

Quick Reference

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- Important safety information
- Warranty and other notices
- Computer setup
- Software recovery
- Troubleshooting and diagnostics
- Help and Service
- IBM Lotus software offer

ThinkCentre

Quick Reference

Note

Before using this information and the product it supports, be sure to read the following:

- “Important safety information” on page v
- Appendix B, “Lenovo Statement of Limited Warranty,” on page 37
- Appendix D, “Notices,” on page 73

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Important safety information

Note

Please read important safety information first.

This information can help you safely use your desktop or notebook personal computer. Follow and retain all information included with your computer. The information in this document does not alter the terms of your purchase agreement or the Lenovo™ Statement of Limited Warranty in Appendix B, “Lenovo Statement of Limited Warranty,” on page 37.

Customer safety is important. Our products are developed to be safe and effective. However, personal computers are electronic devices. Power cords, power adapters, and other features can create potential safety risks that can result in physical injury or property damage, especially if misused. To reduce these risks, follow the instructions included with your product, observe all warnings on the product and in the operating instructions, and review the information included in this document carefully. By carefully following the information contained in this document and provided with your product, you can help protect yourself from hazards and create a safer computer work environment.

Note: This information includes references to power adapters and batteries. In addition to notebook computers, some products (such as speakers and monitors) ship with external power adapters. If you have such a product, this information applies to your product. In addition, computer products contain a coin-sized internal battery that provides power to the system clock even when the computer is unplugged, so the battery safety information applies to all computer products.

Conditions that require immediate action

Products can become damaged due to misuse or neglect. Some product damage is serious enough that the product should not be used again until it has been inspected and, if necessary, repaired by an authorized servicer.

As with any electronic device, pay close attention to the product when it is turned on. On very rare occasions, you might notice an odor or see a puff of smoke or sparks vent from your product. Or you might hear sounds like popping, cracking, or hissing. These conditions might merely mean that an internal electronic component has failed in a safe and controlled manner. Or, they might indicate a potential safety issue. However, do not take risks or attempt to diagnose the situation yourself. Contact the Customer Support

Center for further guidance. For a list of Service and Support phone numbers, see “Worldwide telephone list” on page 62.

Frequently inspect your computer and its components for damage, wear, or signs of danger. If you have any questions about the condition of a component, do not use the product. Contact the Customer Support Center or the product manufacturer for instructions on how to inspect the product and have it repaired, if necessary.

In the unlikely event that you notice any of the following conditions, or if you have any safety concerns with your product, stop using the product and unplug it from the power source and telecommunication lines until you can speak to the Customer Support Center for further guidance.

- Power cords, plugs, power adapters, extension cords, surge protectors, or power supplies that are cracked, broken or damaged.
- Signs of overheating, smoke, sparks, or fire.
- Damage to a battery (such as cracks, dents, or creases), discharge from a battery, or a buildup of foreign substances on the battery.
- A cracking, hissing, or popping sound, or strong odor that comes from the product.
- Signs that liquid has been spilled or an object has fallen onto the computer product, the power cord, or power adapter.
- The computer product, the power cord, or power adapter has been exposed to water.
- The product has been dropped or damaged in any way.
- The product does not operate normally when you follow the operating instructions.

Note: If you notice these conditions with a product (such as an extension cord) that is not manufactured for or by Lenovo, stop using that product until you can contact the product manufacturer for further instructions, or until you get a suitable replacement.

General safety guidelines

Always observe the following precautions to reduce the risk of injury and property damage.

Service and upgrades

Do not attempt to service a product yourself unless instructed to do so by the Customer Support Center. Use only a service provider who is approved to repair your particular product.

Note: Some computer parts can be upgraded or replaced by the customer. Upgrades typically are referred to as options. Replacement parts approved for customer installation are referred to as Customer Replaceable Units, or CRUs. Lenovo provides documentation with instructions when it is appropriate for customers to install options or replace CRUs. You must closely follow all instructions when installing or replacing parts. The Off state of a power indicator does not necessarily mean that voltage levels inside a product are zero. Before you remove the covers from a product equipped with an ac power cord, always make sure that the power is turned off and that the product is unplugged from any power source. For more information on CRUs, refer to Appendix C, “Customer Replacement Units (CRUs),” on page 71. If you have any questions or concerns, contact the Customer Support Center.

Although there are no moving parts in your computer after the power cord has been disconnected, the following warnings are required for your safety.

Danger



Hazardous moving parts. Keep fingers and other body parts away.

Attention



Before replacing any CRUs, turn off the computer and wait three to five minutes to let the computer cool before opening the cover.

Static electricity prevention

Static electricity, although harmless to you, can seriously damage computer components and options. Improper handling of static-sensitive parts can cause

damage to the part. When you unpack an option or CRU, do not open the static-protective package containing the part until the instructions direct you to install it.

When you handle options or CRUs, or perform any work inside the computer, take the following precautions to avoid static-electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully. Handle adapters, memory modules, and other circuit boards by the edges. Never touch exposed circuitry.
- Prevent others from touching components.
- When you install a static-sensitive option or CRU, touch the static-protective package containing the part to a metal expansion-slot cover or other unpainted metal surface on the computer for at least two seconds. This reduces static electricity in the package and your body.
- When possible, remove the static-sensitive part from the static-sensitive packaging and install the part without setting it down. When this is not possible, place the static-sensitive packaging on a smooth, level surface and place the part on it.
- Do not place the part on the computer cover or other metal surface.

Power cords and power adapters

Use only the power cords and power adapters supplied by the product manufacturer.

The power cords shall be safety approved. For Germany, it shall be H05VV-F, 3G, 0.75 mm², or better. For other countries, the suitable types shall be used accordingly.

Never wrap a power cord around a power adapter or other object. Doing so can stress the cord in ways that can cause the cord to fray, crack, or crimp. This can present a safety hazard.

Always route power cords so that they will not be walked on, tripped over, or pinched by objects.

Protect power cords and power adapters from liquids. For instance, do not leave your power cord or power adapter near sinks, tubs, toilets, or on floors that are cleaned with liquid cleansers. Liquids can cause a short circuit, particularly if the power cord or power adapter has been stressed by misuse. Liquids also can cause gradual corrosion of power cord terminals and/or the connector terminals on a power adapter, which can eventually result in overheating.

Always connect power cords and signal cables in the correct order and ensure that all power cord connectors are securely and completely plugged into receptacles.

Do not use any power adapter that shows corrosion at the ac input pins or shows signs of overheating (such as deformed plastic) at the ac input or anywhere on the power adapter.

Do not use any power cords where the electrical contacts on either end show signs of corrosion or overheating or where the power cord appears to have been damaged in any way.

Extension cords and related devices

Ensure that extension cords, surge protectors, uninterruptible power supplies, and power strips that you use are rated to handle the electrical requirements of the product. Never overload these devices. If power strips are used, the load should not exceed the power strip input rating. Consult an electrician for more information if you have questions about power loads, power requirements, and input ratings.

Plugs and outlets

If a receptacle (power outlet) that you intend to use with your computer equipment appears to be damaged or corroded, do not use the outlet until it is replaced by a qualified electrician.

Do not bend or modify the plug. If the plug is damaged, contact the manufacturer to obtain a replacement.

Do not share an electrical outlet with other home or commercial appliances that draw large amounts of electricity; otherwise, unstable voltage might damage your computer, data, or attached devices.

