



**Note:** Before using this information and the product it supports, be sure to read the general information under "Safety Information" on page viii and "Notices" on page 160. For ergonomics information, see the *Online User's Guide*.

## **First Edition (August 1999)**

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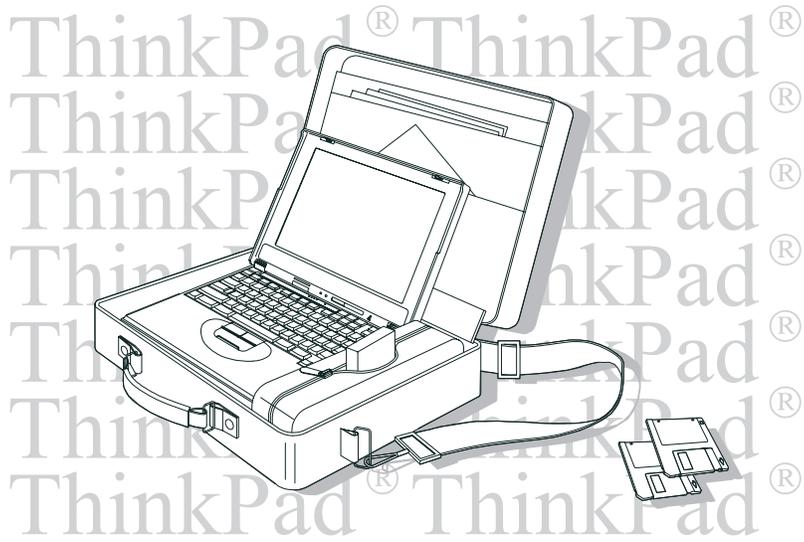
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## Thank You for Selecting an IBM ThinkPad 390X Computer

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We at IBM have developed this ThinkPad computer to meet both your technical requirements and your high expectations. To help us continue to build products that address your mobile computing needs, please take a moment to complete the ThinkPad Registration.

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## Functional Highlights

**All-in-one design with core technology** The well-balanced, all-in-one design of the ThinkPad 390X computer brings ease-of-use to your computing needs.

**High-speed processor** The Intel® high-speed processor enables high-speed data processing and provides advanced performance.

**Large-capacity hard disk drive** The large-capacity hard disk drive can respond to a wide variety of your business demands.

**Large color LCD** The large TFT (thin-film transistor) display provides clear and brilliant text and graphics.

**Nickel metal hydride or lithium-ion battery pack** The large-capacity battery pack extends the operating time of your computer, further enhancing its portability.

**Audio with 3D Stereo Sound** Your computer is equipped with internal audio record and playback capabilities including 3D audio from just two speakers. When you enable the 3D stereo feature, sounds will appear to be generated all around you, even though only two speakers are used.

The audio feature supports the following:

- Wave audio recording and playback of up to 16 bits, stereo, and 48 KHz sampling.
- DOS games using the Sound Blaster Pro\*\* interface.

For more information on using the audio function, see the *Online User's Guide*.

**ThinkPad Modem** The ThinkPad modem enables you to send or receive data and faxes over a telephone line.

For more information on using the ThinkPad modem, see the *Online User's Guide*.

**TrackPoint with Enhanced Controls** Your computer has an enhanced TrackPoint function that enables you to make selections merely by pressing on the TrackPoint. A new

## ***Functional Highlights***

center button converts the TrackPoint into a scroll controlling device or a magnifying glass on the screen.

For more information on using the TrackPoint, see “TrackPoint” on page 11.

**PC Card Support** Your computer provides two PC Card slots that accept a 16-bit PC Card, CardBus Card, and Zoomed Video Card.

For more information on installing PC Cards, see “Inserting a PC Card” on page 79.

## About This Book

# About This Book

This book contains information that will help you operate the IBM ThinkPad 390X computer. Be sure to read the *ThinkPad 390X Setup Guide* and Chapter 1 of this book before using the computer.

**Chapter 1. "Getting Familiar with Your Computer,"** acquaints you with the basic features of your computer



**Chapter 2. "Extending the Features of Your Computer,"** provides information on installing options and using your computer's high-technology features.

**Chapter 3. "Protecting Your Computer,"** provides information on using passwords, and using locks.

**Chapter 4. "Solving Computer Problems,"** describes what to do when you have a computer problem. The chapter includes a troubleshooting guide and information on how to recover lost or damaged software.

**Chapter 5. "Getting Service,"** describes various options of IBM's support and service.

**Appendix A, Features and Specifications** describes the features and specifications associated with your computer, including information on power cords.

**Appendix B, Product Warranties and Notices** contains the warranty statements for your computer and notices for this book.

The book concludes with an **index**.

## About This Book

### Icons Used in This Book

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



Information for Microsoft Windows 98 users.



Information for Microsoft Windows NT users.



Information for Microsoft Windows 95 users.



Information for Microsoft Windows 3.11 users.



Information for IBM PC DOS users.



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

## Safety Information

### Electrical Safety Notice



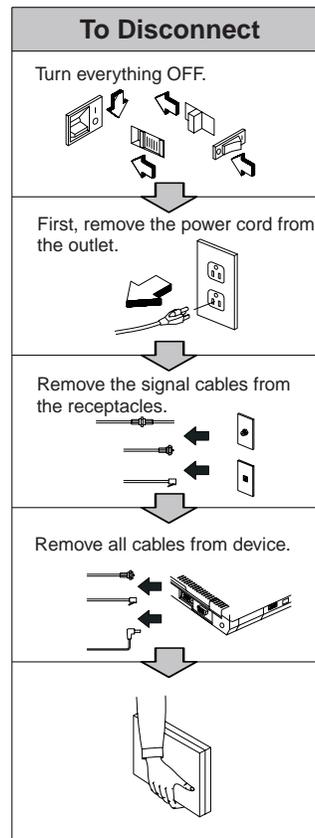
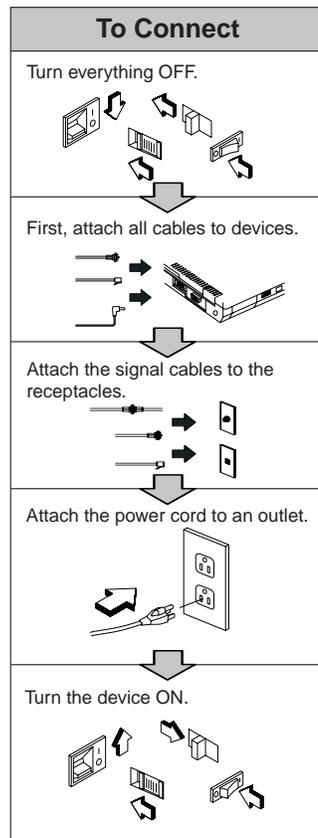
#### **DANGER**

**Electrical current from power, telephone, and communication cables is hazardous. Reduce the risk of fire and electric shock by always following basic safety precautions, including the following:**

- **Do not use your computer in or near water.**
- **During electrical storms, do not connect the cable to or disconnect it from the telephone outlet on the wall.**

**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.**

## Safety Information



### DANGER

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

## Safety Information



### DANGER

There is a danger of an explosion if the battery is incorrectly replaced.

The lithium battery (IBM P/N 02K6502 UL-recognized component [file no. MH12210]) contains lithium and can explode if it is not properly handled or disposed of.

Replace only with a battery of the same type.

Do not: (1) throw or immerse it into water, (2) allow it to heat to more than 100°C (212°F), or (3) attempt to repair or disassemble it. Dispose of it as required by local ordinances or regulations.

### CAUTION:

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

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

## Laser Compliance Statement

The CD-ROM drive or DVD-ROM drive option of the ThinkPad 390X computer is a laser product. The CD-ROM or DVD-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

## ***Safety Information***

### APPAREIL A LASER DE CLASSE 1 KLASS 1 LASER APPARAT

The CD-ROM or DVD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products.

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



#### **CAUTION:**

**Do not open the CD-ROM or DVD-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 1 laser products are not considered to be hazardous. The CD-ROM or DVD-ROM drive has an internal, Class 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 or DVD-ROM drive ensures that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.



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## Getting Familiar with Your Computer

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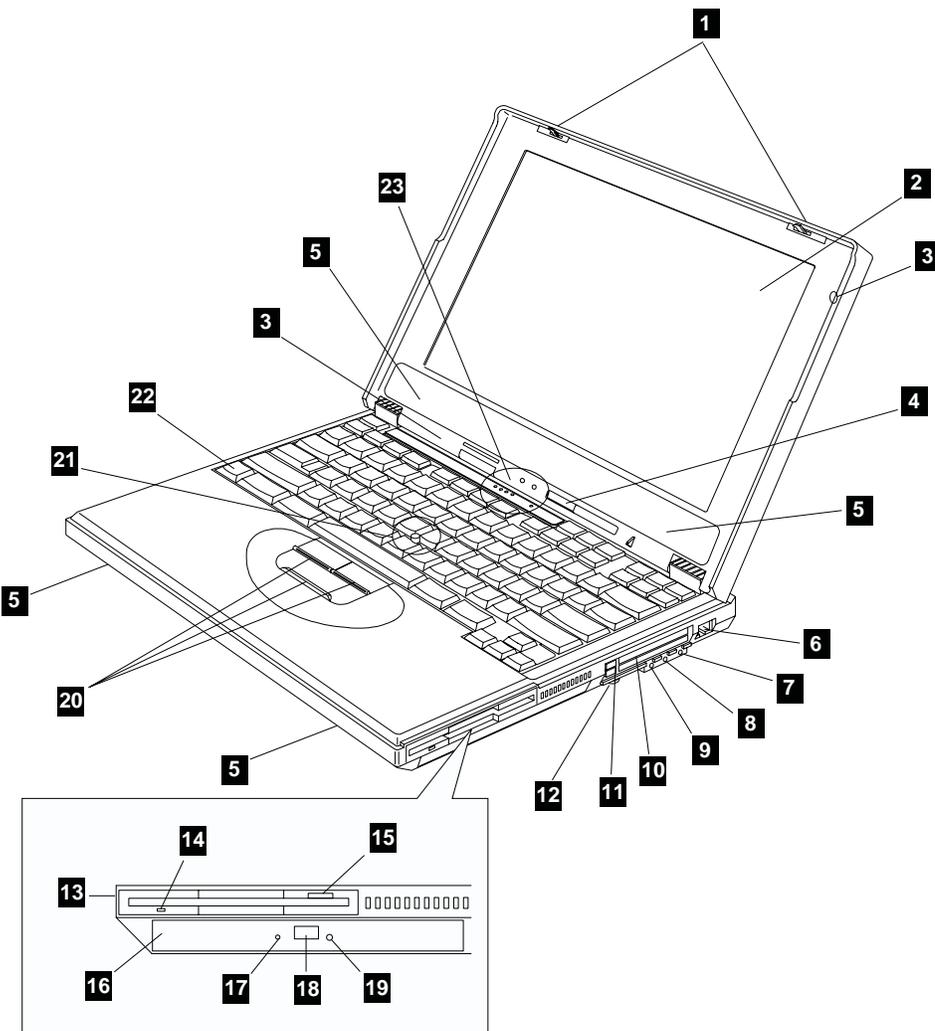
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## Identifying the Hardware Features

### Front View of the Computer

- (1) The **LCD latches** release the LCD when pressed and allow it to be opened.
- (2) The **color LCD screen** displays computer output.
- (3) The **built-in microphone** captures sound and voice when it is used with an application program capable of handling audio.  
**Note:** The built-in microphone is located at the top right corner of the LCD for 12.1-/14.1-inch LCD models, or at the left lower edge of the LCD for 15.0-inch models.
- (4) The **brightness control** adjusts the brightness of the display.
- (5) The left and right **internal speakers** generate stereo sound.  
**Note:** The internal speakers are located below the LCD for 12.1-/14.1-inch LCD models, or on the front ends of the computer for 15.0-inch LCD models.
- (6)  The **internal modem port (select models only)** is used for connecting your computer to an analog telephone line.
- (7)  The **headphone jack**, a  $\frac{1}{8}$  inch (3.5mm) diameter jack, is where you connect stereo headphones or external speakers.
- (8)  The **line-in jack**, a  $\frac{1}{8}$  inch (3.5mm) diameter jack, is where you connect an external audio device.
- (9)  The **microphone jack**, a  $\frac{1}{8}$  inch (3.5mm) diameter jack, is where you connect a self-powered stereo microphone.  
**Note:** Do not plug any device into the microphone jack except a microphone.
- (10) The **PC Card slots** accept PC Cards.
- (11) The **PC Card eject buttons** eject the PC Card from the PC Card slot.
- (12)  The **audio volume control** adjusts the volume of the speakers.
- (13) The **diskette drive** (shown installed in the UltraBay FX).
- (14) The **diskette-drive-activity indicator** lights up when the computer is accessing the diskette drive.
- (15) The **diskette-eject button** ejects the diskette from the diskette drive.

## Identifying the Hardware Features



(16) The **CD-ROM drive** (shown installed in the UltraBay FX).

**Note:** You can purchase a DVD-ROM drive option which can be installed in the UltraBay FX.

(17) The **CD-ROM access indicator** is on when data is read from a CD-ROM in the CD-ROM drive.

(18) The **CD-ROM eject button** ejects the CD-ROM tray .

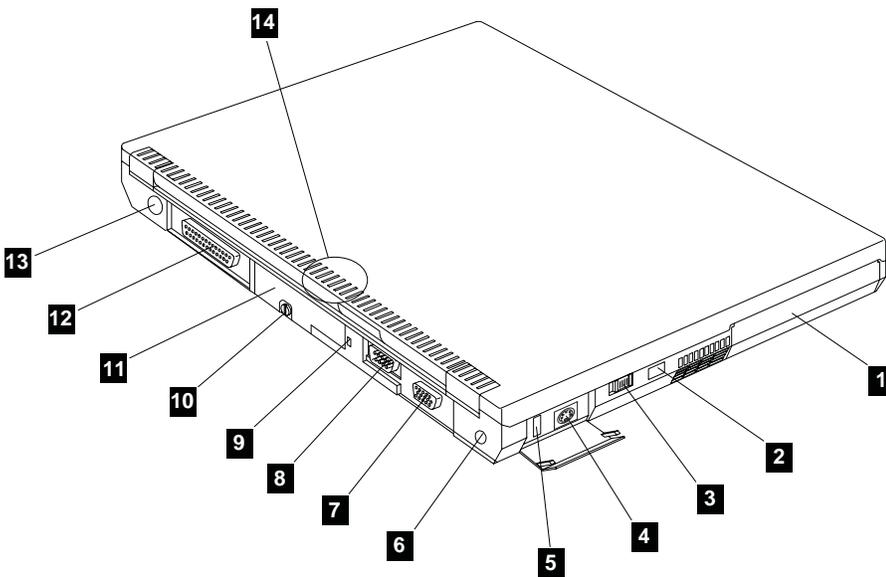
(19) The **manual-eject hole** is used to eject the CD-ROM tray when it does not open with the eject button.

## *Identifying the Hardware Features*

- (20) The **TrackPoint buttons** work with the TrackPoint stick (21) and function similar to the buttons on a mouse.
- (21) The **TrackPoint** is a built-in pointing device that provides a function similar to that of a mouse.
- (22) The **Fn key** is used with the function keys to activate the **Fn** key functions.
- (23) The **indicator panel** consists of the system-status indicators and their associated symbols.

## Identifying the Hardware Features

### Rear View of the Computer

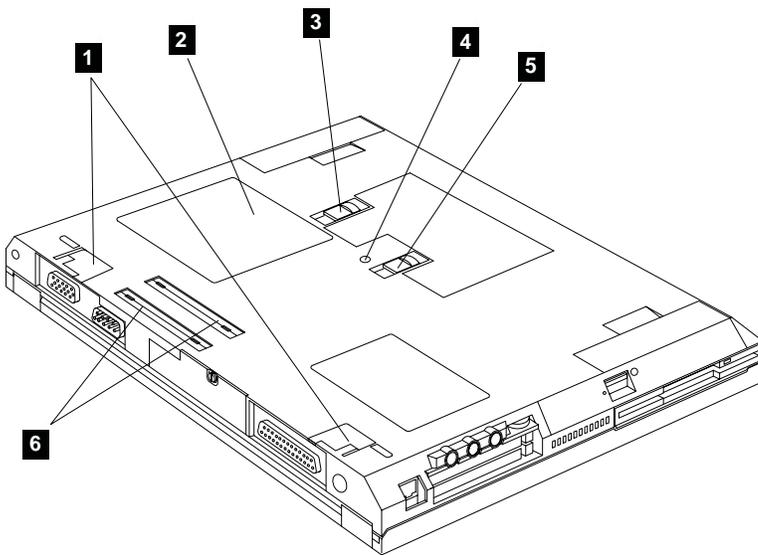


- (1) The **battery pack** is a built-in power source for the computer.
- (2)  The **infrared port** allows the computer to communicate with other devices that have infrared data-transfer capability.
- (3)  The **power switch** turns the computer on and off.  
**Note:** If you power off the computer, wait at least 5 seconds before you power it on again.
- (4) The **S-video jack** is where you connect a television or external display devices with an S-video in-out cable.
- (5)  The **universal serial bus (USB)** allows you to connect any device that conforms to the USB standard.
- (6)  The **power jack** is where the AC Adapter cable is connected.
- (7)  The **external-monitor connector** is where you attach the external monitor.
- (8)  The **serial connector** is where you connect a 9-pin, serial-device cable.
- (9)  The **security keyhole** is used with a mechanical lock.
- (10) To remove the hard disk (11), loosen this **hard disk screw**.

## Identifying the Hardware Features

- (11) The **hard disk drive** is the built-in mass storage device for the computer.
- (12)  The **parallel connector** is where you connect a parallel-printer signal cable.
- (13)  The **external-input-device connector** is used to attach a mouse, external keyboard, or external numeric keypad to the computer.
- (14)  The **battery status lamp** shows the status of the battery pack.
-  The **suspend lamp** lights when the computer is in suspend mode.

## Bottom View of the Computer



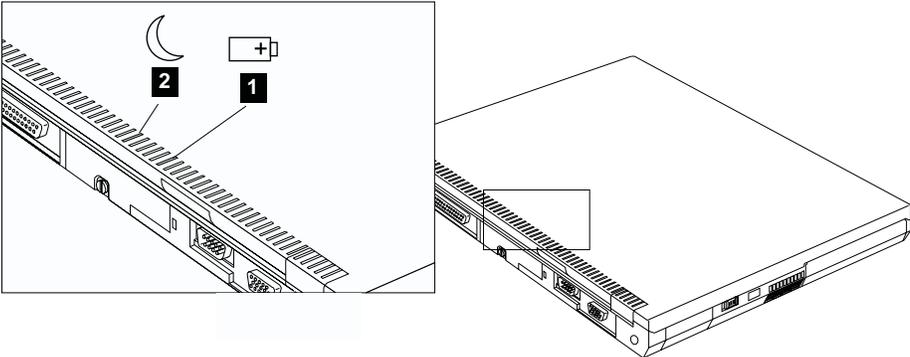
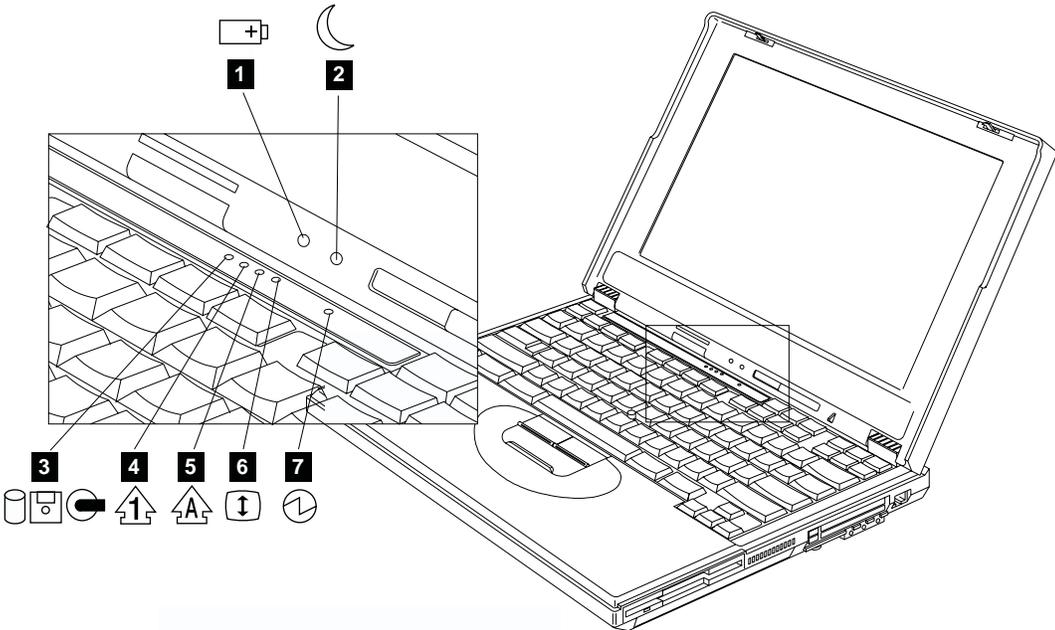
- (1) Flip out the **tilt feet** to tilt the computer to an angle for more comfortable use of your computer, especially when typing.
- (2) The **memory-slot cover** covers the memory slot.  
The **two memory slots** accept dual inline memory module (DIMM) options.  
**Note:** Base memory (32 MB or 64 MB) occupies one memory slot.
- (3) The **battery-pack latch** locks or releases the battery pack.
- (4) When the **bay LED** is on, you should not remove the UltraBay FX device.
- (5) The **UltraBay FX device lock** locks or releases the UltraBay FX device.
- (6)  The **system-expansion connector** (240-pin) allows you to connect the ThinkPad Port Replicator with Advanced Etherjet Feature.

## *Identifying the Hardware Features*

### **System Status Indicators**

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

**System Status Indicators**



## System Status Indicators

Symbol	Color	Meaning
(1) Battery status 	Green	Enough battery power remains for operation.
	Blinking orange	The battery pack needs to be charged
	Orange	The battery pack is being charged.
(2) Suspend mode 	Green	The computer is in suspend mode
	Blinking green	The computer is entering suspend mode, hibernation mode, or is resuming normal operation.
(3) Drive in use 	Orange	Data is being read from or written to the hard disk, floppy drive, or data is being read from the CD-ROM drive. Do not enter suspend mode or power off the computer when this indicator is on.
(4) Numeric lock 	Green	The numeric keypad on the keyboard is enabled. You enable or disable the keypad by pressing and holding the <b>Shift</b> key, and pressing the <b>NumLk</b> key. For details, see "Numeric Keypad" on page 16.
(5) Caps lock 	Green	Caps Lock mode is enabled. All alphabetic characters (A-Z) are entered in capital letters without the <b>Shift</b> key being pressed. You enable or disable the Caps Lock mode by pressing the <b>Caps Lock</b> key.
(6) Scroll lock 	Green	Scroll Lock mode is enabled. The <b>Arrow</b> keys can be used as screen-scroll function keys. The cursor cannot be moved with the <b>Arrow</b> keys. <i>Not all application programs support this function.</i> You enable or disable Scroll Lock mode by pressing the <b>ScrLk</b> key.
(7) Power on 	Green	The computer is operational. This indicator is on when the computer is on and not in suspend mode.

