IBM

Enhanced IDE
Hard Disk Drive

User's Guide

OPTIONS
by IBM

> **Note:** If you are using this product in the United States, Canada, or Puerto Rico, be sure to read the *Enhanced IDE Hard Disk Drive User's Guide Supplement* for warranty information and jumper setting information for your hard disk drive. Also, refer to Appendix C, "Notices" on page 3-16 for Notice information.
>
> *For all other countries, the warranty terms and conditions applicable in the country of purchase are available from IBM or your reseller.*

Contents

Safety: Read First

⚠

CAUTION: Read the Safety Information in the Appendix, page 3-1, before installing this product.

Bitte beachten: Vor der Installation dieses Produkts bitte die Sicherheitsinformationen im Anhang (Seite 3-1) durchlesen.

ATTENTION: Lire les Consignes de Sécurité en Annexe, page 3-1, avant d'installer ce produit.

Precaución: Antes de instalar este producto, lea la información sobre seguridad que aparece en el apéndice, páginas 3 a 1.

注意：この製品をインストールする前に、付録ページ 3-1 の安全に関する表示をお読み下さい。

ATTENZIONE: Prima di procedere all'installazione di questo dispositivo, leggere le Informazioni sulla sicurezza nell'Appendice a

ADVERTÊNCIA: Leia a informação sobre segurança no Apêndice, página 3-1, antes de instalar este produto.

OPOZORNĚNÍ: Před instalací tohoto výrobku si přečtěte Informace o bezpečnosti v Dodatku, str. 3-1.

BEMÆRK: Læs sikkerhedsinformationen i tillægget, side 3-1, før du installerer dette produkt.

LET OP: Voordat dit produkt wordt geïnstalleerd dient de informatie over veiligheid in de bijlage op pagina 3-1 gelezen te worden.

ATTENTION: Avant d'installer ce produit, veuillez lire les renseignements en matière de sécurité à la page 3-1 de l'Annexe.

VAROITUS: Lue liitteen sivulla 3-1 olevat turvallisuusohjeet, ennen tämän laitteen asentamista.

זהירות: קרא את הוראות הבטיחות המופיעות בנספח, עמ' 3-1, לפני התקנת מכשיר זה.

FIGYELMEZTETÉS: Mielôtt beszerelné a terméket, olvassa el a függelék 3-1 oldalán található biztonsági információkat.

주의 : 본 제품을 설피하기 전에 부록의 3쪽 1항에 있는 안전 수칙을 숙독한다.

ADVARSEL: Les informasjonen om sikkerhet i Appendiks, side 3-1, før du installerer dette produktet.

UWAGA: Przed zainstalowaniem tego wyrobu należy przeczytać informację dotyczącą bezpieczeństwa w Załączniku na str. 3-1.

CUIDADO: Leia as Informações de Segurança no Anexo, página 3-1, antes de instalar este produto.

小心：請在安裝本產品之前仔細閱讀3-1頁附錄中的安全信息。

Opozorilo: Upoštevajte varnostna obvestila v dodatku, stran 3.-1., preden napravo instalirate.

VARNING: Läs säkerhetsinformationen i bilagan, sid. 3-1 innan du installerar denna produkt.

Product Registration

Thank you for purchasing OPTIONS by IBM. Please take a few
moments to register your product and provide us with information that
will help IBM to better serve you in the future. Your feedback is
valuable to us in developing products and services that are important
to you, as well as in developing better ways to communicate with you.
Register your option on the IBM Web site at:

http://www.pc.ibm.com/register

IBM will send you information and updates on your registered product
unless you indicate on the Web site questionnaire that you do not want
to receive further information.

Part 1: About This Book

This book contains instructions for installing, setting up, and using your IBM Enhanced IDE Hard Disk Drive. The manual is divided into the following parts:

Part 1:   Manual outline

Part 2:   Product and software description, installation requirements, and handling, installation, and configuration instructions

Part 3:   Safety, service and notice information

The illustrations in this publication might be slightly different from your hardware.

Note: Be sure to read the *Enhanced IDE Hard Disk Drive User's Guide Supplement* for jumper setting and product warranty information.

Product Description

The IBM Enhanced IDE Hard Disk Drive is a 3.5-inch slimline (1-inch high) drive that can be installed only in computers that use the AT attachment/integrated drive electronics (ATA/IDE) architecture.

Your hard disk drive can be configured in any of the following ways:

Single drive
– To install as the only hard disk drive in a computer
– To replace a hard disk drive
Multiple drive
– To operate with installed IDE (ATA) hard disk drives
– To operate with installed (SCSI) hard disk drives

In addition to this User's Guide, your option package contains:

Enhanced IDE hard disk drive
DiskGo! diskette or CD-ROM
Four drive mounting screws
IDE cable for connecting two IDE devices
(some option packages)
Mounting brackets with screws (some option packages)
Enhanced IDE Hard Disk Drive User's Guide Supplement

Contact your place of purchase if parts are missing or damaged. Be sure to retain your proof of purchase. It might be required to receive warranty service.

Software Description

Attention: If your option comes with a *DiskGo!* CD-ROM, and you will be installing the new drive on a computer system that does not have a CD-ROM drive, you can build a *DiskGo!* installation diskette on another system that has a CD-ROM drive using a blank formatted diskette and your *DiskGo!* CD-ROM. To create the installation diskette to use in a system that does not have a CD-ROM drive:

1. Insert the *DiskGo!* CD-ROM in the CD-ROM drive on another system.
2. Start the program as directed by the CD-ROM.
3. Follow on-screen instructions to create an installation diskette using your *DiskGo!* CD-ROM and the blank formatted diskette.

The diskette or CD-ROM that comes with your option contains the *DiskGo!* and *Disk Manager* drive installation utility programs.

The *DiskGo!* utility program creates customized step-by-step drive installation instruction for computer systems using the Windows 98,

Windows 95 or Windows 3.1 operating systems on the existing drive. The instructions include directions on setting configuration jumpers, physically installing the drive, and using *DiskGo!* to partition and format the drive.

Disk Manager is a DOS-based installation utility program included on the *DiskGo!* diskette or CD-ROM that tests, partitions, formats, and prepares the drive for the installation of an operating system. (*Disk Manager* can be started from the *DiskGo!* diskette or CD-ROM, eliminating the need for a System Diskette.) You must attach the new drive to the computer before installing *Disk Manager*.

If you are using the Windows NT or OS/2 operating system, you can use your operating system instead of *DiskGo!* or *Disk Manager* to partition and format an additional drive. However, be sure to read the *Enhanced IDE Hard Disk Drive User's Guide Supplement* before installing the drive.

The *DiskGo!* and *Disk Manager* utility programs contain programs that:

   Overcome system BIOS limitations in order to use the full capacity of larger and newer IDE drives

   Provide jumper settings for your old and new drives

   Partition and format your drive

In addition, the *DiskGo!* diskette or CD-ROM contains the following:

FileCopy

FileCopy copies all files from one drive to another, simplifying the task of adding a new hard disk drive that will replace your startup drive and will contain your operating system. For more information on FileCopy, see "FileCopy" on page 2-22.

CD Update

CD Update is a Windows utility program that modifies your application configuration to access a changed CD-ROM drive letter. For more information on CD Update, see "CD Update" on page 2-23.

Determining Where to Begin

> **Attention:** If you are familiar with IDE products and experienced in installing options, use the following instructions to quickly install your Enhanced IDE Hard Disk Drive. For more detailed information about preparing your drive for installation, go to "Installation Planning" on page 2-5.

If you are installing your new drive in a computer that does not have an existing drive, install your new drive in the computer using instructions given in "Installing the Drive" on page 2-9.

If you are using Windows 98 or Windows 95 on your existing drive, install *DiskGo!* using instructions given in "Installing DiskGo! in Windows 98 or Windows 95" on page 2-4.

If you are using Windows 3.1 on your existing drive, install *DiskGo!* using instructions given in "Installing DiskGo! in Windows 3.1" on page 2-4.

If you are using Windows NT or OS/2 on your existing drive, install your new drive in the computer using instructions given in "Installing the Drive" on page 2-9.

Installing DiskGo! in Windows 98 or Windows 95

If your computer's current operating system is Windows 98 or Windows 95, install *DiskGo!* in order to receive customized instructions for installing your new drive.

To install *DiskGo!* in Windows 98 or Windows 95:

1. Turn on your computer.

2. Insert the *DiskGo!* diskette or CD-ROM in the diskette or CD-ROM drive.

3. Select **Run** from the Start menu.

4. Type **x:setup** where **x** is the drive letter of your diskette or CD-ROM, and click on **OK**.

5. Follow on-screen instructions to install *DiskGo!*.

6. Follow *DiskGo!* screen instructions to complete the drive installation process.

Installing DiskGo! in Windows 3.1

If your computer's current operating system is Windows 3.1, install *DiskGo!* in order to receive customized instructions for installing your new drive.

To install *DiskGo!* in Windows 3.1:

1. Turn on your computer.

2. Insert the *DiskGo!* diskette or CD-ROM in the diskette or CD-ROM drive.

3. Select **Run** from the Program Manager.

4. Type **x:setup** where **x** is the drive letter of your diskette or CD-ROM, and click on **OK**.

5. Follow on-screen instructions to install *DiskGo!*.

6. Follow *DiskGo!* screen instructions to complete the drive installation process.

Installation Planning

The following sections contain detailed information to help you plan your hard disk drive installation.

Installation Requirements

To install the EIDE Hard Disk Drive you must have:

Documentation
  The documentation that comes with your computer and operating system.

