IBM

Quick Reference

Inside:
- **Safety, warranty, and other notices**
- **Computer setup**
- **Software recovery**
- **Troubleshooting and diagnostics**
- **IBM help and service**

IBM

Quick Reference

> **Note**
>
> Before using this information and the product it supports, be sure to read "Safety notices" on page v, Appendix A, "Warranty information" on page 33, and Appendix B, "Notices" on page 49.

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Safety notices

DANGER

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

To avoid a shock hazard:

- **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:	To disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

DANGER

Le courant électrique provenant de l'alimentation, du téléphone et des câbles de transmission peut présenter un danger.

Pour éviter tout risque de choc électrique :

- **Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.**
- **Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.**

- **Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.**
- **Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.;**
- **Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.**
- **Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de té lécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).**
- **Lorsque vous installez, que vous déplacez, ou que vous manipulez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.**

Connexion:	Déconnexion:
1. Mettez les unités hors tension.	1. Mettez les unités hors tension.
2. Commencez par brancher tous les cordons sur les unités.	2. Débranchez les cordons d'alimentation des prises.
3. Branchez les câbles d'interface sur des connecteurs.	3. Débranchez les câbles d'interface des connecteurs.
4. Branchez les cordons d'alimentation sur des prises.	4. Débranchez tous les câbles des unités.
5. Mettez les unités sous tension.	

Lithium battery notice

CAUTION:
Danger of explosion if battery is incorrectly replaced.

When replacing the battery, use only IBM Part Number 33F8354 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.

ATTENTION

Danger d'explosion en cas de remplacement incorrect de la batterie.

Remplacer uniquement par une batterie IBM de type ou d'un type équivalent recommandé par le fabricant. La batterie contient du lithium et peut exploser en cas de mauvaise utilisation, de mauvaise manipulation ou de mise au rebut inappropriée.

Ne pas :
- **Lancer ou plonger dans l'eau**
- **Chauffer à plus de 100°C (212°F)**
- **Réparer ou désassembler**

Mettre au rebut les batteries usagées conformément aux règlements locaux.

Modem safety information

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.

Consignes de sécurité relatives au modem

Lors de l'utilisation de votre matériel téléphonique, il est important de respecter les consignes ci-après afin de réduire les risques d'incendie, d'électrocution et d'autres blessures :

- N'installez jamais de cordons téléphoniques durant un orage.
- Les prises téléphoniques ne doivent pas être installées dans des endroits humides, excepté si le modèle a été conçu à cet effet.
- Ne touchez jamais un cordon téléphonique ou un terminal non isolé avant que la ligne ait été déconnectée du réseau téléphonique.
- Soyez toujours prudent lorsque vous procédez à l'installation ou à la modification de lignes téléphoniques.
- Si vous devez téléphoner pendant un orage, pour éviter tout risque de choc électrique, utilisez toujours un téléphone sans fil.
- En cas de fuite de gaz, n'utilisez jamais un téléphone situé à proximité de la fuite.

Laser compliance statement

Some IBM 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) 825 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.

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. **Do not remove the drive covers.**

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.**

DANGER:

Certains modèles d'ordinateurs personnels sont équipés d'origine d'une unité de CD-ROM ou de DVD-ROM. Mais ces unités sont également vendues séparément en tant qu'options. L'unité de CD-ROM/DVD-ROM est un appareil à laser. Aux État-Unis, l'unité de CD-ROM/DVD-ROM est certifiée conforme aux normes indiquées dans le sous-chapitre J du DHHS 21 CFR relatif aux produits à laser de classe 1. Dans les autres pays, elle est certifiée être un produit à laser de classe 1 conforme aux normes CEI 825 et CENELEC EN 60 825.

Lorsqu'une unité de CD-ROM/DVD-ROM est installée, tenez compte des remarques suivantes:

ATTENTION: Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites.

L'ouverture de l'unité de CD-ROM/DVD-ROM peut entraîner un risque d'exposition au rayon laser. Pour toute intervention, faites appel à du personnel qualifié.

Certaines unités de CD-ROM/DVD-ROM peuvent contenir une diode à laser de classe 3A ou 3B. Tenez compte de la consigne qui suit:

> **DANGER**
>
> **Rayonnement laser lorsque le carter est ouvert. Évitez toute exposition directe des yeux au rayon laser. Évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques.**

Additional help

This *Quick Reference* provides the information for installing your IBM®
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 IBM. Use Adobe Acrobat Reader to read and print your *User Guide* for
use when installing optional hardware.

Access IBM contains more detail about the following topics:

* Using your computer
* Installing software from the *Software Selections CD*
* Installing hardware options
* Connecting communication cables
* Troubleshooting common problems
* Registering your computer

If you have Internet access, you can get the most up-to-date hints, tips,
Frequently Asked Questions, and discussion forums, as well as the *User Guide*
for your computer from the World Wide Web. For computer service
technicians, the *Hardware Maintenance Manual* is also available. To access any of
this information, point your browser to http://www.ibm.com/pc/support/.

Type your machine type and model number in the **Quick Path** field, and click
Go.

Chapter 1. Preparing your computer

> **Before you begin**
>
> Be sure to read "Safety notices" on page v and Appendix B, "Notices" on page 49.

Completing important tasks

After you have set up your computer and before you start using it, take the time to complete these important tasks. Performing these tasks at the beginning will save you time and trouble later:

- Create a *Recovery Repair* diskette. Your computer has a built-in program, the Product Recovery program, that restores the operating system. Normally, this program can be accessed with the F11 key during computer startup. If the F11 prompt becomes unusable or not visible, the *Recovery Repair* diskette will restore access to the Product Recovery program. See "Creating a Recovery Repair diskette" on page 15.

- Create an *Enhanced Diagnostics* diskette. The Enhanced Diagnostics tool can isolate hardware problems and is part of the Product Recovery program. Making an *Enhanced Diagnostics* diskette ahead of time assures you use of the Enhanced Diagnostics tool if the Product Recovery program becomes inaccessible. See "Creating an IBM Enhanced Diagnostics diskette" on page 22.

- 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 11.

