

Contents

Finding information in this Online User's Guide	v
Chapter 1. Using your computer outside your home country	1
Changing the date and time	1
Power cord requirements	2
Chapter 2. Using the features of your computer	5
Using the Norton Mobile Essentials	6
Using Before You Go	7
Using Location Controller	8
Using the audio features	9
Setting the volume	9
Using the built-in modem features	11
Setting the modem	12
Using the 56-Kbps modem	14
Telephony features	14
Using the Auto Answer feature	16
Viewing a DVD movie	18
Chapter 3. Protecting your computer	21
Protecting your computer	22
Using passwords	22
Using mechanical locks	22
Chapter 4. Using your computer with a battery pack	25
Using the battery pack	26
Charging the battery pack	26
Monitoring the battery status	26
Saving battery power	30
Using the power management modes	30
Customizing power management	37
Considerations when using a power management mode	40
Using other battery-saving methods	43
Chapter 5. Using your computer with a PC Card	45
Using a PC Card	46
PC Card types	46
PC Card interface	48
PC Card support software	49
Power management	50

Using a PC Card in Windows 95 (with CardWorks)	52
Self-check	53
PC Card properties	54
Stopping the PC Card	56
Help	57
Using a PC Card in Windows NT (with CardWizard)	58
Self-check	60
PC Card properties	60
Hot swapping the PC Card	61
PC Card Activator	62
Enhanced power management	62
Stopping the PC Card	63
Help	64
Chapter 6. Resolving system resource conflicts	65
Resource conflict	65
Resolving a resource conflict	65
Default resource assignments	70
Default IRQ assignments	71
System resources and IRQs	71
Chapter 7. Frequently asked questions	75
Frequently asked questions	75
Chapter 8. Installing software	83
Installing a new operating system and its device drivers	84
Installing software for Windows 98	85
Overall procedure	85
Installing Microsoft Windows 98	86
Installing software for Windows 95	88
Overall procedure	89
Installing Microsoft Windows 95	90
Installing software for Windows NT Version 4.0	95
Overall procedure	95
Installing Microsoft Windows NT	96
Chapter 9. Using system management	99
Using system management	100
System-management features	100
Intel WfM full support	101

Desktop Management Interface (DMI)	101
Remote program load (RPL)	102
Preboot eXecution Environment (PXE)	102
Wake on LAN	103
Waking up from suspend mode by an incoming call	103
Universal Management Agent	104
Asset ID EEPROM	105
Setting up system-management features	105
Enabling or disabling Wake on LAN	105
Automatic power-on startup sequence	107
Enabling or disabling a Flash (POST/BIOS) update from the network	107
Appendix A. Using PS2 commands	111
Using PS2 Command	111
Syntax rules	111
PS2 commands	112
Appendix B. Using modem commands	119
Modem commands	119
Running commands	119
Command format	119
AT commands	119
Extended AT commands	122
V.42bis commands	123
Modem response codes	124
S registers	127
Appendix C. Handling the ThinkPad	131
Handling tips	131
ThinkPad don'ts	131
ThinkPad do's	133
Cleaning your computer	133
Carrying your computer	133
Extending your computer's battery life	134
Ruggedized mobile computers	135
Ergonomics information	135
Appendix D. Getting service	139
Getting service	139

Customer support and service	139
Help at the ThinkPad Web site	139
Help by telephone	140
ThinkPad EasyServ	141
Getting help around the world	141
Fax information	142
Electronic support services	142
Purchasing additional services	144
Enhanced PC Support Line	144
900-number operating system and hardware support line	145
Network and Server Support Line	145
Ordering support line services	145
Warranty and repair services	146
Obtaining IBM operating system updates	147
Getting update diskettes	147
Ordering publications	147
Appendix E. Notices	149
Edition notice	149
Appendix F. Trademarks	151
Trademarks	151
Glossary	153
Index	157

Finding information in this Online User's Guide

The following topics are covered in this *Online User's Guide*. Click the topic you want to read:

- Changing the date and time
- Ergonomics information
- Frequently asked questions
- Getting service
- Handling tips
- Installing a new operating system and its device drivers
- Power cord requirements
- Setting the modem
- Using the audio features
- Using the battery pack
- Using passwords
- Using a PC Card
- Using system management
- Viewing a DVD movie

Chapter 1. Using your computer outside your home country

This section provides necessary information if you are using the computer outside the region where you purchased it.

Changing the date and time	1
Power cord requirements	2

Changing the date and time

Note

If you are a U.S. user, you should use the Norton Mobile Essentials for the location settings. For details → Using the Norton Mobile Essentials.

You need to change the date and time settings if you go to a different time zone.

- 1** In the Windows 98 desktop, click **Start**, move the cursor to **Settings**, and then click **Control Panel**.
- 2** Double-click **Date/Time**.
- 3** Set the current date and time.
- 4** Click the **Time Zone** tab.
Click , and select the region closest to your location from the list. Press **Enter**.
Note: If you do *not* want the clock to be automatically adjusted for daylight saving time, clear the check box.
- 5** Click **OK**.

Power cord requirements

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

Attention

The use of an improper power cord might cause severe damage to your computer.

For 2-pin power cords:

Part number	Country or region
13H5264	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
13H5267	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China (including Hong Kong), Qatar, Singapore, United Kingdom
13H5270	Austria, Bosnia-Herzegovina, Belgium, Bulgaria, Chile, Croatia, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Israel, Italy, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Yugoslavia
13H5273	Japan
13H5276	Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
13H5279	Bangladesh, Pakistan, South Africa, Sri Lanka

For 3-pin power cords:

Part number	Country or region
02K0539	People's Republic of China (other than Hong Kong)
76H3514	Argentina, 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
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	Switzerland, Liechtenstein
76H3530	Chile, Ethiopia, Italy, Libya
76H3532	Israel
76H3535	Korea

Chapter 2. Using the features of your computer

This section provides necessary information if you are using the various features of your ThinkPad computer.

Using the Norton Mobile Essentials	6
Using Before You Go	7
Using Location Controller	8
Using the audio features	9
Setting the volume	9
Setting the volumes with device drivers	10
Using the built-in modem features	11
Setting the modem	12
Using the 56-Kbps modem	14
Telephony features	14
Using the Auto Answer feature	16
Viewing a DVD movie	18

Using the Norton Mobile Essentials

Your ThinkPad computer provides the Norton Mobile Essentials, which enable you to manage your ThinkPad location settings easily. When you travel with your ThinkPad computer, the Norton Mobile Essentials can help you with ThinkPad location settings.

The Norton Mobile Essentials include the following features:

Before You Go is for learning about the power cord and modem requirements of your destination country or region. Use **Checklists** to plan for your trip effectively. **Before You Go** also contains many international phone numbers for travel services and links to Web sites with additional information about your destination.

Location Controller is for setting up all of the location-sensitive settings, such as modem properties, time and date, time zone, printer, and so forth. Once you set up a location, you don't have to set it up again.

Connection Doctor is for resolving any problem you might have with your modem connection at your destination.

To use the Norton Mobile Essentials, do the following:

- 1** Click **Start**.
- 2** Move the cursor to **Programs** and **Norton Mobile Essentials**; then click **Norton Mobile Essentials**.

The main window appears:



You can activate all the features from this window, or you can launch each feature individually from the Norton Mobile Essentials program group. For more detail on the Norton Mobile Essentials, click **Help**.

Note: You might need to install the Norton Mobile Essentials from the hard disk drive or the Software Selections CD before you use it for the first time.

Using Before You Go

To start Before You Go, do the following:

- 1 Click **Start**.
- 2 Move the cursor to **Programs** and **Norton Mobile Essentials**.
- 3 Click **Norton Mobile Essentials Before You Go**.

To check the power cord and modem requirements for your destination:

- a) Click **Destination**.
- b) Select your location from the list.

To use the various checklists to plan your trip or to obtain travel services:

- a) Click **Checklist**.
- b) Select **Guides**. View the guides in the window.

Note: See the following IBM Web site for the latest information about your modem's status for international use:

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

Using Location Controller

To start the Location Controller, do the following:

- 1** Click **Start**.
- 2** Move the cursor to **Programs** and **Norton Mobile Essentials**.
- 3** Click **Norton Mobile Essentials Location Controller**.
- 4** To create a new location, click **New** and follow the instructions on the window.

Notes:

1. Make sure that you set up the location for your *home* or *office*, so that you can switch back to those settings easily when you return from your trip.
2. For the best location settings, always use the **Location Controller** when you set up a new location. If your Internet dialer application also has location settings, it will adjust its settings based on the **Location Controller** settings in most cases. You need to choose additional location settings in your Internet dialer application, such as a local phone number.
3. If you are using a Personal Digital Assistant (PDA) such as IBM WorkPad, do not allow the Location Controller to adjust the windows clock automatically. This might lead to unwanted changes in your PDA calendar.

Using the audio features

Your computer is equipped with the following:

A 1/2-inch (3.5-mm) diameter external monaural microphone jack.

A 1/2-inch (3.5-mm) diameter stereo headphone or an external-powered speaker jack.

Your computer also has an audio chip that enables you to enjoy various multimedia audio features. This audio chip provides the following features:

Recording and playing back of PCM and WAV files in 8-bit or 16-bit format.


Sampling of various rates from 8 KHz to 48 KHz for the WAV file.

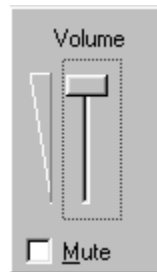
Playback of MIDI files through an FM synthesizer.

Recording from various sound sources, such as an integrated microphone, an external microphone, or an audio device attached to a line-in jack.

Game compatibility. You might select Sound Blaster Pro for the audio adapter in the sound setup for a game.

Setting the volume

You can customize the volume in a volume control window, which appears when you click the small speaker icon () on the task bar.



Your computer might provide volume control as part of its hardware—for example, with a volume control knob. If your

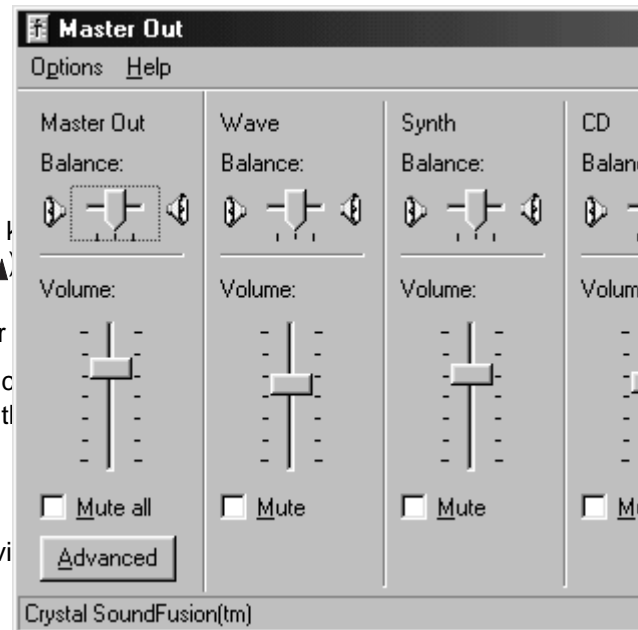
computer does not have a volume control key, you can control volume by pressing the **PgUp** (🔊▲)

For more information about your computer, see the IBM ThinkPad 570 User Guide.

Note: The value you set with the volume control key combination is the value of the volume.

Setting the volumes with device drivers

The volume is also controlled by each device driver. For each device, click the speaker icon in the device driver's control panel.



Double-click the small speaker icon (🔊) at the bottom right of the Windows desktop.

or

Click **Start**; move the cursor to **Program, Accessories, Entertainment**; and click **Volume Control**.

A “Master” window similar to the following appears:

After you make any changes, exit the “Master” window.

Note: Dock In and ZV Port are set to mute by default. To use these functions, clear check boxes.

Using the built-in modem features

The built-in modem enables you to send or receive data, faxes, and voice over the telephone line. This modem uses a digital signal processor (DSP), and its software can be upgraded, allowing great flexibility. It supports ITU-T V.90 protocols with data rates of 56 Kbps, and K56flex protocol with data rates of 56 Kbps.

You can use the built-in modem only on a public-switched telephone network (PSTN). You cannot use a private branch exchange (PBX) or some other type of digital telephone extension line. If you connect the built-in modem to a line other than PSTN, an error message appears, preventing you from using the line. If you are not sure which kind of phone line you are using, contact your telephone company.

Attention for use overseas

In many regions, you cannot use the built-in modem function until IBM has received approval from the proper authorities.

Your built-in modem is a worldwide modem and can be used in any region where Postal Telegraph and Telephone (PTT) type approval has been obtained. You can change the modem setting according to the region where you use the modem. If the region you want is not on the Region Selection listing, see <http://www.ibm.com/thinkpad> on the Internet, and download the newest Region Selection list.

If you are a non-U.S. user, the parameter for using the modem is set automatically during the modem installation. The “Modem Region Selection” window enables you to change the region name to that of the region in which you are actually going to use the built-in modem telephony function. Confirm whether the selection matches the region name in the **Dialing Properties** listing.

For more information on the use of the built-in modem in a specific region, contact the IBM customer support center in that region.

DANGER



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

Setting the modem

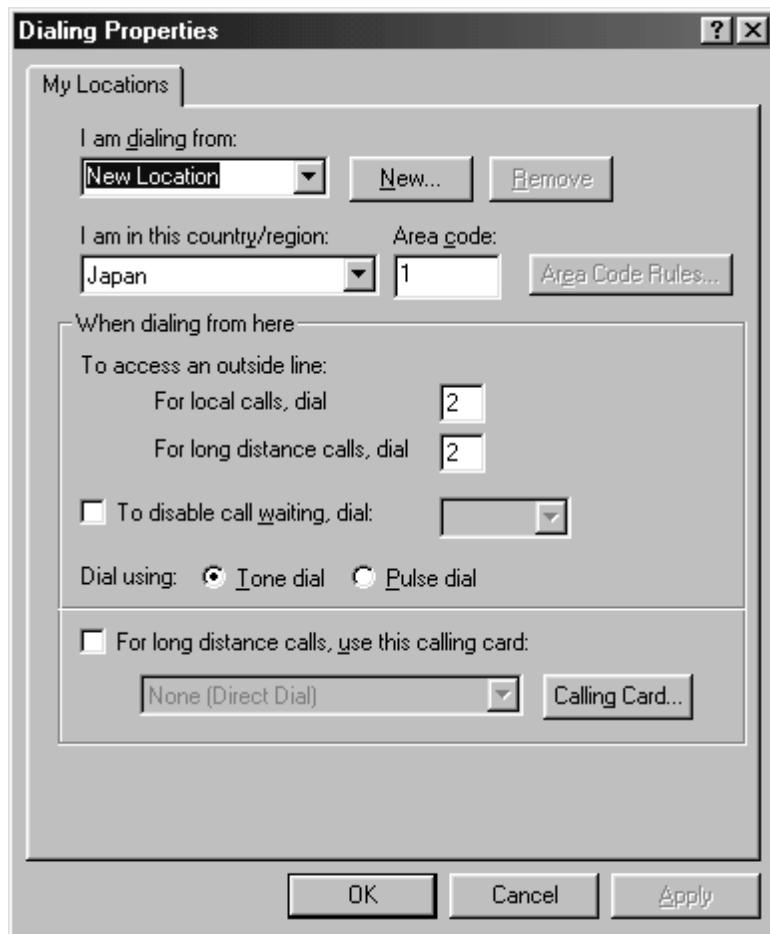
To use the built-in modem, connect one end of the telephone cable to the modem connector; then connect the other end to the telephone outlet on the wall.

Note: To use a DOS modem application in the Windows 95 or Windows 98 DOS box, disable the infrared port.

When you start Windows, the modem automatically starts and is ready for use.

To use the built-in modem outside the region where you purchased the computer, you must change the region name.

- 1** In the Windows 98 desktop, click **Start**.
- 2** Move the cursor to **Settings** and click **Control Panel**.
- 3** Double-click **Modems**.
- 4** Click the **Dialing Properties** button.



- 5** Select the region that you are using your modem, and set other dialing options; then click **OK**.

Notes:

1. Check the IBM Web site for the latest information. When updates become available, they are posted on:

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

2. You can also perform the basic modem functions by using the AT commands from the DOS prompt.
→ AT commands.

Using the 56-Kbps modem

To take advantage of your modem's 56-Kbps standard protocol (ITU-T V.90), you must first make sure that your Internet service provider (ISP) supports the protocol.

Contact your ISP and determine which 56-Kbps modem protocol it uses.

If your ISP supports the 56-Kbps standard protocol (ITU-T V.90) or K56flex technology, your modem uses the same 56-Kbps protocol. Your modem and your ISP must support the same 56-Kbps protocol, or your maximum connection speed will be limited to V.34 technology.

Significantly higher Internet modem connection speeds up to 56 Kbps require all-digital transmission connections from your ISP to the line card in the central office to which your phone line is connected. The higher speeds at which this modem is capable of operating on a specific network implementation is only one of many ways to deliver high-quality voice telephony to customers. Failure of the modem to operate at high speed should not be reported as a fault, unless ordinary voice telephone calls are substandard.

In the U.S., current FCC regulations limit the maximum speed for downstream communication to 56 Kbps. Even though your modem contains 56-Kbps technology, the connect rate in the receive direction might be significantly less than 56 Kbps.

Currently, the 56-Kbps capability is in the receive direction only (from the ISP to your local modem). The transmit or send direction (from your local modem to the ISP) uses V.34 technology.

Note: 56-Kbps transfer rates are not available in all locations. You must check with your ISP to determine if your area is capable of 56-Kbps transfer rates.