IDE bus adapter
  Your computer must have an IDE port on the system board or on an IDE bus adapter. If the interface cable connectors in your computer have 40 pins, your computer uses the IDE architecture. If you are not sure about your IDE bus adapter, see the documentation that comes with your computer.

IDE cables and connectors
  The IDE cables connect the IDE port on the system board, or on an IDE adapter, to your IDE storage devices. IDE storage devices include hard disk drives, CD-ROM drives, tape drives, and diskette drives greater than 100 MB.[1]

You can attach up to two devices to an IDE cable, as shown. If your computer has two IDE ports (one IDE cable on each port), you can attach up to four devices (two devices on each cable).
Note: Not all cables have connectors for two IDE devices.

If you have only one drive in your system, attach it here 1 .
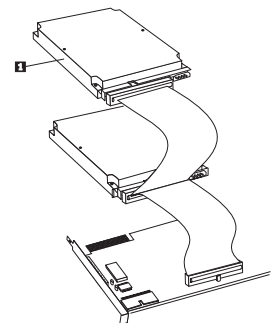
Mounting brackets and tools

  Most computers have 3.5-inch and 5.25-inch drive bays. The hard disk drive you are installing is designed for a 3.5-inch bay, but it can be adapted to a 5.25-inch bay. Common bay dimensions are:

  – 3.5-inch—10 cm x 15 cm x 2.5 cm (4 in. x 6 in. x 1 in.)

  – 5.25-inch—15 cm x 20 cm x 4 cm (6 in. x 8 in. x 1.63 in.)

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[1] *When referring to hard-disk-drive capacity, MB means 1 000 000 bytes; total user-accessible capacity may vary depending on operating system.*

To mount the hard disk drive in a 5.25-inch bay, attach a pair of 3.5-inch to 5.25-inch adapter brackets (included in some option packages) as shown.
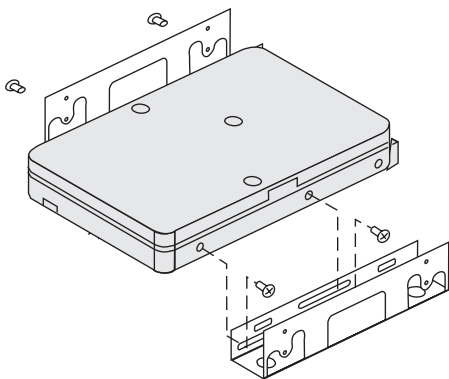
Special mounting hardware is needed for some installations. If you are not sure about what is needed for your computer, contact your dealer or refer to the documentation that comes with your computer.

You will need a flat-blade and a Phillips-head screwdriver.

Configuration Planning

The *DiskGo!* and *Disk Manager* utility programs provide information on placing and configuring hard disk drives.

The *DiskGo!* on-screen instructions for the Windows 98, Windows 95 or Windows 3.1 operating systems provide customized directions on how to place and configure your drives.

If you are not using Windows 98, Windows 95 or Windows 3.1, you can obtain drive placement and configuration information from the *Disk Manager* utility program.

To run *Disk Manager*:

1. Go to a DOS prompt.

2. Insert the *DiskGo!* diskette or CD-ROM.

3. Type **x:dm** where **x** is the drive letter of the diskette or CD-ROM, and press **Enter**.

4. Follow the instructions on the screen.

5. When the *Disk Manager* main menu displays, select **View/Print Online Manual** and press **Enter**.

6. Select **Before Running Disk Manager**.

7. Select **Adding a Hard Drive - Considerations**.

8. Select **Notes on Adding a Drive** to view information on placing and configuring your drive.

Partitioning Planning

The latest releases of Microsoft operating systems, including Windows 98, have an option for a 32-bit file allocation table called FAT32. FAT32 supports partitions as large as 2 TB[2] and cluster sizes of 4 KB[3] for partitions up to 8 GB.[4] If you have FAT32, you will be able to prepare your drive without concern for partition size limits or storage efficiency. To determine if you have FAT32 installed, select your existing drive under **My Computer**, and select **Properties**. If FAT32 is installed, the **General** tab will display **FAT32** under the drive label.

The largest partition size that you can create under the DOS, Windows 95, Windows 3.x, and OS/2 operating systems that use the 16-bit file allocation table (FAT16) file system is approximately 2.14 GB. Therefore, if your operating system uses the FAT16 file system, you must create more than one partition to use the full capacity of your drive.

If you use the DOS-based FDISK utility to partition your drive and you are using the maximum partition size of 2.14 GB, you must enter the partition size as 2047 MB.

If you are using OS/2, you can use the high performance file system (HPFS) developed for OS/2, instead of the FAT16 file system, to partition an additional drive. HPFS allocates files in 512-byte units, reducing lost disk space. HPFS also creates large partitions and accommodates large numbers of files more efficiently than FAT16 does. For more information on partitioning a drive for OS/2, see "Partitioning and Formatting Using OS/2" on page 2-16.

If you are using the Windows NT operating system, you must use the NT File System (NTFS) to partition your new drive. For more information on partitioning a drive for Windows NT, see "Partitioning and Formatting Using Windows NT" on page 2-16.

Selecting a Drive Partition Size Using FAT16

Base your partition size on how you use your computer.

Select a larger partition size if you want the convenience of having many files in one partition or if you have large databases.

Select a smaller partition size if you have a large number of small files such as text files.

FDISK assigns space on a hard disk drive in clusters. A cluster, or allocation unit, is the smallest unit of space on the drive that your operating system can address using FAT conventions. The operating system assigns one or more clusters to each file. Even a very small file uses one full cluster. The following table shows how the cluster size is incremented as the partition size increases.

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[2] *When referring to hard-disk-drive capacity, TB means 1 000 000 000 000 bytes; total user-accessible capacity may vary depending on operating system.*

[3] *When referring to cluster sizes, KB means 1 024 bytes.*

[4] *When referring to hard-disk-drive-capacity, GB means 1 000 000 000 bytes; total user-accessible capacity may vary depending on operating system.*

Partition Size	Cluster Size (FAT16)
0 MB - 16MB	4 KB
16 MB - 128 MB	2 KB
128 MB - 256 MB	4 KB
256 MB - 512 MB	8 KB
512 MB - 1 GB	16 KB
1 GB - 2 GB	32 KB

These examples illustrate the effect of cluster size on hard disk space allocation.

If you create a 2.14 GB partition, each disk cluster is 32 KB. A one KB file takes one cluster or 32 KB of disk space.

If the partition size is 1.00 GB, the cluster size is 16 KB. A one KB file takes one cluster or 16 KB of disk space. A normal mix of application and data files can include thousands of small files.

Smaller partitions (cluster sizes) save hard disk capacity, particularly when the partition contains many small files. However, when a large file is placed in small partitions, the file must be spread over many clusters, causing it to be fragmented (scattered around the disk) which can result in slower performance. Therefore, small partitions are well suited for small files while large clusters are well suited to large files for optimal capacity and performance.

If you replace a hard disk drive with a much larger capacity drive, normally you will create a larger partition size on the new drive. When you copy files from a smaller partition to a larger partition, the same files require surprisingly more space on the disk because of the increased cluster size.

For more information, see your operating system user's guide. Also, the *Disk Manager Online Manual* contains information about clusters and how to assign hard disk drive partitions. To open the *Disk Manager* manual:

1. Go to a DOS prompt.
2. Insert the *DiskGo!* diskette or CD-ROM.
3. Type **x:dm\h** where **x** is the drive letter of your diskette or CD-ROM, and press **Enter**.

Creating Utility Diskettes for OS/2

If you will be using the OS/2 operating system on your existing drive to partition your new drive, create three OS/2 Utility Diskettes before starting your installation. The Utility Diskettes allow you to recover if you cannot restart (boot) your computer from a previously installed hard disk drive, and you do not have a backup diskette.

To create Utility Diskettes for OS/2:

1. Open **OS/2 System** on your Desktop.
2. Open **System Setup**.
3. Open **Create Utility Diskettes**.
   The Create Utility Diskettes screen displays.
4. Follow the on-screen instructions to create OS/2 Utility Diskettes.

You can also create the Utility Diskettes from the OS/2 CD-ROM by running **cdinst.cmd** from the file directory.

Installing the Drive

> **Attention:** If you are replacing an installed hard disk drive, be sure to make a backup copy of the data from the drive that you are replacing. Optionally, you can use the FileCopy utility program on the *DiskGo!* diskette to copy data from your old drive to your new drive. For more information about FileCopy, see "FileCopy" on page 2-22.

If you are using the Windows 98, Windows 95 or Windows 3.1 operating systems, install *DiskGo!* prior to installing the drive in your computer. *DiskGo!* will create customized drive installation instructions that provide directions on how to install your drive. For instructions on installing *DiskGo!*, go to "Installing DiskGo! in Windows 98 or Windows 95" on page 2-4 or "Installing DiskGo! in Windows 3.1" on page 2-4.

If you are using the OS/2 operating system on your existing drive, you must install your new drive in the computer before using OS/2 to partition and format your drive. Be sure to create OS/2 Utility Diskettes before installing your new drive. For more information, see "Creating Utility Diskettes for OS/2" on page 2-8.

If you are using the Windows NT operating system on your existing drive, you must install your new drive in the computer before using Windows NT to partition and format your new drive.

If you are installing your new drive in a computer that does not have an existing drive, you must install your new drive in the computer before you can use *Disk Manager* or an operating system to partition and format the drive.