Some products are equipped with a three-pronged plug. This plug fits only into a grounded electrical outlet. This is a safety feature. Do not defeat this safety feature by trying to insert it into a non-grounded outlet. If you cannot insert the plug into the outlet, contact an electrician for an approved outlet adapter or to replace the outlet with one that enables this safety feature. Never overload an electrical outlet. The overall system load should not exceed 80 percent of the branch circuit rating. Consult an electrician for more information if you have questions about power loads and branch circuit ratings.

Be sure that the power outlet you are using is properly wired, easily accessible, and located close to the equipment. Do not fully extend power cords in a way that will stress the cords.

Be sure that the power outlet provides the correct voltage and current for the product you are installing.

Carefully connect and disconnect the equipment from the electrical outlet.

External devices

Do not connect or disconnect any external device cables other than USB and 1394 cables while the computer power is on; otherwise, you might damage your computer. To avoid possible damage to attached devices, wait at least five seconds after the computer is shut down to disconnect external devices.

Batteries

All personal computers manufactured by Lenovo contain a non-rechargeable coin cell battery to provide power to the system clock. In addition many mobile products, such as notebook computers, utilize a rechargeable battery pack to provide system power when in portable mode. Batteries supplied by Lenovo for use with your product have been tested for compatibility and should only be replaced with approved parts.

Never attempt to open or service any battery. Do not crush, puncture, or incinerate batteries or short circuit the metal contacts. Do not expose the battery to water or other liquids. Only recharge the battery pack strictly according to instructions included in the product documentation.

Battery abuse or mishandling can cause the battery to overheat, which can cause gasses or flame to “vent” from the battery pack or coin cell. If your battery is damaged, or if you notice any discharge from your battery or the buildup of foreign materials on the battery leads, stop using the battery and obtain a replacement from the battery manufacturer.

Batteries can degrade when they are left unused for long periods of time. For some rechargeable batteries (particularly Lithium Ion batteries), leaving a battery unused in a discharged state could increase the risk of a battery short circuit, which could shorten the life of the battery and can also pose a safety hazard. Do not let rechargeable Lithium-Ion batteries completely discharge or store these batteries in a discharged state.

Heat and product ventilation

Computers generate heat when turned on and when batteries are charging. Notebook PCs can generate a significant amount of heat due to their compact size. Always follow these basic precautions:

- Do not leave the base of your notebook 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 produces some heat during normal operation. Extended contact with the body could cause discomfort or, potentially, a skin burn.

- Do not operate your computer or charge the battery near flammable materials or in explosive environments.
- Ventilation slots, fans, and/or heat sinks are provided with the product for safety, comfort, and reliable operation. These features might inadvertently become blocked by placing the product on a bed, sofa, carpet, or other flexible surface. Never block, cover or disable these features.

You should inspect your desktop computer for dust accumulation at least once every three months. Before inspecting your computer, turn off the power and unplug the computer's power cord from the electrical outlet; then remove any dust from vents and perforations in the bezel. If you notice external dust accumulation, you should also examine and remove dust from the inside of the computer including heat sink inlet fins, power supply vents, and fans. Always turn off and unplug the computer before opening the cover. If possible, avoid operating your computer within 2 feet of high-traffic areas. If you must operate your computer in or near a high-traffic area, you should inspect and, if necessary, clean your computer more frequently.

For your safety and to maintain optimum computer performance, always follow these basic precautions with your desktop computer:

- Keep the cover closed whenever the computer is plugged in.
- Regularly inspect the outside of the computer for dust accumulation.
- Remove dust from vents and any perforations in the bezel. More frequent cleanings might be required for computers in dusty or high-traffic areas.
- Do not block or restrict airflow into the front of the computer.
- Do not block the airflow vents on the back of the computer.
- Do not store or operate your computer inside furniture, as this might increase the risk of overheating.
- Airflow temperatures into the computer should not exceed 35° C (95° F).
- Do not use non-desktop air filtration devices.

Operating environment

The optimal environment in which to use your computer is 10°C-35°C (50°F-95°F) with humidity ranging between 35% and 80%. If your computer is stored or transported in temperatures less than 10°C (50°F), allow the cold computer to rise slowly to an optimal operating temperature of 10°C-35°C (50°F-95°F) before use. This process could take two hours in extreme conditions. Failure to allow your computer to rise to an optimal operating temperature before use could result in irreparable damage to your computer.

If possible, place your computer in a well-ventilated and dry area without direct exposure to sunshine.

Keep electrical appliances such as an electric fan, radio, high-powered speakers, air conditioner, and microwave oven away from your computer because the strong magnetic fields generated by these appliances can damage the monitor and data on the hard disk drive.

Do not place any beverages on top of or beside the computer or other attached devices. If liquid is spilled on or in the computer or an attached device, a short circuit or other damage might occur.

Do not eat or smoke over your keyboard. Particles that fall into your keyboard can cause damage.

Electrical current safety information

Danger

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **To prevent possible shock hazard, do not use your computer during a lightning storm.**
- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To connect: <ol style="list-style-type: none">1. Turn everything OFF.2. First, attach all cables to devices.3. Attach signal cables to connectors.4. Attach power cords to outlet.5. Turn device ON.	To disconnect: <ol style="list-style-type: none">1. Turn everything OFF.2. First, remove power cords from outlet.3. Remove signal cables from connectors.4. Remove all cables from devices.
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Lithium battery notice

Caution
Danger of explosion if battery is incorrectly replaced.

When replacing the battery, use only the same or an equivalent type battery recommended by the manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

The following statement applies to users in the state of California, U.S.A.

Perchlorate material: Special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

Modem safety information

Caution
To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

To reduce the risk of fire, electrical shock, or injury when using telephone equipment, always follow basic safety precautions, such as:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

Laser compliance statement

Some personal computer models are equipped from the factory with a CD-ROM drive or a DVD-ROM drive. CD-ROM drives and DVD-ROM drives are also sold separately as options. CD-ROM drives and DVD-ROM drives are laser products. These drives are certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, these drives are certified to conform to the requirements of the International Electrotechnical Commission (IEC) 60825 and CENELEC EN 60 825 for Class 1 laser products.

When a CD-ROM drive or a DVD-ROM drive is installed, note the following handling instructions.

Caution

Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

Do not remove the drive covers. Removing the covers of the CD-ROM drive or DVD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive or DVD-ROM drive.

Some CD-ROM drives and DVD-ROM drives contain an embedded Class 3A or Class 3B laser diode. Note the following statement.

Danger

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Power supply statement

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Data safety

Do not delete unknown files or change the name of files or directories that were not created by you; otherwise, your computer software might fail to work.

Be aware that accessing network resources can leave your computer vulnerable to computer viruses, hackers, spyware, and other malicious activities that might damage your computer, software, or data. It is your responsibility to ensure that you have adequate protection in the form of firewalls, antivirus software, and anti-spyware software and keep this software up to date.

Cleaning and maintenance

Keep your computer and workspace clean. Shut down the computer and then disconnect the power cord before cleaning the computer. Do not spray any liquid detergent directly on the computer or use any detergent containing flammable material to clean the computer. Spray the detergent on a soft cloth and then wipe the computer surfaces.

Additional safety information

Plastic bags can be dangerous. Keep plastic bags away from babies and children to avoid danger of suffocation.

Additional help

This *Quick Reference* provides the information for installing your computer and starting the operating system. This publication also includes basic troubleshooting information, software recovery procedures, help and service information, and warranty information.

The *User Guide* for your computer has information about installing optional hardware. This Portable Document Format (PDF) file is available through Access Help by clicking on the ThinkVantage™ Productivity Center icon on your computer desktop. Use Adobe Acrobat Reader to view your *User Guide* or print it before installing optional hardware.