Telephony features

The built-in modem provides the following telephony features:

Industry standard modem support up to 56 Kbps

Data protocols	Bell 103 (300 bps) Bell 212A (1200 bps) V.21 (300 bps) V22bis (2400 bps) V.22 (1200 bps) V.34bis (33600, 31200 bps) V.34 (28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800 bps) K56flex (downstream only, up to 56000 bps) V.90 (downstream only, up to 56000 bps)
Error correction protocols	MNP2-4 (Microcom error correction) V.42 (error-correcting procedures for DCEs using asynchronous automatic dialing and control)
Data compression protocols	V.42bis (DCE data compression) MNP5 (Microcom data compression)
Miscellaneous protocols	V.8 (startup sequence) V.80 (video phone)

Industry standard fax support up to 14.4 Kbps

Fax protocols	V.21 Ch 2 (300 bps fax) V.17 (up to 14.4 kbps fax) V.29 (9600 bps fax) V.27ter (4800 bps fax)
---------------	--------------------------------------------------------------------------------------------------------

Computer telephony function support

- DTMF and pulse dialing
- Detecting DTMF digits received from the phone line
- Call progress monitoring
- An auto-dialing feature
- Telephony API (TAPI) support through Windows 98 or Windows 95

Telephone answering machine support (Windows 98 and Windows 95)

- Recording and playback of message and greetings
- Answering device with caller ID (North America only)¹
- Modem class-8 AT commands for TAPI calls

Full-duplex speaker phone support (Windows 98 and Windows 95 only)

- Acoustic echo cancellation

Using the Auto Answer feature

If you use a modem communication software program, your modem might need to be set for *Auto Answer*. The Auto Answer feature lets your computer answer calls from another computer automatically.

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

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

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

In some communication software programs, you might need to select the "Auto Answer On" or "Auto Answer Off" option to turn off the Auto Answer feature.

Note: If you are using Auto Answer with a fax software program, setting a high number of rings enables you to answer the telephone before the fax modem answers.

¹ This function can be used only where the caller ID services is available. Currently, this service is available only in the U.S. and Canada.

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

Viewing a DVD movie

Note

You need a DVD-ROM drive and the ThinkPad 570 UltraBase, available as an option, to view a DVD movie.

If you want to view a DVD movie on your computer, you need to set the DVD region code. You can set the region code when you start DVD Express for the first time.

Notes:

1. The DVD movie player program is supported by Windows 98 and Windows 95 OSR2.0 or later version.
2. Some DVD movies might not play in your computer. If it is possible to play another DVD movie in your computer, the problem is not with your computer. Check with the DVD vendor whether there is a problem with the DVD content.
3. You need to disable system timers when viewing a DVD movie to avoid screen blanking.

DVD regional codes

Regional coding is part of the protection strategy for DVD content. The world is divided into six regions. Specific content can be viewed only in a specific region. For example, Region 1 (U.S. and Canada) content should be viewed only in Region 1. The DVD Movie Player Program application is also region-specific.

You must select a region to play DVD content. After you select the region, you can play content only for that region. Be sure to select your correct region. ***An incorrect region code setting causes your computer to hang; you can recover your computer only with the Recovery CD.***

Attention

Make sure the first DVD content you play is from the appropriate region. You can verify the region code of the content by looking at the region code symbol on the back of the content packaging. If the first DVD you play is from a region other than the region you selected, your system will no longer play DVD content. Recover your system using the Recovery CD.

To set the region code, do as follows:

- 1 Click **Start**, move the cursor to **Programs** and **Mediamatics DVD Express**, and then click **Mediamatics DVD Player**.

The "Select DVD Region" window appears.

- 2 Select the region code and click **OK**.

Region Code	Region
1	U.S, Canada
2	Europe, Middle East, South Africa, Japan
3	Southeast Asia, Taiwan, Korea, Hong Kong
4	Latin America, Australia, New Zealand
5	Former Soviet Union, the rest of Africa, India
6	People's Republic of China (except Hong Kong)

Your computer has been configured to provide the highest quality audio and video playback based on the available system resources. You can alter the default settings, however, by changing the video resolution setting within the **Control Panel** of Windows 95 or Windows 98.

Note: Some systems do not have enough resources to provide full quality audio and video playback at all resolution settings. If you experience poor playback performance, adjust the resolution setting to a lower setting.

To view a DVD movie, do the following:

- 1** Insert the DVD title into the DVD drive.
- 2** Click **Start**, move the cursor to **Programs** and **Mediamatics DVD Express**, and then click **Mediamatics DVD Player**.
The DVD express operation window appears.
- 3** Click the **Play** button. The playback window appears.
- 4** Follow the instructions on the screen.
For more information, click the **Help** button on the operating window.

Chapter 3. Protecting your computer

Protecting your computer	22
Using passwords	22
Using mechanical locks	22

Protecting your computer

This section provides overall information about how to protect your ThinkPad computer. To protect your computer from theft or unauthorized use, you can use:

- Passwords
- A mechanical lock

For information on mechanical locks and for more details about passwords → *User's Reference*.

Using passwords

The password-setting feature prevents your computer from being used by others. Once you set a password, a prompt appears on the screen each time you power 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:

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

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

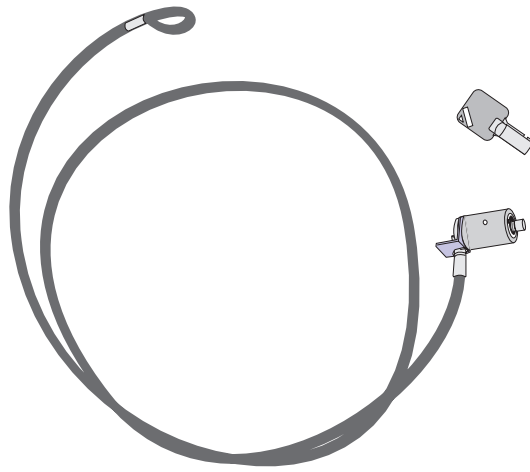
The **supervisor password** protects the system information stored in BIOS Setup Utility so that without knowing the password, nobody can change the configuration of the computer.

To use the different passwords, refer to the *User's Reference*.

Using mechanical locks

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

Attach a mechanical lock to the keyhole of the computer; then secure the chain on the lock to a stationary object. Refer to the instructions shipped with the mechanical lock.



Note

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

If you attach an option, such as ThinkPad 570 UltraBase or port replicator, to your computer, refer to the *User's Reference* for how you can protect your system by using the mechanical lock.

Chapter 4. Using your computer with a battery pack

This section provides necessary information if you are using a battery pack.

Using the battery pack	26
Charging the battery pack	26
Monitoring the battery status	26
Using the battery status indicator	26
Using the Fuel-Gauge program	29
Saving battery power	30
Using the power management modes	30
Customizing power management	37
Setting the suspend timer	37
Enabling hibernation mode	39
Considerations when using a power management mode	40
Considerations for suspend mode	40
Considerations for hibernation mode	41
Notes for reinstalling or installing the operating system	42
Using other battery-saving methods	43

Using the battery pack

If you use your ThinkPad computer with the battery pack, you need to conserve the power for long operation. Your computer is provided with power management for saving battery power, and it always indicates the battery status. This section describes the functions for battery operation.

Charging the battery pack

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

- When you purchase a new battery pack
- If the battery status indicator starts blinking
- If the battery pack has not been used for a long time

Notes:

1. Before you charge the battery pack, ensure that its temperature is at least 10°C (50°F).
2. If the battery pack has not been used for a long time, it will not be fully charged with only a single charging. You will have to completely discharge it; then recharge it three to six times to maximize battery operating time.

Monitoring the battery status

You can monitor the battery status by using the battery status indicator or the Fuel-Gauge program.

Using the battery status indicator

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

Compare the battery status indicator with the following table to determine the condition of your battery:

Status	Condition
Green	Enough power remains for operation.
Orange	The battery pack is being charged.
Blinking orange	The battery pack needs charging. If the indicator starts blinking orange, the computer beeps three times.
Off	The battery pack is not installed. The computer is turned off or is in suspend mode when the AC Adapter is not connected.

Attention

You should take corrective actions when the battery status indicator is *blinking orange*, and your computer sounds three consecutive beeps. (If your computer enters suspend mode because of a low-battery condition, data in memory might be lost.)

Immediately connect the AC Adapter to the computer.

Then take either of the following actions:

To continue your work with the AC Adapter, press the **Fn** key.

or:

To continue your work with a fully charged battery pack, do the following:

1. Replace the battery pack with a fully charged one. (See the *User's Reference*.)
2. Press the **Fn** key.
3. Disconnect the AC Adapter from the computer.

If you do not take corrective actions within about 30 seconds, the computer will enter suspend mode.

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

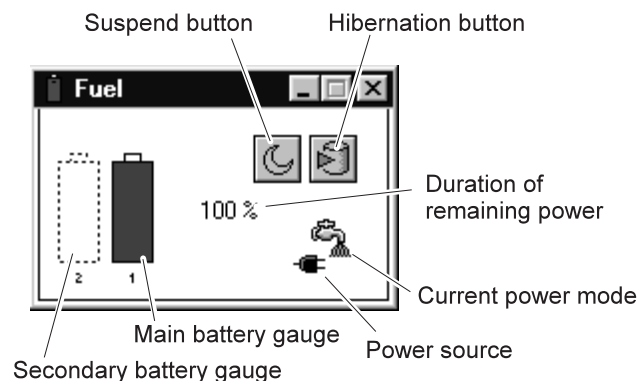
Using the Fuel-Gauge program

You can display the battery status and power mode (High Performance, Automatic, or Customized) by using the Fuel-Gauge program.



If you are using the secondary battery, you can see the secondary battery status by the Fuel-Gauge program. In the Fuel-Gauge program window are with two gauges: **1** is for main battery status and **2** is for secondary battery. The computer uses the secondary battery first. When you are charging batteries, the computer charges the main battery first.


You also can select suspend or hibernation mode.

To start the Fuel-Gauge program, click **Start**, move the cursor to **Program** and **ThinkPad**, and then click **Fuel-Gauge**. The following window appears:



Notes:

1. The "Current Power Mode" icon depends on the power mode.
2. The "Power Source" icon depends on the power source. ( is for the AC Adapter and  is for battery pack.)
3. The "Duration of Remaining Power" indicator does not appear when the AC Adapter is connected.

You can minimize the window to an icon by clicking the icon () at the top of the window. You can toggle between the Fuel-Gauge window and its icon by pressing the **Fn+F2** key combination.

Saving battery power

Your battery pack should be useful for approximately 3 years, or 300 charge-discharge cycles. The number of years or charge-discharge cycles might vary depending on how efficiently you use your computer. This section describes the following:

- Using the power management modes
- Using the other battery-saving methods

Using the power management modes

You can run your computer on battery power for a considerable time by using the power management modes (standby mode, suspend mode, and hibernation mode).

Note: Even if you don't set the low-battery alarm, the charge indicator will let you know when the battery is low, and then your computer will automatically enter the power-saving mode. This default low-battery behavior is independent of the operating system, so the computer might behave differently from your setting if you set the low-battery alarm. The computer chooses appropriately between your setting and the default setting.

Attention

Do not enter suspend or hibernation mode when your computer is doing any of the following:

- Playing or recording audio
- Playing a movie
- Playing a game
- Running any other multimedia application

Stop these applications before entering suspend or hibernation mode.

Standby mode

For Windows 98 users:

The LCD and external monitor turn off. Also the audio is muted. If no application program is running in the background, the hard disk stops turning.

For Windows 95 users:

The LCD turns off. Also, if a power-saving monitor (Energy Star Monitor) is in use when the computer enters standby mode, the computer activates the monitor's low-power mode.

You can **enter standby mode** by:

- Pressing the **Fn+F3** keys.

You can **return to normal operation** by:

- Pressing any key or moving the TrackPoint.


Suspend mode

Your computer stops all tasks and stores all data in memory.

You can **enter suspend mode** by:

- Pressing the **Fn+F4** keys.
- Closing the cover.

If you select the **Will not suspend even if LCD is closed** check box in the “Power Management Properties” window, the computer does not enter suspend mode when the LCD is closed. Only the LCD turns off.

- Selecting the **Suspend** button () in the Fuel-Gauge program.
- **For Windows 98 users:**
Click **Start** and **Shut Down...**, and then select **Stand by** by clicking the radio button.

Note: The term **Stand by** on the Windows 98 screen has a different meaning from the term **standby** in the user's manuals.

Your computer automatically enters suspend mode when:

- The preset timeout is reached.

For Windows 98 users:

You can set the **System standby timer** in the “Power Management Properties” window.

For Windows 95 users:

You can set the **Suspend Timer** in the “Power Properties” window.

- The battery is low.

For Windows 98 users:

You can set the alarm action by specifying **Standby** for the prompt **When the alarm goes off, the computer will:**

For Windows 95 users:

If you select the **Hibernate when battery becomes low** check box in the “Power Management Properties” window, the computer enters hibernation mode when the battery is low.

You can **return to normal operation** by:

- Pressing the **Fn** key.
- Opening the LCD.
- Turning the power switch on.

Your computer automatically returns to normal operation when:

- The preset timeout for the resume timer is reached.

For Windows 98 users:

You can set the timer in **Scheduled Tasks**.

For Windows 95 users:


You can set the timeout with the **resume on timer** specification in the “Power Properties” window.

RediSafe:



To prevent loss of data during suspend mode when the battery is critically low, your ThinkPad computer has a **RediSafe** function. Once you set this function, the hibernation file is activated each time the computer enters suspend mode, and is ready to enter hibernation mode from suspend mode whenever the battery is low.

Set **RediSafe** as follows:

From Windows 95 or Windows 98:

1. Start the ThinkPad Configuration program.
2. Click the **Power Management** button ().
3. Click the **Hibernation** tab.
4. Enable hibernation mode if it is disabled:
 - a) Click the **Enable Hibernation..** button.
 - b) Click **Create Now**; then **Close**.
5. Select the **RediSafe** check box.
6. Click **OK**.

From Windows NT:


1. Start the ThinkPad Configuration program.
2. Click the **Power Management** button ().
3. Click the **Suspend/Hibernation/Resume Options** button ().
4. Enable hibernation mode if it is disabled:
 - a) Click the **Enable Hibernation..** button.
 - b) Click **OK**.
5. Select the **RediSafe** check box.
6. Click **OK**.

Hibernation mode

Your computer stops all tasks and stores all data in the hard disk; then it powers off. Set your computer to this mode if you want to maintain the present operating condition until the next day, for instance.

To use this mode, you have to create a hibernation file with the ThinkPad Configuration program. (See Enabling hibernation mode.)

You can **enter hibernation mode** by:

- Pressing the **Fn+F12** keys.
- Clicking the **Hibernation** button () in the Fuel-Gauge program.
- Turning the power switch off.
You can enable this option by selecting the **Hibernate by power switch** check box in the “Hibernation” subwindow of the “Power Management Properties” window.

Your computer automatically enters hibernation mode when:

- The preset timeout is reached. (Windows 95 user only)
If you select the **Hibernate by timer** check box in the “Hibernation” subwindow and set **Suspend timer** in the “Power Mode” subwindow, your computer enters hibernation mode when it reaches timeout.
- The battery is low.

For Windows 98 users:

You can set the alarm action by specifying **Hibernate** for the prompt **When the alarm goes off, the computer will:**

For Windows 95 users:

If you select the **Hibernate when battery becomes low** check box, your computer enters hibernation mode when the battery is low.

You can **return to normal operation** by turning the power on.



For Windows NT users:

You cannot create a hibernation file in a Windows NT system that uses the NTFS file format, the Windows NT default. If you want to use hibernation mode, you should reinstall Windows NT with the FAT file format.

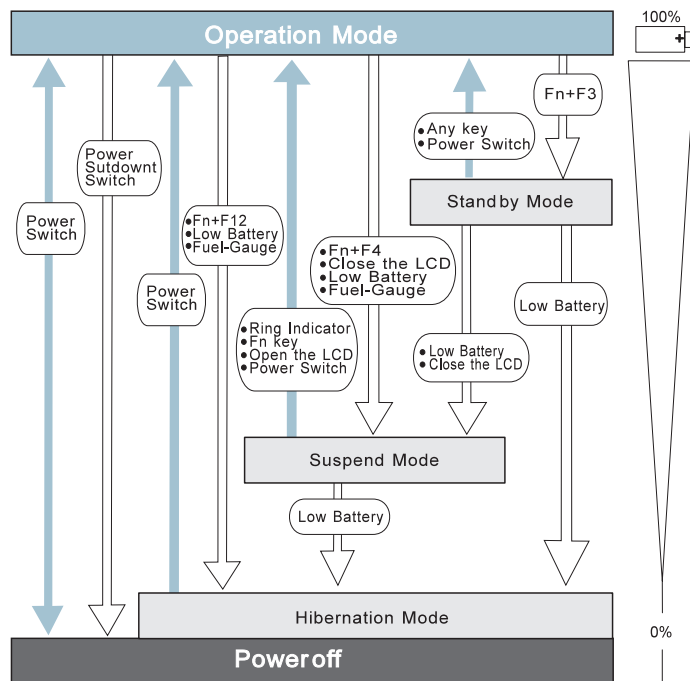
Notes:

1. Windows 95 users cannot enter hibernation mode when you are using the communication network.
2. Hibernation mode might end if you connect your computer to a port replicator or if you use a particular PC Card.

The following table shows how the indicator behaves in each power management mode:

Current status	Indicator	
	 Suspend mode	 Power-on
Normal operation or standby mode	Off	Green
Suspend mode	Green	Off
Entering or resuming from suspend mode	Blinking green	Green
Power off or hibernation mode	Off	Off

The following figure shows the relationship between different power management modes, how to switch between them, and battery power consumption:




Customizing power management

This section describes how to customize power management so that you are using the power management mode appropriate to your operation.


Setting the suspend timer

To set the suspend timer, do the following:

For Windows 98:

- 1** Start the ThinkPad Configuration program.
- 2** Click the **Power Management** () button.
The “Power Management Properties” window appears.
- 3** Click the **Power Schemes** tab.
The “Power Schemes” window appears.
- 4** Set the length of time for the suspend timer at **System standby timers** under **Settings for Portable/Laptop power scheme**.
Note: You can also set the **LCD off timers** and **Hard disk off timers**.
- 5** Click **OK**.

For Windows 95:

- 1** Start the ThinkPad Configuration program.
- 2** Click the **Power Management** () button.
The “Power Properties” window appears.
- 3** Click the **Power Mode** tab.
The “Power Mode” window appears.
- 4** Select **Customized**.