The instructions in this section are general guidelines that apply to most computers. For specific information on installing a hard disk drive in your computer, see the documentation that comes with your computer.

Step 1. Opening Your Computer

Before opening your computer, complete the following steps:

1. Turn off the computer.

2. Unplug the cables from the power outlets for your computer and all attached devices.

It is now safe to open your computer. For specific information about opening your computer, see the documentation that comes with the computer.

Step 2. Unpacking the Drive

Use the following procedure to unpack and handle the drive. To prevent damage and static-electricity discharge, limit handling to a minimum.

1. Do not open the antistatic bag until you are ready to install the drive. Static electricity can damage the drive and other computer components.

2. Touch the inner conductive surface of the antistatic bag containing the drive, and your hand, to an unpainted metal surface on the computer for two seconds. This drains static electricity from the bag and your body.

3. Before handling the drive, ground yourself by touching an unpainted surface on the computer. Ground yourself again after leaving and returning to your work area.

4. Always handle the drive by its edges. Do not touch any exposed printed circuitry, components or connector pins.

5. While installing the drive, avoid all unnecessary handling. Rough handling can damage the heads, rotating disks, and bearings inside the drive housing.

6. If you must put the drive down, place the antistatic bag on a flat padded surface, such as a magazine, and place the drive on the bag with the component side facing up.

Step 3. Setting the Configuration Jumpers

> **Attention:** Be sure to refer to the *Enhanced IDE Hard Disk Drive User's Guide Supplement* for information about setting configuration jumpers.

If you are installing the EIDE Hard Disk Drive as the only drive on the IDE cable, you must place the jumpers in the master configuration.

If the EIDE Hard Disk Drive will not be the only drive on the IDE cable, note these jumper configuration positions:

  Master
  Slave
  Cable Select
  Slave Present

Use the appropriate positions for your configuration:

Master
If you are installing the EIDE Hard Disk Drive as the only drive on the IDE cable or you are replacing the master drive on the IDE cable, verify that the jumpers are in the master position.

Slave
If you are installing the EIDE Hard Disk Drive as the slave drive, place the jumpers in the slave position. If the existing master drive is also an EIDE Hard Disk Drive, verify that the jumpers for the existing drive are in the master position.

To verify the jumper positions on your drives, try the following procedures (**listed in order of preference**):

> **Attention:** Installing the *Disk Manager* utility on the drive erases all user data on the drive.

1. Run the *Disk Manager* utility.

   To find your current drive's jumper settings using *Disk Manager*:

   a. Close the computer cover.

   b. Turn on the computer.

   c. Go to a DOS prompt.

   d. Insert the *DiskGo!* diskette or CD-ROM.

   e. Type **x:dm** where **x** is the drive letter of your diskette or CD-ROM, and press **Enter**.

   f. Follow the instructions on the screen.

   g. When the *Disk Manager* main menu displays, select **Easy Disk Installation** and press **Enter**.

   h. Select **Yes** if the displayed list of drives is correct.

   i. *Disk Manager* will then display jumper settings for the drives in your computer.

   j. If you can not verify that the displayed jumper settings are correct, return to the main menu, select **View/Print Online Manual**, and press **Enter** in order to view information on jumper settings.

   k. Turn off your computer and unplug the power cord.

   l. If the jumper settings are correct, open your computer and continue with "What to Do Next" on page 2-12.

2. Check the drive label.

3. Call the drive manufacturer to determine if you need to reset the jumpers. For information on how to contact the most common hard disk drive manufacturers, see "Step 5. Placing the Call to Hard Disk Drive Manufacturers" on page 3-15.

Cable Select
Some systems use special ATA cables with two wires reversed in the device connectors to allow the drives to be ordered by the cable rather than by the jumper position. The cable select position is to be used only for systems equipped with these special cables. See the documentation that comes with your computer to determine if your ATA adapter requires you to place the jumpers in the cable select position.

If you place the jumpers in the cable select position, the IDE cable automatically assigns the master and slave settings based on the position of the drive on the cable. Any other devices on the IDE cable must also be set to Cable Select.

Slave Present

Your ATA drive has a slave present position for the special case when you are installing the EIDE Hard Disk Drive as master with an older and slower slave drive that does not comply with the ATA communication standard. However, nearly all drives with a capacity above 500 MB comply with the ATA communication standard.

If you are installing the EIDE Hard Disk Drive as the master, you have a slave device on the same ATA cable, and your configuration-setup program does not recognize the slave drive, turn off your computer and unplug the power cord. Open your computer. On the master drive, change your jumpers from the master position (the factory default) to the slave present position. Then close your computer, reattach the power cord, and restart your computer.

What to Do Next

If you are installing the drive in a 3.5-inch bay, go to "Step 5. Mounting the Drive in the Bay" on page 2-13.

If you are installing the drive in a 5.25-inch bay, continue with "Step 4. Preparing the Drive for a 5.25-inch Bay."

Step 4. Preparing the Drive for a 5.25-inch Bay

To attach the drive in a 5.25-inch bay:

1. Attach a pair of 3.5-inch to 5.25-inch expansion brackets, as shown in the illustration below.
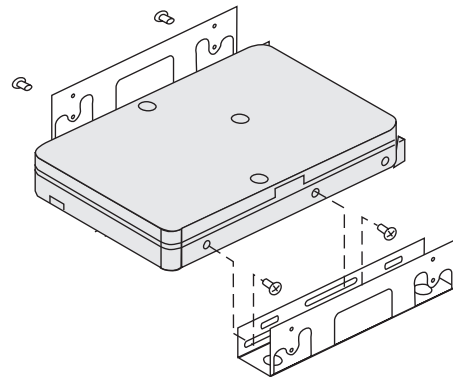
2. Some computers require that you attach special hard-disk-drive mounting hardware to ensure that the drive mounts securely into the bay. Contact your computer dealer or refer to the documentation that comes with your computer if you need specialized mounting hardware or more information.

Step 5. Mounting the Drive in the Bay

The drive can be mounted in either the horizontal or the vertical position. To mount the drive in the bay:

1. Slide the drive into the bay.

2. If you will be adding your new drive to a system with an existing drive, make sure the new drive is positioned so that it is adjacent to, and oriented in the same direction as, the existing hard drive so that you will not have to twist the interface cable in order to connect the drives.

3. Align the drive-bay screw holes with the threaded holes in the drive housing or expansion brackets.

4. Hand thread the screws to lightly secure the drive in the bay. For some installations, you might have to use the screw holes on the bottom (circuit board side) of the drive.

5. Check the drive alignment and tighten the screws. *Do not overtighten.*

Step 6. Attaching the Cables to the Drive

Use the following procedure to attach the cables.

1. Locate a free device connector on the IDE interface cable in your computer. The illustration shows an interface cable with three connectors and two attached devices.

If you have only one drive in your system, attach it here 1 .
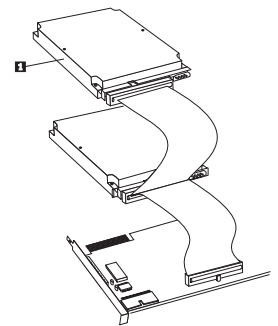
The connector on one end and the connector in the middle connect to the storage devices. The other end of the cable connects to the IDE port. The IDE port can be on the computer system board or on an adapter installed in an expansion slot. For the best signal quality when you have only one device on the IDE cable, connect the device to the connector on the end opposite the IDE port.

2. Attach an available connector on the interface cable to the connector on the hard disk drive, as shown. Be sure that the colored wire is connected to pin 1 on the drive connector and is the closest wire to the 4-pin dc power connector.

Pin 1

Pin 40

Step 7. Completing the Installation of the Drive

To complete the installation of the drive:

1. Verify that the hard disk drive is securely mounted and the cables are firmly attached.

2. Verify that the cables do not interfere with the computer cover and do not block the power-supply fan blades or air-flow paths.

3. Reinstall the computer cover.

4. Reconnect all devices. Make sure that the keyboard, mouse, and monitor cables are firmly connected.

5. Reconnect all ac power cords.

3. Find an unused power connector on a cable coming from the computer power supply and attach it to the four-pin dc power connector. The power connector is keyed so that it attaches one way only. Do not force it. If the connector does not attach using reasonable pressure, recheck the orientation of the cable connector to the drive connector, and try again.

If all power cables are in use, purchase a dc Y-connector (available at many electronic stores) and split a connection to provide power for more devices.

Preparing the Drive for Use

> **Attention:** Partitioning a hard disk drive or installing the *Disk Manager* utility program on the drive erases all user data on the drive.

Determining What To Do Next

When you restart your computer, the configuration-setup information screen displays because you changed the hardware in your computer. Some computers require you to make configuration choices the first time you restart after installing a new device. If the screen does not display, see your computer documentation for information about how to access it. For most IBM computers, you can see the configuration information during computer startup by pressing **F1** when the configuration graphic displays in the upper right corner of your screen.

Check your configuration-setup information for one of the following:

If the configuration-setup program reports the size of your new drive as what you expected, save your changes, close the configuration program, and continue with "Partitioning and Formatting Your Drive."

If the configuration-setup program reports your new drive capacity as *very much less* than what you expected, refer to the *Enhanced IDE Hard Disk Drive User's Guide Supplement* for information on correcting BIOS limitations, and then go to "Partitioning and Formatting Using Disk Manager" on page 2-17.

If your computer seems to lock up, hang, or does not restart successfully, go to "Correcting Hardware Problems" on page 2-18.