- Decide to perform scheduled backups of computer files to preserve your data. It is good practice to regularly copy your data and program files to a LAN, diskettes, recordable CDs, tape, or any alternate medium that might be available to you. Backing up your files monthly or quarterly are basic suggestions.

- 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.

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.
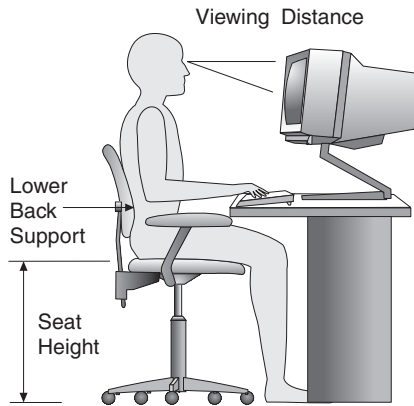
Adjust the monitor so the top of the screen is at, or slightly below, eye level. Place the monitor at a comfortable viewing distance, usually 51 to 61 cm (20 to 24 in.), and position it so you can view it without having to twist your body. Also position other equipment you use regularly, such as the 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 "Power cord notice" on page 56 of this book.

Using wireless keyboards and USB connectors

Some models of the Rapid Access III Keyboard and the Rapid Access III Wireless Keyboard have USB connectors at the rear of the keyboard. You can use these USB connectors for small devices that have their own power supply. USB devices that need a power supply must be connected to the rear of the computer.

The IBM Rapid Access III Wireless Keyboard and ScrollPoint® Wireless Mouse come with an IBM Dual Wireless Receiver. Connect the receiver into one of the USB connectors at the rear of the computer. The Rapid Access Wireless Keyboard and the ScrollPoint Wireless Mouse operate with this receiver.

If your keyboard and mouse come with software and documentation, use and refer to that information when installing your keyboard and mouse.

> **Important**
>
> When using wireless devices, be certain that no items are placed between the device and the receiver. Items left between the wireless receiver and the device will interfere with wireless function.

Notes:

1. Cable connectors for USB devices fit only one way. They cannot be connected incorrectly.

2. The USB connectors on the Rapid Access III Keyboard and Rapid Access III Wireless Keyboard are designed only for small USB devices.

3. USB devices requiring a power source, such as speakers or an unpowered USB hub, must be connected to one of the USB connectors on the computer.

4. Do not place the IBM Dual Wireless Receiver on top of the power supply.

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 90–137 V ac, set the switch to 115 V.
   - If the voltage supply range is 180–265 V ac, set the switch to 230 V.
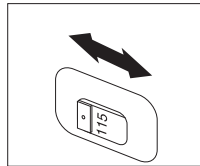
2. Your keyboard cable might have a standard keyboard connector **1** or a Universal Serial Bus (USB) connector **2** . Connect the keyboard cable to the appropriate keyboard connector.
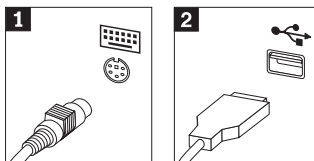
3. Your mouse cable might have a standard mouse connector **1** or a USB connector **2** . Connect the mouse cable to the appropriate mouse connector.
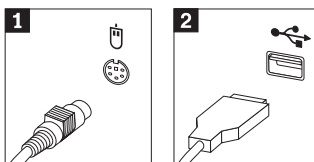
4. If you have the IBM Dual Wireless Receiver, connect the receiver into one of the USB connectors at the rear of the computer. Arrange the IBM Rapid Access III Wireless Keyboard and ScrollPoint Wireless mouse in a position which will be comfortable for you.

5. Connect the monitor cable to the monitor connector, and tighten the screws.
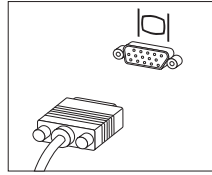
6. If you have a modem, connect the modem using the following instructions.
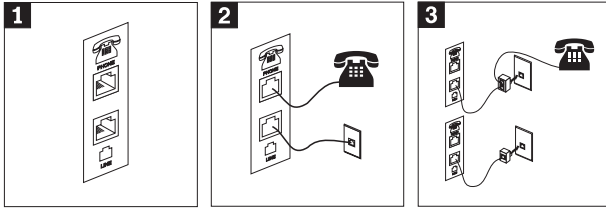
1   Use this dual connection on the back of the computer to set up your modem.

2   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 some cases, a splitter or converter is required to attach the cables to the telephone outlet, as shown at the top of this illustration. You can also use the splitter without the telephone, as shown at the bottom of the illustration.

7. If you have audio devices, attach them using the following instructions. For more detailed information about speakers, see item 8 on page 7.
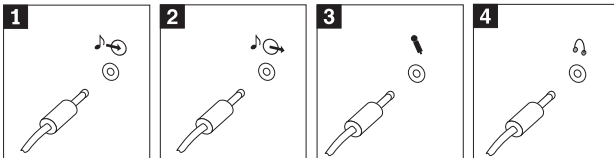
1	Audio line-in	This connector receives audio signals from an external audio device, such as a stereo system.
2	Audio line-out	This connector sends audio signals from the computer to external devices, such as powered stereo speakers.
3	Microphone	Use this connector to attach a microphone to your computer 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.

8. If you have *powered* speakers with an ac adapter, use the following instructions.
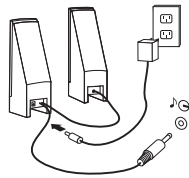
   a. Connect the cable that runs between the speakers, if necessary. On some speakers, this cable is permanently attached.

   b. Connect the power-supply cable to the speaker.

   c. Connect the speakers to the computer.

   d. Connect the power supply to the ac power source.

9. If you have *unpowered* speakers with no ac adapter, use the following instructions.
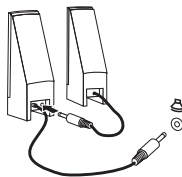
   a. Connect the cable that runs between the speakers, if necessary. On some speakers, this cable is permanently attached.

   b. Connect the speakers to the computer.

