) session: Otherwise, the screen will black out or be corrupted. To avoid this, switch to the LCD using the **Fn+F7** keys, before you go to the full-screen session or return to the PM session. And then switch to the television.


How to Attach a Television to the Computer

Displaying Output on the External SVGA Monitor

Note

You can attach both a television and an SVGA monitor to the computer; however, you can display the computer output on only one of the two at the same time. To switch between those two, you need to use the ThinkPad Features program.

To display computer output on the attached external SVGA monitor after using the television, do the following:

- 1** Turn off the computer and attach the SVGA monitor to the external-monitor connector at the rear of the computer.
- 2** Turn on the computer and start the ThinkPad Features program.
- 3** Click on the **CRT** () icon; then click on **Enable External Display**.

Using the Enhanced Video/MPEG Features



The Enhanced Video feature provides the video overlay/capture and MPEG functions and video in-out port on the side of the computer to attach your home video equipment. It also provides the total image video with MPEG-1 and MPEG-2 HHR (half-horizontal resolution).

With the Enhanced Video feature, you can take advantage of the following:

MPEG playback: The MPEG playback viewer can play back many available CD-i movies, video CDs, and karaoke MPEG video titles. No DOS/CD-i game titles are currently supported. MPEG2 titles are restricted to HHR at 4 Mbps.

Video-in (video capture):

- Capture still images or motion video from the video-in port.
- Overlay motion video from the video-in port.

Video-out: To use the video-out function, see “Attaching a Television to the Computer” on page 61.

When using the video overlay/capture and MPEG functions, keep the following in mind:

You cannot enable or disable the Enhanced Video feature, or change from video-in to video-out, while the playback or capture window is open. Close the playback or capture window before you make changes.

The MPEG playback and the video-in (video capture) functions use the same hardware resources. Only one of the two functions can be used at the same time. For the same reason, two MPEG functions cannot be used at the same time.

Using the Video Overlay/Capture and MPEG Functions for OS/2 Warp



This section describes how to use the video overlay/capture and MPEG functions in OS/2.

You need at least 12MB of memory to play MPEG or to capture video from the video-in port using Video IN.

When reinstalling the video overlay/capture and MPEG device drivers, install **Video IN** from the BonusPak, preloaded on the computer, prior to the device drivers.

When the Enhanced Video feature is enabled by the ThinkPad Features program, and any of the following is being played or used, do not enter suspend mode:

- AVI file
- MPEG file
- Video CD
- CD-i
- Video-in feature

Make sure you close the application that plays any of these files before entering suspend mode.

Using the MPEG Playback for OS/2

To use MPEG playback function in OS/2, open the **Multimedia** folder and do one of the following:

When you want to play MPEG files:

- 1** Select the **Digital Video 3** icon, and click on **File** on the tool bar.
- 2** Select **Open** to specify the **MPEG** file name.
- 3** Select **OK**.

Using the Enhanced Video/MPEG Functions

Note:

The Video CD Player program cannot play some video CDs. If you cannot play your video CD, click on the **Digital Video 3** icon instead; then follow the instructions on the screen.

When you want to play a video CDs or CD-i movies from the CD-ROM drive of your computer, select the **Video CD Player** icon.

MPEG under WIN-OS/2

WIN-OS/2 does not support the playing of MPEG files. When you select **IBM MPEG-2**, **MPEG Video**, or **CD-i/VideoCD** in the Device Driver folder of Media Player, the following error message might appear:

```
IBM MPEG: This driver can NOT be loaded under Win-OS2
```

When you click on **Video CD Player**, the following error message appears:

```
Win32s Error ...
```

Ignore any error messages; then click on **OK** to exit the error message screen.

The following shows considerations when using the MPEG playback in OS/2 Warp:

When you run other tasks while an MPEG file is being played, the MPEG file image might be distorted temporarily.

The bar displaying the running time for the video CD might not be exact.

You cannot play two MPEG files at the same time. Also, you cannot play the MPEG file while using the video-in function. If you try to do this, the following error message is displayed:

```
Unable to open device 'IBM MPEG-enh Vid 3', use the  
Multimedia Set up program to ensure that the file  
is associated to a MMPM/2 device.
```

Using the Video-in (Video Capture and Video Overlay) for OS/2

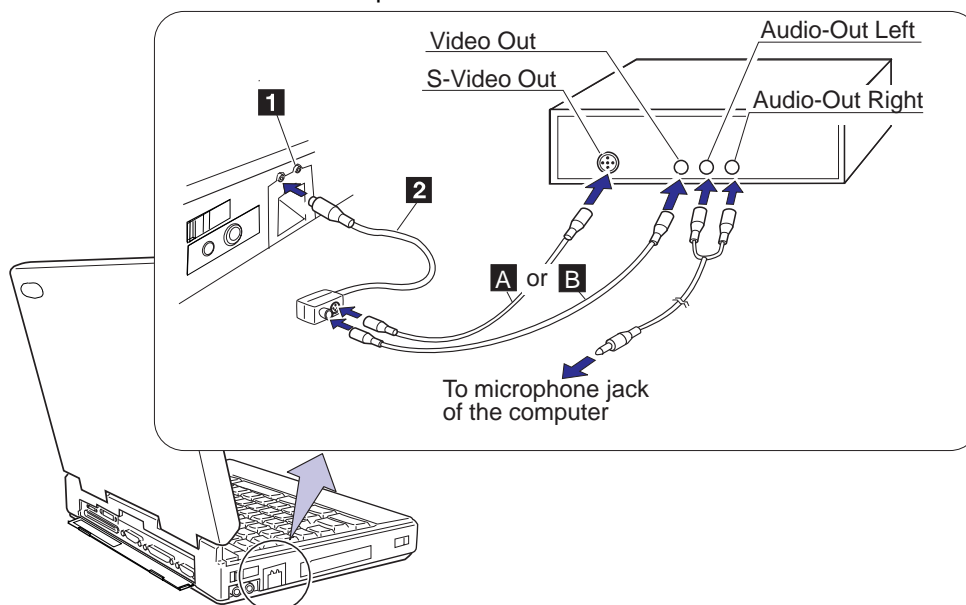
You can capture still images or motion video using video capture application **Video IN** supported by MMPM/2, and the video-in port of the computer.

Using the Enhanced Video/MPEG Functions

To capture motion video:

- 1 Turn off the computer and connect the video in-out cable 2 to the video-in port () 1 of the computer; then connect your video equipment.

Cables, except for the video in-out cable 2, are not supplied with the computer.



If you are using video equipment with S-video output, connect the S-video port of the video in-out cable to the S-video-out connector of your video equipment **A** for better picture quality.

If you are **not** using video equipment with S-video output, connect the composite video port of the video in-out cable and the video-out port of your video equipment **B**.

If your video equipment has only one audio output connector, use the left-audio connector on the audio cable for connection.

- 2 Check the Enhanced Video status.
 - a) Open the ThinkPad Features program and select the **Enhanced Video** () icon.

Using the Enhanced Video/MPEG Functions

b) If **Video capture/MPEG status** is enabled, go to step 4 on page 69.

If not, continue to the next step.

c) Click on **Advanced**; then click on the **1st IRQ** list box and assign an IRQ for the device. (The default IRQ is 11.)

3 Restart the computer to make the IRQ setting take effect.

4 Open the **Multimedia** folder in OS/2.

5 Click on the **Video IN Recorder** icon.

For more information on how to use video-in function in OS/2, use *Help*.

Note

When you use the video-in recorder in OS/2, you can use only **Ultimotion Real-Time Compression** as the compression type. Other compression types are not supported even if they are listed on the screen.

The following shows considerations when using the video-in feature or video capture in OS/2:

Only one capture window can be open at a time.

Video-IN Recorder is an OS/2 MPM/2 application for video capture and video overlay. Its video capture size (width and length) is limited to up to 320×240 pixels (for a NTSC video source) or 384×288 pixels (for a PAL video source).

Also, largesize capture, for example, 640×480 for NTSC or over 768×576 for PAL, might be not available with your computer. If you try capturing large images, the captured image will not look as expected, or the capture application will be suspended with the following error message:

```
SWVR118: The recording initialization failed return code is
          5 8 - system out of memory
```

If you have this error message, close Video-IN; then restart it. Before trying again, set the capture size to a smaller one.

Using the Enhanced Video/MPEG Functions

Common Restrictions for Video Capture/Overlay and MPEG Playback

You must be aware of the following when using the video capture/overlay functions or the MPEG playback functions. Otherwise, the video image might not be visible on the computer screen or the television, or the computer might become locked up or suspended. In these cases, close the Video-IN Recorder or Digital Video Player and restart it, or restart the computer.

You can use only one video application at a time—for example, you cannot capture video while playing back an MPEG file. If you use multiple applications, an error message appears on the screen and the computer might become locked up or suspended. In that case, restart the computer.

Do not enter suspend mode while attempting video capture or overlay.

Do not use the Enhanced Video functions (such as capturing or overlaying video using the Video-IN Recorder, or playing back the MPEG files using the Digital Video Player) in the following display modes:

- 1024×768 resolution, 256 color depth, and 75Hz refresh rate
- 1024×768, 65,536, and 75Hz
- all 1280×1024 resolution mode

Otherwise, the image might be corrupted.

Do not select virtual screen in the ThinkPad Features program.

Video overlay and capture are not supported in virtual screen mode, such as 1024×768 on an LCD or 800×600 on a television.

Using the Video Overlay/Capture and MPEG Functions for Windows 3.11 and Windows 95



This section describes how to use the video overlay/capture and MPEG functions in Windows 3.11 and Windows 95.

To use the MPEG playback in Windows 3.11: See “Using the MPEG Playback for Windows 3.11.”

To use the MPEG playback in Windows 95: See “Using the MPEG Playback for Windows 95” on page 73.

To use the video-in (video capture and overlay) in Windows 3.11 and Windows 95: See “Using the Video-in (Video Capture and Video Overlay) for Windows 3.11 and Windows 95” on page 75.

Using the MPEG Playback for Windows 3.11



To use MPEG playback in Microsoft Windows 3.11, do the following:

- 1** Open **Media Player**.
- 2** Click on **Device**.
- 3** Do one of the following:
 - When you want to play MPEG files, select **IBM MPEG-2**.
 - When you want to play a movie or CD, select **CD-i/VideoCD**.
- 4** When you want to play a video CD or CD-i movie from the CD-ROM drive of your computer, click on the **Play** (▶) icon. Otherwise, select the MPEG file you want to play; then click on the **Play** (▶) icon.

You can also use the IBM Video CD Player program to play a video CD or CD-i in Windows. For information on how to use this application, *Help* is available in the Video CD Player screen.

Using the Enhanced Video/MPEG Functions

The following are considerations when using the MPEG playback function in Windows 3.11:

Smart drive caching of the CD-ROM drive

To be able to play CD-i movies, 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.

Video CD Player program

- The chapter-control-related functions might not work with some karaoke CDs.
- Check the following if you do not have enough audio volume with the Video CD Player program:
 - The audio volume of the Video CD Player program
 - The WAVE and MASTER volume control of the Mwave Audio Control menu
 - The speaker volume control on the computer

Drive letter for MCI* video CD/CD-i and Video CD Player

To change the drive letter for MCI video CD/CD-i and Video CD Player:

- 1** Select **Control Panel** from the Main folder.
- 2** Select **Drivers**.
- 3** Select **[MCI] CD-i/VideoCD**.
- 4** Click on **Setup**.
- 5** Change the drive letter.

Using the Enhanced Video/MPEG Functions

Using the MPEG Playback for Windows 95



The MPEG feature enables hardware to decode MPEG playback files under playback application programs.

Important—Before Using Video CDs in Windows 95

When you play your video CDs, the playback speed might be slow or playback might stop intermittently. To get a smooth playback of video CDs, disable the current CD-ROM driver and install the CD-ROM driver for DOS/Windows. Do the following:

- 1** Start Windows 95.
- 2** Disable the 32-bit storage driver:
 - a) Select **My Computer**, **Control Panel**, and then **System**.
 - b) Click on the **Performance** tab; then click on the **File System** button.
 - c) Click on the **Troubleshooting** tab.
 - d) Check **Disable all 32 bit protect-mode disk drivers**.
 - e) Click on **Apply**, **OK**, and then **Close**.
 - f) Select **Yes** to the question “Do you want to restart your computer now?” to make the change effective.
- 3** Install the CD-ROM device driver for DOS/Windows:
 - a) Insert the ThinkPad CD-ROM Driver Diskette in the diskette drive.
 - b) Select **Start** and **Run**.
 - c) Type `A:\UINSTALL`; then click on **OK**.
 - d) Follow the instructions on the screen.
 - e) After the installation is complete, remove the diskette; then restart the computer.

You can play video CDs at a normal speed.

Note: This procedure might cause the following:

- Some functional restrictions (such as the auto sense function)
- Decreasing computer performance

Using the Enhanced Video/MPEG Functions

To use MPEG playback in Windows 95, do the following:

- 1 Open **Media Player**.
- 2 Click on **Device**.
- 3 Do one of the following:
 - When you want to play MPEG files, select **IBM MPEG-2**.
 - When you want to play a movie or CD, select **CD-i/VideoCD**.
- 4 When you want to play a video CD or CD-i movie from the CD-ROM drive of your computer, click on the **Play** (▶) icon. Otherwise, select the MPEG file you want to play; then click on the **Play** (▶) icon.

You can also use the IBM Video CD Player program to play a video CD or CD-i in Windows. For information on how to use this application, *Help* is available in the Video CD Player screen.

The following are considerations when using the MPEG playback function in Windows 95:

CD-i support

Windows 95 does not support playing of CD-i movies.

Video CD Player program

- The chapter-control-related functions might not work with some karaoke CDs.
- If you do not have enough audio volume with the Video CD Player program, check:
 - The audio volume of the Video CD Player program
 - The WAVE and MASTER volume control of the Mwave Audio Control menu
 - The speaker volume control on the computer

Drive letter for MCI Video CD/CD-i and Video CD Player

To change the drive letter for MCI video CD/CD-i and Video CD Player:

- 1 Select **Control Panel** from the **My Computer** folder.

Using the Enhanced Video/MPEG Functions

- 2** Click on the **Multimedia** icon.
- 3** Select **Advanced**.
- 4** Click on **Media control device**.
- 5** Click on **[MCI] CD-i/VideoCD**.
- 6** Confirm that "Use this Media Control device" is selected; then select **Settings**.
- 7** Change the drive letter.

Using the Video-in (Video Capture and Video Overlay) for Windows 3.11 and Windows 95



You can use the capture applications supported by Video for Windows** and your computer. You can also overlay motion video from the video-in port by using applications supported by MCI (Media Control Interface) overlay.

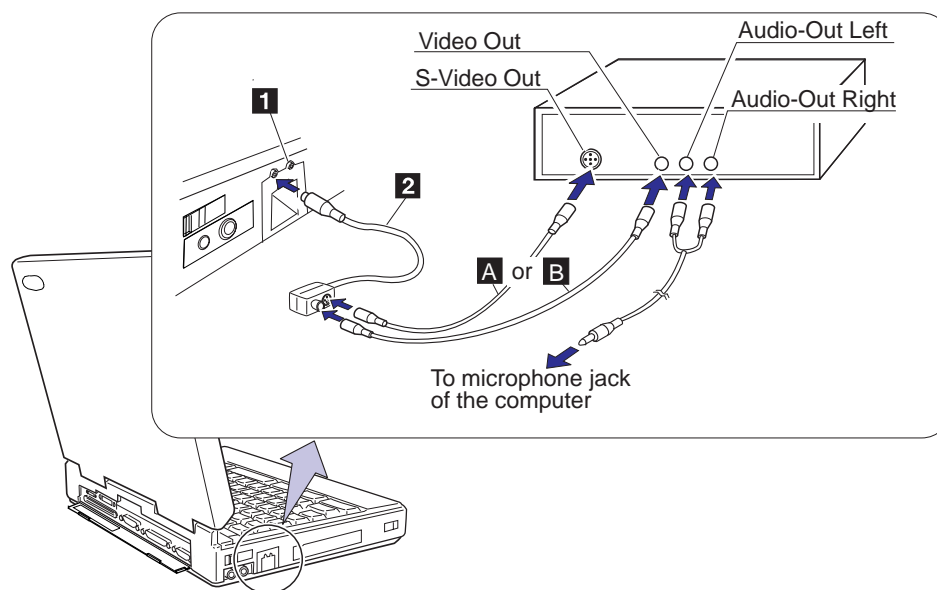
Notes:

Only one capture window can be open at a time.
When you use video capture with the overlay screen on, the capturing screen might be distorted. However, the data is correctly captured.

To capture motion video:

- 1** Turn off the computer.
- 2** Connect the video in-out cable **2** to the video-in port (□) **1** of the computer; then connect your video equipment.

Using the Enhanced Video/MPEG Functions




Cables, except for the video in-out cable 2, are not supplied with the computer.

If you are using video equipment with S-video output, connect the S-video port of the video in-out cable to the S-video-out connector of your video equipment A for better picture quality.

If you are **not** using video equipment with S-video output, connect the composite video port of the video in-out cable and the video-out port of your video equipment B.

If your video equipment has only one audio output connector, use the left-audio connector on the audio cable for connection.

- 3 Check the Enhanced Video status.
 - a) Open the ThinkPad Features program.
 - b) Select the **Enhanced Video** () icon.
 - c) If **Video capture/MPEG status** is enabled, go to step 5 on page 77.
If not, continue to the next step.

Using the Enhanced Video/MPEG Functions

- d) Click on **Advanced**.
 - e) Click on the **1st IRQ** list box and assign an IRQ for the device. (The default IRQ is 11.)
- 4** Restart the computer to make the IRQ setting take effect.
 - 5** Start the video capturing application program.
If you use the Digital Video Producer (DVP) program, see “Using the Digital Video Producer for Windows.”
If you use the Media Player, see “Using the Overlay with Media Player for Windows” on page 81.

Using the Digital Video Producer for Windows



Digital Video Producer (DVP) is an application program that has the following functions:

- Capturing, compressing, and building a video file
- Capturing a still image (see page 80)

Capturing, Compressing, and Building a Video File

This sample procedure describes how to capture a video clip, import it in DVP, and build a compressed .AVI file that you can use in a presentation and other computer-based materials. The video file created in this example has the following characteristics. (You need approximately 17MB of hard disk space to capture a video file.)

Frame size	160 pels by 120 pels
Frame rate	15 frames per second
Number of seconds	30 seconds
Audio sampling rates	8-bit, 11.025 kHz, mono

Important

Make sure your video source (such as a VCR or video camera) is correctly connected to your computer before you start the video capture. If you select overlay mode from the Options menu in DVP Capture, you can verify the connection and look at your video both before and during the capture.

Using the Enhanced Video/MPEG Functions

To capture, compress, and build a video file:

- 1 Start DVP; then select **Video Capture** from the Tools menu.
- 2 Select **Set Capture File** from the File menu.
- 3 Enter a name for your capture file (such as CAPTURE.AVI) and specify the directory in which to save the file; then click on **OK**.
- 4 Select **Allocate File Space** from the File menu and enter 17MB as the hard disk space to set aside for your capture file; then click on **OK**.
- 5 Select **Audio Format** from the Options menu.
- 6 Select these sound options: **8-bit**, **11kHz**, and **Mono**. Then click on **OK**.
- 7 Select **Video Format** from the Options menu.
- 8 Select **160×120** for Image Dimensions and **Overlay YUV422** or **Compressed YUV422** for Image Format; then click on **OK**.
- 9 Select **Video Source** from the Options menu, the type of video connector your video source uses (video or S-video), and the type of video signal (NTSC or PAL).

To see the supported color standard list of countries, see the ThinkPad Features program help.

- 10 Select **Settings** from the Capture menu and specify the following options:

Frame Rate 15 frames per second

Enable Capture Time Limit 30 seconds

Capture Storage Capture to Disk

End Capture Using Escape Key

- 11 Check **Capture Audio**; then click on **OK**.
- 12 To start the video capture, select **Video** from the Capture menu.

DVP Capture saves the file with the name you specified in step 3. You can then save the file to a new name by choosing **Save Captured File As** from the File menu.

Using the Enhanced Video/MPEG Functions

- 13** Select **Exit** from the File menu to close DVP Capture and return to DVP.

DVP automatically imports the video file you just captured and displays it in the Media window.

- 14** Drag your video clip from the Media window onto the tick bar (directly above the video A track on the timeline).

Dragging a clip onto the tick bar is an efficient way to lay out your clip because the video and audio information in the file appears automatically on both the video A and audio A tracks. You can also lay out a video clip on the timeline by dragging it first from the Media window to a video track, and then from the Media window to an audio track.

- 15** Select **Compression** from the Video menu to specify the compression/decompression (CODEC) routine you want to use.

- 16** Select **Intel** Indeo** Video R3.2** for Compressor and accept the default values for Key Frame Every and Data Rate; then click on **OK**.

- 17** Select **Build** from the Video menu. Enter the name and location of your final .AVI file (making sure to keep the .AVI extension); then click on **Build**.

The Build Progress dialog box opens, so you can look at the percentage-complete bar and the preview window to track the progress of the build. Building a video can take anywhere from a few minutes to several hours, depending on its length and complexity, and on the type of compressor you select.

Using the Enhanced Video/MPEG Functions

Capturing a Still Image

This section describes how to capture a still image.

Important

Be sure your video source (such as a VCR or video camera) is correctly connected to your computer before you capture the still image. If you select overlay mode from the Options menu in DVP Capture, you can verify the connection and look at your image before you capture it.

To capture a still image, whose frame size is 320 pels by 240 pels:

- 1 Start DVP; then select **Video Capture** from the Tools menu.
- 2 Select **Video Format** from the Options menu; then select **320 × 240** for Image Dimensions and **Overlay YUV422** or **Compressed YUV422** for Image Format; then click on **OK**.

For the best color display, make sure that you install and select the 65536 (16-bit) video display driver. For detailed information about the display driver, see the *User's Guide*.

- 3 Select **Video Source** from the Options menu; then select the type of video connector your video source uses (video or S-video) and the type of video signal (NTSC or PAL) for Video Standard. Then click on **OK**.

To see the supported color standard list of countries, see the ThinkPad Features program help.

- 4 When the image you want to capture appears in the Preview window, select **Single Frame** from the Capture menu.
- 5 Select **Save Single Frame** from the File menu to save it as a bitmap file (with a .BMP extension).

Using the DVP Help System

To learn more about DVP or DVP capture, use the DVP online Help system.

Note:

Because many paint programs, such as Windows Paintbrush, do not yet support 16-bit still images, you will typically capture 8-bit or 24-bit still images.

Using the Enhanced Video/MPEG Functions

Using the Overlay with Media Player for Windows



To view a video by using the overlay function with Windows Media Player, do the following:

- 1 Open **Media Player** in Windows.
- 2 Click on **Device**.
- 3 Select **MCI OVERLAY Driver**.

Operational Restrictions

The following shows restrictions when using the Enhanced Video functions in Windows 3.11 or Windows 95:

You can use only one video application at a time—for example, you cannot capture video while playing back an MPEG file.

Some types of video CDs cannot be viewed.

Video overlay, capture, and MPEG playback functions do not work under the following video modes:

- 1024×768 resolution, 256 color depth, and 75Hz refresh rate
- 1024×768, 65,536, and 75Hz
- 1280×1024 and 256
- All 16 color modes

Do not select virtual screen in the ThinkPad Features program.

Video overlay, capture, and MPEG playback functions are not supported in virtual screen mode, such as 1024×768 on an LCD or 800×600 on a television.

For Windows 3.11 only: When you load QuickTime** for Windows as the MCI driver, the MPEG video might not be played correctly. To avoid this, open **Control Panel** in the Main window and click on **Drivers**; then remove QuickTime for Windows from the driver list.

Using the Enhanced Video/MPEG Functions

Chapter 4. Using Battery Power

This chapter describes battery pack operations.


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Charging the Battery Packs

Charging the Battery Packs

To charge the battery pack, install the battery pack in the computer and connect the AC Adapter.

When charging starts, the battery status indicator looks like this:

. The charge indicator (▶) turns off when the battery is fully charged.

Note:

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

Hints

You can use an optional battery pack and install it in the UltraBay and have two battery packs for longer battery-powered operation.

When you have two battery packs installed in the computer and start charging, charging starts on the battery pack in the battery pack bay. When it is fully charged, charging starts on the battery pack installed in the UltraBay.

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 discharge and recharge it three to six times to maximize battery operating time, and to keep battery status accuracy.

The *Quick Charger* is available as an option to charge the battery packs.

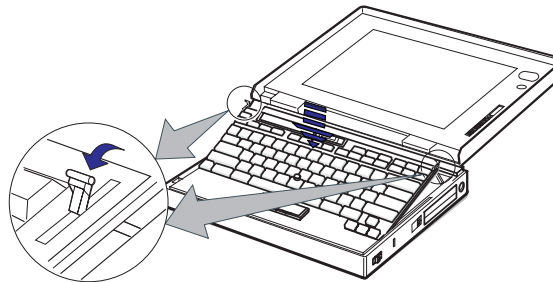
Replacing the Battery Pack

The battery pack can be replaced with computer power on or off. To replace the battery pack without turning off the computer, follow these instructions:

Important


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

- 1 Open the LCD so it lies flat; then slide the keyboard raiser on the side of the computer toward you so the keyboard lies flat on the computer.



Attention:


Make sure the security latch at the right side of the computer is unlocked. (See step 2 on page 7.)

- 2 Open the keyboard.
The computer automatically enters suspend mode. Wait for the beep, which indicates that the computer has completely entered suspend mode.
- 3  Go to step 5 on page 86.

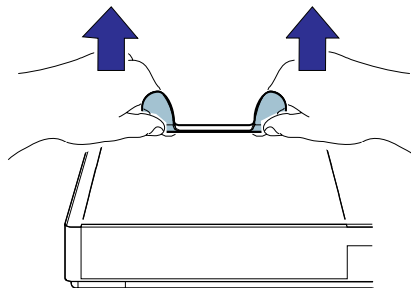
Replacing the Battery Pack

Attention:

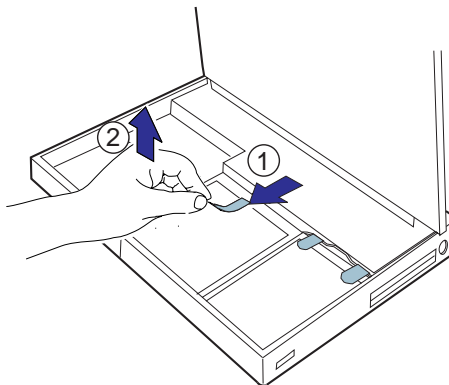
Make sure the CD-ROM tray is closed and no CD is in the CD-ROM drive.


-  Lift the handle on the CD-ROM drive with the plastic tape, and remove the CD-ROM drive.


Some pressure might be needed to remove the CD-ROM drive if it is tight.



- Pull the battery pack toward the front of the computer; then quickly remove the battery pack and replace it with a fully charged spare.



-  Go to step 8.

-  Reinstall the CD-ROM drive.

Make sure the CD-ROM handle snaps into place after installing the CD-ROM drive.

- Close the keyboard. The computer resumes normal operation.

If the computer does not resume normal operation, press the **Fn** key.


Attention:

Do not press on the middle part of the CD-ROM drive.


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. Also, the remaining battery power in digits is displayed.

Note:

The battery-status indicator () stands for the secondary battery pack installed in the UltraBay.

Attention:






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

Note:

When you set the alarm with the ThinkPad Features program, you hear three beeps the moment this indicator starts blinking.

Note:

When this indicator is blinking, the remaining battery indicator (%) does not always show the correct percentage. In that case, repeat discharging and charging of the battery pack at least three times.

Battery Status Indicator	Remaining Power (Percentage)	Status/Action Required
	100%–Less than 25%	Enough power remains for computer operation.
	0%	Empty
 (Blinking)	Approximately 10 minutes remains for operation.	The battery pack is almost discharged and is about to enter the low-battery condition. Take either of the following actions immediately: Connect the AC Adapter to the computer. Replace the battery pack with a fully charged spare If corrective actions are not taken within about 30 seconds, the computer will enter suspend mode.
	Percentage of charging completed.	The battery pack is being charged (only appears when the AC Adapter is connected).
	Percentage of discharging completed.	The battery pack is being discharged (or is being used).
Off (Not displayed)	—	The battery pack is not installed. The computer is turned off.

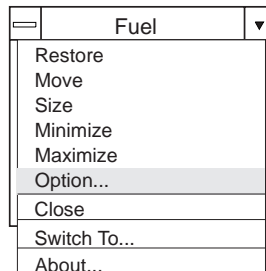
Using the Battery Status Indicator

Remaining Battery Indicator shows the amount of remaining battery power by a percentage (100%), day (2^d), hour (12^h), or hours and minutes (2:50).

When using a secondary battery, the percentage indicates the total remaining power for both battery packs, up to 100%.

Hints

To change the display of remaining power between hours and percent, select **Option...** from the pull-down menu of the Fuel-Gauge program; then click on your choice to display the remaining power in either hours or percent.



Using the Fuel-Gauge Program



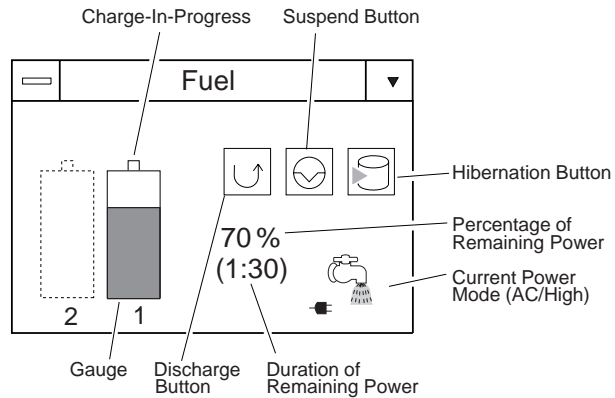
The Fuel-Gauge program displays the following battery-pack conditions on the screen:

- Power mode
- Battery status
- Suspend or hibernation options
- Discharge option

To install the ThinkPad Features program with the Fuel-gauge program:

→ Chapter 7.

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



For more information on how to use Fuel-Gauge program, see the online help. (Click the button at the left upper corner of the Fuel-Gauge window.)

Preserving Battery-Pack Life

Discharging the Battery Pack for OS/2 and Windows

Note:

Repeatedly charging a battery pack that has not been completely discharged shortens the battery operating time. To preserve battery operating time, discharge the battery pack completely; then recharge it.

When the battery pack needs to be discharged, the computer prompts you with a message. To discharge the battery, connect the AC Adapter to the computer and click on the discharge button (⏻) on the Fuel-Gauge program.

The discharge-in-progress (⏻) appears above the gauge symbol, and the charge button (⏻) appears in place of the Discharge button.

You can use the computer while the battery pack is discharging; however, do not enter suspend mode or turn off the computer until the discharge is complete. Complete discharging of the battery pack takes time.

When the battery pack is completely discharged, charging starts automatically.

To cancel discharging, click on the charge icon (⏻).

Preserving Battery-Pack Life

To preserve the life of the battery pack:

Attention:

Make sure the battery pack power is completely used before you recharge it. Recharging a battery pack that is not completely discharged can shorten battery life.