Partitioning and Formatting Your Drive

> **Attention Windows NT and OS/2 Users:** If you placed a **2 GB Clip** jumper on your drive as directed by the *Enhanced IDE Hard Disk Drive User's Guide Supplement*, you must use *Disk Manager* to partition and format the drive. For more information, go to "Partitioning and Formatting Using Disk Manager" on page 2-17.

If you are using OS/2 on your existing drive, go to "Partitioning and Formatting Using OS/2" on page 2-16.

If you are using Windows NT on your existing drive, or you will be installing Windows NT on the first drive in the computer, go to "Partitioning and Formatting Using Windows NT" on page 2-16.

If your new drive is the first drive that has been installed in the computer, and you will be installing an operating system other than Windows NT, go to "Partitioning and Formatting Using Disk Manager" on page 2-17.

Partitioning and Formatting Using OS/2

This section contains instructions about partitioning and formatting an additional hard disk drive for the OS/2 operating system.

If you are using OS/2 on your existing drive, use the following procedures to prepare the new drive in order to install OS/2:

1. Refer to the *Enhanced IDE Hard Disk Drive User's Guide Supplement* in order to obtain the OS/2 device drivers necessary to use the full capacity of your drive.

2. Partition and format your new drive for OS/2 using the FAT16 or HPFS file system, or both FAT16 and HPFS, using directions given in the OS/2 *User's Guide*.

   Note: In larger capacity drives, the OS/2 operating system can partition only up to the first 2.14 GB, or the first 1024 logical cylinders, of the drive using the FAT file system. However, you can partition the entire drive using the HPFS file system.

   Use the following equation to determine the extent of the drive capacity that OS/2 and FAT can partition (see the *Enhanced IDE Hard Disk Drive User's Guide Supplement* for specifications on your drive's logical sectors and logical heads):

   ```
   1 24 (default number of cylinders) multiplied by your
   drive's logical sectors multiplied by your drive's
   logical heads multiplied by 512 bytes
   ```

   Since you cannot partition the entire capacity of the drive using FAT, you must use HPFS to partition the rest of the drive.

3. If you choose to make your new drive a boot drive, refer to your OS/2 *User's Guide* for information on installing OS/2 on your new drive.

Partitioning and Formatting Using Windows NT

Attention: If you are using Windows NT and you are installing a drive larger than 9 GB, you must obtain the Windows NT Service Pack 3 or later so that your system can realize the full capacity of your drive.

To obtain the Windows NT Service Pack 3 or later:

1. Go to the Microsoft Web site at www.microsoft.com.
2. Select **Free Downloads**.
3. Select **Support Drivers, Patches and Service Packs**.
4. Follow on-screen instructions.

If you added your drive to a computer that has Windows NT on an existing drive, follow the instructions below to partition and format your new hard disk drive using the NTFS (NT File System) convention:

1. Turn on your computer.
2. Click on **Start** on the desktop.
3. Select **Programs, Administrative Tools (Common)**.
4. Click on the **Disk Administrator** icon.
5. Follow the screen prompts to partition and format an additional hard disk drive.

If you installed your drive to a computer that had no existing drive, follow the instructions below to partition and format your new hard disk drive for the Windows NT operating system using NTFS:

1. Insert the first Windows NT installation diskette (*Setup Disk #1*) in the diskette drive or insert the Windows NT installation CD-ROM in the CD-ROM drive.

2. Restart your computer.

3. Use instructions given in the Windows NT user's guide to partition and format your drive for Windows NT.

Partitioning and Formatting Using Disk Manager

> **Note:** *Disk Manager* will add a **Dynamic Drive Overlay (DDO)** to your drive if it finds a BIOS limitation on your system. DDO is a device driver that *Disk Manager* adds to your drive in order to allow your system to access the drive's full capacity. For important information on starting your computer from a diskette or CD-ROM after DDO is added, see the box on the next page.

To install *Disk Manager* in order to partition and format your new drive:

1. Turn off the computer.

2. Insert the *DiskGo!* diskette or CD-ROM and restart the computer.

3. If *Disk Manager* does not boot automatically, type **x:dm** where **x** is the drive letter of your diskette or CD-ROM at the DOS prompt and press **Enter**.

4. Follow the instructions on the screen.

5. When the *Disk Manager* main menu displays, select **View/Print Online Manual** and press **Enter** to view information by operating system on how to partition your drive and install your operating system.

6. Return to the main menu, select **Easy Disk Installation**, and press **Enter** to accept the default partitioning. If you do not want to accept the default drive partitioning, select **Advanced Disk Installation** to select your own partition sizes.

7. Follow the on-screen prompts to complete the drive partitioning process.

8. To install an operating system on your new drive, use instructions given in the *Disk Manager Online Manual*.

Correcting Hardware Problems

If you install your new hard disk drive and the startup program seems to hang or does not report the new drive correctly, the problem can be in your hardware or it can be a BIOS limitation.

To isolate a hardware problem, try the following:

1. Use the following procedures to check the cable connections and the jumper settings.

   a. Turn off the computer.

   b. Unplug the cables from the power outlets for your computer and all attached devices.

   c. Remove the computer cover and disconnect the IDE cable from the drive.

   d. Verify that the colored wire is connected to pin 1 on the drive connector and is the closest wire to the 4-pin power connector. Some connectors are keyed and will only fit one way. Do not force the connector onto the pins. If the connector does not seem to fit, recheck the orientation of the cable connector to the drive connector, and try again.

   e. Check the configuration jumper setting on all devices on all IDE ports. For more information about the jumper settings, see "Step 3. Setting the Configuration Jumpers" on page 2-10, or refer to the *Enhanced IDE Hard Disk Drive User's Guide Supplement*

   f. Verify that the power cable is correctly attached to the drive.

g. Replace the computer cover.

h. Reconnect the power cord to the computer.

i. Restart your computer.

> If the problem does not happen again, go back to "Preparing the Drive for Use" on page 2-15 to restart the preparation process.

> If the problem happens again, continue with step 2.

2. Check for a conflict with another device and restart the computer with only the new hard disk drive connected.

a. Turn off the computer.

b. Unplug the cables from the power outlets for your computer and all attached devices.

c. Remove the computer cover and disconnect all devices from the IDE ports.

d. Connect the new hard disk drive as the master drive on the primary IDE port. You might have to reset the configuration jumper. (The *Enhanced IDE Hard Disk Drive User's Guide Supplement* lists your drive's jumper settings.)

e. Replace the computer cover.

f. Recheck all external cables.

g. Restart the computer and check the drive size reported by the configuration-setup program. If the drive is not detected at all, go to step 4. If the hard disk drive is now correctly detected, you have an incompatibility problem.

h. To isolate an incompatibility problem, try the following:

> Refer to the user's guides for the attached devices.

> Use the *Disk Manager Online Manual* for information about jumper settings for hard disk drives from other manufacturers. To open the *Disk Manager Online Manual*, go to the **x**: prompt (where **x** is the drive letter of your diskette or CD-ROM) on DOS, insert the *DiskGo!* diskette or CD-ROM, type **dm/h**, and press **Enter**.

> If the conflicting device is a hard disk drive that is not an IBM product, contact the drive manufacturer. See "Step 5. Placing the Call to Hard Disk Drive Manufacturers" on page 3-15 for a list of drive manufacturers.

> When you have corrected the incompatibility problem, go back to "Preparing the Drive for Use" on page 2-15 to complete the disk drive preparation process.

3. If the drive is detected, but the drive capacity is not correctly reported, you will need to address a BIOS limitation on your computer that prevents it from recognizing the full capacity of the drive. For more information, continue with "Overcoming BIOS Limitations" on page 2-20.

4. If your computer still seems to lock up or hang, you might need to use a special jumper setting to overcome a BIOS limitation on your computer. For more information, refer to your *Enhanced IDE Hard Disk Drive User's Guide Supplement*.

Overcoming BIOS Limitations

> **Attention:** Refer to the *Enhanced IDE Hard Disk Drive User's Guide Supplement* for important information on configuration jumper settings that might help your computer overcome BIOS limitations in order to recognize the full capacity of your drive.

The basic input and output system (BIOS) manages communication between the processor and the input-output devices. Your computer BIOS might contain limitations that can keep the computer from recognizing the full capacity of your drive or from recognizing your large drive at all.

To solve BIOS limitations in IBM computers, install *Disk Manager* using instructions given in "Partitioning and Formatting Using Disk Manager" on page 2-17.

The following procedures contain steps to solve most known BIOS limitations in non-IBM computers.

1. Access your configuration-setup information.

2. Select the drive number for the new drive that you are installing.

   Based on BIOS type, number of IDE controllers, and number of IDE devices in your computer, the configuration-setup program displays options for up to four devices.

   Normally, drives 1 and 2 are connected to the primary IDE port and drives 3 and 4 are connected to the secondary IDE port.

   If you have two IDE ports, drives 1 and 3 are the master devices and drives 2 and 4 are the slave devices.

   If you have one IDE controller, drive 1 is the master device and drive 2 is the slave device.

3. Based on your configuration, one of the following options will be available. The choices **listed in order of preference** are:

   a. Select the **Auto Detect** configuration-setup option, if available.

      If your configuration-setup information displays the correct capacity, go to "Partitioning and Formatting Your Drive" on page 2-15.