## Distinctive Functions of Your Computer

Your computer has unique keyboard functions and utility programs for easy configuration. This section includes the following topics:

- Keyboard functions
- UltraBay FX
- ThinkPad utilities
- Online User's Guide

### Keyboard Functions

Your computer's keyboard has the following functions:

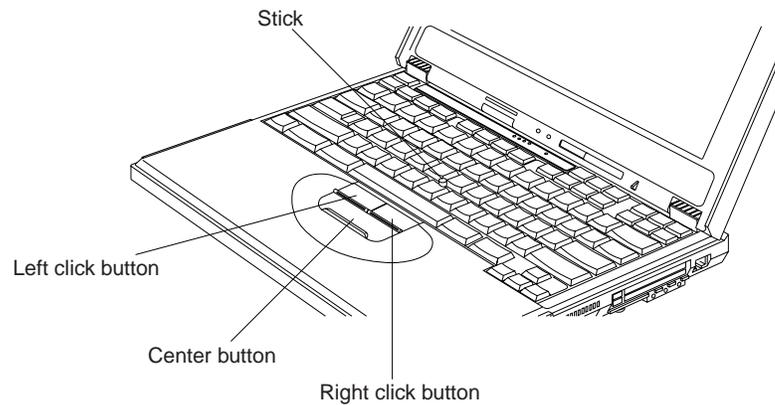
- TrackPoint
- Fn key
- Numeric keypad

#### *TrackPoint*

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

The TrackPoint consists of a **stick** on the keyboard and three **click buttons** below the keyboard. Movement of the pointer on the screen is controlled by the amount of pressure you apply to the nonslip cap on the stick in any direction parallel to the keyboard; the stick itself does not move. The speed at which the pointer moves corresponds to the pressure you apply to the stick. The function of the click buttons depends on the software you are using.

## *Distinctive Functions of Your Computer*



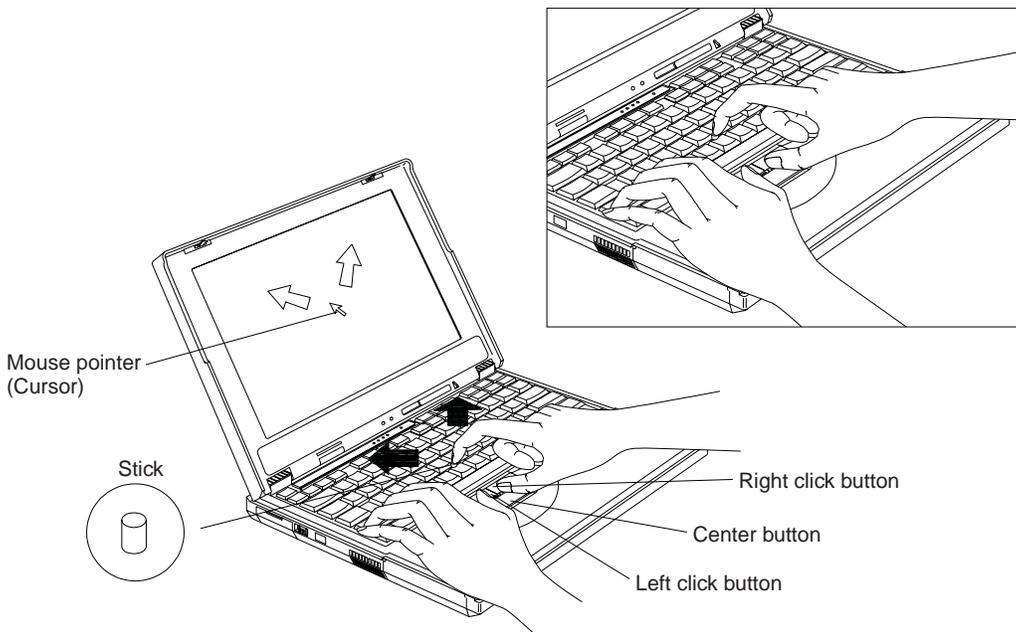
If you are not familiar with using the TrackPoint, these instructions will help you get started:

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

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

**Note:** The cursor may drift. This is not a defect. Do not use the TrackPoint until the cursor stops moving.

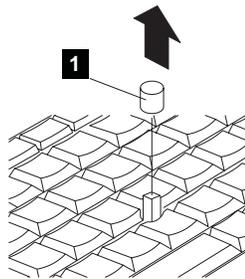
## Distinctive Functions of Your Computer



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

### Changing the Cap

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

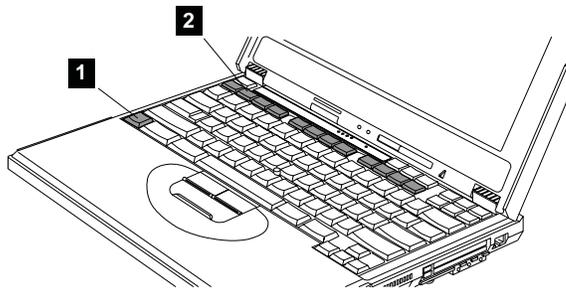


For more information on customizing the TrackPoint, see “Customizing the TrackPoint” on page 46.

## Distinctive Functions of Your Computer

### Fn Key

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**).



#### The Fn Key Lock Function

The following setup give you the same effect as when you press and hold the **Fn** key and then press an appropriate function key:

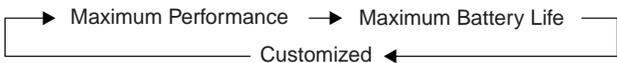
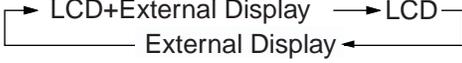
Start the ThinkPad Configuration program, (See “ThinkPad Configuration” on page 33.) click on the **Accessibility** (  ) button, and click on **Enable** for **Fn key lock**.

After you enable the **Fn** key lock and press **Fn** *once*, press one of the function keys. The computer works the same as when you press **Fn** + the function key.

If you press **Fn** *twice* after enabling the lock, pressing a function key alone is recognized as a combination of **Fn** + that function key. To stop this function, press **Fn** again.

## Distinctive Functions of Your Computer

The following table shows the function of the **Fn** key combined with keys:

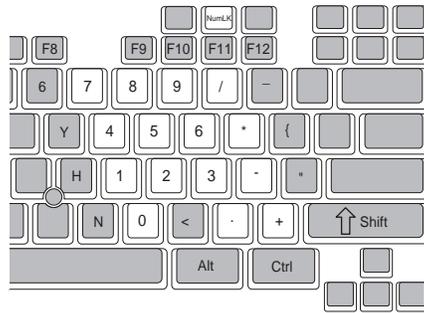
Feature and Icon	Key Combination	Meaning
Power Mode Functions		
Fuel-Gauge display on or off 	<b>Fn+F2</b> (Windows 98, Windows 95 and Windows NT only)	If you press this key combination, the window for the battery status appears or disappears. You can set parameters for battery status in the window.  <b>Note:</b> The Fuel-Gauge program must be activated before you can use this key combination.  To activate the Fuel-Gauge program, do the following: <ol style="list-style-type: none"> <li>1. Click <b>Start</b>.</li> <li>2. Move the cursor to <b>Programs, ThinkPad</b>, and then click <b>Fuel-Gauge</b>.</li> </ol>
Power mode switching 	<b>Fn+F11</b>	During battery power operation, the power mode changes as follows:  
Power Conservation Functions for Battery Power		
Standby mode 	<b>Fn+F3</b>	The computer enters standby mode. For more information about this mode, see the <i>Online User's Guide</i> .
Suspend mode 	<b>Fn+F4</b>	The computer enters suspend mode. For more information about this mode, see the <i>Online User's Guide</i> .
Hibernation mode 	<b>Fn+F12</b>	The computer enters hibernation mode. For more information about this mode, see the <i>Online User's Guide</i> .
Other Functions		
Switching between the LCD and the external monitor 	<b>Fn+F7</b>	Computer output is displayed in the following order when an external monitor is attached.  

## Distinctive Functions of Your Computer

### Numeric Keypad

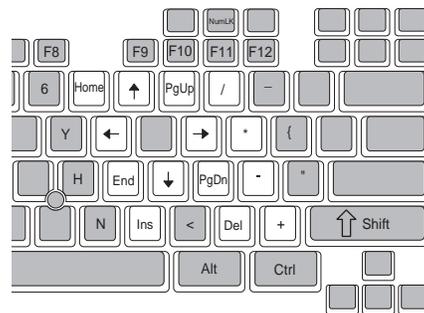
The keyboard has some keys that, when enabled, work as if they were on a 10-key numeric keypad. (The numeric keypad on the keyboard is not active when the external keyboard or the external numeric keypad is attached to the computer.)

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



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

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



## *Distinctive Functions of Your Computer*

### **UltraBay FX**

The UltraBay FX is located at the front right corner of your ThinkPad 390X computer.



The UltraBay FX allows you to use a variety of devices with your computer. With the UltraBay FX, you can swap in new devices (such as upgraded drives or a second battery) to get the most flexibility from your computer. You can install the following drives or devices in the UltraBay FX:

- CD-ROM drive/diskette drive
- DVD-ROM drive/diskette drive
- Second battery pack
- Second hard disk drive

**Note:** UltraBay FX device options can be purchased through your IBM reseller or IBM marketing representative.

For information on replacing the UltraBay FX device, see “Replacing the UltraBay FX Device” on page 59.

#### *CD-ROM Drive*

The ThinkPad 390X computer comes with a CD-ROM/diskette drive bay device installed. The CD-ROM drive allows you to use compact discs (CDs).

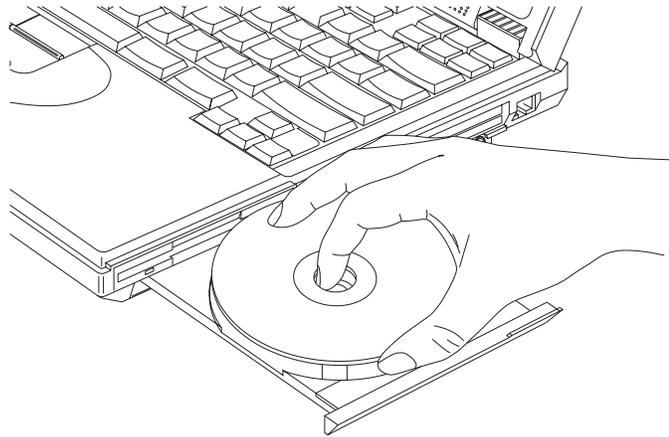
## *Distinctive Functions of Your Computer*

The following CDs are supported by the computer:

- Music CDs
- Photo CDs
- CD-ROM or CD-ROM XA
- Video CDs

To use the CD-ROM drive, do the following:

1. Turn on the computer.
2. Push the CD-ROM eject button on the side of the computer; then pull out the CD-ROM tray.
3. Fit your CD on the center pivot. Firmly press the CD down until you hear it click into place.



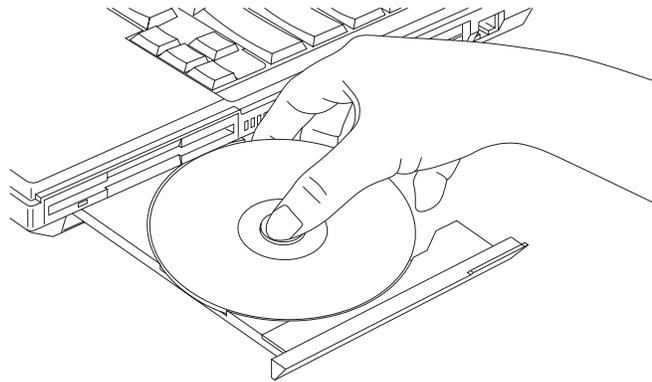
4. Push the tray into the computer until it fully closes.

The way you access the data on the CD depends on what type of CD it is.

To remove the CD, do the following:

1. Close the application program that uses the CD.
2. Push the CD-ROM eject button on the side of the computer; then pull out the CD-ROM tray.
3. Lift the CD by its edge while pressing the pivot.

## *Distinctive Functions of Your Computer*



4. Push the tray into the computer until it fully closes.

### **Handling CDs**

CDs are high-density media that must be handled with care and kept clean to ensure that data remains readable. Keep in mind the following to maintain reliability:

- Hold the CD by the edges. Do not touch the surface of the disc.
- To remove dust or fingerprints, wipe the CD from the center to the outside of the disc. Wiping the disc in a circular direction can cause loss of data.
- Do not write on the surface.
- Do not store or place the CD in direct sunlight
- Do not use benzene, thinner, or other cleaners to clean the CD. Use a CD-ROM cleaner kit.
- Do not flex or bend the CD.

**Note:** These handling tips also apply to DVDs.

## **ThinkPad Utility Programs**

Your ThinkPad computer has the following utility programs for easy configuration:

- BIOS Setup Utility
- ThinkPad Configuration program

## *Distinctive Functions of Your Computer*

This section summarizes these utility programs.

### *BIOS Setup Utility*

Your computer provides a BIOS Setup Utility which allows you to select various setup parameters:

- **Config** sets the configuration of your computer.
- **Date/Time** sets the date and time.
- **Password** sets password(s).
- **Startup** sets the startup device.
- **Restart** restarts the system.

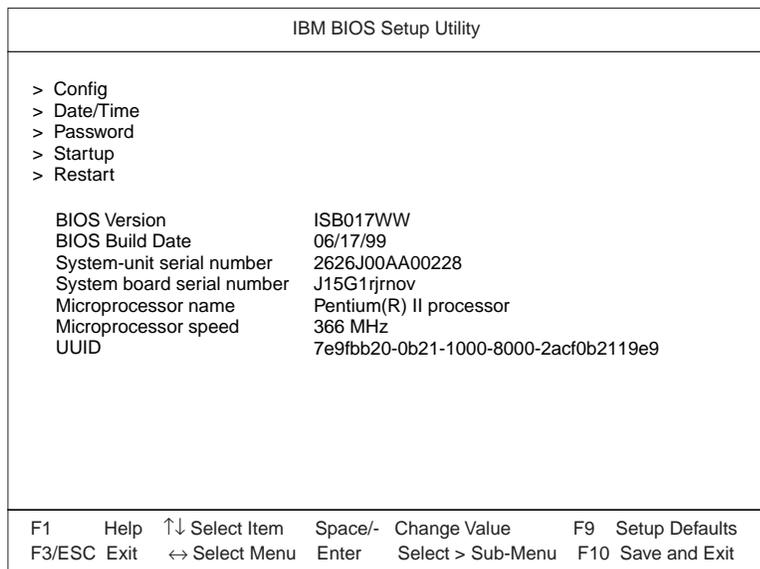
To start the BIOS Setup Utility, do as follows:

1. Remove any diskette from the diskette drive, and remove any CD from the CD-ROM drive; then turn off the computer.
2. Turn on the computer; then press **F1** while the IBM ThinkPad logo is being displayed.

The BIOS Setup Utility menu appears:

**Note:** The screen below is a sample of the BIOS Setup Utility menu and is intended only as a reference. Items in this screen may differ from the items on your computer, depending on your computer's configuration.

## Distinctive Functions of Your Computer



3. Move to an item you want to change using the arrow keys, and press **Enter**.

A submenu is displayed.

4. Change the items you wish to change.

To change the value of an item, use the **+** or **-** key.

5. Press **Esc** to exit from the submenu.

**Note:** If you are in a nested submenu, press **Esc** until you reach the BIOS Setup Utility main menu.

6. Press **F10** and press **Enter** to save your changes and exit from the BIOS Setup Utility menu.

Your computer restarts.

**Note:** If you would like to discard your changes, use the discard option in "Restart" on page 33.

## Distinctive Functions of Your Computer

**Config:** Selecting the **Config** item and pressing **Enter** displays the following "Config" submenu.

IBM BIOS Setup Utility	
Config	Item Specific Help
> Memory > System Board > Network Initialize > Advanced Setup	
F1 Help F3/ESC Exit	↑↓ Select Item ↔ Select Menu
Space/- Change Value Enter Select > Sub-Menu	F9 Setup Defaults F10 Save and Exit

The "Config" submenu includes the following:

- **Memory** enters the "Memory" submenu.
- **System Board** enters the "System Board" submenu.
- **Network** enters the "Network" submenu.
- **Initialize** loads the default values for all parameters in the BIOS Setup Utility.
- **Advanced Setup** enters the "Advanced Setup" submenu.

### Memory

Selecting the **Memory** item and pressing **Enter** displays the following "Memory" submenu.

## *Distinctive Functions of Your Computer*

IBM BIOS Setup Utility			
Memory		Item Specific Help	
Installed memory	65536 KB		
Usable memory	64768 KB		
F1 Help	↑↓ Select Item	Space/- Change Value	F9 Setup Defaults
F3/ESC Exit	↔ Select Menu	Enter Select > Sub-Menu	F10 Save and Exit

This submenu shows your computer's memory information.

### **System Board**

Selecting the **System Board** item and pressing **Enter** displays the following "System Board" submenu.

## Distinctive Functions of Your Computer

IBM BIOS Setup Utility	
System Board	Item Specific Help
BIOS Version: ISB017WW VideoBIOS Version: V1.17.01.19 Slave Controller Version: 01.29.10	
F1 Help    ↑↓ Select Item    Space/- Change Value    F9 Setup Defaults F3/ESC Exit    ↔ Select Menu    Enter Select > Sub-Menu    F10 Save and Exit	

This submenu shows information about your computer's system board.

### Network

Selecting the **Network** item and pressing **Enter** displays the following "Network" submenu.

## Distinctive Functions of Your Computer

IBM BIOS Setup Utility		Item Specific Help
Network		
Wake On LAN	[Enabled]	
Flash Over LAN	[Enabled]	
F1 Help	↑↓ Select Item	Space/- Change Value
F3/ESC Exit	↔ Select Menu	Enter Select > Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit

The "Network" submenu includes the following:

- **Wake On LAN** allows you to remotely wake-up the computer over the network.
- **Flash Over LAN** allows the system supervisor to update the computer's BIOS over the network.

### Advanced Setup

**Note:** You do not need to change the settings in the screen because the default settings are already optimized for you. Changing the values may cause device conflicts and your operating system may not boot up properly.

Selecting the **Advanced Setup** item and pressing **Enter** displays the following "Advanced Setup" submenu.

## Distinctive Functions of Your Computer

IBM BIOS Setup Utility	
Advanced Setup	Item Specific Help
> Serial Port > InfraRed > Modem for Legacy OS > Parallel Port > PCI > Keyboard/Mouse > Power > Others	
F1 Help F3/ESC Exit	↑↓ Select Item ↔ Select Menu Space/- Change Value Enter Select > Sub-Menu F9 Setup Defaults F10 Save and Exit

The "Advanced Setup" submenu includes the following:

- **Serial port** enters a submenu where you can set resource values for the serial port.
- **Infrared** enters a submenu where you can set resource values for the infrared port.
- **Modem for Legacy OS** enters a submenu where you can set resource values for the modem port if you are using an operating system which is not Plug-and-Play such as DOS or Microsoft Windows 3.11.
- **Parallel port** enters a submenu where you can set resource values for the parallel port.
- **PCI** enters a submenu where you can arrange ISA IRQ lines for PCI devices.
- **Keyboard/Mouse** enters a submenu where you can set values for the keyboard and mouse.
- **Power** enters a submenu where you can set values related to power management.

## Distinctive Functions of Your Computer

- **Others** enters a submenu where you set other hardware options for the computer.

**Date/Time:** Selecting the **Date/Time** item and pressing **Enter** displays the following "Date/Time" submenu.

IBM BIOS Setup Utility	
Date/Time	Item Specific Help
System Time [16:10:25] System Date [06/26/1999]	

F1 Help ↑↓ Select Item Space/- Change Value F9 Setup Defaults  
F3/ESC Exit ↔ Select Menu Enter Select > Sub-Menu F10 Save and Exit

To change the date and time, do the following:

1. Press the up or down arrow keys to select the item to change, date or time.
2. Press **Tab** or **Enter** to select a field.
3. Type the date or time.

**Note:** Instead of typing, you can press the **space bar** or **-**keys to adjust the date or time.

4. Press **F10** and press **Enter** to exit from the BIOS Setup Utility menu.

Your computer restarts.

**Note:** You can also set the current date and time with the application of the operating system installed in your computer.

## Distinctive Functions of Your Computer

**Password:** Selecting the **Password** item and pressing **Enter** displays the following "Password" submenu.

IBM BIOS Setup Utility	
Password	Item Specific Help
Set Power-On Password [Enter] Set Hard Disk1 Password [Enter] Set Hard Disk2 Password [Enter] Set Supervisor Password [Enter]	
F1 Help    ↑↓ Select Item    Space/- Change Value    F9 Setup Defaults F3/ESC Exit    ↔ Select Menu    Enter Select > Sub-Menu    F10 Save and Exit	

This submenu is used to set the power-on password, hard disk password, and setup password. For more information, see the "Using Passwords" on page 86.

## Distinctive Functions of Your Computer

**Startup:** Selecting the **Startup** item and pressing **Enter** displays the following "Startup" submenu.

IBM BIOS Setup Utility	
Startup	Item Specific Help
> Power On > Network	
F1 Help    ↑↓ Select Item    Space/- Change Value    F9 Setup Defaults	
F3/ESC Exit    ↔ Select Menu    Enter Select > Sub-Menu    F10 Save and Exit	

The "Startup" submenu includes the following:

- **Power On** enters the "Power On" submenu
- **Network** enters the "Network" submenu.

### Power On

Selecting the **Power On** item and pressing **Enter** displays the following "Power On" submenu.

## Distinctive Functions of Your Computer

IBM BIOS Setup Utility	
Power On	Item Specific Help
+Removable Devices ATAPI CD-ROM Drive +Hard Drive Network Boot	
F1 Help    ↑↓ Select Item    Space/- Change Value	F9 Setup Defaults
F3/ESC Exit    ↔ Select Menu    Enter Select > Sub-Menu	F10 Save and Exit

The "Power On" submenu is used to change the startup sequence of drives in your computer. For example, if you have different operating systems on different replacement hard disk drives or CD-ROM, you can have the system boot up from one of these devices.

**Note:** The ThinkPad 390X computer supports a second hard disk drive option which can be installed in the UltraBay FX. The second hard disk drive option can be purchased through your IBM reseller or IBM marketing representative.

**Attention:** You must be extremely careful not to specify a wrong device during a copy, save, or a format operation after you change your startup sequence. If you specify a wrong device, your data and programs might be erased or overwritten.

### Network

Selecting the **Network** item and pressing **Enter** displays the following "Network" submenu.

## *Distinctive Functions of Your Computer*

IBM BIOS Setup Utility	
Network	Item Specific Help
Network Boot +Removable Devices +Hard Drive ATAPI CD-ROM Drive LANDesk (R) Service Agent II Turbo 16/4 T-Ring PC Card RPL	
F1 Help    ↑↓ Select Item    Space/- Change Value    F9 Setup Defaults F3/ESC Exit    ↔ Select Menu    Enter Select > Sub-Menu    F10 Save and Exit	

The "Network" submenu is used to change the startup sequence of drives in your computer if Wake On LAN is enabled.

**Notes:**

1. Wake On LAN is typically used by LAN administrators in corporate networks to access your computer remotely.
2. The LANDesk (R) Service Agent II option refers to the network feature in the ThinkPad Port Replicator with Advanced Etherjet Feature.

**Note:**

**Attention:** You must be extremely careful not to specify a wrong device during a copy, save, or a format operation after you change your startup sequence. If you specify a wrong device, your data and programs might be erased or overwritten.

## *Distinctive Functions of Your Computer*

### **Changing the Startup Sequence**

To change the startup sequence, do the following:

1. Press the up or down arrow keys to select the item to change.
2. Press the **+** or **-** keys to move the item up and down in the priority list.