The ThinkVantage Productivity Center program also provides information to help you learn more about the following topics:

- Using your computer
- Installing hardware options
- Connecting communication cables
- Troubleshooting common problems
- Registering your computer

You can start the ThinkVantage Productivity Center program by clicking the icon on your desktop, or by clicking **start-> All Programs ->ThinkVantage**.

If you have Internet access, the most current information for your computer is available from the World Wide Web at <http://www.lenovo.com/think/support>.

You can find the following information on this Web site:

- CRU removal and installation instructions
- Publications
- Troubleshooting information
- Parts information
- Downloads and drivers
- Links to other useful sources of information
- Phone support list

Chapter 1. Arranging your workspace

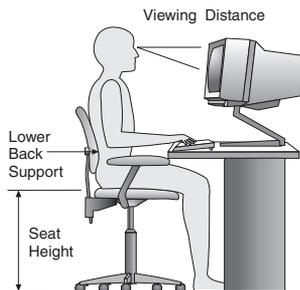
To get the most from your computer, arrange both the equipment you use and your work area to suit your needs and the kind of work you do. Your comfort is of foremost importance, but light sources, air circulation, and the location of electrical outlets also can affect the way you arrange your workspace.

Comfort

Although no single working position is ideal for everyone, here are a few guidelines to help you find a position that suits you best.

Sitting in the same position for a long time can cause fatigue. A good chair can make a big difference. The backrest and seat should adjust independently and provide good support. The seat should have a curved front to relieve pressure on the thighs. Adjust the seat so that your thighs are parallel to the floor and your feet are either flat on the floor or on a footrest.

When using the keyboard, keep your forearms parallel to the floor and your wrists in a neutral, comfortable position. Try to keep a light touch on the keyboard and your hands and fingers relaxed. You can change the angle of the keyboard for maximum comfort by adjusting the position of the keyboard feet.



Adjust the monitor so the top of the screen is at, or slightly below, eye level. Place the monitor at a comfortable viewing distance, usually 51 to 61 cm (20 to 24 in.), and position it so you can view it without having to twist your body. Also position other equipment you use regularly, such as the telephone or a mouse, within easy reach.

Glare and lighting

Position the monitor to minimize glare and reflections from overhead lights, windows, and other light sources. Even reflected light from shiny surfaces can cause annoying reflections on your monitor screen. Place the monitor at right

angles to windows and other light sources, when possible. Reduce overhead lighting, if necessary, by turning off lights or using lower wattage bulbs. If you install the monitor near a window, use curtains or blinds to block the sunlight. You might have to adjust the Brightness and Contrast controls on the monitor as the room lighting changes throughout the day.

Where it is impossible to avoid reflections or to adjust the lighting, an antiglare filter placed over the screen might be helpful. However, these filters might affect the clarity of the image on the screen; try them only after you have exhausted other methods of reducing glare.

Dust buildup compounds problems associated with glare. Remember to clean your monitor screen periodically using a soft cloth moistened with a nonabrasive liquid glass cleaner.

Air circulation

Your computer and monitor produce heat. The computer has a fan that pulls in fresh air and forces out hot air. The monitor lets hot air escape through vents. Blocking the air vents can cause overheating, which might result in a malfunction or damage. Place the computer and monitor so that nothing blocks the air vents; usually, 51 mm (2 in.) of air space is sufficient. Also, make sure the vented air is not blowing on someone else.

Electrical outlets and cable lengths

The location of electrical outlets and the length of power cords and cables that connect to the monitor, printer, and other devices might determine the final placement of your computer.

When arranging your workspace:

- Avoid the use of extension cords. When possible, plug the computer power cord directly into an electrical outlet.
- Keep power cords and cables neatly routed away from walkways and other areas where they might get kicked accidentally.

For more information about power cords, see Appendix D, “Notices,” on page 73 of this book.

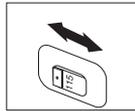
Chapter 2. Setting up your computer

Note: Your computer might not have all of the connectors that are described in this chapter.

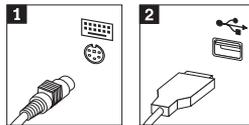
Use the following information when setting up your computer. Look for the small connector icons on the back of your computer.

If your computer cables and connector panel have color-coded connectors, match the color of the cable end with the color of the connector. For example, match a blue cable end with a blue connector, a red cable end with a red connector.

1. Check the position of the voltage-selection switch on the rear of the computer. Use a ballpoint pen to slide the switch, if necessary.
 - If the voltage supply range is 100–127 V ac, set the switch to 115 V.
 - If the voltage supply range is 200–240 V ac, set the switch to 230 V.

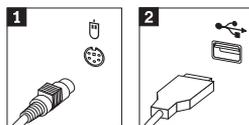


2. Your keyboard cable might have a standard keyboard connector **1** or a Universal Serial Bus (USB) connector **2**. Connect the keyboard cable to the appropriate keyboard connector.



Note: Some models will have keyboards with a fingerprint reader. See the ThinkVantage Productivity Center program for more information.

3. Your mouse cable might have a standard mouse connector **1** or a USB connector **2**. Connect the mouse cable to the appropriate mouse connector.



4. Connect the monitor cable to the monitor connector on the computer.

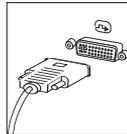
- If you have a Standard Video Graphics Array (SVGA) monitor, connect the cable to the connector as shown.

Note: If your model has two monitor connectors, be sure to use the connector on the accelerated graphics port (AGP) adapter.

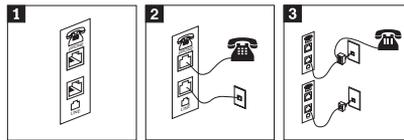


- If you have a digital video interface (DVI) monitor, connect the cable to the connector as shown.

Note: Your computer must have an adapter installed that supports the DVI monitor.

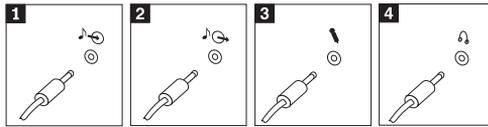


5. If you have a modem, connect the modem using the following instructions.



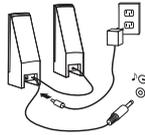
- 1** This illustration shows the two connections on the back of the computer to set up your modem.
- 2** This illustration shows how modem connections are made in the United States and other countries or regions that use the RU-11 telephone outlet. Attach one end of the telephone cable to the telephone and the other end to the telephone connector on the back of the computer. Attach one end of the modem cable to the modem connector on the back of the computer and the other end to the telephone outlet.
- 3** In countries or regions that do not use RU-11 telephone outlets, a splitter or converter is required to attach the cables to the telephone outlet, as shown at the top of this illustration. You also can use the splitter or converter without the telephone, as shown at the bottom of the illustration.

6. If you have audio devices, attach them using the following instructions. For more information about speakers, see steps 7 and 8.

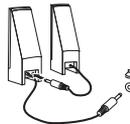


- 1** Audio line-in This connector receives audio signals from an external audio device, such as a stereo system.
- 2** Audio line-out This connector sends audio signals from the computer to external devices, such as powered stereo speakers.
- 3** Microphone Use this connector to attach a microphone to your computer when you want to record sound or if you use speech-recognition software.
- 4** Headphone Use this connector to attach headphones to your computer when you want to listen to music or other sounds without disturbing anyone. This connector might be located on the front of the computer.