      If your configuration-setup information does not display the correct capacity, install *Disk Manager* using instructions given in "Partitioning and Formatting Using Disk Manager" on page 2-17.

   b. Select the **User Definable** drive type. The User Definable type for the BIOS configuration will be a number between 47 and 49. Enter 1024 for cylinders, 16 for heads, and 63 for sectors. Set the Landing Zone and Write Precomp entries to zero. When the partitioning process completes, the configuration-setup information displays 504 MB, but you can use the full capacity of your drive. Save the changes and exit from the configuration-setup program. Then install *Disk Manager* using instructions given in "Partitioning and Formatting Using Disk Manager" on page 2-17.

c. Select **Drive Type 1**. The value displayed for the type 1 drive is `1  MB`. When the partitioning process completes, the configuration-setup information still displays 10 MB, but you can use the full capacity of your drive. Save the changes and exit from the configuration-setup program. Then install *Disk Manager* using instructions given in "Partitioning and Formatting Using Disk Manager" on page 2-17.

Managing Your Hard Disk Drive

The *DiskGo!* diskette or CD-ROM contains hard disk management programs that:

> Reconfigure your applications that access your CD-ROM drive

> Copy files from your old hard disk drive to your new drive without changing directory or file names

> Run diagnostic programs to test and manage your drive

The hard disk drive management programs are:

> FileCopy
> CD Update
> Disk Utilities and Diagnostics

FileCopy

> **Note:** The customized installation instructions created by the *DiskGo!* utility program for Windows 98, Windows 95, and Windows 3.1 include directions on running FileCopy.

FileCopy is a program that runs under DOS and copies all files from one drive letter to another. You can use FileCopy to simplify the task of adding a new hard disk drive that will replace your startup drive and will contain your operating system.

Moving a single program to another drive (for example from the C drive to the D drive) can cause access problems in many applications.

To avoid these problems, use the FileCopy utility program to copy all files from the source drive (normally C) to a destination drive (normally D). Then reconfigure (rejumper) the destination drive as the master drive, reconfigure or remove the original source drive, and restart your computer. The new drive becomes drive C and your applications run normally because they originally were on your old drive C. If you replace an older slower drive, you might want to keep the old drive as a spare.

If you are replacing your drive C with a new and much larger drive, the files that you copy from the smaller drive might use much more space because the new drive can have a larger cluster size. For information about cluster sizes, see "Selecting a Drive Partition Size Using FAT16" on page 2-7.

For more information about FileCopy, see the FileCopy online help. To access the FileCopy online help:

1. Insert the *DiskGo!* diskette or CD-ROM into the diskette or CD-ROM drive.

2. Open an editor and access the drive containing the root directory.

3. Open FILECOPY.TXT to view the FileCopy online information.

> **Important:** FileCopy does not check the destination drive. All data on the destination drive is overwritten.

Be sure to run SCANDISK or CHKDSK to check for errors on the source drive before using FileCopy to copy files from the source drive to the destination drive.

To run SCANDISK in Windows 95 or Windows 98:

1. Click on **Start**.
2. Select **Programs**.
3. Select **Accessories**.
4. Select **System Tools**.
5. Click on **ScanDisk**.

To run SCANDISK in Windows 3.1:

1. Exit Windows and go to a DOS prompt.
2. Type **SCANDISK X:** where **X** is the letter of the source drive.

To run CHKDSK:

1. Go to a DOS prompt.
2. Type **CHKDSK X:** where **X** is the letter of the source drive.

To start FileCopy:

1. Insert the *DiskGo!* diskette or CD-ROM into the diskette or CD-ROM drive.

2. At a DOS prompt, type **filecopy:**.

3. Press **Enter**.

4. Follow the instructions on the screen.

   You are prompted to enter the source and destination drives. The program accepts either C: or C. Press **Esc** at any time to cancel the copy.

CD Update

> **Note:** The customized installation instructions created by the *DiskGo!* utility program for Windows 98, Windows 95, and Windows 3.1 include directions on running CD Update.

CD Update is a Windows-based utility program in *DiskGo!* that modifies your application configuration information to access a changed CD-ROM drive letter.

When you add a new hard disk drive, your operating system reassigns the drive partition letters based on priorities that are assigned after the partitions are defined and saved. Primary partitions are assigned the next available letter beginning with C. An extended partition is assigned the next available letter after letters have been assigned to all primary partitions. A CD-ROM drive is assigned the next available letter after all primary and extended partitions have been assigned. For example, if your CD-ROM was drive D and you have added a second hard disk drive with two partitions, CD Update would modify your CD-ROM drive configuration, changing it to drive F.

If you have any problems accessing CD-ROM applications or games after running CD Update, you will need to reinstall the applications or games.

Disk Utilities and Diagnostics

Store the *DiskGo!* diskette or CD-ROM in a safe place. The *Disk Manager* utility program on the diskette or CD-ROM contains a set of advanced hard disk drive diagnostic and test programs that might assist you if serious problems occur with your drive. Do not use these programs if you have not experienced problems with the hard disk drive. If you have a disk drive problem that you cannot solve and you call technical support for assistance, the support representative might want to talk you through solving the problem by using one or more of the diagnostic programs on the diskette or CD-ROM.

For more information about installing and using *Disk Manager*, see the *Disk Manager Online Manual*. To open the online help, go to a DOS prompt, insert the *DiskGo!* diskette or CD-ROM, type **x:dm\h** where **x** is the drive letter of your diskette or CD-ROM, and press **Enter**.

Appendix A.
Safety Information
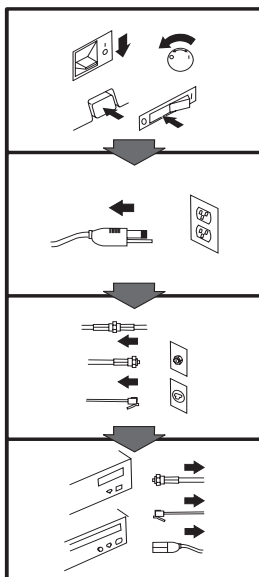
To Disconnect:

⚠ **Danger:**

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, disconnect cables as shown before opening the computer covers to install this product. The power cord must be used with a properly grounded outlet.

- Turn Everything OFF.
- First, remove power cord from outlet. (In the U.K., by law, the power cord must be disconnected after the telephone line cable.)
- Remove signal cables from receptacles.
- Remove all cables from devices.

Vor dem Entfernen der Anschlüsse:

⚠ **Vorsicht:**

Befolgen Sie die folgenden Schritte, um gesundheitliche Schäden durch stromführende Telefon- und Verbindungskabel auszuschließen. Um eine Berührungsspannung zu vermeiden, Kabel vor dem Öffnen der Computerabdeckungen bei der Installation dieses Produktes, wie abgebildet, herausziehen. Das Netzkabel darf nur an eine ordnungsgemäß geerdete Steckdose angeschlossen werden.

- Schalten Sie alle Geräte AUS.
- Ziehen Sie zuerst das Netzkabel aus der Steckdose.
- Entfernen Sie die Signalkabel von den Anschlußbuchsen.
- Entfernen Sie alle Kabel von den Geräten.

Précautions de déconnexion

⚠ **Danger:**

Le courant électrique des câbles électriques, téléphoniques et de communication est dangereux. Pour éviter tout risque d'électrocution, déconnectez les câbles comme indiqué avant d'ouvrir les capots de l'ordinateur pour installer ce produit. Il convient d'utiliser le câble d'alimentation avec une prise correctement raccordée à la terre.

- Eteignez tous les appareils.
- Débranchez tout d'abord le câble d'alimentation de la prise de courant. (Au Royaume-Uni, la législation exige que le câble d'alimentation soit débranché après le câble téléphonique).
- Débranchez les câbles de signalisation des prises femelles.
- Débranchez l'ensemble des câbles des périphériques.

Para desconectarse

⚠ **Peligro:**

La corriente eléctrica procedente de cables de alimentación, teléfono y comunicaciones es peligrosa. Para evitar descargas eléctricas, desconecte los cables tal y como se muestra y abra las cubiertas del ordenador antes de instalar este producto. El cable de alimentación debe utilizarse con una toma debidamente conectada a tierra.

- Desconecte todo.
- En primer lugar, retire el cable de alimentación de la toma.(En el Reino Unido, la legislación determina que el cable de alimentación se desconecte después del cable de línea telefónica.)
- Retire los cables de señal de los receptáculos correspondientes.
- Retire todos los cables de los dispositivos.

取外し時：

電源、電話及び通信ケーブルからの電流は危険なものです。電気ショックの危険を避けるために、この製品をインストールするためにコンピューターのカバーを取外す前に、次の順序でケーブルを取外してください。

- すべての電源を切ってください。
- 始めにコンセントから電源コードを取外してください。
- コネクターから通信ケーブルを取外してください。
- 装置から全てのケーブルを取外してください。

Per scollegare:

⚠ **Pericolo:**

La corrente elettrica che attraversa i cavi di alimentazione, i cavi telefonici e i cavi per le comunicazioni è pericolosa. Per evitare il rischio di scosse elettriche, prima di procedere all'apertura del coperchio dell'elaboratore per installare il dispositivo, scollegare i cavi nel modo qui indicato. Il cavo di alimentazione deve essere inserito in una presa elettrica collegata correttamente a terra.

- Spegnere tutto (posizione OFF).
- Innanzitutto, scollegare il cavo di alimentazione dalla presa. (nel Regno Unito, per disposizione di legge, è obbligatorio scollegare il cavo di alimentazione dopo aver scollegato il cavo telefonico).
- Scollegare i cavi di segnale dai connettori.
- Scollegare tutti i cavi dai dispositivi.

Para desligar

⚠ **Perigo:**

A corrente elétrica da unidade de alimentação, do telefone e dos cabos de comunicação é perigosa. Para evitar o risco de choques elétricos, desligue os cabos de acordo com as instruções relativas à instalação antes de abrir as tampas do computador para instalar este produto. O cabo de alimentação deve ser usado numa tomada devidamente ligada à terra.