**Note:** If an item has a **+** sign before it, it means there are sub-items in that category. Press the **Enter** key to expand the item. Select a sub-item; then use the **+** or **-** keys to move the sub-item up and down in the priority list. Press the **Enter** key to collapse the item.

3. Repeat steps 1 and 2 for other items you want to change.
4. Press **F10** and press **Enter** to exit from the BIOS Setup Utility menu.

Your computer restarts.

To enable or disable a device in the startup sequence, do the following:

1. Press the up or down arrow keys to select the item to remove.
2. Hold down the **Shift** key and press the **1** key to enable or disable the device.
3. Repeat steps 1 and 2 for other items you want to enable or disable.
4. Press **F10** and press **Enter** to exit from the BIOS Setup Utility menu.

Your computer restarts.

## Distinctive Functions of Your Computer

**Restart:** Selecting the **Restart** item and pressing **Enter** displays the following "Restart" submenu.

IBM BIOS Setup Utility	
Restart	Item Specific Help
Exit Saving Changes Exit Discarding Changes Discard Changes Save Changes	
F1 Help    ↑↓ Select Item    Space/- Change Value    F9 Setup Defaults F3/ESC Exit    ↔ Select Menu    Enter Select > Sub-Menu    F10 Save and Exit	

This submenu includes the following:

- **Exit Saving Changes:** exits the BIOS Setup Utility, saving your changes.
- **Exit Discarding Changes:** exits the BIOS Setup Utility, discarding your changes.
- **Discard Changes:** discards your changes.
- **Save Changes:** saves your changes.

Select a restart option and press **Enter**.

### ThinkPad Configuration

The ThinkPad Configuration program allows you to set up and customize the computer's built-in devices to your needs. For example, you can enable or disable a port, switch between your computer's LCD and an external monitor, and set the power management mode.

## Distinctive Functions of Your Computer

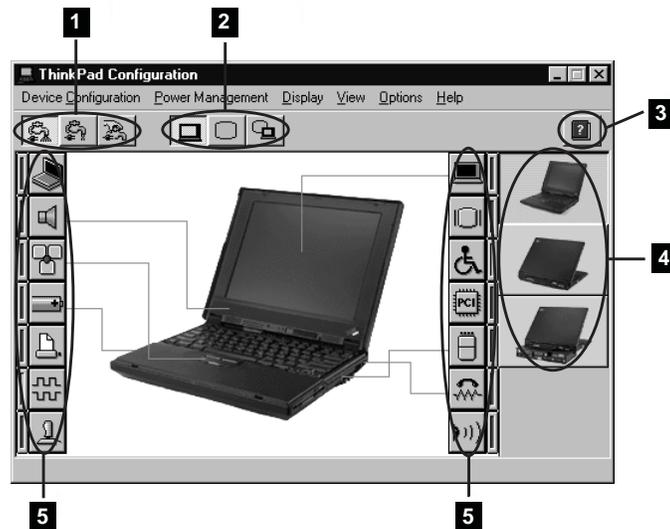


To start the ThinkPad Configuration program, find the ThinkPad icon on the right side of the taskbar; then double-click the icon.

**Note:** You can also start the ThinkPad Configuration program as follows:

1. Click **Start**.
2. Move the cursor to **Programs, ThinkPad**; then click **ThinkPad Configuration**.

The following window appears:



- (1) The **Power Mode** buttons  
Click on one of these buttons to set the power mode to maximum-performance mode, maximum-battery-life mode, or customized mode.
- (2) The **Display Device** buttons  
Click on one of these buttons to set the display output type to the LCD, external monitor, or both.
- (3) The **Help** button displays online help.
- (4) The **View Angle** buttons  
Click on the front view or rear view buttons to display the hardware feature locations.

## *Distinctive Functions of Your Computer*

(5) The **Device** buttons

Click on the button of your choice from the window. If the device is enabled, the red indicator next to the button is lit. Otherwise, it stays off.

## **Online User's Guide**

Your ThinkPad computer features an online user's guide, so that you will always have key information at your fingertips even if you are traveling. It contains the following information:

- Using your computer outside your home country
- Using the audio, infrared, modem and DVD features
- Using your computer with a battery pack
- Using your computer with a PC Card
- Resolving system resource conflicts
- Solving computer problems
- Installing software
- Using system management
- Handling the ThinkPad
- Getting service

To start the online user's guide, click **Start**, move the cursor to **Programs** and **ThinkPad 390X**; then click **ThinkPad 390X User's Guide**.

The online book appears. Go to the section you want, and make a printout if necessary.

## Reinstalling Software

To back up your system or reinstall the operating system, your ThinkPad computer has the following features:

**Note:** These features are for Windows 98, Windows NT and Windows 95. If you are using a different operating system, get the hardware device driver from the ThinkPad Web site (see “ThinkPad Web Site or Bulletin Board” on page 37).

- ThinkPad Software Selections CD
- Recovery CD
- ConfigSafe
- ThinkPad Web site or bulletin board

For more information about recovering lost or damaged software, see “Recovering Lost or Damaged Software” on page 132.

### ThinkPad Software Selections CD

You can customize your system using this CD. It contains all the software applications and hardware device drivers for your computer in the Windows 98, Windows 95, or Windows NT environment. It features the ThinkPad Software Selections program (see “Using the ThinkPad Software Selections CD” on page 133).

### Recovery CD

If you accidentally erase your hard disk, you can use the Recovery CD to restore the contents of the preinstalled hard disk to what it was at the time of purchase. (To use the Recovery CD, see “Using the Recovery CD” on page 134.)

### ConfigSafe

ConfigSafe is an application program for Windows 98, Windows NT or Windows 95 that periodically takes *snapshots* of your system files. If your computer does not operate properly after you install a new device driver or software, use ConfigSafe to restore the last working version of your system files. Although it might not make your new hardware or software work, it will set your computer up and running again. This application protects your data.

## **ThinkPad Web Site or Bulletin Board**

IBM supplies all of the latest hardware device drivers and system BIOS for your computer on the ThinkPad Web site:  
**<http://www.pc.ibm.com/thinkpad>**

You can also use the IBM bulletin board service.

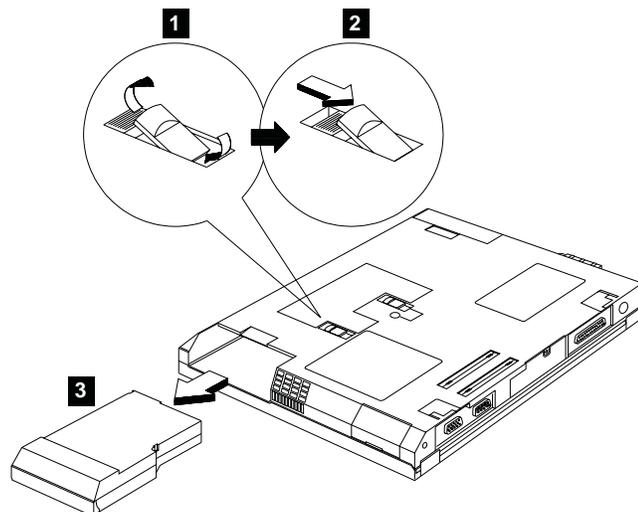
For more information about electronic service and support, see "Getting Service" on page 137.

For Web browser links to the IBM Web site, see the *Online User's Guide*.

## Replacing the Battery Pack

To replace the battery pack, do as follows:

1. Power off your computer.
2. Disconnect the AC Adapter and cables.
3. Close the LCD and turn the computer over.
4. Slide and hold the battery pack latch to the unlocked position (1); then remove the battery pack (2).



5. To install the new battery pack, insert it into the battery bay. The battery-pack latch automatically snaps into place.

You have finished replacing the battery pack.

**Note:** You can replace the battery pack when the computer is in hibernation mode or when it is powered off. If you are using a PC Card, the computer might not be able to enter hibernation mode. If this happens power off the computer.

When the AC Adapter supplies the computer with power, you can replace the battery pack without turning off the computer. The battery pack can also be installed in the UltraBay FX (see “Replacing the UltraBay FX Device” on page 59).

## Service Hints & Tips

ThinkPad computers are designed and tested to be durable and function reliably in normal environments. Using common sense and following these tips will help get you many years of comfortable and productive use from your computer.

### Handling Your ThinkPad Computer

Laptop computers are precision machines that require a bit of careful handling. Though the IBM ThinkPad computer is designed and tested to be a durable notebook computer that functions reliably in normal work environments, you need to use some common sense in handling it.

### ThinkPad Don'ts

- Do not leave the base of your computer in contact with your lap or any part of your body for an extended period when the computer is functioning or when the battery is charging. Your computer dissipates some heat during normal operation. Extended contact to the skin could cause discomfort or, eventually, a skin burn.
- Do not subject your computer to physical punishment, such as dropping or bumping.
- Do not place heavy objects on your computer.
- Do not spill or allow liquids into your computer.
- Do not use your computer in or near water (to avoid the danger of electrical shock).
- Do not pack your computer in a tightly packed suitcase or bag. The compression might cause internal damage.
- Do not disassemble your computer. Only an authorized IBM ThinkPad repair person should disassemble and repair your computer.
- Do not scratch, twist, hit, or push the surface of your computer display.

## Service Hints & Tips

- Do not place any objects between the display and keyboard or under the keyboard.
- Do not pick up or hold your computer by the display. When picking up your open computer, hold it by the bottom (keyboard) half.
- Do not modify or tape the latches to keep the display open or closed.
- Do not turn your computer over while the AC Adapter is plugged in. This could break the adapter plug.
- Do not use or store your computer where the temperature is below 5° C or above 35°C (41°F and 95°F).
- Do not place your computer closer than 13 cm (5 in.) from any electrical appliance that generates a strong magnetic field, such as a motor, magnet, TV, refrigerator, or large audio speakers.
- Do not hard-mount your computer in a vehicle or anywhere that it is subject to strong vibration. See the section on ruggedized mobile computers for information on a more appropriate model for demanding applications.
- Do not crush, drop, or physically punish the external or removable hard disk, diskette, or CD-ROM drive when it is outside of your computer.
- Do not press on the middle part of the diskette drive.
- Do not insert a diskette at an angle. Not inserting the diskette straight into the drive can damage the drive.
- Do not place more than one label on a diskette. Multiple or loose labels can detach or tear and then lodge in the drive.
- Do not touch the lens on the CD-ROM tray. You should hold the compact disc by the edges and not touch its surface.
- Do not connect a PBX (private branch exchange) or other digital telephone extension line. **Your computer can use only a public-switched telephone network (PSTN).** Use of a phone line 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 tele-

## ***Service Hints & Tips***

phone extension lines, so check before connecting the telephone cable in such places.

- Do not place an active cellular phone on the computer.

## **ThinkPad Do's**

- Replace the plastic bezel faces (if supplied) when you exchange drives in your computer.
- Store your external and removable hard disk, diskette, and CD-ROM drives in the appropriate container or packaging when not in use.
- When installing your hard disk, or UltraBay FX device, apply pressure only where indicated on the device.
- When installing devices into the UltraBay FX, make sure the AC Adapter is disconnected from your computer.
- Choose a quality carrying case that will provide excellent protection for your computing investment. Treat your computer like a precision piece of electronic machinery.
- Register your ThinkPad products with IBM. This can help authorities return your computer to you if it is lost or stolen. Registering your computer also enables IBM to notify you about possible upgrades.
- Retain and store packing materials safely out of reach of children to prevent the risk of suffocation from plastic bags.
- Check the IBM Web pages at <http://www.pc.ibm.com/support> periodically to get current information about your computer.

## **Carrying Your Computer**

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

1. Remove any media from the CD-ROM drive or diskette drive.
2. Turn off all attached devices.
3. Turn off the computer and close the LCD.
4. Unplug all external cables and cords connected to your computer.

## **Service Hints & Tips**

5. Make sure all computer doors and covers are closed.
6. Use a quality carrying case that provides adequate cushion and protection.

## **Cleaning Your Computer**

You should occasionally clean your computer as follows:

- Use a soft cloth moistened with non-alkaline detergent to wipe the exterior of the computer.
- Don't spray cleaner directly on the display or keyboard.
- Gently wipe the LCD with a dry, soft cloth.

## **Extending Your Battery Life**

The amount of battery power consumed by your computer depends on such conditions as the usage frequency, the operating temperature, and the period in storage (if unused). The following tips can help you to extend the life of your battery:

- If your battery is brand new and you are charging it for the first time, it might not become fully charged due to the characteristics of the chemicals in the cell. To maximize performance, ensure that all chemicals in the battery are fully activated by cycling the battery (fully charge, then fully discharge) three times. This procedure is also recommended if you stored the battery for a few months.
- Do not charge the battery pack until all of its power is used. Recharging a battery pack that is not completely discharged can shorten battery life.
- Once you start charging the battery pack, do not use it until it is fully charged.
- Whenever possible, use the ThinkPad battery power-saving modes:
  - standby: The LCD and the hard disk drive are turned off.
  - suspend: All tasks are stopped and stored in memory to save power.

## ***Service Hints & Tips***

- hibernation: All tasks are stopped. The memory data and the current status of the computer are stored in the hard disk drive; then the power is turned off.
- Decrease the LCD brightness.
- Use Advanced Power Management (APM). Each operating system comes with its own power management system.
- Stop the power supply to a serial device if it is not in use.
- Remove the battery pack and keep it in a cool place if you will not be using the computer for a long period.

## **Getting Service**

**Always read “Solving Computer Problems” on page 95 before calling IBM.**

During the warranty period, you can get help and information from the International Warranty Service (IWS) in your country. Before you call, fill out the front of this card. Also have:

- Exact wording of any error messages
- Hardware and software configuration information
- Description of the problem
- Information and serial numbers of any options installed on your system

### ***International Warranty Service***

This IBM product is eligible for service internationally wherever your machine type is sold by IBM. Your computer must be registered to receive international service. To register, call one of the following IWS offices:

Southeast Asia, Australia, New Zealand, and Hong Kong:	61-2-9354-4171
Canada, Latin America, and the U.S.:	1-800-497-7426
	or 248-740-1215
Europe, Middle East, and Africa:	44-1475-893638
Japan, Korea, China (except Hong Kong), and Taiwan:	81-462-73-7598

## Service Hints & Tips

### *Help through a ThinkPad Web Site*

- The latest information about ThinkPad computers:  
**<http://www.ibm.com/thinkpad>**
- Technical support information:  
**<http://www.ibm.com/support>**

## For More Information

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For product and dealer location information	1 800 426-2968
To access the IBM PC Company Bulletin Board	1 919 517-0001
For product information sent directly to your fax machine	1 800 IBM-3395 (1 800 426-3395)
IBM PC Product Guide Directory (to specific product sections)	Select FaxDoc #12745
IBM ThinkPad Information Directory	Select FaxDoc #11078

## Extending the Features of Your Computer

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This chapter provides information on how to customize and extend the features of your ThinkPad 390X computer. You can use the ThinkPad computer with external devices and increase the memory.

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## Customizing the TrackPoint

You can customize the TrackPoint by doing the following:

1. Click on **Start**.
2. Move the cursor to **Settings**, then click on **Control Panel**.
3. Double-click on **TrackPoint**.

The "TrackPoint Properties" window appears.

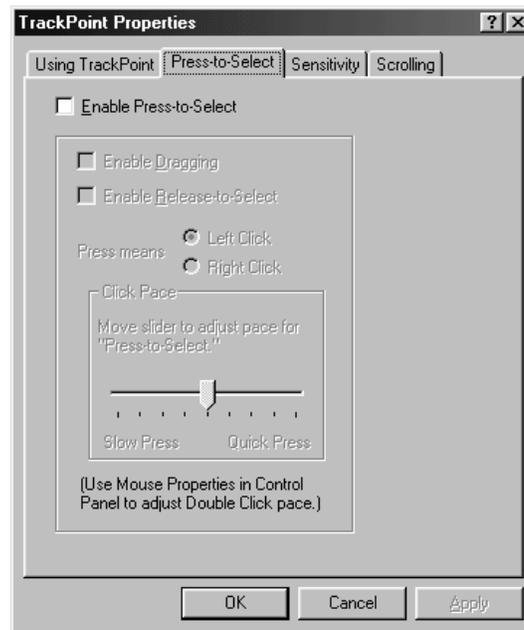
You can set the following features in this window:

- Press-to-Select
- Sensitivity
- Scrolling or Magnifying Glass

**Note:** To use the TrackPoint functions, you must disconnect any PS/2 mouse and enable the TrackPoint.

You can set the features by going to windows corresponding to the tabs.

## Using the Press-to-Select Window



**Note:** To use the Press-to-Select functions, you must disconnect any PS/2 mouse and enable the TrackPoint.

If you enable Press-to-Select by putting a check mark in the **Enable Press-to-Select** box, you can make the TrackPoint stick function the same as the left or right click button on the keyboard.

- If you check **Enable dragging**, you can drag the icon that you select with the TrackPoint stick by putting light pressure on the stick.
- If you check **Enable Release-to-Select**, you can click simply by lifting your finger quickly off the TrackPoint. Moving the cursor onto an icon and then lifting your finger off the TrackPoint works like clicking. Pressing the TrackPoint again works like double-clicking.
- Click one of the **Press means** radio buttons to select which button the stick will simulate: either the left or the right button. For example, if you select **Left Click**, you can start a program

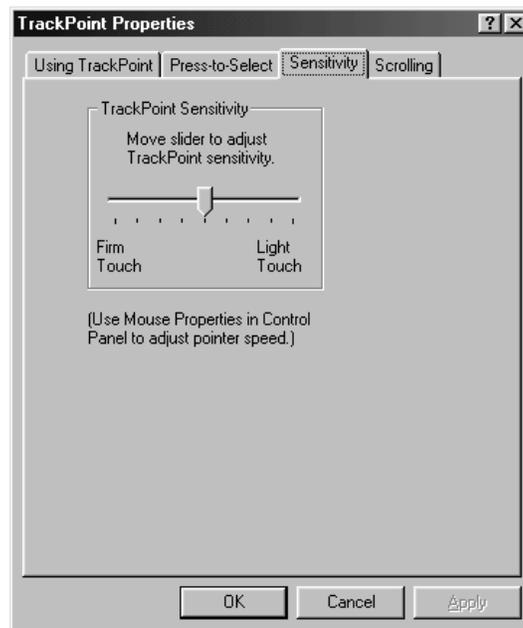
## *Customizing the TrackPoint*

with the TrackPoint by putting the pointer on the program's icon and applying light pressure on the stick.

To adjust the pressing timing of the stick, set **Click Pace**.

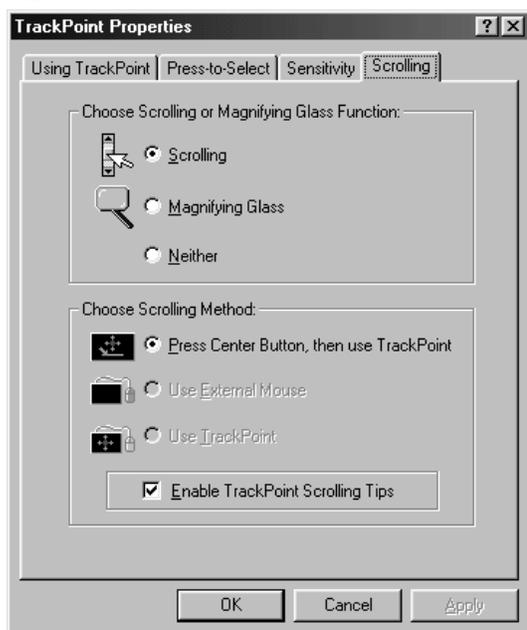
**Note:** If you set the pace too slow, you might notice unintended clicks, a pointer delay, or a dragging delay. However, if you set the pace too fast, you might find Press-to-Select hard to use.

## Using the Sensitivity Window



This function adjusts the force required for both cursor movement and Press-to-Select. Slide toward **Firm Touch** to increase the force needed to move the pointer, and to increase the force needed to activate Press-to-Select. Slide toward **Light Touch** to decrease the force needed to move the pointer, and to reduce the force needed to activate Press-to-Select.

## Using the Scrolling Window



**Note:** To use the Scrolling functions, you must disconnect any PS/2 mouse and enable the TrackPoint.

By clicking on the **Scrolling** tab, you can set the scrolling properties of your TrackPoint:

- **Choose Scrolling or Magnifying Glass Function** Select one of the following radio buttons:
  - **Scrolling**

This function enables you to navigate easily through long documents or large spreadsheets with a press of a button. To scroll, press the center button and then use the TrackPoint instead of the scroll bars in any program.
  - **Magnifying Glass**

This function enables you to enlarge a movable area of your display. You can click on objects "through" the magnifying glass. The right button changes the size of the magnifying glass, and left button changes its magnifying power. Move

## ***Customizing the TrackPoint***

the magnified area the same way as you use the scrolling function; in other words, press the center button and then use the TrackPoint to move the magnified area.

- **Neither**

This function disables the scrolling and magnifying glass functions.

- **Choose Scrolling Method:**

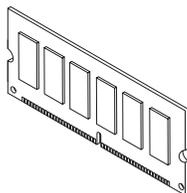
- **Press Center Button, then use TrackPoint**

Holding down the center button on the keyboard allows the TrackPoint to control the scrolling or the magnifying glass. The TrackPoint operates normally (controls the mouse cursor) when the center button is not pressed.

**Note:** The **Use External Mouse** and the **Use TrackPoint** radio buttons are not supported.

## Increasing Memory

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



Different capacities of DIMM are available. You can install DIMMs directly in the memory slots on the bottom of the computer. Your computer memory capacity can be expanded up to 256 MB (two 128 MB DIMM options).

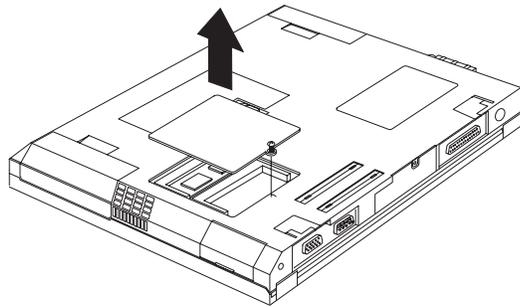
**Note:** Base memory (32 MB or 64 MB) occupies one DIMM slot.

**Attention:** The ThinkPad 390X computer supports the PC-100 static dynamic random access memory (SDRAM) card only. It does not support the enhanced data output dynamic random access memory (EDO DRAM) card. If you install a DIMM that is not supported by your computer, an error code might appear when the system starts. The appropriate memory option can be purchased through your IBM reseller or IBM marketing representative.

To install the DIMM, do the following:

1. Power off the computer; then disconnect the AC Adapter and all cables from the computer.
2. Close the LCD, turn the computer over, and then remove the battery pack.
3. Loosen the screw on the memory slot cover; then remove the cover.