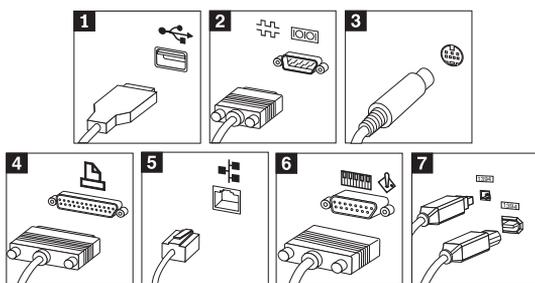
7. If you have *powered* speakers with an ac adapter, use the following instructions.



- a. Connect the cable that runs between the speakers, if necessary. On some speakers, this cable is permanently attached.
 - b. Connect the ac adapter cable to the speaker.
 - c. Connect the speakers to the computer.
 - d. Connect the ac adapter to the ac power source.
8. If you have *unpowered* speakers with no ac adapter, use the following instructions.



- a. Connect the cable that runs between the speakers, if necessary. On some speakers, this cable is permanently attached.
 - b. Connect the speakers to the computer.
9. Connect any additional devices that you have. Your computer might not have all connectors that are shown.



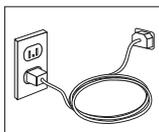
- 1** USB Use these connectors to attach a device that requires a Universal Serial Bus (USB) connection, such as a mouse, scanner, printer, or personal digital assistant (PDA).
- 2** Serial Use this connector to attach an external modem, serial printer, or other device that uses a 9-pin serial connector.
- 3** S-video Use this connector to attach a television set that has an S-Video connector. This connector is present on some high-performance video adapters.
- 4** Parallel Use this connector to attach a parallel printer or any other device that requires a 25-pin parallel connection.
- 5** Ethernet Use this connector to attach the computer to an Ethernet-type local area network or to a cable modem.

Important

To operate the computer within FCC limits when it is connected to an Ethernet network, use a Category 5 Ethernet cable.

- 6** MIDI/joystick Use this connector to attach a joystick, gamepad, or a musical instrument digital interface (MIDI) device such as a MIDI keyboard.
- 7** IEEE 1394 This connector is sometimes called Firewire because it transmits data rapidly. There are two types of IEEE 1394 connectors: the 4-pin and the 6-pin. IEEE 1394 offers connection to several types of consumer electronics, including digital audio devices and scanners.

10. Connect the power cords to properly grounded electrical outlets.



Note: For more information about connectors, see the ThinkVantage Productivity Center program on your computer desktop.

Turning on power

Turn on the monitor and other external devices first, and then turn on the computer. When the power-on self-test (POST) is finished, the logo window closes. If your computer has preinstalled software, the software installation program starts.

If you experience any problems during startup, see Chapter 5, “Troubleshooting and diagnostics,” on page 25 and Chapter 4, “Getting information, help, and service,” on page 21.

Finishing the software installation

Important

Read the license agreements carefully before using the programs on this computer. These agreements detail your rights, obligations, and warranties for the software on this computer. By using these programs, you accept the terms of the agreements. If you do not accept the agreements, do not use the programs. Instead, promptly return the entire computer for a full refund.

Note: Some models might have a multilingual version of Microsoft® Windows® XP Pro preinstalled. If your computer has the multilingual version, you will be prompted to choose a language during the initial installation process. After installation, the language version can be changed through the Windows Control Panel.

After you start the computer for the first time, follow the instructions on the screen to complete the software installation. If you do not complete the software installation the first time the computer is turned on, unpredictable results might occur. When the installation is complete, click **ThinkVantage Productivity Center** icon on your desktop then click **Access Help** to learn more about your computer.

Completing important tasks

After you have set up your computer, perform the following tasks, which will save you time and trouble later:

- Create a *diagnostics* diskette. The diagnostics tool can isolate hardware problems and is part of the Product Recovery program. Making a *diagnostics* diskette ahead of time assures that you will be able to use the diagnostics tool if the Product Recovery program becomes inaccessible. See “Creating Diagnostics diskettes” on page 28.

- Record your computer machine type, model, and serial number. If you need service or technical support, you will probably be asked for this information. See “Recording your computer information” on page 10.

Keep this *Quick Reference* in a safe place. It is the only publication that has important information about reinstalling factory-installed software. Chapter 3, “Recovering software,” on page 13 contains the information about recovering factory-installed software.

Updating your operating system

Microsoft makes updates available for various operating systems through the Microsoft Windows Update Web site. The Web site automatically determines what Windows updates are available for your specific computer and lists those updates only. Updates could include security fixes, new versions of Windows components (such as media player), fixes to other portions of the Windows operating system, or enhancements.

For details about updating your operating system, refer to the ThinkVantage Productivity Center program.

Installing other operating systems

If you install your own operating system, follow the instructions that come with your operating-system CDs or diskettes. Remember to install all device drivers after you install your operating system. Installation instructions are usually provided with the device drivers.

Creating a a secure environment

Creating a secure environment enables you to recover if your power-on or hard-disk-drive passwords are lost or forgotten. However, creating the secure environment does not help you recover from forgotten Windows passwords, or passwords associated with the Rescue and Recovery workspace. By creating this environment, you are adding an additional bootable device to the Startup Device Menu, from which you can reset or erase your forgotten hardware passwords.

To access the Startup Device Menu, turn on your computer and press F12. You must set an Administrator or Supervisor password before you can create a secure environment.

Note: It is a good idea to print the Creating a secure environment procedure and save it in a safe place for future reference.

You can only reset or erase a hardware password if you have installed, enabled, and enrolled your secure environment. After you create a secure environment, you can use the Password Reset Service to reset or erase a hardware password.

Note: It is a good idea to print the Resetting or erasing hardware passwords procedure and save it in a safe place for future reference.

For more details about creating a secure environment, click on the **ThinkVantage Productivity Center** icon on your desktop. Then click on **Access Help**.

Updating your antivirus software

Your computer comes with the Symantec Client Security software you can use to detect and eliminate viruses. You should run the LiveUpdate application to get the latest updates from the Symantec Client Security Web site. LiveUpdate will download the latest virus list and Symantec Client Security will use the new list when it scans your computer the next time.

For more details about updating your antivirus software, click on the **ThinkVantage Productivity Center** icon on your desktop. Then click on **Access Help**.

Starting the Setup Utility

The Setup Utility enables you to view, set, or change BIOS configuration settings and passwords.

1. Shut down the operating system and turn off your computer.
2. While turning on your computer, repeatedly press and release the F1 key to enter the Setup Utility.

Note: If a password has been set, the Setup Utility program menu is not displayed until you type your password. For more information on the Setup Utility program, see your *User Guide*.

In some cases the Setup Utility starts automatically when POST detects that hardware has been removed from or new hardware has been installed in your computer.

Shutting down the computer

When you are ready to turn off your computer, always follow the shutdown procedure for your operating system. This prevents the loss of unsaved data or damage to your software programs. To shut down the Microsoft Windows operating system select Shut down or Turn off computer from the Start menu.

Recording your computer information

Recording information about your computer can be helpful if you ever need to have your computer serviced. The service technician will probably ask you for this information.

The machine type, model, and serial number are labeled on your computer. Use the following table to record this information.

Product name	_____
Machine type and model	_____
Serial number (S/N)	_____
Date of purchase	_____

You can register your computer over the Internet at the following Web site:

<http://www.lenovo.com/register>

When you register your computer, you will receive the following benefits:

- Faster service when you call for help
- Automatic notification of free software and special promotional offers

For more information about registering your computer, refer to the Access Help in the ThinkVantage Productivity Center program.