- Desligue tudo
- Primeiro remova o cabo de alimentação da tomada. (De acordo com as leis do Reino Unido, o cabo de alimentação deve ser desligado depois do cabo da linha telefônica.)
- Remova os cabos de sinal dos receptáculos.
- Remova todos os cabos dos dispositivos.

Odpojení:

⚠ **Výstraha:**

Elektrický proud ze sit'ových, telefonnich a komunikačních kabelů je nebezpečný. Abyste při instalaci tohoto výrobku předešli úrazu elektrickým proudem, před otevřením krytů počítače odpojte kabely dle obrázku. Sit'ový kabel musí být použit s řádně uzemněnou zásuvkou.

- Vypněte všechna připojená zařízení.
- Najdříve odpojte sit'ový kabel ze zásuvky. (Ve Spojeném království musí být podle zákona sit'ový kabel odpojen až po odpojení telefonní přípojky).
- Odpojte signálové kabely.
- Odpojte všechny kabely perifernich zařízení.

Læs følgende inden frakobling:

⚠ **Fare:**

Elektrisk strøm fra strømførende kabler og telefon- og kommunikationskabler er farlig. For at undgå elektrisk stød skal du sørge for at koble kablerne fra som vist, før du åbner computerens dæksler for at installere dette produkt. Den strømførende ledning skal tilsluttes en javdet stikkantakt.

- SLUK for alt.
- Fjern først den strømførende ledning fra stikkantateten. (I Storbritannien skal den strømførende ledning frakobles efter telefonkablet iflg. lov).
- Fjern signalkabler fra kontakter.
- Fjern alle kabler fra enheder.

Ontkoppelen

⚠ **Gevaarlijk:**

Elektrische stroom afkomstig uit netsnoeren, telefoonkabels en communicatiekabels kan gevaarlijk zijn. Als u dit produkt wilt installeren, moet u, ter voorkoming van elektrische schokken, voordat u de computer openmaakt de kabels, zoals afgebeeld, ontkoppelen. Sluit het netsnoer altijd aan op een geaard stopcontact.

- Zet alles UIT.
- Haal eerst de stekker uit het stopcontact. (In het Verenigd Koninkrijk bent u wettelijk verplicht eerst de telefoonkabel en pas dan het netsnoer los te maken.)
- Haal de signaalkabels uit de ingangen.
- Verwijder alle kabels van de apparaten.

Pour déconnecter

⚠ **Danger:**

Le courant électrique des câbles électriques, téléphoniques et de communication est dangereux. Pour éviter tout risque d'électrocution lors de l'installation de ce produit, déconnectez les câbles tel que montré avant d'ouvrir les couvercles de l'ordinateur. Utilisez le câble d'alimentation avec une prise correctement raccordée à la terre.

- Éteignez tous les appareils.
- Débranchez d'abord le câble d'alimentation de la prise de courant. (Au Royaume-Uni, la réglementation exige que le câble d'alimentation soit débranché après le câble téléphonique.)
- Débranchez les câbles de transmission du signal des prises femelles.
- Débranchez tous les câbles des appareils.

Irrota laite seuraavasti:

⚠ **Vaara:**

Virta-, puhelin- ja tietoliikennejohdoissa liikkuva sähkövirta on vaarallista. Voit tätä laitetta asentaessasi välttää sähköiskut irrottamalla johtimet esitetyllä tavalla ennen tietokoneen kansien avaamista. Virtajohto on liitettävä oikein maadoitettuun pistorasiaan.

- Katkaise kaikista laitteista virta.
- Irrota virtajohto pistorasiasta. (Yhdistyneiden Kuningaskuntien lain mukaan virtajohto on irrotettava ennen puhelinjohdon irrottamista.)
- Irrota signaalikaapelit vastakkeista.
- Irrota kaikki johdot laitteista.

כדי לנתק:

⚠ **סכנה:**

זרם חשמלי מכבלי כח, טלפון ותקשורת מהווה סכנה. כדי למנוע התחשמלות, נתק את הכבלים לפי האיור לפני פתיחת מארז המחשב לשם התקנת מכשיר זה. את כבל החשמל יש לחבר לשקע מוארק כראוי.

- כבה את כל המפסקים.
- נתק תחילה את כבל החשמל מהשקע (בבריטניה החוק דורש לנתק את כבל החשמל אחרי כבל הטלפון).
- נתק את כבלי האותות משקעיהם.
- נתק את כל הכבלים מההתקנים השונים.

Szétcsatlakoztatás

⚠ **Balesetveszély:**

A hálózati, telefon és kommunikációs kábelben levő elektromos áram veszélyes. Az áramütés veszélyének elhárítása érdekében, a termék beszerelésekor, a számítógép burkolatának felnyitása előtt húzza ki a vezetékeket. A hálózati vezetéknek megfelelően földeltnek kell lennie.

- Kapcsoljon mindent KI.
- Először a hálózati vezetéket húzza ki az aljzatból. (Az Egyesült Királyságban előírás, hogy a hálózati vezetéket a telefonvezeték után kell szétosatlakoztatni.)
- Húzza ki a jel-kábelt az aljzatából.
- Húzza ki az összes vezetéket a berendezésekből.

차단하려면 :

⚠ 위험 :

전원, 전화, 통신 케이블에
서 나오는 전류는 유해하
다. 쇼크 위험을 없애려면
본 제품 설치를 위해 컴퓨
터 뚜껑을 열기 전에 케이
블을 차단한다. 전원 코드
는 제대로 접지된 콘덴사
와 사용돼야 한다.

• 모든 전원을 차단한다.

• 우선 콘덴사에서 전원
코드를 뺀다. (영국에서는
법으로, 전화선을 뺀 다음
전원 코드를 차단해야 한
다.)

• 수신기로 부터 신축 케
이블을 뺀다.

• 컴퓨터 장치에서 모든
케이블을 뺀다.

Frakobling

⚠ **Fare:**

Elektrisk strøm fra strøm -,
telefon - og
kommunikasjonskabler er
farlig. For å unngå fare for
støt, må du koble fra kabler,
som vist, før du åpner
datamaskindeksler for å
installere dette produktet.
Strømledningen må kun
brukes i jordede stikkontakter.

• Slå alt AV.
• Trekk først ut
  strømledningen fra
  stikkontakten. (I
  Storbritannia sier loven at
  strømledningen må kobles
  fra etter telefonledningen.)
• Trekk ut signalkablene fra
  kontaktene.
• Trekk ut alle kablene fra
  enhetene.

Aby rozłączyć:

⚠ **Ostrzeżenie:**

Prąd elektryczny obecny w
kablach zasilania,
telefonicznych lub
komunikacyjnych jest
niebezpieczny. Aby uniknąć
niebezpieczeństwa
porażenia, przed otwarciem
pokrywy komputera w celu
zainstalowania tego wyrobu,
należy odłączyć kable, jak to
zostało pokazane. Musi być
użyty przewód zasilania
elektrycznego z
odpowiednim uziemieniem.

• Wyłącz wszystko
  (położenie OFF).
• W pierwszej kolejnoci
  odłącz przewód zasilania
  elektrycznego z gniazdka.
  (W Wielkiej Brytanii
  prawo nakazuje, by
  przewód zasilania został
  odłączony po kablu linii
  telefonicznej).
• Wyłącz kable sygnałowe z
  gniazdek.
• Wyłącz wszystkie kable z
  urządzeń.

Para desligar:

⚠ **Perigo:**

A corrente eléctrica da
unidade de alimentação, do
telefone e dos cabos de
comunicação é perigosa. Para
evitar o risco de choques
eléctricos, desligue o cabo de
acordo com as indicações
antes de abrir a caixa do
computador para instalar este
produto. O cabo de
alimentação deve ser utilizado
numa tomada devidamente
ligada à terra.

• Desligue tudo.
• Primeiro, retire o cabo de
  alimentação da tomada.(De
  acordo com as leis do Reino
  Unido, o cabo de
  alimentação deve ser
  desligado depois do cabo da
  linha telefónica.)
• Retire os cabos de sinal das
  tomadas.
• Retire todos os cabos dos
  dispositivos.

斷開步驟 :

⚠ 危險 :

動力電纜、電話電纜和
通信電纜上的電流是危
險的。爲避免電擊危
險，在打開電腦機蓋安
裝本產品之前斷開電
纜，如圖所示。動力電
纜必須妥善接地。

• 關掉一切電源。

• 首先將動力電纜從輸
出端取下。（根據英
國法律規定，動力電
纜必須在電話電纜之
後斷開。）

• 從插座上取下信號電
纜。

• 從裝置上取下所有電
纜。

Izključenje:

⚠ **Nevarnost:**

Struja iz električnega, telefonskega ali komunikacijskega voda je nevarna. V namenu, da se izognete šoku, izključite vode, kot kaže slika, preden dvignete računalniške pokrove, da bi napravo instalirali. Strujni vod je treba uporabljati s primerno ozemljitvijo.

- Izključite vse (na "OFF").
- Najprej odstranite strujni vod iz izhodnega vtikališča. (V Veliki Britaniji je po zakonu treba strujni vod izključiti po telefonskem vodu).
- Odstranite signalne vode iz sprejemnikov.
- Odstranite vse vode iz naprav.

Urkoppling

⚠ **Fara:**

Ström från el-, tele- och kommunikationskablar måste behandlas med försiktighet. För att undvika att få en elektrisk stöt måste du innan du öppnar höljet på datorn koppla ur kablarna enligt beskrivningen nedan. Strömkabeln måste alltid användas i ett jordat uttag.