The bottom gray portion is displayed in black, and you can specify the timeout value in minutes in the **Suspend Timer** box.

5 Click **OK**.

For Windows NT:

1 Start the ThinkPad Configuration program.

2 Click the **Power Management** () button.

Three buttons appear on the right.

3 Click the **Power Mode Settings** () button.

The “Power Mode Settings” window appears.


4 Specify the timeout value in minutes in the **Suspend Timer** box.

5 Click **OK**.



Enabling hibernation mode

To enable hibernation mode, do the following:

For Windows 98 and Windows 95:

- 1** Start the ThinkPad Configuration program.
- 2** Click the **Power Management** () button.
The “Power Properties” window appears.
- 3** Click the **Hibernation** tab.
The “Hibernation” subwindow appears.
- 4** Click **Enable Hibernation**. (If you have already created a hibernation file, this button appears in gray and you cannot click it.)
The “Enable Hibernation” subwindow appears.
- 5** Click **Create Now**.
- 6** Click **Close**; then **OK**.

For Windows NT:

- 1** Start the ThinkPad Configuration program.
- 2** Click the **Power Management** () button.
- 3** Click the **Suspend/Resume Options** () button.
The “Suspend/Resume Options” window appears.
- 4** Click the **Enable Hibernation...** button.
- 5** Click **OK**.

Considerations when using a power management mode

When you use a power management mode, you need to consider a few points, especially if you are using the network.

Considerations for suspend mode

Consider the following before using suspend mode:

Before playing audio, it is better to turn off any automatic timers that put the computer into suspend or hibernation mode. In addition, it is better to stop playing audio before entering suspend or hibernation mode. If the computer enters suspend or hibernation mode, data from a running audio program might be lost.

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

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

If the computer resumes normal operation by reaching the ThinkPad Configuration timer setting or because of an incoming call, only a blank screen is displayed. To display a power-on password prompt, press any key or move your pointing device.

If you are using some communication cards and the computer is powered with ac power, your computer enters standby mode rather than suspend mode.

If you are using other PC Cards and the computer enters suspend mode, all application programs stop. For some PC Cards, power to the PC Cards might also turn off.

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

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

Even if you are using a communication card with a ring-resume function, some cards cannot detect an incoming call.


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

If you select the **Disable in the hardware profile** check box under the **Device usage** of the **General** tab in the **Advanced Power Management Support** area of the “System Properties” window, your computer does not enter suspend mode.



Note:

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

For Windows 95 and Windows 98:

1. Click the **Power Management** () button.
2. Click the **Suspend/Resume options** tab.
3. Select the **Resume on incoming call** check box.

For Windows NT:

1. Click the **Battery** () button.
2. Click the **Suspend/Hibernation/Resume options** () button; then select the **Resume on incoming call** check box.

For DOS: Enter PS2 RI E

Considerations for hibernation mode

Consider the following before using hibernation mode:

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

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

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

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

If you are using some communication cards and your computer is powered with ac power, the computer does not enter hibernation mode. This prevents possible problems from occurring with communication application programs after the computer returns to normal operation.

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

Notes for reinstalling or installing the operating system

Install your operating system with Advanced Power Management (APM), and install the ThinkPad Configuration program with the Utility Diskette to use power management mode.

Note: To install the software → Installing a new operating system and its device drivers.

If you are using Windows 98 or Windows 95, APM is automatically installed in your computer.

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

Power Management Status

Setting = ADV: REG
CPU: idle 32% of time.

AC Line Status : OFFLINE


Battery status : High

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

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

Using other battery-saving methods

Another battery-saving method is to decrease the LCD brightness. You can use the ThinkPad Configuration program to decrease the

brightness of the LCD by clicking the **LCD** () button and selecting **Normal** for **Brightness (battery operation)** in the window that appears.

Chapter 5. Using your computer with a PC Card

This section provides necessary information if you are using the computer with a PC Card.

Using a PC Card	46
PC Card types	46
Storage cards	46
Modem cards	47
Network cards	47
SCSI cards	47
Other PC Cards	47
PC Card interface	48
16-bit PC Cards	48
CardBus Cards	48
ZV Cards	48
PC Card support software	49
Power management	50
Using a PC Card in Windows 95 (with CardWorks)	52
Self-check	53
PC Card properties	54
Attributes	55
Resources	55
Drivers	55
Stopping the PC Card	56
Help	57
Using a PC Card in Windows NT (with CardWizard)	58
Self-check	60
PC Card properties	60
Attributes	60
Name	61
Hot swapping the PC Card	61
PC Card Activator	62
Enhanced power management	62
Stopping the PC Card	63
Help	64

Using a PC Card

This section explains PC Card functions and interfaces. It describes PC Card support software and explains how to use your PC Card in the operating system that you have installed.

A PC Card enables you to send and receive faxes, communicate through a network, store data, and use other functions. PC Cards can be distinguished by their functions:

- Storage cards
- Modem cards
- Network cards
- SCSI cards
- Other PC Cards

A PC Card is also distinguished by the interface that supports it. Before you use a PC Card, you need to make sure that your computer supports it.

- 16-bit PC Card
- CardBus Card²
- Zoomed Video Card³ (ZV Card)

PC Card types

Storage cards

An **Advanced Technology Attach (ATA) card** functions as a hard disk with the Integrated Drive Electronics (IDE) interface. You can transfer data between devices by inserting a card in a PC Card slot just as you would with a diskette in a diskette drive. There are two types of ATA card:

- The **ATA hard disk card** has a large capacity; you can use the card as you would an external hard disk.
- The **ATA Flash disk card** acts as a memory card; you can use the card to back up your data.

² CardBus allows PC Cards and your computer to use 32-bit busmastering and to operate at speeds up to 33 MHz.

³ Zoomed Video (ZV) is a connection between a PC Card and your computer that allows the card to write video data directly to the graphics controller. The data is transferred with no buffering requirements, because it is transferred over a ZV port rather than the system bus.

A **memory card** is used to read or write moderate amounts of data. There are three types of memory card:

- A **static-random-access-memory (SRAM) card** backs up computer memory. The card has its own battery.
- A **read-only-memory (ROM) card** is used for reading data only.
- A **Flash memory card** is a writeable and readable card. No battery is needed.

Modem cards

A **fax modem card** is used for communication through a telephone line; ac power is not needed. You can use this card to access the PC network or the Internet, or to send a fax.

Network cards

A **LAN/Network card** physically connects PCs in a LAN or Network. The following LAN-or-Network cards are available:

- An **Ethernet card** is for constructing a small area network.
- A **TokenRing card** is for constructing a global area network.
- An **IBM 3270 card** and an **IBM 5250 card** are also available.

An **integrated services digital network (ISDN) card** is used to connect your computer to the ISDN network.

SCSI cards

A **small computer system interface (SCSI) card** connects a SCSI device to your computer. For example, it enables you to use a SCSI disk drive that cannot fit in a small notebook PC.

Other PC Cards

A **sound card** enables your computer to play music and other sounds. It typically has an audio and a MIDI in/out connector.

A **video capture card** captures signals from video devices, enabling you to use the data in your computer.

There are also multi-function PC Cards, such as the Combo Card and the Multi Function Card.

PC Card interface

16-bit PC Cards

Most PC Cards are 16-bit PC Cards (PCMCIA 2.0 or 2.1), providing ISA device performance.

CardBus Cards

The CardBus Card is connected as a PCI device and provides higher performance than the 16-bit PC Card.

ZV Cards

The Zoomed Video port interface provides the connection for the ZV Card. The ZV Card enables you to write video data directly to an input port of the graphics controller. The following video-related cards are considered ZV Cards:

- Video capture card
- MPEG card

The ZV Card cannot be used without a PC Card device driver and a display device driver.

Attention

When you use PC Cards, be aware of the following restrictions:

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

Before removing storage PC Cards from the PC Card slot, **you must power off** the computer. Otherwise, data in the PC Card might be corrupted or lost.

Note: According to the operating system, you can stop the PC Card with the PC Card support software and remove it without powering off the computer. (See the PC Card support software section of each operating system to see how to stop the PC Card.)

PC Card support software

ThinkPad PC Card support software enables you to use a PC Card as soon as you insert it into the ThinkPad computer.

Each operating system needs its own ThinkPad PC Card support software, as follows:

Windows 98: You can use the PC Card without the PC Card support software; the PC Card support function is included within the operating system.

Windows 95 (OSR2.1): CardWorks for Windows 95.

Windows NT 4.0: CardWizard for Windows NT.

To install the PC Card software → Installing a new operating system and its device drivers.

The following table shows the PC Cards supported by Windows 98 and the different PC Cards support software:

	Windows 98	CardWorks (Windows 95 ²)	CardWizard (Windows NT 4.0)
16-bit PC Card	Supported	Supported	Supported ³
CardBus Card	Supported	Supported	Supported ³
ZV Card	Note 1	Supported	Not supported
Notes: ¹ Check the Web site of the card vendor. ² The PC Card support software is supported by OEM Service Release Version 2 (OSR2) or a later version. ³ See the SystemSoft Web site for the card list that the CardWizard supports: http://www.systemsoft.com/catalog/support3.htm			

When you insert the PC Card into your ThinkPad computer:

The PC Card support software detects the card and reads the information about it.

The PC Card support software searches for the corresponding card service device driver.

The device driver requests the PC Card support software to allocate such system resources as memory space, I/O port, and

IRQ. If these resources are available, the support software recognizes the PC Card and you can use it.

If there is a resource conflict, you need to change either the resources or the system configuration:

Either:

- **Change the requested resources of the PC Card:** You can allocate the available resources by using each operating system or PC Card support software function.

Or:

- **Change the system configuration:** You can change the system configuration with your operating system or with the ThinkPad Configuration program.

Note: If the PC Card device driver is the PC Card point enabler, you cannot use the PC Card with ThinkPad PC Card support software. If you cannot set up the PC Card with PC Card support software, check with the card vendor whether the device driver is a client device driver or a point enabler.

For Windows NT, you can select the PC Card support software or other software. For details → “Using a PC Card in Windows NT (with CardWizard).”

Power management

Depending on the function of the PC Card, changing the power state might cause your ThinkPad computer to hang. PC Card support software prevents this occurrence through special handling during power state transition.

The following table approximately indicates the supported power management function depending on the type of PC Card. If you need a power management function, make sure that your PC Card supports the function.

Note: This table shows the power management functions that are supported by the PC Card support software. Since Windows 98 does not support the PC Card support software, this table does not apply to Windows 98.

Card type	Suspend request (Fn+F4)		Hibernation request (Fn+F12)	
	ac power	Battery power	ac power	Battery power
Modem or network	Accepted	Accepted	Not accepted	Accepted
Other	Accepted	Accepted	Accepted	Accepted
Note: Standby mode is always accepted. Windows 98 might change the capability of the power state transition. CardWizard for Windows NT enhances the capability of the power state transition.				

For more information about the PC Card support software, go to the appropriate section.

Using a PC Card in Windows 95 (with CardWorks)

You can make your PC Card easy to use with the PC Card support software called CardWorks. It is supported only by the Windows 95 OEM Service Release Version 2.1 (OSR2.1).

CardWorks minimizes user intervention in configuring many PC Cards. CardWorks with CardWizard provides the following:

Self-check

If you have a problem, refer to this section.

PC Card properties

CardWorks provides various information about your PC Card.

Stopping the PC Card

If you remove the PC Card from your computer, sometimes you need to stop the PC Card.

Help

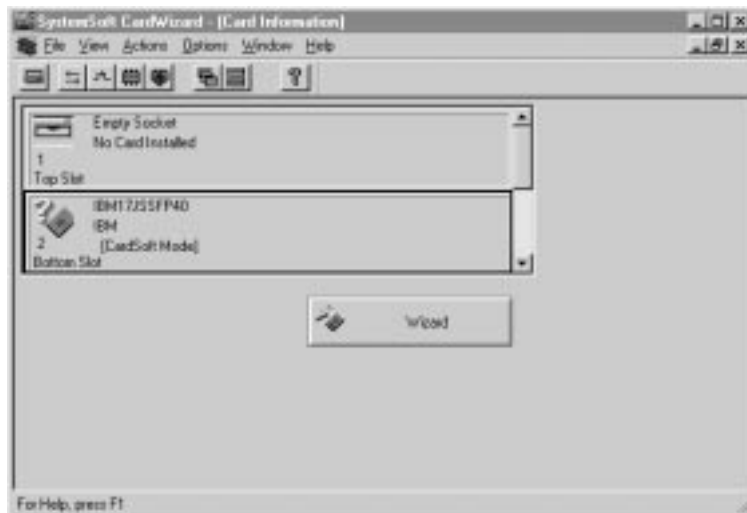
You can get help for most of the windows.

CardWorks provides **Plug and Play mode** for using a PC Card. You can use the PC Card in this mode if the device driver of the card is supported by Windows 95.

To start CardWizard, do as follows:

- 1** Click **Start**.
- 2** Move the cursor to **Programs** and **CardWorks**. Then click **CardWizard**.

The CardWizard window appears:



This information panel displays up-to-date information about the PC Cards and PC Card slots being used in your computer.

It also displays up to three lines of card information, which it reads directly from the card:

The first line shows the card name.

The second line shows the manufacturer.

The third line shows the card's function or type.

Self-check

CardWorks has a self-check function that solves such problems as incorrect or missing PC Card device drivers, system resource conflicts (IRQ, memory, or I/O ports), and unconfigured PC Cards, as well as memory conflicts.

If there are any problems, click **Wizard**. Each time you click the **Wizard** button, a series of self-checks is run to assure that all necessary components are installed and working properly. CardWizard then analyzes the computer to verify that there are resources available for PC Card configuration.

Even if CardWizard cannot automatically solve a problem, it can pinpoint the problem exactly so that you or a technical support engineer can fix the problem more easily.

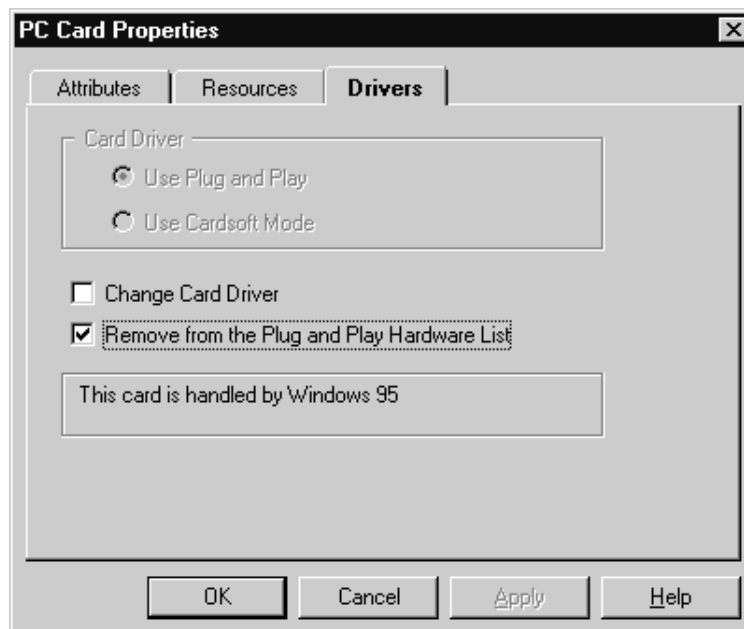
PC Card properties

You can see the attributes, resources, drivers, and memory card utilities that are loaded for PC Card support in the “PC Card Properties” window.

To open the “PC Card Properties” window of the PC Card that you are using, do the following:

- 1** Select the PC Card in the CardWizard window by clicking it.
- 2** Click **View** in the menu bar of the window.
- 3** Click **Properties...** in the pop-up menu.

The “PC Card Properties” window appears:



The window provides the following information:

Attributes

Resources
Drivers

Attributes

The following information appears depending on the type of PC Card:

Slot	The slot number and assigned name for the slot. (You can change the slot name by selecting slot management from the options menu.)
Card	The type of this PC Card.
Manufacturer	The manufacturer of the PC Card.
Size	The storage capacity of the PC Card.
Drive	The drive letter.
Battery status	The charge status of the SRAM Card battery.
Write protect	The write protect status—either enabled or disabled.
File system	The file system used by the PC storage.
Port	The communication port used by this PC modem card. If this is not shown, click the Wizard button and Auto Correct .

Resources

Some resource information is not relevant to all types of PC Cards. These nonrelevant resources are displayed as “Not Applicable.”

IRQ	The interrupt request being used.
I/O	The starting and ending addresses of the input/output range for the PC Card.
DMA	The DMA channel used.
Memory range	The range of physical memory.

Drivers

CardWizard determines the type of device driver being used. It also displays whether the card is configured by Windows 95 or by CardWorks.

Card driver	Indicates that Plug-and-Play mode is used in configuring the PC Card. This field is enabled only if the Change card driver box is selected. You should <i>not</i> change drivers if your card has been identified and configured successfully.
Change card driver	If this item is enabled (checked), you can select either Plug and Play (if available) or the CardWorks device drivers.
Remove from the Plug-and-Play hardware list	If this item is enabled (checked), you can delete the Plug-and-Play device driver assigned to a card. This applies only if the card is handled by Windows 95 (Plug-and-Play mode). Later, when you reinsert the same PC Card, CardWorks configures the card as if it were the first insertion.
Memory card utility	<p>This item appears only if you insert an SRAM card or a Flash memory card. You can format the SRAM card or Flash memory card as follows:</p> <p>Note: You can also format these cards from the file system with the DOS FORMAT command.</p> <ol style="list-style-type: none"> 1. Open the "PC Card Properties" window. 2. Click the Memory Card Utility tab. 3. Enter a Volume Label (if desired). 4. Click Format Drive/Partition. 5. Click Start. <p>This procedure enables you to completely erase an SRAM or a Flash memory card, especially a brand-new card. Make sure to save the data on the card before erasing it.</p>

Stopping the PC Card

If you are removing a PC Card, you must first stop it. The system might freeze or data might be lost if a PC Card is removed before it is stopped.