Chapter 3. Recovering software

The ThinkVantage™ Rescue and Recovery™ program provides an environment that runs independently of the Windows operating system and is hidden from the Windows operating system. Because the Rescue and Recovery workspace is hidden, it is immune from most virus attacks and provides a safe place to perform rescue and recovery operations that might not be possible in the Windows environment. This chapter will help you become familiar with the following recovery solutions provided by the Rescue and Recovery program installed on your computer:

- Create Product Recovery discs. See “Creating and using product recovery discs.”
- Create rescue media. See “Creating and using rescue media” on page 18.
- Back up your hard disk periodically. See “Backup and recovery” on page 14.
- Create a Recovery Repair diskette. See “Solving recovery problems” on page 17.

Note: The rescue disc, first disc of the Product Recovery discs and backup discs are startable (bootable). They can be started in any type of CD or DVD drive except for a DVD-RAM media.

If you encounter a problem, you can use the recovery tools from either the Windows environment or from the Rescue and Recovery workspace to do one of the two recovery operations:

- Rescue files
- Restore your backups

See “Using the rescue and recovery workspace” on page 15 to perform one of the two recovery operations.

See the ThinkVantage Productivity Center program for additional information about the Rescue and Recovery program.

Creating and using product recovery discs

If your computer is equipped with a recordable CD or DVD drive, you can create a set of Product Recovery discs that enables you to restore the contents of the hard disk to the same state as when the computer was originally shipped from the factory. Product Recovery discs are useful if you transfer the computer to another area, sell the computer, recycle the computer, or as a last resort put the computer in an operational state after all other methods of recovery have failed. It is a good idea to create a set of Product Recovery discs as soon as possible.

Note: Your Microsoft Windows license permits you to create only one set of Product Recovery discs, so it is important that you store the discs in a safe place after you make them.

To create Product Recovery discs, do the following:

1. From the Windows desktop, click **Start**, click **Create Recovery Media**, then select **Create a set of Product Recovery discs now**.
2. Follow the instructions on the screen.

To use Product Recovery discs, do the following:

Attention: When you restore the factory contents from the Product Recovery discs, all files currently on the hard disk will be deleted and replaced by the original factory contents. During the restore process, you will be given the opportunity to save one or more files currently on your hard disk drive to other media before any data is removed.

1. Insert the Rescue and Recovery disc into your CD or DVD drive.
2. Restart your computer.
3. After a short delay, the Rescue and Recovery workspace opens.

Note: If the Rescue and Recovery workspace fails to open, you might not have your startup device (CD drive or DVD drive) set correctly in your BIOS startup sequence. See “Setting a rescue device in the startup sequence” on page 20 for more information.

4. In the Rescue and Recovery menu, click **Restore your system**.
5. Click **Restore my hard drive to the original factory state** and then click **Next**.
6. Follow the instructions on the screen. Insert the appropriate Product Recovery disc when prompted.

Note: After restoring your hard disk to the original factory content, you might have to reinstall some software or drivers. See “Post-recovery notes” on page 17 for details.

Backup and recovery

The Rescue and Recovery program enables you to back up your complete hard disk contents including the operating system, data files, application programs, and personal settings. You can designate where the Rescue and Recovery program stores the backup:

- On a protected area of your hard disk
- On a second hard disk installed in your computer
- On an externally attached USB hard disk

- On a network drive
- On recordable CDs or DVDs (a recordable CD or DVD drive is required for this option)

After you have backed up your hard disk, you can restore the complete contents of the hard disk, restore selected files only, or restore only the Windows operating system and applications.

To perform a backup operation, do the following:

1. From the Windows desktop, click **Start**, click **All Programs**, click **ThinkVantage**, then click **Rescue and Recovery**. The Rescue and Recovery program opens.
2. In the menu bar, click **Create and view backups**.
3. Follow the instructions on the screen.

To perform a restore operation from Rescue and Recovery, do the following:

1. From the Windows desktop, click **Start**, click **All Programs**, click **ThinkVantage**, then click **Rescue and Recovery**. The Rescue and Recovery program opens.
2. In the menu **Restore your system** bar, do one of the following:
 - Click **Restore your system from a backup** if you want to restore your hard disk to a previously backed-up state or to restore only the Windows operating system and applications.
 - Click **Restore individual files** if you want to restore only selected files from your backup.
3. Follow the instructions on the screen.

For information about performing a restore operation from the Rescue and Recovery workspace, see “Using the rescue and recovery workspace.”

Using the rescue and recovery workspace

The Rescue and Recovery workspace resides in a protected, hidden area of your hard disk that operates independently from the Windows operating system. This enables you to perform recovery operations even if the Windows operating system cannot be started. You can perform the following recovery operations from the Rescue and Recovery workspace:

- **Rescue files from your hard disk or from a backup:** The Rescue and Recovery workspace enables you to locate files on your hard disk and transfer them to a network drive or other recordable media such as a USB hard disk drive or a diskette. This solution is available even if you did not back up your files or if changes were made to the files since your last

backup operation. You also can rescue individual files from a Rescue and Recovery backup located on your local hard disk, a USB device, or a network drive.

- **Restore your hard disk from Rescue and Recovery backup:** Once you perform a backup operation using the Rescue and Recovery program, you can perform restore operations from the Rescue and Recovery workspace, even if you cannot start Windows.
- **Restore your hard disk to the factory contents:** The Rescue and Recovery workspace enables you to restore the complete contents of your hard disk to the same state as it was when originally shipped from the factory. If you have multiple partitions on your hard disk, you have the option to restore the factory contents to the C: partition and leave the other partitions intact. Because the Rescue and Recovery workspace operates independently from the Windows operating system, you can restore the factory contents even if you cannot start Windows.

Attention: If you restore the hard disk from a Rescue and Recovery backup or restore the hard disk to the factory contents, all files on the primary hard disk partition (usually drive C) will be deleted in the recovery process. If possible, make copies of important files. If you are unable to start Windows, you can use the Rescue files feature in the Rescue and Recovery workspace to copy files from your hard disk to other media.

To start the Rescue and Recovery workspace, do the following:

1. Turn off your computer for at least 5 seconds.
2. Repeatedly press and release the Enter or F11 key as you turn on your computer.
3. When you hear beeps or see a logo screen, stop pressing the Enter or F11 key.
4. If you set a Rescue and Recovery password, type your password when prompted. The Rescue and Recovery workspace opens after a short delay.

Note: If the Rescue and Recovery workspace fails to open, see “Solving recovery problems” on page 17.

5. Do one of the of the following:
 - To rescue files from your hard disk or from a backup, click **Rescue files**; then, follow the instructions on the screen.
 - To restore your hard disk from a Rescue and Recovery backup or to restore your hard drive to the factory contents, click **Restore your system**; then, follow the instructions on the screen.

Note: After restoring your hard disk to the original factory content, you might have to reinstall some software or drivers. See “Post-recovery notes” on page 17 for details.

- For information about other features of the Rescue and Recovery workspace, click **Help**.

Post-recovery notes

Notes:

1. After restoring a hard disk to the original factory contents you might have to reinstall device drivers for some devices. See “Recovering or installing device drivers” on page 19.
2. Some computers come with Microsoft Office or Microsoft Works preinstalled. If you need to recover or reinstall your Microsoft Office or Microsoft Works applications, you must use the *Microsoft Office CD* or *Microsoft Works CD*. These CDs are provided only with computers that come with Microsoft Office or Microsoft Works preinstalled.