## Increasing Memory

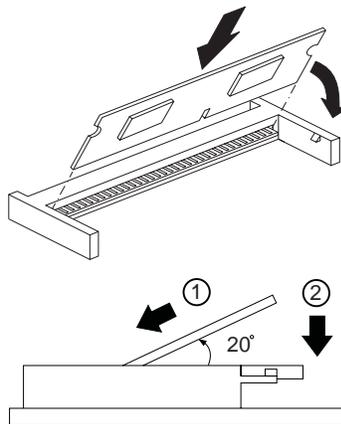


4. Install the DIMM into the memory slot.

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

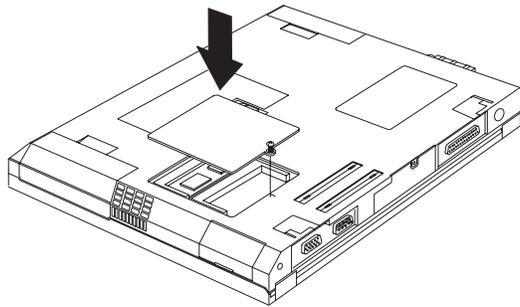
- a. Find the notch on the side of the DIMM.
- b. With the notched end of the DIMM toward the right side of the socket, insert the DIMM, at an angle or approximately  $20^\circ$ , into the socket; then press it firmly (1).
- c. Pivot the DIMM until it snaps into place (2).

If you want to install two DIMMs, repeat these steps.



5. Replace the memory slot cover over the memory slot, aligning the back side of the cover first as shown; then tighten the screw.

## Increasing Memory



6. Replace the battery pack.
7. Turn the computer over again, power on the computer.
8. Confirm that the new memory size is detected:
  - a. Press **F1** while the IBM ThinkPad logo is being displayed to enter the BIOS Setup Utility.
  - b. Select **Config** and press **Enter**.
  - c. Verify the values in the memory section (see page 54).
9. You have finished installing the DIMM. Reconnect all cables.

### Notes:

1. If the total memory size is not the same as the value you calculated, power off the computer and go to page 52 to reinstall the DIMM.
2. If you changed the memory installed in the computer, you need to create a new hibernation file. To create the hibernation file, refer to "Creating the Hibernation Function" on page 55 or see the *Online User's Guide*.

### How to Calculate Total Memory Size

Calculate your total memory size in kilobytes (KB) by adding the DIMM memory size to the base memory size (32384 KB for a computer with 32 MB base memory).

**Note:** 384 KB is reserved by the system.

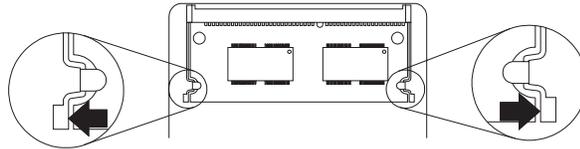
For example, if you installed a 32MB DIMM to a computer with 32 MB base memory, you should have about 64 MB.

## Increasing Memory

Your computer displays the memory size in kilobytes. For example, 640 KB (system memory) + 64512 (extended memory) = 65152 KB.

### Removing the DIMM

1. Power off the computer and disconnect the AC Adapter and all cables from the computer.
2. Close the LCD, turn the computer over, and then remove the battery pack.
3. Loosen the screw and remove the memory slot cover.
4. Press out on the latches on both edges of the socket at the same time.



5. Remove the DIMM.  
Be sure to save the DIMM for future use.
6. Replace the memory slot cover; then tighten the screw.
7. Replace the battery pack.
8. Turn the computer over again; then connect the AC Adapter and all the cables you disconnected.

## Creating the Hibernation Function

Your computer can enter hibernation mode if you create the hibernation function.

**Note:** Hibernation does not work in OS/2. It also does not work in a system with OS/2 Boot Manager installed, or when the drive is formatted for NTFS.

## Increasing Memory



To create and enable the hibernation function, do as follows:

1. Click **Start**.
2. Move the cursor to **Programs, ThinkPad**, then click **ThinkPad Configuration**.
3. Click the **Power Management** (  ) icon.
4. Create and enable the hibernation function:
  - a. Click the **Hibernation Options** tab.
  - b. Click the **Enable/Disable Hibernation** button.  
The Enable/Disable Hibernation window appears.
  - c. If the hibernation file is correctly allocated, click **Close**. Otherwise, click **Create Now**, verify the hibernation file size, and click **OK**; then click **Close**. Press **OK** to restart the computer.

**Note:** If you change the memory size, you need to re-create the hibernation function. Refer to the previous steps.

## Upgrading the Hard Disk Drive

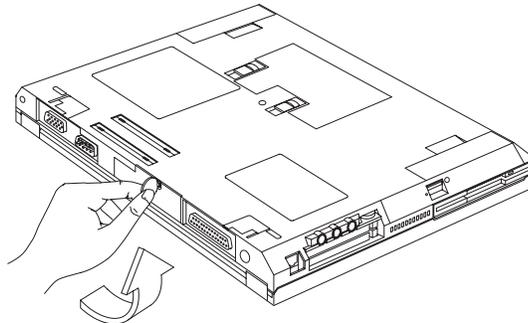
You can increase the storage capacity of your computer by replacing the original, built-in hard disk drive with an optional one. You can purchase the option from your IBM reseller or IBM marketing representative.

**Note:** Replace the hard disk drive only if you upgrade it or have it repaired. You should not replace it often.

**Attention:** Do not drop or apply any shock to the hard disk drive. The drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the hard disk drive. Before removing the hard disk drive, have a backup copy of all the information on the hard disk drive. Never remove the drive while the system is operating or in suspend mode.

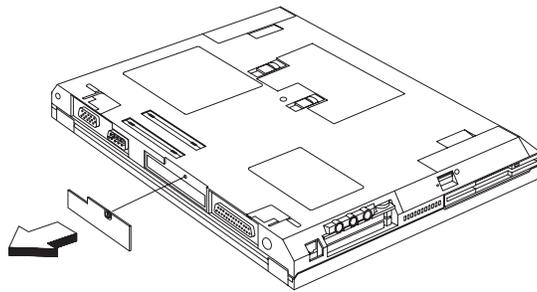
To replace the hard disk drive, do the following:

1. Power off the computer; then disconnect the AC Adapter and all cables from the computer.
2. Close the LCD, turn the computer over, and then remove the battery pack.
3. Loosen the coin screw by rotating it counterclockwise with a coin, as shown.

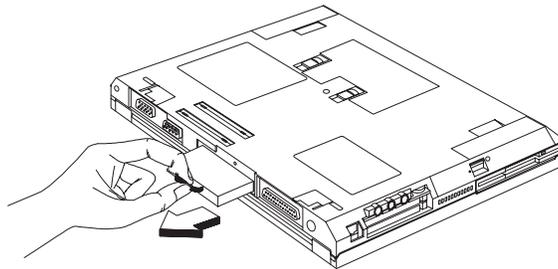


4. Remove the hard disk drive cover.

## Upgrading the Hard Disk Drive



5. Pull the strap of the hard disk drive to remove the drive.



6. To install the new hard disk drive, do the following:
  - a. Insert the new hard disk drive into the bay. Make sure you connect the drive firmly.
  - b. Replace the hard disk drive cover, and tighten the screw.
  - c. Turn the computer right-side up, and power it on.

## Replacing the UltraBay FX Device

You can install the following drives and devices in the UltraBay FX:

- CD-ROM drive/diskette drive
- DVD-ROM drive/diskette drive
- Second battery pack
- Second hard disk drive

**Note:** UltraBay FX device options can be purchased through your IBM reseller or IBM marketing representative.

### Swapping UltraBay FX Devices

You can warm swap the CD-ROM drive/diskette drive and DVD-ROM drive/diskette drive into and out of the UltraBay FX. Warm swap means to remove or reconnect a device when the computer is in suspend mode. Warm swap is only available under the Windows 98 or Windows 95 OSR2 operating system; otherwise, turn off your computer before swapping the CD-ROM drive/diskette drive and DVD-ROM drive/diskette drive.

Under the Windows 98 or Windows OSR2 operating system, you can warm swap the battery pack when the AC Adapter supplies the computer with power. Otherwise, you can hot swap the battery pack when the AC Adapter supplies the computer with power.

To swap a second hard disk drive, you need to power off the computer.

**Note:** Do not swap UltraBay FX devices if the computer is in hibernation mode.

To swap UltraBay FX devices, do the following:

1. Save your work.
2. Prepare the computer and UltraBay FX for swap.

## Replacing the UltraBay FX Device

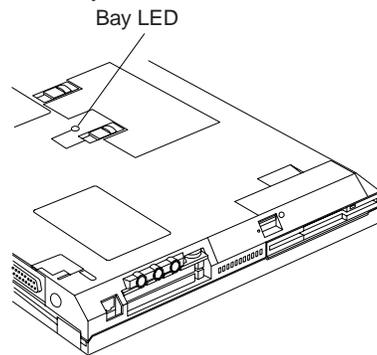
**Warm swap:** Click the **Swap Bay** icon on the taskbar; then click **Change Swap Bay**. Click on **OK**.

—or—

Shutdown the computer.

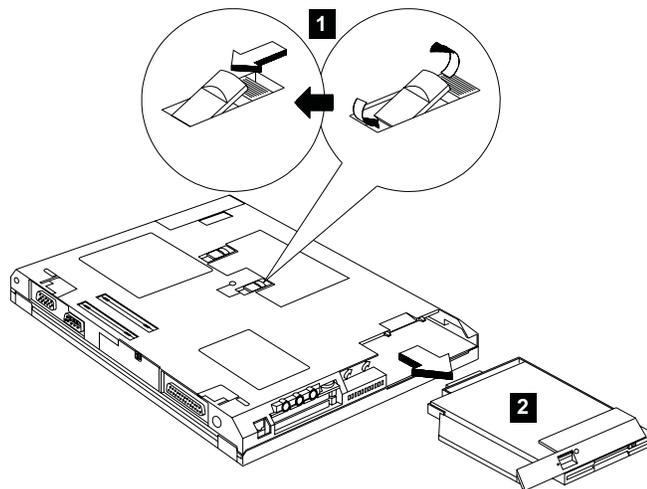
3.

The bay LED turns off.



**Attention:** Make sure that the bay LED is off. Never remove the UltraBay FX device when the bay LED is on.

4. Slide and hold the UltraBay FX device lock to the unlock position (1); then pull to remove the UltraBay FX device (2).



5. Insert an UltraBay FX device into the bay.

## Replacing the UltraBay FX Device

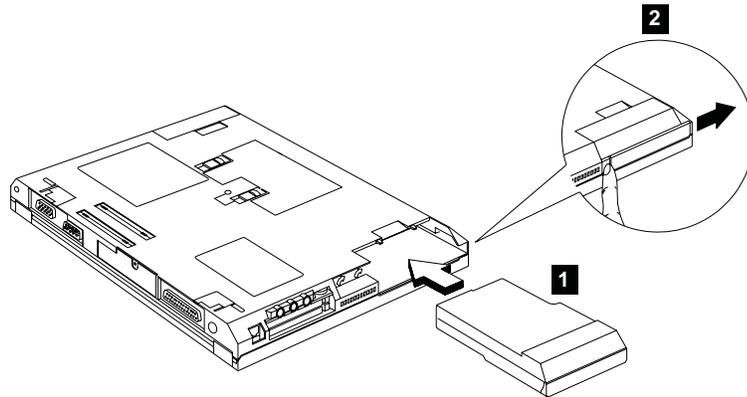
The UltraBay FX device lock automatically snaps into place.

6. Turn on the computer.

## Installing a Second Battery Pack

To install a second battery pack, do as follows:

1. Save your work.
2. If there is not enough charge left in the main battery pack, shut down the computer or connect a powered AC Adapter to the computer.
3. Insert the second battery pack (1) into the UltraBay FX.



The UltraBay FX device lock automatically snaps into place.

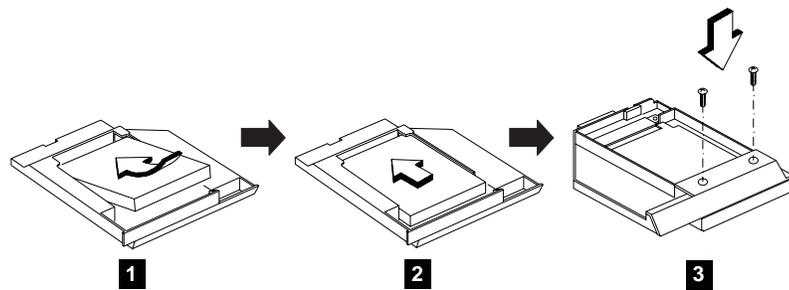
4. Slide the battery pack extension cover (2) to complete the installation.

## Installing a Second Hard Disk Drive

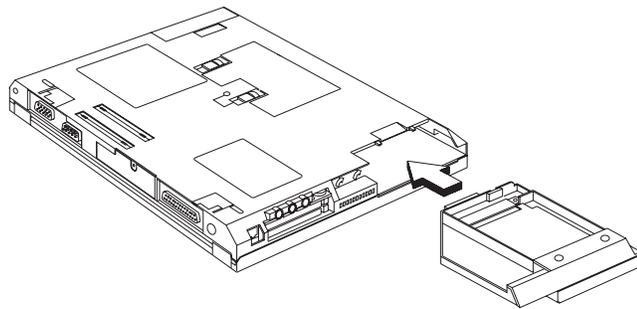
To install a second hard disk drive, do as follows:

1. Save your work and shut down the computer.
2. Install the hard disk drive into the hard disk drive bay adapter by: (1) inserting the hard disk drive into the hard disk drive bay adapter, (2) sliding the hard disk drive in place, and (3) securing the hard disk drive into the hard disk drive bay adapter.

## Replacing the UltraBay FX Device



3. Insert the second hard disk drive into the UltraBay FX.



The UltraBay FX device lock automatically snaps into place.

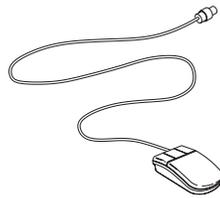
4. Turn on the computer.

## Attaching an External Mouse, Keypad or Keyboard

This section explains how to attach an external mouse, external numeric keypad, and external keyboard to your computer.

### Attaching an External Mouse or Numeric Keypad

You can attach an external mouse or numeric keypad to the external-input-device connector (  ) on the rear of the computer.

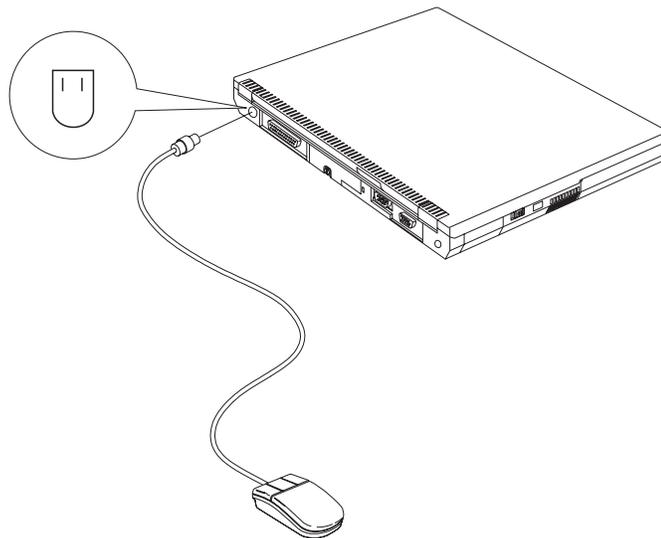


**Mouse**



**External keypad**

If you want to attach the mouse, attach the mouse directly to the external-input-device connector as shown:



If PS/2 mouse is attached, the TrackPoint is disabled automatically.

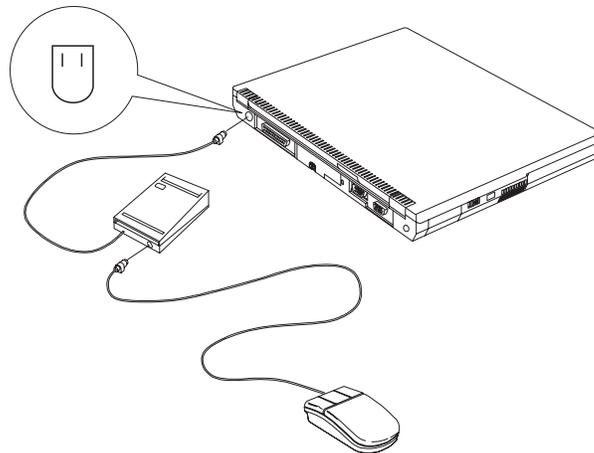
## Attaching an External Mouse, Keypad or Keyboard

You can use an external serial or USB mouse simultaneously with the TrackPoint.

### Notes:

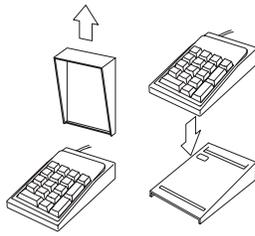
1. If you have not installed the serial mouse device driver before, do as follows after attaching the serial mouse:
  - a. Click **Start**.
  - b. Move the cursor to **Settings**, then click **Control Panel**.
  - c. Double-click **Add New Hardware** to search for and install the serial mouse driver.
  - d. Follow the instructions on the screen.
2. Disabling the TrackPoint is required when the serial mouse is hot-attached (see "Disabling the TrackPoint" on page 67).

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



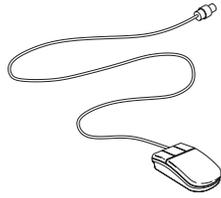
**Note:** You can remove the keypad cover and use it as a stand for the keypad.

***Attaching an External Mouse, Keypad or Keyboard***

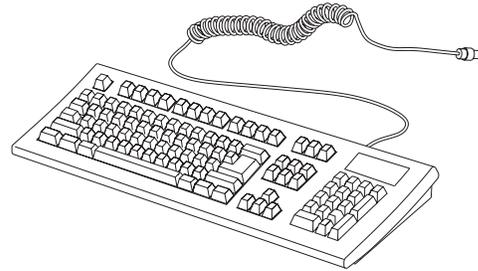


## *Attaching an External Mouse, Keypad or Keyboard*

### **Attaching an External Keyboard and Mouse**



**Mouse**



**External keyboard**

You can connect an external keyboard to your computer either directly through the external input-device connector or through the keyboard/mouse cable (available separately as an option).

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

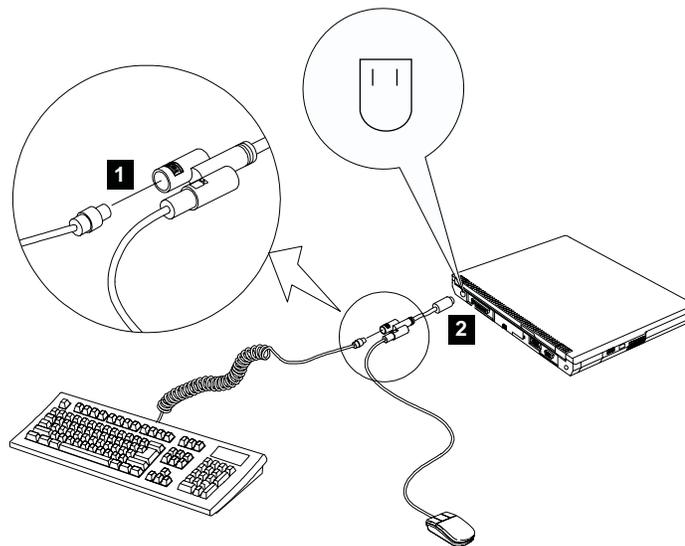
- Numeric keypad on the computer keyboard
- External numeric keypad

Instead, use the numeric keypad on the external keyboard.

To attach the external keyboard, turn off the computer, attach the keyboard to the keyboard connector of the keyboard/mouse cable (1), and then attach the keyboard/mouse cable to the computer (2).

You can attach a mouse to the mouse connector of the keyboard/mouse cable.

## Attaching an External Mouse, Keypad or Keyboard



### Using the IBM ThinkPad Space Saver Keyboard

When using the IBM ThinkPad Space Saver Keyboard, you do not need to install the device driver supplied with the Space Saver Keyboard. The TrackPoint on the ThinkPad is disabled when you use the Space Saver Keyboard.

## Disabling the TrackPoint

Attaching a PS/2 mouse automatically disables the TrackPoint. You can use a serial or USB mouse simultaneously with the TrackPoint. If you wish, you can choose to disable the TrackPoint.

### Notes:

1. Before you disable the TrackPoint, make sure you connect and enable an external mouse.
2. When a serial mouse is hot-attached, you need to disable the TrackPoint.

## Attaching an External Mouse, Keypad or Keyboard



To disable the TrackPoint:

1. Start the ThinkPad Configuration program. (See “ThinkPad Configuration” on page 33.)
2. Click the **TrackPoint** (  ) button.
3. Click **Disable** for the TrackPoint.

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

## *Attaching an External Mouse, Keypad or Keyboard*

## **Attaching an External Monitor**

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

The LCD of your computer uses thin-film transistor (TFT) technology. The LCD displays output with XGA (1024x768 resolution) or SVGA (800x600 resolution) video mode and 16M colors.

If you are attaching an external monitor that supports a resolution higher than VGA mode, you can achieve a maximum of 1280x1024 video resolution.

To attach an external monitor, do the following:

1. Connect the external monitor to the external-monitor connector (  ) at the rear of the computer; then connect the monitor to an electrical outlet.
2. Turn on the monitor
3. Start the ThinkPad Configuration program. (See “ThinkPad Configuration” on page 33.)
4. Change the display output location by clicking the **LCD+External Display** (  ) button or the **External Display** (  ) button.

### **Notes:**

1. If you select the **LCD+External Display** button, do not attach an external monitor that supports only VGA mode (640x480 resolution). Otherwise, the external monitor is scrambled and output is not displayed, or the screen might be damaged. Use **External Display** instead.
2. You can change the display output location by pressing **Fn+F7**.
3. Set your monitor type and display device driver as follows:

If you are attaching an SVGA monitor, refer “Display Modes” on page 71 for information on the supported color depth or resolution.

## Attaching an External Monitor

- a. Click the **LCD** or **External Display** (  or  ) button.
- b. Click the **Advanced Properties...** button.

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

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

4. Restart the computer to make the changes effective.

## Display Output Location

**Attention:** Do not change the display output location while a moving picture is being drawn—for example, while playing a movie or a game. Stop the application before changing the display output location.

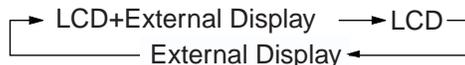
You can change the display output location with the ThinkPad Configuration program. Select one of the following display output locations:

- LCD (  ): The computer output is displayed only on the LCD of the computer.
- External Display (  ): The computer output is displayed only on the attached external monitor.

If no external monitor is attached to the computer and the display output location is set to External Display, the output is displayed on the LCD.

- LCD+External Display (  ): The computer output is displayed on both the LCD and the external monitor.

You can also change the display output location using the **Fn** key function. Press and hold the **Fn** key; then press the **F7** key. The output is displayed sequentially as follows:



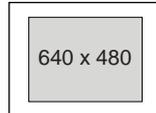
## Attaching an External Monitor

### Important

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

### The DOS Screen Image on the LCD

If you use a DOS application that supports only VGA mode (640x480 resolution) with your computer, the screen image might appear smaller than the display size, as shown:



This is to maintain compatibility with DOS applications. To expand the screen image to the same size as the actual screen, you can use the *screen expansion* function. You can expand the screen image by clicking on the LCD button (  ) in the ThinkPad Configuration program and enabling the radio button for **Screen Expansion** and clicking **OK**. However, the image might look slightly distorted.

## Display Modes

The ThinkPad 390X computer has an LCD that supports an XGA (1024x768 resolution) video mode or an SVGA (800x600 resolution) video mode. The following table shows the various display modes (resolution and color depth) available with your computer or external monitor. Use this table to set the display output (**LCD**, **External Display** or **LCD+External Display**).

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

## Attaching an External Monitor

- Display output on the LCD, or both on the LCD and external monitor (**LCD** or **LCD+External Display**).