10. Connect any additional devices that you have. Your computer might not have all connectors that are shown.
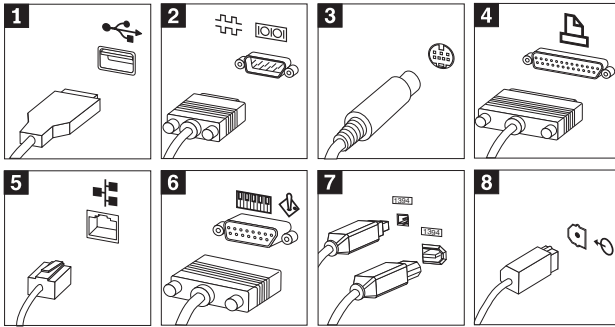
1 USB — Use these connectors to attach a device that requires a Universal Serial Bus (USB) connection, such as a USB scanner, printer, or personal digital assistant (PDA).

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.

8 S/PDIF — The S/PDIF connector enables you to connect consumer digital equipment such as digital audio tape (DAT) devices, CD drives, and other S/PDIF-compatible devices.

11. Connect the power cords to properly grounded electrical outlets.
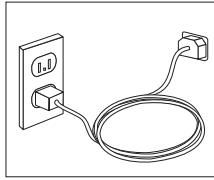
Note: For more information about connectors, see Access IBM on your computer desktop.

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 IBM logo window closes. If your computer has preinstalled software, the software installation program starts.

If you experience any problems during startup, see Chapter 4, "Troubleshooting and diagnostics" on page 19 and Chapter 5, "Getting information, help, and service" on page 27.

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.

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 **Start,** and then click **Access IBM** to learn more about your computer.

Using the Software Selections CD

The *Software Selections CD* contains tools such as virus-protection software, network-management software, Internet tools, and tools for digital subscriber line (DSL) connectivity.

Insert the *Software Selections CD* into your CD drive, and follow the instructions on the screen. You can use the CD to:

- Install software or documentation directly from the CD on models that are equipped with a CD drive.
- Create an image of the *Software Selections CD* on your hard disk or on a local area network (LAN) disk and install the software from that image.

The *Software Selections CD* has an easy-to-use graphical interface and automated installation procedures for most programs. It also has a help system that describes the features of the CD.

For more information about installing software from the *Software Selections CD*, see Access IBM.

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.

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:

1. Click **Start** on the Windows desktop.
2. Click **Shut Down**.
3. Select **Shut down** from the pull-down menu.
4. Click **OK**.

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	_____

Register your computer over the Internet when you first visit the IBM Web site. When you register your computer with IBM, you will receive the following benefits:

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

Go to http://www.ibm.com/pc/register/ and follow the on-screen instructions. See Access IBM for more information on how to register your computer.

Chapter 3. Recovering software

The Product Recovery Program will reinstall your computer operating system and factory-installed software. The Product Recovery Program is located on separate partition on your hard disk. Be sure to read the important notes under "Performing a recovery" before using the Product Recovery program. The Product Recovery program runs independently of the operating system.

Performing a software recovery

> **Important**
>
> Understand the following information before recovering your software:
>
> - Perform a recovery only as a last resort after you have tried using all other diagnostic and troubleshooting tools.
> - If possible, make backup copies of your data files before starting the recovery process. The recovery process deletes all information that is stored on the primary hard disk partition (usually drive C).
> - The Product Recovery program is the method to perform a software recovery.
> - If the Product Recovery program does not work or will not start as described, see "Solving recovery problems" on page 14.

To recover your factory-installed software use the Product Recovery program on the hard disk. This section provides instructions for using this program. If you have any problems running the Product Recovery program, see "Solving recovery problems" on page 14.

To perform a software recovery, use the following procedure:

1. Make backup copies of your data files, if possible. Any files on the hard disk that are not backed up will be lost during recovery.
2. Turn off your computer for at least 5 seconds. Press and hold the F11 key while you press the power button. The Product Recovery program will start. Continue with step 5.

   Was the F11 prompt displayed?

   Yes. Go to step 3 on page 14.

   No, **F11 didn't start.** Either the Product Recovery program on the hard disk or the F11 prompt is damaged. Go to "Solving recovery problems" on page 14.

No, **another program started.** If a program other than the Product Recovery program started, exit this program and turn off the computer for at least 5 seconds. Restart the computer and at the same time Press F11.

3. Did the Product Recovery program start after you pressed F11?

   Yes. Go to Step 4.

   No. Go to "Solving recovery problems".

4. When the Product Recovery program starts, you might have the opportunity to select an operating system. If a menu of operating systems is displayed, use the arrow keys (↑↓) to select the appropriate operating system, and press Enter.

5. Follow the instructions on the screen. Your computer might restart during the recovery process, possibly more than once. When the recovery process is finished, a completion message is displayed. When the Product Recovery program is finished, the factory-installed software will be restored.

Notes:

1. After recovery, you might have to reinstall device drivers for some devices. If you need to reinstall device drivers, see "Recovering or installing device drivers" on page 17.

2. Some computers come with Microsoft Office or Microsoft Works preinstalled. If you need to recover 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.

3. If you replace the original hard disk drive, no Product Recovery program is on the new hard disk. See Chapter 5, "Getting information, help, and service" on page 27 for information on how to contact IBM.

Solving recovery problems

If you are unable to access the Product Recovery program, use the following section headings to identify your situation and use the corresponding instructions.

The F11 prompt is not displayed

Use your *Recovery Repair* diskette to recover the F11 prompt. Using the F11 prompt will start the Product Recovery program menu. See "Using the Recovery Repair diskette".

To use the instructions in "Creating a Recovery Repair diskette" on page 15, the operating system must be functioning.

Using the Recovery Repair diskette
To use the *Recovery Repair* diskette, use the following procedure:

1. Shut down the operating system, and turn off the computer.

2. Insert the *Recovery Repair* diskette into the diskette drive.
3. Turn on the computer, and follow the instructions on the screen

Note: If the repair operation finishes without error, the F11 prompt will be displayed the next time you restart your computer.

If an error message is displayed during the repair operation and the repair operation cannot be completed, you might have a problem with the Product Recovery program or the partition that contains the Product Recovery program. See Chapter 5, "Getting information, help, and service" on page 27 for further information.

Creating a Recovery Repair diskette

Note: This procedure works only if the operating system is working. If the operating system is not working, refer to Chapter 5, "Getting information, help, and service" on page 27.