Note: You can stop only one card at a time. After invoking stop, you cannot stop another card until the first stop has either completed or failed.

You can stop a card as follows:

- 1** Click the right button on the CardWizard window.

A pop-up menu appears.

Note: The stop option appears in gray if the card is already stopped.

- 2** Click **Stop**. The following message appears:

The card has been stopped. You can safely remove the card.

Help

If you press **F1** or click the **Help** button, a glossary of terms and an index of Help items are made available.

Using a PC Card in Windows NT (with CardWizard)

You can make your PC Card easy to use with the PC Card support software called CardWizard.

CardWizard minimizes user intervention in configuring many PC Cards. CardWizard provides the following:

Self-check

If you have a problem, refer to this section.

PC Card properties

CardWizard provides various information about your PC Card.

Hot swapping the PC Card

You can use a mass-storage, modem, or network PC Card as soon as you insert it into your computer; you do not need to reboot.

PC Card Activator

You can select the PC Card support function of Windows NT rather than CardWizard without uninstalling CardWizard.

Enhanced power management

Depending on the state of your computer, the PC Card type, and the capability of the drivers, CardWizard enhances the transition between power states.

Stopping the PC Card

If you remove the PC Card from your computer, sometimes you need to stop the PC Card.

Help

You can get help for most of the windows.

Using mass-storage PC Cards

To use a removable mass-storage PC Card such as an ATA, an SRAM, or a Flash memory card for the first time, you need to format the card as follows:

1. Start **CardWizard**.
2. Select the PC Card that you want to format in the CardWizard window.
3. Click **Actions**.
4. Click **Format...**
5. Click **Start**.

To start CardWizard for Windows NT, do as follows:

- 1** Start Windows NT 4.0.
- 2** Click **Start**.
- 3** Move the cursor to **Programs** and **CardWizard for Windows NT**.
- 4** Click **CardWizard for Windows NT**.

The menu bar for the CardWizard window includes **File**, **View**, **Actions**, **Options**, and **Help** options. Each option provides CardWizard functions to perform actions with cards, modify user-selected options, and obtain help.

Quick launch

Once you have installed CardWizard for Windows NT, you can start it by clicking the **CardWizard** icon. The **CardWizard** menu appears on the taskbar, to the left of the **CardWizard** icon. Click the menu once with the left mouse button to start the wizard application.

Another way to start CardWizard for Windows NT is to double-click the system tray icon with the left mouse button.

Self-check

If you have a problem configuring your PC Card, click the **Wizard** button in the “CardWizard for Windows NT” window.

Each time you click the **Wizard** button, a series of self-checks is run to ensure that all necessary components are installed and working properly. CardWizard then analyzes the computer to verify that there are resources available for PC Card configuration.

Click this button to fix most PC Card problems. Even if CardWizard cannot automatically solve a problem, it can pinpoint the problem exactly so that you or a technical support engineer can fix the problem more easily.

Note: If the PC Card device driver is the PC Card point enabler, you cannot use the PC Card with CardWizard. To use such a PC Card, use the PC card support function of Windows NT rather than CardWizard. For details, see PC Card Activator.

PC Card properties

You can see the attributes, resources, drivers, and memory card utilities that are loaded for PC Card support in the “PC Card Properties” window.

To open the “PC Card Properties” window, do the following:

- 1** Start the **CardWizard**.
- 2** Select **Properties** from the “Actions” menu.
- 3** From the “Card Information” panel:
 - a** Click the right mouse button while the cursor is on an inserted card icon.
 - b** Click **Properties**.

The “Properties” window provides information about the attributes and drivers associated with the selected PC Card.

Attributes

Slot	The slot number and assigned name for the slot
------	------------------------------------------------

Card	The type of this PC Card
Manufacturer	The manufacturer of the PC Card
Function	The function of the PC Card
Hot-swappable	The capability for hot swapping the PC Card
IRQ	The interrupt request being used (if relevant)
Port	The I/O address associated with a communication port (if relevant)
Capacity	The memory or disk capacity of the mass-storage PC Card (if relevant)
File system	The file system of the mass-storage PC Card (if relevant)
Volume label	The volume label of the storage drive in the mass-storage PC Card (if relevant)
DOS Device	The communication port (for example, COM 1) or drive letter used by this device (if relevant)

Name

When you select device drivers, the following information is displayed:

Driver	The full path to the driver for this PC Card
Version	The version for the current driver

Hot swapping the PC Card

You can use any one of the following PC Cards as soon as you insert it into your computer:

- Mass-storage PC Card (ATA, SRAM, or Flash memory)
- PC Card modem
- Hot-swappable network PC Card

You determine whether the PC Card is hot-swappable in the "Attribute" subwindow in **PC Card Properties**.

PC Card Activator

PC Card Activator is an easy interface for switching between CardWizard and the PC Card support function of Windows NT. To switch to the PC Card support function of Windows NT, do as follows:

- 1** Start Windows NT.
- 2** Click **Start**.
- 3** Move the cursor to **Program** and **CardWizard for Windows NT**.
- 4** Click **PC Card Activator**.
- 5** Follow the instructions on the screen.

Note: With the PC Card support function of Windows NT, you can use a PC Card that is not supported by CardWizard. However, you cannot use some PC Cards, such as a CardBus Card, and some PC Card functions, such as network PC Card hot swapping.

Enhanced power management

The principal feature of power management is to save the life of your computer's battery. CardWizard for Windows NT provides enhanced power management in the following ways:

CardWizard maintains system integrity, ensuring the stability of your computer.

Depending on the state of your computer, the card type, and the capability of the drivers, CardWizard enhances the transition between power states.

See the following table for details:

	ATA, SRAM, and Flash memory card	Modem card	LAN card		SCSI card
			Hot-swappable	Non-hot-swappable	
Cold insertion ¹	OK	OK	OK	OK	OK
Stop	Note 2	Note 2	OK	Not OK	Not OK
Standby mode	OK	OK	OK	OK	OK
Suspend mode	Note 2	Note 2	OK	Note 3	Note 3
Hibernation mode	Note 2	Note 2	OK	Note 3	Note 3

Note:

¹Insertion while the computer is powered off.
² If the card is in use, you cannot stop it. A warning message appears.
³The computer enters standby mode instead of entering suspend or hibernation mode.

Stopping the PC Card

If you are removing a PC Card, you must first stop it. The system might freeze or data might be lost if a PC Card is removed before it is stopped.

Note: You can stop only one card at a time. After invoking stop, you cannot stop another card until the first stop has either completed or failed.

To stop a card, select **Stop** from the “Actions” menu.

The stop function powers off the PC Card. If data on the card is lost, this function is disabled or rejected. This function is related to the power management support of the PC Card; for details, see Enhanced power management.

Help

If you press **F1** or select the **Help** button, you can get help for most of the windows. A glossary of terms and an index of Help items are also available.

Chapter 6. Resolving system resource conflicts

This section describes the default system resources and how to share an IRQ between two devices.

Resource conflict	65
Resolving a resource conflict	65
Using the Device Manager	66
Using the BIOS Setup Utility	66
Default resource assignments	70
Default IRQ assignments	71
System resources and IRQs	71

Resource conflict

To use devices, the following system resources are required:

Interrupt request (IRQ):

A signal from the devices to the processor. The system has 16 levels of IRQs.

Direct memory access (DMA):

A mechanism to help the overall system performance by transferring data between memory and devices without processor intervention. The system has eight DMA channels.

The IRQ levels, DMA channels, and I/O addresses must be configured without introducing conflict among devices. When you add new devices to your ThinkPad computer, you might exceed the number of IRQs or DMAs allowed in the operating system.

This section explains how to resolve such a resource conflict.

Note: For details of the default resource mapping, refer to Default resource assignments.

Resolving a resource conflict

You can resolve a resource conflict easily with the ThinkPad Configuration program, which notifies you if there is a resource conflict and enables you to disable devices that are in conflict. The ThinkPad Configuration program tries to maintain the hardware

configuration by managing the system resources automatically. In some cases, you might have to disable one device in order to use the another device.

To resolve the resource conflict, you can also use the Device Manager or the BIOS Setup Utility.

Using the Device Manager

To open the Device Manager:

1. Click **Start**.
2. Move the cursor to **Programs** and **Settings**, and then click **Control panel**.
3. Double-click **System**.
4. Click the **Device Manager** tab.

You can also access the Device Manager from the ThinkPad Configuration program. There is a **Device Manager** button in each ThinkPad Configuration submenu window.

For details about the device, select the device and click **Properties**. General information as well as information on drivers and resources is displayed. For example, from the "Driver" window, you can see the device driver version, and you can update the driver.

If there is an **X** on the left side of the device, the device is disabled. To enable the device, select it and click **Properties**. You can see whether the device can be enabled. To change the default configuration setting, click **Resources**.

If **!** is on the left side of the device, the device has a problem. To resolve the problem, select the device and click **Properties**.

Using the BIOS Setup Utility

This section describes the items in the **Advanced** submenu of the **Config** menu of the BIOS Setup Utility.

Only the PCI configuration is a unique function of the BIOS Setup Utility. You can set up the other functions with the ThinkPad

Configuration program. The settings in the ThinkPad Configuration program take precedence over those in the BIOS Setup Utility.

Notes:

1. Here are the meaning of *Enabled* and *Disabled*:

Enabled: The function is configured

Disabled: The function is not configured

2. Default values are in **boldface**.

Function	Selection	Comments
Serial port		
Serial port Enabled Disabled	I/O address and IRQ: 3F8 IRQ4 2F8 IRQ3 3E8 IRQ4 2E8 IRQ3	You can select the base I/O address if you enable this function.
Infrared		
Infrared Enabled Disabled	I/O address and IRQ: 3F8 IRQ4 2F8 IRQ3 3E8 IRQ4 2E8 IRQ3	You can select the base I/O address if you enable this function.
Parallel port		
Parallel port Enabled Disabled	(Enabled) Mode: – Output only – Bi-directional – ECP I/O address and IRQ: – 378/IRQ7 – 378/IRQ5 – 278/IRQ7 – 278/IRQ5 – 3BC/IRQ7 – 3BC/IRQ5 (Disabled) Mode: – Output only – Bi-directional – ECP	You can select the base I/O address if you enable this function.

Function	Selection	Comments
PCI		
1st PCI IRQ 2nd PCI IRQ 3rd PCI IRQ 4th PCI IRQ	Disabled 3 4 5 7 9 10 11 15	You can set up the PCI IRQ.
Keyboard/mouse		
Fn key lock	Disabled Enabled	You can enable or disable the Fn key lock.
Typematic rate	Normal Fast	You can set up the typematic rate of the keyboard.
TrackPoint	Disabled Enabled AutoDisable	You can set up the TrackPoint.
Power		
Power mode for ac	Customized Maximum Battery Life Maximum Performance	You can set the power mode when you are using ac power.
Power mode for battery	Customized Maximum Battery Life Maximum Performance	You can set the power mode when you are using the battery pack.
Processor speed	Fixed Max Fixed Medium Fixed Slow Auto Medium Auto Slow	Auto medium and auto slow change the processor speed automatically between ac power and battery power. You can set this function if you select Customized for the power mode for the battery.
Suspend timer LCD-off timer	Disabled 1 Minute 2 Minutes 3 Minutes 5 Minutes 10 Minutes 15 Minutes 20 Minutes 25 Minutes 30 Minutes 45 Minutes 60 Minutes	You can set the LCD-off timer and suspend timer. You can set this function if you select Customized for the power mode for the battery.

Function	Selection	Comments
HDD-off timer	Disabled 3 Minutes 5 Minutes 10 Minutes 20 Minutes	You can set the HDD-off timer. You can set this function if you select Customized for the power mode for the battery.
Hibernating by timer	Disabled Enabled	You can set the hibernation timer.
Low-battery action	Suspend Hibernation	You can set the low-battery action.
Suspending when LCD is closed	No suspend Suspend	If you select No suspend , the computer doesn't enter suspend mode when you close the LCD.
Suspending or Hibernating while docked	Disabled Enabled	If you select Enabled , the computer enters suspend or hibernation mode automatically when you dock your computer to the docking station.
RediSafe	Disabled Enabled	If you want to enable RediSafe, you need to create the hibernation file with the ThinkPad Configuration program.
Resume on time Disabled Enabled	Resume Timer [00:00:00] Resume Date [00:00:0000]	You can set the resume time.
Resume on modem ring	Disabled Enabled	If you enable this function, your computer resumes when an incoming call occurs.
Screen blanking	Disabled Enabled	If you use your computer to make a presentation, disable this function to avoid the LCD blanking.
Power switch mode	On/Off Hibernation	If you select hibernation, you can switch between hibernation mode and operational mode with the power switch.
Suspend-to-hibernation timeout	Disabled 30 Minutes 60 Minutes 90 Minutes	You can set the timer to specify when the computer enters hibernation mode from suspend mode.
CD-ROM speed	High Normal Silent	You can set the CD-ROM speed.
CPU power management	Disable Automatic	You can enable or disable this power-saving feature, which stops the processor clock automatically when there is no system activity. You usually don't need to change the function.

Function	Selection	Comments
PCI Bus Power Management	Disable Automatic	You can enable or disable this power-saving feature, which stops the PCI bus clock automatically when there is no system activity. You usually don't need to change the function.
Alarm		
Power control beep	Disabled Enabled	If you enable this function, a beep sounds when the computer enters a power management mode and when it resumes operational mode. There is also a beep when the AC Adapter is connected or disconnected.
Low-battery alarm	Disabled Enabled	You can enable or disable the low-battery alarm.
Volume beep	Disabled Enabled	If you enable this function, a beep sounds when you change the volume by pressing Fn+PgUp or PgDn .
Other		
Resetting configuration data	No Yes	Select Yes if you want to reset your configuration data.
Booting the display device	LCD CRT Both	You can select the boot video device.
HV expansion	Off On	You can control the LCD horizontal and vertical expansion state.
Brightness	High Normal	If you select High , the brightness of the LCD is always the same under either ac power or battery power. High diminishes the battery power.
Startup screen	Enabled Disabled	If you enable this function, the IBM logo always appears on the LCD when the computer boots.
RPL token ring speed	4 16	If you use the remote program loading (RTP) system through the token ring card, you can set its speed.

Default resource assignments

To see the default resource assignment, go to the appropriate section:

Default IRQ assignments

System resources and IRQs

Default IRQ assignments

The following table shows the default system resource assigned for each IRQ:

IRQ value	Assignment
0	Timer
1	Keyboard
2	Cascade
3	Not used
4	Not used
5	Audio (set by device driver)
6	Diskette
7	Parallel port
8	Real-time clock
9	Not used
10	Not used
11	PCI
12	Auxiliary device
13	Math co-processor
14	Primary IDE
15	Secondary IDE (in the ThinkPad 570 UltraBase)

System resources and IRQs

The following table shows the available system resources for your computer and the port replicators. The values in parentheses are alternate values that are selectable from the ThinkPad Configuration program or from an application program. The default values are highlighted in **boldface**.

System resources	IRQ	I/O address (hex)	Memory address (hex)	DMA channel
Audio accelerator	PCI IRQ (3, 4, 5, 7, 9, 10, 11, or 15)		PCI memory	None
CD-ROM and DVD drive in UltraBay II	15	0170–0177, and 0376,	None	None
Diskette controller	6	03F0–03F5, and 03F7	None	2
Game device (set by device driver)	5	0220–022F, 0240–024F and 0388–038B,	None	1, 2, or 3
	5, 7, 9, or 10	0220–022F, 0240–024F 0260, or 026F and 0388–038B, 0390–0393, 0398, or 039B	None	1
Hard disk drive	14	01F0–01F7 and 03F6	None	None
Infrared port	4 3 4 3 3, 4, 5, or 7	03F8–03FF 02F8–02FF 03E8–03EF 02E8–02EF 03F8–03FF, 02F8–02FF 03E8–03EF, or 02E8–02EF		
OS other than Windows NT 4.0	Disabled	Disabled		
Joystick port (set by device driver)	200–207	None	None	None
Keyboard	1	0060 and 0064	None	None
Math co-processor exception	13	None	None	None
Modem	PCI IRQ (3, 4, 5, 7, 9, 10, 11, 15)	PCI I/O	PCI memory	None
Parallel port	7	03BC–03BE and 07BC–07BE		0, 1, or 3
	7	0378–037F and 0778–077A		0, 1, or 3
	5	0278–027F and 0678–067A		0, 1, or 3
	Disabled	Disabled		

System resources	IRQ	I/O address (hex)	Memory address (hex)	DMA channel
PC Card	(Dependent on the PC Card type)	(Dependent on the PC Card type)	(Dependent on the PC Card type)	None
PC Card controller (CardBus)	PCI IRQ (3, 4, 5, 7, 9, 10, 11, 15)	03E0–03E1 (the PC Card slot in the docking station: 03E2–03E3) or none	(PCI memory)	
Real-time clock	8	0070–0071	None	None
Serial port	4 3 4 3 Disabled	03F8–03FF 02F8–02FF 03E8–03EF 02E8–02EF Disabled		
Timer	0	0040–0043		
TrackPoint or mouse	12	0060 and 0064		
Video	PCI IRQ (3, 4, 5, 7, 9, 10, 11, 15)	03B0–03BB or 03C0–03DF	A0000–BFFFF, C0000–CBFFF, or PCI memory	None
Notes:				
<ol style="list-style-type: none"> 1. PCI I/O and PCI memory are automatically set by the system. 2. IRQ 5 and 7 cannot be set for infrared by Windows NT 4.0. 3. Joystick and game device resources are set by the device driver. 4. For Windows 95 OSR2 or Windows 98, memory-mapped I/O is used instead of the I/O address. 				

Chapter 7. Frequently asked questions

Frequently asked questions

This section addresses frequently asked questions. Click the button in the following chart and do the specified action.

Questions	Page
How can I stop the screen from blanking?	76
How can I set the infrared port?	76
How can I set the serial connector?	77
How can I switch the TrackPoint and mouse?	78
How can I set the display resolution?	78
How can I set the external monitor?	79
How can I maximize battery life?	80
How can I install the operation system?	81
How can I use the Recovery CD?	81

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 the icon.