Resolution	Supported Color Depth
640x480 (VGA)	16, 256, 65,536, and 16,777,216
800x600 (SVGA)	256, 65,536, and 16,777,216
1024x768 (XGA) (available only for 14.1-inch and 15.0-inch models)	256, 65,536, and 16,777,216

- Display output only on the external monitor (**External Display**).

Resolution	Supported Color Depth	Frame Rate
640x480 (VGA)	256	60 Hz, 75 Hz, or 85 Hz
	65,536	
	16,777,216	
800x600 (SVGA)	256	60 Hz, 75 Hz, or 85 Hz
	65,536	
	16,777,216	
1024x768 (XGA)	256	60 Hz, 70 Hz, 75Hz, or 85 Hz
	65,536	
	16,777,216	
1280x1024	256	60 Hz

**Note:** If you are using an old external monitor, the resolution and color depth might be limited.

## Using the Dual Display Function

Windows 98 supports a function named *Multiple Display Support*, and your computer supports a function named *dual display* in the Windows 98 environment. This function allows the Windows 98 desktop to display output on the LCD-CRT display pair. You can display different desktop images on each monitor.

## ***Attaching an External Monitor***

To enable dual display, do as follows:

1. Attach the computer to an external monitor (CRT).
2. Click **Start**.
3. Move the cursor to **Settings** and **Control Panel**; then click **Control Panel**.
4. Double-click **Display**.
5. Click the **Settings** tab.
6. Click **Advanced...**
7. Click the **NeoMagic** tab.
8. Select the **Set Dual Display** checkbox; then click **OK**.  
The "System settings change" window appears, to prompt you to restart the application.
9. Click **Yes** to restart the computer.
10. Open the "Display Properties" window again by double-clicking **Display** in the Control Panel.
11. Click the **Settings** tab.  
An image of two monitors assigned with numbers appears.
12. Click the **Monitor-2** icon (for the secondary display, the CRT).
13. Click **Yes** to enable monitor 2 (if disabled).
14. Click the **Monitor-1** icon (for the primary display, the LCD).
15. Select the color depth and the resolution of the primary display.
16. Click the **Monitor-2** icon (for the secondary display, the CRT).
17. Select the color depth and the resolution of the secondary display.
18. Set the relative position of each monitor by dragging its icon.  
**Note:** You can set the monitors in any relative position, but the icons must touch each other.
19. Click **OK** to apply the changes.

## Attaching an External Monitor

### *Disabling Dual Display*

1. Click **Start**.
2. Move the cursor to **Settings**; then click **Control Panel**.
3. Double-click **Display**.
4. Click the **Settings** tab.
5. Click the **Monitor-2** icon (for the secondary display, the CRT).
6. Clear the **Extend my Windows desktop onto this monitor** check box.

The secondary display (monitor 2) is disabled.

If you do not want to disable the dual display function entirely (because you might wish to use it later in this session, for example), just click **OK** and skip the remaining steps. Then you can enable the secondary display by clicking the display icon.

To disable the dual display function entirely (for better performance and to remove some limitations), continue the procedure as follows. (You can always reenable the function by following the procedures from step 12 on page 72.)

7. Click **Advanced...**
8. Select the **NeoMagic** tab.
9. Clear the **Set Dual Display** check box.
10. Click **OK**.

The "System settings change" window appears, to prompt you to restart the application.

11. Click **Yes** to restart the computer.

### *Considerations When Using Dual Display*

- The primary display is always the LCD of your computer, and the secondary display is a CRT.
- You can select up to 64K colors for your secondary display, the CRT.
- You cannot set the dual display if you specify the primary display (the LCD) to a 1024x768 resolution and 16M colors for color depth.

### ***Attaching an External Monitor***

- The following are the settings that are *not* supported:
- You can select a resolution up to 1024x768 for your secondary display.

<b>Primary (LCD)</b>	<b>Secondary (CRT)</b>
1280x1024, 256	1024x768, 64K
1024x768, 64K	1024x768, 64K
800x600, 16M	1024x768, 64K

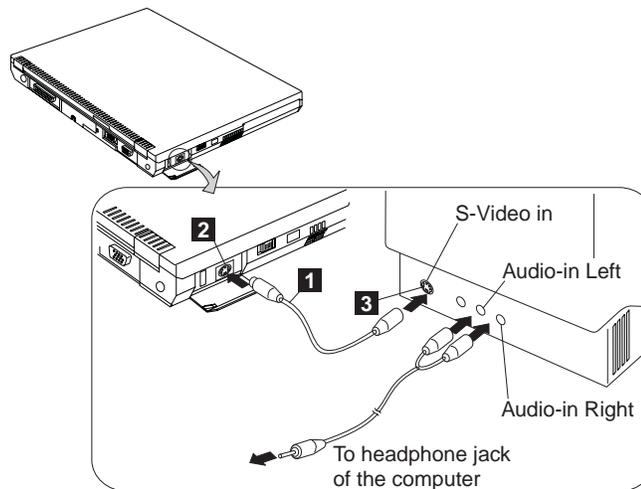
- If you want to show DOS full screen, both primary (LCD) and secondary (CRT) display in DOS full-screen mode.
- If you play a video clip (AVI or MPEG file) and move the cursor on the window, the cursor disappears under the image.
- An application using DirectDraw or Direct3D is shown only on the primary display (LCD) when it is played in full-screen mode.
- You cannot use the **Fn+F7** (display switching) function when you are in dual display mode.

## Attaching an External Monitor

# Attaching a Television to Your Computer

You can attach a television (NTSC or PAL) to your computer and display the computer screen on it. To display the computer screen on television, do the following:

1. Turn off the computer and television.
2. Connect an S-video in-out cable (1) to the S-video jack (2); then connect your television.



3. Start the ThinkPad Configuration program.
4. Click **Display**, then click **External Display**.
5. Click the **Settings** tab.
6. Click the **Advanced...** button.
7. Click the **NeoMagic** tab.
8. Enable **TV**.

You can set advanced options by clicking **Advanced Settings**.

9. Click **OK**.

## *Attaching a Television to Your Computer*

**Notes:**

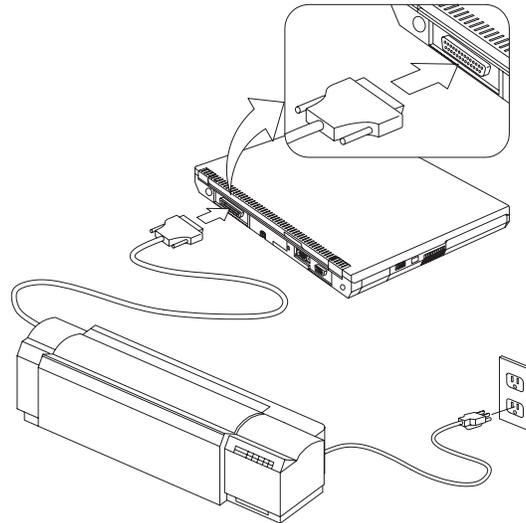
1. The S-video in-out cable (1) and audio in-out cable are not supplied with your computer; you must purchase them.
2. If your video equipment has only one audio-input connector, use the left-audio connector of the audio cable.

## *Attaching a Television to Your Computer*

## **Attaching a Printer**

Any parallel printer with the standard Centronics\*\* interface can be attached to the 25-pin, parallel connector at the rear of the computer.

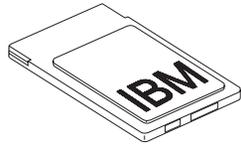
1. Attach the printer as shown.



2. Turn on the printer.

## Inserting a PC Card

This section describes how to prepare to use a PC Card.

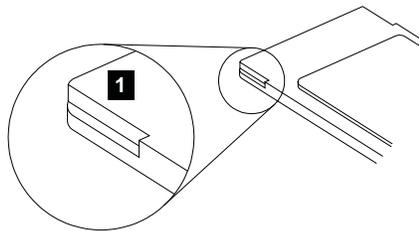


Your computer has two PC Card slots (upper slot and lower slot) and supports the following types of cards:

- PC Card (Type I, Type II, and Type III)
- CardBus
- Zoomed Video (ZV)

To install a PC Card in your computer, do the following:

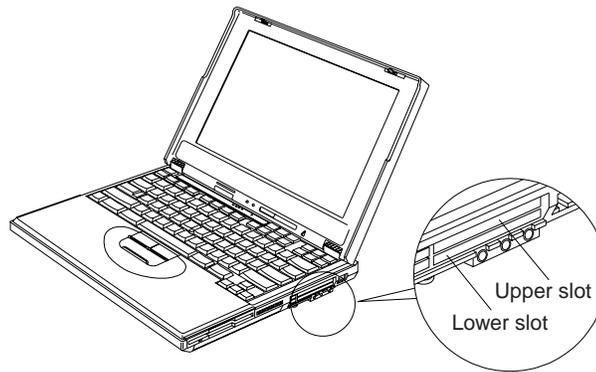
1. Find the notched edge (1) of the PC Card as shown.



2. Insert the PC Card into the appropriate slot according to your PC Card type.

- If you are using a PC Card with an XJACK\*\* connector, insert it into the upper slot.
- If you are using a Type I or Type II PC Card, insert it into either the upper slot or the lower slot.
- If you are using a Type III PC Card, insert it into the lower slot.

## Inserting a PC Card



**Note:** When an XJACK modem PC Card is in use, you might not be able to connect an external microphone to the microphone-in jack.

3. Press the PC Card firmly into the connector.

A window appears and informs you about the new card.

**Note:** If you have not installed the PC Card driver, Windows 98 starts "PCMCIA Card Services Wizard" to install it. Follow the instructions on the screen.

You have completed setting up the PC Card, and you can now use it. For more information on how to use the PC Card software, see the *Online User's Guide*.

## Removing the PC Card

Before removing a PC Card, **you must stop it**. Otherwise, the system might freeze or data might be corrupted or lost.

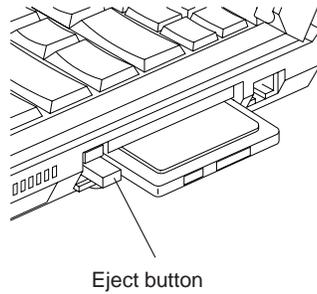
1. Stop the card.

To stop the PC Card, find the PC Card icon on the right side of the taskbar; then click the icon and click **Stop**. For more information, see the *Online User's Guide*.

**Note:** The **Stop** option appears in gray when you are in CardSoft mode or when the card is already stopped.

2. Press the PC Card eject button to pop out the button. Then press it again until the PC Card pops out.
3. Remove the PC Card and store it safely for future use.

## ***Inserting a PC Card***



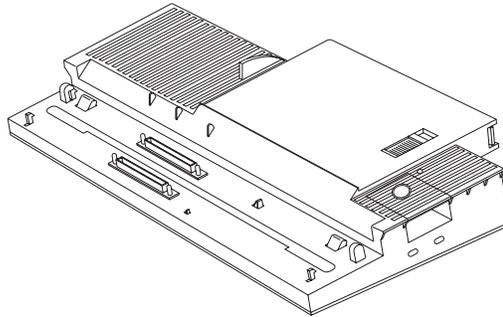
For more information for using a PC Card, see the *Online User's Guide*.

## Inserting a PC Card

## Using a Port Replicator

**Note:** See the user's guide shipped with the port replicator for instructions on how to attach or detach your computer.

After you attach your computer to a port replicator, all connectors on the rear of the computer are covered and are not available for use. Instead, you can use the connectors on the port replicator, plus extra features.



### ThinkPad Port Replicator with Advanced Etherjet Feature

#### Important

The port replicator works only with AC power. You cannot use the port replicator with battery power from the computer. Do not remove the AC Adapter while you are using the port replicator. Removing it during use might cause the computer to malfunction.

## Using a Port Replicator



You can dock or undock the computer **while the computer is in suspend mode (warm dock) or when the computer power is turned off**. For example, when undocking the computer, you have the following alternatives:

- Select **Eject PC** in the **Start** menu (suspend mode).

**or:**

- Press the **Eject Request** button of the port replicator (suspend mode).

**or:**

- Power off the computer and close the LCD.

**Note:** Warm dock is only available under the Windows 98 or Windows 95 OSR2 operating system.

**Do not dock or undock the computer when the computer is in hibernation mode.**



You can dock or undock the computer only **when the computer power is turned off**.

- Power off the computer and close the LCD.

**Note:** If the power-on indicator of the computer or the port replicator does not turn on, press **Fn**.

## Enabling the CardBus Sockets on the ThinkPad Port Replicator with Advanced Etherjet Feature (for Windows 98)

The ThinkPad Port Replicator with Advanced Etherjet Feature might not function properly if you attach a computer to it that is in suspend mode. In such a case, enable the CardBus sockets as follows:

1. Click **Start**.
2. Move the cursor to **Settings**, and then click **Control Panel**.
3. Double-click **System**.
4. Click **Device Manager** and double-click **PCMCIA socket**. If the CardBus sockets are not enabled, you see two CardBus controller lines (**Texas Instruments PCI-1250 CardBus Controller**,

## *Using a Port Replicator*

and **Texas Instruments PCI-1251B CardBus Controller**) with exclamation marks (!), under **PCMCIA socket**.

5. Click one of the lines; then click on the **Remove** button.
6. Click the other line; then click on the **Remove** button.
7. Click the **Refresh** button.

The CardBus sockets are now enabled.

## Protecting Your Computer

---

This chapter provides information about how to protect your computer from theft or unauthorized use.

Using Passwords . . . . .	86
Setting a Password . . . . .	88
Entering a Password . . . . .	90
Changing or Removing a Password . . . . .	91
Using Locks . . . . .	93
Using the Security Screw . . . . .	94

## Using Passwords

The password-setting feature helps to prevent your computer from being used by others. Once you set a password, a prompt appears on the screen each time you turn on the computer. You must enter your password at the prompt. You cannot use the computer unless you type the correct password. You can set the following passwords on your computer:

- Power-on password

Set the power-on password to protect your computer from use by another person. It provides the following security features:

- You need to type the power-on password at startup. Therefore, unauthorized users cannot use your computer.
- You need to type the power-on password when resuming from suspend and hibernation mode. Therefore, unauthorized users cannot use your computer.

- Hard disk password

The hard disk password provides an extra measure of security. Even if you set a power-on password, another user can remove the hard disk drive in your computer and put it in a different computer to access your data. If you set a hard disk password, however, another person cannot access the data on your hard disk without knowing the password. It provides the following features:

- You need to type the hard disk password at startup.
- If the hard disk drive is moved to another computer, the hard disk password must be typed at startup. Therefore, unauthorized users cannot access your hard disk even if the drive is removed from the computer.
- The hard disk password is required when the computer resumes from hibernation mode.

**Note:** The hard disk password might be disabled by your system administrator.

- Supervisor password

## ***Using Passwords***

The supervisor password is a tool provided for the system administrator to control many ThinkPad computers. The supervisor password is set by the system administrator and it is not required for users. Users can start the computer without providing the supervisor password. The supervisor password is required only to access the BIOS Setup Utility. It provides the following security features:

- Only a system administrator can access the BIOS Setup Utility. If a supervisor password is set, a password prompt appears if you try to start the BIOS Setup Utility.
  - The system administrator can use the supervisor password to access the computer even if you have set a power-on password. The supervisor password overrides the power-on password.
  - The supervisor password overwrites the hard disk password. The hard disk is protected by the supervisor password so that unauthorized users cannot access data on the hard disk. You will be unable to use your hard disk drive in a different computer that has its own supervisor password.
  - The system administrator can set the same supervisor password on many ThinkPad computers to make administration easier.
- Other password

Some Microsoft operating systems provide special Windows passwords. Refer to that system's user's guide for information on how to set, change, and use these passwords.

## Using Passwords

### Do Not Forget Your Password

If you forget your supervisor password, there is no way to reset your password. You have to take your computer to an IBM 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 hard disk password, you can no longer access the hard disk. The password cannot be reset and you will lose all data and files on the hard disk. Neither an IBM reseller nor IBM marketing representative can make the hard disk drive usable. To use the computer, you will need to replace the hard disk. This replacement will incur expenses for parts and labor.

## Setting a Password

To set a password, do the following:

1. Restart the computer.
2. Press **F1** to enter the BIOS Setup Utility.
3. Select **Password** and press **Enter**. The "Password" submenu appears:

## Using Passwords

IBM BIOS Setup Utility	
Password	Item Specific Help
Set Power-On Password [Enter] Set Hard Disk1 Password [Enter] Set Hard Disk2 Password [Enter] Set Supervisor Password [Enter]	
F1 Help ↑↓ Select Item Space/- Change Value F9 Setup Defaults F3/ESC Exit ↔ Select Menu Enter Select > Sub-Menu F10 Save and Exit	

- **Set Power-On Password** Selecting this displays a window for setting the power-on password.
  - **Set Hard Disk1 Password** Selecting this displays a window for setting the hard disk password.
  - **Set Hard Disk2 Password** Selecting this displays a window for setting the second hard disk password (enabled only when a second hard disk drive is installed in the UltraBay FX).
  - **Set Supervisor Password** Selecting this displays a window for setting the supervisor password.
4. Select the type of password you want to set, and press **Enter**. The "Set Password" window appears.
  5. Type your desired password and press **Enter**.

**Note:** You can type a maximum of seven random characters using a combination of letters (A to Z) and numbers (0 to 9). Uppercase and lowercase letters (for example, A and a) are treated as the same character.

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

## Using Passwords

6. Type your password again and press **Enter** to verify it.

**Note:** Write down the password and keep it in a safe place.

### Do Not Forget Your Password

If you forget your supervisor password, there is no way to reset your password. You have to take your computer to an IBM 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 hard disk password, you can no longer access the hard disk. The password cannot be reset and you will lose all data and files on the hard disk. Neither an IBM reseller nor IBM marketing representative can make the hard disk drive usable. To use the computer, you will need to replace the hard disk. This replacement will incur expenses for parts and labor.

## Entering a Password

Once you set a power-on password, a password prompt (  ) appears at the top left corner of the screen. Each time you turn on your computer or when your computer returns from hibernation mode to normal operation.

However, a password prompt is not displayed if the computer returns to normal operation by a preset timer or an incoming call on the modem, in which case you will have to display it by pressing a key or moving the pointing device.

To enter a password, do the following:

1. Type your password.

Don't hold down a key too long, because the same character will be entered continuously.

2. Press the **Enter** key.

An **OK** appears if you enter the correct password, and an **X** appears if you enter the wrong password. If you fail to enter the

correct password in three tries, you must turn off the computer, wait 5 seconds, and then turn it on again and retry.

## Changing or Removing a Password

This security feature prevents someone from removing a password and using your computer. To change or remove a password, do the following:

1. Save your work and shut down the computer.
2. Turn on the computer.
3. Press **F1** to enter the BIOS Setup Utility.
4. If the power-on password is set, the password prompt appears (  ).

**Note:** If both power-on and supervisor passwords are set, you can only change the power-on password (you cannot remove it) if you entered the BIOS Setup Utility with the power-on password. System administrators should enter the BIOS Setup Utility using the supervisor password if they wish to change the supervisor or hard disk passwords.

Enter the power-on or supervisor password.

5. If the hard disk password is set, the hard disk password prompt appears (  ).

Enter the hard disk password.

6. Select **Password** and press **Enter**. The "Password" submenu appears.
7. Select the type of password you want to change or remove, and press **Enter**. A window appears.
8. Type the current password and press **Enter**.
9. Type your desired new password and press **Enter**.

**Note:** If you want to remove the password, do not type anything. If you entered the BIOS Setup Utility using the power-on password, you cannot remove the password.

10. Type your new password again and press **Enter** to verify it.

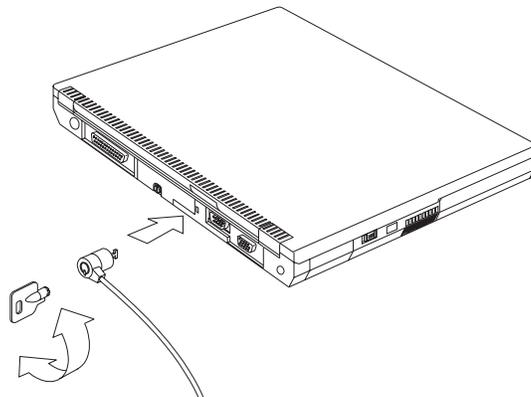
## *Using Passwords*

**Note:** Write down the password and keep it in a safe place.

## Using Locks

You can attach a mechanical lock to your computer, to help to prevent it from being removed without your permission.

Attach a mechanical lock to the keyhole (1) on the left side of the computer; then secure the chain on the lock to a secure stationary object.

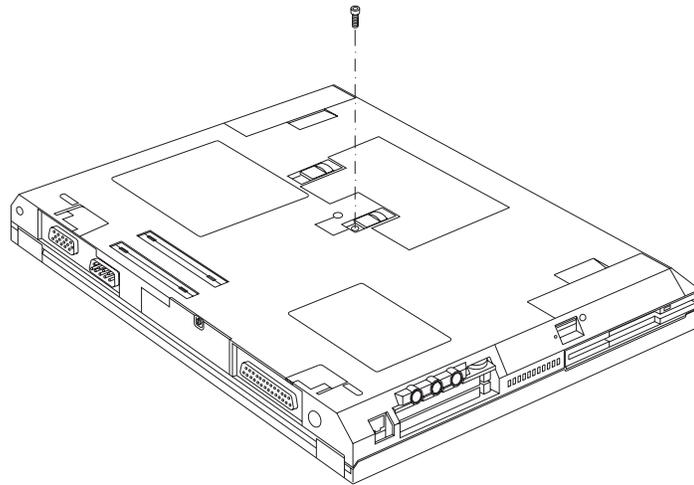


**Note:** Please carefully evaluate, select, and implement the locking devices and security features you intend to use. IBM makes no comments, judgements, or warranties about the function, quality, or performance of locking devices and security features.

## Using Locks

### Using the Security Screw

You can use the security screw shipped with your computer to prevent the devices in the UltraBay FX from being removed easily.



To secure the UltraBay FX with the security screw, do as follows:

1. Power off the computer; then disconnect the AC Adapter and all cables from the computer.
2. Turn the computer over.
3. Install the security screw and tighten it with a 2.5-mm allen wrench.
4. Turn the computer back to its original position.
5. Connect the AC Adapter; then power on the computer.

## Solving Computer Problems

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## Frequently Asked Questions

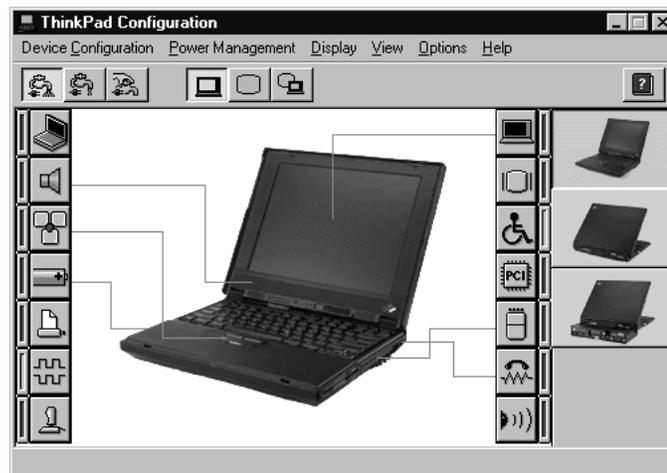
This section addresses frequently asked questions. Go to the page indicated in the following chart and do the specified action.