To create a *Recovery Repair* diskette, use the following procedure:
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 ibmtools folder, which is usually on drive C.
4. Double-click **RRDISK.BAT**, and follow the instructions on the screen.

F11 will not start the Product Recovery program

Either the Product Recovery program is damaged, or there is a problem with the partition that contains the Product Recovery program. See Chapter 5, "Getting information, help, and service" on page 27 for details.

Changing the startup sequence

You can change the order of the devices in the startup sequence. This section explains starting from a CD or DVD drive as an example.

If you inserted a CD into the CD or DVD drive and your computer does not read the CD immediately on startup, use the Startup Device menu to select the CD or DVD drive during startup.

If you need to change the first startup device to the CD or DVD drive and there is no F12 prompt and no Startup Device menu, use the IBM Setup Utility[1]. See "Using the IBM Setup Utility" on page 17. To see the IBM Setup Utility, press F1 during startup.

Using the Startup Device menu

Some computers have a Startup Device menu from which you can choose the startup device. To use the Startup Device menu, do the following:

1. Turn off your computer.
2. Turn on your computer. During startup, the prompt, `Press F12 for Startup Device Menu` is displayed.

    Note: If you do not see the F12 prompt, your startup device must be changed using the IBM Startup Utility. See "Using the IBM Setup Utility" on page 17.

3. Press the F12 function key while the computer starts.
4. Using the arrow keys (↓↑) select the CD or DVD drive, and press Enter.

Displaying the Startup Device menu prompt

If your computer has a Startup Device menu and you do not see the prompt `Press F12 for Startup Device Menu`, do the following to verify that your computer has this feature:

1. Turn off your computer.
2. Turn on your computer
3. Press and hold the F1 function key as the computer starts.
4. From the IBM Setup Utility menu, select **Startup**.
5. Using the Down Arrow key (↓), highlight **Startup device menu prompt**, and verify that the setting is **Enabled**. Press Enter.
6. Press Esc to return to the IBM Setup Utility main menu.
7. Exit the program with saved changes. The computer will complete the start process.
8. Shut down the operating system, and then restart the computer.

The next time you start your computer, `Press F12 for Startup Device Menu` will be displayed. Continue with "Using the Startup Device menu".

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1. In some models, this program is called the Configuration/Setup Utility program.

Using the IBM Setup Utility

If you inserted a CD into the CD or DVD drive and your computer does not read the CD immediately on startup, change the first device in the startup sequence to the CD or DVD drive. Use the following procedure.

1. Turn off your computer.
2. Turn on your computer.
3. When the IBM Setup Utility program prompt is displayed, quickly press F1 (the prompt is displayed for only a few seconds).
4. From the IBM Setup Utility menu, select **Startup** or **Start Options**.
5. Note the device that is currently selected as the first startup device, and write it down for future reference. You must restore this setting when you have completed the recovery process.
6. Change the first startup device to your CD drive or DVD drive.
7. Save the settings, and exit from the program.
8. Turn off your computer.

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 IBM-installed devices are located on the computer hard disk (usually drive C) in the ibmtools\drivers folder. The instructions for installing device drivers (readme.txt) are also located in the ibmtools\drivers folder. Other device drivers are on the software media that come with individual devices.

The latest device drivers for IBM-installed devices are also available on the World Wide Web at http://www.ibm.com/pc/support/.

To recover a device driver for an IBM-installed device, use the following procedure:

1. Start your computer and operating system.
2. Use Windows Explorer to display the directory structure of your hard disk.
3. Open the 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 win98.txt. Follow the instructions in this file.
- 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.

Chapter 4. Troubleshooting and diagnostics

This chapter describes some basic troubleshooting and diagnostic tools. If your computer problem is not described here, see Access IBM for more detailed troubleshooting information.

Basic troubleshooting

Symptom	Action
The computer does not start when you press the power button.	Verify that: • 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. If you cannot correct the problem, have the computer serviced.
The monitor screen is blank.	Verify that: • 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. **Note:** If your computer has two monitor connectors, verify that your monitor is connected to the one in the AGP option slot rather than the one in the rear of the system board. See Step 5 on page 6. If you cannot correct the problem, have the computer serviced.

Symptom	Action
The keyboard does not work. The computer does not respond to the keyboard.	Verify that: • 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. If you cannot correct the problem, have the computer serviced.
The Rapid Access III Keyboard does not work	Verify that: • The computer is turned on. • The keyboard is securely connected to a USB connector on the rear of the computer. • No keys are stuck. If you cannot correct the problem, have the computer serviced.
The Rapid Access III Wireless Keyboard does not work.	When the wireless receiver is installed, a software utility provides status icons and help information in the lower-right corner of your desktop, just above the default Windows task bar. Click **?** (help) to find more information about the wireless keyboard. • Verify that the computer is turned on and the brightness controls are set correctly. • Verify that no keys are stuck. • Change the batteries in the keyboard. • Change the channel on the keyboard. If you cannot correct the problem, have the computer serviced.
The mouse does not work. The computer does not respond to the mouse.	Verify that: • 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. If you cannot correct the problem, have the computer serviced.

Symptom	Action
The ScrollPoint III Mouse does not work.	Clean the mouse. Verify that: • The computer is turned on and the brightness controls are set correctly. • The mouse is securely connected to a USB connector on the computer. If you cannot correct the problem, have the computer serviced.
The ScrollPoint III Wireless Mouse does not work.	When the wireless receiver is installed, a software utility provides status icons and help information in the lower-right corner of your desktop just above the default Windows task bar. Click **?** (help) to find more information about the wireless keyboard. • Clean the mouse. • Verify that the computer is turned on and the brightness controls are set correctly. • Change the batteries in the mouse. • Change the channel on the mouse. If you cannot correct the problem, have the computer serviced.
The operating system will not start.	Verify that: • 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. During startup, look for the prompt to start the IBM Setup Utility program. Press the function key that is specified. Verify the startup sequence in the IBM Setup Utility program. If you cannot correct the problem, have the computer serviced.
An error code is displayed before the operating system starts.	Write down the code number, and see "Error codes" on page 23.
The computer beeps multiple times before the operating system starts.	Verify that no keys are stuck down. If you cannot correct the problem, have the computer serviced.