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.

Discharge the battery pack occasionally by using the Fuel-Gauge program.

Turn off the computer whenever it is not in use.

Maximizing Battery-Powered Operation

To save battery power:

Use Advanced Power Management (APM)

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 preloaded operating system, APM is already installed correctly.

Decrease the LCD brightness

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

Use the Battery Power-Management function

Using the Battery Power-Management Function

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 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 the ThinkPad Features program online help.

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

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

The following are the three power-saving modes:

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

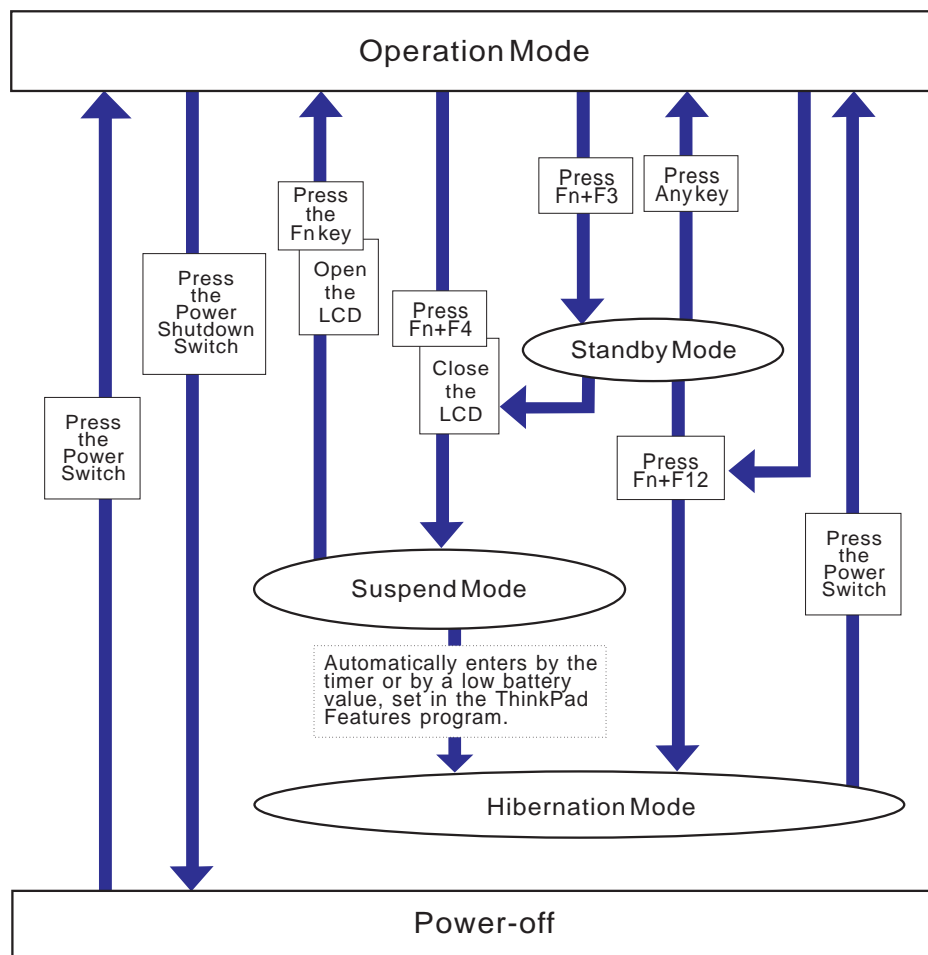
Suspend Mode You can enter suspend mode for somewhat longer times when you are away from your computer.

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

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

Using Power Management

The following figure shows the operations required when the computer moves from a power-off condition to operation mode, and vice versa.



Using Power Management

Standby Mode

In standby mode, the LCD (and external monitor output) turns off. The computer immediately resumes normal operation when you press any key or use any pointing device.

To enter standby mode, press **Fn+F3**. You can also set the standby timer using the ThinkPad Features program. (To return to normal operation, press any key.)


Suspend Modes


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

- Suspend mode
- RediSafe suspend mode

To enter suspend mode, do one of the following:

- Press **Fn+F4**.
- Close the LCD of the computer.
- Open the keyboard of the computer.
- Set the suspend timer using the ThinkPad Features program.

When the computer is entering suspend mode, the suspend indicator lamp  blinks first, and then stays on (in green) with a beep.

The power indicator lamp  turns off.

To return to normal operation, press the **Fn** key.

Suspend mode

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


Using Power Management

RediSafe suspend mode

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

If all battery power is used and the computer turns off during RediSafe suspend mode, install a fully charged battery pack or connect the AC Adapter; then press the power switch to resume operation. All tasks are restored. *Create the hibernation file before using this mode.* (See “Creating the Hibernation File” on page 98.)

To enable RediSafe suspend mode, first, create the hibernation file; then set **RediSafe suspend** in the ThinkPad Features program's

Battery () menu. For more information, see the ThinkPad Features program online help, or use PS2 commands.

Using Power Management

Considerations for Suspend Mode

Consider the following before using suspend mode.

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

- DOS Version 7.0
- OS/2 Warp Version 3
- Microsoft Windows Version 3.11 with DOS Version 7.0
- Microsoft Windows 95
- 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 190.

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

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

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.

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

Standby mode:

➔ Page 94.

Using Power Management


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

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

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

When the computer is attached to the Dock II and the “Suspend/hibernate while docked” option is disabled, the computer enters standby mode instead of suspend mode.



Note:

To disable the “Suspend/hibernate while docked” option, open the ThinkPad Features program and click on the **Docking Station** () option.

Note:

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

For OS/2 or Windows:

1. Click on the **Battery** () icon.
2. Click on the **Suspend/Resume option** () icon; then select the **Resume on incoming call** option.

For DOS: Enter PS2 RI E

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

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

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

Using Power Management

Hibernation Mode

Note:

With a base memory of 8MB, it takes approximately 10 seconds to enter hibernation mode and 18 seconds to resume normal operation. (The time to enter or exit hibernation mode depends on the computer memory size.)

In hibernation mode, all tasks are stopped and memory data and the current status of the computer are stored on the hard disk drive; *then power is turned off*. No battery power is used. When power is turned on again, the computer automatically restores the tasks and resumes normal operation.

To enter hibernation mode, press **Fn+F12**. To return to normal operation, turn on the power switch.

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

Creating the Hibernation File

Attention:

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

When installing an operating system or installing additional computer memory, you must create a hibernation file on the hard disk drive to use the hibernation mode.

Note:

You can create a hibernation file on the hard disk drive in the main hard disk drive bay.

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

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

See the ThinkPad Features program online help or PS2 command help on how to create the hibernation file.

Considerations for Hibernation Mode

Consider the following before using hibernation mode:

Using a docking station or a particular PC Card can disable hibernation mode.

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

The computer uses battery power to enter hibernation mode. Therefore, it reserves some battery power when it is set to enter hibernation mode when a low-battery condition occurs.

Using Power Management



When you enter hibernation mode while playing music CDs or multisession photo CDs, you will not return to where you left off after resuming normal operation.

Note:

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

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

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

- 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.

When the computer enters hibernation mode while attached to the docking station, it may not resume correctly.

Using Power Management

Chapter 5. Protecting Your Computer

This chapter provides information about how to protect your computer and its internal devices.

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Using a Power-On Password

Using Passwords

There are three types of passwords you can use to protect your computer and the removable hard disk drive:

The *power-on password* protects your computer from being used by unauthorized persons.

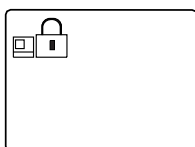
The *hard disk password* protects the data on your removable hard disk drive from being accessed by unauthorized persons.

The *supervisor password* protects the system information in Easy-Setup from being modified and your removable hard disk drive from being used 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 116.

Power-On Password



If a power-on password is set, the password prompt (🔒) appears on the screen whenever you turn on the computer and reminds you to enter the password.

Setting a Power-On Password

To set a power-on password:

Note:

If **Initialize** in the Config menu, **Password**, or **Start up** cannot be selected when using Easy-Setup, a supervisor password is set. You must enter the supervisor password instead of the power-on password to use all Easy-Setup functions.

- 1 Start Easy-Setup by pressing and holding **F1** and then turning on the computer.
- 2 Select the **Password** icon and then the **Power-On** icon (🔒).

Using a Power-On Password

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**.

Do Not Forget Your Power-On Password!

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

Once you set the password, you cannot change or remove it in Easy-Setup; you must change or remove a password at the password prompt screen that appears when you turn on the computer. See “Changing a Power-On Password” on page 104 or “Removing a Power-On Password” on page 104.

Entering a Power-On Password

Notes:

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.

To resume from standby mode when the computer is attached to the Dock I or Dock II, you might need to enter the power-on password.

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, type your power-on password and 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.

Using a Power-On Password

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. To change a power-on password, at the power-on password prompt (🔒) screen, do the following:

- 1** Type your *current* power-on password; then press the **Spacebar**.
- 2** Type the *new* password; then press the **Spacebar**.
Use no more than 7 characters.
- 3** 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.

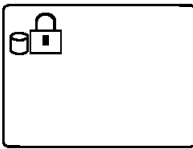
Do Not Forget Your Power-On Password!

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

Removing a Power-On Password

You must remove your power-on password at the password prompt that appears when you turn on the computer. To remove a power-on password, at the power-on password prompt (🔒), type your current password, press the **Spacebar**, and then press **Enter**.

Hard Disk Password



The hard disk password helps you protect the information stored on your removable hard disk drive. Even if your hard disk was removed from the computer, the information stored in your hard disk cannot be accessed without the hard disk password.

Note:

The hard disk password is stored on the hard disk drive when you set the hard disk password, while the power-on password is stored in the nonvolatile memory of the computer.

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 do 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.

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 and then the hard disk password prompt appears on the screen. Enter the correct passwords.

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

Using a Hard Disk Password

Setting a Hard Disk Password

Note:

If **Initialize** in the Config menu, **Password**, or **Start up** functions cannot be selected when using Easy-Setup, the supervisor password is set. You must enter the supervisor password instead of the power-on password to use all Easy-Setup functions.

SelectaDock Docking System:

➔ Page 155.

Note:

HDD-1 represents a main hard disk password and **HDD-2** represents a secondary hard disk (installed in the UltraBay) password.

Note:

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

To set a hard disk password:

Note

Before you set a hard disk password for the hard disk drive in the SelectaDock Docking System attached to the computer, you need to move that drive to the main hard disk drive bay of the computer from the SelectaDock Docking System. You cannot set a password for a hard disk installed in the SelectaDock Docking System.

- 1 Start Easy-Setup by pressing and holding **F1** and then turning on the computer.
- 2 Select the **Password** icon and then select **HDD-1** (🔒¹) or **HDD-2** (🔒²) according to the hard disk type you want to set.
- 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**.

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**. Neither an IBM authorized reseller nor IBM marketing representative can make the hard disk drive usable.




Using a Hard Disk Password

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.

 requests the hard disk password for the hard disk in the main hard disk drive bay of the computer,  requests the hard disk password for the hard disk in the UltraBay of the computer, and  requests the hard disk password for the hard disk in the UltraBay of the SelectaDock Docking System attached to the computer.

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.

Using a Hard Disk Password

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 104.

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 106.
- 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 in the hard disk drive**. Neither an IBM authorized reseller nor IBM marketing representative can make the hard disk drive usable.

Using a Hard Disk Password

Removing a Hard Disk Password

The procedure to remove a hard disk password depends on whether or not 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 104.

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

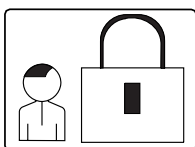
- 2** If you need a power-on password, reset it in Easy-Setup.

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 a Supervisor Password

Supervisor Password



The supervisor password helps you protect classified information. A supervisor password:

- Secures the system information stored in Easy-Setup.

- Prohibits modification to the hardware.

- Stops the computer after a POST error to restrict access to the system information.

- Overrides the power-on password. (The supervisor password has priority over the power-on password.)

Note:

The supervisor password has priority over the power-on password. You can start the computer with the supervisor password even if you do not know the power-on password.

If a supervisor password is set, you are prompted with a **power-on** icon (🔒) to enter the supervisor password when entering the Easy-Setup program and when a POST error occurs. You can start all normal operations for the computer except Easy-Setup without the supervisor password.

Using Both Supervisor and Hard Disk Passwords

When a supervisor password is set, the same password is automatically set for the hard disk password.

When you change or remove the supervisor password, the hard disk password also is changed or removed.


Setting a Supervisor Password

If in addition to the hard disk in the main hard disk drive bay, another hard disk is installed in the UltraBay of the computer, you can set the same supervisor password for that hard disk as the supervisor password for the main hard disk. However, if another hard disk is installed in the UltraBay of the SelectaDock Docking System, you cannot set the same supervisor password for it. (See page 113.)

To set a supervisor password:

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

Using a Supervisor Password

- 2 Select the **Password** icon and select the **Supervisor** icon ().
- 3 Type your desired supervisor 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 supervisor password again to verify it; then press **Enter**.

Do Not Forget Your Supervisor Password!

Note the password and keep it in a safe place. If you forget your supervisor password, there is **no way to reset your password or recover data from the hard disk**. You have to take the computer to an IBM authorized reseller or IBM marketing representative to have the system board replaced. Proof of purchase is required, and an additional charge might be required for the service. Neither an IBM authorized reseller nor IBM marketing representative can make the hard disk drive usable.

If you are using more than one hard disk drive, see page 114.

Entering a Supervisor Password

To enter your supervisor password, at the power-on password prompt, type your supervisor password; then press **Enter**.

*When the password is entered correctly, **OK** appears.*

*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 Supervisor Password

To change your supervisor password:

Using a Supervisor Password

- 1 Turn off the computer and wait at least 5 seconds; then turn it on.
- 2 Start Easy-Setup by pressing and holding **F1** and then turning on the computer.
- 3 Type your *current* supervisor password at the power-on prompt (🔒); then press **Enter**.
- 4 Select the **Password** icon from the *Easy-Setup* menu.
- 5 Select the **Supervisor** icon; then type your *current* supervisor password and press the **Spacebar**.
A window appears so you can enter a new password.
- 6 Type the *new* password; then press **Enter**.
- 7 Type the *new* password again for verification; then press **Enter**.

Do Not Forget Your Supervisor Password!

Note the password and keep it in a safe place. If you forget your supervisor password, you have to take the computer to an IBM authorized reseller or IBM marketing representative to have the system board replaced. Proof of purchase is required, and an additional charge might be required for the service.


If you forget your supervisor password, there is **no way to reset your password or recover data from the hard disk**. Neither an IBM authorized reseller nor IBM marketing representative can make the hard disk drive usable.


If you are using more than one hard disk drive, see page 115.

Using a Supervisor Password

Removing a Supervisor Password

To remove the supervisor password:

- 1** Turn off the computer and wait at least 5 seconds; then turn it on.
- 2** Start Easy-Setup by pressing and holding **F1** and then turning on the computer.
- 3** When the power-on prompt () appears, type your current supervisor password; then press **Enter**.
- 4** Select the **Password** icon from the *Easy-Setup* menu.
- 5** Select the **Supervisor** icon; then type your current password and press the **Spacebar**.
- 6** Press **Enter** at the blank box.
- 7** Press **Enter** again at the verification screen.

When the supervisor password is removed, the lock in the **Supervisor** icon is unlocked () and you can select the **HDD** icons.

If you are using more than one hard disk drive, see page 115.

Using Several Hard Disk Drives with the Supervisor Password

Because the supervisor password automatically sets a hard disk password, you must set a supervisor password for each hard disk drive you are using in the main hard disk drive bay.

If you install a hard disk in the UltraBay of the computer or the SelectaDock Docking System, you must set the same supervisor password for those hard disk drives. You can set the same supervisor password for the hard disk in the main hard disk as the one in the UltraBay of the computer. But you need to move the hard disk in the SelectaDock Docking System to the main hard disk drive bay to set a supervisor password for that hard disk.

To change or remove a supervisor password when you are using several hard disk drives, you must change or remove the hard disk password for each hard disk drive.

Using a Supervisor Password

Setting a Supervisor Password when Using Several Hard Disk Drives:

To set a supervisor password when using more than one hard disk drive on your computer:

To set a supervisor password:

➔ Page 110.

To install the hard disk drive:

➔ Page 132.

- 1** Set a supervisor password on your computer.
- 2** Install the hard disk drive that you want to set the supervisor password for, in the main hard disk drive bay (to the right of the battery pack).
- 3** Turn on the computer. A 158 error appears.
- 4** Press **Enter**.
- 5** Type your supervisor password at the power-on password prompt.

If an error code 158 appears, press **Enter** to go to the Easy-Setup password screen.
- 6** Select the **Supervisor** icon; then press **Enter**.

The supervisor password sets the hard disk password on the hard disk drive.
- 7** Turn off the computer. Repeat steps 2 through 7 to set the supervisor password for each hard disk drive.

Using a Supervisor Password

Changing or Removing the Supervisor Password when Using Several Hard Disk Drives:

To change or remove the supervisor password when using more than one hard disk drive on your computer:

To change the supervisor password:

➔ Page 111.

To remove the supervisor password:

➔ Page 113.

To install the hard disk password:

➔ Page 132.

- 1** Change or remove your supervisor password on your computer.
- 2** In the main hard disk drive bay, install the hard disk drive that has the old supervisor password set.
- 3** Turn on the computer. The hard disk password prompt appears.
- 4** Do one of the following:
 - If you removed the supervisor password* in step 1, type the old supervisor password; then press the **Spacebar**.
 - If you changed the supervisor password* in step 1, change the old password on the hard disk drive to the new supervisor password:
 - a) Type your *old* password and press the **Spacebar**.
 - b) Type your *new* password and press the **Spacebar**.
 - c) Type your *new* password again.
- 5** Press **Enter**.
- 6** Turn off the computer. Repeat steps 2 through 5 to change or remove the supervisor password for each hard disk drive.

Using the Personalization Editor

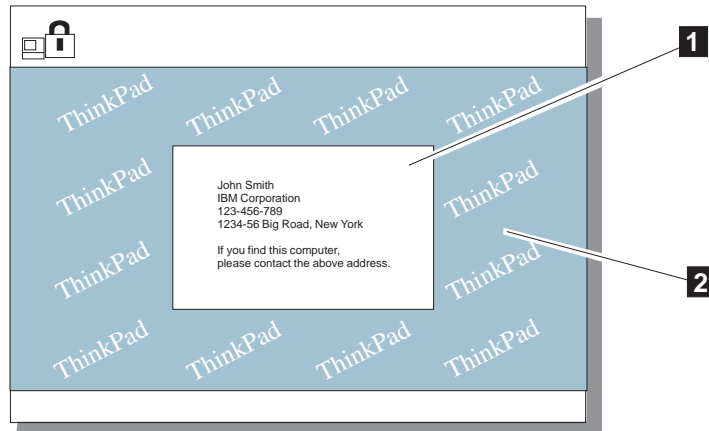


You can display personal information, such as your name or address, every time the computer is turned on and a power-on or hard disk password is set. This can help you when you misplace your computer. Because the password is set, your data is secured and cannot be accessed, but your personal information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

To set the password:

➔ Page 102.

You can display your favorite background bitmap image **2** around your personal data **1**.



To use the personalization editor, start the **Personalization** icon in the ThinkPad Features utility and see the online help.

For OS/2 Users

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

Using Locks

Note:

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

You can protect your computer and its internal devices with locks.

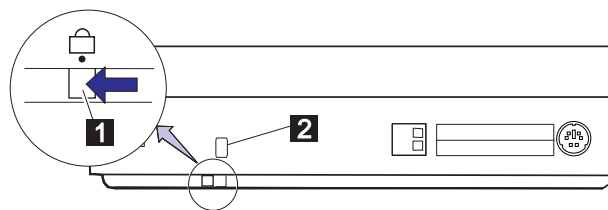
To protect the internal devices under the keyboard and prevent the removal of your computer, you can purchase a Kensington MicroSaver Security System lock (hereafter called a *Kensington lock*) or a compatible lock.

To protect PC Cards, you can use a PC Card lock.

Using the Security Lock

To prevent your computer and its internal devices from being removed without permission, purchase a Kensington lock or a compatible lock and do the following:

- 1 Lock the latch 1 on the right side of the computer to open the keyhole 2 .



Using Locks

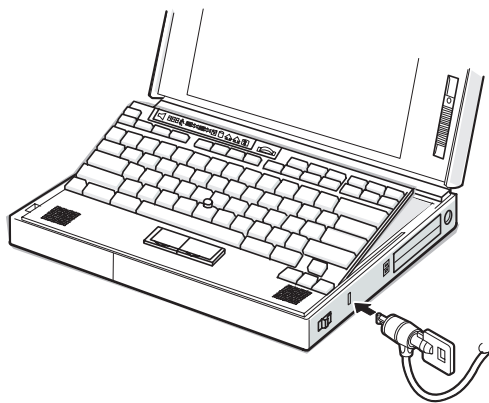
Note:

This also prevents the removal of:

Internal devices under the keyboard

Memory modules (DIMMs) in the memory slot on the bottom of the computer.

- 2 Attach a Kensington lock or a compatible lock to the keyhole on the side of the computer; then secure the chain on the lock to a secure stationary object.



Using the PC Card Lock

To prevent PC Cards from being removed from the PC Card slots:

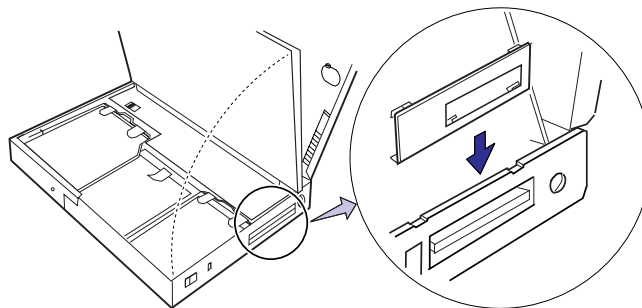
Attention:

Make sure the security latch at the right side of the computer is unlocked. (See step 2 on page 7.)

Attention:

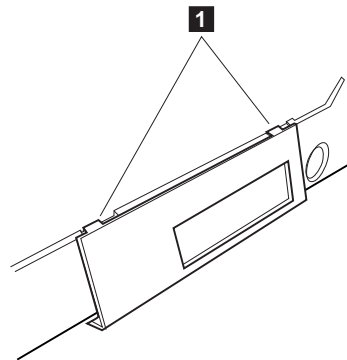
The hard disk drive is a very delicate device that needs careful handling. If it falls onto a hard surface, severe damage can occur.

- 1 Open the keyboard and remove the hard disk drive; then position the PC Card lock as shown.

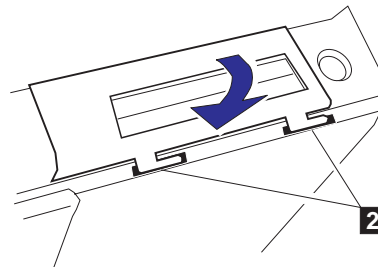


Using Locks

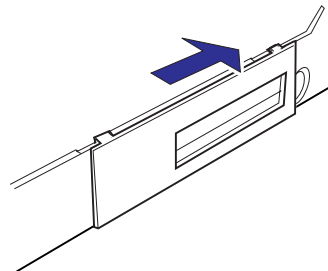
- 2 Fit the upper portion of the PC Card lock into the two notches 1 as shown.



- 3 Insert the lower portion of the PC Card lock into the openings 2 on the bottom edge of the computer.

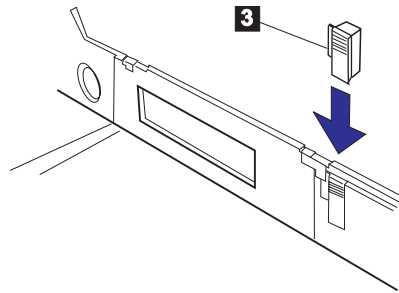


- 4 Slide the PC Card lock to the right.



Using Locks

- 5 Insert the spacer 3 from the inner side of the computer as shown to stop the PC Card lock from sliding.



To use the security keyhole:

➔ Page 117.

- 6 Replace the hard disk drive and lock the keyboard using the security keyhole.

Removing the PC Card Lock

To remove the PC Card lock:

Attention:

Make sure the security latch at the right side of the computer is unlocked. (See step 2 on page 7.)

Attention:

The hard disk drive is a very delicate device that needs careful handling. If it falls onto a hard surface, severe damage can occur.

- 1 Open the keyboard and remove the hard disk drive.
- 2 Remove the spacer from the computer.
- 3 Slide the PC Card lock toward the front of the computer.
- 4 Remove the PC Card lock first from the lower portion and then from the upper portion.

Be sure to save the PC Card lock for future use.

Chapter 6. Installing and Removing Options

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

Installing and Removing PC Cards	122
Inserting the PC Card	122
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Installing and Removing PC Cards

Installing and Removing PC Cards

This section explains how to install and remove a PC Card. For information about operating the computer with PC Cards, refer to "Using PC Cards" on page 44.

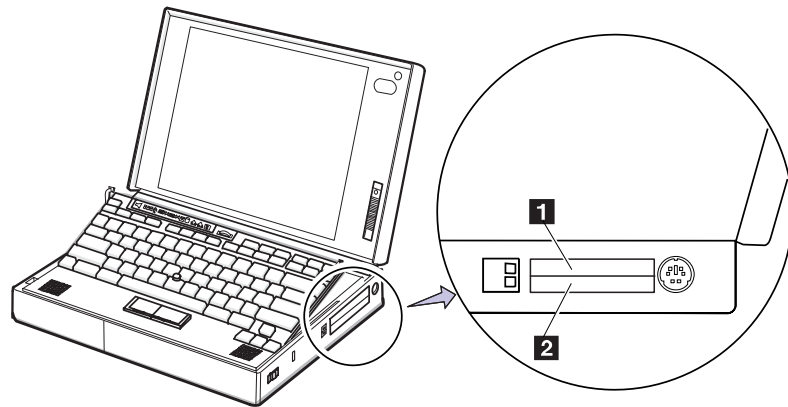
Note:

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

The computer has two PC Card slots (upper slot 1 and lower slot 2), and you can install two *Type I* or *Type II* PC Cards (one in each slot), or a single *Type III* PC Card (in the lower slot).

To install the PCMCIA device driver:

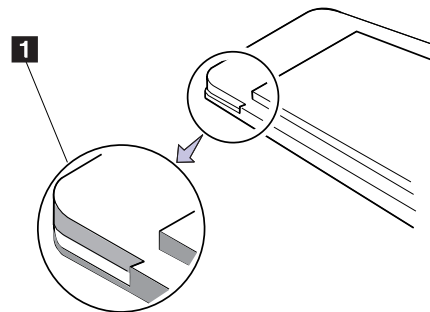
➔ Chapter 7.



Inserting the PC Card

To insert the PC Card to the computer:

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

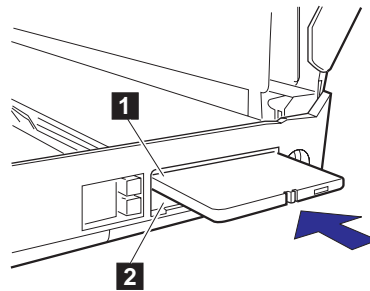


Installing and Removing PC Cards

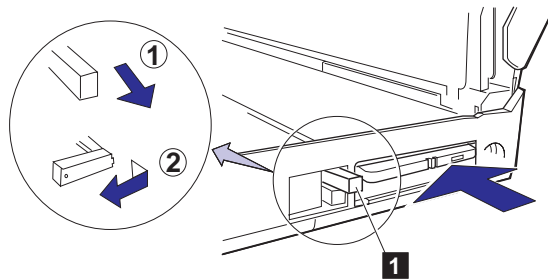
- 2 Insert the PC Card into an appropriate slot according to your PC Card type. Slot covers open to the inside when you insert the PC Card.

If you are using a Type I or Type II PC Card, insert it into either the upper slot 1 or the lower slot 2 .

If you are using a Type III PC Card, insert the card into the lower slot 2 .



- 3 Press the PC Card firmly into the connector until the eject button 1 pops out. Then, pull the eject button out slightly and fold it to the left.



Refer to the following sections:

To use PC Cards, see “Using PC Cards” on page 44.

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

- “Considerations for Suspend Mode” on page 96.
- “Considerations for Hibernation Mode” on page 98.

To secure your PC Card with a lock, see “Using the PC Card Lock” on page 118.

Installing and Removing PC Cards

Removing the PC Card

Attention:

Make sure the PC Card lock is removed.

To remove PC Card lock:

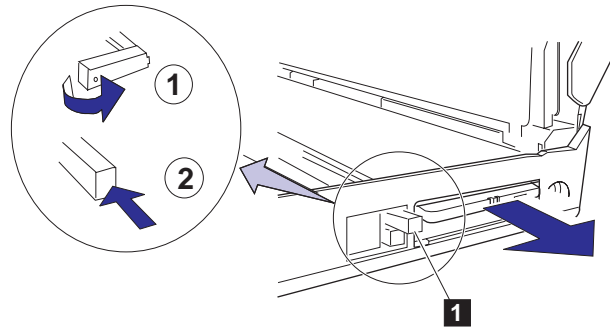
➔ Page 120.

Attention

Before removing such storage PC Cards as the hard disk PC Card, flash memory PC Card, or SRAM PC Card from the PC Card slot, **turn off the computer**. Otherwise, data in the PC Card may be corrupted or lost.

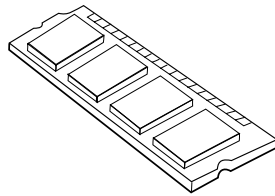
However, there is a safe way to remove the storage PC Card without turning off the computer. See page 48.

Raise the PC Card eject button 1 for the PC Card you want to remove. Then press the PC Card eject button and remove the PC Card.



Installing a Memory Option

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



Important

Changing memory while your computer is in suspend mode or hibernation mode may cause permanent damage to the equipment.

Installing and Removing the DIMM

- 1** Touch any metal object with your hand.
- 2** Turn off the computer; then disconnect the AC Adapter and all cables from the computer.
- 3** If you are using any locking device with a security keyhole, remove it.

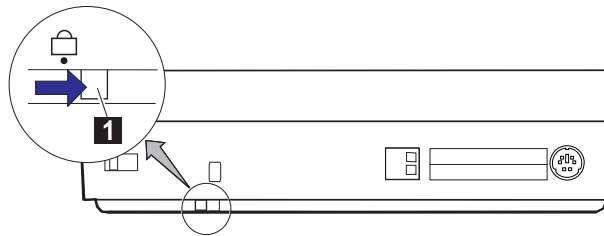
Attention:

Make sure that any locking device is unlocked.

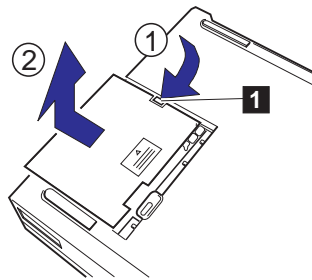
Installing a Memory Option

- 4 Press and slide the security latch 1 on the right side of the computer to unlock the security lock.

Some pressure might be needed to slide the latch.