<b>Questions</b>	<b>Page</b>
How to stop the screen from blanking	97
How to set the infrared port	97
How to set the serial port	98
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How to set the display resolution	100
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How to use the Recovery CD	103
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To solve the problems discussed in this section, you need to use the ThinkPad Configuration program. To start the ThinkPad Configuration program, find the ThinkPad icon on the taskbar; then double-click on the icon.

The ThinkPad Configuration program window appears:

## Frequently Asked Questions



**Note:** You can also start the ThinkPad Configuration program as follows:

1. Click **Start**.
2. Move the cursor to **Programs, ThinkPad**; then click **ThinkPad Configuration**.

---

### **My screen keeps blanking when I do not want it to. How do I stop this?**

You can disable any system timers, such as the LCD turn off timer or the power management mode timers with the ThinkPad Configuration program.

1. Start the ThinkPad Configuration program.
2. Click the **Power Management** (  ) button.
3. Using the **Turn off monitor:** item in the Power Schemes tab, you can set longer timeout values for the display or you can disable it by setting it to **Never**.
4. Click **OK** to accept.

---

### **How do I use my infrared port as a communication port?**

---

## Frequently Asked Questions

---

You can disable your ThinkPad's infrared port in order to free resources for another communication device, such as the serial port. If the infrared port is disabled, you need to enable it before you use it again. To enable your infrared port, do as follows:

1. Save your work and quit any program you are using.
2. Start the ThinkPad Configuration program.
3. Click the **Infrared** (  ) button.
4. Click **Enable**.

A "Warning" might appear that the hardware resource is in use by another communication device.

5. Click **OK**. The computer restarts.

**Note:** If you check your infrared port and it is already enabled, you can use it immediately without changing any settings.

After your infrared port is enabled, you can use it as a communication port. If it does not work properly, you might have a problem with the communication software application on your system or the device that you are trying to communicate with. Check the online help system for your communication software if the other device appears to be working properly.

---

**How do I use my serial port as a communication port?**

---

## Frequently Asked Questions

---

You can disable your ThinkPad's serial port in order to free resources for another communication device, such as the infrared port. If the serial port is disabled, you need to enable it before you use it again. To enable your serial port, do as follows:

1. Save your work and quit any program you are using.
2. Start the ThinkPad Configuration program.
3. Click the **Serial Port** (  ) button.
4. Click **Enable**.

A "Warning" might appear that the hardware resource is in use by another communication device.

5. Click **OK**. The computer restarts.

**Note:** If you check your serial port and it is already enabled, you can use it immediately without changing any settings.

After your serial port is enabled, you can use it as a communication port. If it does not work properly, you might have a problem with the communication software application on your system or the device that you are trying to communicate with. Check the online help system for your communication software if the other device appears to be working properly.

---

**How can I use an external mouse when I am at my desk, but then use the TrackPoint when I am away from my desk?**

---

## Frequently Asked Questions

---

**For a PS/2 mouse:**

Connect the PS/2 mouse. The TrackPoint is automatically disabled. To use the TrackPoint again, disconnect the PS/2 mouse.

**For a serial mouse:**

To use a serial mouse, do as follows:

1. Save your work and quit any program you are using.
2. Connect the serial mouse.

**Note:** If you have not previously installed a serial mouse, you need to install the serial mouse device driver. See "Attaching an External Mouse or Numeric Keypad" on page 63 for instructions.

3. Restart the computer.

**For a USB mouse:**

To use a USB mouse, do as follows:

1. Save your work and quit any program you are using.
2. Connect the USB mouse.

**Note:** You can use the TrackPoint with the external serial or USB mouse simultaneously.

---

**Why do I not get the highest possible resolution out of my external monitor when I am using the LCD and external monitor at the same time?**

---

## Frequently Asked Questions

---

You can set any resolution for either the ThinkPad LCD or the external monitor. When you use both at the same time, the resolution of both is the same. If you set a higher resolution for the ThinkPad LCD, you can see only part of the screen at a time. You can see other parts by moving the image with the TrackPoint or other pointing device. You can change the display output type to the LCD, external monitor, or both with the **Display Device** buttons of the ThinkPad Configuration program or with **Fn+F7**.

You can set up the external monitor as follows:

1. Start the ThinkPad Configuration program.
2. Click the **External Display** ( ) button. The "Display Properties" window appears.
3. Click the **Settings** tab.
4. Click **Advanced...** button.
5. Click the **Monitor** tab.
6. Click the **Change** button.
7. Select the **Model** and **Manufacturer** of your monitor.
8. Click **OK**; then **Close**.
9. Set the **Colors** and **Screen area** in the "Display Properties" windows.
10. Click **OK**.

---

**How can I set up the external monitor if the Windows plug-and-play feature does not detect it?**

---

## Frequently Asked Questions

---

Do as follows:

1. Start the ThinkPad Configuration program.
2. Click the **External Display** () button. The "Display Properties" window appears.
3. Click the **Settings** tab.
4. Click **Advanced...** button.
5. Click the **Monitor** tab.
6. Make sure that **Automatically detect Plug & Play monitors.** is checked.
7. If the option is checked and your monitor is still not recognized after you restart the computer, click the **Change** button.
8. Select the **Model** and **Manufacturer** of your monitor.
9. Click **OK**; then **Close**.
10. If you are prompted to restart your computer, click **OK**.

---

### How do I maximize battery life?

To maximize battery life, do the following:

- Use the battery pack until the charge is completely depleted (until the battery status and power LEDs flash in unison).
  - Recharge the battery pack completely before using (the battery is fully charged when the AC Adapter is plugged in and the battery status LED is green).
  - For a new battery pack or a battery pack that you have not used recently:
    1. Use the battery pack until the charge is completely depleted (until the battery status and power LEDs flash in unison).
    2. Recharge the battery pack completely before using (the battery is fully charged when the AC Adapter is plugged in and the battery status LED is green).
    3. Repeat these steps three times.
  - Always use power management features such as Advanced Power Management (APM), power modes, standby, suspend, and hibernation.
  - For more detailed information about power management features, see the *Online User's Guide*.
-

## Frequently Asked Questions

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### How do I load a different operating system on my computer?

—Or—

### Where do I get the ThinkPad device drivers for this operating system?

See the *Online User's Guide* for information on installing a new operating system and device drivers. Before installing a new operating system, do the following:

- Print the software installation section of the *Online User's Guide*.
- **For Windows 98, Windows NT or Windows 95:** Use the ThinkPad Software Selections CD. Refer to "Using the ThinkPad Software Selections CD" on page 133.

**For DOS, OS/2 or Windows 3.11:** See the IBM Web site for more information. Refer to "Recovering Lost or Damaged Software" on page 132.

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### How do I use the Recovery CD to reload my factory-installed ThinkPad operating system and applications?

See "Using the Recovery CD" on page 134.

---

### How do I test/troubleshoot my ThinkPad factory-installed hardware if I suspect a failure?

See "Using the PC-Doctor Program" on page 132.

---

### How do I restart the computer if it locks, will not accept any input, or will not turn off using the power switch?

See "Other Problems" on page 130.

---

### How do I purchase accessories and upgrades for my ThinkPad computer?

Please visit our Web site at <http://www.ibm.com> and click on Shop IBM. Here you can find a variety of accessories and upgrades that can be purchased online to be used with your ThinkPad computer.

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### How do I arrange for service if I suspect my ThinkPad computer has a hardware problem?

If you suspect there may be a hardware problem with a factory-installed device on your ThinkPad computer, you can test that device by running diagnostics (see "Using the PC-Doctor Program" on page 132). If servicing the ThinkPad computer becomes necessary, this should be arranged by calling 1-800-772-2227 and speaking to a technical support representative who will make those arrangements for you.

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## Hints, Tips and Limitations

This section provides hints, tips, and limitations.



### For Windows 98 and Windows 95:

Hibernation is not supported if OS/2 Boot Manager is installed.

If you are using the Intel USB camera and the system resumes from suspend mode, the USB camera is disabled. To enable it, unplug it and plug it in again.

Your computer might not enter suspend mode or hibernation mode after the end of a timeout period that was specified in the ThinkPad Configuration program because of the CD-ROM drive property settings. If you want to use suspend mode and hibernation mode, change the properties of the CD-ROM drive as follows:

1. Click **Start**.
2. Move the cursor to **Settings** and click **Control Panel**.
3. Double-click **System**.
4. Click the **Device Manager** tab and double-click **CDROM**.
5. Click the CD-ROM drive name under **CDROM**; then click the **Properties** button.
6. Click **Settings** tab and remove the check mark from the **Auto insert notification** check box in **Option** by clicking on it.
7. Click **OK**, and restart the computer.

If you want to use the scrolling or magnifying glass functions of the TrackPoint, you need to disconnect any PS/2 mouse and enable the internal TrackPoint.



### For Windows NT:

Hibernation is not supported if OS/2 Boot Manager is installed.

Hibernation is not supported when the drive is formatted for NTFS.

## Hints, Tips and Limitations



### For OS/2 Warp:

Hibernation is not supported.

If you receive incoming faxes or mail under OS/2, you must set the modem settings in the fax application to one of the following:

- Hardware FIFO enabled
- Hardware Flow Control on
- UART 16550A modem

In OS/2 FaxWorks for example, select **Utilites, Settings, Modem Type**, and **H/W FIFO (16650A)**.

If you do not set your modem to one of these settings, you will not be able to receive an incoming fax.



### For DOS and Windows 3.11:

Hibernation is not supported if OS/2 Boot Manager is installed.

## Using a PC Card with the Port Replicator

In the Windows NT, Windows 3.11 or DOS environment, you need to install the PC Card support software after docking your computer to the port replicator. If you have already installed the PC Card support software, uninstall it and then reinstall it after you dock your computer to the replicator.

## Using the Network Feature in the Port Replicator

When you dock your computer to the ThinkPad Port Replicator with Advanced Etherjet Feature, do as follows:

1. Click **Start**.
2. Move the cursor to **Settings**; then click **Control Panel**.
3. Double-click **System**.
4. Click the **Device Manager** tab.
5. Expand the **Network adapters** item by clicking it.
6. Double-click the **Intel 8255X-based PCI Ethernet Adapter (10/100)** item.

## *Hints, Tips and Limitations*

7. Make sure the **Exists in all hardware profiles** item is unchecked.
8. Click **OK**.

**Note:** You only need to do this procedure once.

### **USB Connector Considerations**

If the computer does not recognize your USB device, unplug and plug in the USB device. If your computer is in standby mode, your system might not recognize USB devices when operation resumes. Resume operation first, then plug in the USB device.

### **Using a Second CardBus Card**

If a CardBus Card is already configured in your computer or in the port replicator, you must configure the second CardBus manually by using the Device Manager. To get to the Device Manager, double-click on the **System** icon in the Control Panel.

### **Using an External Condenser Microphone**

The microphone-in jack supports a self-battery-powered condenser microphone which might need a battery. See the instructions which come with the microphone.

## Troubleshooting Guide

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**If a beep sounds, a message appears, or a function-related problem occurs:**

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1. Find your symptom in the Troubleshooting Charts and try solving the problem. See "Troubleshooting Charts" on page 108.
  2. If you can't solve the problem, try using PC-Doctor to diagnose the problem. See "Using the PC-Doctor Program" on page 132.
  3. If you still can't solve the problem, note the error code and have the computer serviced. See "Getting Service" on page 137.
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**If you accidentally lose or damage software in your computer:**

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Recover it by using the ThinkPad Software Selections CD. See "Recovering Lost or Damaged Software" on page 132.

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## Troubleshooting Charts

If your computer has an error, it often displays a message or an error code, or a beep sounds when you power it on. Go through the charts and look for your problem. If you find the problem, go to the page indicated and do the specified action.

<b>Troubleshooting Chart</b>	<b>Page</b>
Error codes or screen messages	109
No error codes or screen messages	112
Input problems	113
Suspend or hibernation problems	115
LCD problems	117
Indicator problems	118
Battery problems	118
CD-ROM drive problems	119
Infrared communication problems	120
Audio or telephony problems	121
Universal serial bus (USB) problems	121
Modem problems	122
PC Card problems	123
Printer problems	124
External display problems	125
Port replicator problems	127
Other option problems	128
Software problems	129
Other problems	130

## Error Codes or Messages

The following table contains error codes or messages and specified action to take.

**Note:** In the charts, *x* or *n* can be any character.

Problem	Action
0200 (Failure Fixed Disk)	<p>Do the following:</p> <ol style="list-style-type: none"> <li>1. Turn off the computer.</li> <li>2. Remove, then re-install the hard disk drive securely. See the “Upgrading the Hard Disk Drive” on page 57.</li> <li>3. Turn on the computer.</li> </ol> <p>If you still have a problem, have the computer serviced.</p>
021x (Keyboard error)	<p>Make sure no object is placed on the keyboard or on the external keyboard, if you have one; also check for stuck keys. Power off the computer and power off all attached devices. Power on the computer first; then power on the attached devices.</p> <p>If you still have a problem, do the following:</p> <ul style="list-style-type: none"> <li>• If an external keyboard is connected, do the following: <ul style="list-style-type: none"> <li>– Turn off the computer and disconnect the external keyboard; then turn on the computer. Make sure that your keyboard operation is correct. If it is, have the external keyboard serviced. Otherwise, have the computer serviced.</li> <li>– Make sure that the external keyboard is connected to the correct connector if connected to computer using the keyboard/mouse cable.</li> </ul> </li> </ul>
023x (Memory error), 0281 (Memory size error)	<p>Verify that the DIMM option is correctly installed; otherwise, contact your IBM reseller or IBM marketing representative for a replacement. The computer may also need to be serviced.</p>
0250 (System battery is dead – Replace and run SETUP)	<p>The CMOS clock battery needs to be replaced. Have the computer serviced.</p>
0251 (System CMOS checksum bad – Default configuration used)	<p>The CMOS may have been corrupted or modified incorrectly. Enter the BIOS Setup Utility and load the default settings; then restart the computer. If you still have a problem, have the computer serviced.</p>

## Troubleshooting Charts

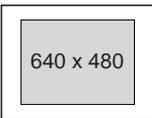
Problem	Action
0270 (Real time clock error)	There is an error with the Real-Time Clock. Have the computer serviced.
0271 (Check date and time settings)	The Real-Time Clock has been reset. Enter the BIOS Setup Utility to verify and set (if necessary) the date and time settings.
02Bx (Diskette drive error)	<p>Do as follows:</p> <ol style="list-style-type: none"> <li>1. Restart the computer.</li> <li>2. While the IBM ThinkPad logo is being displayed, press <b>F1</b> to enter the BIOS Setup Utility.</li> <li>3. Use the cursor up/down keys to select Config and press <b>Enter</b>.</li> <li>4. Select Advanced Setup and press <b>Enter</b>.</li> <li>5. Select Others and press <b>Enter</b>.</li> <li>6. Select FDD and verify that it is set to <b>Internal</b>.</li> <li>7. Press <b>F10</b> to save and exit the BIOS Setup Utility.</li> </ol> <p>If you still have a problem, have the computer serviced.</p>
02D0 (System cache error - Cache disabled)	Have the computer serviced.
I/O device IRQ conflict	There is an IRQ (interrupt request) conflict with I/O devices in your computer. See "Resolving System Resource Conflicts" in the <i>Online User's Guide</i> .
Failing Bits: nnnn	There are errors reported during the memory test. Note down the number and have the computer serviced. You may need to replace the DIMM.
Operating system not found	<p>An operating system cannot be found in the hard disk drive or diskette drive. Turn off the computer, then do as follows:</p> <ul style="list-style-type: none"> <li>• Verify that the hard disk drive (with an operating system) is correctly installed in the hard disk drive bay. Then turn on the computer.</li> <li>• Enter the BIOS Setup Utility and verify that the diskette drive is correctly identified. Then insert a diskette (with an operating system) into the diskette drive and turn on the computer.</li> </ul> <p><b>For Windows 98, 95 and NT users:</b> Use the Windows startup diskette to help diagnose the problem.</p> <p>If you still have a problem, have the computer serviced.</p>

## Troubleshooting Charts

Problem	Action
<p>ERROR EDO RAM exist, system halt! Non PC100 SDRAM exist, system halt!</p>	<ul style="list-style-type: none"> <li>• The computer does not support EDO RAM modules. Turn off the computer and replace the EDO RAM modules with the IBM DIMM option.</li> <li>• The computer does not support SDRAM that is not PC100 compatible. Turn off the computer and replace the memory module with IBM DIMM option.</li> </ul> <p>Contact your IBM Authorized Dealer or your IBM Marketing Representative to purchase the DIMM option.</p>
<p>Read Data Error from RFID EEPROM</p>	<p>The EEPROM which stores your computer's unique identification information has an error and needs to be replaced. Have the computer serviced.</p>
<p>The power-on password prompt (  )</p>	<p>A power-on password is set. Type the correct password and press <b>Enter</b> to use the computer (see "Entering a Password" on page 90).</p> <p>If you still have a problem, have the computer serviced.</p>
<p>The hard disk drive password prompt (  )</p>	<p>A hard disk drive password is set. Type the correct password and press <b>Enter</b> to use the computer (see "Entering a Password" on page 90).</p> <p><b>Attention:</b> If you forget your hard disk password, you can no longer access the hard disk. The password cannot be reset and you will lose all data and files on the hard disk. To use the computer, you will need to replace the hard disk. This replacement will incur expenses for parts and labor.</p> <p>If you still have a problem, have the computer serviced.</p>

## Troubleshooting Charts

### No Error Codes or Messages

Problem	Action
<p>The DOS full-screen looks smaller.</p> 	<p>When you use a DOS application that supports only the 640x480 resolution (VGA mode), the screen image might look slightly distorted or might appear smaller than the display size. This is to maintain compatibility with other DOS applications. To expand the screen image to the same size as the actual screen, start the ThinkPad Configuration program and click on <b>LCD</b> (  ); then select the <b>Screen expansion</b> function. (The image might look slightly distorted.)</p>
<p>The screen is blank and you don't hear any beeps.</p> <p><b>Note:</b> If you are not sure whether you hear any beeps, turn the computer off; then turn it on again, and listen again.</p> <p>If you are using an external monitor, go to "External Monitor Problems" on page 125.</p>	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The battery pack is installed correctly.</li> <li>• The AC Adapter is connected to the computer and the power cord is plugged into a working electrical outlet.</li> <li>• The computer power is on. (Turn on the power switch again for confirmation.)</li> </ul> <p>If a power-on password is set but does not appear, the brightness control might be set to minimum brightness. Adjust the brightness.</p> <p>If the screen still remains blank, have the computer serviced.</p>
<p>The screen is blank and you hear a continuous beep, or two or more beeps.</p>	<p>Have the computer serviced.</p>

## Input Problems

Problem	Action
The cursor does not move after the computer awakens from one of the power management modes.	If you connect an external PS/2 mouse, try using it. If you still have a problem, turn off your computer; then turn it on again.
All or some keys on the keyboard do not work.	<ul style="list-style-type: none"> <li>• If the problem occurred immediately after the computer returned from suspend mode, enter the power-on password if it set.</li> <li>• If an external keyboard is connected, the numeric keypad on your computer will not work. This is not a defect.</li> <li>• If an external numeric keypad or a mouse is connected:               <ol style="list-style-type: none"> <li>1. Turn off the computer.</li> <li>2. Remove the external numeric keypad or the mouse.</li> <li>3. Turn on the computer and try using the keyboard again.</li> </ol> </li> </ul> <p>If the keyboard problem is solved, check the connection of the external numeric keypad, external keyboard, or mouse.</p> <p>If you still have a problem, have the computer serviced.</p>
The cursor drifts when the computer is turned on or after it resumes normal operation.	<p>The cursor might drift when you are not using the TrackPoint during normal operation. This is a normal characteristic of the TrackPoint and is not a defect. Cursor drifting might occur for several seconds under the following conditions:</p> <ul style="list-style-type: none"> <li>• When the computer is turned on.</li> <li>• When the computer resumes normal operation.</li> <li>• When the TrackPoint is pressed for a long time.</li> <li>• When the temperature changes.</li> </ul>
The mouse or pointing device does not work.	<ul style="list-style-type: none"> <li>• Make sure that the pointing device is enabled in the ThinkPad Configuration program.</li> <li>• Make sure that the mouse or pointing-device cable is securely connected to the computer.</li> <li>• Try using the TrackPoint. If the TrackPoint works, the error might be due to the mouse.</li> <li>• Disable the TrackPoint using the ThinkPad Configuration program if you use an external mouse.</li> </ul> <p><b>Note:</b> See the manual supplied with the mouse for more information.</p>

## Troubleshooting Charts

Problem	Action
The mouse buttons do not work.	Reinstall the Standard PS/2 Port Mouse driver; then reinstall the PS/2 TrackPoint driver. See the online user's guide for instructions on how to install the driver.
The scrolling or Magnifying Glass function does not work.	See the General tab page in "Mouse Properties", and make sure that the PS/2 TrackPoint driver is loaded.
A number appears when you type a letter.	The numeric lock function is on. To disable it, press and hold <b>Shift</b> ; then press <b>NumLk</b> .
All or some keys on the external numeric keypad do not work.	Make sure that the external numeric keypad is correctly connected to the computer.
All or some keys on the external keyboard do not work.	<p>To use an external keyboard, you can attach it to the computer either directly or through the keyboard/mouse cable. Make sure that:</p> <ul style="list-style-type: none"><li>• The keyboard cable is correctly connected to the computer (if the keyboard is connected directly to the computer).</li><li>• The keyboard/mouse cable is correctly connected to the computer.</li><li>• The keyboard cable is connected to the correct side of the keyboard/mouse cable.</li></ul> <p>If these items are correct, disconnect the keyboard/mouse cable from the computer and make sure that the operation of the system keyboard is correct. If the system keyboard works, have the keyboard/mouse cable or the external keyboard serviced.</p>

## Suspend or Hibernation Problems

Problem	Action
The computer enters suspend mode automatically.	The computer enters suspend mode automatically when the processor temperature reaches a certain level. This is not a defect.
Performance degrade when the computer gets hot during use.	The processor speed might decrease under the following conditions: <ul style="list-style-type: none"> <li>• Use in a hot environment.</li> <li>• High-powered processing that requires high-power consumption.</li> </ul> This is not a defect.
The computer enters suspend mode immediately after POST (the suspend indicator is on).	Make sure that: <ul style="list-style-type: none"> <li>• The battery pack is charged.</li> <li>• The operating temperature is within the acceptable range. Refer to Appendix A, "Features and Specifications" on page 147.</li> </ul> If these items are correct, have the computer serviced.
The computer turns on and immediately turns off.	The battery pack power is getting low. Connect the AC Adapter to the computer, or replace the battery pack with a fully charged one.
The computer does not return from suspend mode, or the suspend lamp stays on and the computer does not work.	The computer automatically enters suspend or hibernation mode when the battery power is exhausted. Do one of the following: <ol style="list-style-type: none"> <li>1. Connect the AC Adapter to the computer.</li> <li>2. Replace the battery pack with a fully charged one; then press Fn.</li> </ol>
The LCD is blank after resuming.	Check if an external monitor was connected before the computer entered suspend mode. <b>Do not disconnect the external monitor while the computer is in suspend mode or hibernation mode. If no external monitor is attached when the computer resumes, the LCD remains blank and output is not displayed. This restriction does not depend on the resolution value.</b>
Your computer does not enter suspend or hibernation mode.	Check if the suspend or hibernation options are set. Make sure the hibernation function is created. (See "Creating the Hibernation Function" on page 55.)