IBM Enhanced Diagnostics

The IBM Enhanced 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 IBM Enhanced Diagnostics program using the Product Recovery program on your hard disk. Alternatively, you can create an *IBM Enhanced Diagnostics* diskette from the Product Recovery program.

You can also download the latest version of the Enhanced Diagnostics program from http://www.ibm.com/pc/support/ on the World Wide Web. Type your machine type and model number into the **Quick Path** field to find the downloadable files that are specific to your computer.

Running IBM Enhanced Diagnostics from the Product Recovery program

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

Note: If the Product Recovery program on your computer hard disk is damaged or not accessible, the IBM Enhanced Diagnostics can be run from the *Enhanced Diagnostics* diskette.

1. Shut down your operating system, and turn off the computer.
2. Turn on your computer. Quickly press F11 when the Product Recovery program prompt is displayed (the prompt is displayed for only a few seconds). Wait for the Product Recovery menu to be displayed.
3. Depending on your operating system, you might be prompted to select a system setting. If no prompt is displayed, go to the next step.
4. When the main menu is displayed, select **System Utilities**.
5. From the System Utilities menu, select **Run Diagnostics**. The IBM Enhanced Diagnostics program starts. When you are finished running diagnostics, you will be returned to the Product Recovery main menu.
6. Restart the computer.

Creating an IBM Enhanced Diagnostics diskette

Use the following steps to create an *IBM Enhanced Diagnostics* diskette from the Product Recovery program:

1. Shut down your operating system, and turn off the computer.
2. Turn on your computer. Quickly press F11 when the Product Recovery program prompt is displayed (the prompt is displayed for only a few seconds). Wait for the Product Recovery menu to be displayed.

3. Depending on your operating system, you might be prompted to select a system setting. If no prompt is displayed, go to the next step.

4. From the main menu, select **System Utilities**.

5. Select **Create a diagnostic diskette**, and 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.

Note: You can also download the latest version of the diagnostic program from http://www.ibm.com/pc/support/ on the World Wide Web. In the **Quick Path** field, type your machine type to find the downloadable files specific to your computer.

Running the IBM Enhanced Diagnostics diskette

Use the following steps to run the *IBM Enhanced Diagnostics* diskette:

1. Shut down the operating system, and turn off the computer.

2. Insert the *IBM Enhanced Diagnostics* diskette into the diskette drive.

3. Turn on your computer.

4. Follow the instructions that are displayed on the screen. For help, press F1.

5. When the program finishes, remove the diskette from the diskette drive.

6. Shut down or restart your computer.

Error codes

The following table includes some of the more common printed 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, use Access IBM to run IBM Enhanced Diagnostics and see the entire online troubleshooting procedures.

  – If the operating system will not start, have the computer serviced.

Code	Description	Action
161 or 0250	The battery is defective.	Replace the battery. See the battery replacement procedure in your online *User Guide*, which is available through Access IBM.
162 or 0251	A change in device configuration occurred.	Verify that: • All external devices are turned on. • All devices are properly installed and securely connected. If you cannot correct the problem, have the computer serviced.
301, 303, 0211, or 0212	A keyboard error has occurred.	Verify that: • The keyboard is properly connected. • No keys on the keyboard are stuck. If you cannot correct the problem, have the computer serviced.
0280	Previous startup was incomplete; the default configuration was used.	The previous POST was not completed successfully. POST loads default values and offers to run IBM Setup Utility. This error is cleared the next time the computer is turned on.
860x (x=any number)	A pointing device or mouse error has occurred.	Verify that the pointing device or mouse is securely attached. If you cannot correct the problem, have the computer serviced.

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
1-3-3-1	No on-screen message. Beeps occur before video initialization.	Reseat the dual inline memory modules (DIMMs). If the problem persists, have the computer serviced.

Beep pattern	Description	Action
1-3-1	RAM test has failed	Reseat the dual inline memory modules (DIMMs).

If the problem persists, have the computer serviced. |

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 Access IBM to learn how to run IBM Enhanced Diagnostics and see the entire online troubleshooting procedures.
  - If the operating system will not start, have the computer serviced.

Chapter 5. Getting information, help, and service

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, 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 IBM 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 IBM products is available on the World Wide Web and through the IBM Automated Fax System.

Using the World Wide Web

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

You can find support information for your IBM products, including supported options, at http://www.ibm.com/pc/support/.

If you click **Profile** from the support page, you can create a customized support page that is specific to your hardware, complete with Frequently Asked Questions, Parts Information, Technical Hints and Tips, and Downloadable Files. In addition, you can choose to receive e-mail notifications whenever new information becomes available about your registered products.

You can order publications through the IBM Publications Ordering System at http://www.elink.ibmlink.ibm.com/public/applications/publications/ cgibin/pbi.cgi.

Getting information by fax

If you have a touch-tone telephone and access to a fax machine, in the U.S. and Canada, you can receive, by fax, marketing and technical information on many topics, including hardware, operating systems, and local area networks (LANs).

You can call the IBM Automated Fax System 24 hours a day, 7 days a week. Follow the recorded instructions, and the requested information will be sent to your fax machine. In the U.S. and Canada, to access the IBM Automated Fax System, call 1-800-426-3395.

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 IBM 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. IBM 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.ibm.com/pc/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 IBM PC HelpCenter®. 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.
- **IBM hardware repair** - If the problem is determined to be caused by IBM 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. IBM or your reseller, if authorized by IBM, will make selected Engineering Changes (ECs) available that apply to your hardware.

The following items are not covered:

- Replacement or use of non-IBM parts or nonwarranted IBM parts. All warranted parts contain a 7-character identification in the format IBM FRU XXXXXXX.
- 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 IBM Statement of Limited Warranty for a full explanation of IBM warranty terms. Be sure to retain your proof of purchase to obtain warranty service.

In the U.S. and Canada, these services are available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9:00 a.m. to 6:00 p.m.

Note: Response times vary; may exclude some holidays.

If possible, be at your computer when you call. Please have the following information ready:
- Machine type and model
- Serial numbers of your IBM hardware products
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

Telephone numbers

Phone numbers are subject to change without notice. For the most up-to-date phone numbers, go to http://www.ibm.com/pc/support/ and click **Support Phone List**.