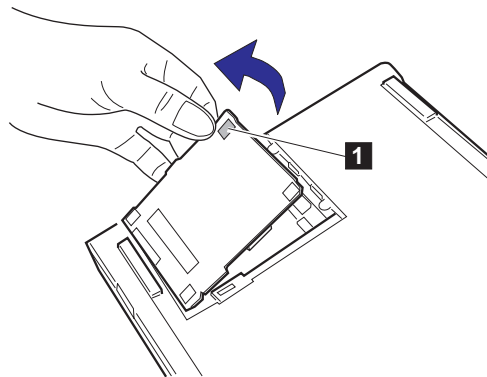
- 5 Turn over the computer; then slide the memory slot cover 1 and remove it.



Attention:

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

- 6 Remove the DIMM adapter by lifting up the edge 1 from the computer, and place it on a flat surface.



- 7 Which are you going to do?

Install a DIMM

Go to the next step.

Remove a DIMM

Go to step 10 on page 128.

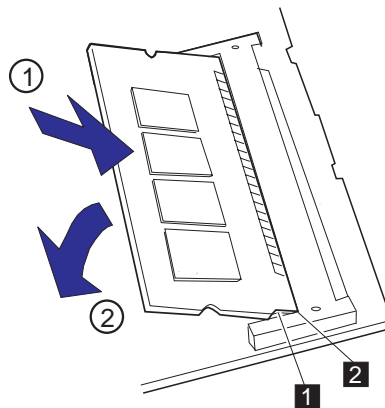
Installing a Memory Option

Attention:

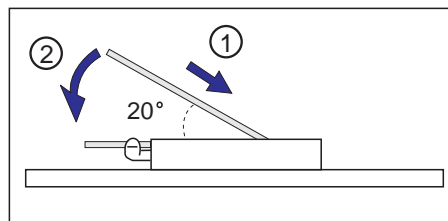
When attaching the DIMM to the DIMM adapter, place the DIMM adapter on a flat surface. Otherwise, the DIMM adapter may be damaged.

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

If you have another DIMM to install, insert it into the other socket in the same way.



Side View



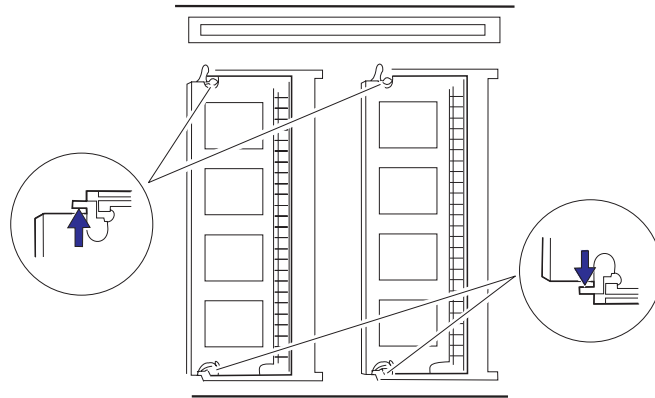
- 9 Go to step 11 on page 128.

Installing a Memory Option

Attention:

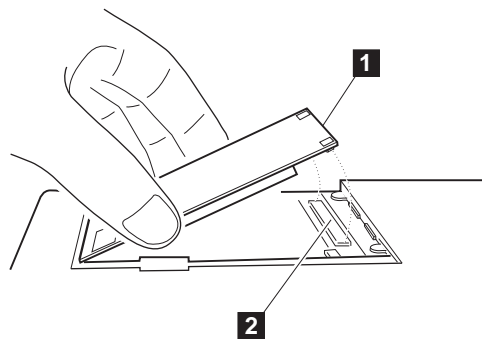
To avoid damaging the DIMM, do not touch its contact edge.

- 10 Press out on the latches on both edges of the socket at the same time and remove the DIMM.



Be sure to save the DIMM for future use.

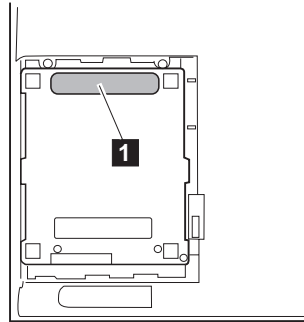
- 11 Attach the DIMM adapter to the computer.
 - a) Turn over the DIMM adapter.
 - b) Place it into the memory slot and then align the connectors of the DIMM adapter 1 and the memory slot 2.



Installing a Memory Option

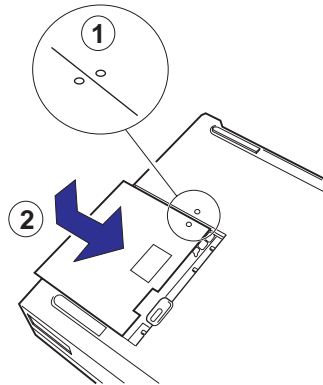
- c) Press on the shaded area 1 until the DIMM adapter snaps into the memory slot connector.

Press on three points (both sides and center) of the shaded area.



- d) Make sure the DIMM adapter is firmly connected.

- 12** Align the matching () marks on the memory slot cover and the bottom of the computer; then slide in the memory slot cover.



Installing a Memory Option

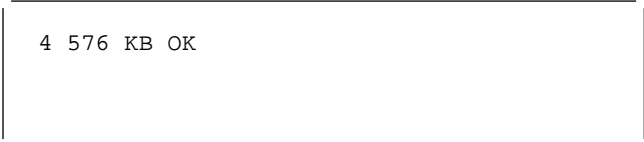
13 To confirm that the DIMM adapter is correctly attached to the computer, do the following:

- a) Calculate your total memory size by adding the DIMM memory size to the base memory size (for example, 7808KB).

For example, if you installed two 16MB DIMMs in addition to 7808KB base memory, the total memory size can be calculated as follows:

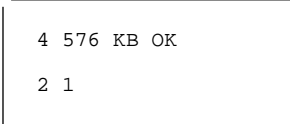
$$16(\text{MB}) \times 2 \times 1024(\text{KB}) + 7808(\text{KB}) = 4576(\text{KB})$$

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



4 576 KB OK

If a 2 1 error code appears under the memory count, turn off the computer and go to page 125 to reinstall the DIMM.



4 576 KB OK
2 1

- c) Is the total memory size the same as the value you calculated in step 13a?

Yes Go to the next step.

No Turn off the computer and go to page 125 to reinstall the DIMM.

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

The memory test starts.

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

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

No You need to reinstall the DIMM adapter. Go to page 125 and reinstall the DIMM adapter.

Note:

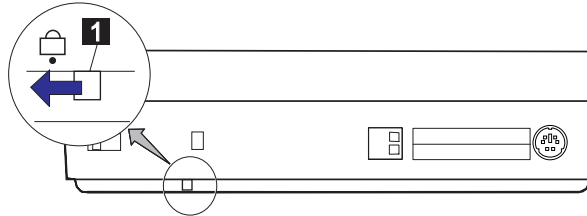
To start Easy-Setup, press and hold **F1**; then turn on the computer.

Note:

It may take some time to complete the memory test.

Installing a Memory Option

- 14** Slide the latch 1 to lock the memory slot cover.



To prevent the installed DIMMs from being removed from the computer, attach a lock to the security keyhole. See page 117.

- 15** Close the keyboard and reconnect all cables.

Note

If you changed the memory installed in the computer, create a new hibernation file to use hibernation mode. See “Creating the Hibernation File” on page 98.

Replacing the Hard Disk Drive

Replacing the Hard Disk Drive

The capacity of the hard disk can be increased by replacing the original hard disk drive with an optional one. This option can be purchased through your IBM authorized reseller or IBM marketing representative.

- 1 Turn off the computer; then disconnect the AC Adapter and all cables from the computer.
- 2 Open the LCD; then open the keyboard.

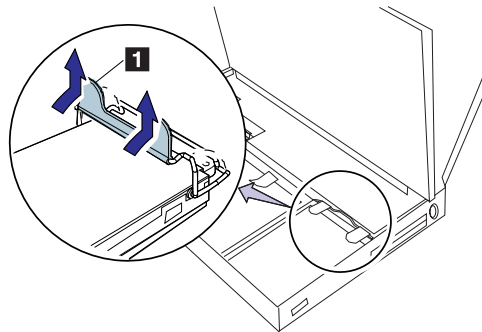
Attention:

Make sure the security latch at the right side of the computer is unlocked. (See step 2 on page 7.)

Attention:

The hard disk drive is a very delicate device that needs careful handling. If it falls onto a hard surface, severe damage can occur.

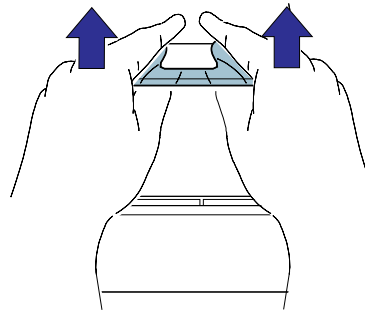
- 3 Lift the hard disk drive handle by pulling the plastic tape 1 .



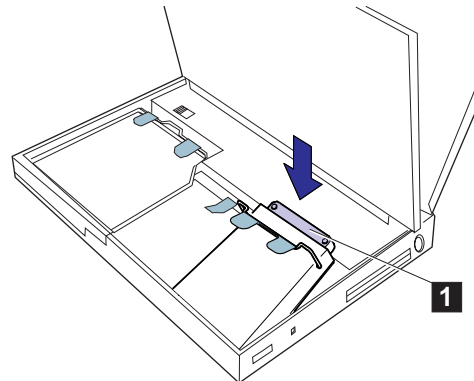
Replacing the Hard Disk Drive

4 Remove the hard disk drive.

Be careful to hold the drive as it comes out of the bay. Gently place it on a flat surface. After removing the drive, store it in the carrying case that contained the replacement drive.



5 Insert the replacement drive. Press on the shaded area 1 as shown until the drive snaps into the connector and then replace the hard disk drive handle.



6 Close the keyboard, and connect the AC Adapter to the computer; then turn on the computer.

Installing the CD-ROM Drive

Installing the CD-ROM Drive



To remove the diskette drive from the UltraBay and install the CD-ROM drive:

Note:

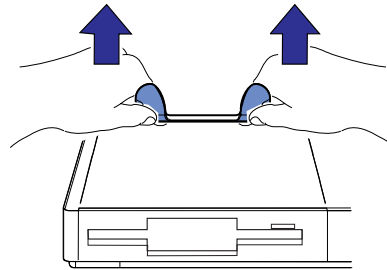
If you are using DOS or Windows, the diskette drive can be removed without turning off the computer. Refer to the documents supplied with your operating systems.

Attention:

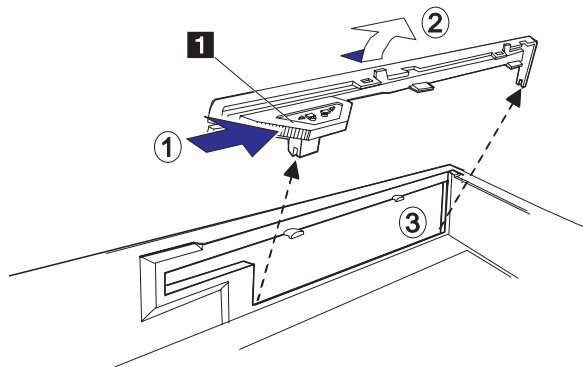
Make sure that any locking device is unlocked.

The CD-ROM and diskette drives are very delicate devices that need careful handling. Do not press on, drop, or apply any shock to the drives when they are removed from the computer.

- 1 Make sure that no diskette is in the diskette drive.
- 2 Open the LCD; then open the keyboard.
- 3 Lift the handle on the diskette drive with the plastic tape, and remove the diskette drive.

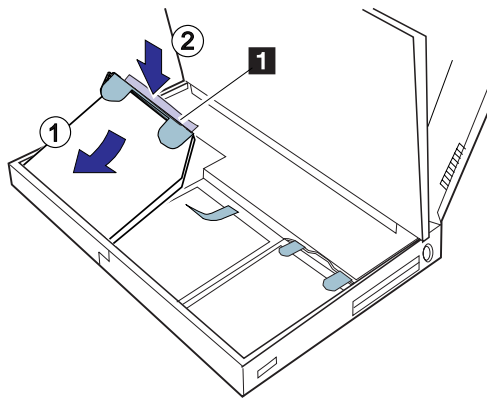


- 4 Remove the front bezel from the *inside* of the computer.
 - a) Slide the lever 1 on the bezel to the right as shown.
 - b) Pull the upper portion of the bezel to remove the bezel.



Installing the CD-ROM Drive

- 5 Install the CD-ROM drive. Press area 1 until the drive snaps into the connector. Close the keyboard; then reconnect all cables.



Installing the Diskette Drive

Installing the Diskette Drive



The CD-ROM drive can be removed and replaced with the internal diskette drive supplied with the computer. When using DOS or Windows, you can replace the drives without turning off the computer.

To install the diskette drive:

- 1 Close any CD-ROM applications and make sure the CD-ROM tray is closed.
- 2 Open the LCD; then open the keyboard.
- 3 Lift the handle on the CD-ROM drive with the plastic tape, and remove the CD-ROM drive.

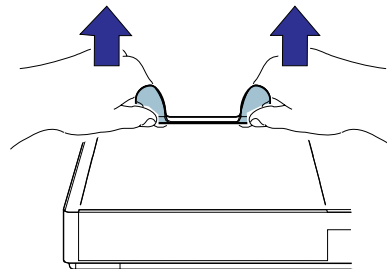
Note:

If you are using DOS or Windows, the CD-ROM drive can be removed without turning off the computer. Refer to the documents supplied with your operating systems.

Attention:

Make sure that any locking device is unlocked.

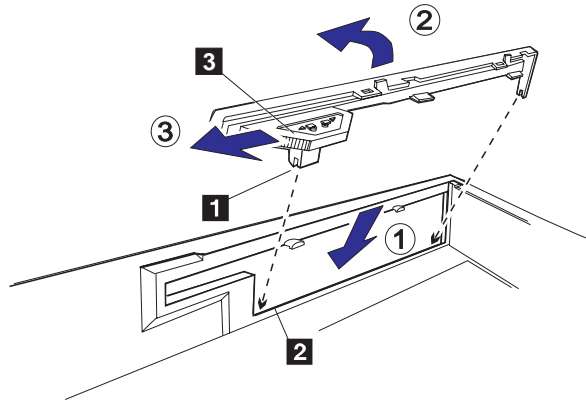
The CD-ROM and diskette drives are very delicate devices that need careful handling. Do not press on, drop, or apply any shock to the drives when they are removed from the computer.



Installing the Diskette Drive

- 4 Install the diskette drive bezel on the *inside* of the computer.
 - a) Fit notch 1 on the lower portion of the bezel into the catch at the bottom of the drive bezel slot 2.
 - b) Push the upper portion of the bezel into the slot until it snaps into place.
 - c) Slide the lever 3 on the bezel to the left as shown.

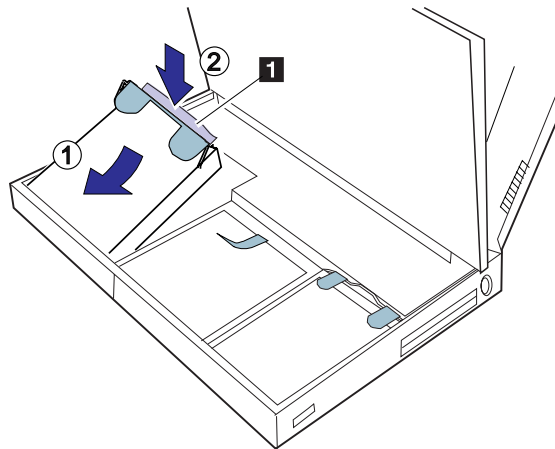
The following figure shows the installation as seen from the inside of the computer.



Attention:

The diskette drive is a very delicate device. Do not press on the middle part of the drive.

- 5 Install the diskette drive. Press area 1 until the drive snaps into the connector.



- 6 Close the keyboard; then reconnect all cables.

Installing a Secondary Battery Pack in the UltraBay

Installing a Secondary Battery Pack in the UltraBay

You can extend battery operation time by using two battery packs installed in the computer at the same time. A secondary battery pack is available as an option. Before installing a secondary battery pack, remove the CD-ROM drive or diskette drive from the UltraBay.

Attention:

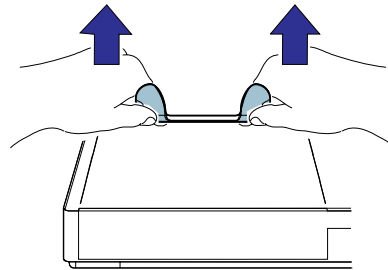
To prevent damage to the CD-ROM drive or diskette drive, make sure the AC Adapter is disconnected from the computer.

The CD-ROM drive and diskette drive are very delicate devices that need careful handling. Do not press on, drop, or apply any shock to the CD-ROM drive or diskette drive while it is removed from the computer.

Attention:

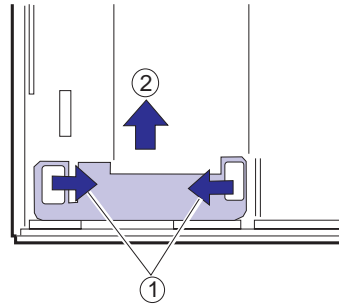
Make sure the security latch at the right side of the computer is unlocked. (See step 2 on page 7.)

- 1 Stop any running applications; then make sure the CD-ROM tray is closed or any diskette is removed from the diskette drive.
- 2 Turn off the computer; then disconnect the AC Adapter and all cables from the computer.
- 3 Open the LCD; then open the keyboard.
- 4 Lift the drive handle with the plastic tape, and remove the CD-ROM drive or diskette drive.



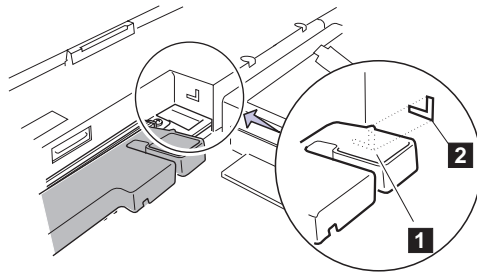
Installing a Secondary Battery Pack in the UltraBay

- 5 Pinch together both holes and remove the spacer by lifting it up slightly.

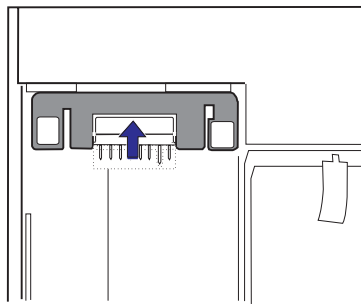


- 6 Place the spacer to cover the CD-ROM drive or diskette drive connector.

a) Make sure the projected end 1 fits into the opening 2.



b) Place the spacer onto the connector and then open the battery connector cover.




- 7 Which drive are you removing?

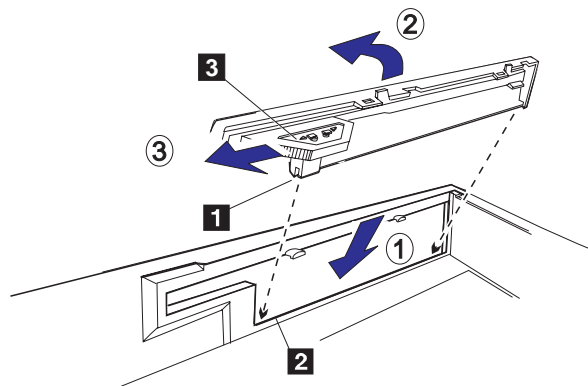
CD-ROM drive Go to step 8 on page 140.

Diskette drive Go to step 10 on page 140.

Installing a Secondary Battery Pack in the UltraBay


- 8**  Install the blank front bezel on the *inside* of the computer.
- Fit notch 1 on the lower portion of the bezel into the catch at the bottom of the drive bezel slot 2.
 - Push the upper portion of the bezel into the slot until it snaps into place.
 - Slide the lever 3 on the bezel to the left as shown.

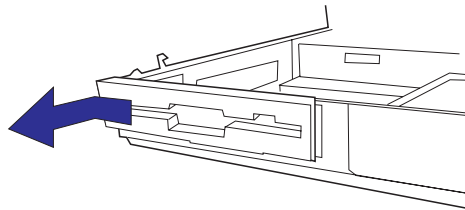
The following figure shows the installation as seen from the inside of the computer.



- 9** Go to step 12 on page 141.

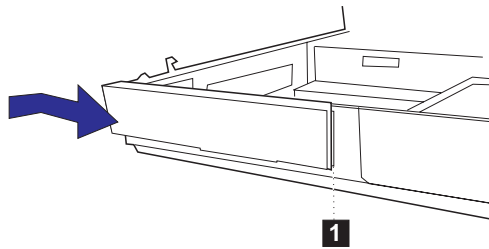
Note:
Keep the diskette drive bezel for future use.

- 10**  Slide the diskette drive bezel slightly to the left and remove it by pulling toward the front.

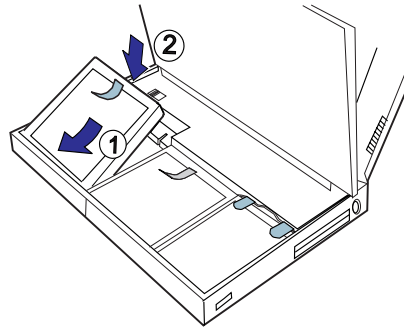


Installing a Secondary Battery Pack in the UltraBay

- 11** Place the blank bezel at position 1 as shown and slide it to the right.



- 12** Insert the secondary battery pack into the UltraBay.



- 13** Close the keyboard and reconnect all cables.

When Replacing the CD-ROM Drive or Diskette Drive

Before you replace the CD-ROM drive or diskette drive in the UltraBay:

1. Cover the battery connector with its cover.
2. Move the spacer back to its original position (shown in step 5 on page 139).

Installing a Secondary Hard Disk Drive in the UltraBay

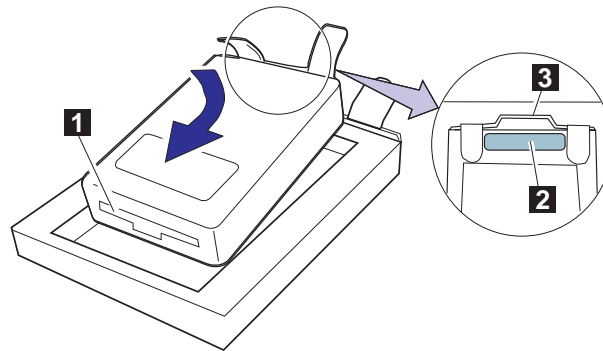
Installing a Secondary Hard Disk Drive in the UltraBay

You can use two hard disk drives at the same time by installing a secondary hard disk in the UltraBay. To use the secondary hard disk, you need to purchase another hard disk drive and a hard disk holder. Before installing the secondary hard disk, remove the CD-ROM drive or diskette drive.

Attention:

The hard disk drive is a very delicate device that needs careful handling. Do not press on, drop, or apply any shock to the hard disk drive.

- 1** Attach the secondary hard disk drive to the hard disk holder.
 - a) Insert the hard disk drive in the hard disk holder so that the slot **1** on the hard disk drive fits into the projection on the hard disk holder.
 - b) Press the shaded area **2** until the hard disk firmly snaps into the hard disk holder; then replace the hard disk drive handle **3**.



- 2** Close any running applications on the computer; then make sure the CD-ROM tray is closed or no diskette is in the diskette drive.

Installing a Secondary Hard Disk Drive in the UltraBay

Attention:

To prevent damage to the CD-ROM drive or diskette drive, make sure the AC Adapter is disconnected from the computer.

The CD-ROM drive and diskette drive are very delicate devices that need careful handling. Do not press on, drop, or apply any shock to the CD-ROM drive or diskette drive while it is removed from the computer.

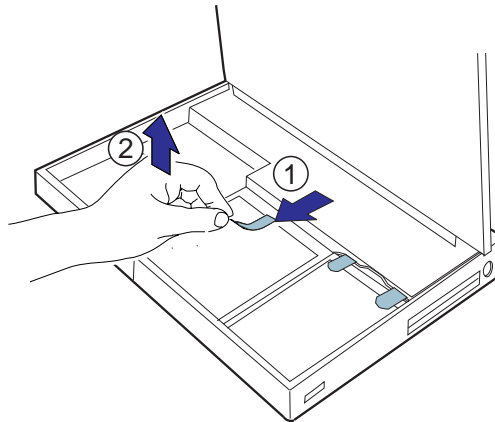
Attention:

Make sure the security latch at the right side of the computer is unlocked. (See step 2 on page 7.)

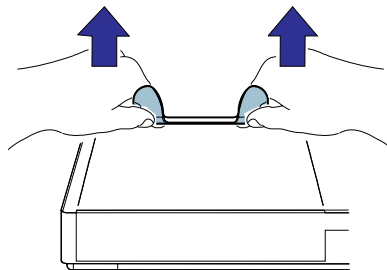
- 3 Turn off the computer; then disconnect the AC Adapter and all cables from the computer.

- 4 Open the LCD; then open the keyboard.

- 5 Remove the battery pack.



- 6 Lift the drive handle with the plastic tape, and remove the CD-ROM drive or diskette drive.




Installing a Secondary Hard Disk Drive in the UltraBay

7 Which drive are you removing?

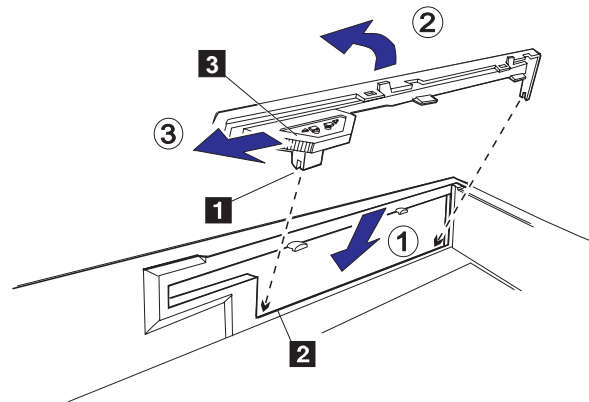
CD-ROM drive Go to next step.

Diskette drive Go to step 9 on page 145.

8  Install the diskette drive bezel from the *inside* of the computer.

- Fit notch 1 on the lower portion of the bezel into the catch at the bottom of the drive bezel slot 2.
- Push the upper portion of the bezel into the slot until it snaps into place.
- Slide the lever 3 on the bezel to the left as shown.

The following figure shows the installation as seen from the inside of the computer.

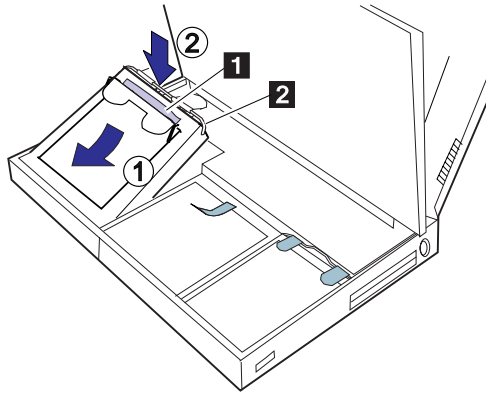


Installing a Secondary Hard Disk Drive in the UltraBay

Note:

You can see the lamp on the secondary hard disk, which turns on when data in the secondary hard disk drive is accessed, through the diskette drive bezel.

- 9** Place the hard disk holder (with the hard disk drive attached) into the UltraBay. Press on the shaded area **1** as shown until the drive snaps into the connector; then replace the drive handle **2**.



- 10** Replace the battery pack.
11 Close the keyboard; then reconnect all cables.

Installing an Option in the UltraBay

Installing an Option in the UltraBay

Note:

To install the diskette drive into the UltraBay, see page 136.

The CD-ROM drive or diskette drive and its bezel (on the front of the computer) can be removed to install different options in the UltraBay. Some options may require you to remove the option cover from the left side of the computer.

Attention:

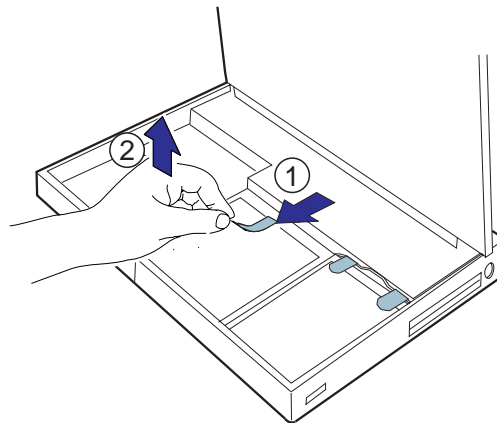
To prevent damage to the CD-ROM drive or diskette drive, make sure the AC Adapter is disconnected from the computer.

The CD-ROM drive and diskette drive are very delicate devices that need careful handling. Do not press on, drop, or apply any shock to the CD-ROM drive or diskette drive while it is removed from the computer.

Attention:

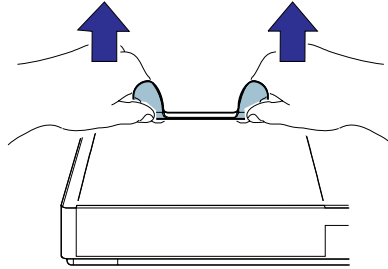
Make sure the security latch at the right side of the computer is unlocked. (See step 2 on page 7.)

- 1 Close any running applications; then make sure the CD-ROM tray is closed or any diskette is removed from the diskette drive.
- 2 Turn off the computer; then disconnect the AC Adapter and all cables from the computer.
- 3 Open the LCD; then open the keyboard.
- 4 Remove the battery pack.



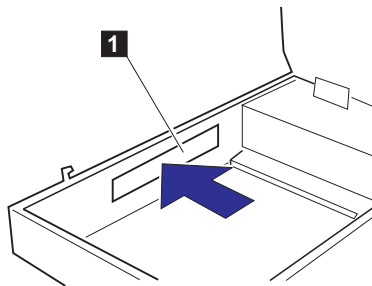
Installing an Option in the UltraBay

- 5 Lift the drive handle with the plastic tape, and remove the CD-ROM drive or diskette drive.

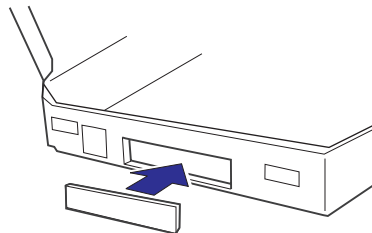


- 6 If the option you are installing has its own option cover to be attached at the left side of the computer, do the following:

- a) Push the current option cover 1 from the *inside* of the computer to remove it.



- b) Attach the *new* option cover that came with your option to the side of the computer.



- 7 Which drive are you removing?

CD-ROM drive Go to next step.

Diskette drive Go to step 10 on page 148.

Installing an Option in the UltraBay

To install a blank front bezel:

➔ Page 136.

Note:

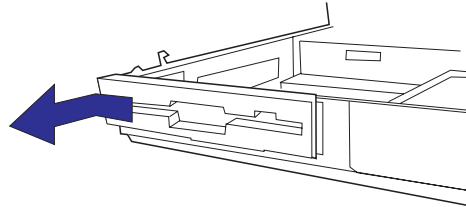
Keep the diskette drive bezel for future use.