## Troubleshooting Charts

Problem	Action
<p>The computer does not enter suspend mode as set by the timer under Windows 98, Windows 95 or Windows NT.</p>	<p><b>For Windows 98 and Windows 95:</b></p> <p>The Windows 98 and 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 your computer from entering suspend mode even after a timeout.</p> <p>To prevent this from occurring, do the following:</p> <ol style="list-style-type: none"> <li>1. Double-click <b>My Computer, Control Panel, and System</b>.</li> <li>2. Click the <b>Device Manager</b> tab.</li> <li>3. Click the + mark of <b>CDROM</b>.</li> <li>4. Double-click the CD-ROM drive name.</li> <li>5. Click <b>Settings</b> tab.</li> <li>6. Remove the check mark from the <b>Auto insert notification</b> check box.</li> <li>7. Click <b>OK</b>, and restart the computer.</li> </ol> <p>Windows 98 and Windows 95 no longer detects the CD-ROM insertion automatically.</p> <p><b>For Windows NT:</b></p> <p>The computer does not enter suspend mode by the timer if you enable the CD-ROM AutoRun feature. To enable the Suspend Timer function in the registry, do the following:</p> <pre>HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Cdrom\ Autorun: x1 Autorun:</pre>
<p>The computer does not enter hibernation mode with the <b>Fn+F12</b> key combination.</p>	<p>Make sure the hibernation function is created. (See "Creating the Hibernation Function" on page 55.)</p> <p>To enter hibernation mode, stop the communication program, and then remove the PC Card or turn off power to the PC Card slot using the <b>Control Panel</b>.</p>

## LCD Problems

Problem	Action
<p>The screen is unreadable or distorted.</p>	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The ThinkPad display driver is installed correctly.               <ol style="list-style-type: none"> <li>1. Click <b>Start</b> and move the cursor to <b>Settings</b>; then click <b>Control Panel</b>.</li> <li>2. Double-click <b>Display</b>.</li> <li>3. Select the <b>Settings</b> tab in the "Display Properties" window.</li> <li>4. (For Windows 98) Click <b>Advanced...</b>; then click the <b>Adapter</b> tab. (For Windows 95) Click <b>Advanced Properties</b>. The "Adapter/Driver Information" window appears. Make sure that the display driver information is correct.</li> </ol> </li> <li>• The refresh rate setting is set to your display resolution and color depth by doing the following:               <ol style="list-style-type: none"> <li>1. Start the ThinkPad Configuration program.</li> <li>2. Click <b>LCD</b> (  ).</li> <li>3. Click <b>Properties</b>.</li> <li>4. Make sure the settings in the "Display Properties" window are correct.</li> <li>5. Click <b>OK</b> to close the window.</li> </ol> </li> </ul>
<p>Incorrect characters appear on the screen.</p>	<p>Did you install the operating system or application program with the correct procedure? If they are installed and configured correctly, have the computer serviced.</p>
<p>The screen stays on even after you power off the computer.</p>	<p>Push and hold the power switch for about five seconds; then release it to turn off your computer. Turn it on again.</p>
<p>Missing, discolored, or bright dots appear on the screen everytime you power on your computer (TFT display model.)</p>	<p>This is a characteristic of TFT technology. Your computer display contains multiple thin-film transistors (TFTs). A small number of missing, discolored, or bright dots on the screen might exist all the time.</p>

## Troubleshooting Charts

### Indicator Problems

Problem	Action
The battery status indicator does not go on even though a battery pack is installed in the computer.	The over-current protection device inside the battery pack has been activated. Wait several hours and try again. If the indicator still does not go on, replace the battery pack or have the computer serviced.

### Battery Problems

Problem	Action
The battery pack cannot be fully charged in 3.5 hours by the power-off charging method.	The battery pack might be over-discharged. Do the following: <ol style="list-style-type: none"><li>1. Turn off the computer.</li><li>2. Make sure that the over-discharged battery pack is in the computer.</li><li>3. Connect the AC Adapter to the computer and let it charge.</li></ol> If the battery pack cannot be fully charged in 24 hours, use a new battery pack.
Your computer shuts down before the battery status indicator shows empty.  <b>-or-</b> Your computer operates after the battery status indicator shows empty.	Repeat discharging and charging the battery pack at least three times.
The computer does not operate with a fully charged battery pack.	The over-current protective function in the battery pack might be activated. Turn off the computer for 1 minute to reset this function; then turn it back on again.
The battery pack cannot be charged.	The battery pack might not be able to charge when it is hot. In this case, remove it from the computer and leave it at room temperature for a while. After it cools down, reinstall it and recharge it. If it still cannot be charged, have it serviced.

## CD-ROM Problems

<b>Problem</b>	<b>Action</b>
The CD-ROM does not work.	Make sure that: <ul style="list-style-type: none"><li>• The computer power is turned on and a compact disc is in the CD-ROM drive.</li><li>• The CD-ROM drive tray is firmly closed.</li><li>• The device drivers are correctly installed.</li></ul>
You hear a noise from the CD-ROM drive when the disc is spinning.	The CD-ROM drive cover might be bent. Have the computer serviced.
The CD-ROM tray does not open even if you press the CD-ROM eject button.	Insert a pin into the CD-ROM emergency eject hole and eject the CD-ROM.
The compact disc cannot be read.	Make sure that: <ul style="list-style-type: none"><li>• The compact disc is not dirty. If it is, clean it with a CD-ROM cleaner kit.</li><li>• The compact disc is not defective. If it is, try another compact disc.</li><li>• The compact disc is placed in the tray with the label side up.</li><li>• The compact disc format conforms with one of the following:<ul style="list-style-type: none"><li>– Music CD</li><li>– CD-ROM or CD-ROM XA</li><li>– Multisession photo CD</li><li>– Video CD</li></ul></li></ul>

## Troubleshooting Charts

### Infrared Communication Problems

Problem	Action
You computer cannot communicate with other devices using the infrared port.	<p>Make sure that:</p> <ul style="list-style-type: none"><li>• The communication speeds are the same.</li><li>• The infrared ports are clean.</li><li>• No objects are between the computer and the communicating device.</li><li>• The distance and angle between your computer and the device is within the set range.</li><li>• The infrared ports are enabled.</li><li>• The other computer's infrared port complies to the same standard as yours.</li><li>• You are not operating under direct sunlight.</li><li>• The infrared ports are directly facing each other.</li></ul> <p>Communication can be affected by the light from the display on the computer. To avoid this, open the display to a wide angle.</p> <p>The same communications application has to be running on your computer and the other computer. Refer to the application manuals for more information.</p>
Incorrect data is sent between your computer and a communicating device.	<p>Make sure that:</p> <ul style="list-style-type: none"><li>• The distance and angle between your computer and the device is within the set range.</li><li>• The communication speeds are the same.</li><li>• There are no other devices that radiate infrared rays, such as remote-controlled devices or wireless headphones, near your computer or the communicating device.</li><li>• You are not operating under direct sunlight.</li><li>• No fluorescent lamps are near your computer or the communicating device.</li></ul>

## Audio Problems

Problem	Action
General problems.	<p>Problems may be due to such factors as:</p> <ul style="list-style-type: none"> <li>• The audio volume control is not adjusted to the desired level.</li> <li>• The audio volume in Windows is muted or not adjusted to the desired level.</li> <li>• The audio cable configuration is not correct for your application.</li> <li>• The audio is disabled.</li> <li>• The audio cable is defective.</li> <li>• The audio equipment is defective.</li> </ul>

## Universal Serial Bus (USB) Problems

Problem	Action
A device connected to the USB connector does not work.	<ol style="list-style-type: none"> <li>1. Make sure that the USB device is connected correctly.</li> <li>2. Open the "Device Manager" window, and make sure that the USB device setup is correct, and that computer resource assignment and device driver installation are correct.</li> </ol> <p><b>Note:</b> To open the "Device Manager" window, click <b>Start</b> and move the cursor to <b>Settings</b> and click <b>Control Panel</b>. Double-click <b>System</b>; then click the <b>Device Manager</b> tab in the "System Properties" window.</p>
The computer does not recognize your USB device.	<p>Unplug and plug in the USB device.</p> <p><b>Note:</b> If your computer is in standby mode, your system might not recognize USB devices when operation resumes. Resume operation first, then plug in the USB device.</p>

## Modem Problems

Problem	Action
<p>Your modem application does not work with the ThinkPad modem.</p>	<p>Make sure that the internal modem port is enabled by opening the "Device Manager" window and running the Modem Wizard or by opening the ThinkPad Configuration program and doing as follows:</p> <ol style="list-style-type: none"> <li>1. Start the ThinkPad Configuration program.</li> <li>2. Click on <b>Internal Modem</b> (  ).</li> <li>3. Select <b>Enable</b>.</li> <li>4. Click on <b>OK</b>.</li> </ol> <p><b>For Windows 98 and Windows 95:</b></p> <p>If the modem does not work correctly, see the Online User's Guide and correct the resource conflict. If the modem works correctly, set the following modem settings by doing the following:</p> <ol style="list-style-type: none"> <li>1. Double-click <b>My Computer</b>, <b>Control Panel</b>, and <b>Modem</b>. The <b>Lucent Win Modem</b> is highlighted.</li> <li>2. Click <b>Properties</b>, <i>not</i> <b>Dialing Properties</b>.</li> <li>3. Click the <b>Connection</b> tab.</li> <li>4. If there is a check mark (✓) in the <b>Wait for dial tone before dialing</b> box, click and remove it.</li> <li>5. Click on <b>Advanced</b>.</li> <li>6. If there is a check mark (✓) in the <b>Use error control</b> box, click and remove it.</li> <li>7. Add a check mark (✓) to the <b>Use flow control</b> box by clicking the box and make sure that <b>Hardware (RTS/CTS)</b> is selected.</li> <li>8. Click <b>OK</b> to close the window.</li> <li>9. Click <b>OK</b> and return to the "Modem Properties" window.</li> <li>10. Click <b>Dialing Properties</b> and fill in all boxes and click on either <b>Tone dialing</b> or <b>Pulse dialing</b>.</li> </ol> <p><b>Note:</b> Most telephones today use tone dialing, where each button produces a different tone, instead of pulse dialing.</p> <ol style="list-style-type: none"> <li>11. Click <b>OK</b>.</li> <li>12. Click <b>Close</b> to close the window.</li> <li>13. Close all active windows.</li> </ol> <p>Run your modem application again.</p>

## Troubleshooting Charts

Problem	Action
The internal modem does not work when you start your computer from an operating system other than Windows 98 or Windows 95.	<p>The operating system might be sharing the same IRQ levels as your modem. The ThinkPad modem software might not work under these conditions. You must cancel the IRQ shared condition to use the modem.</p> <p>To cancel the IRQ shared condition, see the <i>Online User's Guide</i>.</p>

## PC Card Problems

Problem	Action
The PC Card shows "Ready", but it does not work correctly.	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The system resources reserved for the PC Card do not conflict with other system devices.</li> <li>• Refer to "Resolving System Resource Conflicts" in the Online User's Guide.</li> <li>• The resources reserved for the PC Card match the settings in the application program.</li> <li>• If you are using a network card, check the I/O port address, IRQ level, and memory window address.</li> </ul>
A system resource conflict occurred when a PC Card was used.	See "Resolving System Resource Conflicts" in the <i>Online User's Guide</i> .
The system cannot start from the PC Card.	Make sure that the correct system resources are being used for the PC Card.
You 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 the "Virtual Card Services" section in the <i>Online User's Guide</i> for setting the VDM and the sample configuration files on the PCMCIA Installation Diskette for OS/2.</p> <p>If the PCMCIA Installation Diskette for OS/2 did not come with the computer, go to the IBM Web site to get the drivers. Refer to "Recovering Lost or Damaged Software" on page 132.</p>

## Troubleshooting Charts

Problem	Action
PC Card support software does not recognize your PC Card.	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• If the PC Card is not a modem, an ATA, a Flash, or an SRAM card, you have the proper client device driver for the card. In Windows 98 and Windows 95, the PC Card must have an INF file associated with it.</li> <li>• Your PC Card supports PCMCIA Release 2.0, 2.01, and 2.10. Refer to the manual that came with your PC Card. If your PC Card does not support those releases of PCMCIA, you cannot use the PC Card support software. Contact your PC Card supplier.</li> <li>• Your PC Card is working by following the diagnostic instructions for your PC Card, if any.</li> </ul>
The PC Card is recognized by PC Card support software, but the "Not Ready" or "Not Configured" message is shown.	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• If the PC Card is not a modem, an ATA, a Flash, or an SRAM card, you have the proper client device driver for the card. In Windows 98 and Windows 95, the PC Card must have an INF file associated with it.</li> <li>• The resources for the PC Card are correctly reserved. Refer to "Resolving System Resource Conflicts" in the <i>Online User's Guide</i>.</li> </ul>

## Printer Problems

Problem	Action
The printer does not work.	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The parallel port is enabled. <ol style="list-style-type: none"> <li>1. Start the ThinkPad Configuration program.</li> <li>2. Click <b>Parallel Port</b> (  ).</li> <li>3. Select <b>Enable</b>.</li> <li>4. Click <b>OK</b>.</li> </ol> </li> <li>• The printer is turned on and ready to print.</li> <li>• The printer signal cable is connected to the correct connector of your computer.</li> </ul> <p>If these 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>

## External Monitor Problems

Problem	Action
<p>The external monitor is blank.</p>	<p>Do the following:</p> <ol style="list-style-type: none"> <li>1. Connect the external monitor to another computer and make sure it works.</li> <li>2. Reconnect the external monitor to your computer.</li> <li>3. Start the ThinkPad Configuration program.</li> <li>4. Click <b>External Display</b> (  ) or <b>LCD + External Display</b> (  ) on the toolbar in the ThinkPad Configuration program.</li> </ol> <p>If nothing appears on the external monitor, have the computer serviced.</p>
<p>You cannot set a higher resolution than the present one on your external monitor.</p>	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The ThinkPad display driver is installed correctly. <ol style="list-style-type: none"> <li>1. Click <b>Start</b> and move the cursor to <b>Settings</b>; then click <b>Control Panel</b>.</li> <li>2. Double-click <b>Display</b>.</li> <li>3. Select the <b>Settings</b> tab in the "Display Properties" window.</li> <li>4. (For Windows 98) Click <b>Advanced...</b>; then click the <b>Adapter</b> tab. (For Windows 95) Click <b>Advanced Properties</b>. The "Adapter/Driver Information" window appears. Make sure that the ThinkPad display driver is installed.</li> </ol> <p>If you are not sure that the ThinkPad display driver is installed correctly, reinstall it.</p> </li> <li>• An appropriate display type or refresh rate is selected. <ol style="list-style-type: none"> <li>1. Start the ThinkPad Configuration program.</li> <li>2. Click <b>LCD</b> (  ).</li> <li>3. Click <b>Properties</b>.</li> <li>4. Make sure the settings in the "Display Properties" window are correct.</li> <li>5. Click <b>OK</b> to close the window.</li> </ol> </li> </ul>

## Troubleshooting Charts

Problem	Action
<p>The screen is unreadable or distorted.</p>	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The ThinkPad display driver is installed correctly.               <ol style="list-style-type: none"> <li>1. Click <b>Start</b> and move the cursor to <b>Settings</b>; then click <b>Control Panel</b>.</li> <li>2. Double-click <b>Display</b>.</li> <li>3. Select the <b>Settings</b> tab in the "Display Properties" window.</li> <li>4. (For Windows 98) Click <b>Advanced...</b>; then click on the <b>Adapter</b> tab. (For Windows 95) Click <b>Advanced Properties</b>. The "Adapter/Driver Information" window appears. Make sure that the ThinkPad display driver is installed.</li> </ol> <p>If you are not sure that the ThinkPad display driver is installed correctly, reinstall it.</p> </li> <li>• The display is set correctly.               <ol style="list-style-type: none"> <li>1. Start the ThinkPad Configuration program.</li> <li>2. Click <b>LCD</b> (  ).</li> <li>3. Click <b>Properties</b>.</li> <li>4. Make sure the settings in the "Display Properties" window are correct.</li> <li>5. Click <b>OK</b> to close the window.</li> </ol> <p>If the settings are correct, run the tests described in the manual supplied with the external monitor. If the tests show that the external monitor is OK, have the computer serviced.</p> </li> </ul>
<p>Wrong characters appear on the screen.</p>	<p>Did you install the operating system or application program with the correct procedure?</p> <p>If you did, have the external monitor serviced.</p>

## Port Replicator Problems

Problem	Action
The computer hangs when you power on or resume operation.	<p>Make sure that the computer is securely attached to the port replicator.</p> <p>If there is still a problem, have the port replicator serviced.</p>
The joystick port of the port replicator does not work.	<p>To enable the joystick port of the port replicator, use the ThinkPad Configuration program. Make sure that the joystick port is enabled by doing the following:</p> <ol style="list-style-type: none"> <li>1. Start the ThinkPad Configuration program.</li> <li>2. Click <b>Joystick Port</b> (  ).</li> <li>3. Select <b>Enable</b>.</li> <li>4. Click <b>OK</b>.</li> <li>5. Close the ThinkPad Configuration program and restart the computer.</li> </ol> <p><b>Note:</b> When you restart the computer, you might need to install the joystick driver. Follow the instructions on the screen and install the device driver for your computer's operating system.</p>

## Troubleshooting Charts

### Other Option Problems

Problem	Action
An IBM option that you just installed does not work.	<p>Make sure that:</p> <ul style="list-style-type: none"><li>• The option is designed for your computer.</li><li>• The option was installed following the instructions supplied with the option or this book.</li><li>• Other installed options or cables are not loose.</li><li>• There is no I/O address or interrupt level (IRQ) DMA channel conflict. To see the system resource status, start the ThinkPad Configuration program and click on the respective device buttons.</li></ul> <p>If the test program for the option did not find the problem, have the computer and option serviced.</p>
An IBM option that used to work no longer works.	<p>Make sure that:</p> <ul style="list-style-type: none"><li>• The option is securely connected to your computer.</li><li>• If the option came with its own test instructions, use those instructions to test the option.</li><li>• There is no system resource conflict (see "Resolving System Resource Conflicts" in the Online User's Guide).</li></ul> <p>If these items are correct and the test program did not find the problem, have the computer and the option serviced.</p>
The serial port does not work.	<p>Make sure that the serial port is enabled by doing the following:</p> <p><b>For Windows 98 and Windows 95:</b></p> <ol style="list-style-type: none"><li>1. Start the ThinkPad Configuration program.</li><li>2. Click <b>Serial Port</b> (  ).</li><li>3. Select <b>Enable</b>.</li><li>4. Click <b>Device Manager</b>.</li><li>5. Set up the port in the "Device Manager" window.</li><li>6. Click <b>OK</b>.</li></ol>

## Software Problems

Problem	Action
<p>An application does not run correctly.</p>	<p>Check the following to make sure that the problem is not being caused by the application:</p> <ul style="list-style-type: none"> <li>• Your computer has the minimum required memory to run the application. Refer to the manuals supplied with the application.</li> <li>• The application is designed to operate with your operating system.</li> <li>• Other applications run correctly on your computer.</li> <li>• The necessary device drivers are installed. See the <i>Online User's Guide</i></li> <li>• The application works OK when it is run on some other computer.</li> </ul> <p>If an error message appears when you are using the application program, refer to the manuals supplied with the application. If these items are correct and you still have a problem, contact your place of purchase or the service representative for help.</p>
<p>The Windows Safe Mode screen appears.</p>	<p>Your computer may not have shutdown properly the last time. In Safe Mode, shutdown and restart your computer.</p> <p>If you still have a problem, contact your place of purchase or the service representative for help.</p>
<p>You cannot install OS/2 Warp</p>	<p>See the <i>Online User's Guide</i>.</p>

## Troubleshooting Charts

### Other Problems

Problem	Action
The computer locks or does not accept any input.	<ul style="list-style-type: none"><li>• Your computer might lock when it enters suspend mode during a communication operation. Disable the Suspend Timer when you are working on the network.</li><li>• When you turn on the computer with OS/2 Warp installed, make sure no compact disc (CD) is in the CD-ROM drive. If there is, remove the CD, turn off the computer, and turn it on again.</li><li>• To turn off the computer, push and hold the power switch for about five seconds, then release it.</li></ul>
The computer does not turn off with the power switch.	<p>If the suspend indicator is on and you are working under battery power, change the battery to a fully charged one or change your power source to ac power.</p> <p>If you still have a problem, push and hold the power switch for about five seconds, then release it to turn off the computer. Restart the computer.</p> <p>If the computer still does not turn off, remove all power sources (battery pack and AC Adapter) from the computer; then reinstall the power sources and restart the computer.</p>
The computer does not start from a diskette.	Make sure that the startup sequence in the BIOS Setup Utility is set so that the computer starts up from the diskette drive (see "Startup" on page 29).
Performance degrades when the computer gets hot during use.	<p>The processor speed might decrease under the following conditions:</p> <ul style="list-style-type: none"><li>• Use in a hot environment</li><li>• High-powered processing that requires high-power consumption</li></ul> <p>This is not a defect.</p>

## Troubleshooting Charts

Problem	Action
A memory shortage or memory error occurs.	<ul style="list-style-type: none"><li>• If you are using DOS:<ol style="list-style-type: none"><li>1. Use the DOS command MEM /C to review your DOS memory usage occasionally.</li><li>2. Unload any unnecessary drivers from the CONFIG.SYS file. (For example, unload printer drivers if you do not use a printer.)</li><li>3. Reconfigure the UMB (upper memory block) using the DEVICEHIGH statement.</li><li>4. Use the multiple configuration setup for DOS (refer to the documents supplied with DOS).</li></ol></li><li>• If you are using Windows 3.11:<ol style="list-style-type: none"><li>1. Try the same actions as described for DOS.</li><li>2. Unload any unnecessary programs from the WIN.INI file.</li></ol></li></ul>

## Troubleshooting Charts

### Recovering Lost or Damaged Software

This section describes how to recover lost or damaged software. The following table shows what is needed to recover your system.

Problem	Tools Provided	For More Information
Windows 98, Windows 95 and Windows NT		
You need to diagnose your computer.	Use the PC-Doctor program.	See "Using the PC-Doctor Program" for general information.
You need to recover a lost or damaged device driver.	Use the ThinkPad Software Selections CD.	See "Using the ThinkPad Software Selections CD" on page 133 for general information. The CD-ROM also contains online help for detailed instructions.
You need to recover (reinstall) a lost or damaged software application.	Use the ThinkPad Software Selections CD.	See "Using the ThinkPad Software Selections CD" on page 133 for general information. The CD-ROM also contains online help for detailed instructions.
You need to recover your entire hard disk.	Use the Recovery CD (Windows 98 and Windows 95 only).	See "Using the Recovery CD" on page 134 for general information.
OS/2, Windows 3.11 or DOS users		
You need to recover a lost or damaged device driver.	Go to the ThinkPad Web site to download the latest hardware device driver diskettes; then install them.	See the web site for general information.

### Using the PC-Doctor Program

The PC-Doctor program allows you to run diagnostics tests on your computer. You have the option to run test sets, or individual tests. To run PC-Doctor, do as follows:

1. Click **Start**.
2. Move the cursor to **Programs, PC-Doctor**; then click **PC-Doctor for Windows**.
3. Follow the instructions on the screen.

## Using the ThinkPad Software Selections CD

The ThinkPad Software Selections CD is provided for your installation convenience. If you need to reinstall a software application or a hardware device driver, put the ThinkPad Software Selections CD in your CD-ROM or DVD-ROM drive. The menu of the features appears automatically.