Note: You can also open the ThinkPad Configuration program as follows:

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

For more information on how to start the ThinkPad Configuration program → *User's Reference*.

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

You can disable any system timers, such as the LCD turnoff timer or the system standby timer, with the ThinkPad Configuration program.

- 1 Start the ThinkPad Configuration program.
- 2 Click the **Power Management** button; then click the **Power Schemes** tab.

You can disable the system timers by selecting **never** rather than a specific time.

How can I use my infrared port as a communication port?

If the infrared port is disabled, you must enable it before you can 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 Select **Enable** from the **Infrared** list box.

A "Warning" might appear that the hardware resource is being used by another communication device.

5 Click **Disable Device**.

Another “Warning” window prompts you to restart your computer.

6 Click **OK**. The computer restarts.

Notes:

1. If you check your infrared port and it is already enabled, you can use it immediately without changing any settings.
2. You can disable your computer's serial connector to free resources for another communication device, such as the infrared port.

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 your communication software or the device that you are trying to communicate with. Check the online help for your communication software if the other device appears to be working properly.

How can I use my serial connector as a communication port?

If the serial connector is disabled, you must enable it before you can use it again. To enable your serial connector, do as follows:

- 1** Save your work and any program you are using.
- 2** Start the ThinkPad Configuration program.
- 3** Click the **Serial Port** button.
- 4** Select **Enable** from the **Serial port** list box.

A “Warning” might appear that the hardware resource is being used by another communication device.

5 Click **Disable Device**.

Another “Warning” window prompts you to restart your computer.

6 Click **OK**. The computer restarts.

Notes:

1. If you check your serial connector and it is already enabled, you can use it immediately without changing any settings.
2. You can disable your computer's infrared port to free resources for another communication device, such as the serial connector.

After your serial connector 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 or the cable or device attached to the serial connector. Check the online help system for your communication software if the cable and attached device appear 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?

The TrackPoint has an “auto disable” setting that disables it when you power on or restart the computer with an external mouse attached. When you want to enable the TrackPoint, remove the external mouse; then restart the computer.

Note: You can set up the TrackPoint manually with the ThinkPad Configuration program as follows:

- 1** Start the ThinkPad Configuration program.
 - 2** Click the **TrackPoint** button.
 - 3** Select **enable**, **disable**, or **auto disable** from the **TrackPoint** list box.
 - 4** Click **OK**.
-

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?

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 another pointing device. You can change the display output type to the LCD, external monitor (CRT), 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** Double-click **My Computer**, **Control Panel**, and then **Display**.

The “Display Properties” window appears.

- 2** Click the **Settings** tab.
- 3** Click the **Advanced...** button.
- 4** Click the **Monitor** tab.
- 5** Click the **Change...** button.

The “Update Device Driver Wizard” window appears.

- 6** Click the **Next** button, and follow the instructions on the screen by selecting **Display a list of all the drivers in a specific location, so you can select the driver you want**; and then **Show all hardware**.
- 7** Select **Manufacturers** and **Models** for your monitor, and follow the instructions on the screen.
- 8** Click **OK** to close the “Properties” window after updating the driver.
- 9** Set **Colors** and **Screen area** in the “Display Properties” window.
- 10** Click the **OK** button.

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

Do as follows:

- 1** Make sure that the external monitor is a DDC or plug-and-play monitor (see the manual for the external monitor).

- 2** Make sure you are using a D-Sub (Subminiature-D) connector cable.
- 3** Double-click **My Computer**, **Control Panel**, and then **Display**.

The “Display Properties” window appears.

- 4** Click the **Settings** tab.
- 5** Click the **Advanced...** button.
- 6** Click the **Monitor** tab.
- 7** Make sure the **Automatically detect Plug & Play monitors** check box is selected.

If not, select the check box, and click **OK** to close the window. Restart the computer; then make sure the plug-and-play feature detects the monitor.

- 8** If your monitor is still not recognized, click the **Change...** button. The “Update Device Driver Wizard” window appears.
- 9** Check if the display driver information in the window is correct. If necessary, install the display driver by following the instructions on the screen.
- 10** Click the **OK** button.

How can I maximize battery life?

To maximize battery life, do the following:

Use the battery until the charge is completely depleted (until the battery and power LEDs flash in unison).

Recharge the battery completely before using (the battery is fully charged when the AC Adapter is plugged in and the battery LED is green).

For a new battery or a battery that you have not used recently:

1. Recharge completely before using (the battery is fully charged when the AC Adapter is plugged in and the battery LED is green).

2. Use the battery until the charge is completely depleted (until the battery and power LEDs flash in unison).

Always use power management features such as power modes, standby, suspend, and hibernation.

For more detailed information about power management features → “Using the battery pack” on page 26.

How can I load a different operating system on my computer?

–Or–

Where can I get ThinkPad device drivers for this operating system?

See Installing a new operating system and its device drivers for information on installing a new operating system and device drivers.

You can get the ThinkPad device drivers by using the Diskette Factory. Before installing a new operating system, do the following:

1. Print Installing a new operating system and its device drivers.
2. Make backup diskettes of the device drivers and applications for your new operating system with the Diskette Factory. For more information → *User's Reference*.
3. Make a DOS system diskette that has the DOS FDISK.COM and FORMAT.COM utilities and the CD-ROM device driver for DOS.

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

→ *User's Reference*.

Chapter 8. Installing software

This section provides procedures for installing an operating system and the necessary software.

Installing a new operating system and its device drivers	84
Installing software for Windows 98	85
Overall procedure	85
Installing Microsoft Windows 98	86
Installing software for Windows 95	88
Overall procedure	89
Installing Microsoft Windows 95	90
Installing Windows 95 OSR1	90
Installing Windows 95 OSR2.1 or OSR2.5	91
Installing software for Windows NT Version 4.0	95
Overall procedure	95
Installing Microsoft Windows NT	96

Installing a new operating system and its device drivers

Note

You need a CD-ROM Drive and the ThinkPad 570 UltraBase, available as an option, to use the Software Selections CD.

If you want to install a new operating system in your computer, you need to install the ThinkPad device drivers for it at the same time. The Software Selections CD includes the preloaded software and ThinkPad device drivers for Windows 98, Windows 95, and Windows NT.

This section describes how to install a supported operating system and corresponding device drivers using the Software Selections CD. You should print the sections you will be using before you reinstall the operating system. Go to appropriate section depending on the operating system you are using.

The following table shows the country code that you will need in the instructions:

Country	Code	Country	Code
Denmark	DK	Netherlands	NL
Finland	FI	Norway	NO
France	FR	Spain	SP
Germany	GR	Sweden	SW
Italy	IT	United States	US
Japan	JP		

Installing software for Windows 98

Installing software for Windows 95

Installing software for Windows NT Version 4.0

Installing software for Windows 98

This section describes the installation procedures for Windows 98 and its software for your computer using the Software Selections CD.

Note: You can install Windows 98 by restoring the original preloaded image from the Recovery CD. Refer to the *User's Reference* for how to use the Recovery CD.

Overall procedure

- 1** Have the Windows 98 installation package in hand.
- 2** Back up your software and personal data files on the hard disk.
- 3** Install Windows 98.
- 4** Insert the Software Selections CD into the CD-ROM drive.
The Software Selections main window appears.

5 Click **Install Software**.

6 Click the **View All** radio button above the "Program Name" list window.

All the device drivers and other programs in the Software Selections CD are listed.

7 Select the check box of the device drivers and programs that you want to install.

You can select multiple device drivers and programs.

8 Click the **Install** button at the bottom right of the window, and follow the instructions on the screen.

You need to install at least the following device drivers if you are restoring your ThinkPad computer to its original state at the time of purchase:

- ThinkPad Configuration program
- Display driver
- Audio device driver
- TrackPoint driver
- ThinkPad modem driver

ThinkPad UltraBase hot/warm swap driver

For details on how to use the Software Selections CD, refer to its help.

Installing Microsoft Windows 98

Notes:

1. If you are installing Windows 98 on a drive other than the C drive, more than 25 MB is required on the C drive.
2. To use the CD-ROM drive to install Windows 98, create the Startup Disk for Windows 98, which enables you to use the CD-ROM drive. Then boot the system with the diskette.

To create the Startup Disk for Windows 98, do as follows:

- a) Insert a blank diskette into the diskette drive.
- b) Open the **Control Panel** window.
- c) Double-click **Add/Remove Programs**.
- d) Click the **Startup Disk** tab.
- e) Click **Create Disk...**
- f) Follow the instructions on the screen.

1 Insert the Windows 98 CD-ROM into the CD-ROM drive.

2 Search for SETUP.EXE in the CD-ROM, and run the SETUP.EXE. Type the following:

```
src_cd:\tgt_dir\SETUP.EXE
```

where `src_cd` is the drive letter of the CD-ROM drive and `tgt_dir` is the directory that SETUP.EXE is in.

For more information, refer to the SETUP.TXT in the Windows 98 CD-ROM.

3 Press **Enter**.

4 After Windows 98 is installed, replace the Windows 98 CD-ROM with the Software Selections CD.

5 Click **Start**.

6 Click **Run...**

7 Type the following:

```
src_cd:\DATA\WIN98\cc\WIN98SUPP\PIXX4\APM2APM\APM2APM.REG
```

where `src_cd` is the drive letter of the CD-ROM drive and `cc` is the respective country code.

8 Click **OK**.

9 Follow the instructions on the screen.

10 To support 1280 x 1024 resolution, do as follows:

a) Click **Start**.

b) Move the cursor to **Program** and click **MS-DOS Prompts**.

c) Change the directory to `C:\WINDOWS\INF`

d) Type the following:

```
COPY src_cd:\DATA\WIN98\cc\WIN98SUPP\RTMINF\MONITOR.INF C:
```

where `src_cd` is the drive letter of the CD-ROM drive and `cc` is the respective country code.

e) Press **Enter**. `MONITOR.INF` in the `WIN98SUPP` directory is copied to drive C.

f) Enter `EXIT` to close the DOS prompts.

11 After the installation has finished, remove the Software Selections CD from the CD-ROM drive and restart the computer.

Note: Depending on the optional applications you install with Windows 98, your required disk space varies. The following information applies to installing only Windows 98 in your computer:

Full installation on a FAT 16 drive:

About 225 MB disk space is required. Depending on your system configuration and the options you select, the required space ranges from 165 MB to 355 MB.

Full installation on a FAT 32 drive:

About 175 MB disk space is required. Depending on your system configuration and the options you select, the required space ranges from 140 MB to 225 MB.

Installing software for Windows 95

This section describes the installation procedures for Windows 95 and its software for your ThinkPad computer.

The following versions of Windows 95 are available for your computer:

- Service Pack Version 1 (OSR1)
- OEM Service Release Version 2.1 (OSR2.1)
- OEM Service Release Version 2.5 (OSR2.5)

The SP1 can be downloaded from the Microsoft Web site

<http://www.microsoft.com/windows/downloads/contents/updates>

Your version of Windows 95:

You can check which version of Windows 95 you are using by clicking **Start** and moving the cursor to **Settings** and **Control Panel**, and then double-clicking **Control Panel** and **System**.

The following window appears:



You can check the version in this window. Read the numbers under “System.”

4.00.950a means that it is Windows 95 OSR1

4.00.950B means that it is Windows 95 OSR2.1

4.00.950C means that it is Windows 95 OSR2.5

Overall procedure

- 1** Have the Windows 95 installation package in hand.
- 2** Back up your software and personal data files on the hard disk.
- 3** Install Windows 95.
- 4** Insert the Software Selections CD into the CD-ROM drive.
The Software Selections main window appears.
- 5** Click **Install Software**.
- 6** Click the **View All** radio button above the “Program Name” list window.
All the device drivers and other programs in the Software Selections CD are listed.
- 7** Select the check box of the device drivers and programs that you want to install.
You can select multiple device drivers and programs.
- 8** Click the **Install** button at the bottom right of the window, and follow the instructions on the screen.

You need to install at least the following device drivers if you are restoring your ThinkPad computer to its original state at the time of purchase:

ThinkPad Configuration program

Notes:

- a) The ThinkPad Configuration program is supported by Windows 95 OSR2.0 and later.
- b) You need to install Internet Explorer Version 4.0 or later.

Display driver

PC Card support software

Audio device driver

TrackPoint driver

ThinkPad modem driver

ThinkPad UltraBay hot/warm swap driver

For details on how to use the Software Selections CD, refer to its help.

Installing Microsoft Windows 95

Some new files must be incorporated at the time of installation.

Note: To use the CD-ROM drive to install Windows 95, create the Startup Disk for Windows 95, which enables you to use the CD-ROM drive. Then boot the system with the diskette.

To create the Startup Disk for Windows 95, do as follows:

1. Insert a blank diskette into the diskette drive.
2. Open the **Control Panel** window.
3. Double-click **Add/Remove Programs**.
4. Click the **Startup Disk** tab.
5. Click **Create Disk...**
6. Follow the instructions on the screen.

Installing Windows 95 OSR1

1 Make sure there is enough space in the hard disk to store the cabinet files and the installation programs (the required space might vary depending on the national language supported by your version of Windows 95).

2 Make a temporary directory.

For example, at the DOS prompt, type the following:

```
MD c:\win95
```

and press **Enter**.

3 Insert the Windows 95 CD-ROM into the CD-ROM drive.

4 Copy all the cabinet (.CAB) files and the installation programs from the \WIN95 directory of the Windows 95 CD-ROM to the temporary directory.

At the DOS prompt, type the following:

```
COPY src_cd:\WIN95\ . c:\win95
```


where `src_cd` is the drive letter of the CD-ROM drive, `c` is the drive letter of your hard disk drive, and `win95` is the temporary directory that you made in step 2.

- 5** Press **Enter**.
- 6** Replace the Windows 95 CD-ROM with the Software Selections CD.
- 7** Copy the Windows 95 supplementary files from the Software Selections CD to the temporary directory.
At the DOS prompts, type the following:

```
COPY src_cd:\DATA\WIN95\cc\OSR INF\ . c:\win95
```

where `src_cd` is the drive letter of the CD-ROM drive, `cc` is the respective country code, `c` is the drive letter, and `win95` is the temporary directory that you made in step 2.
- 8** Press **Enter**.
- 9** Install the operating system by entering `SETUP.EXE` at the temporary directory prompt.
- 10** Refer to the Windows 95 documentation and the instructions that appear on the screen to complete the installation.
- 11** To activate the PC Card slot, double-click the **PC Card** icon in the **Control Panel**. The PC Card Wizard window launches. Click **No** twice, and reboot the computer.
- 12** If required, install the Service Pack Version 1, available from the Microsoft Web site.
- 13** Remove all the files in the temporary directory and then remove the directory itself after you complete the installation, to free the space on the hard disk.

Installing Windows 95 OSR2.1 or OSR2.5

If you have a CD-ROM version of Windows 95 OSR2.1, do the following:

- 1** Make sure there is enough space in the hard disk to store the cabinet files and the installation programs (the required space

might vary depending on the language supported by your version of Windows 95).

2 Make a temporary directory.

For example, at the DOS prompt, type the following:

```
MD c:\win95
```

and press **Enter**.

3 Insert the Windows 95 CD-ROM into the CD-ROM drive.

4 Copy all the cabinet (.CAB) files and the installation programs from the \WIN95 directory of the Windows 95 CD-ROM disk to the temporary directory.

At the DOS prompt, type the following:

```
COPY src_cd:\WIN95\ . c:\win95
```

where `src_cd` is the drive letter of the CD-ROM drive, `c` is the drive letter of your hard disk drive, and `win95` is the temporary directory that you made in step 2.

5 Press **Enter**.

6 Replace the Windows 95 CD-ROM with the Software Selections CD.

7 Copy the Windows 95 supplementary files from the Software Selections to the temporary directory.

At the DOS prompt, type the following:

```
COPY src_cd:\DATA\WIN95\cc\OSR2INF\ . c:\win95
```

where `src_cd` is the drive letter of the CD-ROM drive, `cc` is the respective country code, `c` is the drive letter, and `win95` is the temporary directory that you made in step 2.

8 Press **Enter**.

9 Type the following:

```
COPY src_cd:\DATA\WIN95\cc\CARDBUS\ . c:\win95
```

10 Press **Enter**.

- 11** Install the operating system by entering `SETUP.EXE` at the temporary directory prompt.
- 12** Refer to the Windows 95 documentation and the instructions that appear on the screen to complete the installation.
Disregard the instruction to install the `USBD.SYS` and `UHCD.SYS` files.
- 13** Replace the Software Selections CD with the Windows 95 CD-ROM.
- 14** Change the current drive letter to the CD-ROM drive letter, and run `USBSUPP.EXE` and `USBUPD2.EXE` in the `\OTHERS\UPDATES\USB` directory of the CD-ROM.
- 15** Replace the Windows 95 CD-ROM with the Software Selections CD.
- 16** At the DOS prompt, type the following:

```
src_cd:\DATA\WIN95\cc\QFE444\PCCARDUP.EXE
```

where `src_cd` is the drive letter of the CD-ROM drive and `cc` is the respective country code.
- 17** Press **Enter**.
- 18** Reboot the system.
- 19** To replace the Unimodem drivers to support the Intel Video Phone application, from the DOS prompt, go to `C:\WINDOWS\SYSTEM` (or the `SYSTEM` subdirectory where Windows 95 is installed).
- 20** Rename the `UNIMODEM.VXD` and `UNIMDM.TSP` files by entering:

```
REN UNIMODEM.VXD UNIMODEM.BAK  
REN UNIMDM.TSP UNIMDM.BAK
```
- 21** Copy the new files by typing the following:

```
COPY src_cd:\DATA\WIN95\cc\UNIMODEM\ .
```

where `src_cd` is the drive letter of the CD-ROM drive and `cc` is the respective country code.

22 Press **Enter**.

23 Refer to the documentation shipped with this version to finish the installation.

24 To activate the PC Card slot, double-click the **PC Card** icon in the **Control Panel**. The PC Card Wizard window launches. Click **No** twice, and reboot the computer.