Solving recovery problems

The Rescue and Recovery workspace runs independently of the operating system. In order to gain access to the workspace, repeatedly press and release the Enter or F11 key during startup. If you are unable to start the Rescue and Recovery workspace using this method, you have three options:

- Use your rescue media (CD, DVD, or USB hard disk) to start the Rescue and Recovery workspace. See “Creating and using rescue media” on page 18 for details.
- Use a Recovery Repair diskette to reinstall a file that controls access to the Rescue and Recovery workspace. See “Creating and using a Recovery Repair diskette” on page 18 for details.
- If your intent is to restore the hard disk to its original factory contents, you can use a set of Product Recovery discs. See “Creating and using product recovery discs” on page 13.

It is a good idea to create a Recovery Repair diskette, rescue media, and a set of Product Recovery discs as soon as possible and store them in a safe place as a precautionary measure.

If you are unable to access the Rescue and Recovery workspace from rescue media or a set of Product Recovery CDs, you might not have the rescue device, CD drive, DVD drive or USB hard disk drive, defined as a startup device in the BIOS startup sequence. See “Setting a rescue device in the startup sequence” on page 20 for more information.

Rescue media enables you to start the Rescue and Recovery program from CD, DVD or an externally attached USB hard disk drive. Rescue media is extremely important if you are unable to access the Rescue and Recovery program using the Enter or F11 key.

Creating and using rescue media

Rescue media enables you to start the Rescue and Recovery program from CD or DVD. Rescue media is extremely important if you are unable to access the Rescue and Recovery program using the Enter or F11 key.

To create rescue media, do the following:

1. From the Windows desktop, click **Start**, click **All Programs**, click **ThinkVantage**, then click **Create Recovery Media**.
2. Select the radio button for the type of rescue media you want to create.
3. Click OK.
4. Follow the instructions on the screen.

To use rescue media, do one of the following:

- Insert the rescue disc (CD or DVD) into your CD or DVD drive, then restart your computer.
- Attach your rescue USB hard disk drive to one of the USB connectors on your computer, then restart your computer.

When the rescue media starts, the Rescue and Recovery workspace opens. Help for each feature is available from the Rescue and Recovery workspace. If your rescue media fails to start, you might not have your rescue device (CD drive or DVD drive) set correctly in your BIOS startup sequence. See “Setting a rescue device in the startup sequence” on page 20 for more information.

Creating and using a Recovery Repair diskette

If you are unable to start the Rescue and Recovery workspace, use a Recovery Repair diskette to reinstall a file that controls access to the workspace. It is a good idea to create a Recovery Repair diskette as soon as possible and store it in a safe place.

To create a Recovery Repair diskette, do the following:

1. If you are not already connected to the Internet, connect now.
2. Open an Internet browser and go to the following Web address:

<http://www.lenovo.com/think/support/site.wss/document.do?Indocid=MIGR-54483>

3. Insert a blank diskette into diskette drive A.
4. Double-click on the Recovery Repair `rnrrepair.exe` file; then follow the instructions on the screen. The Recovery Repair diskette is created.
5. Remove the diskette and label it Recovery Repair diskette.

To use the Recovery Repair diskette, do the following:

1. Shut down the operating system and turn off the computer.
2. Insert the Recovery Repair diskette into diskette drive A.
3. Turn on the computer and follow the instructions on the screen.

If the repair operation finishes without error, you will be able to access the Rescue and Recovery workspace by repeatedly pressing and releasing the Enter or F11 key while you restart your computer.

If an error message appears during the repair operation and the repair operation cannot be completed, you might have a problem with the partition that contains the Rescue and Recovery workspace. Use your rescue media to access the Rescue and Recovery workspace. For information about creating and using rescue media, see “Creating and using rescue media” on page 18.

Recovering or installing device drivers

Before you can recover or install device drivers, your operating system must be installed on your computer. Make sure that you have the documentation and software media for the device.

Device drivers for factory-installed devices are located on the computer hard disk (usually drive C) in the `ibmtools\drivers` folder. Other device drivers are on the software media that come with individual devices.

The latest device drivers for factory-installed devices are also available on the World Wide Web at <http://www.lenovo.com/think/support/>.

To recover a device driver for an factory-installed device, do the following:

1. Start your computer and operating system.
2. Use Windows Explorer or My Computer to display the directory structure of your hard disk.
3. Open the `C:\IBMTOOLS` folder.
4. Open the `drivers` folder. Within the `drivers` folder are several subfolders that are named for various devices that are installed in your computer (for example, audio, video, and so on).
5. Open the appropriate subfolder.
6. Use one of the following methods to recover the device driver:
 - In the device subfolder, look for a `readme.txt` file or other file with the `.txt` extension that contains information about reinstalling the device driver. This file might be named after the operating system, such as `winxp.txt`. The text file has information on how to reinstall the device driver.
 - If the device subfolder contains a file with an `.inf` extension, you can use the Add New Hardware program (located in the Windows Control

Panel) to reinstall the device driver. Not all device drivers can be reinstalled using this program. In the Add New Hardware program, when prompted for the device driver that you want to install, click **Have Disk** and **Browse**. Then select the appropriate device-driver (.inf) file from the device subfolder.

- In the device subfolder, look for a setup.exe file. Double-click **SETUP.EXE** and follow the instructions on the screen.

Setting a rescue device in the startup sequence

Before you start recovery from a CD, DVD, USB HDD or any other external device, you must first change the startup sequence in the CMOS Setup Utility.

1. While turning on your computer, press and release the F1 key repeatedly to enter the CMOS Setup Utility.
2. Select **Advanced BIOS feature** and press enter.
3. In the Startup sequence, select your startup device.
4. Press Esc to return to the CMOS Setup Utility program menu.
5. Select **Save & Exit Setup** and press enter.
6. Shut down the operating system and turn off the computer.
7. Do one of the following:
 - If you have an external device, connect it to your computer.
 - If you have a CD or DVD, insert it into your computer.
8. Turn on your computer.

Chapter 4. Getting information, help, and service

If you need help, service, or technical assistance or just want more information about products manufactured by Lenovo, you will find a wide variety of sources available from Lenovo to assist you. This section contains information about where to go for additional information about Lenovo, products manufactured by Lenovo, what to do if you experience a problem with your computer, and whom to call for service should it be necessary.

Getting information

Information about your computer and preinstalled software, if any, is available in the documentation that comes with your computer. That documentation includes printed books, online books, README files, and help files. In addition, information about the products Lenovo manufactures is available on the World Wide Web.

On the World Wide Web, the Lenovo Web site has up-to-date information about Personal Computer products and support. The address for the Personal Computing home page is <http://www.lenovo.com/think>.

You can find support information for your products, including supported options, at <http://www.lenovo.com/think/support>.

Getting help and service

If you have a problem with your computer, you will find a wide variety of sources available to help you.

Using the documentation and diagnostic programs

Many computer problems can be solved without outside assistance. If you experience a problem with your computer, the first place to start is the troubleshooting information in your computer documentation. If you suspect a software problem, see the documentation, including README files and online help, that comes with the operating system or application program.

Most computers and servers come with a set of diagnostic programs that you can use to help you identify hardware problems. See the troubleshooting information in your computer documentation for instructions on using the diagnostic programs.

The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. Lenovo maintains pages on the World Wide Web where you can get the latest technical

information and download device drivers and updates. To access these pages, go to <http://www.lenovo.com/think/support> and follow the instructions.