Your ThinkPad Software Selections CD contains telephone numbers for some software vendors. These vendors can help you with questions about their software. See the CD for details.

The following features are included:

- **Welcome**

This main page describes the Software Selections CD and its features.

- **Install Software**

Use this page to do the following:

- Reinstalling a software application
- Reinstalling hardware device drivers

- **Uninstall Software**

Use this page to remove software installed on your computer.

- **Advanced Functions**

Use this page to do the following:

- Change language and location settings for the ThinkPad Software Selections program.
- Create a Software Selections CD image on your computer.

- **Read the License Agreement**

This page contains the license agreement for using the ThinkPad Software Selections CD.

- **Help**

Use this page to learn how to use the ThinkPad Software Selections program.

## *Recovering Lost or Damaged Software*

### **Using the Recovery CD**

You can restore the contents of your hard disk to what it was at the time of purchase.

**Attention:** The Recovery program erases your entire hard disk, including the operating system, software, and personal data. It then restores your operating system and hard disk to its factory-shipped configuration.

The Recovery CD consists of the original preinstalled software and device drivers.

The recovery process might take up to 2 hours.

Your computer supports startable CDs. To use the Recovery CD, do as follows:

**Note:** Make sure the UltraBay FX has the CD-ROM/diskette drive device (or DVD-ROM/diskette drive device) installed.

1. Insert the Recovery CD into the CD-ROM or DVD-ROM drive.
2. Power off the computer; then turn on the computer.

**Note:** Make sure that the boot priority for CD-ROM is higher than the hard disk drive. See "Startup" on page 29.

3. Follow the instructions on the screen.
4. When a completion message appears, remove the Recovery CD from the CD-ROM or DVD-ROM drive.
5. Restart the computer.

The computer restarts with the preinstalled configuration.

### **ThinkPad Web Site or Bulletin Board**

IBM supplies all of the latest hardware device drivers and system BIOS for your computer on the ThinkPad Web site at:

**<http://www.pc.ibm.com/support>**

You can also use the IBM bulletin board service.

### ***Recovering Lost or Damaged Software***

For more information about online support services, see “Online Support Services” on page 140.



## Getting Service

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### Preparations

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

You will need to know the following information when requesting repair service:

- Identification number of your computer
- Options installed in your system

**Note:** Use the record sheet on "Option List" on page 138.

- Error message or problem

**Note:** Error messages can help identify which service action is required and help the service representative provide quick and efficient service.

Use the record sheet on "Problem Recording Sheet" on page 139.

### About Your Warranty

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

For full information on product warranties, see Appendix B, "Product Warranties and Notices" on page 155.

For your convenience, write the service phone numbers here:

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*Information on Your Computer*

## Information on Your Computer

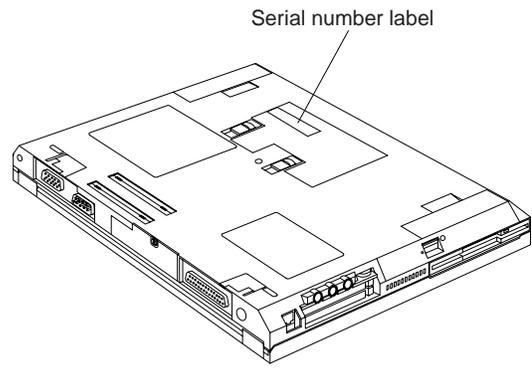
### Option List

- DIMM  
    \_\_\_\_ MB  
    \_\_\_\_ MB
- \_\_\_\_ GB Hard Disk Drive
- UltraBay FX Devices  
    \_\_\_\_\_  
    \_\_\_\_\_
- PC Cards  
    \_\_\_\_\_  
    \_\_\_\_\_
- Battery Pack

### Identification Numbers

The serial number label is on the bottom of your computer. Write down the machine type and serial number (S/N) in the following box.

IBM Product Name	ThinkPad 390X
Machine Type	2626-_____
Serial Number	_____



## **Problem Recording Sheet**

- Computer information:

Machine type: \_\_\_\_\_

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

Date of purchase: \_\_\_/\_\_\_/\_\_\_

- Type of problem:

Continuous problem

Intermittent problem

- Error code:

- The operating system and its version number, if available:

OS/2 Version \_\_\_\_\_

DOS Version \_\_\_\_\_

Windows 98 Version \_\_\_\_\_

Windows 95 Version \_\_\_\_\_

Windows NT Version \_\_\_\_\_

Windows 3.1 Version \_\_\_\_\_

- Application programs running at the time of the problem:

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- Problem symptom:

Describe the problem more specifically:

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- Can the problem be reproduced?

Yes

No

If yes, describe how it can be reproduced:

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## **Customer Support and Service**

Purchasing an IBM PC hardware product entitles you to receive support and services during the limited warranty period. If you need additional support and services, a wide variety of extended solutions that addresses most needs are available for purchase.

### **Online Support Services**

You can contact us on the Internet for answers to your technical support questions. If you link to our support home page, you can search for technical tips, download update drivers, and find out about many other things. You can visit the site at the following URL:

**<http://www.pc.ibm.com/thinkpad>**

Personalized web-based site PC support provides PC users easy access to online support, including personalized IBM website tailored to their machine type, computing environment, and individual interests such as business applications or games. Customers profile once with IBM and are thereafter greeted by name and presented targeted information selected specifically to meet their particular needs. For example, a corporate ThinkPad user might receive information on Microsoft Windows NT and remote connectivity. IBM customers can also elect to receive proactive e-mail, alerting them to time-saving hints and tips and product-specific update such as modem speed and BIOS files. Interactive web-based forums are monitored around the clock by IBM specialists, complementing its support on all the major internet service providers. You can set up your profile at:

**<http://www.pc.ibm.com/support>**

### **Fax Information**

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

## ***Customer Support and Service***

To access the IBM PC Company Automated Fax System, call:

- In the U.S., 1-800-426-3395.
- In Canada, 1-800-465-3299.

### **Help by Telephone**

You can get support and information by telephone during the limited warranty period at no additional charge, through the IBM PC Support Line. Experienced technical-support representatives will be on hand to assist you in answering any questions you might have, such as:

- How to set up your computer
- How to install and set up your IBM options purchased directly from IBM or through an IBM reseller
- How to use the 30-day support for the preloaded operating system
- How to get service

Please have the following information ready when you call:

- Serial number of your computer and proof of purchase
- Description of the problem
- Exact wording of the error message
- Hardware and software configuration information for your system

Before you call, run PC-Doctor diagnostics to help identify the cause of your computer problem. See "Using the PC-Doctor Program" on page 132 for more information about PC-Doctor.

If possible, be at your computer when you call.

- In the U.S. and Puerto Rico, call 1-800-772-2227.
- In Canada, call 1-800-565-3344.

These lines are available 24 hours a day, 7 days a week. The answering technical-support representative can also fax or mail you technical or product information, such as:

- Sales information

## ***Customer Support and Service***

- Product brochures
- Locations of IBM resellers
- Services available from IBM

### **EasyServ**

ThinkPad EasyServ is a courier repair service for IBM mobile products whereby your ThinkPad computer will be picked up, sent to IBM for repair, and then returned to the location of your choice. This service is available at no additional charge during the limited warranty period. Most computers can be repaired the day that it arrives at the IBM repair location.

Support personnel first try to solve your problem over the phone. If they are unsuccessful, you can arrange for EasyServ service by calling the PC Support Line.

If possible, you should use the original ThinkPad shipping materials that your computer came in, for re-sending it to IBM. If the box is not available, the courier will deliver a shipping carton and will return later to pick it up. This service is available only in the U.S. and Canada.

### **Getting Help Around the World**

If you make frequent overseas trips or you are residing abroad, you can register with the International Warranty Service Office. The office will issue an International Warranty Service Certificate, which you can use wherever IBM or IBM resellers sell and service IBM PC products.

For more information on registering with the International Warranty Service Office, call 1-800-497-7426 in the U.S. or Canada.

## **Purchasing Additional Services**

During and after the limited warranty period, you can purchase additional services, such as:

- Support for IBM and non-IBM hardware, operating systems, and application programs
- Network setup and configuration
- Upgraded or extended hardware repair services
- Custom installation

The availability of the service and its name might vary by country.

## **Enhanced PC Support Line**

Enhanced PC Support is available for desktop and mobile IBM computers that are not connected to a network. Technical support is provided for IBM computers and IBM or non-IBM options, operating systems, and application programs on the supported products list. This service includes technical support for the following:

- Installing and configuring your out-of-warranty IBM computer
- Installing and configuring non-IBM options in IBM computers
- Assistance with the preloaded operating system
- Using selected application software and games
- Tuning performance, such as memory management
- Installing device drivers remotely
- Setting up and using multimedia devices
- Identifying system problems
- Interpreting documentation

You can purchase this service for a single incident or multiple incidents. For more information about purchasing Enhanced PC Support, see "Ordering Support Line Services" on page 144.

## ***Purchasing Additional Services***

### **Client Support Line**

Client support is available to provide assistance with the following:

- Installation and configuration of clients
- Identification of system problems related to the client in a network environment
- Assistance with client network interface cards and options

You can purchase this service on a one-time basis (for a single incident).

### **Network and Server Support Line**

Network and Server Support includes all the features of the Enhanced PC Support Line and is available for simple or complex networks made up of IBM workstations and servers using major network operating systems. This line also supports many popular non-IBM adapters and network interface cards. This service includes technical support for: Installing and configuring client workstations and servers Identifying system problems and correcting problems on the client or the server Using IBM and non-IBM network operating systems Interpreting documentation You can purchase this service for a single incident or for multiple incidents. For more information about purchasing Network and Server Support, see "Ordering Support Line Services."

### **Ordering Support Line Services**

The Enhanced PC Support Line, Client Support Line, and Network and Server Support Line services are available for products on the Supported Products list.

To receive a Supported Products list:

- In the U.S.:
  - Call 1-800-772-2227.
  - Select the automated fax system option.
  - Select the service for which you would like a Supported Products list:

### ***Purchasing Additional Services***

- For the Enhanced PC Support Line, select document 11682.
- For the Network and Server Support Line, select document 11683.
- In Canada
  - Call 1-800-465-7999 or 1-800-465-7999.
- In other countries, contact your IBM reseller or IBM marketing representative.

For more information on how to purchase the Support Line Services:

- In the U.S.: call 1-800-772-2227.
- In Canada: call 1-800-465-7999.
- In 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 their period of service.

Upgradeable warranties for the U.S. include:

- Overnight service option. You can upgrade your current warranty that provides ThinkPad EasyServ/Carry-in repair service. Your warranty provides ThinkPad EasyServ/Carry-in repair service.

You can also extend your warranty. The "Warranty and Repair Services" offers a ThinkPad EasyServ Maintenance Agreement.

For more information on warranty upgrades and extensions:

- In the U.S.: call 1-800-426-7697.
- In Canada: call 1-800-465-7999.
- In other countries, contact your IBM reseller or IBM marketing representative.

## *Purchasing Additional Services*

### **Obtaining IBM Operating System Updates**

IBM provides update diskettes, called ServicePaks or corrective service diskettes (CSDs), to customers who report a DOS or an OS/2 problem for which there is or will be a corrective program.

#### **Getting Update Diskettes**

You can obtain update diskettes from:

- IBM PC Company BBS IBM Software Solutions Center (1-800-992-4777 for the U.S. and Canada)
- An IBM authorized reseller or an 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 all other countries, contact your IBM reseller or IBM marketing representative.

## **Appendix A. Features and Specifications**

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This appendix describes the features and specifications for the computer.

## *Features*

# Features

### **Processor**

Intel® Mobile Pentium™ II processor, or Intel® Mobile Celeron™ processor with on-die external cache

### **Memory**

Base: 32 or 64 MB

Option: 32/64/128 MB DIMM

Total: Max. 256 MB

### **Storage devices**

2.5-inch hard disk drive

Option: Second 2.5-inch hard disk drive (UltraBay FX)

### **Display**

The color display uses TFT technology

1024-by-768 or 800-by-600 resolution on the LCD

Up to 1280 by 1024 resolution on the external monitor

Brightness control

### **Keyboard**

84-key, 85-key, or 89-key

TrackPoint

Fn key function

**Internal diskette drive**

To get the best performance from your diskette drive, use high-quality diskettes (such as IBM diskettes) that meet or exceed the following standards:

**1-MB, 3.5-inch, unformatted diskette:**

- ANSI (American National Standards Institute) X3.137
- ISO (International Standards Organization) 8860
- ECMA (European Computer Manufacturers Association) 100

**2-MB, 3.5-inch, unformatted diskette:**

- ANSI X3.171
- ISO 9529
- ECMA 125

**Internal CD-ROM drive**

24X max. speed

**Internal DVD-ROM drive (option)**

4X speed

**External interfaces**

Serial connector (EIA-RS232D)

Parallel connector (Centronics)

External-input-device connector

External-monitor connector

System-expansion connector

PC Card slots (two Type I or Type II PC Cards, or one Type III PC Card)

Headphone jack

Microphone jack (supports a self-battery-powered condenser microphone)

## **Features**

Stereo line-in jack

Infrared port

Universal Serial Bus (USB) connector

Telephone connector (RJ11) (select models only)

Network connector (RJ45) (select models only)

S-video jack

## Specifications

### Size

With a 12.1-inch display:

- Width: 315 mm (12.4 in.)
- Depth: 255 mm (10 in.)
- Height: 45.7 mm (1.8 in.)

With a 14.1-inch display:

- Width: 315 mm (12.4 in.)
- Depth: 260 mm (10.4 in.)
- Height: 46.7 mm (1.84 in.)

With a 15.0-inch display:

- Width: 327.4 mm (12.9 in.)
- Depth: 268 mm (10.6 in.)
- Height: 46.7 mm (1.84 in.)

### Environment

Temperature (at altitudes less than 2438 m 8000 ft.):

- Operating with no diskette: 5°C to 35°C (41°F to 95°F)
- Operating with a diskette: 10°C to 35°C (50°F to 95°F)
- Nonoperating: -20°C to 60°C (-4°F to 140°F)

**Note:** When you charge the battery pack, its temperature must be at least 10°C (50°F).

Relative humidity:

- Operating with no diskette: 8% to 95%
- Operating with a diskette: 8% to 80%

Maximum altitude: 3048 m (10,000 ft.) in unpressurized conditions

- Maximum operating temperature at 2438 m (8000 ft.) thru 3048 m (10,000 ft.): 31.3°C (88°F)

## **Specifications**

### **Heat output**

Approximately 48 Kcal per hour

### **Electrical (AC Adapter)**

Sine-wave input, at 50 to 60 Hz is required

The input rating of the AC Adapter: 100–240 V ac, 50/60 Hz

### **Battery pack**

Nickel Metal Hydride battery pack

- Nominal voltage: 9.6 V dc
- Capacity: 4.0 AH

Lithium-ion battery pack

- Nominal voltage: 10.8 V dc
- Capacity: 4.8 AH

## IBM Power Cords

To use the AC Adapter outside the country where you purchased your computer, you need an ac power cord that is certified for the country or region you are visiting. You can purchase one through an IBM authorized reseller or IBM marketing representative in that country or region.

**Attention:** Using an improper power cord might cause severe damage to your computer.

**For 2-pin power cords:**

IBM power cord part number	Used in these countries or regions
13H5273	Japan

For 3-pin power cords:

**Note:** The grounded adapter is required for full MPRII compliance. If a 3-pin power cord came with your computer, see “Safety Information” on page viii.

IBM power cord part number	Used in these countries or regions
02K0539	People's Republic of China (other than Hong Kong)
36L8867	Argentina
76H3514	Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
76H3516	Aruba, Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela

## IBM Power Cords

<b>IBM power cord part number</b>	<b>Used in these countries or regions</b>
76H3518	Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Macao, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, Yugoslavia
76H3520	Denmark
76H3522	Bangladesh, Myanmar, Pakistan, South Africa, Sri Lanka
76H3524	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Malaysia, Nigeria, Oman, Qatar, Singapore, United Kingdom
76H3528	Liechtenstein, Switzerland
76H3530	Chile, Ethiopia, Italy, Libya
76H3532	Israel
76H3535	Korea

## Appendix B. Product Warranties and Notices

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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 your reseller. The term "Machine" means an IBM machine, its features conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.*

**Machine:** IBM ThinkPad 390X and the Battery Pack

**Warranty Period\*:** One Year

*\*Elements and accessories are warranted for three months. Contact your place of purchase for warranty service information. Some IBM Machines are eligible for On-site warranty service depending on the country where service is performed.*

### The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

#### **Extent of Warranty**

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

#### **Items Not Covered by Warranty**

IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless IBM specifies otherwise, IBM provides non-IBM machines WITHOUT WARRANTIES OF ANY KIND.

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided WITHOUT WARRANTIES OF ANY KIND.

### **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-IBM-SERV (426-7378)**. In Canada, call IBM at **1-800-465-6666**. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange services, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade, IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to:

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange.
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided
  - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
  - b. secure all programs, data, and funds contained in a Machine,
  - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and
  - d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

### **Production Status**

Each IBM Machine is manufactured from new parts, or new and used 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 appropriate warranty terms apply.

### **Limitation of Liability**

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than:

1. damages for bodily injury (including death), and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible for.

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, ITS SUPPLIERS OR YOUR RESELLER 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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## Year 2000 Readiness and Instructions

A product is Year 2000 Ready if the product, when used in accordance with its associated documentation, is capable of correctly processing, providing and/or receiving date data within and between the 20th and 21st centuries, provided all other products (for example, software, hardware, and firmware) used with the product properly exchange date data with it.

This IBM PC hardware product has been designed to process four-digit date information correctly within and between the 20th and 21st centuries. If your IBM computer is on when the century changes, you should turn it off and then back on again once, or restart the operating system, to ensure that the internal clock resets itself for the new century.

This IBM PC product cannot prevent errors that might occur if software you use or exchange data with is not ready for the Year 2000. IBM software that comes with this product is Year 2000 Ready. However, software from other companies might come with this IBM PC product. Although IBM cannot take responsibility for the readiness of that software, these companies have stated that it is ready.

## **Notices**

You should contact the software developers directly if you wish to verify readiness, understand limitations, or look for any software updates.

To learn more about IBM PC products and the Year 2000, visit our Web site at <http://www.pc.ibm.com/year2000>. The information and tools there can help you with your Year 2000 transition plan, especially if you have multiple IBM PCs. IBM encourages you to check periodically for updated information.

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## **Electronic Emission Notices**

### *Federal Communications Commission (FCC) Statement* ThinkPad 390X

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.

Responsible party:

## Notices

International Business Machines Corporation  
New Orchard Road  
Armonk, NY 10504  
Telephone 1-919-543-2193

 Tested To Comply  
With FCC Standards  
FOR HOME OR OFFICE USE

### *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 electromagnetic 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 Communication (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

## Notices

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 you 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.
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.

## **Notices**

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.

### ***Fax Branding***

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including fax machines, to send any message 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. (The telephone number provided may not be a 900 number or any other number for which charges exceed local or long-distance transmission charges.)

In order to program this information into your fax machine, follow the setup instructions for **RingCentral\*\***.

### ***Notice for Australia***

The following notice applies when using the telephony functions:

**FOR SAFETY REASONS, ONLY CONNECT AUSTEL PERMITTED OR CERTIFIED EQUIPMENT.**

## **Industry Canada Requirements**

### ***Notice***

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications networks protective, operational, and safety requirement. The Depart-

## **Notices**

ment does not guarantee the equipment will operate to the user's satisfaction.

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

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

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

### *Caution*

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

The **Ringer Equivalent Number** (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Number of all the devices does not exceed 5.

### *Avis*

L'étiquette du ministère de l'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des

## **Notices**

réseaux de télécommunications. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. Dans certains cas, les fils intérieurs de l'entreprise utilisés pour un service individuel à ligne unique peuvent être prolongés au moyen d'un dispositif homologué de raccordement (cordon prolongateur téléphonique interne). L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations. Actuellement, les entreprises de télécommunication ne permettent pas que l'on raccorde leur matériel à des jacks d'abonné, sauf dans les cas précis prévus par les tarifs particuliers de ces entreprises.

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

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

### ***Avertissement***

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

L'indice de charge (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui peut être raccordée à un circuit téléphonique bouclé utilisé par ce dispositif. La terminaison du circuit bouclé peut être constituée de n'importe quelle combinaison de dispositifs, pourvu que la somme des indices de charge de l'ensemble des dispositifs ne dépasse pas 5.

## **Notices**

### **Regions where ThinkPad 390X has ThinkPad Modem Integrated**

Your ThinkPad 390X computer does not include a modem if it was not purchased within one of the following regions:

- Australia
- Austria
- Belgium
- Canada
- Denmark
- Finland
- France
- Germany
- Hong Kong
- Ireland (tone only, no pulse dialing)
- Italy
- Latin America
- Netherlands
- New Zealand
- Norway
- Portugal (tone only, no pulse dialing)
- Singapore
- Sweden
- Switzerland
- UK
- US

### **Notice to European Users of the IBM ThinkPad Modem**

This equipment has been approved to Council Decision 98/ 482/EC - "CTR 21" for pan-European single terminal connection to the Public Switched Telephone Network (PSTN). However, due to differences between the individual PSTNs provided in different countries, the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN termination point. In the event of problems, you should contact your equipment supplier in the first instance.

## **Warning Notice to New Zealand Users of the IBM ThinkPad Modem**

- The grant of a Telepermit for a device in no way indicates Telecom acceptance of responsibility for the correct operation of that device under all operating conditions.

In particular the higher speeds at which this modem is capable of operating depend on a specific network implementation which is only one of many ways of delivering high quality voice telephony to customers. Failure to operate should not be reported as a fault to Telecom.

In addition to satisfactory line conditions a modem can only work properly if:

1. it is compatible with the modem at the other end of the call and
  2. the application using the modem is compatible with the application at the other end of the call - e.g. accessing the Internet requires suitable software in addition to a modem.
- Some parameters required for compliance with Telecom's Telepermit requirements are dependent on the equipment (PC) associated with this device. The associated equipment shall be set to operate within the following limits for compliance with Telecom's Specifications:
    1. There shall be no more than 10 call attempts to the same number within any 30 minute period for any single manual call initiation.
    2. The equipment shall go on-hook for a period of not less than 30 seconds between the end of one attempt and the beginning of the next attempt.
    3. Where automatic calls are made to different numbers, the equipment shall go on-hook for a period of not less than 5 seconds between the end of one attempt and the beginning of the next attempt.
    4. The equipment shall be set to ensure that calls are answered between 3 and 30 seconds of receipt of ringing (S0 set between 2 and 10). This ensures:

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- a. a person calling your modem will hear a short burst of ringing before the modem answers. This confirms that the call has been successfully switched through the network.
  - b. caller identification information (which occurs between the first and second ring cadences) is not destroyed.
- The preferred method of dialling is to use DTMF tones (ATDT...) as this is faster and more reliable than pulse (decadic) dialling. If for some reason you must use decadic dialling, your communications program must be set up to record numbers using the following translation table as this modem does not implement the New Zealand "Reverse Dialling" standard.

Number to be dialled:	0	1	2	3	4	5	6	7	8	9
Number to program into computer:	0	9	8	7	6	5	4	3	2	1

Note that where DTMF dialling is used, the numbers should be entered normally.

NOTE THAT FAULT CALLOUTS CAUSED BY ANY OF THE ABOVE CAUSES MAY INCUR A CHARGE FROM TELECOM.

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