- Stäng av allting.
- Ta först ur strömkabeln från strömuttaget. (I Storbritannien måste enligt lag strömkabeln tas ur efter telefonkabeln.)
- Ta bort signalkablarna från uttagen.
- Ta bort alla kablarna från enheterna.
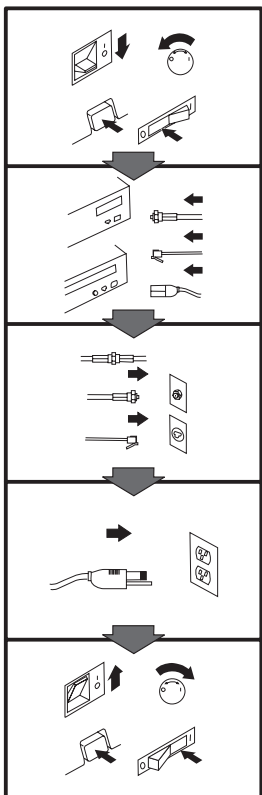
To Connect:

⚠ **Danger:**

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, connect cables as shown after closing the computer covers. The power cord must be used with a properly grounded outlet.

• Turn everything OFF.
• Attach all cables to devices. (In the U.K., by law, the telephone cable must be connected after the power cord.)
• Attach signal cables to receptacles.
• Attach power cord to outlet.
• Turn device ON.

Vor dem Anschließen:

⚠ **Vorsicht:**

Befolgen Sie die folgenden Schritte, um gesundheitliche Schäden durch stromführende Telefon- und Verbindungskabel auszuschließen. Um eine Berührungsspannung zu vermeiden, Kabel nach dem Schließen der Computerabdeckungen, wie abgebildet, anschließen. Das Netzkabel darf nur an eine ordnungsgemäß geerdete Steckdose angeschlossen werden.

• Schalten Sie alle Geräte AUS.
• Schließen Sie alle Kabel an die Geräte an.
• Schließen Sie die Signalkabel an die dafür vorgesehenen Anschlußbuchsen an.
• Verbinden Sie das Netzkabel mit der Steckdose.
• Schalten Sie das Gerät EIN.

Avant de vous connecter

⚠ **Danger:**

Le courant électrique des câbles électriques, téléphoniques et de communication est dangereux. Pour éviter tout risque d'électrocution, connectez les câbles comme indiqué après avoir replacé les capots de l'ordinateur. Il convient d'utiliser le câble d'alimentation avec une prise correctement raccordée à la terre.

• Mettez tous les appareils hors tension.
• Raccordez l'ensemble des câbles aux périphériques. (Au Royaume-Uni, la législation exige que le câble téléphonique soit branché après le câble d'alimentation).
• Raccordez les câbles de signalisation aux prises femelles.
• Raccordez le câble d'alimentation à la prise de courant.
• Mettez les appareils sous tension.

Para conectarse

⚠ **Peligro:**

La corriente eléctrica procedente de cables de alimentación, teléfono y comunicaciones es peligrosa. Para evitar descargas eléctricas, conecte los cables tal y como se muestra después de cerrar las cubiertas del ordenador. El cable de alimentación debe utilizarse con una toma debidamente conectada a tierra.

• Desconecte todo.
• Conecte todos los cables a los dispositivos. (En el Reino Unido, la legislación determina que el cable de teléfono se conecte después del cable de alimentación.)
• Conecte los cables de señal de los receptáculos correspondientes.
• Conecte el cable de alimentación a una toma.
• Active el dispositivo.

接続時：

⚠ 危険：

電源、電話及び通信ケーブルか
らの電流は危険なものです。電
気ショックの危険を避けるため
に、コンピューターのカバーを
取り付け後に、次の順序でケー
ブルを接続してください。

- すべての電源を切ってくだ
  さい。
- すべてのケーブルを装置 に
  接続してください。
- コネクターに通信ケーブル
  を接続してください。
- コンセントに電源コードを
  接続してください。
- 装置の電源を入れてくださ
  い。

Per collegare:

⚠ **Pericolo**

La corrente elettrica che
attraversa i cavi di
alimentazione, i cavi telefonici
e i cavi per le comunicazioni è
pericolosa. Per evitare il
rischio di scosse elettriche,
collegare i cavi nel modo qui
indicato solo dopo aver
richiuso l'elaboratore con il
coperchio. Il cavo di
alimentazione deve essere
inserito in una presa elettrica
collegata correttamente a terra.

- Spegnere tutto (posizione
  OFF).
- Collegare tutti i cavi ai
  dispositivi. (nel Regno
  Unito, per disposizione di
  legge, è obbligatorio
  collegare il cavo telefonico
  dopo aver collegato il cavo
  di alimentazione).
- Collegare i cavi di segnale
  agli appositi connettori.
- Collegare il cavo di
  alimentazione a una presa
  elettrica
- Accendere la periferica
  (posizione ON)

Para ligar:

⚠ **Perigo:**

A corrente elétrica da unidade
de alimentação, do telefone e
dos cabos de comunicação é
perigosa. Para evitar o risco de
choques elétricos, ligue os
cabos de acordo com as
instruções relativas à
instalação depois de fechar as
tampas do computador. O
cabo de alimentação deve ser
usado numa tomada
devidamente ligada à terra.

- Desligue tudo
- Ligue os cabos aos
  dispositivos. (De acordo
  com as leis do Reino Unido,
  o cabo de alimentação deve
  ser desligado depois do
  cabo da linha telefônica.)
- Ligue os cabos de sinal aos
  receptáculos.
- Ligue o cabo de alimentação
  à tomada.
- Ligue o dispositivo.

Připojení:

⚠ **Výstraha:**

Elektrický proud ze
sit'ových, telefonních a
komunikačních kabelů je
nebezpečný. Abyste předešli
úrazu elektrickým proudem,
kabely dle obrázku připojte
až po uzavření krytů
počítače. Sit'ový kabel musí
být použit s řádně
uzemněnou zásuvkou.

- Vypněte všechna zařízení.
- Připojte všechny kabely
  periferních zařízení. (Ve
  Spojeném království musí
  být podle zákona
  telefonní přípojka
  připojena až po přípojení
  sit'ového kabelu).
- Připojte signálové kabely.
- Připojte sit'ový kabel do
  zásuvky.
- Zapněte přístroj.

*Læs følgende inden
tilkobling:*

⚠ **Fare:**

Elektrisk strøm fra
strømførende kabler og
telefon- og
kommunikationskabler er
farlig. For at undgå elektrisk
stød skal du sørge for at koble
kablerne til som vist, før du
lukker computerens dæksler
igen. Den strømførende
ledning skal tilsluttes en
javdet stikkantakt.

- SLUK for alt.
- Tilslut alle kabler til
  enheder. (I Storbritannien
  skal telefonkablet tilsluttes
  efter den strømførende
  ledning iflg. lov).
- Tilslut signalkabler til
  kontakter.
- Tilslut den strømførende
  ledning til stikkontakten.
- TÆND for enheden.

Aansluiten

⚠ **Gevaarlijk:**

Elektrische stroom afkomstig uit netsnoeren, telefoonkabels en communicatiekabels kan gevaarlijk zijn. Ter voorkoming van elektrische schokken, moet u nadat de computer dichtgemaakt is de kabels, zoals afgebeeld, aansluiten. Sluit het netsnoer altijd aan op een geaard stopcontact.

- Zet alles UIT.
- Bevestig de snoeren aan de apparaten. (In het Verenigd Koninkrijk bent u wettelijk verplicht eerst het netsnoer en pas dan de telefoonkabel aan te sluiten.)
- Bevestig de signaalkabels in de juiste ingangen.
- Steek de stekker van het netsnoer in het stopcontact.
- Zet het apparaat AAN.

Pour connecter

⚠ **Danger:**

Le courant électrique des câbles électriques, téléphoniques et de communication est dangereux. Pour éviter tout risque d'électrocution, connectez les câbles tel que montré après avoir fermé les couvercles de l'ordinateur. Utilisez le câble d'alimentation avec une prise correctement raccordée à la terre.

- Mettez tous les appareils hors tension.
- Raccordez tous les câbles aux appareils. (Au Royaume-Uni, la réglementation exige que le câble téléphonique soit branché après le câble d'alimentation.)
- Raccordez les câbles de transmission du signal aux prises femelles.
- Raccordez le câble d'alimentation à la prise de courant.
- Mettez l'appareil sous tension.

Kytke seuraavasti:

⚠ **Vaara:**

Virta-, puhelin- ja tietoliikennejohdoissa liikkuva sähkövirta on vaarallista. Voit välttää sähköiskut liittämällä johdot esitetyllä tavalla, sen jälkeen kun olet sulkenut tietokoneen kannet. Virtajohto on liitettävä oikein maadoitettuun pistorasiaan.

- Katkaise kaikista laitteista virta.
- Liitä kaikki johdot laitteisiin. (Yhdistyneiden Kuningaskuntien lain mukaan virtajohto on liitettävä ennen puhelinjohdon irrottamista.)
- Liitä signaalikaapelit vastakkeisiin.
- Liitä virtajohto pistorasiaan.
- Kytke laitteeseen virta.

כדי לחבר:

⚠ **סכנה:**

זרם חשמלי מכבלי כח, טלפון ותקשורת מהווה סכנה. כדי למנוע התחשמלות, חבר את הכבלים לפי האיור אחרי סגירת מארז המחשב. את כבל החשמל יש לחבר לשקע מוארק כראוי.