Calling for service

If you have tried to correct the problem yourself and still need help, during the warranty period, you can get help and information by telephone through the Customer Support Center. The following services are available during the warranty period:

- **Problem determination** - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- **Hardware repair** - If the problem is determined to be caused by hardware under warranty, trained service personnel are available to provide the applicable level of service.
- **Engineering Change management** - Occasionally, there might be changes that are required after a product has been sold. Lenovo or your reseller, if authorized by Lenovo, will make selected Engineering Changes (ECs) available that apply to your hardware.

The following items are not covered:

- Replacement or use of parts not manufactured for or by Lenovo or nonwarranted Lenovo parts.
- Identification of software problem sources.
- Configuration of BIOS as part of an installation or upgrade.
- Changes, modifications, or upgrades to device drivers.
- Installation and maintenance of network operating systems (NOS).
- Installation and maintenance of application programs.

Refer to your Statement of Limited Warranty for a full explanation of warranty terms. Be sure to retain your proof of purchase to obtain warranty service.

If possible, be at your computer when you call. Please have the following information ready:

- Machine type and model
- Serial numbers of your hardware products
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

Telephone numbers

For a list of Service and Support phone numbers, see “Worldwide telephone list” on page 65. Phone numbers are subject to change without notice. For the most current phone numbers, go to <http://www.lenovo.com/support/phone>. If the number for your country or region is not listed, contact your Lenovo reseller or Lenovo marketing representative.

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

Other services

If you travel with your computer or relocate it to a country where your ThinkCentre or ThinkPad machine type is sold, your computer might be eligible for International Warranty Service, which automatically entitles you to obtain warranty service throughout the warranty period. Service will be performed by service providers authorized to perform warranty service.

Service methods and procedures vary by country, and some services might not be available in all countries. International Warranty Service is delivered through the method of service (such as depot, carry-in, or on-site service) that is provided in the servicing country. Service centers in certain countries might not be able to service all models of a particular machine type. In some countries, fees and restrictions might apply at the time of service.

To determine whether your computer is eligible for International Warranty Service and to view a list of the countries where service is available, go to <http://www.lenovo.com/think/support>, click **Warranty**, and follow the instructions on the screen.

For technical assistance with the installation of, or questions related to, Service Packs for your preinstalled Microsoft Windows product, refer to the Microsoft Product Support Services Web site at <http://support.microsoft.com/directory/>, or you can contact the Customer Support Center. Some fees might apply.

Purchasing additional services

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

For more information about these services, see the online information.

Chapter 5. Troubleshooting and diagnostics

This chapter describes some basic troubleshooting and diagnostic tools. If your computer problem is not described here, use Access Help for more detailed troubleshooting information or see “Additional help” on page xvii.

Basic troubleshooting

Symptom	Action
The computer does not start when you press the power button.	<p>Verify that:</p> <ul style="list-style-type: none">• The power cord is plugged into the rear of the computer and into a working electrical outlet.• If your computer has a secondary power switch on the back of the computer, ensure that it is switched on. Check the power indicator on the front of the computer to ensure that the power is on.• The power supply and system board are working. See “Power Supply and System board Diagnostic LEDs” on page 27. <p>If you cannot correct the problem, have the computer serviced.</p>
The monitor screen is blank.	<p>Verify that:</p> <ul style="list-style-type: none">• The monitor cable is securely attached to the rear of the monitor and to the rear of the computer.• The monitor power cord is plugged into the monitor and into a working electrical outlet.• The monitor is turned on, and the brightness and contrast controls are set correctly.• The monitor signal cable is securely connected to the monitor and to the monitor connector on the computer.• The power supply and system board are working. See “Power Supply and System board Diagnostic LEDs” on page 27. <p>Note: If your computer has two monitor connectors, verify that your monitor is connected to the one in the PCI-express (PCI-e) option connector rather than the one in the rear of the system board. See Step 4 on page 3.</p> <p>If you cannot correct the problem, have the computer serviced.</p>

Symptom	Action
<p>The keyboard does not work. The computer does not respond to the keyboard.</p>	<p>Verify that:</p> <ul style="list-style-type: none"> • The computer and monitor are turned on and the brightness and contrast controls are set correctly. • The keyboard is securely connected to the keyboard connector on the computer. • No keys are stuck. <p>If you cannot correct the problem, have the computer serviced.</p>
<p>The Enhanced Performance USB Keyboard does not work</p>	<p>Verify that:</p> <ul style="list-style-type: none"> • The computer is turned on. • The keyboard is securely connected to a USB connector on the front or rear of the computer. • No keys are stuck. <p>If you cannot correct the problem, have the computer serviced.</p>
<p>The mouse does not work. The computer does not respond to the mouse. Note: This applies to a mechanical mouse only.</p>	<p>Clean the mouse. Verify that:</p> <ul style="list-style-type: none"> • The computer and monitor are turned on and the brightness and contrast controls are set correctly. • The mouse is securely connected to the mouse connector on the computer. <p>If you cannot correct the problem, have the computer serviced.</p>
<p>The operating system will not start.</p>	<p>Verify that:</p> <ul style="list-style-type: none"> • There is no diskette in the diskette drive. • The startup sequence includes the device where the operating system resides. Usually, the operating system is on the hard disk. <p>Start the Setup Utility program. See “Starting the Setup Utility” on page 9.</p> <p>Verify the startup sequence in the Setup Utility program.</p> <p>If you cannot correct the problem, have the computer serviced.</p>
<p>An error code is displayed before the operating system starts.</p>	<p>Write down the code number, and see “Error codes” on page 29.</p>
<p>The computer beeps multiple times before the operating system starts.</p>	<p>Verify that no keys are stuck down.</p> <p>If you cannot correct the problem, have the computer serviced.</p>

Power Supply and System board Diagnostic LEDs

Your computer has two LEDs located on power supply on the back of the chassis. The power button LED located on front of your computer and the two LEDs on the back will help you determine if the power supply or system board is working correctly. The following table uses the LEDs to diagnose possible power supply and system board problems.

Power Button LED	Green LED	Yellow LED	Diagnosis
Off	Off	Off	Check the following first: <ul style="list-style-type: none">• Is power cord plugged in?• Is the power strip on? Failing power supply
Off (After pressing the power button)	On	Off	Failing system board
On	On	On	Failing power supply
On	On	Off	Normal working conditions, but if your computer is not working correctly then you have a failing system board or a failing microprocessor

If you cannot correct the problem, have your computer serviced.

Note: To reset the computer once a yellow LED is on, unplug the power cord.

PC Doctor for DOS Diagnostics

The PC Doctor for DOS Diagnostics program runs independently of the operating system. You can use this program to test hardware components of your computer. You can use this program when other methods are not available or have not been successful in isolating a possible hardware problem.

You can run the diagnostics from the Rescue and Recovery workspace on your hard disk. Alternatively, you can create bootable diagnostics diskettes from the Rescue and Recovery workspace.

You can also download the latest version of the diagnostics program from <http://www.lenovo.com/think/support/> on the World Wide Web. Type your machine type into the **Use Quick Path** field and click **Go** to find the downloadable files that are specific to your computer.

Running Diagnostics from the Rescue and Recovery workspace

Use the following steps to run diagnostics from the Product Recovery program:

1. Shut down your operating system, and turn off the computer.
2. Repeatedly press and release the Enter or F11 key as you turn on your computer.
3. When you hear beeps or see a logo screen, stop pressing the Enter or F11 key. The Rescue and Recovery workspace opens.
4. From the Rescue and Recovery workspace, select **Diagnose Hardware**.
5. Follow the prompts on the screen.
6. Restart the computer as instructed.