Country		Telephone number
Austria	Österreich	01-24 592 5901
Belgium - Dutch	Belgie	02-210 9820
Belgium - French	Belgique	02-210 9800
Canada	Toronto only	416-383-3344
Canada	Canada - all other	1-800-565-3344
Denmark	Danmark	45 20 82 00
Finland	Suomi	09-459 6960
France	France	02 38 55 74 50
Germany	Deutschland	07032-1549 201
Ireland	Ireland	01-815 9200
Italy	Italia	02-7031 6101
Luxembourg	Luxembourg	298-977 5063
Netherlands	Nederland	020-514 5770
Norway	Norge	66 81 11 00
Portugal	Portugal	21-791 51 47
Spain	España	91-662 49 16
Sweden	Sverige	08-477 4420
Switzerland	Schweiz/Suisse/Svizzera	058-333 0900
United Kingdom	United Kingdom	01475-555 055
U.S.A. and Puerto Rico	U.S.A. and Puerto Rico	1-800-772-2227

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

Other services

IBM Update Connector™ is a remote communication tool that you can use with some IBM computers to communicate with the HelpCenter. Update Connector enables you to receive and download updates for some of the software that might come with your computer.

If you travel with your computer or relocate it to a country where your NetVista™ 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 IBM or by IBM resellers who are 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.ibm.com/pc/support/, and click **Warranty Lookup**. Eligible IBM computers are identified by their four-digit machine types. For more information about International Warranty Service, see Service Announcement 601-034 at http://www.ibm.com/. Click **Support & downloads**, click **Announcement letters**, and click **Announcements search**. In the **Search by letter number only** field, type 601-034, and click **Search**.

IBM Integrated Technology Services offers a broad range of information technology support, implementation, and management services. For more information about these services, refer to the Integrated Technology Services Web site at http://www.ibm.com/services/its/.

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 IBM HelpCenter. Some fees might apply.

Purchasing additional services

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

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

Appendix A. Warranty information

This section contains the warranty period for your product, information about obtaining warranty service and support, and the IBM Statement of Limited Warranty.

Warranty period

The warranty period varies by machine type and country or region.

Notes:

- Contact your place of purchase for warranty service information. Some IBM Machines are eligible for on-site warranty service depending on the country or region where service is performed.

- A warranty period of 3 years on parts and 1 year on labor means that IBM will provide warranty service without charge for:
  1. parts and labor during the first year of the warranty period
  2. parts only, on an exchange basis, in the second and third years of the warranty period. IBM will charge you for any labor it provides in performance of the repair or replacement.

- The IBM Machine Warranties Web site at http://www.ibm.com/servers/support/machine_warranties/ contains a worldwide overview of the IBM Limited Warranty for IBM Machines, a glossary of terms used in the Statement of Limited Warranty, Frequently Asked Questions (FAQ), and links to Product Support Web pages. The IBM Statement of Limited Warranty is available from this Web site in 29 languages in Portable Document Format (PDF).

Machine types 2251 and 2271

Country or region	Warranty period
United States and Puerto Rico	Parts - 3 years, labor - 1 year
All other countries and regions	Parts - 1 year, labor - 1 year

Machine types 2254, 6336, and 6337

Country or region	Warranty period
United States and Canada	Parts - 1 year, labor - 1 year

Machine types 2256 and 2257

Country or region	Warranty period
Europe, Middle East, and Africa	Parts - 3 years, labor - 3 years
United States	Parts - 3 years, labor - 1 year
Canada, Latin America, Japan, China, Australia, New Zealand, China (Hong Kong S.A.R.), Taiwan, and all other countries and regions	Parts - 1 year, labor - 1 year

Machine type 2292

Country or region	Warranty period
United States	Parts - 1 year, labor - 1 year

Machine type 6029

Country or region	Warranty period
United States, Canada, China (Hong Kong S.A.R.), Latin America except Argentina, Singapore, India, Malaysia, Thailand, Indonesia, Philippines, Vietnam, Brunei, Sri Lanka, Bangladesh, Japan, Australia, New Zealand, Taiwan	Parts - 3 years, labor - 1 year
Argentina, Europe, Middle East, Africa, People's Republic of China	Parts - 3 years, labor - 3 years
Japan	Parts - 1 year, labor - 1 year

Machine types 6058, 6059, 6346, 6347, 6348, 6830, 6840, and 6841

Country or region	Warranty period
All countries and regions worldwide	Parts - 3 years, labor - 3 years

Machine types 6339, 6341, and 6342

Country or region	Warranty period
China, Europe, Middle East, Africa, and Latin America	Parts - 3 years, labor - 3 years
United States, Canada, China (Hong Kong S.A.R.), Japan, Taiwan, Australia, and New Zealand	Parts - 3 years, labor - 1 year
All other countries and regions	Parts - 3 years, labor - 1 year

Machine types 6343, 6349, 6350, and 6831

Country or region	Warranty period
All countries and regions worldwide	Parts - 3 years, labor - 1 years

Machine types 6568, 6569, 6578, 6579, 6648, and 6649

Country or region	Warranty period
United States, Europe, Middle East, Africa, and Argentina	Parts - 3 years, labor - 3 years
All other countries and regions	Parts - 3 years, labor - 1 year

Machine types 6790, 6791, 6792, 6793, 6794, 6823, and 6825

Country or region	Warranty period
United States, Canada, Europe, Middle East, Asia, Latin America, and all other countries and regions worldwide	Parts - 3 years, labor - 3 years
Bangladesh, China, China (Hong Kong S.A.R.), India, Indonesia, Malaysia, Phillipines, Singapore, Sri Lanka, Taiwan, Thailand, and Vietnam	Parts - 3 years, labor - 1 year
Japan	Parts - 1 year, labor - 1 year

Machine types 6832 and 6833

Country or region	Warranty period
United States, Puerto Rico, Europe, Middle East, and Africa	Parts - 3 years, labor - 3 years
Canada, Bangladesh, China, China (Hong Kong S.A.R.), India, Indonesia, Malaysia, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and Vietnam	Parts - 3 years, labor - 1 year
All other countries and regions	Parts - 1 year, labor - 1 year

Warranty service and support

With the original purchase of an IBM computer, you have access to extensive support. During the IBM Machine warranty period, you may call IBM or your reseller for problem-determination assistance under the terms of the IBM Statement of Limited Warranty.