Installing software for Windows NT Version 4.0

This section describes the installation procedures for Windows NT Workstation Version 4.0 and its device drivers using the Software Selections CD.

Overall procedure

- 1** Have the Windows NT installation package in hand.
- 2** Back up your software and personal data files on the hard disk.
- 3** Install Windows NT.
- 4** Insert the Software Selections CD into the CD-ROM drive.
The Software Selections main window appears.
- 5** Click **Install Software**.
- 6** Click the **View All** radio button above the "Program Name" list window.
All the device drivers and other programs in the Software Selections CD are listed.
- 7** Select the check box of the device drivers and programs that you want to install.
You can select multiple device drivers and programs.
- 8** Click the **Install** button at the bottom right of the window, and follow the instructions on the screen.

You need to install at least the following device drivers if you are restoring your ThinkPad computer to its original state at the time of purchase:

- ThinkPad Configuration program
- Display driver
- PC Card support software
- Audio device driver
- TrackPoint driver
- Infrared device driver
- IDE driver
- ThinkPad modem driver

For details on how to use the Software Selections CD, refer to its help.

Installing Microsoft Windows NT

Before installing Windows NT, do the following:

Read the Windows NT installation guide.

If you plan to use OS/2 Warp with Windows NT, you need to use the OS/2 Warp Boot Manager. For more information, see the Web site. → <http://www.ibm.com/thinkpad>

To install Windows NT using an external CD-ROM drive, do the following.

Note: If you have an external CD-ROM drive that connects under a DOS environment, you can install Windows NT in DOS.

- 1** Insert the Windows NT CD-ROM into the external CD-ROM drive.
- 2** Go to the CD-ROM drive; then go to the `\I386` directory.
For example, if your CD-ROM drive letter is D, go to `D:\I386`
- 3** At the command prompt, type `WINNT` and press **Enter**.
For example, `D:\I386>WINNT`
Follow the instructions on the screen.

If your computer does not have a CD-ROM drive, use a network server, you can install Windows NT on multiple computers by first copying the Windows NT master source files to a shared drive on a network server. After connecting your computer to a network, such as with the DOS LAN requester, you can install the files from the network server to your computer at the DOS command prompt.

For more information, refer to the installation guide of Windows NT, Windows NT Version 4 Service Pack 3, or Windows NT Version 4 Service Pack 4.

Notes for installing the PC Card support software

If you are installing Service Pack 4, you should install it before you install the PC Card support software. If you have already installed Service Pack 4, you need to reinstall the PC Card support software.

If you are going to use a Port Replicator with Advanced EtherJet Feature with your computer, do the following:

- 1.** If your system is connected to a network, log off before starting the installation.
- 2.** You need to uninstall PC Card support software (CardWizard).
- 3.** Dock your computer to the Port Replicator with Advanced EtherJet Feature.
- 4.** If you want to install the Windows NT Service Pack, install it before you install the PC Card support software.
- 5.** Reinstall the PC Card support software.

Chapter 9. Using system management

Using system management	100
System-management features	100
Intel WfM full support	101
Desktop Management Interface (DMI)	101
System Management BIOS Reference Specification (SMBIOS) Version 2.2	101
Desktop Management Interface (DMI) Version 2.0, defined by the Desktop Management Task Force (DMTF)	102
Remote program load (RPL)	102
Preboot eXecution Environment (PXE)	102
Wake on LAN	103
Waking up from suspend mode by an incoming call	103
Universal Management Agent	104
Asset ID EEPROM	105
Setting up system-management features	105
Enabling or disabling Wake on LAN	105
Setting up in BIOS Setup Utility	105
Setting up for NetFinity Service	106
Automatic power-on startup sequence	107
Enabling or disabling a Flash (POST/BIOS) update from the network	107

Using system management

This section is intended primarily for network administrators.

Your computer is designed for manageability, so that you can redirect more of your resources to better meet your business objectives. This manageability, or “Total Cost of Ownership” (TCO), enables you or your network administrator to remotely power on your computer, format the hard disk drive, install the software of your choice (for example, Windows 98, Windows 95, or Windows NT with user and system-management applications), and have the computer start up and function in the same way as an ordinary desktop PC. Once the computer is configured and operational, you can achieve ongoing management through software and manageability features already integrated into the client system and the network.

This section describes the system management features of your computer, including the following:

- The system management features of your computer
- How to set up the system management features

System-management features

This section describes the system-management features provided by your computer.

Your computer has features that make it possible for a network administrator to manage and control it remotely over a network from a management console when it is connected to the Port Replicator with Advanced EtherJet Feature.

These features are:

- Intel WfM full support
- Desktop Management Interface (DMI)
 - System Management BIOS Reference Specification (SMBIOS) Version 2.2
 - Desktop Management Interface (DMI) Version 2.0 defined by the Desktop Management Task Force (DMTF)
- Remote program load (RPL)
- Preboot eXecution Environment (PXE)

Wake on LAN
Waking up from suspend mode by an incoming call
Universal Management Agent (UMA)
Asset ID EEPROM

The following sections tell you more about the functions and the software that provides these functions.

Your computer supports the DMI function using the Desktop Management BIOS (DMI BIOS).

Intel WfM full support

Your computer supports not only the *required* functions of the (Wired for Management (WfM) but also *recommended* functions of the WfM.

Those functions are:

Instrumentation (*required function*)
Remote new system setup (*recommended function*)
Remote Wake on LAN (*recommended function*)
Power management–ACPI compliance (*required function*)

Desktop Management Interface (DMI)

Desktop Management Interface (DMI)⁴ is an interface for managing computers in a network. Using DMI, a system administrator can easily make an inventories of all the software and hardware of the computers on a network. DMI can be used to remotely track many types of information about networked computers, including serial numbers, memory attributes, product-specific characteristics of installed devices, and operating system configuration information.

System Management BIOS Reference Specification (SMBIOS) Version 2.2

The basic input/output system (BIOS) of your computer supports an interface called System Management BIOS Reference Specification (SMBIOS) Version 2.2. The SMBIOS provides some of the hardware component information. It is the responsibility of the BIOS to supply this database with information about itself and the devices on the

system board. The SMBIOS Specification documents the standards for accessing this BIOS information.

Desktop Management Interface (DMI) Version 2.0, defined by the Desktop Management Task Force (DMTF)

The Desktop Management Task Force (DMTF) is the industry organization that is leading the development, adoption, and unification of management standards and initiatives for desktop, enterprise, and Internet environments. Working with key technology vendors and affiliated standards groups, the DMTF is enabling a more integrated, cost-effective, and less crisis-driven approach to management through interoperable management solutions.

Remote program load (RPL)

The remote program load (RPL) enables a network administrator to remotely control your computer. RPL enables your computer to start directly from a server over a LAN that has been configured for RPL. Network-management software, such as IBM LANClient Control Manager (LCCM), is required to take advantage of RPL.

If you use RPL with LCCM software, you can use the *Hybrid RPL* feature. With Hybrid RPL you install hybrid images (or files) on the hard disk. Each time the computer starts from the network, LCCM recognizes your computer as a Hybrid RPL client, and a *bootstrap* program is downloaded to your computer. This bootstrap program is small and helps prevent network congestion. Working from the hybrid images, the bootstrap program starts the startup process from the hard disk drive of your computer. One of the advantages of Hybrid RPL is that the network load associated with standard RPL is avoided.

Preboot eXecution Environment (PXE)

Preboot eXecution Environment (PXE) technology enhances your PC's manageability by providing the capability to boot (load an operating system or another executable image) from a server. Your computer supports the PC functions that PXE requires. For

⁴ DMI is a standard defined by the Desktop Management Task Force (DMTF) for gathering information about the hardware and software in your computer so that network administrators can remotely monitor and control it.

example, your computer can be booted from the PXE server if it is attached to a Port Replicator with Advanced EtherJet Feature with PXE enabled.

Wake on LAN

Wake on LAN can be used by a network administrator to turn on your computer from a management console. When Wake on LAN is used with such network management software as LANClient Control Manager (LCCM) and NetFinity, many types of functions, such as data transfer, software updates, and Flash (POST/BIOS) updates can be performed remotely without remote attendance. This updating can be done after normal working hours and on weekends, which saves time and increases productivity. Users are not interrupted during normal working hours, and LAN traffic is kept to a minimum.

If you dock your computer to a Port Replicator with Advanced EtherJet Feature, you can use the Wake on LAN function.

The Wake on LAN function is valid only when both your computer and the Port Replicator with Advanced EtherJet Feature are powered off.

If your computer is powered on by the Wake on LAN function, the **Automatic Power On Startup Sequence** is used. For more information, see Automatic power-on startup sequence.

Waking up from suspend mode by an incoming call

If your computer is connected to a telephone line and **Resume on incoming call** has been selected, your computer will resume from suspend mode when there is an incoming (telephone) call. The system administrator can resume operation on your computer and communicate remotely through a modem.

To enable your computer to wake up from suspend mode, do the following from Windows 98 or Windows 95:

- 1** Open the **ThinkPad Configuration** program.
- 2** Click **Power Management** and then **Resume option**.

3 Select the **Resume on incoming** check box.

Universal Management Agent

Your computer supports IBM Universal Management Agent (UMA), which consists of three main components:

Universal Management Agent—a common client management agent based on LANDesk Client Manager and NetFinity Manager services technologies. Tivoli-ready, UMA natively integrates into other management applications (such as Microsoft's SMS and Intel's LANDesk Management Suite) that will run on IBM desktops, mobile systems and servers, as well as other manufacturers' PCs. The UMA is a network-management program controlled from the network administrator's console or a peer workstation on the network. UMA provides the necessary software to take advantage of the network-management features built into the ThinkPad computer.

The UMA converts PFA alerts by SMART drives into useful responses, such as E-mail messages, alphanumeric and numeric pages, screen messages, automated backup routines, audio messages, or the execution of some other program.

Netfinity Service—Using the Netfinity Service, the system administrator does not need to stop his task to watch and control the system, because it can be done remotely. When the Netfinity Service runs in the background, the tasks running on your system do not need to be halted. The network administrator, at the same time, can monitor the network, so any problems can be avoided before they become severe. The remote workstation control function of Netfinity Service allows help desk personnel to remotely connect to a user's system and take control of the PC to diagnose and repair system problems.

Universal Management plug-ins—applications or solutions that provide additional management capabilities throughout the life cycle of networked system hardware with the goal of reducing TCO.

Asset ID EEPROM

The Asset ID EEPROM contains information about the system including its configuration and the serial numbers of key components. It also includes a number of blank fields you can record with your choice of end user information.

Setting up system-management features

This section describes how to configure the network interface in your computer. You can change the settings of system-management features in BIOS Setup Utility. BIOS Setup Utility contains the following functions:

- Enabling or disabling Wake on LAN
- Automatic power-on startup sequence
- Enabling or disabling Flash (POST/BIOS) update from the network

If the administrator's password (supervisor password) is set, but you did not specify it when you started BIOS Setup Utility, you cannot use these functions.

Enabling or disabling Wake on LAN

This setting is used to enable or disable the Wake on LAN feature, which enables your computer to be powered on remotely by a network administrator from a management console. Remote network-management software, such as LCCM and NetFinity, must be used to support Wake on LAN.

Setting up in BIOS Setup Utility

You can enable or disable Wake on LAN from the BIOS Setup Utility menu. When Wake on LAN is enabled, the network administrator can power on remote machines connected on a LAN by using remote network-management software. Disable the function when your computer is not under the network administrator's system management.

To set this function, do the following:

- 1** Start the BIOS Setup Utility menu.

For details → *User's Reference*.

- 2** Select the **CONFIG** item.
The "Config" item submenu appears.
- 3** Select the **Network** item.
The "Network" item submenu appears.
- 4** Select either **Enable** or **Disable** beside "Wake On Lan."
- 5** Press **PF10**.

Setting up for NetFinity Service

If you have NetFinity Service 5.0 installed in the network and wish to use the Wake on LAN function, do the following:

For Windows 95 systems:

Add the following line in the AUTOEXEC.BAT file in the root directory of the boot drive:

```
SET NFWAKEONLAN=YES
```

For Windows NT systems:

- 1** Log on to the system with administrator privilege.
- 2** Double-click the **System** icon in the **Control Panel** window.
- 3** Click the **Environment** tab.
- 4** Click one of the system variables.
- 5** Change the variable name to "NFWAKEONLAN" and the value to "YES," and click the **Set** button.
- 6** To save the new settings, click **OK**.
- 7** Restart the system.

Automatic power-on startup sequence

The automatic power-on startup sequence settings determine the order in which devices in or attached to your computer will start when your computer is turned on remotely.

To define a sequence:

1 Go to the BIOS Setup Utility menu.

For details → *User's Reference*.

2 Select the **Startup** item.

The “Startup” item submenu appears.

3 Select the **Network** item.

The “Network” item submenu appears.

The device list on the left window applies to the startup sequence.

a) Highlight the device you want to move.

b) Use the + or – to move the device.

4 Press **PF10**.

Note: If you want to initialize the settings, press **PF9** and make the settings again.

Enabling or disabling a Flash (POST/BIOS) update from the network

When a Flash (POST/BIOS) update from the network is enabled, the system programs in your computer can be updated remotely by a network administrator from a management console. The following requirements must be met, however:

Update Flash from network must also be enabled. (See the following steps.)

Your computer must be started over the LAN.

Your computer must be engaged in a remote program load.

Network-management software is required in the remote administrator's computer.

To enable or disable the Flash (POST/BIOS) update from the network setting, do the following:

1 Start the BIOS Setup Utility menu.

For details → *User's Reference*.

2 Select the **CONFIG** item.

The "Config" item submenu appears.

3 Select the **Network** item.

The "Network" item submenu appears.

4 Select either **Enable** or **Disable** beside "Flash Over Lan."

5 Press **PF10**.

System programs:

System programs are the basic layer of software built into every IBM computer. They include the power-on self test (POST), the basic input/output system (BIOS) code, and the Configuration/Setup Utility program. POST is a set of tests and procedures performed every time you switch on your computer. The BIOS is a layer of software that translates instructions from other layers of software into electrical signals that the computer hardware can understand.

In the past, the system programs were stored in a read-only memory (ROM) module on the system board. Generally, the contents of ROM modules cannot be modified once they have been originally programmed. However, a type of nonvolatile memory referred to as electrically erasable programmable ROM (EEPROM) can be reprogrammed while it is in the computer, and has replaced the ROM module on the system board in ThinkPad computers. System programs are stored in a type of EEPROM module referred to as Flash memory. The contents of Flash memory can be easily updated with an update (Flash) diskette. The process of updating system programs is often referred to as "flashing the BIOS."

As part of its continuous efforts to improve quality, IBM might make changes and enhancements to the system programs. When updates are released, they will be made available on the World Wide Web (<http://www.ibm.com/thinkpad>). Instructions for using the system program updates will be available in a README file included in the downloaded files.

If your computer is docked to a docking station in which either IBM 100/10 EtherJet PCI Adapter with Wake on LAN or IBM Auto Wake Token Ring ISA Adapter is installed, the system programs can also be updated remotely when the computer is unattended.

Appendix A. Using PS2 commands

Using PS2 Command

This section describes PS commands. The PS2 commands are subject to change without notice. If you enter a command written in this section and receive an error, type PS2 ? and refer to the online help menu.

You can enter the following PS2 command options from the DOS command prompts on Windows 98, Windows 95, Windows NT, or DOS to set the features for your computer. When entering a command, enter it in the following syntax:

```
PS2 [Parameter1] [Parameter2] [Parameter3]
```

Note: You cannot use the following PS2 commands in the Windows 98 environment:

PRESENTation	HTimer	POwer	DISK
LCd	ON	Timer	DEFAULT

Syntax rules

Refer to these notes when you enter a command.

Syntax	Rule
	Select one of the options on either side of the vertical bar ().
Highlighted	Enter the exact highlighted letters in either uppercase or lowercase.
UPPERCASE	Enter any value within the specified range for the following: XX: 0–20 HH: 0–23 MM: 0–59 SS: 0–59 Note: The MM (minutes) and SS (seconds) parameters are optional. The default values are 0.
lowercase	Command elements in lowercase are optional. For example, entering PS2 SE OF and PS2 SErIal OFF gives the same results.

PS2 commands

The following is a list of commonly used PS2 commands. The descriptions have the following format:

Description of the command

Parameter1	Parameter2	Parameter3
------------	------------	------------

—Or—

Parameter1	Parameter2	Parameter3	Parameter4
------------	------------	------------	------------

Alarm (Sound) command

Set the computer to beep in certain conditions:

BEEP	ON OFf	Alarm System Warn Volume
-------------	-----------------	---------------------------------------

CD-ROM speed

Set the CD-ROM speed

Note: The default is Normal.

CDSPeed	High Normal Silent DEFAULT	—
----------------	-----------------------------------------	---

Configuration commands

Display the interrupt level assignments:

? IRQ	—	—
--------------	---	---

Reserve the IRQ for PCI devices:

PCIIRQ	Disable 3 4 5 7 9 10 11 15	—
---------------	---------------------------------------------	---

Set the startup screen when the computer is powered on:

STARTup	Enable Disable	—
----------------	------------------	---

Display the DMA channel assignments:

? DMA	—	—
--------------	---	---

CPU speed

Set the processor speed:

AC: Specifies CPU speed when the AC Adapter is connected.

DC: Specifies CPU speed when using battery power.

Note: If the AC or DC option is not specified, this command is effective on the current power management mode set by the PM commands.