Creating Diagnostics diskettes

Use the following steps to create diagnostics diskettes:

1. Shut down your operating system, and turn off the computer.
2. Repeatedly press and release the Enter or F11 key as you turn on your computer.
3. When you hear beeps or see a logo screen, stop pressing the Enter or F11 key. The Rescue and Recovery workspace opens.
4. From the Rescue and Recovery workspace, select **Create diagnostic disks**.
5. Follow the instructions on the screen.
6. When prompted, insert a blank, formatted diskette into the diskette drive, and follow the instructions on the screen.

Notes:

1. You also can download the latest version of the diagnostic program from <http://www.lenovo.com/think/support/> on the World Wide Web. In the **Use Quick Path** field, type your machine type to find the downloadable files specific to your computer.
2. You can download a self starting bootable CD image (known as an .iso image) of the diagnostics program from <http://www.lenovo.com/think/support> to support systems without a diskette drive.

Running diagnostics from diskettes or a CD

Use the following steps to run the diagnostics diskette or CD image:

1. Shut down the operating system, and turn off the computer.
2. Insert the diagnostics diskette into the diskette drive or CD into the drive.
3. Turn on your computer.
4. When the diagnostics program opens, follow the instructions that are displayed on the screen. For help, press F1.
5. When the program finishes, remove the diskette or CD from the drive.

6. Shut down or restart your computer.

Error codes

The following table includes some of the more common error codes that might be displayed when your computer is performing the power-on self-test (POST).

- Record error codes that are displayed. If you call for service, you will be asked for the error codes.
- If there are multiple error codes, always work to solve problems in the order in which the error codes are displayed. Usually, solving the first error code will solve succeeding ones.
- If the error code is not in the following table, more in-depth troubleshooting is required.
 - If the operating system starts when you turn on your computer, see “PC Doctor for DOS Diagnostics” on page 27 to run diagnostics. Also, use Access Help for more information on problem solving.
 - If the operating system will not start, have the computer serviced.

Code	Description	Action
135	Fan failure	Have the computer serviced.
162	A change in device configuration occurred.	Verify that: <ul style="list-style-type: none">• All external devices are turned on.• All devices are properly installed and securely connected. Reload the default configuration settings using the Setup Utility. If you cannot correct the problem, have the computer serviced.
164	System memory size is less than expected.	Add more memory to your computer or use the Setup Utility to accept the new memory amount. If you cannot correct the problem, have the computer serviced.
210 or 211	A keyboard error has occurred.	Verify that: <ul style="list-style-type: none">• The keyboard is properly connected.• No keys on the keyboard are stuck. If you cannot correct the problem, have the computer serviced.

Code	Description	Action
250	The battery is defective.	Replace the battery. See the battery replacement procedure in your online <i>User Guide</i> , which is available through Access Help.
270 or 271	Real time clock error	Set the date and time using the Setup Utility. If you cannot correct the problem, have the computer serviced.
662	A change in configuration occurred.	A diskette drive has been added or removed. <ul style="list-style-type: none"> • Restore the original hardware. Or • Accept the new configuration using the Setup Utility. If you cannot correct the problem, have the computer serviced.
1762	A change in configuration occurred.	A hard disk drive has been added or removed. <ul style="list-style-type: none"> • Restore the original hardware. Or • Accept the new configuration using the Setup Utility. If you cannot correct the problem, have the computer serviced.
1962	No operating system found or no device in the startup sequence has a valid boot record.	Change the startup sequence using the Setup Utility. If you cannot correct the problem, have the computer serviced.
5962	A change in configuration occurred.	An ATAPI device has been added or removed. <ul style="list-style-type: none"> • Restore the original hardware. Or • Accept the new configuration using the Setup Utility. If you cannot correct the problem, have the computer serviced.

Code	Description	Action
8603	Pointing device error No mouse was detected.	<ul style="list-style-type: none"> • Install a mouse. Or • Set the mouse option correctly using the Setup Utility. <p>If you cannot correct the problem, have the computer serviced.</p>

POST beep codes

Another way for POST to notify you of errors is through a series of audible beeps. A beep pattern represents a numeric value and provides further information about the location of a potential problem.

The following are the most common POST beep codes that you might hear when starting your computer.

Beep pattern	Description	Action
1 long and 2 short beeps	No on-screen message. Beeps occur before video initialization.	Remove and reinstall the dual inline memory modules (DIMMs). If the problem persists, have the computer serviced.
1 long beep followed by a series of short beeps	External ROM failure (such as VGA)	If the problem persists, have the computer serviced.
2 short beeps	A POST error occurred.	If you have changed the hardware configuration, go into the Setup Utility and exit to save setting. Otherwise refer to error code section to resolve error.
1 short - 3 short - 3 short - 1 short	No memory or no configuration memory	Reinstall the memory. If problem persists, replace the memory.
4 sets of 4 short beeps	POV tamper; POV binding information does not match	Make sure the original POV card is properly seated in the socket.

Here are some general guidelines for working with POST beep codes:

- Record any beep patterns that you hear. If you call for service, you will be asked for the beep patterns.
- If the beep pattern is not in this book, more in-depth troubleshooting is required.

- If the operating system starts when you turn on your computer, use the ThinkVantage Productivity Center program to learn how to run diagnostics and see the entire online troubleshooting procedures.
- If the operating system will not start, have the computer serviced.

Appendix A. IBM Lotus Software Offer

As a qualifying ThinkCentre or ThinkPad personal computer customer, you are receiving a single, limited license for the Lotus Notes® "standalone" client and a single license for the Lotus® SmartSuite® software. These licenses entitle you to install and use this software on your new ThinkCentre or ThinkPad personal computer using one of the following options:

- **Media for this software is not included in this offer. If you do not already have the appropriate Lotus Notes Client or Lotus SmartSuite software media**, you can order a CD and install the software onto your computer. For more information, see "To order a CD" on page 34.
- **If you already have a licensed copy of the software**, you are entitled to make and use one additional copy of the software you have.

About IBM Lotus Notes

With your standalone, limited use Notes® client, you can integrate your most valuable messaging, collaborative and personal information management (PIM) resources -like e-mail, calendar, to-do list - allowing you to access them while connected to or disconnected from your network. The standalone license does not include the right to access any IBM Lotus Domino® servers; however this stand-alone license may be upgraded to a full Notes license at a reduced price. For more information visit <http://www.lotus.com/notes>.

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Lotus SmartSuite contains powerful applications with timesaving features that give you a head start on your work and guide you through individual tasks.

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Customer Support

For support information and phone numbers to help with initial installation of software, visit <http://www.lenovo.com/think/support>. To purchase technical support beyond this initial installation support, visit <http://www.lotus.com/passport>.

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Proof of Entitlement

The proof of purchase for your qualifying personal computer, as well as this Offer document, should be retained as your proof of entitlement.

Purchasing Upgrades, Additional Licenses, and Technical Support

Software upgrades and technical support are available for a fee through the IBM Passport Advantage[®] Program. For information about purchasing additional licenses for Notes, SmartSuite, or other Lotus products, visit <http://www.ibm.com> or <http://www.lotus.com/passport>.

To order a CD

Important

Pursuant to this Offer, you may order one CD media per license. You will need to provide the 7 digit serial number of the new ThinkCentre or ThinkPad personal computer that you purchased. The CD is provided at no charge; however, applicable shipping, duties and taxes may be imposed by local jurisdictions. Please allow 10 to 20 business days from receipt of your request for delivery.

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