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.
- **IBM hardware repair** - If the problem is determined to be caused by IBM hardware under warranty, trained service personnel are available to provide the applicable level of service, either on-site or at an IBM service center as determined by IBM.
- **Engineering Change management** - Occasionally, there might be changes that are required after a product has been shipped from IBM. In those instances, IBM will make Engineering Changes (ECs) available that apply to your hardware.

The following items are not covered under warranty service:

- Replacement or use of non-IBM parts. All IBM parts contain a 7-character identification in the format IBM FRU XXXXXXX.
- Identification of non-IBM software problem sources.
- Installation of customer replaceable units (CRUs).
- Installation and configuration of machine code or licensed internal code that is designated as customer installable.

If you do not register your computer with IBM, you might be required to present proof of purchase to obtain warranty service.

Before you call for service

You can solve many computer problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your computer and software.

Most computers, operating systems, and application programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. The information that comes with your computer also describes the diagnostic tests that you can perform.

If you suspect a software problem, refer to the information for the operating system or application program.

Calling for service

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

- Machine type, model, and serial number
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

To find the telephone number for the HelpCenter nearest you, see "Telephone numbers" in the "Getting information, help, and service" chapter.

IBM Statement of Limited Warranty Z125-4753-06 8/2000

Part 1 - General Terms

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. The terms of Part 2 replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

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

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

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

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

Items Not Covered by Warranty: IBM does not warrant uninterrupted or error-free operation of a Machine. Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service: To obtain warranty service for a Machine, contact IBM or your reseller. If you do not register your Machine with IBM, you may be required to present proof of purchase.

During the warranty period, IBM or your reseller, if approved by IBM to provide warranty service, provides without charge certain types of repair and exchange service to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. At its discretion, IBM or your reseller will 1) either repair or exchange the failing Machine and 2) provide the service either at your location or a service center. IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Some parts of IBM Machines are designated as Customer Replaceable Units (called "CRUs"), e.g., keyboards, memory, or hard disk drives. IBM ships CRUs to you for replacement by you. You must return all defective CRUs to IBM within 30 days of your receipt of the replacement CRU. You are responsible for downloading designated Machine Code and Licensed Internal Code updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

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

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

You also agree to
1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;

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

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

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

Limitation of Liability: Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), except for any liability that cannot be waived or limited by applicable laws, IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and

2. the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

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

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST SAVINGS, EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Governing Law: Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Part 2 - Country-unique Terms

<u>AMERICAS</u>

BRAZIL

Governing Law: *The following is added after the first sentence:*Any litigation arising from this Agreement will be settled exclusively by the court of Rio de Janeiro.

<u>NORTH AMERICA</u>

Warranty Service: *The following is added to this Section:* To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

CANADA

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws in the Province of Ontario.

UNITED STATES

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws of the State of New York.

<u>ASIA PACIFIC</u>

AUSTRALIA

The IBM Warranty for Machines: *The following paragraph is added to this Section:* The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other similar legislation and are only limited to the extent permitted by the applicable legislation.

Limitation of Liability: *The following is added to this Section:* Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974 or other similar legislation, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are

of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws of the State or Territory.

CAMBODIA, LAOS, AND VIETNAM

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*laws of the State of New York.

The following is added to this Section: Disputes and differences arising out of or in connection with this Agreement shall be finally settled by arbitration which shall be held in Singapore in accordance with the rules of the International Chamber of Commerce (ICC). The arbitrator or arbitrators designated in conformity with those rules shall have the power to rule on their own competence and on the validity of the Agreement to submit to arbitration. The arbitration award shall be final and binding for the parties without appeal and the arbitral award shall be in writing and set forth the findings of fact and the conclusions of law.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator.

The two arbitrators appointed by the parties shall appoint a third arbitrator before proceeding upon the reference. The third arbitrator shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the ICC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

The English language version of this Agreement prevails over any other language version.

HONG KONG AND MACAU

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws of Hong Kong Special Administrative Region.

INDIA

Limitation of Liability: *The following replaces items 1 and 2 of this Section:*
1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Limited Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

JAPAN

Governing Law: *The following sentence is added to this Section:*Any doubts concerning this Agreement will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

NEW ZEALAND

The IBM Warranty for Machines: *The following paragraph is added to this Section:* The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: *The following is added to this Section:* Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

PEOPLE'S REPUBLIC OF CHINA (PRC)

Governing Law: *The following replaces this Section:* Both you and IBM consent to the application of the laws of the State of New York (except when local law requires otherwise) to govern, interpret, and enforce all your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Any disputes arising from or in connection with this Agreement will first be resolved by friendly negotiations, failing which either of us has the right to submit the dispute to the China International Economic and Trade Arbitration Commission in Beijing, the PRC, for arbitration in accordance with its arbitration rules in force at the time. The arbitration tribunal will consist of three arbitrators. The language to be used therein will be English and Chinese.

An arbitral award will be final and binding on all the parties, and will be enforceable under the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (1958).

The arbitration fee will be borne by the losing party unless otherwise determined by the arbitral award.

During the course of arbitration, this Agreement will continue to be performed except for the part which the parties are disputing and which is undergoing arbitration.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES: The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

Warranty Service: If you purchase an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM. If you purchase an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchase an IBM Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in that country. Warranty service in Africa is available within 50 kilometers of an IBM authorized service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM authorized service provider.

Governing Law: The applicable laws that govern, interpret and enforce rights, duties, and obligations of each of us arising from, or relating in any manner to, the subject matter of this Statement, without regard to conflict of laws principles, as well as Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided, except that in 1) Albania, Bosnia-Herzegovina, Bulgaria, Croatia,

Hungary, Former Yugoslav Republic of Macedonia, Romania, Slovakia, Slovenia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan, the laws of Austria apply; 2) Estonia, Latvia, and Lithuania, the laws of Finland apply; 3) Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Djibouti, Democratic Republic of Congo, Equatorial Guinea, France, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Mali, Mauritania, Morocco, Niger, Senegal, Togo, and Tunisia, this Agreement will be construed and the legal relations between the parties will be determined in accordance with the French laws and all disputes arising out of this Agreement or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 4) Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe, this Agreement will be governed by English Law and disputes relating to it will be submitted to the exclusive jurisdiction of the English courts; and 5) in Greece, Israel, Italy, Portugal, and Spain any legal claim arising out of this Statement will be brought before, and finally settled by, the competent court of Athens, Tel Aviv, Milan, Lisbon, and Madrid, respectively.