8 If the option you are installing has a front bezel, attach the *new* front bezel that came with your option (refer to the manual that came with your option).

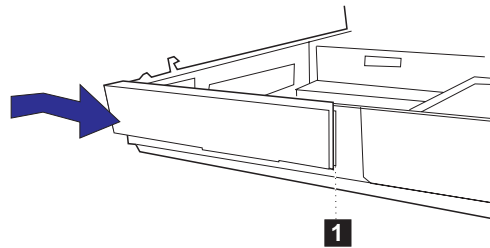
9 Go to step 11 on page 148.

10 If the option you are installing has a front bezel, do the following:

a) Slide the diskette drive bezel slightly to the left and remove it by pulling toward the front.



b) Place the *new* front bezel that came with your option at position 1 as shown and slide it to the right.



11 Refer to the manual that came with the option to install your option in the UltraBay.

12 Replace the battery pack.

13 Close the keyboard and reconnect all cables.

Installing the DAA/Telephony Kit

Note:

In some countries, the Mwave telephony functions are only available when the DAA/Telephony Kit option is installed.

If the telephone connector on the left side of your computer is one with a square receptacle, the computer can be used for telephony or modem/fax functions without any changes. However, if a blank port cover and port cover are attached you need to install the DAA/Telephony Kit option to use the Mwave telephony functions.

The DAA/Telephony Kit may only be used in the countries in which it has been approved by the country's telephone authorities.

Attempting to use the kit in other countries may be contrary to the laws of those countries. If you are traveling to another country where the DAA/Telephony Kit is not approved by the local telecommunications authorities, you may contact IBM or an IBM distributor in that country to check if you can purchase a modem of the ThinkPad DAA/Telephony Kit that is approved for that country.

CAUTION:

Your computer can use only a public-switched telephone network (PSTN). Do not use a PBX (private branch exchange) or other digital telephone extension lines. Use of phone lines other than PSTN can damage your modem. If you are not sure which kind of phone line you are using, contact your telephone company. Many hotels or office buildings use digital telephone extension lines, so check before connecting the telephone cable in such places.

To attach the DAA/Telephony Kit:

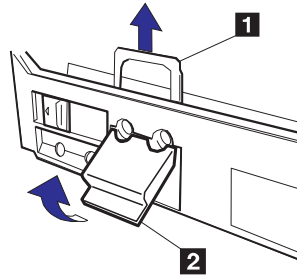
- 1** Turn off the computer and disconnect the power cable.
- 2** Open the keyboard and remove the battery pack.

Attention:

Make sure the security latch at the right side of the computer is unlocked. (See step 2 on page 7.)

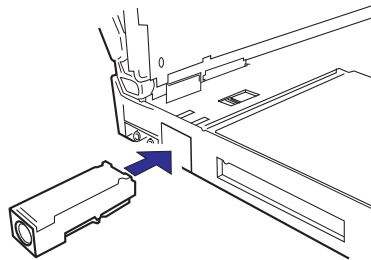
Installing the DAA/Telephony Kit

- 3 Remove the metal port cover lock 1, and remove the blank port cover 2 from the lower portion.

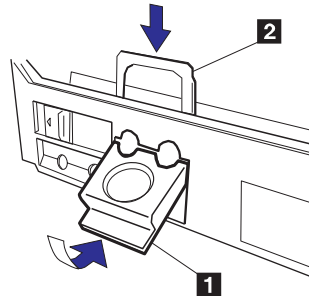


Attention:
Make sure that any locking device is unlocked.

- 4 Install the plug with the round receptacle that came with your option kit. Firmly press it into the connector.



- 5 On the left side of the computer, install the port cover 1 with the round opening that came with your option kit, and insert the metal port cover lock 2.



- 6 Close the keyboard.

Installing the DAA/Telephony Kit

7 Connect the cables:



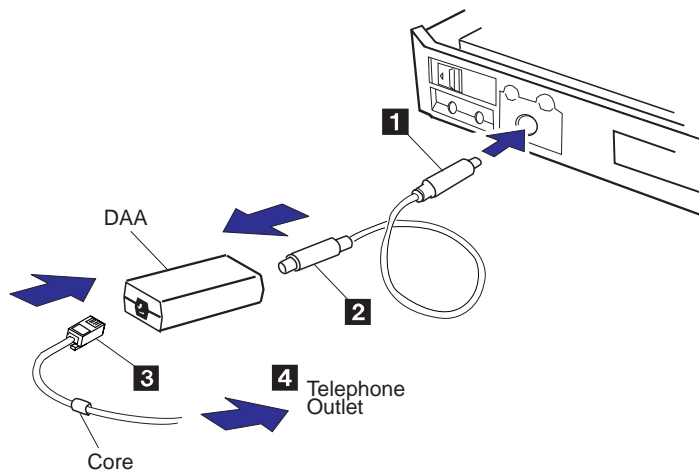
DANGER

To avoid shock hazard, do not connect the telephone cable to or disconnect it from the computer during electrical storms.

Note:

Both ends of the DAA interface cable are identical.

- Connect one end of the DAA interface cable 1 to the connector plug with the round receptacle.
- Connect the other end of the DAA interface cable 2 to the round receptacle on the DAA.
- Connect the ferrite-core end connector 3 of the telephone cable to the square receptacle on the DAA.
- Connect the other end of the telephone cable to the telephone outlet 4 on the wall.



After you have finished attaching the modem/fax port, install the necessary software by referring to the manual that came with the option kit.

Refer to “Using the Telephony Function” on page 56 for information about how to use the Mwave telephony features.

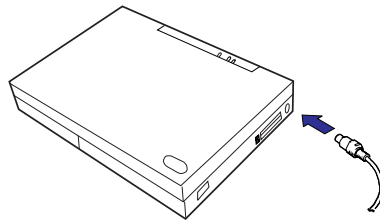
Attaching an External Numeric Keypad or a Mouse

Attaching an External Numeric Keypad or a Mouse

Attention:

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

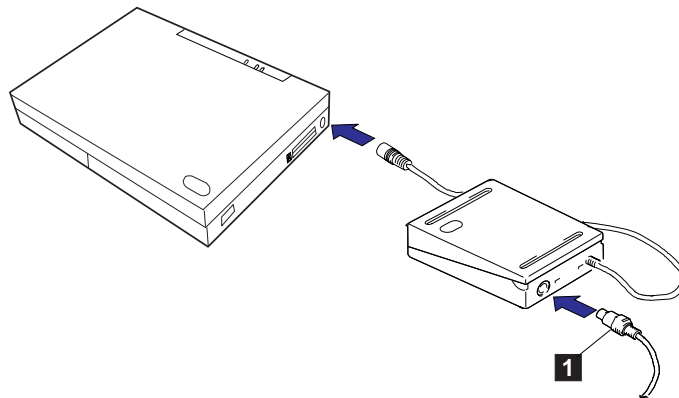
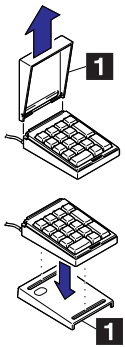
An external numeric keypad or a mouse can be attached directly to the external-input-device connector. You can use both the IBM PS/2 Miniature Mouse and TrackPoint III at the same time.



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 1 to the connector at the rear of the keypad.



Attaching an External Numeric Keypad or a Mouse

Using the Serial Mouse and Other Pointing Devices


Note:

The appropriate software must have already been installed.

If you use a serial mouse connected to the serial port or a pointing device that is not compatible with the PS/2 Mouse, you might need to disable the TrackPoint III before you can use it.



To disable the TrackPoint III:

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

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

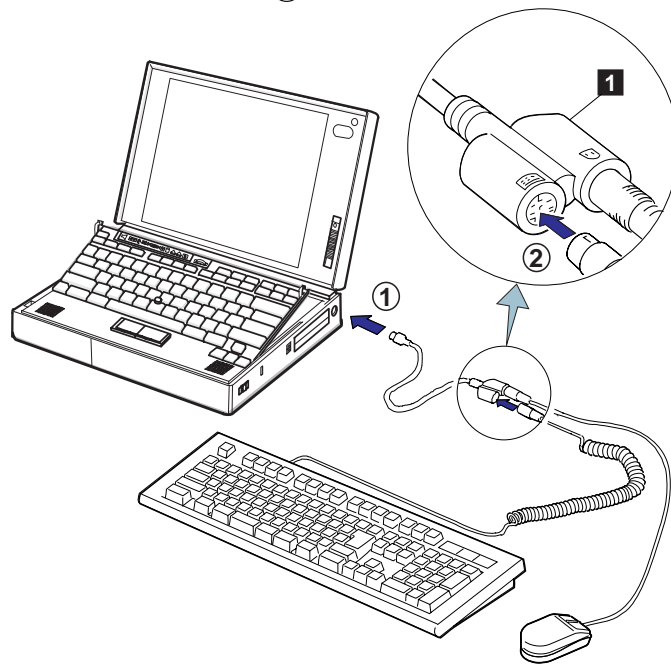
Using the IBM ThinkPad Space Saver Keyboard

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

Attaching an External Keyboard

Attaching an External Keyboard

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



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

- Numeric keypad on the system keyboard
- External numeric keypad

You should use the numeric keypad on the external keyboard.

Using the Docking Station

To expand your computer resources, you can use a docking station such as the SelectaDock Docking System (PCI bus), Dock I (ISA bus), or Dock II (ISA bus).

Using the SelectaDock Docking System

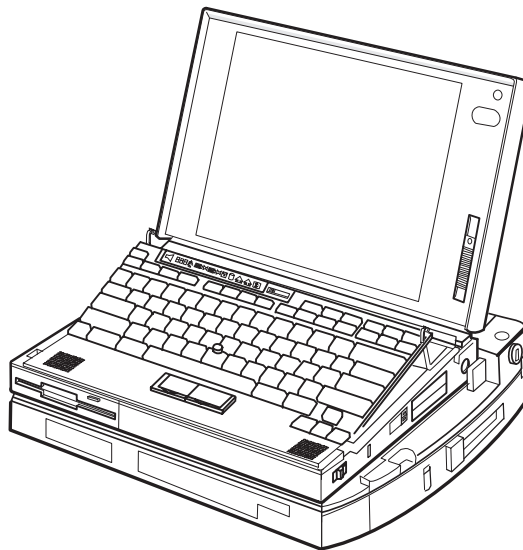
Attention:

When setting up your docking station, avoid any hardware conflicts.

The following shows how the computer is docked. To dock the computer to the SelectaDock Docking System, see the *User's Guide*, which came with the SelectaDock Docking System.

To avoid hardware conflicts:

➔ Page 267.



Using the Docking Station

When you dock the computer to the SelectaDock Docking System with a new hardware or software setting, do the following:


Note:

For example, "device" means:

PC Card or CardBus PC Card
PCI or ISA adapter card
Device in the UltraBay such as
CD-ROM drive, IDE hard disk
drive, or diskette drive
SCSI device
Others

- 1 Install all the new devices in the SelectaDock Docking System.
- 2 Do the following according to your device newly installed:


When you install a PCI adapter card or a SCSI device, at least one IRQ level (default setting is IRQ11) is assigned for that PCI device or SCSI device. Make sure that an IRQ level is selected for the PCI device as follows:

- a) Start the ThinkPad Features program and click on the **Docking Station** () icon.
- b) Click on the **Advanced** button and click on the **PCI device setup** icon.
- c) Make sure an IRQ level is selected.

When you install an ISA adapter card, you need to ensure that the resource setting (such as IRQ or DMA) for the new ISA adapter card does not conflict with settings for the other devices in the computer. Set a jumper or the DIP switches on the adapter card, or change the system resource setting with the ThinkPad Features program. See *Example 2* on page 268.

After that, specify the information about that card by using the ThinkPad Features program. By this action, you might be able to avoid future resource conflict problems.

When you install an IDE device (hard disk drive or CD-ROM drive):


- Check that no resource conflict occurs between the new IDE device and the other devices in the computer by using the ThinkPad Features program.
- Start the ThinkPad Features program and click on the **Docking Station** () icon; then add a check mark for **Enable secondary IDE device**.

Note:

To set a jumper or the DIP switches on the adapter card, see the manual that came with the adapter card.

Note:

To input the resource setting for the adapter card:

1. Start the ThinkPad Features program.
2. Click on the **Docking Station** () icon and click on **Advanced**.
3. Click on **PCI device setup**.

Using the Docking Station

- 3** Dock your computer to the SelectaDock Docking System; then turn on the computer.

The computer automatically starts Easy-Setup and runs an autoconfiguration program to create a new configuration.

After that, the computer restarts, and the new devices in the SelectaDock Docking System are available.

Note:

A device's functional capability in its hot/warm docking depends on operating system and the device driver. For more information, refer to manuals that came with your operating system and the devices.

Once a configuration is created and if hot or warm docking or undocking is enabled by the ThinkPad Features program, the computer can be docked to the SelectaDock Docking System even during operation mode or suspend mode. To use the computer with a new setting including the SelectaDock Docking System, you should create a new configuration by starting the computer with the SelectaDock Docking System docked.

If some devices in the SelectaDock Docking System cannot be enabled due to resource shortage or conflict, see Appendix A and check the system resources that are already occupied by other built-in devices.

Using the Docking Station

Using the Dock I or Dock II

Attention:

When setting up your docking station, avoid any hardware conflicts.

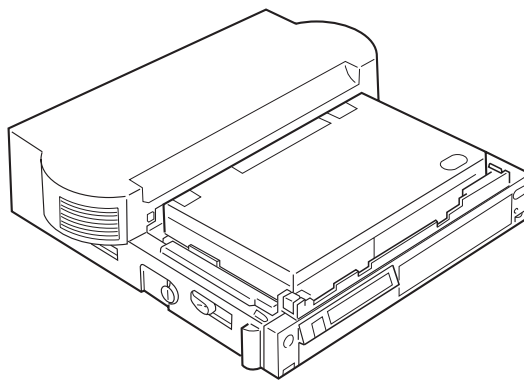
To avoid hardware conflicts:

➔ Page 267.

Attention:

Do not use the Utility Diskettes that came with the IBM Dock II.

The following illustration shows the computer docked to the Dock II:



To dock the computer to the Dock I or Dock II, see the *User's Guide*, which came with the Dock I or Dock II.

Hints

When an IBM Dock I is docked to the computer, you can adjust the sound volume by using the following key combinations:

When you press and hold **Fn** and then press **PgUp** (⏮), the sound volume increases.

When you press and hold **Fn** and then press **PgDn** (⏭), the sound volume decreases.

When you dock the computer to the Dock I or Dock II with a new hardware or software setting, do the following:


Using the Docking Station

Note:

To set a jumper or the DIP switches on the adapter card, see the manual that came with the adapter card.

Note:


To input the resource setting for the adapter card:

1. Start the ThinkPad Features program.
2. Click on the **Docking Station**  icon and click on **Advanced**.
3. Click on **ISA device setup**.

*When you install an ISA adapter card, you need to ensure that the resource setting (such as IRQ or DMA) for the new ISA adapter card does not conflict with settings for the other devices in the computer. Set a jumper or the DIP switches on the adapter card, or change the system resource setting of the computer with the ThinkPad Features program. See *Example 2* on page 268.*

Then, specify the information about that card with the ThinkPad Features program. By this action, you might be able to avoid future resource conflict problems.

When you install an IDE device such as CD-ROM drive or hard disk drive in the Dock I or Dock II:

1. Install the ThinkPad IDE Adapter Kit for Dock I and Dock II (available as an option) in your computer before docking the computer to the SelectaDock Docking System.
2. Check that no resource conflict occurs between the new IDE device and the other devices in the computer by using the ThinkPad Features program.
3. Enable the IDE device as follows:
 - a) Start the ThinkPad Features program and click on the **Docking Station**  icon.
 - b) Add a check mark for **Enable secondary IDE device**.

When you install a Plug and Play ISA adapter card in the Dock I or Dock II, do the following:

1. Install the adapter card in the Dock I or Dock II.
2. Dock the computer to the Dock I or Dock II and turn on the computer.

The card is ready to use.

If a utility program came with the adapter card, you might need to install it in the computer. See the manual that came with the adapter card.

When Using the SCSI Device with the Dock I


Using the SCSI Device with the Dock I



When you dock the computer to the Dock I with the SCSI device installed, and use DOS or Windows, do the following:

Note:

Refer to the *Dock I User's Guide* for information on the DIP switches.

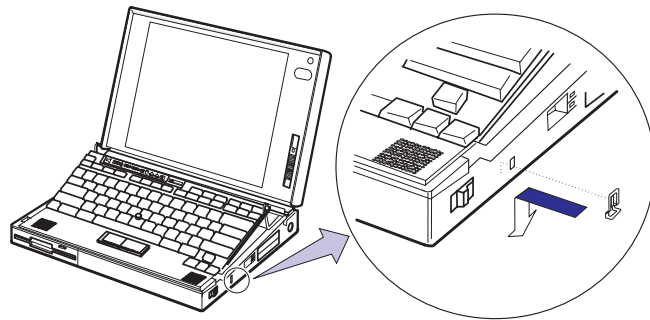
- 1** Check the interrupt level (IRQ) for the SCSI controller in the Dock I by using the the Dock I DIP switches.
- 2** Start the ThinkPad Features program.
- 3** Click on the **Docking Station** () icon and click on **Advanced**.
- 4** Click on **ISA device setup**.
- 5** Assign the same interrupt level as the one you checked in the step 1 for the ISA resource.

For example, if the interrupt level for the Dock I SCSI is **11**, assign **11** for the ISA resource.
- 6** Click on **OK**.

Using the Security Plate for the Docking Station

When you dock the computer to the docking station, you can use the security plate to protect your computer from being removed. To use the security plate:

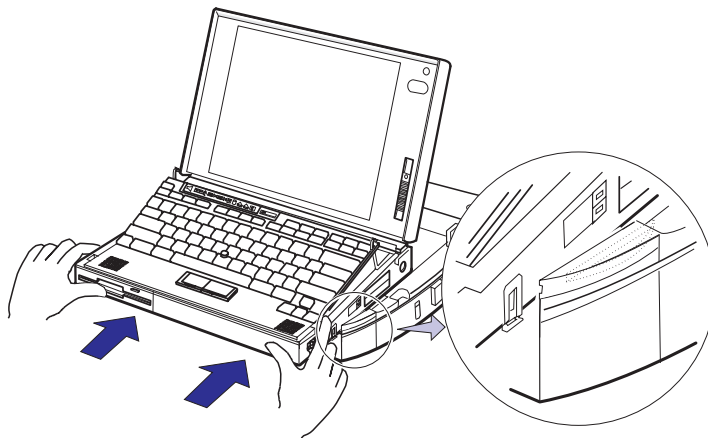
- 1 Attach the security plate to the security keyhole at the right side of the computer.



Note:

The figure shows an example when you are using the SelectaDock Docking System.

- 2 Dock the computer to your docking station.



- 3 Lock the security lock of the docking station.

When you leave the computer, remove the key. The security plate protects your computer from being removed from the docking station.

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.

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Installing the Operating System and Device Drivers

If you purchased a preloaded model of the computer, your computer comes with the following software already installed:

- Operating system
- ThinkPad Features program
- ThinkPad display driver
- Infrared device driver
- PC Card Director program
-  Mwave DSP support software
-  ESS AudioDrive support software
-  CD-ROM device driver
-  Enhanced Video device driver and MPEG device driver
- Online book

To use the online book:

➔ Page vii.

When reinstalling an operating system, you must install an operating system and the software listed above 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. You should make a backup copy of the online book before beginning the reinstallation process.

The operating systems supported by your computer are:

- IBM Operating System/2 (OS/2) Warp Version 3
- IBM PC DOS Version 7.0
- MS-DOS** Version 6.2
- Microsoft Windows Version 3.11
- Microsoft Windows 95
- Microsoft Windows NT Workstation Version 3.51

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



If you are installing OS/2: Go to “Installing Software for OS/2 Warp” on page 168.



If you are installing DOS: Go to “Installing Software for DOS” on page 185.

Installing Software



If you are installing Windows 3.11: Go to “Installing Software for Windows Version 3.11” on page 189.



If you are installing Windows 95: Go to “Installing Software for Windows 95” on page 200.



If you are installing Windows NT: Go to “Installing Software for Windows NT Workstation Version 3.51” on page 216.

Important information

Before reinstalling the operating system and the ThinkPad device drivers:

You need to back up your software and all data files.

An updated version of this chapter may be available on the Internet. Check the **Support** section of the IBM PC Company home page at <http://www.pc.ibm.com/support.html> for the latest information or if you have problems.

You need to create all installation diskettes using the *Diskette Factory* (diskette backup program), which is preloaded on your computer. (In some countries, you will find utility and device driver diskettes packed in the box with the computer.)

To use the Diskette Factory, click on the **Diskette Factory** icon; then follow the instructions on the screen.

(In Windows 95, you can find the **Diskette Factory** icon in the **ThinkPad Tools** folder, where you can create only the ThinkPad device drivers diskette. To create the Windows 95 system diskettes, select **Start, Accessories, System Tools**, and then **Create System Disks**.)

For the device driver diskettes, also check the IBM PC Company home page (<http://www.pc.ibm.com/support.html>). Updated version of diskettes may be available on the Internet.

Installing Software for OS/2 Warp







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

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).

Especially, you *must create the OS/2 Warp Video Fix Diskette* to avoid video problems you encounter during installation of OS/2 Warp.

The following shows the software already installed at the time of purchase. For your computer to work as it did at the time of purchase, install all of this software:

- 1 Install OS/2 Warp
( With the CD-ROM device driver) → Page 169.
- 2 Install the ThinkPad Features program → Page 177.
- 3 Install the PC Card Director → Page 178.
- 4 Install one of the following:
 -  Mwave support software → Page 179
 - or**
 -  ESS AudioDrive support software → Page 180.
- 5 Install the Infrared device driver → Page 181.
- 6 Install the ThinkPad display driver → Page 182.
- 7  Install the Enhanced video and MPEG device driver
→ Page 183.

Before Installing OS/2 Warp



Important

If your computer is the 760EL (ESS AudioDrive model), you **must** do the procedure described in this section before you install OS/2 Warp. Otherwise, the OS/2 installation stops and you cannot complete the installation.

During the installation of OS/2 Warp using the OS/2 Warp Diskette 1, the installation stops at the OS/2 logo screen and does not move beyond the screen. This is because the ESS AudioDrive feature in the computer uses the I/O address 330h (for the MIDI port), where a Sony** CD-ROM device driver in the OS/2 Warp Diskette 1 accesses to detect if the following CD-ROM drive is attached to the computer:

Sony CDU-31A, CDU-7305, CDU-33A, or CDU-7405

To avoid the installation stop, do one of the following, depending on your situation:

*If you are using one of these Sony CD-ROM drives, refer to the chapter describing the special hardware considerations in "Special Hardware Considerations" in the *User's Guide to OS/2 Warp* and read the parameter information for the **SONY31A.ADD** device driver.*

After that, you might need to disable the ESS audio, or change the ESS audio system resource to avoid any resource conflicts. In that case, start the ThinkPad Features program and register the Sony CD-ROM's resource information. Then set the appropriate resources for the ESS audio in the ThinkPad Features program.

*If you are **not** using these Sony CD-ROM drives, do the following:*

- 1** Make a backup copy diskette of the OS/2 Warp Diskette 1.
- 2** Open the CONFIG.SYS file in the backup copy diskette using your editor, and comment out the Sony device driver line as follows:

```
rem BASEDEV=SONY31A.ADD
```

Installing OS/2 Software

- 3 Delete the file **SONY31A.ADD** from the backup copy diskette.
- 4 Install OS/2 Warp using the backup copy diskette you have just created.

Installing IBM OS/2 Warp Version 3

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

Which type are you going to use?

Dual Boot Go to page 170.

Boot Manager Go to page 171.

Avoiding Video Problems for OS/2 Warp

If you have a video problem, such as a screen blackout, when installing OS/2 Warp, go to page 175 to solve the problem.

Installing OS/2 Warp with Dual Boot

To install the DOS ThinkPad Features program:

➔ Page 187.

To install the Windows ThinkPad Features program:

➔ Page 194.

Note:

If you have the OS/2 Warp FixPak 10 (XR0010) or later, install it after you complete the installation of OS/2 Warp. 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 Warp.

To install OS/2 Warp:

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

- Select **VGA** as the **Primary Display** in the **System Configuration** screen.
- Select **No Support Installed**, not **PCMCIA Feature**, at the **System Configuration** screen.

Installing OS/2 Software

 If you are using a 760ED and installing the CD-ROM version of OS/2 Warp using the CD-ROM drive, select one of the following according to your configuration:

- To use the CD-ROM drive and an externally attached diskette drive, go to page 172.
- To use the CD-ROM drive and the internal diskette drive by switching between them, go to page 173.

Important

You need at least 90MB of free space on the hard disk drive.

Installing OS/2 Warp with the Boot Manager

To install the DOS ThinkPad Features program:

➔ Page 187.

To install the Windows ThinkPad Features program:


➔ Page 194.

Note:

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


- 1 Install the Boot Manager, referring to the OS/2 Warp documentation.
- 2 Install DOS and Windows, and the ThinkPad Features programs for both DOS and Windows.
- 3 Install OS/2 Warp:

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

- Select **VGA** as the **Primary Display** at the **System Configuration** screen.
- Select **No Support Installed**, not **System Configuration**, at the **System Configuration** screen.
-  Select **Non-Listed IDE CD-ROM** for the CD-ROM at the **System Configuration** screen.

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

Installing OS/2 Software

 If you are using a 760ED and installing the CD-ROM version of OS/2 Warp using the CD-ROM drive, select one of the following according to your configuration:

- To use the CD-ROM drive and an externally attached diskette drive, go to page 172.
- To use the CD-ROM drive and the internal diskette drive by switching between them, go to page 173.

Important

You need at least 90MB of free space on the hard disk drive.

Installing OS/2 Warp Using an External Diskette 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 to the drive for the CD-ROM drive.
- 4** Type `CDINST` and press **Enter**.
Make copies of the OS/2 Warp diskettes labeled “OS/2 Warp Installation Diskette” and “OS/2 Warp Diskette 1.”
- 5** Shut down OS/2 and turn off the computer.
- 6** Insert the OS/2 Warp Installation Diskette into the external diskette drive and turn on the computer.
- 7** When you are prompted to insert OS/2 Warp Diskette 1, insert it into the external diskette drive and the OS/2 Warp CD-ROM into the CD-ROM drive.

Installing OS/2 Software

Note:

If you have the OS/2 Warp FixPak 10 (XR0010) or later, install it after you complete the installation of OS/2 Warp. 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:

Select **VGA** as the **Primary Display** at the **System Configuration** screen.

Select **No Support Installed**, not **PCMCIA Feature**, at the **System Configuration** screen.

Select **Non-Listed IDE CD-ROM** for the CD-ROM at the **System Configuration** screen.

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

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

Note:

The following terms are used in these instructions:

[cd:] Your CD-ROM drive letter, followed by a colon

[c:] Target hard disk drive letter, followed by a colon

Have ready two formatted, blank 1.44MB diskettes before installation.

- 1 Ensure that you have installed DOS and Windows, and have at least 90MB of free space on the hard disk drive.
- 2 Insert the OS/2 Warp CD-ROM into the internal CD-ROM drive.
- 3 Open the DOS command prompt; then enter the following to copy all the diskette images from the OS/2 Warp CD-ROM to the hard disk drive (do not type the [] brackets):

```
xcopy [cd:]\os2image\ . [c:]\os2image\ . /s
copy [cd:]\diskimgs\ . [c:]\os2image
copy [cd:]\diskimgs\os2\35\disk .dsk [c:]\os2image
copy [cd:]\diskimgs\os2\35\disk1.dsk [c:]\os2image
```

- 4 Shut down OS/2 and turn off the computer.

Installing OS/2 Software

To install the diskette drive:

➔ Page 136.

Note:

You can use the E editor supplied with DOS or any other editor to edit files.

5 Replace the CD-ROM drive with the diskette drive; then turn on the computer.

6 Create the “OS/2 Disk 1” and “OS/2 Warp Installation Diskette” as follows:

a) Place a “OS/2 Warp Diskette 1” label on a blank diskette; then enter the following:

```
C:\>cd os2image  
C:\OS2IMAGE\>loaddiskf disk1.dsk a: /f/y
```

b) After the “OS/2 Warp Diskette 1” diskette has been created, open the CONFIG.SYS file on the diskette and find the following line:

```
set os2_shell=sysinst2.exe
```

Change this line to:

```
set os2_shell=sysinst2.exe [c:]\os2image
```

Save the CONFIG.SYS file.

c) Place a “OS/2 Warp Installation Diskette” label on a blank diskette; then enter the following:

```
C:\OS2IMAGE\>loaddiskf disk .dsk a: /f/y
```

7 Install OS/2 Warp as follows:

a) With the OS/2 Warp Installation Diskette still inserted in the diskette drive, restart your computer by pressing **Ctrl+Alt+Del**.

Installing OS/2 Software

Note:

Because your CD-ROM drive is not yet installed in the computer and cannot be recognized automatically by OS/2 Warp, you need to make OS/2 Warp recognize 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 Warp. Follow the instructions in the README.1ST file in diskette 1 of that FixPak.

- b) Follow the instructions on the screen; however, pay attention to the following during installation:

Select **VGA** as the **Primary Display** at the **System Configuration** screen.

Select **No Support Installed**, not **PCMCIA Feature**, at the **System Configuration** screen.

Select **Non-Listed IDE CD-ROM** for the CD-ROM at the **System Configuration** screen.

- c) When OS/2 Warp installation is complete, shut down OS/2 and turn off the computer.
- d) Replace the diskette drive with the CD-ROM drive; then turn on the computer.

The previous steps leave about 45MB of image files on your hard disk drive. You can leave these files for future reinstallations, or you can remove them to save hard disk space:

8 Clean up (optional).

- a) Open the **OS/2 System** folder; then open the **Drives** folder.
- b) Open **[c:] drive**; then click on the **OS2IMAGE** folder with the right mouse button to bring up the folders menu.
- c) Click on the **Delete** menu.

When you are asked to confirm deletion, select **Yes**.

Avoiding Video Problems When Installing OS/2 Warp

If you have a video problem when installing OS/2 Warp, do the following:

- 1** Make sure you have created the OS/2 Warp Video Fix Diskette using the Diskette Factory program.
- 2** Start installing OS/2 Warp.
- 3** When prompted to remove OS/2 Warp Diskette 1 and restart the computer, insert the OS/2 Warp Installation Diskette and restart the computer instead.

Installing OS/2 Software

- 4 Continue the installation, following the instructions on the screen, until the “Welcome” screen appears.
- 5 Press **F3** and go to the command prompt.
- 6 Insert the OS/2 Warp Video Fix Diskette into the diskette drive; then type the following command at the command prompt:

```
a:\repvga c
```

where *c* is the drive where OS/2 Warp is installed. The video driver files will be replaced.
- 7 Remove any diskettes from the diskette drive; then restart the computer.
The second half of the Warp installation continues.
- 8 When selecting a video driver, select a VGA display driver.
- 9 When prompted to remove any diskettes and restart the computer, insert the OS/2 Warp Installation Diskette and restart the computer instead.
- 10 Repeat steps 4 through 7.
- 11 Install the SVGA video mode driver using the Video Features Diskette for OS/2.