SPeed	Fixed Auto	MAX Medium Slow Medium Slow
--------------	---------------	---------------------------------------------

Display commands

Set the screen expansion:

HVEXP ansion	ON OF f	—
---------------------	-------------------------	---

Disable the screen blanking function, and the standby and suspend timers:

PRESEN tation	Enable Disable	—
----------------------	--------------------------------	---

Set the brightness control of the LCD:

BR ightness	High Normal	—
--------------------	-----------------------------	---

Set where to display information:

SC reen	LCD CRT BOTH	—
----------------	---------------------------------------	---

Infrared features command

Set the features for the infrared port (IR):

IR	Enable Disable	—
	ADDRESS	1 2 3 4
	DMA	0 1 3 Disable
	IRQ	3 4 5 7
	COMADDRESS	3F8 2F8 3E8 2E8

Keyboard function commands

Set the **Fn** key lock function:

FN sticky	Enable Disable	—
------------------	--------------------------------	---

Set the keyboard typematic speed:

KR ate	Normal Fast	—
---------------	-----------------------------	---

Set the TrackPoint:

TPOint	Enable Disable AUTODisable	—
---------------	---------------------------------------	---

Parallel connector command

Set the features for the parallel connector:

PARallel	Enable Disable ADDRESS MODE DMA IRQ	— 1 2 3 Uni Bi EPP ECP 0 1 3 Enable Disable
-----------------	-------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------

Port replicator or docking station command

Enable or disable suspend mode if you are attaching a port replicator or a docking station to your computer:

DOCK	Nosuspend Suspend	—
-------------	---------------------	---

Power management commands

Enter hibernation mode:

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

HIBernation	—	—
--------------------	---	---

Enter the RediSafe suspend mode:

SAfe	Enable Disable	—
-------------	------------------	---

Enter hibernation mode when the power switch is pressed:

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

HSWITCH	Enable Disable	
----------------	------------------	--

Enter suspend mode:

OFF SUS pend	—	—
-----------------------	---	---

Set whether to enter suspend mode when the LCD is closed:

Cover	Enable Disable	—
--------------	-------------------------	---

Set the timer to enter hibernation mode after the specified number of minutes:

HTimer	0–60	—
---------------	-------------	---

Set the timer to enter hibernation mode from suspend mode after the specified number of minutes:

S2H	30 60 90 Disable	—
------------	-------------------------------	---

Set the timer to enter suspend mode after the specified number of minutes:

POwer	0–60	—
--------------	-------------	---

Set the hard disk drive power management timer for the specified number of minutes:

DISK	0–20	—
-------------	-------------	---

Set the LCD off timer for the specified number of minutes:

LCd	0–60	—
------------	-------------	---

Set the resume timer:

Note: yyyy can be set from 1980 to 2079.

ON	[yyyy/MM/DD] HH:MM:SS Clear	—
-----------	-------------------------------	---

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

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

Timer	Suspend Hibernation	—
--------------	-----------------------	---

Set the power management mode:

AC: Set the power management mode when the AC Adapter is connected.

DC: Set the power management mode when using battery power.

PMode	Performance Battery Custom	[AC DC]
--------------	--------------------------------	-----------

Set `Power`, `LCd`, `DISK`, and `SPeed` to their original values:

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

DEFAULT	—	—
----------------	---	---

Set the power management mode to enter when a low-battery condition occurs:

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

LBattery	Suspend Hibernation	—
-----------------	-----------------------	---

Enable or disable an incoming call:

RI	Enable Disable	—
-----------	------------------	---

Serial connector commands

Set the features for the serial connector:

SERA	Enable Disable ADDRESS	— 1 2 3 4
-------------	------------------------------------	--------------------

Other commands

Display the help menu:

? Help	—	—
----------	---	---

Power off the computer:

TURN	OFF	—
-------------	------------	---

Enable or disable the automatic CPU clock control:

CPUPower	Auto Disable	—
-----------------	----------------	---

Enable or disable the automatic PCI BUS clock control:

PCIBUSPower	Auto Disable	—
--------------------	----------------	---

Set the second IDE device in the UltraBay or docking station:

IDE2	Enable Disable	—
-------------	------------------	---

Appendix B. Using modem commands

Modem commands

This section provides information on the AT modem commands in case you need to operate your modem from the DOS prompt.

Running commands

Your modem is in command mode at power-on and is ready to receive and run AT commands. The modem remains in command mode until it makes a connection with a remote modem. Commands might be sent to the modem from an attached terminal or a PC running a communication program.

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

Command format

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

Example:

ATL[Enter]

This command causes your modem to lower its speaker volume.

AT commands

Command	Function
A	Answers incoming call.

Command	Function
A/	Repeats the preceding command. Note: Do not precede with AT or follow with Enter .
B0	Specifies ITU/CCITT mode @ 1200 bps.
B1	Specifies bell mode @ 1200 bps. (default)
B15	Specifies ITU/CCITT mode @ 300 bps.
B16	Specifies bell mode @ 300 bps. (default)
Dsn	Dials a telephone number <i>n</i> (<i>n</i> =0–9, A–D, #, and *) automatically. You can also assign the following: <ul style="list-style-type: none"> <i>s</i> = L Redials the last number dialed <i>s</i> = P Specifies pulse dial <i>s</i> = T Specifies tone dial (default) <i>s</i> = W Waits for a second dial tone <i>s</i> = V Switches to speakerphone mode <i>s</i> = , Specifies pause <i>s</i> = @ Waits for 5 seconds of silence <i>s</i> = ! Specifies flash <i>s</i> = ; Returns to command mode after dialing
DS=<i>n</i>	Dials one of four stored telephone numbers (<i>n</i> =0–3) in the modem's nonvolatile memory.
E0	Disables command echo.
E1	Enables command echo. (default)
+++	Switches escape characters from data mode to command mode.
H0	Hangs up (modem on-hook). (default)
H1	Makes busy signal (modem off-hook).
I0	Specifies firmware and device ID.
I1	Specifies checksum code.

Command	Function
I2	Starts ROM test.
I3	Specifies firmware and device ID.
L0	Lowers speaker volume.
L1	Lowers speaker volume.
L2	Specifies medium speaker volume. (default)
L3	Raises speaker volume.
M0	Keeps speaker off.
M1	Keeps speaker on until the carrier is detected. (default)
M2	Keeps speaker on.
N0	Disables automode, with the modem handshake speed specified by S37.
N1	Enables automode, with the modem handshake speed specified by S37. (default)
O0	Returns to data mode.
O1	Starts an equalizer retrain and returns to data mode.
P	Specifies pulse dial.
Q0	Enables result codes. (default)
Q1	Disables result codes.
S <i>r</i> ?	Reads S register <i>r</i> , where <i>r</i> =0–110.
S <i>r</i> = <i>n</i>	Sets S register <i>r</i> to value <i>n</i> (<i>r</i> =0–110; <i>n</i> =0–255).
T	Specifies tone dial.
V0	Specifies numeric responses.
V1	Specifies text responses. (default)
X0	Specifies Hayes Smartmodem 300 compatible responses and blind dialing.

Command	Function
X1	Runs X0 and further specifies all CONNECT responses and blind dialing.
X2	Runs X1 and further specifies dial tone detection.
X3	Runs X1 and further specifies busy signal detection and blind dialing.
X4	Specifies all responses and dial tone and busy signal detection. (default)
Z	Resets and recalls the user profile.

Extended AT commands

Command	Function
&C0	Specifies that carrier detect (CD) is always on.
&C1	Turns on CD when the remote carrier is present. (default)
&D0	Ignores DTR signal.
&D1	Returns modem to command mode after DTR toggle.
&D2	Hangs up modem and returns to command mode after DTR toggle. (default)
&D3	Resets modem after DTR toggle.
&F	Loads factory default configuration.
&G0	Disables guard tone. (default)
&G1	Enables 550-Hz guard tone.
&G2	Enables 1800-Hz guard tone.
&M0	Specifies asynchronous operation.
&S0	Keeps DSR on. (default)

Command	Function
&S1	Keeps DSR off in command mode, on in online mode.
&T0	Stops the test in progress.
&T1	Runs local analog loopback.
&T6	Runs remote digital loopback test.
&V	Displays the active profiles.

V.42bis commands

Command	Function
&K0	Disables flow control.
&K3	Enables RTS/CTS hardware flow control (data mode default).
&K4	Enables XON/XOFF software flow control.
&Q0	Asynchronous mode, buffered (same as \N0).
&Q5	Error control mode, buffered (same as \N3). (default)
&Q6	Asynchronous mode, buffered (same as \N0).
%C0	Disables data compression.
%C1	Enables V.42bis/MNP5 data compression.
\N0	Specifies normal mode (speed buffering) only.
\N1	Specifies direct mode only.
\N2	Specifies MNP mode only.
\N3	Specifies V.42/MNP/normal auto-mode. (default)
\N4	Specifies V.42 mode only.
\Q0	Disables flow control (same as &K0).

Command	Function
\Q1	Enables XON/XOFF flow control (same as &K4).
\Q3	Enables RTS/CTS flow control (same as &K3). (default)
\V0	Disables the protocol result code appended to DCE speed.
\V1	Enables the protocol result code appended to DCE speed. (default)

Modem response codes

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

Digital code	Word code	Meaning
0	OK	The command was run without error.
1	Connect	The modem was connected at 300 bits per second (bps).
2	Ring	A ringing signal is detected.
3	No carrier	The carrier is lost or not heard.
4	Error	Error in the command line. Invalid command. Command line exceeds buffer. Invalid character format.
5	Connect 1200EC*	The modem was connected at 1200 bps.
6	No dial tone	There was no dial tone during the timeout period.
7	Busy	The line being called is busy.

Digital code	Word code	Meaning
8	No answer	The line being called did not answer within the timeout period.
10	Connect 2400EC*	The modem was connected at 2400 bps.
11	Connect 4800EC*	The modem was connected at 4800 bps.
12	Connect 9600EC*	The modem was connected at 9600 bps.
13	Connect 14400EC*	The modem was connected at 14400 bps.
14	Connect 19200EC*	The modem was connected at 19200 bps.
18	Connect 57600EC*	The modem was connected at 57600 bps.
24	Connect 7200EC*	The modem was connected at 7200 bps.
25	Connect 12000EC*	The modem was connected at 12000 bps.
28	Connect 38400EC*	The modem was connected at 38400 bps.
40	Connect 300EC*	The modem was connected at 300 bps.
55	Connect 21600EC*	The modem was connected at 21600 bps.
56	Connect 24000EC*	The modem was connected at 24000 bps.
57	Connect 26400EC*	The modem was connected at 26400 bps.
58	Connect 28800EC*	The modem was connected at 28800 bps.

Digital code	Word code	Meaning
59	Connect 31200EC*	The modem was connected at 31200 bps.
60	Connect 33600EC*	The modem was connected at 33600 bps.
70	Connect 32000EC*	The modem was connected at 32000 EC bits/s, 56 K rate.
71	Connect 34000EC*	The modem was connected at 34000 EC bits/s, 56 K rate.
72	Connect 36000EC*	The modem was connected at 36000 EC bits/s, 56 K rate.
73	Connect 38000EC*	The modem was connected at 38000 EC bits/s, 56 K rate.
74	Connect 40000EC*	The modem was connected at 40000 EC bits/s, 56 K rate.
75	Connect 42000EC*	The modem was connected at 42000 EC bits/s, 56 K rate.
76	Connect 44000EC*	The modem was connected at 44000 EC bits/s, 56 K rate.
77	Connect 46000EC*	The modem was connected at 46000 EC bits/s, 56 K rate.
78	Connect 48000EC*	The modem was connected at 48000 EC bits/s, 56 K rate.
79	Connect 50000EC*	The modem was connected at 50000 EC bits/s, 56 K rate.
80	Connect 52000EC*	The modem was connected at 52000 EC bits/s, 56 K rate.
81	Connect 54000EC*	The modem was connected at 54000 EC bits/s, 56K rate.
82	Connect 56000EC*	The modem was connected at 56000 EC bits/s, 56 K rate.

Digital code	Word code	Meaning
86	Connect 16800EC*	The modem was connected at 16800 bps.
87	Connect 115200EC*	The modem was connected at 115200 bps.
88	Delayed	
89	Blacklisted	
90	Blacklist full	
<p>* EC appears only when the extended result codes configuration option (ATV1) is enabled. EC is replaced by one of the following symbols, depending on the error control method used:</p> <p>V.42bis: V.42 error control V.42bis data compression V.42: V.42 error control only MNP 5: MNP class 4 error control and MNP class 5 data compression MNP 4: MNP class 4 error control only NoEC: No error control protocol</p>		

S registers

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

To read the value of an S register, use the `ATSr?` command (*r*=register number 0–110).

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

To change the value of an S register, use the `ATSr=n` command (*r*=register number 0–110, *n*=the new value you want to assign).

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

The following table summarizes the R registers:

Regis	Function	Register/units	Default
S0	Auto-answer ring	0–255/rings	0
S1	Ring counter	0–255/rings	0
S2	Escape code character	0–127/ASCII	43
S3	Carriage return character	0–127/ASCII	13
S4	Line feed character	0–127/ASCII	10
S5	Backspace character	0–127/ASCII	8
S6	Dial tone wait time	2–65/seconds	2
S7	Remote carrier wait time	1–255/seconds	50
S8	Comma pause time	0–65/seconds	2
S10	Carrier loss time	1–254/10ths of a second	20

Regis	Function	Register/units	Default
S11	Touch-tone dialing speed	50–150/milliseconds	95
S12	Escape character detect time	0–255/50ths of a second	50
S28	V.34 modulation enable/disable	0–255/ASCII	1
S35	Data calling tone	0–1/ASCII	0
S37	Connection speed	Bitmapped register	0
S38	K56flex connection speed	0–16	1
S89	Sleep mode timer	0, 5–255	10

Appendix C. Handling the ThinkPad

Handling tips

By using common sense and by following these handling tips, you will get the most use and enjoyment out of your computer for a long time to come.

This section provides tips for handling notebook computers in general. Some descriptions might not suit your situation. Check your shipping checklist to confirm the items you get with your computer.

Notebook computers are precision machines that require a bit of careful handling. Though your 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 subject your computer to physical punishment, such as dropping or bumping.

Do not place heavy objects on your computer.

Do not spill 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. Your LCD might be damaged.

A scratchlike marking on your LCD might be a stain transferred from the keyboard (including from the TrackPoint stick) when the cover was pressed from the outside. Wipe such a stain gently with a dry soft cloth. If the stain remains, moisten the cloth with LCD cleaner and wipe the stain again. Be sure to dry the LCD before closing it.

Do not disassemble your computer. Only an authorized IBM ThinkPad repair technician should disassemble and repair your computer.

Do not scratch, twist, hit, or push the surface of your computer display.

Do not place any objects between the display and 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 move the computer when the hard disk drive is accessing data (when the indicator is blinking).

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, a magnet, a TV, a refrigerator, or large audio speakers.

Do not hard-mount your computer in a vehicle or anywhere that it is subject to strong vibration. See Ruggedized mobile computers for information on a more appropriate model for demanding applications.

Do not crush or drop the external or removable hard disk, diskette, or CD-ROM drive when it is outside your computer.

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

Do not close the CD-ROM tray until you hear the CD-ROM click into the center pivot of the CD-ROM drive.

Do not touch the surface of a compact disc; handle the compact disc only by its edges.

Do not connect the modem to 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 telephone extension lines, so check before connecting the telephone cable in such places.

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. This heat is a function of the level of system activity and battery charge level.

ThinkPad do's

Store your CD-ROM drive in the CD carrying case and the diskette drive in its enclosure.

When installing your hard disk, diskette, or CD-ROM drive, follow the instructions in this online book and apply pressure only where needed on the device.

Treat your computer like a precision piece of electronic machinery.

Retain and store packing materials safely out of reach of children to prevent the risk of suffocation from plastic bags.

Register your ThinkPad products with IBM (refer to the *Setup Guide*). 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.

Check the IBM Web pages by clicking **Notebook & PDA Support** at <http://www.pc.ibm.com/support> periodically to get current information about your computer.

Cleaning your computer

Occasionally clean your computer as follows:

Use a soft cloth moistened with nonalkaline 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.

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. Power off the computer, or enter suspend or hibernation mode; then close the LCD. Make sure the suspend indicator is on when it is in suspend mode, or the power indicator is off when it is powered off or in hibernation mode.
4. Unplug all external cables and cords connected to your computer.
5. Make sure all computer doors and covers are closed.
6. Use a quality carrying case that provides adequate cushion and protection.

Do not move the computer when the hard disk drive is accessing data (when the indicator is blinking). Make sure the indicator is off before you carry the computer.

Extending your computer's 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:

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**
- **Suspend**
- **Hibernation**

For more information  Using the power management modes.

Decrease the LCD brightness.

Use Advanced Power Management (APM). Each operating system comes with its own power management.

Stop the supply of power to the internal serial devices, including the modem, the serial port, and the infrared port, if they are 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.

Ruggedized mobile computers

Some professionals work in environments that may require special ruggedized features to protect their computers from extreme temperature, humidity, and physical punishment. Construction, public service, distribution, repair service, and utilities are some of the environmentally demanding professions that may require rugged mobile computers that can withstand stresses. For these applications, IBM offers such computers (not ThinkPad systems), especially designed for mobile professionals who need a system for managing and communicating information from the field.

For more information on these computers, consult your IBM Business Partner.

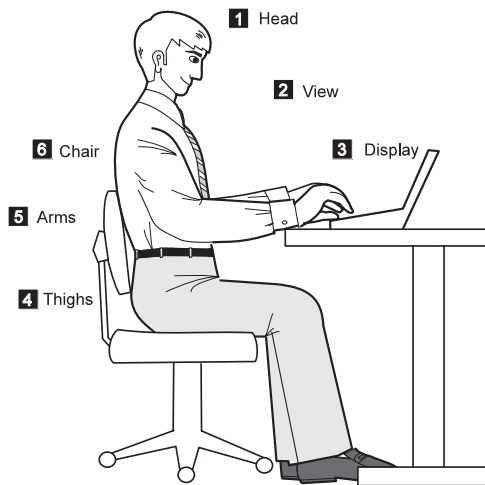
Ergonomics information

This is important information you should read before using your computer in your “virtual office.”

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

Note:

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



1 Head

Keep your head in a comfortable and vertical position.

2 View

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

3 Display

Position the display to avoid glare or reflections from overhead lighting or outside sources of light.

Keep the display screen clean and set the contrast and brightness to levels that allow you to see the screen clearly.

4 Thighs

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

5 Arms

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

6 Chair

Use a chair that gives you good back support.

What if you are traveling?