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA AND GERMANY

The IBM Warranty for Machines: *The following replaces the first sentence of the first paragraph of this Section:* The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:

The minimum warranty period for Machines is six months. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: *The second paragraph does not apply.*

Warranty Service: *The following is added to this Section:* During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Limitation of Liability: *The following paragraph is added to this Section:* The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2: IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

EGYPT

Limitation of Liability: *The following replaces item 2 in this Section:* as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

Applicability of suppliers and resellers (unchanged).

FRANCE

Limitation of Liability: *The following replaces the second sentence of the first paragraph of this Section:*In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: *(items 1 and 2 unchanged).*

IRELAND

Extent of Warranty: *The following is added to this Section:* Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: *The following replaces items one and two of the first paragraph of this Section:*1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and 2. the amount of any other actual direct damages, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section: IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY

Limitation of Liability: *The following replaces the second sentence in the first paragraph:*In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than: 1. *(unchanged)* 2. as to any other actual damage arising in all situations involving nonperformance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim. *Applicability of suppliers and resellers (unchanged).*

The following replaces the third paragraph of this Section: Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: *(items 1 and 2 unchanged)* 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND

Limitation of Liability: *The following is added to this Section:* IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

UNITED KINGDOM

Limitation of Liability: *The following replaces items 1 and 2 of the first paragraph of this Section:*
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;
2. the amount of any other actual direct damages or loss, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim;

The following item is added to this paragraph: 3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section: IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

Appendix B. Notices

IBM may not offer the products, services, or features discussed in this document in all countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

> IBM Director of Licensing
> IBM Corporation
> North Castle Drive
> Armonk, NY 10504-1785
> U.S.A.

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 PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information 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 publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product, and use of those Web sites is at your own risk.

Television output notice

The following notice applies to models that have the factory-installed television-output feature.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Trademarks

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

> HelpCenter
> IBM
> NetVista
> ScrollPoint
> Update Connector

Lotus, Freelance, and Word Pro are trademarks of Lotus Development Corporation and/or IBM Corporation in the United States, other countries, or both.

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

PC Direct is a trademark of Ziff Communications Company in the United States, other countries, or both and is used by IBM Corporation under license.

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

Electronic emissions notices

The following paragraph refers only to machine types 2251, 2271, 2292, 6058, 6059, 6343, 6349, 6350, 6568, 6569, 6578, 6579, 6648, 6649, 6790, 6791, 6792, 6793, 6794, 6823, 6825, 6830, 6831, 6832, 6833, 6840, and 6841.

This computer is classified as a Class B digital device. However, this computer includes a built-in network interface controller (NIC) and is considered a Class A digital device when the NIC is in use. The Class A digital device rating and

compliance notice are primarily because the inclusion of certain Class A options or Class A NIC cables changes the overall rating of the computer to Class A.

Cet ordinateur est enregistré comme un appareil numérique de classe B. Toutefois, lorsque la carte réseau qu'il contient est utilisée, il est considéré comme un appareil de classe A. Il a été déclaré de classe A dans l'avis de conformité car la présence de certaines options de classe A ou de câbles de carte réseau de classe A modifie ses caractérisques et le rend conforme aux normes de la classe A.

Class B notices

These notices refer to machine types 2251, 2254, 2256, 2257, 2271, 2292, 6029, 6058, 6059, 6336, 6337, 6339, 6341, 6342, 6343, 6346, 6347, 6348, 6349, 6350, 6568, 6569, 6578, 6579, 6648, 6649, 6790, 6791, 6792, 6793, 6794, 6823, 6825, 6830, 6831, 6832, 6833, 6840, and 6841.

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference,

and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

FC Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Industry Canada Class B emission compliance statement

This Class B digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Class A notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement
This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement
Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

European Union EMC Directive conformance statement
This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Taiwan Class A warning statement

警告使用者：
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

Federal Communications Commission (FCC) and telephone company requirements

1. This device complies with Part 68 of the FCC rules. A label is affixed to the device that contains, among other things, the FCC registration number, USOC, and Ringer Equivalency Number (REN) for this equipment. If these numbers are requested, provide this information to your telephone company.

   Note: If the device is an internal modem, a second FCC registration label is also provided. You may attach the label to the exterior of the computer in which you install the IBM modem, or you may attach the label to the external DAA, if you have one. Place the label in a location that is easily accessible, should you need to provide the label information to the telephone company.

2. The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all areas, the sum of the RENs of all devices should not exceed five (5). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to determine the maximum REN for your calling area.

3. If the device causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance; if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

4. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice to give you an opportunity to maintain uninterrupted service.

5. If you experience trouble with this product, contact your authorized reseller, or call IBM. In the United States, call IBM at **1-800-772-2227**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

   The telephone company may ask you to disconnect the device from the network until the problem has been corrected, or until you are sure the device is not malfunctioning.

6. No customer repairs are possible to the device. If you experience trouble with the device, contact your Authorized Reseller or see the Diagnostics section of this manual for information.

7. This device may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.

8. When ordering network interface (NI) service from the local Exchange Carrier, specify service arrangement USOC RJ11C.

Canadian Department of Communications certification label

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements documents. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

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

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

NOTICE: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may

consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Étiquette d'homologation du ministère des Communications du Canada

AVIS : L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

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

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

AVIS : L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

Power cord notice

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
13F9940	Argentina, Australia, China (PRC), New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, China (Macau S.A.R.), Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
13F9997	Denmark
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
14F0033	Antigua, Bahrain, Brunei, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dubai, Fiji, Ghana, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Ethiopia, Italy, Libya, Somalia

IBM power cord part number	Used in these countries and regions
14F0087	Israel
1838574	Thailand
6952301	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela

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