Note:
SVGA means resolution of 1024×768 or more with 256 colors or more.


To install the video driver:

➔ Page 182.

Note

When you open System Configuration in Selective Install after the video driver installation, Video Graphics Array [VGA] is shown as the Primary Display (representing the LCD). However, the video driver is correctly installed if you have followed the foregoing procedure.

Installing the CD-ROM Device Driver for OS/2

-  If you installed a CD-ROM device driver (**Non-listed IDE CD-ROM** on the System Configuration screen) when installing OS/2 Warp, you do not need to install the CD-ROM device driver. Continue with “Installing the ThinkPad Features Program for OS/2” on page 177.

Installing OS/2 Software

Have the diskettes that came with the OS/2 system ready; then install the CD-ROM device driver for OS/2:

- 1** Start OS/2 Warp; then open **OS/2 System, System Setup**, and then **Selective Install**.
- 2** Select the **CD-ROM Device Support** icon.
- 3** Select **Non-listed IDE CD-ROM** and click on **OK**.
- 4** Click on **OK** at the System Configuration screen.
- 5** 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 Driver Diskette.

Installing the ThinkPad Features Program for OS/2

To install the ThinkPad Features program:

- 1** Start OS/2 Warp; 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 **Device Driver Install** and click on the **Install...** button.
 - c) 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 3.11" on page 194.

Installing OS/2 Software

- 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 187.

Installing the PC Card Director for OS/2

To use PC Card Director:

➔ Page 44.

Note:

CardBus PC Cards cannot be used in OS/2 Warp.

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

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

To install the PC Card Director:

- 1 Start OS/2 Warp; then open the OS/2 full screen command prompt.
- 2 Insert the PC Card Director Diskette for OS/2 and Windows 95 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 Mwave DSP Support Software for OS/2



If you have multiple operating systems, you might need to install the Mwave DSP support software for each operating system. For example, to enable OS/2 and Windows applications for Mwave functions, install the Mwave DSP support software for both OS/2 **and** Windows.

Note:

When installing an operating system, you need to install the Mwave DSP support software.

To install the Mwave DSP support software:

- 1** Start OS/2 Warp; then open the OS/2 screen command prompt.
- 2** Insert the Mwave DSP Features Diskette 1 for OS/2 into the diskette drive; then type `A:SETUP` and press **Enter**.
The installation window appears on the screen.
- 3** Follow the instructions on the screen to complete the installation.
- 4** Restart OS/2 to make the Mwave features effective.
- 5** Install Mwave MMPM audio support software as follows:
 - a) Insert the Mwave DSP Features Diskette for OS/2 Audio into the diskette drive; then type `A:SETUP` at the command prompt and press **Enter**.
 - b) Follow the instructions on the screen.
- 6** After the installation is complete, remove any diskette from the diskette drive; then restart OS/2.

Note

Non-U.S. users must run the Country Selection program in the Mwave window after the Mwave installation is complete. Restart the computer after you run Country Selection.

Installing OS/2 Software

When You Use the WIN-OS/2 Environment

If you use the Mwave functions in WIN-OS/2:

1. Install the Mwave DSP support software for Windows in a full screen WIN-OS/2 environment with the procedure on page 195.
2. Check your **WIN-OS/2 Settings** and modify them as follows, referring to your OS/2 manuals:

```
WIN_RUN_MODE 3.1 Enhanced Compatibility
HW_TIMER      ON
INT_DURING_IO ON
DOS_BACKGROUND_EXECUTION ON
```

Installing the ESS AudioDrive Support Software for OS/2



To install the AudioDrive support software:

- 1 Start OS/2 Warp; then open the OS/2 full-screen command prompt.
- 2 Insert the AudioDrive Features Diskette for OS/2 into the diskette drive; then type `A:ESINST`; and press **Enter**.
- 3 Select **AudioDrive ES1688** from the list.
Make sure the source drive is A:.
If you have WIN-OS/2 installed on your computer, also select **ES1688 WinOS2/Windows Audio**.
- 4 Click on **Install**; then follow the instructions on the screen.
- 5 When you have completed the installation, restart the computer.

Note:

When you install OS/2 Warp, you must select **Multimedia Software Support** in the OS/2 Setup and Installation window.
If you encounter the SYS1041 error message during the AudioDrive software installation, make sure you selected the multimedia software support.

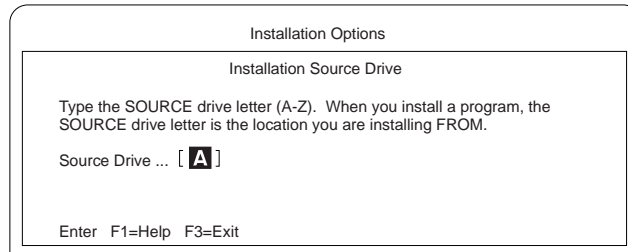
Installing the Infrared Device Driver for OS/2

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

If you have an infrared application such as TranXit version 1.0 for Windows that runs in WIN-OS/2, install the WIN-OS/2 infrared device driver:

- 1** Start OS/2 Warp.
- 2** If you have not installed DOS and WIN-OS/2 support for OS/2, install it by referring to your operating system documents.
- 3** Go to the DOS command prompt and insert the Infrared Features Diskette into the diskette drive.
- 4** Type `A:UINSTALL` and press **Enter**.

The following screen appears:



- 5** Press **Enter**; then follow the instructions on the screen.
Select **Install Win-OS2 ThinkPad InfraRed Driver** when you are asked.

Installing OS/2 Software

Starting TranXit for Windows or Other IR Applications

If you are going to start TranXit version 1.0 for Windows or any other Windows infrared applications that use the ThinkPad infrared device driver from:

The Program Manager window, do the following:

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

COM_DIRECT_ACCESS ON

A separate object that you have created for the infrared application, do the following:

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

COM_DIRECT_ACCESS ON

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

To use the ThinkPad Features program:

➔ Page 35.

Before Installation

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

Installing OS/2 Software

To install the ThinkPad display device driver:

- 1 Start OS/2 Warp.
- 2 Insert the Video Features 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 `INSTALL` and press **Enter**.
Follow the instructions on the screen.
- 4 After the installation is complete, remove the diskette, shut down OS/2, and restart the computer.

Installing the Enhanced Video/MPEG Device Driver for OS/2



This section is for computers with the Enhanced Video/MPEG features installed.

Important

To use the Video Overlay/Capture and MPEG functions, make sure you have installed the following software before installing the Video Overlay/Capture and MPEG device drivers:

ThinkPad Display Driver (9385) for OS/2 Warp
Mwave DSP support software
Video IN from the OS/2 BonusPak preloaded on the computer

Installing the MMPM/2 MPEG Update Diskette

Important

This procedure is necessary only for OS/2 Warp Version 3 and 3.01. For versions of OS/2 Warp later than that, skip this section.

Installing OS/2 Software

To install the MMPM/2 MPEG Update Diskette:

- 1** Start OS/2 Warp and open the **Multimedia** folder from the desktop; then click on the **Multimedia Application Install** icon.
- 2** Insert the MMPM/2 MPEG Update Diskette into the diskette drive.
- 3** Make sure the drive letter is A:; then click on **OK**.
- 4** Select from the list on the screen; then click on **Install**.
Follow the instructions on the screen.

Installing the Video Overlay/Capture and MPEG Device Drivers

To install the Video Overlay/Capture and MPEG device drivers:

- 1** Start OS/2 Warp and open the **Multimedia** folder from the desktop; then click on the **Multimedia Application Install** icon.
- 2** Insert the MPEG/Video Capture Driver Diskette for OS/2 into the diskette drive of the computer.
- 3** Make sure the drive letter is A:; then click on **OK**.
- 4** Select all of the driver listed on the screen; then click on **Install**.
Follow the instructions on the screen.

Installing Software for DOS

DOS

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


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).

Note:

Mwave DSP support software for DOS is installed when you install Mwave DSP support software for Windows 3.11.

The following shows the software already installed at the time of purchase. For your computer to work as it did at the time of purchase, install all of this software:

- 1 Install DOS → Page 185.
- 2  Install the CD-ROM device driver → Page 186.
- 3 Install the ThinkPad Features program → Page 187.
- 4 Install the PC Card Director → Page 188.

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 3.11, go to “Installing Microsoft Windows Version 3.11” on page 190.

Installing the CD-ROM Device Driver for DOS



To install the CD-ROM device driver:

- 1 Start DOS.
- 2 Insert the CD-ROM Driver Diskette into the diskette drive; then type `A:UINSTALL` and press **Enter**.
- 3 Select **Install IBM ThinkPad CD-ROM Driver for DOS/Windows(**)** at the Installation Options screen, then follow the instructions on the screen.
- 4 After the installation is complete, remove any diskette from the diskette drive and restart the computer.

Note:

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

Note:

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

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 /R [/C] [/S]
```

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

- /R** Enables the resident type device driver. Even when the CD-ROM drive is not installed at power-on, the device driver can be loaded in the memory. Remove this option if you use the CD-ROM drive in a docking station.
- [/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.

Installing DOS Software

Note

For the software parameter in the AUTOEXEC.BAT file, refer to the README file in the CD-ROM Driver 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 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

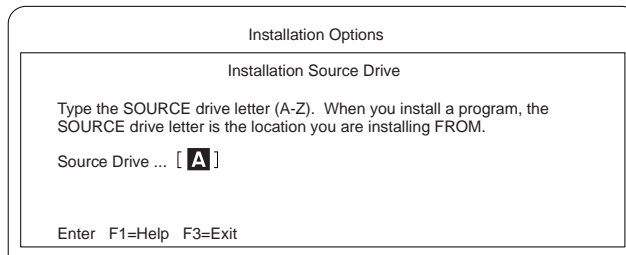
Note:

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:



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

Installing DOS Software

Installing the PC Card Director for DOS

Note:

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

PC Card Director:

➔ Page 44.

Note:

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

Note:

Whenever you update the CONFIG.SYS file, see page 279.

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

PC Card device drivers:

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

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

To install the PC Card Director:

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

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).


The following shows the software already installed at the time of purchase. For your computer to work as it did at the time of purchase, install all of this software:

- 1 Install DOS → Page 185.
 -  Install the CD-ROM device driver for DOS → Page 186.
 - Install the ThinkPad Features program for DOS → Page 187.
- 2 Install Windows 3.11 (with Advanced Power Management) → Page 190.
- 3 Install the ThinkPad display driver → Page 193.
- 4 Install the ThinkPad Features program for Windows → Page 194.
- 5 Install the PC Card Director → Page 194.
- 6 Install one of the following:
 -  Mwave support software → Page 195.
 - or*
 -  ESS AudioDrive support software → Page 196.
- 7  Install the MIDI Port device driver → Page 196.
- 8 Install the Infrared device driver → Page 197.
- 9  Install the Enhanced Video/MPEG device driver and Video CD Player → Page 197.

Installing Microsoft Windows Version 3.11

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

DOS Version 7.0 (see your DOS manuals)

 CD-ROM Device Driver for DOS (see page 186)
ThinkPad Features program for DOS (see page 187)

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

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**.

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

Installing Windows 3.11 Software

- 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 1d.

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


Installing Windows 3.11 Software

- 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)

 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 Display Driver for Windows 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.

Note:

Cyberxxxx in the right screen means:

For the TFT model: Cyber9385
For the DSTN model: Cyber9320

Do the following to install the ThinkPad display driver for Windows 3.11 so that you can get a correct display setting and a 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:       Cyberxxxx 1 24x768 256 small font
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 the ThinkPad Features Program for Windows 3.11

Note:

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

If you are going to use Windows, install the ThinkPad Features program for DOS first (see page 187); then do the following to install the ThinkPad Features program for Windows 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 Director for Windows 3.11

Note:

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

When installing Windows 3.11, you need to install the PC Card Director. You must install the following device drivers and software associated with PCMCIA before you can use the PC Cards:

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

To use PC Card Director:

➔ Page 44.

To install the PC Card Director:

- 1 Start Windows.
- 2 Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.
- 3 Insert the PC Card Director Diskette for DOS and Windows into the diskette drive; then type `A:PCMINSTW` and press **Enter**.

Installing Windows 3.11 Software

- 4 Follow the instructions on the screen to complete the installation.
Default choices are already highlighted at the choice screens.
- 5 After the installation is complete, remove any diskette from the diskette drive and restart the computer.

Installing the Mwave DSP Support Software for Windows 3.11



To install the Mwave DSP support software:

- 1 Start Windows.
- 2 Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.
- 3 Insert the Mwave DSP Features Diskette 1 for Windows into the diskette drive; then type `A:SETUP` and press **Enter**.
- 4 Follow the instructions on the screen.
Default choices are already highlighted at the choice screens.
- 5 After the installation is complete, remove any diskette from the diskette drive and restart the computer.

Note:

When installing an operating system, you need to install the Mwave DSP support software.

Attention:

Before you install the Mwave DSP support software, close all open applications.

Note

Non-U.S. users must run the Country Selection program in the Mwave window after the Mwave installation is complete. Restart the computer after you run Country Selection.

If this is your first time to install the Mwave DSP support software for Windows, also install the MIDI sample files as follows:

- 6 Follow the same procedures from step 2 to step 5; however, use the MIDI Samples Diskette 1 instead of the Mwave DSP Features Diskette 1 for Windows.
- 7 After the installation is complete, remove any diskette from the diskette drive and restart the computer.

Installing the MIDI Port Device Driver for Windows 3.11



To use the MIDI port, when connecting a MIDI keyboard device or external synthesizer, install the Mwave MIDI Port device driver:

- 1** Select the **Control Panel** from the Main window in the Windows Program Manager; then select **Drivers**.
- 2** Select **Add...**; then select **Unlisted or Updated Driver**.
- 3** Select **OK**.
- 4** Type `C:\MWW\MIDIPOINT` and select **OK**.

MIDIPOINT is the subdirectory name where you have installed the Mwave DSP support software.

- 5** Select **Mwave MIDI Port Driver**; then select **OK**.

Installing the ESS AudioDrive Support Software for Windows 3.11



To install the AudioDrive support software:

- 1** Start Windows.
- 2** Select **File...** from the Program Manager window; then select **Run...** from the pull-down menu.
- 3** Insert the AudioDrive Features Diskette for Windows into the diskette drive of your computer; then type `A:\SETUP` and press **Enter**.

Follow the instructions on the screen to complete the installation.

Installing the Infrared Device Driver for Windows 3.11

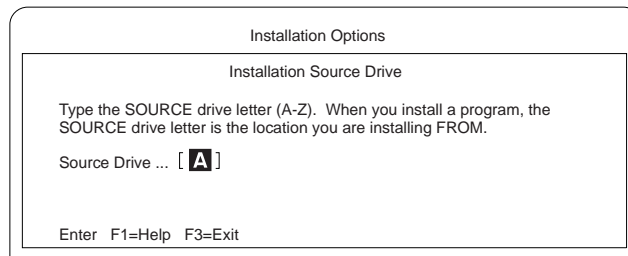
Note:

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

To install the infrared device driver:

- 1 Start Windows; then insert the Infrared Features Diskette into the diskette drive.
- 2 Go to the DOS command prompt; then type `A:UINSTALL` and press **Enter**.

The following screen appears:



- 3 Press **Enter**; then follow the instructions on the screen.

Select **Install Windows ThinkPad InfraRed Driver** when you are asked.

Installing the Enhanced Video/MPEG Device Driver and the Video CD Player for Windows 3.11



To use the Enhanced Video functions in Windows 3.11, you must install the ThinkPad display driver (Cyber...) and the Mwave DSP support software before installing the Enhanced Video device drivers.

Installing the Video Overlay/Capture Device Driver for Windows 3.11

The Video Overlay/Capture device driver enables the video in-out port on Video for Windows or compatible software. Install Video for Windows or compatible software; then do the following to install the video overlay/capture device driver:

- 1 Start Windows.

Installing Windows 3.11 Software

- 2** Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.
- 3** Insert the MPEG/Video Capture Driver Diskette for Windows into the diskette drive; then type `A:SETUP` and press **Enter**.
Follow the instructions on the screen.
- 4** After the installation is complete, remove the diskette and restart the computer to activate the Video Overlay/Capture device driver.

To run the video capture and playback functions, refer to the Video for Windows or compatible software manuals. To install the MPEG device driver, proceed to the following section.

Installing the MPEG Device Driver for Windows 3.11

The MPEG device driver enables playback for MPEG motion videos, CD-i movies, and video CDs.

Important

If this is not your first time installing the MPEG device driver for Windows 3.11, remove **IBM MPEG-2** and **CD-i/VideoCD** from the Installed Driver list in the Drivers menu.

To install the MPEG device driver:

- 1** Install the Microsoft Win32s** driver:
 - a) Start Windows.
 - b) Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.
 - c) Insert the Microsoft Win32s Setup Diskette 1 into the diskette drive; then type `A:\SETUP` and press **Enter**. Follow the instructions on the screen.
 - d) After you have completed the installation, restart Windows.
- 2** Click on **Control Panel** from the Main window.
- 3** Click on **Drivers**; then click on the **Add** button.
- 4** Select **Unlisted or Updated Driver**; then click on **OK**.

Installing Windows 3.11 Software

- 5** Insert the MPEG Features Diskette for Windows into the diskette drive of the computer.
- 6** Make sure the drive letter is A:; then click on **OK** and follow the instructions on the screen.

Install all the drivers listed by repeating steps 2 on page 198 to 6. After you have completed the installation, restart Windows.

Installing the IBM Video CD Player for Windows 3.11

The IBM Video CD Player for Windows enables playback of video CDs or CD-i movies with more options than with the Media player:

- 1** Start Windows.
- 2** Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.
- 3** Insert the Video CD Player Install Diskette into the diskette drive; then type A:SETUP and press **Enter**.

Follow the instructions on the screen.

Installing Software for Windows 95






This section describes the installation procedures for Windows 95 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).

The following shows the software already installed at the time of purchase. For your computer to work as it did at the time of purchase, install all of this software:

- 1 Install Windows 95 → Page 201.
- 2 Install the ThinkPad display driver → Page 201.
- 3 Install the ThinkPad Features program → Page 203.
- 4 Install the PC Card Director → Page 204.
- 5 Install one of the following:
 -  Mwave support software → Page 207.
 - or**
 -  ESS AudioDrive support software → Page 208.
- 6 Install the Infrared support software → Page 209.
- 7  Install the CD-ROM device driver → Page 210.
- 8 Install the Enhanced video/MPEG device driver and Video CD Player → Page 212.

Also, if you use the docking station, see page 214 and page 215.

Installing Microsoft Windows 95

Install Windows 95 as described in its documentation.

To Avoid Problems While Installing

If you encounter a problem while installing Windows 95, refer to the following:

If the screen blacks out during installation, do the following:

1. When the screen blacks out, wait until the hard disk activity stops (until the hard disk indicator disappears); then restart the computer.
2. Start the Windows 95 setup from the beginning.
3. On the Safe Recovery screen of the Windows 95 Setup Wizard, select **Use Safe Recovery (recommended)**; then click on the **Next>** button.
4. On the Setup Options screen of the Windows 95 Setup Wizard, select **Custom**; then click on the **Next>** button.
5. On the Analyzing Your Computer screen of the Windows 95 Setup Wizard, select **Yes, redetect now**; then click on the **Next>** button.

Follow the instructions to complete the installation of Windows 95.

If you encounter `Unknown Hardware Found` messages during installation, select **Do not install a driver (Windows will not prompt you again)**.

Installing the ThinkPad Display Driver for Windows 95

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

- 1 Start Windows 95.
- 2 Open **My Computer**, **Control Panel**, and **System**; then click on the **Device Manager** tab.

Installing Windows 95 Software

- 3** Click on the + mark for **Display adapters**.
- 4** Click on the **Trident** Super VGA**, and click on the **Remove** button. Click on **OK** when prompted to remove the device.
- 5** Select **No** when prompted to restart Windows 95.

Windows 95 will restart.

- 6** Click on the + mark for **Other devices**.
- 7** Click on **PCI VGA-Compatible Display Adapter** and click on the **Properties** button.
- 8** Click on the **Driver** tab, and click on the **Change driver** button.
- 9** In the **Select Hardware Type** dialog, select **Display adapters** and click on **OK**.
- 10** Insert the Video Features Diskette for Windows 95 into the diskette drive; then click on the **Have Disk** button and click on **OK**.
- 11** Make sure the following is shown as the selection:
For TFT model: IBM ThinkPad (Cyber9385/82) PCI
For DSTN model: IBM ThinkPad (Cyber9320) PCI
Then click on **OK**.
- 12** Click on **OK** to install the driver into the computer.
- 13** When prompted to restart, click on **Yes**; then remove the diskette from the drive and restart Windows 95.

Installing Windows 95 Software

If you want to change the monitor type, screen resolution, or color depth, do the following:

- 14** Move the mouse pointer to the desktop and click the right mouse button.
When pop-up menu appears, select **Properties**.
- 15** In the **Display Properties** window, click on the **Setting** tab; then click on the **Change Display Type** button.
- 16** Click on the **Change** button in the **Monitor Type** box.
- 17** If you are attaching an external monitor, select the appropriate monitor from the list. If not, select **Laptop Display Panel (1024x768)** or **Laptop Display Panel (800x600)**.
- 18** Click on **OK**; then click on **Close**.
- 19** In the **Desktop area** box, drag the slider to the appropriate resolution, such as **1024 by 768 pixels**; then click on **OK**.
- 20** Select your favorite color depth (for example, 256 color) from the Color palette.
- 21** When prompted to resize the desktop, click on **OK**.
The desktop size (screen resolution) changes.

Note:

If you are attaching an external monitor and not sure what to choose, select **Super VGA 1280x1024**.

Installing the ThinkPad Features Program for Windows 95

The ThinkPad Features program for Windows also works for Windows 95.

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

To start the ThinkPad Features program:

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

If you installed Windows 95 on a blank hard disk or if you have not installed the ThinkPad Features program, install the

Installing Windows 95 Software

ThinkPad Features program using the Utility Diskette for Windows supplied with the computer:

- 1** Insert ThinkPad Utility Diskette for Windows into the diskette drive.
- 2** Click on **Start**; then click on **Run...**
- 3** Type a : `INSTALLW` and click on **OK**.
Follow the instructions on the screen.

Installing the PC Card Director for Windows 95

Note:

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

The following is a summarized procedure to use the PCMCIA features in Windows 95 (each step is explained in detail later):

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

Note:

CardBus PC Cards cannot be used in Windows 95.

Disabling the PC Card Director for DOS and Windows

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

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

- 1** Start Windows 95; then select **My Computer**, **Control Panel**, and then **PC Card**.
- 2** Select **No** for the question "Are you using a PC card to install Windows?" and click on **Next**.

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- 3** Select **No** for the question “Do you want to review your system files and select real-mode PC card drivers so Windows can disable them?” and click on **Finish**.
- 4** Complete the Windows 95 PCMCIA support setup; then restart your computer.

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

Installing the Socket Services Device Driver

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

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

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

You will see the “PCIC or compatible PCMCIA controller on IBM system” item in the “Models:” list.

- 9** Click on the **OK** button.

IBMCSS01.VXD and IBMPCDIF.VXD will be listed in the Driver files: list.

Installing Windows 95 Software

- 10 Click on the **OK** button.

Windows 95 now starts copying files. The **Insert Disk** panel asks for one of the Windows 95 installation diskettes or the CD-ROM.

- 11 Change the source for **Copying files from:** to **A:** when Windows 95 tries to copy **IBMCSS01.VXD** or **IBMPCDIF.VXD**.

- 12 Insert the PC Card Director Diskette for OS/2 and Windows 95 into the diskette drive; then click on **OK**.

IBMCSS01.VXD and **IBMPCDIF.VXD** are copied from the diskette.

- 13 Click on the **OK** button at the Insert Disk panel.

- 14 Click on the **Skip File** button at the Copying Files... panel when Windows 95 tries to copy the following files:

CARDDRV.EXE
CSMAPPER.SYS
FLS1MTD.VXD
FLS2MTD.VXD
PCCARD.VXD
SRAMMTD.VXD

- 15 Restart the computer.

Note:

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

Installing the PC Card Director for Windows 95

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

- 1 Start Windows 95; then open **My Computer**, **Control Panel**, and then **Add/Remove Programs**.
- 2 Click on the **Install...** button.
- 3 Insert the PC Card Director Diskette for OS/2 and Windows 95 into the diskette drive; then click on the **Next>** button.
- 4 Click on the **Finish** button when you see "A:\INSTALLP.EXE" on the screen.
- 5 Click on the **Continue** button when the opening panel of the installation program appears on the screen. Follow the instructions on the screen.

Installing the Mwave DSP Support Software for Windows 95



Do one of the following:

If you are installing the Mwave DSP support software for Windows for the first time, you need to install Mwave DSP support software for Windows 95 and MIDI sample files.

If you have already installed the Mwave DSP support software for Windows, you need to install only the Mwave DSP support software. You do not need to install the MIDI sample files.

Installing the Mwave DSP Support Software

To install the Mwave DSP support software:

- 1** Start Windows 95; then click on **Start**, and then **Run...**
- 2** Insert the Mwave DSP Features Diskette 1 for Windows 95 into the diskette drive; then type `A:SETUP` and press **Enter**.

The Mwave installation window appears and prompts you to input the destination directory for the software. If the default directory is OK, press **Enter**. Otherwise, type a directory name and press **Enter**.

Follow the instructions on the screen.

- 3** If you are installing the Mwave DSP support software for the first time, go to "Installing the Mwave MIDI Sample Files" on page 208 and follow the instructions. Otherwise, remove any diskette from the diskette drive and restart Windows 95.

Note

Non-U.S. users must run the Country Selection program in the Mwave window after the Mwave installation is complete. Restart the computer after you run Country Selection.

Encounter a problem?

If you encounter a problem when using the Mwave DSP features for Windows 95 after installation, verify that "C:\MWW\DLL" is included in the PATH statement of AUTOEXEC.BAT.

Installing the Mwave MIDI Sample Files

To play MIDI files on your computer, install the Mwave MIDI sample files as follows:

- 1 Start Windows 95; then click on **Start**, and then **Run...**
- 2 Insert the MIDI Samples Diskette 1 into the diskette drive; then type `A:SETUP` and press **Enter**.

The Mwave installation window appears and prompts you to input the destination directory for the software. If the default directory is OK, press **Enter**. Otherwise, type a directory name and press **Enter**.

- 3 Follow the instructions on the screen. After the installation is completed, remove any diskette from the diskette drive; then restart Windows 95.

Installing the AudioDrive Support Software for Windows 95



When you install Windows 95, it might detect the AudioDrive chip installed in your computer, and automatically install the required audio software in your hard disk drive. However, the version of the AudioDrive support software supplied with Windows 95 might be an earlier version than the one needed for your computer.

In any case, you should reinstall the AudioDrive support software as follows:

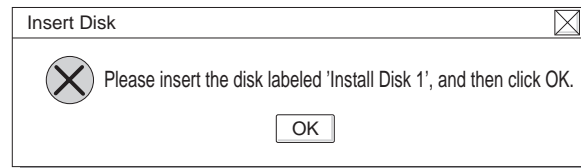
- 1 Start Windows 95; then open **My Computer**.
- 2 Click on **Control Panel** and then **System** to open the System Properties window.
- 3 Click on the **Device Manager** tab; then double-click on **Sound, video, and game controllers** from the list.

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- 4 Double-click on **ESS AudioDrive**; then click on the **Driver** tab.
- 5 Click on the **Change Driver** button; then click on the **Have Disk...** button.
- 6 Insert the AudioDrive Features Diskette for Windows 95 into the diskette drive; then type **A:** and click on **OK**.

If an error message appears on the screen, do steps 7 to 9. If the installation begins without any problem, go to step 10.

- 7 Click on **OK** until you see the following message:



- 8 Make sure the AudioDrive Features Diskette for Windows 95 is inserted in the diskette drive; then click on **OK**.
- 9 Type **A:** at the Copy Files From window; then click on **OK**.
- 10 After the installation is complete, click on the **Close** button.

Installing the Infrared Device Driver for Windows 95

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

- 1 Start Windows 95; then go to the MS-DOS command prompt.
- 2 Insert the Infrared Features Diskette into the diskette drive; then type **A:UINSTALL** and press **Enter**.
- 3 At the Installation Options screen, press **Enter** to accept the default source drive.
Follow the instructions on the screen.
- 4 Select **Install Windows ThinkPad Infrared Driver** when you are asked.

Make sure you specify the directory where you have installed Windows 95 when asked.

To make sure that the infrared port is configured correctly, do the following:

Installing Windows 95 Software

- 1 Start Windows 95 and select **My Computer**.
- 2 Click on **Control Panel** and then **System**.
- 3 Click on the **Device Manager** tab; then see if the **Generic IrDA Compatible Device** node has **(COM1)** or **(COM2)**.

If not, do the following:

- a) Go to the MS-DOS command prompt.
- b) Type `edit c:\windows\inf\msports.inf` and press **Enter**.
- c) Locate the following line:

```
% PNP 51 .DeviceDesc%=NoDrv, PNP 51
```

Change this line to:

```
% PNP 51 .DeviceDesc%=ComPort, PNP 51
```

- d) Save the changed file and exit the MS-DOS command prompt.
- e) In the Device Manager panel, click on **Generic IrDA Compatible Device** node.
- f) Click on **Remove** and then **Yes** to remove this node temporarily.
- g) Click on **Refresh**, then **Yes** to register this node using the new port definition.
- h) Restart Windows 95.

Installing the CD-ROM Device Driver for Windows 95



This section describes how to disable unnecessary DOS/Windows CD-ROM device driver.

If you installed Windows 95 on a blank hard disk drive without DOS and Windows, 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. Go to "Installing the Enhanced Video/MPEG Device Driver and the Video CD Player for Windows 95" on page 212.

Installing Windows 95 Software

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

To disable the DOS/Windows CD-ROM device drivers:

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

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:\xxxxxxx\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:\xxxxxxx\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:\xxxxxxx\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:\xxxxxxx\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.

Installing the Enhanced Video/MPEG Device Driver and the Video CD Player for Windows 95



To use the Enhanced Video functions in Windows 95, you must install the ThinkPad display driver (Cyber...) and the Mwave DSP support software before installing the Enhanced Video device drivers.

Installing the Video Overlay/Capture Device Driver for Windows 95

The Video Overlay/Capture device driver enables the video in-out port and Video for Windows (a standard component in Windows 95) or its compatible software.

To install the Video Overlay/Capture device driver for Windows 95:

- 1** Start Windows 95; then click on **My Computer, Control Panel,** and then **Add New Hardware.**
- 2** Click on **Next>**; then select **No** to the question **Search for your new hardware?**
- 3** Click on **Next>**; then select **Sound, video, and game controllers.**
- 4** Click on **Next>**; then click on **Have Disk.**
- 5** Insert the MPEG/Video Capture Driver Diskette for Windows 95 into the diskette drive; then select **OK.**
- 6** Install all the drivers listed on the screen.
You cannot install multiple drivers at the same time.
- 7** After the installation is complete, remove the diskette from the diskette drive.
- 8** Restart the computer to make the video overlay/capture device driver effective.

To use the video capture and playback functions, refer to the Windows 95 documentation or your video capture/playback software manual.

Installing Windows 95 Software

To install the MPEG device driver, proceed to the following section.

Installing the MPEG Device Driver for Windows 95

The MPEG device driver enables playback for MPEG motion video, CD-i movies, and Video CDs on your computer. To install the MPEG driver for Windows 95:

- 1** Start Windows 95; then click on **My Computer**.
- 2** Click on **Control Panel** and then **Add New Hardware**.
- 3** Click on **Next>**; then select **No** to the question **Search for your new hardware?**
- 4** Click on **Next>**; then select **Sound, video and game controller**.
- 5** Click on **Next>**.
- 6** Insert the MPEG Features Diskette for Windows 95 into the diskette drive; then click on **Have Disk...**
- 7** Highlight **IBM MPEG CD-i/VideoCD (mci)**; then click on **OK**.
- 8** Click on **OK**; then click on **Finish**.
- 9** Click on **Finish**.
- 10** When Windows 95 prompts you to restart the computer, click on **No**, and repeat steps 2 to 9 to install IBM MPEG Files/ISO9660 (mci), by selecting **IBM MPEG Files/ISO9660 (mci)** in step 7.
- 11** When Windows 95 prompts you to restart the computer, click on **No**, and repeat steps 2 to 9 to install IBM MPEG PCI Bridge by selecting **IBM MPEG PCI Bridge** in step 7.

If this is the first installation of the IBM MPEG PCI Bridge, you must do the following once. This procedure removes the device from the unknown class and adds it to the sound, video, and game controllers.
 - a) Select **Control Panel, System**, and then **Device Manager**.
 - b) Select **Other Devices** and **PCI Multimedia Device**.
 - c) Select **Remove**; then click on **OK**.
- 12** Shut down Windows 95 and restart the computer.

Installing Windows 95 Software

Installing the IBM Video CD Player for Windows 95

The IBM Video CD Player application enables the playback of video CDs and CD-i movies with more options than the Windows 95 standard Media Player. To install the IBM Video CD Player:

- 1 Start Windows 95; then click on the **Start** button and click on **Run....**
- 2 Insert the Video CD Player Install Diskette into the diskette drive; then type `A:SETUP` and press **Enter**.

Follow the instructions on the screen.

Disabling the Docking Control Program

All docking functions, once provided by the ThinkPad Docking Control Utility program for Windows, are now supported by the ThinkPad Plug-and-Play BIOS and Windows 95.

If you have installed Windows 95 on a computer in which the Docking Control Utility for Windows had already been installed, stop this utility program from working as follows:

Note:

To open the WIN.INI file, type `EDIT WIN.INI` and press **Enter**.

- 1 Open the WIN.INI file using your editor; then remove the following statement:

```
[windows]
:
load=C:\THINKPAD\DOCKWIN.EXE ← Remove this statement
:
```

- 2 Save and close the file.
- 3 Open the SYSTEM.INI file using your editor; then remove this statement:

```
[386Enh]
:
device=IBMPNP.386 ← Remove this statement
```

- 4 Save and close the file; then restart Windows to make the changes effective.

Using Windows 95 with the Dock II

When you use the Dock II with your computer and Windows 95, you need to disable the host adapter SCSI BIOS for Dock II. You can disable the host adapter SCSI BIOS by using either the Dock II SCSISelect™ utility or the DIP switches in the Dock II:

Using the Dock II SCSISelect Utility

- 1** Attach your computer to the Dock II and turn on the computer.
- 2** Press and hold the **Ctrl** key; then press the **A** key when prompted at boot time.
- 3** Select **Configure/View Host Adapter Settings** and disable the Host Adapter BIOS.

Using the DIP Switches in the Dock II

To use the DIP switches, refer to the section “Using the SCSI controller” in the *Dock II User's Guide*.

Installing Software for Windows NT Workstation Version 3.51



This section describes the installation procedures for Windows NT Workstation Version 3.51 (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 (or Microsoft) 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/files.html>

Select **IBM Portables**, **Notebooks**, and then **Laptops Files**.

FTP Site:

<ftp.pc.ibm.com/pub/mobiles>

CompuServe** ThinkPad Forum:

Join CompuServe ThinkPad Forum (GO THINKPAD) and download the necessary software from the library.



IBM PC Company BBS:

919-517-0001

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

Installing Windows NT Workstation Software

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

- 1 Install Microsoft Windows NT Workstation Version 3.51 or later
➔ Page 218.
- 2 Install the ThinkPad Video Features Diskette for Windows NT 3.51
➔ Page 218.
- 3 Install the Windows NT PCMCIA Token Ring Device Driver,
NTTRCC for IBM PCMCIA Token Ring User ➔ Page 220.
- 4 Install the Windows NT ThinkPad Features Program Diskette,
UTTP1WNT ➔ Page 221.
- 5 Install one of the following:
 -  The Windows NT Mwave Diskette ➔ Page 222.
 - or**
 -  The Windows NT ESS Audio Driver Diskette
➔ Page 223.
- 6 Install the ThinkPad PCI-IDE Driver for Windows NT ➔ Page 225.

Installing Microsoft Windows NT

Note:

You can install Windows NT using a built in CD-ROM drive or the CD-ROM drive of the SCSI CD-ROM in the IBM docking station.

Note:

When you install a later version of Windows NT 3.51, you do not need to follow this instruction about a video problem.

Before Installing Windows NT

You need to read the following before installing:

Review the Windows NT installation guide. If you need to use such PC Card hard disk drives (such as the IBM 105MB/260MB hard disk drive, Integral Peripherals Viper 105MB/260MB disk, Maxtor Mobile Max131, or the other PCMCIA ATA storage devices), insert it in the PC Card slot *before* you start the Windows NT installation.

Windows NT recognizes the PCMCIA hard disk only at installation to set up the necessary device driver.

Install Windows NT with **Custom Setup** and specify the video display as **Standard VGA (640x480, 16 colors)**. Otherwise, the screen might black out when you start Windows NT 3.51 the first time after the installation.

To install Windows NT, refer to the installation instruction for Windows NT.

Installing the Video Features Diskette for Windows NT

To display more than 16 colors, install the Video Features Diskette:

- 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 in the diskette drive.
- 6 From the display devices in the selection list, select **IBM ThinkPad (Cyber9320/9385/9382)** and click on **Install**.
- 7 Follow the instructions on the screen.

Installing Windows NT Workstation Software

- 8** Restart Windows NT to make the change effective.

The display resolution has been set to “640x480/256 colors” as the default.

To change the resolution or refresh rate, do the following:

- 1** Go to **Control Panel** and click on **Display**.
- 2** At the Display Setting menu, click on **List All Modes**, and select the color palette, desktop area, and refresh frequency as you want to set.
- 3** Click on **Test** and make sure the selected mode is displayed correctly. Follow the instructions on the screen.
- 4** Restart Windows NT to make the change effective.

Using the Video Features Diskette for the External Monitor

If you attach an external monitor to the computer, do the following to use the SVGA video driver with the attached monitor:

- 1** Start Windows NT, and log on with the user ID authorized as an administrator.
- 2** Click on **Display** in **Control Panel**.
- 3** At the Display Settings menu, click on **List All Modes**; then select the color palette, desktop area, and refresh frequency as you want to set.
- 4** Click on **Test** to make sure that the selected mode is displayed correctly on the monitor.

If the selection is OK, Windows NT prompts you to restart the computer.

Note

If you install the ThinkPad Features program for Windows NT, you can switch the display output type—CRT (external monitor) only, Both, or LCD only, using the ThinkPad Features program.

If your external monitor displays with flicker noise or if the screen image is unstable, you can adjust the monitor refresh rate as follows:

Using the ThinkPad Features program (Display Advanced Setup Menu), specify your **SVGA monitor** type, select the appropriate **Refresh Rate**, and then click on **OK** to adjust with your monitor type.

Installing the PCMCIA Token Ring Device Driver for Windows NT

Windows NT comes with integrated PCMCIA support for some PC Cards. The PCMCIA device driver included in Windows NT does not support the 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 version 3.51 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**.

Installing Windows NT Workstation Software

- 3 When you are prompted, insert the driver diskette in 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 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 Feature 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.

Notices

This section describes some notices you need to aware when you use the Fuel-Gauge program or personalization feature:

About the suspend and resume options

If you encounter some problems with any device when entering suspend or resuming, disable the suspend and resume options in the ThinkPad Features program's power mode setting (.

When you set the **Will not suspend even if LCD is closed** option at the suspend/resume options menu, all the activities to enter suspend mode (such as **Fn+F4**, suspend timer, Fuel-Gauge program, or low-battery suspend) are inhibited. After you set this option, restart Windows NT to make the change effective.

Using personalization editor

When you finish creating your personal data, you must save it in the "ThinkPad Utility Diskette for DOS/Personalization." Have ready this diskette before using the personalization feature. The Windows NT ThinkPad Feature Program diskette does not contain the function available in the "Utility Diskette for DOS/Personalization," such as storing the personalization data into the computer's nonvolatile memory.

Attention:

You must manually shut down the computer when the battery is low. The computer will not go to suspend automatically.

Personalization program:

➔ Page 116.

Installing the Mwave DSP Support Software for Windows NT



To install the Mwave support software:

- 1 Start Windows NT and insert the Windows NT Mwave installation disk #1 in the diskette drive.
- 2 Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.
- 3 Type `A:\SETUP` in the Open window.
- 4 Click on **OK**, and follow the instructions on the screen.

Note:

To use the Mwave DSP feature in Windows NT, your computer must have a minimum of 16 MB of memory.

Note

Non-U.S. users must run the Country Selection program in the Mwave window after the Mwave installation is complete. Restart the computer after you run Country Selection.


Installing MIDI Sample Files

To use MIDI, install the MIDI sample files separately from the Mwave installation:

- 1 Insert the MIDI installation disk in the diskette drive.
- 2 Select **File** from the Program Manager window; then select **Run...** from the pull-down menu.
- 3 Type `A:\SETUP` in the Open window.
- 4 Select **Yes** when asked if you wish to use the samples.
- 5 When the installation is complete, restart the computer.

Configuring the Mwave Modem

After installing the Mwave driver, you need to configure the communication port number to assign the Mwave modem resources for Windows NT:

- 1 Start the ThinkPad Feature program, and double-click on the **Modem** () icon.

Installing Windows NT Workstation Software

Note:

A warning message appears if the COM port is already used.

- 2 Select one of the COM ports in the window.
- 3 Click on **OK**.
- 4 In the Main group, double-click on **Control Panel**. Then double-click on **Ports**.
- 5 Verify that the list of COM ports includes the COM port that you chose in the ThinkPad Feature program. If not, click on **Add**. When the port is listed, double-click on it.
- 6 On the Advanced Settings dialog box, select the following settings:

COM Port	Base I/O Port Address	IRQ
COM1	03F8	4
COM2	02F8	3
COM3	03E8	4
COM4	02E8	3

Select the FIFO Enabled check box.

- 7 Select **OK**.

If you have made any changes, restart the computer to make the changes effective.

Installing the AudioDrive Support Software for Windows NT



Using the Audio Driver diskette, you can play back or record the WAVE/MIDI audio function in Windows NT.

To install the ESS AudioDrive support software:

- 1 Start Windows NT and go to **Main**. Click on **Control Panel** and then **Drivers**.
- 2 At the Install Driver menu, click on **Add...** and select **Unlisted or Updated Driver**.
- 3 Specify the drive and path name as **A:**; then select **OK**.
- 4 Select **ES1688/ES1788 AudioDrive 1.02** as the driver and select **OK**. The following message appears:

Installing Windows NT Workstation Software

The required esfm.dll driver is already on the system.
Do you want to use the current drive or install a new driver?

- 5 Click on **New**.
- 6 Select the ESS Base I/O address, DMA channel, and interrupt level from the list of values.

Default Settings	
Select the default setting for most applications:	
I/O address	220
Interrupt	5
DMA channel	1
Since the ThinkPad 760EL does not support connecting to an external MIDI device, select the following value in the next field:	
MPU401 I/O Address	Disable

- 7 Select **OK**.
- 8 When the installation program prompts you, restart Windows NT to make the change effective.

Changing the Default Setting

If you need to change the default setting of ESS audio resources such as an interrupt level, DMA channel, or I/O base address, make sure that the selected values match with the ones set by the ThinkPad Features program. ThinkPad Feature program allows you to set the following alternative value for each resources:

Base I/O Address	220 or 240 (220 is a default value)
Interrupt	5, 7, or 10 (5 is a default value)
DMA channel	1 or 0 (1 is a default value)

To change the default setting, do the following:

- 1 Start the ThinkPad Feature program, and change the default settings.
- 2 Shut down and restart Windows NT.
- 3 Open the Windows NT **Control Panel** and click on **Drivers**.

Installing Windows NT Workstation Software

- 4** Click on **Setup...**, and change the interrupt level and DMA channel; then click on **OK**.
- 5** If the base I/O address is also changed by the ThinkPad Feature program, the ESS Audio Configuration Panel warns you that you need to change the base I/O address also. Set the value you specified in the ThinkPad Features program.
- 6** Shutdown and restart Windows NT to make the changes effective.

Playback and Recording

You may be able to record or play back the WAVE file or play back MIDI sounds using **Sound Recorder** or **Media Player**, available in the **Accessories** group. For more information, refer to *Microsoft Windows NT Workstation System Guide*.

Installing the ThinkPad PCI-IDE Driver for Windows NT

To install the ThinkPad PCI-IDE device driver:

- 1** Close any running applications; then from the Program Manager, double-click on **Windows NT Setup** in the **Main** group.
- 2** Select **Options** and then **Add\Remove SCSI Adapters** from the menu bar.
- 3** From the SCSI Adapter Setup dialog box, click on **Add...** to add a new driver.

A message box explains how to recover from a bad installation.
- 4** Select the **OK** button.

The Select SCSI Adapter Option dialog box appears.

Installing Windows NT Workstation Software

Note:

If the installation files are located elsewhere, specify the path to these files in the text box.

- 5 Select **Other (Requires a disk from a hardware manufacturer)** from the Adapter: list box.

The Insert Diskette dialog box appears.

- 6 Insert the Utility Diskette into the diskette drive, and press **Enter**.

The Select OEM Option dialog box appears.

- 7 Select **ThinkPad PIIX IDE Driver** and click on **OK**.

The **Select SCSI Adapter Option** dialog box reappears with "ThinkPad PIIX IDE Driver" appearing in the Adapter: list box.

- 8 Click on **Install**.

The Windows NT Setup dialog box prompts you for the path of the installation files.

- 9 Click on **Continue**.

If the installation was successful, the SCSI Adapter Setup dialog box reappears, and **ThinkPad PIIX IDE Driver** is listed.

- 10 Select **Close** to exit **SCSI Adapter Setup**, exit **Windows NT Setup**, and restart the computer when prompted.

After the installation, the PIIXIDE.SYS file is stored in the c:\<Win NT directory>\System32\Drivers directory.

Chapter 8. Solving Computer Problems

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

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

Important

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

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Common Problems and Frequently Asked Questions



This section provides:

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



Common Problems and Actions

Problem	Action
My modem application does not work with the Mwave modem.	<p>Verify that:</p> <p>You have started the Mwave modem as following:</p> <ul style="list-style-type: none"> – <i>For OS/2:</i> <ol style="list-style-type: none"> 1. Open the Mwave ThinkPad folder. 2. Double-click on the Mwave Modem icon. The Mwave modem starts automatically. – <i>For DOS:</i> <ol style="list-style-type: none"> 1. Type FASTCFG at the DOS prompt and press Enter. The FASTCFG utility opens. 2. Select Advanced Modem; then select OK. The Mwave modem starts automatically. – <i>For Windows</i>, the Mwave modem starts automatically when you start Windows. <p>Your application is using COM2 as a communication port. COM2 is assigned to the Mwave modem as a default.</p> <p>Your application's modem type is set to one of the following:</p> <ul style="list-style-type: none"> – Mwave modem – Generic Hayes**-type modem – Hayes SmartModem 2400 – Hayes modem – Hayes-compatible modem <p>For more information:</p> <ul style="list-style-type: none"> – <i>For OS/2 or Windows</i>, double-click on the Read Me icon in the Mwave ThinkPad window. – <i>For DOS</i>, see the README.TXT file in the MWD subdirectory.

Troubleshooting

Problem	Action
My modem application does not work with the PC Card modem.	<p>If the PC Card Director shows the PC Card modem status "Ready," add the following option switch in the CONFIG.SYS file:</p> <p><i>For DOS:</i></p> <pre>DEVICE=C:\THINKPAD\IBMDSS14.SYS /IO =x (or /IO1=x)</pre> <p><i>For OS/2:</i></p> <pre>DEVICE=C:\THINKPAD\IBM2SS14.SYS /IO =x (or /IO1=x)</pre> <p>Note: x shows the PC Card slot number (1 for upper slot, 2 for lower slot, or 12 for both slots) on the computer and "/IO1=" shows the slot number for a docking station or port replicator that is attached to the computer.</p>
My PC Card modem does not work.	<p>Your computer is equipped with a built-in Mwave modem. If you want to use the PC Card modem instead of the Mwave modem, you need to release a communications port (COM port) for the PC Card modem. Do the following:</p> <p><i>For OS/2 or Windows,</i> start the ThinkPad Features program and release a COM port for your PC Card modem by:</p> <ul style="list-style-type: none">- Disabling the infrared device by clicking on the Infrared () icon.- Disabling the internal modem by clicking on the Modem () icon.- Changing the COM port for the internal modem from COM2 to COM1. <p>See page 35 to use the ThinkPad Features program.</p> <p><i>For DOS,</i> use the PS2 command to disable the telephony function or infrared port and to release a COM port for the PC Card modem.</p> <p>For more information or the latest tips, refer to:</p> <ul style="list-style-type: none">- PC Card problems on page 254- READ.ME file and PCMCIA.CRD file in the THINKPAD subdirectory of the computer
I cannot use PC Cards other than IBM ones in the OS/2 Warp environment.	<p>If you do not have the PC Card device driver for OS/2 but you have one for DOS, your PC Card may run in the VDM (virtual DOS machine) environment. Refer to "Virtual Card Services for OS/2" on page 290 for setting the VDM and the sample configuration files on the PC Card Director Diskette for OS/2 and Windows 95. (If the PC Card Director Diskette for OS/2 and Windows 95 did not come with the computer, create it using the Diskette Factory program.)</p>

Troubleshooting

Problem	Action
My computer does not show as good performance as I expected.	<p>Performance varies depending on your hardware and software configurations such as memory size, swapper file size, or smart drive settings.</p> <p>Also, close any windows you are not using; for example, when there is no CD in the CD-ROM drive, make sure the Media Player window is closed.</p>
Error 2XX appears (memory error).	Make sure your memory card is correctly installed. (See page 125.)
A memory shortage or memory error occurs.	<p><i>When you are using DOS</i>, it is recommended that you use the DOS command <code>MEM /C</code> to review your DOS memory usage occasionally. And then:</p> <ul style="list-style-type: none">– 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 <code>DEVICEHIGH</code> statement.– Use the multiple configuration setup for DOS (refer to the documents supplied with DOS). <p><i>When you are using Windows:</i></p> <ul style="list-style-type: none">– Try the same actions as described for DOS.– Unload any unnecessary programs from the WIN.INI file (for example, FUELWIN for AC operations, LRGPTR for large pointer, and so on).
The external monitor screen is blank.	<p>Do the following:</p> <p>Press Fn+F7.</p> <p>Make sure the display output type parameter of the ThinkPad Features program is set to CRT () or Both () .</p> <p>In the ThinkPad Features program, set the computer not to enter suspend mode when the LCD is closed.</p>
The computer does not resume from suspend mode , or the suspend indicator stays on and the computer does not work.	<p>The computer automatically enters suspend or hibernation mode when the battery pack is empty. Do one of the following:</p> <p>Replace the battery pack with a fully charged one and then press Fn. Connect the AC Adapter to the computer.</p>

Troubleshooting

Problem	Action
The computer does not enter suspend or hibernation mode .	Verify that: If the computer is attached to a Dock I, suspend mode is disabled. If the computer is attached to a Dock II or SelectaDock Docking System, open the Docking Control utility and verify suspend and hibernation are not disabled. If either is disabled, enable it. If you are using the AC Adapter and the computer is communicating, suspend and hibernation modes are disabled. (See page 96.)
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 190.

Frequently Asked Questions and Answers

Question	Answer
How can I expand my hard disk space?	Most of the preloaded applications provide a way to be uninstalled and free hard disk space. Check whether the application you want to delete has its own delete icon. After creating all the necessary drivers diskettes using the Diskette Factory, you can delete the diskette files.
How can I expand my memory?	See answers to memory questions on page 231.
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 dealer or IBM marketing representative. (See page 259 for IBM HelpWare information.)
How can I resolve any resource conflicts (for IRQ, COM port, and other settings) that have occurred after installing a new option or a new application?	See Appendix A to get information about any hardware resources already used by devices in the computer.

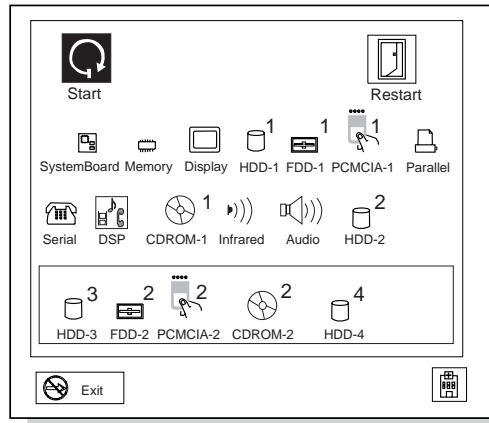
Troubleshooting

Note:

During the test, do not touch the keyboard or the pointing device.

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

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



If the computer did not beep, the speaker is not working correctly. Check that the speaker volume control (see page 21 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 233. If a problem persists, 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 persists, find the problem in the troubleshooting charts on page 235.

- No** Return to step 3 on page 233 and start Easy-Setup again. If you still cannot start Easy-Setup, find the problem in the troubleshooting charts starting on page 235.

Troubleshooting Charts

In the charts, x can be any character.

Error Codes and Screen Messages

Screen Message and Its Meaning	Action
<p>I9990301 I9990302 I9990305</p> <p>(Incorrect connection of the hard disk drive can cause these error codes to appear.)</p>	<p>The computer cannot find the startup drive. Do the following:</p> <ol style="list-style-type: none"> 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? <ul style="list-style-type: none"> Yes Exit this screen, and turn off the computer. No Select the Reset icon. 5. Is an operating system installed? <ul style="list-style-type: none"> 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. <p>If the same screen message appears, have the computer serviced.</p>
<p>I99xxxxx</p> <p>(Except the above I999030x errors)</p>	<p>Have the computer serviced.</p>
<p>111</p> <p>(Docking station error)</p>	<p>If you are using a port replicator or a docking station, disconnect it; then reconnect it.</p> <p>If there is still a problem, have the computer serviced.</p>

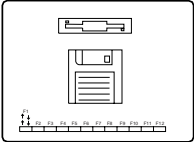
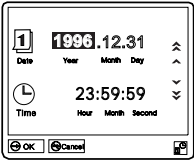
Troubleshooting

Screen Message and Its Meaning	Action
<p>158 (Supervisor password error)</p>	<p>A hard disk drive without a hard disk password is installed when a supervisor password is set.</p> <p>The location of the hard disk drive can be one of the following: the main hard disk drive bay of the computer, the UltraBay of the computer, or the UltraBay of the SelectaDock Docking System attached to the computer.</p> <p>To solve the problem, do the following:</p> <ol style="list-style-type: none"> 1. Make sure the hard disk drive without a hard disk password is installed in the main hard disk drive bay of the computer. If the hard disk drive has been in the UltraBay of the SelectaDock Docking System, turn off the computer and reinstall the hard disk drive in the main hard disk drive bay. 2. Press Enter. 3. Type your supervisor password at the power-on password prompt. If an error 158 screen appears, press Enter to proceed to the Easy-Setup password screen. 4. Select the Supervisor icon; then press Enter. The same password as the supervisor password is set for the hard disk password on the hard disk drive. 5. Turn off the computer.
<p>159 (Supervisor password error)</p>	<p>The hard disk password differs from the supervisor password.</p> <p>The location of the hard disk drive can be one of the following: the main hard disk drive bay of the computer, the UltraBay of the computer, or the UltraBay of the SelectaDock Docking System attached to the computer.</p> <p>To solve the problem, do the following:</p> <ol style="list-style-type: none"> 1. Make sure the hard disk drive with a hard disk drive password different from the supervisor password is installed in the main hard disk drive bay of the computer. If the hard disk drive has been in the UltraBay of the SelectaDock Docking System, turn off the computer and reinstall it in the main hard disk drive bay. 2. Turn off the computer; then turn it on again. 3. Change the hard disk password to the supervisor password at the hard disk password prompt.

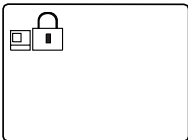
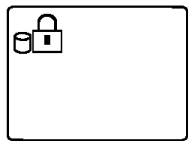

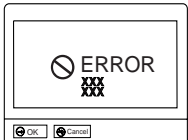
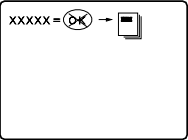
Troubleshooting

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. Check that the hard disk drive and the device in the UltraBay are installed firmly in the connectors.
184 (Invalid password error)	The entered password is invalid. Turn off the computer and wait at least 5 seconds; then turn it on again and type the correct password.
190 (Critical low-battery error)	The computer has turned off because of a critical low-battery condition. Connect the AC Adapter to the computer and charge the battery pack, or replace the battery pack with the fully charged one.
195 (Hibernation error)	The system configuration before and after hibernation mode differs, and the computer cannot resume normal operation. Change the system configuration to what it was before the computer entered hibernation mode. If the memory size is changed, re-create the hibernation file (see page 98).
196 (Hibernation error)	The computer cannot read the hibernation file. Have the computer serviced.
2xx (Memory error)	Verify that the DIMM option is correctly installed.

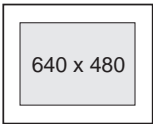

Troubleshooting

Screen Message and Its Meaning	Action
<p>30x (Keyboard error)</p>	<p>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.</p> <p>If there is still a problem, do the following:</p> <p>If the computer has an external keyboard connected, do the following:</p> <ul style="list-style-type: none"> – 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 154). – Verify that the keyboard/mouse connector is correctly connected to the computer. <p>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.</p> <p>Test the computer by selecting the Start icon in the Test menu of Easy-Setup.</p> <ul style="list-style-type: none"> – If the computer stops during testing and does not continue, have the computer serviced.
<p>Diskette and F1 prompt.</p> 	<p>Verify that the hard disk drive is correctly installed. Or, verify that the self-starting diskette is inserted correctly (with the label up and metal-shutter end first) in the diskette drive.</p> <p>If so, press F1. If both prompts remain, have the computer serviced.</p>
<p>Error 163 appears with the date and time screen.</p> 	<p>The date and time screen appears when neither the date nor the time is set in the computer.</p> <p>Set the date and time by typing or clicking on the ▲ or ▼ to set the numbers; then click on the OK button.</p>

Troubleshooting

Screen Message and Its Meaning	Action
<p>Power-on password prompt.</p> 	<p>A power-on or supervisor password was set. To use the computer, type the correct password and press Enter (see page 102).</p> <p>If the power-on password is not accepted, a supervisor password might have been set. Type the supervisor password and press Enter.</p> <p>If there is still a problem, have the computer serviced.</p>
<p>Hard disk password prompt.</p> 	<p>A hard disk password was set. To use the computer, type the correct password and press Enter (see page 102).</p> <p>If there is still a problem, have the computer serviced.</p>
<p>Test menu.</p> 	<p>Select the Start icon and follow the instructions to test your system.</p> <p>If you cannot go beyond the Test screen, have the computer serviced.</p> <p>If the computer stops during testing and does not continue, have the computer serviced.</p> <p>If testing does not find a problem but one persists, find the problem in “What If Testing Cannot Find the Problem?” on page 243.</p> <p>If the test ends with an error, make a note of the error code and have the computer serviced.</p>
<p>POST error prompt.</p> 	<p>An error was found during the POST. Press Enter; then select Start from the test menu to run the test.</p> <p>If the test ends with an error, make a note of the error code and have the computer serviced.</p>
<p>Error prompt.</p> 	<p>Turn off the computer and start Easy-Setup; then select Test to test the computer.</p> <p>If the test ends with an error, make a note of the error code and have the computer serviced.</p> <p>You can start the operating system by pressing F1 instead and ignore the error.</p>

Troubleshooting

Screen Message and Its Meaning	Action
<p>DOS screen looks smaller.</p> 	<p>When you use a DOS application that supports only VGA mode (640-by-480 resolution) with your computer, the screen image might look slightly distorted or might appear smaller than the display size. This is to maintain compatibility with DOS applications. To expand the screen image to the same size as the actual screen, start the ThinkPad Features program and click on the Display button (); then select the <i>screen expansion</i> function. (However, the image may look slightly distorted.)</p>
<p>A screen or message that is not listed.</p>	<p>Turn off the computer and start Easy-Setup; then select Test to test the computer.</p> <p>If the test ends with an error, make a note of the error code and have the computer serviced.</p> <p>If you cannot start Easy-Setup, have the computer serviced.</p>

LCD Blank or Power-On Problems

Problem	Action
<p>The screen is blank and there are no beeps.</p> <p>Note: If you are not sure about the beeps, turn the computer off; then turn it on again, and listen to the beeps.</p>	<p>Verify that:</p> <ul style="list-style-type: none"> 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 is on. (Turn on the power switch again for verification.) <p>If the preceding items are correct and the screen remains blank, have the computer serviced.</p>
<p>The screen is blank and there is one beep.</p> <p>Note: If you are using an external monitor, go to “External Monitor Problems” on page 247.</p>	<p>If a power-on password is set, press any key to display a power-on password prompt and then type the correct password and press Enter (see page 102).</p> <p>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.</p>
<p>The screen is blank and there is a continuous beep, or two or more beeps.</p>	<p>Have the computer serviced.</p>
<p>Only the cursor appears.</p>	<p>Reinstall your operating system and turn on the computer.</p> <p>If there is still a problem, have the computer serviced.</p>

Troubleshooting

Problem	Action
xxxxx KB OK appears and the computer halts.	Have the computer serviced.
The screen is unreadable or distorted.	Verify that: <p style="margin-left: 40px;">The ThinkPad display driver is installed correctly (refer to the Chapter 7 for installation instructions).</p> <p style="margin-left: 40px;">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.</p>
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 rear of the computer with the tip of a pen to turn off the computer; then turn the computer on again.
The computer goes into suspend mode immediately after the POST. (The suspend lamp turns on.)	Verify that: <p style="margin-left: 40px;">The battery pack is charged.</p> <p style="margin-left: 40px;">The keyboard is firmly closed.</p> <p style="margin-left: 40px;">The environmental temperature is within the acceptable range. Refer to Appendix C, "Features and Specifications" on page 291.</p> <p>If the preceding items are correct, have the computer serviced.</p>
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 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.

Troubleshooting

Other General Problems

Problem	Cause or Action
The computer locks up or does not accept any input.	<p>When you turn on the computer with OS/2 Warp installed, make sure no compact disc (CD) is in the CD-ROM drive.</p> <p>Some CDs cause the computer to lock up and accept no input when the computer is turned on with the CD installed. If the computer locks up with the CD installed in the CD-ROM drive, remove the CD, turn off the computer, and turn the computer on again.</p> <p>To turn the computer off, press the Power Shutdown switch on the rear of the computer with the tip of a pen to turn off the computer; then turn the computer on again.</p>
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.
Performance degrades when the computer is getting hot during use.	<p>Processor speed may decrease if the computer is used under the following conditions, for thermal protection. This is not a defect.</p> <p>The computer is used in a high-temperature environment. (See Appendix C.)</p> <p>The computer is getting hot because it is maintaining operations that require high power consumption for a long time.</p>
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.	<p>If the suspend lamp is turned on, connect the AC Adapter or install a fully charged battery pack in the computer; then resume operations.</p> <p>If there is still a problem, press the Power Shutdown switch on the rear of the computer with the tip of a pen to turn off the computer.</p>
The computer does not start from a diskette.	Check that the startup sequence in Easy-Setup is set to start the computer from the diskette drive (see page 38).
The keyboard cannot be opened.	<p>Check that:</p> <p>A Kensington lock or compatible lock is not in use.</p> <p>The security latch at the right side of the computer is unlocked. (See step 2 on page 7.)</p> <p>Note: Slide the keyboard latches toward the front to open the keyboard.</p>

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
When you are using OS/2 or Windows, the message, "Please discharge battery" appears on the screen.	Discharge the battery pack; then recharge it using the Fuel-gauge program (see page 90).
The battery status indicator has turned off although a battery pack is installed in the computer.	The over-current protection device inside the battery pack has been activated. Wait for several hours and try to use it again. If there is still a problem, replace the battery pack or have the computer serviced.
The battery pack cannot be fully charged in 3 hours by the power-off charging method.	<p>The battery pack might be over-discharged.</p> <ol style="list-style-type: none"> 1. Turn off the computer. 2. Make sure that the over-discharged battery pack is in the computer. 3. Connect the AC Adapter to the computer and let it charge. <p>If the battery pack cannot be fully charged in 24 hours, use a new battery pack.</p> <p>If a Quick Charger (available as an option) is available, use it to charge the over-discharged battery pack.</p>
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 off the computer for 1 minute to reset the over-current protective function, and then turn it back on again.

Troubleshooting

CD-ROM Drive Problems

Problem	Action
The CD-ROM will not operate.	<p>Verify that:</p> <ul style="list-style-type: none">The computer power is turned on and a compact disc is set in the CD-ROM tray.The CD-ROM drive connector is firmly attached to the computer.The CD-ROM drive tray is firmly closed.The device drivers have been installed correctly (see page 176 for OS/2 or page 186 for DOS.) <p><i>When you use Windows or DOS, the device driver and support software have been copied to the correct directory on the hard disk. (See page 186.)</i></p> <p><i>When you use DOS, the CONFIG.SYS and AUTOEXEC.BAT files have the correct statements (see page 186).</i></p> <p><i>When you use DOS, refer to your DOS documentation and check the LASTDRIVE statement in your CONFIG.SYS file. (It is recommended to set the LASTDRIVE to Z.)</i></p> <p><i>When you use OS/2, Line/CD is selected as the auxiliary source in the Mwave Auxiliary Control window. (See page 53.)</i></p> <p>If you attach a docking station to the computer and the CD-ROM drive in the docking station does not work, make sure that the secondary IDE device in the docking station is enabled by the ThinkPad Features program:</p> <ol style="list-style-type: none">1. Start the ThinkPad Features program.2. Click on the Docking Station  icon.3. Make sure you have checked Enable secondary IDE device. <p>See page 186 for information about the CD-ROM software parameter in the CONFIG.SYS file.</p>
The CD-ROM tray does not open with the CD-ROM eject button.	Insert a pin into the CD-ROM emergency eject hole to eject the CD-ROM tray. (See page 20.)

Troubleshooting


Problem	Action
The compact disc cannot be read.	<p>Verify that:</p> <ul style="list-style-type: none">The compact disc is not dirty. Clean it with a CD-ROM cleaner kit.The compact disc is not defective. Try another compact disc.The compact disc is placed in the tray with the label side up.The compact disc is a compatible format as follows:<ul style="list-style-type: none">– Music CDs– CD-ROM or CD-ROM XA– Multisession photo CDs– Video CDs and CD-i movies (Windows 95 does not support CD-i movies.) <p>If the problem persists, see information about SMARTDRV on page 186.</p>

Diskette Drive Problems



Problem	Action
The diskette drive in use icon stays on.	<p>If there is a diskette in the drive, verify that:</p> <ul style="list-style-type: none">– The internal or externally attached diskette drive connector is firmly attached to the computer.– The diskette contains the necessary files to start the system.– There is nothing wrong with your application program.– There is nothing wrong with the diskette. Try a backup copy if you have one.– The diskette is inserted correctly (label up and metal-shutter end first) in the diskette drive. <p>If the preceding items are correct, have the computer serviced. If there is no diskette in the drive, have the computer serviced.</p>

Troubleshooting




Enhanced Video/MPEG Feature Problems

Problem	Cause and Action
<p>The Enhanced Video function or the MPEG function does not work.</p>	<p>Verify the Enhanced Video is enabled and no resource conflicts (IRQ or I/O address) exist by doing the following:</p> <ol style="list-style-type: none"> 1. Select the Enhanced Video () icon in the ThinkPad Features program. 2. Click on Advanced..., and make sure at least one IRQ is assigned for the PCI devices. <p>If you find any conflicts with other devices, change the value to avoid any conflicts (see page 267).</p> <p>The MPEG playback and the video capture functions use the same hardware resources. Only one of the two functions can be used at the same time. For the same reason, two MPEG functions cannot be used at the same time.</p>

Docking Station Problems

Problem	Action
<p>SCSI devices in the Dock I or Dock II do not work.</p>	<p>Verify that:</p> <ul style="list-style-type: none"> SCSI devices are installed correctly. (Refer to the user's guide for Dock I or II.) IRQ level for the SCSI controller does not conflict with the system resource. <ul style="list-style-type: none"> – To change the SCSI IRQ, refer to the user's guide for Dock I or II. – To change the system resource, click on the Docking Station () icon in the ThinkPad Features program and click on Advanced and PCI device setup; then change the IRQ level.
<p>The IDE CD-ROM drive or hard disk drive in the docking station (SelectaDock Docking System, Dock I, or Dock II) does not work.</p>	<p>Verify that a secondary IDE device in the docking station does not conflict with the system resource:</p> <ol style="list-style-type: none"> 1. Start the ThinkPad Features program. 2. Click on the Docking Station () icon and put a check mark by Enable secondary IDE device.

External Monitor Problems

Problem	Action
<p>The screen is blank.</p>	<p>Verify that:</p> <ul style="list-style-type: none"> 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. <p>The external monitor (CRT  or Both ) is selected as the display device using the Fn key function (see page 26) or the ThinkPad Features program (see page 35).</p> <p>After verifying the preceding items, turn off the computer; then turn it on.</p> <p>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.</p>
<p>You cannot set the higher resolution for the external monitor.</p>	<p>Verify that:</p> <ol style="list-style-type: none"> 1. The ThinkPad display driver is installed correctly. If you are not sure, reinstall the display driver referring to Chapter 7. 2. An appropriate monitor type is selected. See the ThinkPad Features program's advanced setup window. 3. An appropriate refresh rate is selected. See the ThinkPad Features program.
<p>The screen is unreadable or distorted.</p>	<p>Verify that:</p> <ul style="list-style-type: none"> The ThinkPad display driver is installed correctly (see Chapter 7). The device setup parameters (resolution and refresh rate) 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 40). <p>To change or set up the external monitor, see "Using the LCD and an External Monitor" on page 40.</p> <p>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.</p>

Troubleshooting

Problem	Action
(For the Enhanced video model:) Interference occurs in the overlay window.	<p>When you attach an external monitor to the Enhanced Video model computer and set the following video modes, you might see some interference or low screen resolution in the overlay window of the external monitor:</p> <ul style="list-style-type: none">800×600 (resolution) and 16,777,216 (color depth)1024×768 and 2561024×768 and 65,5361280×1024 and 256 <p>To fix this, change the following settings using the ThinkPad Features program:</p> <ol style="list-style-type: none">1. Change the refresh rate; then check whether the monitor screen is corrected. If the problem persists, go to step 2.2. Change the color depth. Restart the computer; then check whether the monitor screen is corrected. If the problem persists, go to step 3.3. Change the screen resolution. Restart the computer; then check whether the monitor screen is corrected.
Wrong characters appear on the screen.	<p>Verify that the operating systems and application programs have been installed and configured correctly.</p> <p>If so, have the computer serviced.</p>

Television Problems



Problem	Action
The screen is blank.	<p>Even if you selected television output, whenever you turn on the computer, its output is <i>always</i> displayed first on the LCD. Use the Fn+F7 keys to display output on the television.</p>

Suspend and Hibernation Problems

Problem	Action
<p>When you use Windows 95, the computer does not enter suspend mode by timer.</p>	<p>When you use Windows 95, the Windows 95 generic CD-ROM driver accesses the internal CD-ROM drive every 3 seconds to see if a CD-ROM is inserted in the CD-ROM drive. This prevents a ThinkPad 760ED from entering suspend mode by the timer suspend function even if there is no actual system activity for a certain period.</p> <p>To stop this auto-detect function and enable the timer suspend function, do the following:</p> <ol style="list-style-type: none"> 1. Open My Computer. 2. Open Control Panel; then open System. 3. Click on the Device Manager tab. 4. Click on the + mark of CD-ROM. 5. Double-click on the CD-ROM name that appears. 6. Click on the Setting tab. 7. Remove the check mark from Auto insertion notification. <p>Windows 95 will no longer detect CD-ROM insertion automatically.</p>
<p>The computer does not enter hibernation mode with the Fn+F12 key combination.</p>	<p>Did you create the hibernation file?</p> <p>You must create the hibernation file before entering hibernation mode (see page 98).</p> <p>Are you using PC Cards?</p> <p>If you are using one of the IBM communication PC Cards listed in the "Considerations for Hibernation Mode" on page 98, the computer cannot enter hibernation mode.</p> <p>To enter hibernation mode, stop the communication program, and then remove the PC Card or turn off the power to the PC Card slot using the PC Card Director.</p>

Troubleshooting

Infrared Communication Problems

Problem	Action
<p>The computer cannot communicate with other devices using the infrared port on the computer.</p>	<p>Verify that:</p> <ul style="list-style-type: none">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 ThinkPad Features program (click on the Infrared  icon in the ThinkPad Features program).The communicating device is using an equivalent communication speed (see page 50).The infrared ports are cleaned and do 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.The communicating distance might need to be less if:<ul style="list-style-type: none">– The other system is not the same model as your computer.– There is interference from ambient light. It is recommended that you do not use infrared communication in bright sunshine or artificial light conditions.– The infrared port is not directly facing the other communicating port.Wireless headphones that use infrared may interfere with infrared communications. You might hear noise through the headphones, or the computer might not be able to communicate with other devices through the infrared port.Communication can be affected by the light from the LCD on the computer. To avoid this, open the LCD to a wide angle.You need to run the same communication application on both computers to communicate between your computer and another computer device. Refer to the application manuals for more information.When using applications that use a conventional serial port and serial cable to exchange data, your computer infrared ports are used as a replacement for the serial port and cable. In this case, ThinkPad mode cannot be used.
<p>Incorrect data is sent between the computer and device.</p>	<p>Verify that:</p> <ul style="list-style-type: none">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
<p>All or some keys on the system keyboard do not work.</p>	<p>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.</p> <p>If the external keyboard is connected, the numeric keypad on the system keyboard will not work.</p> <p>If the external numeric keypad or the mouse is connected:</p> <ol style="list-style-type: none"> 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. <p>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.</p>
<p>The pointer drifts when the computer is turned on or after resuming normal operation.</p> <p>—or—</p> <p>During computer operation, the pointer drifts when not using the TrackPoint III.</p>	<p>Drifting is a characteristic of the TrackPoint III and is not a defect. The drifting occurs for several seconds under the following conditions:</p> <ul style="list-style-type: none"> 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.
<p>The mouse or pointing device does not work.</p>	<p>Verify that the mouse or pointing-device cable is securely connected to the computer.</p> <p>Try using the TrackPoint III. If the TrackPoint III works, suspect the externally attached pointing device.</p> <p>If you are using Windows 3.11, make sure Computer is set as MS-DOS System with APM. See page 190.</p> <p>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.</p> <ol style="list-style-type: none"> 1. For OS/2 and Windows, see page 153 to disable the TrackPoint III. 2. For DOS, use the PS2 command.
<p>All or some keys on the external numeric keypad do not work.</p>	<p>Verify that the external numeric keypad is correctly connected to the computer.</p>

Troubleshooting

Problem	Action
All or some keys on the external keyboard do not work.	<p>To use an external keyboard, you need to attach the keyboard/mouse connector to the computer. Verify that:</p> <ul style="list-style-type: none"> The keyboard/mouse connector is correctly connected to the computer. The keyboard connector is connected to the correct side of the keyboard/mouse connector. <p>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.</p>
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 .

Mwave DSP Feature Problems (Audio and Telephony)

Problem	Cause and Action
Sound Blaster support cannot be enabled.	This is probably because Mwave is being used for other functions, such as the modem. Type <code>FASTCFG</code> at the command prompt and press Enter ; then select Games at the utility window.
DOS games work slowly in a Windows session.	Some DOS games run slower in a Windows DOS session than in native DOS. Check the documentation of your game for special instructions about improving performance. Configure your computer to use the VGA display driver rather than a higher resolution or less efficient driver. Determine if your game allows you to turn off "background music" and only play special effects.
The modem does not work correctly.	<p>Verify that:</p> <ul style="list-style-type: none"> <i>If you are using OS/2 or DOS, you have started the Mwave modem (see page 57).</i> The modem/fax port is securely installed. The modem is correctly identified in your communication program. <p>This is often caused by a conflict between communication port addresses or interrupt assignments, or both.</p> <p>For more details, see also modem problems on page 229.</p>
A modem error occurred.	Refer to the Mwave command reference in the Mwave ThinkPad window.
A modem application is not working.	<p>Verify that:</p> <ul style="list-style-type: none"> You did not close the modem window instead of minimizing it. The modem is set to support the speed you are trying to use.


Troubleshooting

Problem	Cause and Action
The computer cannot receive incoming calls from the speaker phone or the modem.	Verify that the telephone plug is correctly attached (see page 149).
Voice quality over the Voice Over Data communication is not as good as expected.	Due to limitations of the Mwave DSP hardware, voice quality that is transmitted and received over the Voice Over Data communication is not as good as normal telephone communication. (Momentary voice discontinuity and delay or distortion or both may be expected.)
Other problems.	<p>The following is a list of failures that can cause other problems:</p> <ul style="list-style-type: none"> A compatibility problem exists between the Mwave feature and one or more other adapter cards in the docking station attached to the computer. To isolate a compatibility problem, remove other adapter cards from your docking station and rerun the diagnostics while these adapters are removed. The telephone cable configuration is not correct for your application. The telephone cable is defective. The telephone is defective. The audio cable configuration is not correct for your application. The audio cable is defective. The audio equipment is defective.

Option Problems

Problem	Action
An IBM option that was just installed does not work.	<p>Verify that:</p> <ul style="list-style-type: none"> The option is designed for the IBM ThinkPad 760E, 760ED, or 760EL computer. The option has been installed correctly by following the instructions supplied with the option or this book. Other installed options or cables are not loose. No I/O address or interrupt level (IRQ) conflict has occurred. To see the system resource status, start the ThinkPad Features program and click the device icon. (The Advanced.. button is available for some devices.) <p>If the test programs for the option did not find the problem, have the computer and option serviced, or see Appendix A.</p>

Troubleshooting

Problem	Action
An IBM option that used to work no longer works.	Verify that: All the option hardware and cable connections are securely connected. If the option came with its own test instructions, use those instructions to test the option. System resource conflicts do not occur (see Appendix A). If the preceding items are correct and the test programs did not find the problem, have the computer and option serviced.
The serial port does not work.	Ensure that serial port is enabled and set to COM1 , COM2 , COM3 , or COM4 in the ThinkPad Features program (click on the Serial Port  icon).

PC Card Problems


Problem	Action
PC Card Director does not recognize your PC Card.	Verify that: If you are using the EMS driver under DOS: – You have set the correct value for the <code>/MA=mmmm-nnnn</code> parameter in the Resource Map Utility. In the EMS driver, check the UMB area used for PCMCIA under the <code>X=mmmm-nnnn</code> parameter; then use that range to set the <code>/MA</code> parameter in the Resource Map Utility. Your PC Card supports the PC Card Standard (1995) or PCMCIA Release 2.0 and 2.01. Refer to the manual that came with your PC Card. If your PC Card does not support the PC Card Standard (1995) or PCMCIA Release 2.0 and 2.01, you cannot use PC Card Director. Contact your PC Card supplier. Your PC Card is working by following the diagnostic instructions for your PC Card, if any.

Troubleshooting

Problem	Action
<p>The PC Card is recognized by PC Card Director, but the "Not Ready" message is shown.</p>	<p>Verify that:</p> <ul style="list-style-type: none"> The PC Card enabler is installed. Refer to the manuals supplied with your PC Card. If you are using the EMS driver under DOS: <ul style="list-style-type: none"> You have set the correct value for the /MA=mmmm-nnnn parameter in the Resource Map Utility. In the EMS driver, check the UMB area used for PCMCIA under the X=mmmm-nnnn parameter; then use that range to set the /MA parameter in the Resource Map Utility. If you are using Windows, also set the value for the EMMEXCLUDE= parameter in the SYSTEM.INI file. The resources for the PC Card are correctly reserved. <p>Refer to "Checking the Allocated Resources for the PC Card" on page 288.</p>
<p>The PC Card is shown as "Ready," but it does not work correctly.</p>	<p>Verify that:</p> <ul style="list-style-type: none"> The resources reserved for the PC Card do not conflict with those for other system devices. Refer to "Avoiding System Resource Conflicts When Using PC Cards" on page 269 or open the ThinkPad Features program to resolve a conflict. The resources reserved for the PC Card match the settings in the application program. If you are using a modem card, check the COM number, I/O port address, and IRQ level. If you are using a network card, check the I/O port address, IRQ level, and memory window address. To check the resources assigned to the PC Card, click on the Status button in the PC Card Director program. If you are using an I/O PC Card, it might work if you add the following in the CONFIG.SYS file: <pre style="margin-left: 40px;">DEVICE=C:\THINKPAD\IBMDSS14.SYS /IO =x (or /IO1=x)</pre> <p>Note: x shows the PC Card slot number (1 for upper slot, 2 for lower slot, or 12 for both slots) on the computer and "/IO1=" shows the slot number for a docking station or port replicator that is attached to the computer.</p>
<p>System resource conflicts occurred when using PC Cards.</p>	<p>See "Avoiding System Resource Conflicts When Using PC Cards" on page 269.</p>

Troubleshooting

Printer Problems

Problem	Action
The printer does not work.	<p>Verify that:</p> <ul style="list-style-type: none">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 23.) <p>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.</p>

Software Problems

Problem	Action
An application program does not work correctly.	<p>To determine if a problem is caused by the software, verify that:</p> <ul style="list-style-type: none">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. <p>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.</p> <p>If the preceding items are correct and there is still a problem, contact your IBM authorized reseller or IBM marketing representative for help.</p>
You cannot install OS/2 Warp.	If you are using the 760EL (ESS audio model), see page 169.

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.



Getting Service

Listing Installed Options

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

DIMM (8MB, 16MB, or 32MB) _____MB Hard Disk Drive	Battery Pack Option in the UltraBay
Internal CD-ROM Drive or Diskette Drive	PC Cards _____ _____

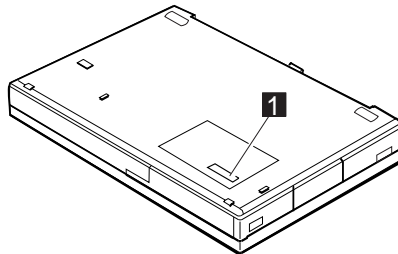
Recording Identification Numbers

The following information is needed when requesting repair services:

IBM Product Name	ThinkPad 760E ThinkPad 760ED ThinkPad 760EL
Machine Type	_____
Serial Number	_____

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

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



Using the HelpWare Support Family

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

Getting Help by Telephone

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

- Setting up your computer and IBM display
- Installing and setting up IBM options purchased from IBM or an IBM reseller
- Using the 60-day support for the preloaded operating system
- Arranging for service

Please have the following information ready when you call:

- Serial numbers of your computer, display, and other components or your proof of purchase
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information for your system

If possible, be at your computer when you call.

- In the U.S. and Puerto Rico, call 1-800-772-2227.
- In Canada, call 1-800-565-3344.
- In all other countries, contact your IBM reseller or IBM marketing representative.

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

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

- Sales information
- Product brochures
- Locations of IBM resellers
- Services available through IBM

Getting Service

ThinkPad EasyServ

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

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

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

Getting Help Around the World

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

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

Online Housecall

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

For more information about configuring your PC for Online Housecall:

In the U.S., call 1-800-772-2227.
In Canada, call 1-800-565-3344.

Getting Service

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, seven 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, seven 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:

- In Markham, call 905-316-4255.
- In Montreal, call 514-938-3022.
- In Toronto, call 416-492-1823.
- In Vancouver, call 604-664-6466.

Commercial online services that contain information about IBM products include:

Getting Service

CompuServe

Use the following GO word: ThinkPad.

PRODIGY**

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

America Online**

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

Purchasing Additional HelpWare Services

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

Enhanced PC Support Line

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

This service includes technical support for:

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

You can purchase this service for a single incident, for multiple incidents, or through a 900 number (billing will be by the telephone company). For more information about purchasing Enhanced PC Support, see "Ordering Support Line Services" on page 263.

Network and Server Support Line

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

Getting Service

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."

PC Software Assistance Support Line

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

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

Ordering Support Line Services

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

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

- In Canada, contact IBM Direct at 1-800-465-7999, or:
 - Call 1-800-465-3299.
 - Select the HelpWare catalog.

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

For more information or to purchase these services:

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

Getting Service

In Canada, call 1-800-465-7999.
In all other countries, contact your IBM reseller or IBM marketing representative.

Warranty and Repair Services

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

Warranty upgrades in the U.S. include:

Overnight service option

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

You can also extend your warranty. HelpWare Warranty and Repair Services offers a ThinkPad EasyServ Maintenance Agreement.

For more information about warranty upgrades and extensions:

In the U.S., call 1-800-426-7697.
In Canada, call 1-800-465-7999.
In all other countries, contact your IBM reseller or IBM marketing representative.

Consulting

If you want to better understand and more effectively use IBM PC Servers and other Personal Computer products, in the U.S. you can purchase HelpWare Consult Line support. This service offers telephone access to experts for consultation on agreed-to topics.

The experts provide recommendations and corrective actions, as appropriate.

For more information about HelpWare Consult Line, call 1-800-772-2227.

Custom Services

If you are setting up a network and need help installing the network or the application programs, in the U.S. you can purchase assistance from HelpWare Custom Services.

The following services are available:

Getting Service

LAN Startup Services provides assistance with setting up and customizing your network, including:

- Unpacking equipment
- Setting up and testing the hardware
- Connecting systems to LAN cabling
- Customizing the network operating system
- Customizing the network printer server

Connectivity Services provides hardware installation and connection to support a server and five or more workstations, using token-ring or 10BaseT Ethernet cabling.

For more information about LAN Startup and Connectivity Services, call 1-800-772-2227.

Obtaining IBM Operating System Updates

IBM provides update diskettes, called ServicePaks or corrective service diskettes (CSDs), to customers who report a DOS or OS/2 problem for which there is or will be a corrective program.

You can obtain update diskettes from the following sources:

IBM PC Company BBS.
IBM Software Solutions Center. In the U.S. or Canada, call 1-800-992-4777.
IBM authorized reseller or IBM marketing representative.

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 D.

Getting Service

Appendix A. System Resources

This appendix describes how to avoid system resource conflicts with listing the default and optional hardware settings. It also describes how to do a network remote program load and how to start the computer from an ATA PC Card.

Avoiding System Resource Conflicts

When a new option such as an adapter card is installed, the computer might not operate correctly because of conflicting settings for IRQ (interrupt) levels, I/O addresses, DMA channels, and memory addresses.

To avoid these resource conflicts, you must know the hardware requirements, such as IRQ level and I/O addresses, for each option and program as shown in their manuals.


ThinkPad Features program:
➔ Page 35.

Then you must check the current resource allocations for the computer and your docking station, and select the available resource values by using the ThinkPad Features program.



Example 1:

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 Sound Blaster in the computer.

You need to disable the Sound Blaster when you use the Ethernet PC Card as follows:

- 1 Install the Ethernet PC Card in the PC Card slot.
- 2 Open the ThinkPad Features program and click on the **PC Card** () icon.
- 3 Click on the **Auto Config** button.


The Sound Blaster has been automatically disabled by the ThinkPad Features program, and the Ethernet PC Card is ready to use.

When you want to disable the Ethernet PC Card and enable the Sound Blaster, open the ThinkPad Features program, click on the **Audio** () or () icon; then click on the **Advanced** button. You can enable the Sound Blaster at the Audio/Alarm Advanced Setup screen.

System Resources

Example 2:

When you install an ISA adapter card in the docking station, do the following:

- 1** Start the ThinkPad Features program.
- 2** Click on the **Docking Station** () icon and click on **Advanced**.
- 3** Click on **ISA device setup** and specify the resource information for that adapter card in the appropriate fields.

For resource information for the adapter card, see the manual that came with the adapter card.

- 4** Click on **OK**.
- 5** Install the adapter card in the docking station.

List of system resources:

➔ Page 272.

You can see from the list of default settings on page 272 which system resources are already used by the devices in the computer.


Avoiding System Resource Conflicts When Using PC Cards

When you do a network remote program load (RPL) or start the computer from a PC Card, you must make sure that the system resources used by the PC Card do not conflict with the resources used by other devices.



Using the ThinkPad Features Program

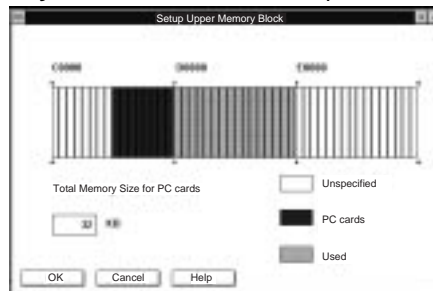
When PC Card resources conflict with a built-in device, you can resolve the conflict using the ThinkPad Features program:

- 1 Insert the PC Card into the PC Card slot.
- 2 Start Windows or OS/2.
- 3 Start the ThinkPad Features program.
- 4 Click on the **PC Card** () icon.
- 5 Click on the **Auto Config** button.
- 6 Exit the ThinkPad Features program and restart your computer.

The built-in device in conflict may have been disabled to resolve the resource conflict.

If you are using Windows, you can set the memory area used by the PC Card as follows:

- 1 Start the PC Card Director.
- 2 Select **Set Memory Area...** from the Actions pull-down menu.



System Resources

- 3 Plan carefully which memory area to use for the PC Card and Card Services from the displayed information.
- 4 Using the mouse pointer, click on the desired memory area for the PC Card.
- 5 Click on the **OK** button.
- 6 Restart the computer.

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.

System Resources

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

Notes

If you install the IDE hard disk or CD-ROM drive in the docking station such as Dock I, II, or SelectaDock Docking System, IRQ15 is the default setting used by the IDE hard disk or CD-ROM drive. Remove the IDE hard disk or CD-ROM drive to use an ATA PC Card.

- 2 Start Easy-Setup and select the **Start Up** icon.
- 3 Select the **PCMCIA** icon.



The PC Card (PCMCIA icon) should not be set to follow the computer hard disk drive (HDD-1 icon) in the list. If the **HDD-1** icon is already in the drive-startup sequence, click on the **Reset** icon; then set the sequence so that the PC Card icon is before the HDD-1 icon.

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





System Resources

List of System Resources

The following table summarizes the available system resources for the computer and docking station. 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	4 , 3, 5, 10, 11, 15, or disabled	01A0–01AF , 01B0–01BF, 01C0–01CF, or 01D0–01DF and 03F8–03FF , 02F8–02FF, 02E8–02EF, or 03E8–03EF	None	0 and 3 or disabled
Diskette Controller	6	03F0–03F7	None	2
Video Controller	None	03BA, 03B4–03B5, 03C0–03CF, 03D4–03D5, 03D8–03D9, 03DA, 2100–21FF, 43C6–43C9, 46E8, and 83C6–83C9	A0000–BFFFF and C0000–C7FFF	None
 Enhanced Video/MPEG (for the Enhanced Video model)	11 , 3, 4, 5, 7, 9, 10, 15, or disabled	None	(Automatically set by the system)	None
 Mwave DSP Device	10 , 5, 7, 11, 15, or disabled	4E30–4E3F , 8E30–8E3F, or CE30–CE3F	None	7 , 0, 1, or 6

System Resources

System Resources	IRQ	I/O Address (Hex)	Memory Address (Hex)	DMA Channel
 Sound Blaster	5, 7, 10, 11, or disabled	0220–022F or 0240–024F	None	1, 0, 6, or 7
 MIDI Port	5, 7, 10, 11, or disabled	0330–0332 or 0300–0302	None	None
 Joystick Port	None	0201	None	None
 Mwave Modem	3	02F8–02FF	None	None
	4	03F8–03FF		
	4	03E8–03EF		
	3	02E8–02EF		
	Disabled	Disabled		
Hard Disk Drive, CD-ROM Drive (for the CD-ROM drive model), or Hard Disk Drive in the UltraBay	14	01F0–01F7 and 03F6–03F7	None	None
PCMCIA Controller	None	03E0–03E1 (The PCMCIA Cartridge option in the UltraBay: 13E0–13E1 Docking station's PC Card slots: 03E2–03E3)	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
SCSI Controller in Dock I	11, 3, 5, 10, 12, 14, or 15	None	CA000–CBFFF, C8000–C9FFF, CE000–CFFFF, or DE000–DFFFF	None

System Resources

System Resources	IRQ	I/O Address (Hex)	Memory Address (Hex)	DMA Channel
SCSI Controller in Dock II	11, 9, 10, or 12	340–35F or 140–14F	DC000–DFFFF, CC000–CFFFF, C8000–CBFFF, D0000–D3FFF, D4000–D7FFF, D8000–DBFFF, or disabled	None
SCSI Controller in SelectaDock Docking System	11, 3, 4, 5, 7, 9, 10, 15, or disabled	(Automatically set by the system)	None	None
IDE hard disk drive or IDE CD-ROM drive in the Docking Station	15	0170–0177 and 0376–0377	None	None
ISA adapter card (option card) in the docking station	(Refer to manual that came with the adapter card.)			
PCI adapter card (option card) in the SelectaDock Docking System	11, 3, 4, 5, 7, 9, 10, 15, or disabled	(Refer to manuals that came with the adapter card.)		
<p>Note: Select an IRQ and the memory addresses with the jumper and DIP switches on the system board of the Dock I or Dock II. See “Using SCSI Controller and Support Software” in the <i>Dock I User's Guide</i> or <i>Dock II User's Guide</i>. Do not select Disabled when OS/2 is used.</p>	<p>Note: Enhanced Video features and PCI adapter card in the SelectaDock Docking System share the same IRQ11. Sound Blaster and MIDI share the same IRQ.</p>	<p>Note: Addresses in the parentheses are also used when ECP is enabled by the ThinkPad Features program as the printer operating mode. Memory-mapped I/O</p>	<p>Note: Memory upper than the system memory will be automatically set by the system.</p>	<p>Note: When you enable ECP as the printer operating mode by ThinkPad Features program, one of the choices (including “disabled”) must be selected.</p>

Appendix B. Advanced Information for PC Cards

This appendix describes advanced information related to using PC Cards.

Auto Configurator for PC Card Director

Note:

When installing an operating system, install the PCMCIA device driver that is on the PC Card Director Diskette to use the Auto Configurator.

To install the PCMCIA device driver:

➔ Chapter 7.

The computers provide the *Auto Configurator*, a program for some PC Cards, so that you do not have to install the device driver supplied with the card to use it.

The resource and configuration information for the PC Cards are written in the script files. Once the information is written, you can use the *Auto Configurator Utility* to edit these script files.

When Auto Configurator is installed, the following line is added to the CONFIG.SYS file according to your operating system:

For OS/2:

```
BASEDEV=AUTODRV2.SYS
```


For DOS and Windows:

```
DEVICE=[drive:] [directory] AUTODRV.SYS
```

Starting the Auto Configurator Utility for OS/2 or Windows



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

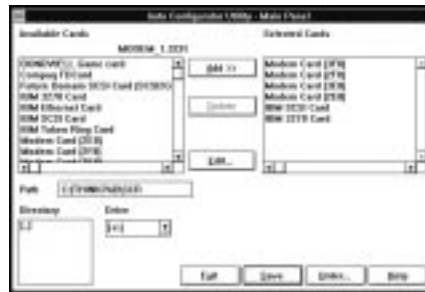
To start Auto Configurator Utility for OS/2 or Windows, select the **Auto Configurator Utility** () icon from the PC Card Director window.

The operation for OS/2 and for Windows is the same.

Advanced Information for PC Cards

Registering a PC Card in Auto Configurator

- 1 Select a card from the Available Cards list in the Auto Configurator Utility main panel.



Select the card for which you want to assign the resources first. For example, when you want to assign COM3 to a modem card, and not COM2, select the setting for COM3 first.

- 2 Click on the **Add>>** button.
- 3 Click on the **Save** button.

The names in the left list box (**Available Cards**) are the cards that can be registered. The names in the right list box (**Selected Cards**) are the cards that are already registered in Auto Configurator. When a PC Card is installed, Auto Configurator starts from the top of the list to assign the resources to the card.

Deleting a Registered Card

- 1 Select the PC Card you want to delete from **Selected Cards** in the Auto Configurator Utility main panel.
- 2 Click on the **Delete** button.
- 3 Click on the **Save** button.

Advanced Information for PC Cards

Changing the Registered Order for PC Cards

To change the order of the registered PC Cards, do the following:

- 1 Click on the **Order...** button in the Auto Configurator Utility main panel.



The operation for OS/2 and for Windows is the same.

- 2 Refer to the following to change the order of the PC Cards in the list:

Moving a card toward the bottom

- a) Select the PC Card you want to move.
- b) Click on the **Down** button.

Every time you click on the **Down** button, the PC Card is moved toward the bottom of the list.

Moving a card toward the top

- a) Select the PC Card you want to move.
- b) Click on the **Up** button.

Every time you click on the **Up** button, the PC Card is moved toward the top of the list.

- 3 Click on the **OK** button to save the changes.

The changes are saved. To cancel the changes click on the **Cancel** button.

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.

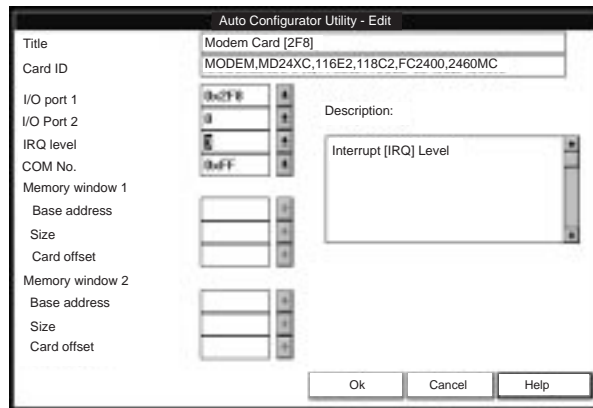
- 2 Click on the **Edit...** button.

The following screen is displayed:

Advanced Information for PC Cards

Note:

The current resource information is set as the default and appears in the input field of each item. The number that can be set is displayed in the pull-down list box.



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

The items that can be changed differ among PC Cards.

- Card ID
- I/O port address
- IRQ level
- COM number of the serial port
- Memory window address
- Memory window size
- Card offset address

- 4 Click on the **OK** button, and save the changes.

To cancel the changes, click on the **Cancel** button.

Adding to the CONFIG.SYS File

For PC Card Director to work correctly, the PC Card device drivers (which make up the structured file of PC Card Director) must be registered in the CONFIG.SYS file. These drivers are automatically registered in the CONFIG.SYS file when you install PC Card Director following the instructions in Chapter 7. The following shows each driver registered in the CONFIG.SYS file and the standard rules.

Registered Drivers and Standard Rules for OS/2



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

```

:
BASEDEV=PCMCIA.SYS           ← Card Services
BASEDEV=ICRMU 1.SYS         ← Resource Map Utility
BASEDEV=IBM2SS14.SYS        ← Socket Services
                             (CardBus controller)
BASEDEV=IBM2SS 4.SYS        ← Socket Services
                             (R2 PCIC controller)
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

```

- Rule 1** Card Services, Resource Map Utility, and Socket Services must be listed before any other PCMCIA drivers.
- Rule 2** The Resource Map Utility is necessary only for OS/2 Version 2.1x.
- Rule 3** The PCMCIA Power Management Support driver must be listed after all drivers, at the end of the CONFIG.SYS file.
- Rule 4** When using storage cards, the device drivers must be installed according to the card type:

Advanced Information for PC Cards

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.

Registered Drivers and Standard Rules for DOS and Windows



The following is a sample of the CONFIG.SYS file for DOS and Windows:

```

:
DEVICE=C:\DOS\EMM386.EXE FRAME=D      X=C8  -CFFF
:
DEVICEHIGH=C:\THINKPAD\IBMDSS14.SYS ← Socket Services
                                   (CardBus controller)
DEVICEHIGH=C:\THINKPAD\IBMDSS 4.SYS ← Socket Services
                                   (R2 PCIC controller)
DEVICEHIGH=C:\THINKPAD\IBMDOSCS.SYS ← Card Services
DEVICEHIGH=C:\THINKPAD\IBMDSCSE.SYS
                                   ↑ Enhanced Card Services
DEVICEHIGH=C:\THINKPAD\DICRMU 1.SYS /MA=C8  -CFFF
                                   ↑ Resource Map Utility
DEVICEHIGH=C:\THINKPAD\$\ICPMDOS.SYS
                                   ↑ Power Management Support driver
:
REM PC_Card_Client_Device_Driver
:
DEVICEHIGH=C:\THINKPAD\xxxxxxx.SYS
                                   ↑ Storage card device driver
DEVICEHIGH=C:\THINKPAD\AUTODRV.SYS ← Auto Configurator
:

```

- Rule 1** When using the PCMCIA drivers with the Software EMS driver (EMM386.EXE), you must specify the x= parameter for EMM386.EXE. This is to avoid conflict in the memory area used by the PCMCIA drivers and the Software EMS driver.
- Rule 2** Socket Services, Card Services, and Resource Map Utility must be listed in this order.
- Rule 3** The Power Management Support driver must be listed after the Resource Map Utility.
- Rule 4** The PC Card Client device driver must be listed before the Auto Configurator.
- Rule 5** When using storage cards, you must install the device driver according to the card type, as listed below.

Using only an ATA card:

```
DEVICEHIGH=C:\THINKPAD\PAWATA.SYS
```

Using an ATA card and an SRAM card:

```
DEVICEHIGH=C:\THINKPAD\PAWATAS.SYS
```

Advanced Information for PC Cards

Using an ATA card, an SRAM card, and a Flash card:

```
DEVICEHIGH=C:\THINKPAD\FLSHDMTD.SYS
  ↑ Flash card Memory Technology driver
DEVICEHIGH=C:\THINKPAD\PAWATASF.SYS
  ↑ ATA SRAM Flash card driver
```

Rule 6 The Enhanced Card Services (IBMDSCSE.SYS) is necessary only when you are using a Flash card.

When the total storage of the Flash cards used at the same time exceeds 10MB, you must do one of the following:

Assign the /TSIZE:n parameter in the PAWATASF.SYS file.

For example:

1. If the maximum total storage is 20MB, specify:

```
DEVICE=PAWATASF.SYS /TSIZE:6
```

2. If the maximum total storage is 40MB, specify:

```
DEVICE=PAWATASF.SYS /TSIZE:1
```

See the /TSIZE parameter on page 285.

This increases the memory resident area for PAWATASF.SYS.

Assign the /EMS parameter in the PAWATASF.SYS file, and the /NE parameter in the IBMDOSCS.SYS file. This sets IBMDOSCS.SYS not to use the EMS page frame and allows PAWATASF.SYS to use it instead. (The EMS memory must be enabled.)

For example:

```
DEVICE=IBMDOSCS.SYS /NE
DEVICE=IBMDSCSE.SYS
:
DEVICE=PAWATASF.SYS /EMS
```

Storage Card Device Driver

ATA cards, SRAM cards, and Flash cards are PCMCIA storage cards. The following section describes the device drivers for these storage cards, available in PC Card Director.

PCMCIA Storage Card Device Driver for OS/2



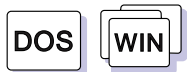
PCM2ATA.ADD supports ATA cards, PCM2SRAM.SYS supports SRAM cards, and PCM2FLSH.SYS supports Flash cards.

Note:

Install PCM2ATA.ADD for all storage cards, even when you are using SRAM or Flash cards.

Any PC Card installed in the slot is recognized by its device driver, so regardless of its type, you can access the card by the drive name assigned to the slot. When using the PCMCIA ATA Card Mount Utility, install the PCMCIA Storage API device driver (PCMSSDIF.SYS) for OS/2.

PCMCIA Storage Card Device Driver for DOS and Windows



PAWATA.SYS supports ATA cards, PAWATAS.SYS supports ATA cards and SRAM cards, and PAWATASF.SYS supports ATA cards, SRAM cards, and Flash cards.

These device drivers assign a drive letter for each usable PC Card slot. These drive letters are displayed when the device drivers are initialized, and then you can use the drive letter to access the installed PCMCIA storage card. When you run FORMAT.COM against the drive letter, the SRAM card is formatted as a diskette and the ATA or Flash card is formatted as a nonremovable disk. In the File Manager under Windows, the drive letters are represented and treated as a diskette drive, regardless of the storage card type.

Before Using PCMCIA Storage Cards

Format new PCMCIA storage cards before use. For Flash cards, run the Flash Format Utility (FFORMAT.EXE/FFORMAT2.EXE); then format the Flash card. For ATA cards and SRAM cards, there is no need to run any programs before formatting the card. Format using the FORMAT.COM program, by displaying the File Manager (for Windows), or by choosing the drive icon (for OS/2).

Using PCMCIA ATA Cards with Multiple Partitions

The device driver assigns a drive letter only to the active (bootable) partition of the ATA card if it holds multiple partitions. For other primary partitions or logical drives in an extended partition, use the PCMCIA ATA Card Mount utility to assign the drive letter to it.

Parameters for the OS/2 PCMCIA ATA Card Device Driver



The following are the parameters in the OS/2 PCMCIA ATA card device driver and their explanations:

```
BASEDEV=PCM2ATA.ADD [/S:n] [/P:h h h h] [/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:h h h h | Specifies the lower limit for the I/O address of the ATA card. The device driver assigns the next usable I/O address from this lower limit to the card. When this parameter is not set, the device driver looks for a usable address and assigns it to the card. |
| /EXIRQ:n | Specifies the IRQ level that <i>is not</i> assigned to the card. You can set more than one IRQ level. |
| /NOBEEP | Specifies not to beep when a storage card is installed. When this parameter is not set, you will hear a beep every time a storage card is installed into the PC Card slot. |
| /B | Specifies that OS/2 has started from an ATA card. When this parameter is set, there will be no redundancy in assigning the logical drive to the slot 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 |

Advanced Information for PC Cards

specified, no extra drive is given to the device driver. The extra drives can be activated by the PCMCIA ATA Card Mount utility.

/!DM Specifies not to use OS2DASD.DMD as the device manager. When this parameter is set, OS2PCARD.DMD is used instead.

Parameters for DOS PCMCIA Storage Card Device Drivers

DOS

The following are the parameters in the DOS PCMCIA storage card device driver and their explanations:

```
DEVICE=[drive:] [directory] PAWATA.SYS [/P:hhhh] [/NOBEEP]
        [/STBTIME:n] [/MDRV:n]
DEVICE=[drive:] [directory] PAWATAS.SYS [/P:hhhh] [/NOBEEP]
        [/STBTIME:n] [/MDRV:n]
DEVICE=[drive:] [directory] PAWATASF.SYS [/P:hhhh]
        [/NOBEEP] [/STBTIME:n] [/MDRV:n] [/EMS] [/TSIZE:n]
```

/P:hhhh Specifies the lower limit for the I/O address of the ATA card. The device driver assigns the next usable I/O address from this lower limit to the card. When this parameter is not set, the device driver looks for a usable address and assigns that address to the card.

/NOBEEP Specifies not to beep when a storage card is installed. When this parameter is not set, you will hear a beep every time a storage card is installed into the PC Card slot.

/STBTIME: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.

Advanced Information for PC Cards

- /EMS** When this parameter is specified, the device driver uses the EMS resources if they are usable. When this parameter is not specified, the device driver does not use the EMS resources.
- /TSIZE:n** You can specify the size of the table for the device driver data in the resident memory area. When the EMS resources are not usable, the data tables are created in the resident memory area. When the EMS resources are usable, this parameter is ignored. The table size depends on the variable *n* and is calculated as follows:

$$\text{table size} = n \times 1024 \text{ bytes}$$

Specify *n* in a decimal number. When this parameter is not specified, the device driver creates the table with $n=4$. Select the variable *n* depending on the total capacity of the Flash card. The following is an example of the relationship between the variable *n* and the total capacity of the Flash card:

- Up to 10MB: $n=4$
- Up to 20MB: $n=6$
- Up to 40MB: $n=10$

PCMCIA Storage Card Device Manager for OS/2



OS2PCARD.DMD is the device manager for the PCMCIA storage card. Specify the `!IDM` parameter in the `PCM2ATA.ADD` line, so OS2PCARD.DMD is used instead of OS2DASD.DMD. If you do not specify `!IDM`, `PCM2ATA.ADD` uses the OS/2 standard Storage Card Device Manager (OS2DASD.DMD); however, under some conditions the format will not be 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]PCSSDIF.SYS
```

Flash Card Memory Technology Driver

This driver is used to read and write to a Flash card. It is used by the DOS storage card device driver (PAWATASF.SYS) and OS2 Flash card driver (PCM2FLSH.SYS).

The following is a line from the CONFIG.SYS file that describes the Flash Card Memory Technology driver, according to the operating system:

For OS/2:

```
DEVICE =[drive:] [directory] FLSH2MTD.SYS
        ↑ Memory Technology driver
DEVICE =[drive:] [directory] PCM2FLSH.SYS
        ↑ Storage card device driver
```

For DOS and Windows:

```
DEVICE=[drive:] [directory] IBMDOSCS.SYS
        ↑ Card Services
DEVICE=[drive:] [directory] IBMDSCSE.SYS
        ↑ Enhanced Card Services
DEVICE=[drive:] [directory] FLSHDMTD.SYS
        ↑ Memory Technology driver
DEVICE=[drive:] [directory] PAWATASF.SYS
        ↑ ATA SRAM Flash card device driver
```

Checking the Allocated Resources for the PC Card

If the resources for the PC Cards are not correctly allocated, you will see error messages. You can check which resources for the PC Card were not correctly allocated by using PC Card Director. To check the resources that could not be allocated, click on the **Status** button in the PC Card Director program.

The following are some reasons why the resources could not be correctly allocated, and corresponding actions you should take to solve the problem.

The resource was already reserved by another device.

Resource Map Utility or other configuration files were not set up correctly.

To change the resource settings for the PC Card or other devices, you can do one of the following:

Refer to the system manual or utility program and check which device is using the resources that you want to use for the PC Card. Then, change the settings for the device by using, for example, the setup programs. For more information, refer to the manuals supplied with your computer.

If your PC Card is enabled by a PC Card enabler, you can change the resources assigned to the PC Card by changing the parameters in the PC Card enabler, or you can change the settings in the configuration file of the PC Card. For more information, refer to the manuals supplied with your PC Card.

If you are using Auto Configurator to enable your PC Card, you can change the resources assigned to the PC Card by using the Auto Configurator. Make sure the resource is not used by other devices and can be used by the PC Card and its application program. For more information, see "Starting the Auto Configurator Utility for OS/2 or Windows" on page 275.

If you are using modem cards, some modem cards use serial port COM1 or COM2 and do not have the setup information for COM3 and COM4. These modem cards cannot be enabled when other devices are using COM1 and COM2. (For example, as a default, COM1 is used by the infrared device and COM2 is used by the Mwave modem.) Error messages are displayed to tell you that the I/O port address 3F8 or 2F8, or IRQ level 3 or 4, were not allocated.

If this is the case, use the ThinkPad Setup Utility in the ThinkPad Features program to:

Advanced Information for PC Cards

- For OS/2, disable the devices using COM1 or COM2; then restart the system.
- For DOS or Windows, reserve COM2 for the PC Card, and use COM1 for other integrated communication devices.

Avoiding PC Card Resource Conflicts

PC Card Director checks the resources for most devices used by the system to avoid resource conflicts, but it does not recognize all option devices used. Especially when you are using the docking station, there is a possibility that the I/O port address or IRQ level may conflict with the PC Card.

Check the status of the PC Card by using PC Card Director. When the PC Card is set to “Ready,” the resources used for that PC Card are displayed. Refer to the manuals supplied with the system or option adapters to check that the resources for the devices in the system or for the option adapters are not conflicting with the resources for the IRQ level, I/O port address, or memory window of the PC Card. If you are using OS/2 Warp Version 3, you can check the assigned system resources using RMVIEW.EXE.

If there is a conflict:

Use the Resource Map Utility, so that those resources are not assigned to the PC Card. (Change the value for the /MA= parameter, or add the /MX=, /PX=, or /IX= parameter.)

If you are using OS/2 Warp Version 3, use RESERVE.SYS to register those resources in OS/2.

To set RESERVE.SYS, refer to the manuals or online help for OS/2 Warp, or refer to the READ.ME file of PC Card Director.

If you are using Auto Configurator, change the enabling order or resource information using the Auto Configurator Utility.

See “Starting the Auto Configurator Utility for OS/2 or Windows” on page 275.

Change the parameter for the PC Card enabler. Refer to the manuals supplied with the PC Card.

If you are using network cards, change the resource information for the PC Card stated in the PROTOCOL.INI or NET.CFG file.

To change the configuration file for the network cards, refer to the manuals or READ.ME files of the PC Cards or network drivers.

Virtual Card Services for OS/2



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.

Note:

* *DOS Object* includes DOS program, Windows program, DOS full-screen, DOS window, WIN-OS/2 full-screen, and WIN-OS/2 window.

Note that 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.

To use Virtual Card Services in a DOS object, do the following:

- 1** Move the mouse pointer to the DOS object icon; then click on the right mouse button.
- 2** Select **Settings**.
- 3** Select **Session**.
- 4** Select **DOS (WIN-OS/2) Settings**.
- 5** Select **All DOS (DOS and WIN-OS/2) Settings**.
- 6** Set **PCMCIA_CARD_SERVICES** as **On**.
- 7** Set **PCMCIA_RELEASE_LEVEL** as **2.1**.
- 8** Set **MEM_EXCLUDE_REGIONS** as **C8000–CFFFF**.
- 9** Specify the PC Card device driver name to the **DOS_DEVICE**.

Appendix C. Features and Specifications

This appendix describes features and specifications for the computer.

Model		760ED	760E	760EL
Microprocessor		Intel Pentium** Processor		
L2 Cache		256KB		—
Memory		Built-in: 8MB or 16MB RAM (Optional: 8MB, 16MB, and 32MB DIMMs)		
CD-ROM drive		Built-in (Removable)	Optional	
Other Storage Devices		2.5-inch removable hard disk drive and 3.5-inch 1.44MB removable diskette drive		
Display	Size ¹	12.1-inch		12.1- or 11.3-inch
	Tech- nology	TFT		TFT or DSTN
	Quality ²	Resolution: 1024x768 Color: 65,536	Resolution: 1024x768 or 800x600 Color: — 1024x768 TFT: 65,536 — 800x600 TFT: 16,777,216 — 800x600 DSTN: 256	
Keyboard		84-key, 85-key, or 89-key		
External interface		Serial connector (EIA-232E) Parallel connector (IEEE P184-A) External input-device connector External-monitor connector External-diskette-drive connector Headphone jack Microphone/line-in jack (supports a dynamic microphone or a self-battery-powered condenser microphone) Infrared ports PC Card slots (see page 293) Fax/modem port (for Mwave model) (see page 293) MIDI/Joystick port (for Enhanced video model) Video In/Out ports (for Enhanced video model)		
System bus		240-pin, 32-bit PCI and ISA (either at a time)		
Video support		Enhanced video (see page 293)	Standard video	

¹ When measured diagonally.

² Maximum value.

Features and Specifications

Model	760ED	760E	760EL
Audio support	Mwave (see page 293)		ESS AudioDrive (see page 293)
Telephony support			—
Size	Width	297 mm (11.7 in.)	
	Depth	210 mm (8.3 in.)	
	Height	50.7 mm (2 in.)	TFT model: 50.7 mm (2 in.) DSTN model: 50.4 mm (1.98 in.)
Weight³	3.02 kg (6.65 lb)	2.91 kg (6.41 lb)	TFT model: 2.91 kg (6.41 lb) DSTN model: 3.04 kg (6.7 lb)
Environment	Temperature (at altitudes less than 2,438 m [8,000 ft]): – Operating ⁴ 5° to 35°C (41° to 95°F) – Operating ⁵ 10° to 35°C (50° to 95°F) – Non operating: 5° to 43°C (41° to 109°F) Relative Humidity: – Operating ⁴ 8% to 95% – Operating ⁵ 8% to 80% Maximum altitude: 3048 m (10 000 ft) ⁶ – Maximum temperature at 3048 m (10 000 ft): 31.3°C (88° F)		
Heat output	Approximately 30 Kcal per hour		
Electrical (AC Adapter)	Sine-wave input, at 100–240 V ac and 50/60 Hz, is required		
Lithium-ion Battery pack⁷	Nominal voltage: 10.8 V dc Capacity: 3.0 AH		

³ Minimum configuration with lithium-ion battery pack.

⁴ With no diskette in drive.

⁵ With diskette in drive.

⁶ In unpressurized conditions.

⁷ When you charge the lithium-ion battery pack, its temperature must be at least 10°C (50°F).

Features and Specifications

Features

PC Card slots

- 16-bit PC Card (PCMCIA 2.0,2.1/ JEIDA 4.1,4.2)
- 32-bit PC Card (CardBus PC Card)
- Multiple-function PC Card
- Operate at: 5V or 3.3V



Mwave DSP (for Mwave model)

- Audio
 - Supports wave audio recording and playback of up to 16 bits, stereo, and 44 kHz sampling
 - Provides a high-quality MIDI wave table synthesizer with 128 instruments and up to 32 voices
 - Supports DOS games using the Sound Blaster interface
- Modem
 - Data modems at up to 28,800 bps
 - Fax modems at up to 14,400 bps with G3 transfers
 - Speaker phone function
 - Telephone answering machine function
 - Mwave voice-over-data function



ESS AudioDrive (for ESS AudioDrive model)

- Compatible with Sound Blaster Pro
- Supports wave audio recording and playback of up to 16 bits and stereo



Enhanced video support (for Enhanced video model)

- Video Capture/Overlay (Video In)
- Video Out (Television Out)
- MPEG Decoder:
 - MPEG2 HHR (Half-Horizontal Resolution) at NTSC resolution
352x480x30 frames/second
Up to 4 Mbit per second bit rate
 - MPEG1 standard: ISO/IEC International Standard 11172-2 (11/93)
 - MPEG audio: Layer I, II (Sampling rate 44.1 kHz)

Note:

MPEG2-HHR Transport stream is not supported under OS/2 Warp.

Features and Specifications

IBM Power Cords

IBM power cords for a specific country are usually available only in that country:

For 2-pin power cords:

IBM Power Cord Part Number	Used in These Countries
13H5264	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
13H5267	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malasia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom
13H5270	Austria, Belgium, Bulgaria, Chile, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, former Yugoslavia
13H5273	Japan
13H5276	Argentina, Australia, New Guinea, New Zealand, Papua, Paraguay, Uruguay
13H5279	Bangladesh, Pakistan, South Africa, Sri Lanka

Features and Specifications

For 3-pin power cords:

Note

The grounded adapter is required for full MPRII compliance.

IBM Power Cord Part Number	Used in These Countries
76H3514	Australia, New Zealand
76H3516	U.S., Canada
76H3518	Europe (except the countries listed here)
76H3520	Denmark
76H3522	South Africa, India
76H3524	United Kingdom
76H3526	Japan
76H3528	Switzerland
76H3530	Italy
76H3532	Israel

Electrical Safety Notice

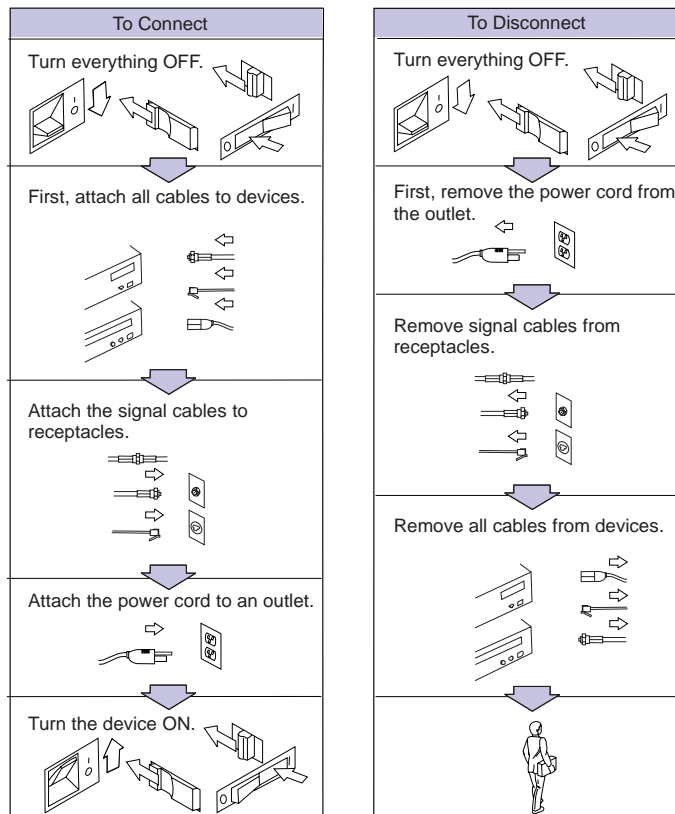
Important

If a 3-pin power cord came with your computer, you must follow the following safety notice.

Features and Specifications

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.



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.

Appendix D. 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 760E, 760ED, or 760EL

Warranty Period*: Three Years, One Year on Battery

**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.

Product Warranties and Notices

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
 - d) for a Machine with exchange service, remove all features, parts, options, alterations, and attachments not under warranty service. Also, the Machine must be free of any legal obligations or restrictions that prevent its exchange; and
3. be responsible for loss of, or damage to, a Machine in transit when you are responsible for the transportation charges.

Extent of Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine. Unless IBM specifies otherwise, IBM provides non-IBM machines on an "AS IS" basis. However, non-IBM manufacturers may provide their own warranties to you.

Misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, removal of product labels or parts identification labels, or failure caused by a product for which IBM is not responsible may void the warranties.

THESE WARRANTIES REPLACE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. HOWEVER, SOME LAWS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES. IF THESE LAWS APPLY, THEN ALL EXPRESS AND IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

In Canada, warranties include both warranties and conditions.

Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part (including fundamental breach) or other liability (including negligence and misrepresentation), you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages, IBM is liable only for:

1. bodily injury (including death), and damage to real property and tangible personal property; and
2. the amount of any other actual loss or damage, up to the greater of \$100,000 or the charge for the Machine that is the subject of the claim.

Under no circumstances is IBM liable for any of the following:

1. third-party claims against you for losses or damages (other than those under the first item listed above);
2. loss of, or damage to, your records or data; or
3. economic consequential damages (including lost profits or savings) or incidental damages, even if IBM is informed of their possibility.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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Multimedia Presentation Manager/2	ThinkPad
Mwave	TrackPoint
Operating System/2	WIN-OS/2
OS/2	Ultimotion
PC Card Director	

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

Electronic Emission Notice

Federal Communications Commission (FCC) Statement

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

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult an IBM authorized dealer or service representative for help.

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

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

Product Warranties and Notices

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class B limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department of Communications.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe B d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada.

European Community Directive Conformance Statement

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electro-magnetic compatibility.

A declaration of Conformity with the requirements of the Directive has been signed by IBM United Kingdom Limited, PO BOX 30 Spango Valley Greenock Scotland PA160AH.

This product satisfies the Class B limits of EN 55022.

Telecommunication Notice

Federal Communications Commission (FCC) and Telephone Company Requirements (Part 68 of the FCC Rules)

1. The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual.

In order to program this information into your computer, you should be sure to follow the installation instructions for your fax software package.

2. The built-in modem is built into the ThinkPad computer. It complies with Part 68 of the FCC Rules. A label is affixed to the bottom of the computer that contains, among other things, the FCC registration number, USOC, and Ringer Equivalency Number (REN) for this equipment. If these numbers are requested, look at the label and provide this information to your telephone company.
3. The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all, areas, the sum of the RENs of all devices should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to determine the maximum REN for your calling area.
4. If the built-in modem causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But, if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.
5. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

Product Warranties and Notices

- 6.** If you experience trouble with this built-in modem, contact your IBM Authorized Seller, or the IBM Corporation, 500 Columbus Avenue, Thornwood, NY 10594, 1-800-772-2227, for repair/warranty information. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected, or until you are sure the equipment is not malfunctioning.
- 7.** No customer repairs are possible to the modem. If you experience trouble with this equipment, contact your Authorized Seller or the IBM Corporation for information.
- 8.** The modem may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.
- 9.** When ordering network interface (NI) service from the Local Exchange Carrier, specify service arrangement USOC RJ11C.

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