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

Questions about vision?

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

Appendix D. Getting service

Getting service

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 in the *User's Reference*.

- 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 in the *User's Reference*.

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 the *User's Reference*.

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.

Help at the ThinkPad Web site

You can get support and information at the ThinkPad Web site.

The latest information about the ThinkPad computers

➔ <http://www.ibm.com/thinkpad>

Technical support information

➔ under **Notebook & PDA Support** at
<http://www.pc.ibm.com/support>

IBM may make improvements or changes to these Web sites at any time without any notice.

Help by telephone

You can get support and information by telephone during the limited warranty period at no additional charge, through the IBM PC Help Center. 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 preinstalled operating system

- How to get service

- How to get overnight shipment of customer-replaceable parts

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

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:

Product brochures

Location of IBM resellers

Services available from IBM

ThinkPad EasyServ

ThinkPad *EasyServ* is a courier repair service for IBM mobile products whereby your ThinkPad computer is 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 they arrive 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.

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 Automated Fax System 24 hours a day, 7 days a week. Follow the recorded instructions, and the information that you request will be sent your fax machine.

To access the IBM Automated Fax System, call:

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

Electronic support services

If you have a modem, you can get help from several popular services. Bulletin boards and online information services provide assistance through question-and-answer message areas, live chat rooms, search databases, and more.

Technical information is available on a wide range of topics, such as:

- Hardware setup and configuration
- Preinstalled software
- OS/2, DOS, and Windows
- Networking
- Communication
- Multimedia

In addition, the latest device driver updates are available.

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

To access the BBS, call:

In the U.S., 1-919-517-0001

For Canada, call the center closest to you:

- 514-938-3022 (Montreal)
- 905-316-4255 or 416-956-7877 (Toronto)
- 604-664-6464 (Vancouver)

Commercial online services that have information on IBM products are:

CompuServe:

Use the **GO** word **ThinkPad**.

Prodigy:

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

America Online:

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

You can also 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 get the information by clicking **Notebook & PDA Support** at the following URL:

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

Personalized Web-based PC support provides PC users easy access to online support, including a personalized IBM Web site tailored to their machine type, computing environment, and such individual interests as business applications or games. Once you set up a profile with IBM, you are thereafter greeted by name and presented targeted information selected specifically to meet your particular needs. For example, if you are a corporate ThinkPad user, you might receive information on Microsoft Windows NT and remote connectivity. You can also choose to receive proactive E-mail, alerting you to time-saving hints and tips and such product-specific updates 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 by clicking **Notebook & PDA Support** at:

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

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

The Enhanced PC Support Line 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 for multiple incidents. For more information about purchasing the Enhanced PC Support Line → Ordering support line services.

900-number operating system and hardware support line

In the U.S., if you prefer to obtain technical support on a pay-as-you-go basis, you can use the 900-number support line. This line provides support for IBM PC products whose warranty period has expired.

To access this support, call 1-900-555-CLUB (2582). You will be notified of the charge per minute.

Network and Server Support Line

The Network and Server Support Line includes all the features of the Enhanced PC Support Line and is available for simple and complex networks made up of IBM workstations and servers using major network operating systems. This line also supports the many popular non-IBM adapters and network interface cards.

This service includes technical support for the following:

- 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 Line → Ordering support line services.

Ordering support line services

The Enhanced PC Support Line, the 900-number 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 1-800-426-3395.
- Select the service for which you would like a Supported Products list:
 - 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 1-800-465-3299.

In other regions, 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 regions, contact your IBM reseller or IBM marketing representative.

Warranty and repair services

You can extend your period of ThinkPad EasyServ warranty service.

For information on warranty extensions:

In the U.S., call 1-888-426-4343.

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

In other regions, contact your IBM reseller or IBM marketing representative.

For more details on service offerings in the U.S., refer to the EasyServ information under "ThinkPad" at the following Web site:
<http://www.pc.ibm.com/us/infobrf>

Obtaining IBM operating system updates

IBM provides update diskettes, called ServicePacks 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 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., Canada, and Puerto Rico: call 1-800-879-2755.

In other regions, contact your IBM authorized reseller or IBM marketing representative.

Appendix E. Notices

Edition notice

First Edition (August 1999)

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law:

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS ONLINE BOOK. "AS IS" WITHOUT ANY WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE LIMITED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimers or express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This online book could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the online book. IBM may make improvements or changes in the products or the programs described in this online book at any time.

Requests for technical information about IBM products should be made to your IBM Authorized Dealer or your IBM marketing representative.

Copyright International Business Machines Corporation 1999. All rights reserved. Note to US Government Users – Documentation related to restricted rights – Use, duplication, or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Appendix F. Trademarks

Trademarks

The following terms are trademarks of the IBM Corporation in the United States or other countries or both:

IBM
PS/2
RediSafe

ThinkPad
TrackPoint

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States and/or other countries.

ActionMedia, LANDesk, MMX, Pentium, and ProShare are trademarks of Intel Corporation in the United States and/or other countries. (For a complete list of Intel trademarks, see the <http://www.intel.com/tradmarx.htm>)

Other company, product, or service names may be the trademarks or service marks of others.

Glossary

This glossary includes terms and definitions from the *IBM Dictionary of Computing* (New York: McGraw-Hill, 1994).

ac. Alternating current.

ac power. Power that is supplied to the computer through an electrical outlet.

Advanced Power Management (APM). A facility consisting of one or more layers of software that support power management in computers with power manageable hardware. The APM software interface allows applications, operating systems, device drivers, and the APM BIOS to work together to reduce power consumption, without reducing system performance.

ANSI. American National Standards Institute.

APM. Advanced Power Management.

application program. A program that performs specific tasks on your computer, such as word processing or creating spreadsheets.

ASCII. American National Standard Code for Information Interchange.

ATA PC Card. A PC Card with an AT attachment hard disk drive interface such as a storage device PC Card.

AUTOEXEC.BAT. A file that contains a startup procedure of DOS. Each time you start your system, DOS performs the commands that are stored in this file.

backup copy. A copy, usually of a file or group of files, that is kept in case the original file or files are unintentionally changed or destroyed.

BIOS (Basic Input/Output System). Microcode that contains such basic hardware operations as interactions with

diskette drives, hard disk drives, and the keyboard.

bitmap graphics. (1) A form of graphics in which all points on the display are directly addressable. (2) In multimedia applications, a form of graphics in an area of computer memory or storage that can be displayed as an image.

boot. To prepare a computer system for operation by loading an operating system.

bps. Bits per second. In serial transmission, the instantaneous bit speed with which a device or channel transmits a character.

bus. A facility for transferring data between several devices located between two end points, only one device being able to transmit at a given moment.

cache memory. A special memory, smaller and faster than main memory, that is used to hold a copy of instructions and data in main memory that are likely to be needed next by the processor, and that have been obtained automatically from main memory.

CD-i. Compact disc-interactive.

cold docking. Docking the computer to the docking station when the computer is powered off.

combination keys. Keys that have specific functions when you hold them down at the same time.

CONFIG.SYS. A file that contains a group of commands to load installable device drivers and reserve space in system memory for information processing. This file is referred to by DOS during system startup.

configuration. (1) The manner in which the hardware and software of an

information processing system are organized and interconnected. (2) The physical and logical arrangement of devices and programs that make up a data processing system. (3) The devices and programs that make up a system, subsystem, or network.

CRT. Cathode ray tube display.

device driver. (1) A file that contains the code needed to use an attached device. Operating system loads device drivers for screens, keyboards, printers, diskette drives, hard disk drives, and auxiliary devices. (2) A program that enables a computer to communicate with a specific peripheral device—for example, a printer, a video disc player, or a CD drive. (3) A collection of subroutines that control the interface between I/O device adapters and processors.

DIMM. Dual inline memory module.

directory. A type of file containing the names and controlling information for other files or other directories.

Diskette Factory. The preload program for creating the installation diskettes of the device drivers and the operating system.

DMA. Direct memory access. The transfer of data between memory and input/output units without processor intervention.

docking station. An option to expand the capabilities of the computer by providing additional PC Card slots and connectors.

double-click. To press and release a mouse button twice within a time frame defined by the user, without moving the pointer off the choice.

DRAM. Dynamic random access memory.

DSP. Digital signal processor.

ECP. Extended Capability Port.

EDO DRAM. Enhanced data output dynamic random access memory.

EGA. Enhanced graphics adapter.

EIA. Electronics Industries Association.

EIA-232D. An EIA interface standard that defines the physical, electronic, and functional characteristics of an interface line that connects a communication device and associated workstation. It uses a 25-pin connector and an unbalanced line voltage.

EMS. Expanded memory specification.

FAQ. Frequently asked questions.

fax. (1) Facsimile machine. (2) A transmitted document from a facsimile machine.

FDD. Floppy disk drive, or diskette drive.

fixed disk. In personal computing, *fixed disk* is synonymous with *hard disk*.

Flash memory. Electrically rewritable storage.

folder. A file used to store and organize documents.

fuel gauge. An indicator on the screen that constantly shows the current power status of the battery pack.

HHR. Half-horizontal resolution.

hibernation. One of the power-saving methods that stores data and applications running in the computer's

memory on the hard disk. During hibernation, the computer is automatically turned off to save power. When power is turned on again, the computer immediately restores the same data and applications as when hibernation started, without restarting the operating system.

high-resolution mode. Video resolutions that are greater than 640 by 480 pels.

hot docking. Docking the computer to the docking station when the computer is powered on.

HPA. High performance addressing.

icon. A graphic symbol, displayed on a screen, that a user can point to with a pointing device such as a TrackPoint or mouse to select a particular function or software application.

IDE. Integrated device electronics.

IR. Infrared.

ISA. Industry standard architecture.

ISO. International Organization for Standardization.

JEIDA. Japan Electronics Industry Development Association.

kilobyte (KB). 1024 bytes.

LAN. Local area network.

LCD. Liquid crystal display.

MCI. Media Control Interface.

megabyte (MB). 1024 kilobytes. About 1 million bytes.

memory. Often referred to as random-access memory (RAM), measured in kilobytes (KB) or megabytes (MB) of information.

MHz. Megahertz.

microcode. One or more microinstructions used in a product as an alternative to hard-wired circuitry to implement functions of a processor or other system component.

MIDI. Musical Instrument Digital Interface.

modem. A device that connects your computer to a telephone line, allowing it to communicate with another computer at another location.

parallel connector. A connector used to attach such devices as dot-matrix printers and input/output units; it transmits data 1 byte at a time.

partial suspend mode. A kind of standby mode that occurs if the computer has failed to enter suspend mode. In this mode, the console is locked if the power-on password is set.

password. A series of letters or numbers that you designate to restrict access to your computer.

PC Card. A card that is based on the PC Card standard.

PCMCIA. Personal Computer Memory Card International Association.

pel. Picture element.

Personalization Editor. A feature that helps you to identify your computer when identical computers are being used in your location, or to deter theft.

picture element. In computer graphics, the smallest element of a display surface that can be independently assigned color and intensity.

pixel. Picture element.

pointing device. An instrument, such as a mouse, TrackPoint, or joystick, that is used to move a pointer on the screen.

pop-up menu. On the display screen, a menu that emerges in an upward direction from a particular point or line on a display screen.

port replicator. An option to expand the capabilities of the ThinkPad computer by providing additional connectors.

POST. Power-on self-test.

power mode. A mode of battery operation to conserve power. The ThinkPad computer has three power modes: High Performance, Automatic, and Customize.

prompt. A visual or audible message sent by a program to request the user's response.

PSTN. Public-switched telephone network.

pull-down menu. On the display screen, a menu that emerges in a downward direction from a point or line at or near the top of the screen.

reboot. To restart all operations of the computer as if the power had just been turned on.

resume. To begin computer operations again from suspend mode.

ROM. Read-only memory.

SDRAM. Synchronous dynamic random access memory.

serial connector. A connector used to attach such devices as display devices, letter-quality printers, modems, plotters,

and such pointing devices as light pens and mice; it transmits data 1 bit at a time.

SRAM. Static random access memory.

suspend. To stop all operations of the computer to reduce power drain and restrict access to the files.

SVGA. Super VGA.

TFT. Thin-film transistor.

TrackPoint. The built-in pointing device of the ThinkPad computer.

TSRs. Terminate-and-stay-resident programs, memory-resident programs that are loaded into memory and stay there so you can conveniently access them whenever you need to.

UltraBay II. The ThinkPad 570 bay for installing a CD-ROM drive, a diskette drive, a DVD-ROM drive, or another device.

USB. Universal serial bus.

vertical expansion. A video display technique in character-display mode to fit video images on the whole LCD screen by adjusting the number of character dots vertically.

VESA. Video Electronics Standards Association.

VGA. Video graphics array, a video mode that produces up to 640-by-480 resolution.

VSYNC. Vertical synchronization frequency.

warm docking. Docking the computer to the docking station when the computer is in suspend or hibernation mode.

XMS. Extended memory specification.

Numerics

56-Kbps modem, using 13
900 number support 145

A

America Online 143
APM (advanced power management) 42
Asset ID EEPROM 105
AT commands 119
audio features, using 9
Auto Answer 16
auto-disable, TrackPoint 78
automatic power-on startup sequence 106

B

battery pack
 charging 26
 low-battery condition 28
 maximizing the life 80, 134
 monitoring the power 26
 saving the power 30, 43
 using 26
battery status indicator 26
 second battery 29
Bulletin Board System (BBS) 142

C

CardWizard for Windows 95
 help 57
 PC Card properties 54
 self-check 53
 stopping the PC Card 56
 Wizard button 53
CardWizard for Windows NT 58, 59, 60, 63
 enhanced power management 62
 help 63
 hot swapping the PC Card 61
 PC Card activator 61

CardWizard for Windows NT (*continued*)

 PC Card properties 60
 self-check 59
 stopping the PC Card 63
CardWorks for Windows 95 52
carrying the computer 133
cleaning the computer 133
CompuServe 143
customer support and service 139

D

default IRQ assignments 71
Desktop Management Interface (DMI) 101
DMTF 102
DOS service 147
DVD movie, viewing 18

E

EasyServ 141
electronic bulletin boards 142
Enhanced PC Support Line 144
ergonomics information 135
extended AT commands 122
external monitor
 plug-and-play 79
 setting 78
external mouse
 setting 78

F

fax, help by 142
Fn key function
 Fn + F12 33
 Fn + F3 30
 Fn + F4 31
fuel-gauge program 29

H

handling tips 131

- hard disk password 22
- hibernation mode 33
 - considerations 41
 - enabling 39

I

- IBM Bulletin Board System 142
- infrared port
 - enabling 76
- installing the software 81
 - for Windows 95 88
 - for Windows 98 85
 - for Windows NT 95
- international warranty service certificate 141

L

- LCCM, flash update from network 107
- location settings 6
- low-battery condition 28

M

- mechanical lock 22
- modem
 - features 11
 - response codes 124
 - setting 12

N

- NetFinity service, setup 106
- Network Support Line 145
- Norton Mobile Essentials 6
 - Before You Go, using 7
 - Location Controller, using 8

O

- online services 143
- operating systems, installing
 - Windows 95 88
 - Windows 98 85

- operating systems, installing (*continued*)
 - Windows NT 95
 - OS/2 service 147

P

- password 22
- PC Card
 - 16-bit PC Card 47
 - CardBus Card 48
 - modem card 47
 - network card 47
 - power management 50
 - restrictions and hints 48
 - SCSI card 47
 - storage card 46
 - support software 49
 - suspend mode, using with 40
 - type 46
 - Zoomed Video Card 48
- PC Card support software 49
 - CardWizard for Windows NT 58
 - CardWorks for Windows 95 52
- PC Support Line 144
- Plug and Play mode 52
- power command 42
- power cord, part number 2
- power management 30
- power-on password 22
- Preboot eXecution Environment (PXE) 102
- Prodigy 143
- profile setting 144
- PS2 command 111
- PS2 commands
 - automatic power-saving timer, setting 117
 - beep on/off 112
 - CD-ROM speed, setting 112
 - CPU clock control 118
 - CPU speed, setting 113
 - DMA information 113
 - Fn key lock, setting 114
 - HDD power saving, setting timer 116
 - help menu 118

PS2 commands (*continued*)

- hibernation mode, entering 115
- hibernation mode, setting timer 116
- IDE, setting 118
- infrared, setting 114
- interrupt level, displaying 113
- IRQ for PCI, reserving 113
- LCD brightness, setting 114
- LCD expansion, setting 113
- LCD off, setting timer 116
- LCD type, setting 114
- low-battery power management, setting 117
- parallel connector, setting 115
- PCI BUS clock control 118
- port replicator 115
- power management, setting 117
- power off 118
- RediSafe mode, entering 115
- resume for incoming call, setting 117
- resume, setting timer 116
- screen blanking, setting 114
- serial connector, setting 117
- startup screen, setting 113
- suspend mode, entering 115
- suspend mode, setting timer 116
- TrackPoint, setting 114
- typematic speed, setting 114

publications, ordering 147

R

RediSafe 33

- region code setting 19
- reinstalling software 81
- remote program load (RPL) 102
- resource conflict 65
- restrictions and hints, for PC Card 48
- ruggedized mobile computer 135

S

S registers 127

screen

- setting 76

security features

- mechanical lock 22
- password 22

serial connector

- setting 77

Server Support Line 145

setting

- time and date 1

Setting up system-management features 105

solving resource conflict 65

- BIOS Setup Utility 66
- defaults resource assignments 70
- device manager 66

standby mode 30

stopping a PC Card

- for Windows 95 56
- for Windows NT 63

supervisor password 22

support line 144, 145

suspend mode 31

- considerations 40
- timer 37

system management features 100

System Management BIOS (SMBIOS) 101

T

telephone features 14

telephone, help by 140

ThinkPad Web site, help by 139

U

Universal Management Agent 104

update diskettes, getting 147

V

V.42bis commands 123

volume setting 9

W

- Wake on LAN 103
- waking up from suspend mode 103
- warranty and repair services 146
- Wfm 101
- Windows 95, installing 90
- Windows 98, installing 86
- Windows NT, installing 96