- כבה את כל המפסקים.
- חבר את כל הכבלים להתקנים (בבריטניה החוק דורש לחבר את כבל הטלפון אחרי כבל החשמל).
- חבר את כבלי האותות לשקעיהם.
- חבר את כבל החשמל לשקע.
- הדלק את המכשיר.

Csatlakoztatás:

⚠ **Balesetveszély:**

A hálózati, telefon és kommunikációs kábelben levő elektromos áram veszélyes. Az áramütés veszélyének elhárítása érdekében csak a számitógép burkolatának bezárása után csatlakcztassa a vezetékeket. A hálózati vezetéknek megfelelően földeltnek kell lennie.

- Kapcsoljon mindent KI.
- Csatlakoztassa a vezetékeket a berendezésekhez. (Az Egyesült Királyságban előírás, hogy a telefonvezetéket a hálózati vezeték után kell csatlakoztatni.)
- Csatlakoztassa a jel-kábelt az aljzatába.
- Csatlakoztassa a hálózati vezetéket az aljzatába.
- Kapcsolja BE a készüléket.

연결하려면 :

⚠위험 :

전원, 전화, 통신 케이블에
서 나오는 전류는 유해하
다. 쇼크 위험을 없애려면
본 제품 설치를 위해 컴퓨
터 뚜껑을 닫은 후에 케이
블을 연결한다. 전원 코드
는 제대로 접지된 콘덴사와
사용돼야 한다.

• 모든 전원을 차단한다.

• 장치에 모든 케이블을
연결한다. (영국에서는 법
으로, 전화선을 먼저 연결
한 다음 전원코드를 연결해
야 한다.)

• 수신기에 신호 케이블
을 연결한다.

• 콘덴사에 전원 코드를
연결한다.

• 컴퓨터 장치를 켠다.

Tilkobling

⚠ **Fare:**

Elektrisk strøm fra strøm -,
telefon - og
kommunikasjonskabler er
farlig. For å unngå fare for
støt, må du koble til kabler,
som vist, etter at
datamaskindekslene er lukket.
Strømledningen må kun
brukes i jordede stikkontakter.
• Slå alt AV.
• Koble alle kablene til
enhetene. (I Storbritannia
sier loven at
telefonledningen må kobles
til etter strømledningen.)
• Sett signalkablene i
kontaktene.
• Sett strømledningen i
stikkontakten.
• Slå apparatet PÅ.

Aby podłączyć:

⚠ **Ostrzeżenie:**

Prąd elektryczny obecny w
kablach zasilania,
telefonicznych lub
komunikacyjnych jest
niebezpieczny. Aby uniknąć
niebezpieczeństwa
porażenia, po zamknięciu
pokryw komputera podłącz
kable jak to zostało
pokazane. Musi być użyty
przewód zasilania
elektrycznego z
odpowiednim uziemieniem.
• Wyłącz wszystko
(położenie OFF)
• Podłącz wszystkie kable
do urządzeń (W Wielkiej
Brytanii prawo nakazyje
by kabel linii telefonicznej
został podłączony po
przewodzie zasilania).
• Podłącz kable sygnałowe
do gniazdek.
• Podłącz przewód zasilania
do gniazdka.
• Włącz urządzenie.
(Położenie ON).

Para ligar:

⚠ **Perigo:**

A corrente eléctrica da
unidade de alimentação, do
telefone e dos cabos de
comunicação é perigosa. Para
evitar o risco de choques
eléctricos, ligue os cabos de
acordo com as indicações
antes de fechar a caixa do
computador. O cabo de
alimentação deve ser utilizado
numa tomada devidamente
ligada à terra.
• Desligue tudo.
• Ligue os cabos aos
dispositivos. (De acordo
com as leis do Reino Unido,
o cabo do telefone deve ser
ligado depois do cabo de
alimentação.)
• Ligue os cabos de sinal as
tomadas.
• Ligue o cabo de alimentação
à tomada.
• Ligue o dispositivo.

連 接 步 驟 :

⚠ 危 險 :

動 力 電 纜 、 電 話 電 纜 和
通 信 電 纜 上 的 電 流 是 危
險 的 。 為 避 免 電 擊 危
險 , 在 蓋 上 電 腦 機 蓋 之
後 連 接 電 纜 , 如 圖 所
示 。 動 力 電 纜 必 須 妥 善
接 地 。

• 關 掉 一 切 電 源 。

• 將 所 有 電 纜 連 接 於 裝
置 。 (根 據 英 國 法 律
規 定 , 電 話 電 纜 必 須
在 動 力 電 纜 之 前 連
接 。)

• 將 信 號 電 纜 連 接 於 插
座 。

• 將 動 力 電 纜 連 接 於 輸
出 端 。

• 打 開 裝 置 電 源 。

Vključenje:

⚠ **Nevarnost:**

Struja iz električnih, telefonskih in komunikacijskih vodov je nevarna. Da se izognete šoku, vključite vode, kot kaže slika, po tem, ko ste zaprli računalniške pokrove. Strujni vod je treba uporabljati s primerno ozemljitvijo.

- Izključite vse (na "OFF").
- Priključite vse vode na naprave. (V Veliki Britaniji je po zakonu treba telefonski vod vključiti po strujnem vodu).
- Priključite signalne vode sprejemnikom.
- Priključite električni vod izhodnemu vtikališču.
- Vključite napravo (na "ON").

Anslutning

⚠ **Fara:**

Ström från el-, tele- och kommunikationskablar måste behandlas med försiktighet. För att undvika att få en elektrisk stöt måste du sedan du stängt höljet på datorn ansluta kablarna enligt beskrivningen nedan. Strömkabeln måste alltid användas i ett jordat uttag.

- Stäng av allting.
- Anslut alla kablarna till enheterna. (I Storbritannien måste enligt lag telefonkabeln anslutas efter strömkabeln.)
- Anslut signalkablarna till uttagen.
- Anslut strömkabeln till strömuttaget.
- Slå på enheten.

Appendix B.
Help and Service Information

If you have questions about your new Options by IBM product, or require technical assistance, visit the IBM Personal Computing Web site at http://www.pc.ibm.com for information about IBM, Options by IBM, or IBM Service and Support. Additionally, you can receive information from the IBM Automated Fax system at 1-800-426-3395 (in Canada, 1-800-465-3299), or from the Personal Systems Group Bulletin Board System (PSG BBS) at 1-919-517-0001. You can also get help and information through the IBM PC HelpCenter, 24 hours a day, seven days a week. Response time may vary depending on the number and nature of the calls received.

Marketing, installation, and configuration support through the HelpCenter will be withdrawn or made available for a fee, at IBM's discretion, 90 days after the option has been withdrawn from marketing. Additional support offerings, including step-by-step installation assistance, are available for a nominal fee.

During the warranty period, assistance for replacement or exchange of defective components is available. In addition, if your IBM option is installed in an IBM computer, you might be entitled to service at your location. Your technical support representative can help you determine the best alternative.

Step 1. Solving Problems

You might be able to solve the problem yourself. Before calling IBM, you might want to try some or all of the following troubleshooting procedures.

If the drive does not operate, make sure that all power and signal cables are securely attached. Disconnect the signal cable and check for bent or misaligned pins. If you do not find any problems, reconnect the cable.

If the drive does not spin up when you restart your computer, or the drive is not recognized by the configuration-setup program, and there are no error messages, try the following:

1. Turn off the computer.

2. Disconnect the power cord from the computer.

3. Open the computer and disconnect the IDE cable from the hard disk drive.

4. Verify that the power cable is correctly attached to the drive.

5. Reconnect the IDE cable to the hard disk drive.

6. Replace the computer cover.

7. Restart the computer and listen for the drive motor to spin up.

8. If the drive motor still does not spin up, turn off the computer, connect a different power connector to the drive,

and restart the computer. If the drive again fails to spin up go to "Step 2. Preparing for the Call" on page 3-12.

9. If the drive motor spins up, turn the computer off and inspect the IDE cable and drive connections for damaged pins.

10. Verify that the colored wire is connected to pin 1 on the drive connector and is the closest wire to the 4-pin power connector. Some connectors are keyed and will fit only one way. Do not force the connector onto the pins. If the connector does not seem to fit, reverse it and try again.

11. Reconnect the IDE cable and restart the computer.

If your computer appears to stop during restart, the problem is probably caused by your BIOS. To solve the problem, access your configuration information, disable Auto Detect, and select Manual Setup. Set heads to 16, sectors to 63, and cylinders to less than 2048.

For information about installing system upgrades, see the documentation that comes with your computer. Look for topics about system setup or system configuration. For more information about your computer BIOS, contact your manufacturer. For a list of the most common manufacturers, see "Step 4. Placing the Call to Computer and BIOS Manufacturers" on page 3-14.

Step 2. Preparing for the Call

To assist the technical support representative, have available as much of the following information as possible:

1. Option name
2. Option number
3. Proof of purchase
4. Computer manufacturer, model, serial number (if IBM), and manual
5. Exact wording of the error message (if any)
6. Description of the problem
7. Hardware and software configuration information for your system

If possible, be at your computer. Your technical support representative might want to walk you through the problem during the call.

Step 3. Placing the Call to IBM

If you call 90 days or more after the date of withdrawal or after your warranty has expired, you might be charged a fee.

For the support telephone number and support hours by country, refer to the following table or to the enclosed technical support insert. If the number is not provided, contact your IBM reseller or IBM marketing representative.

Support 24 hours a day, 7 days a week	
Canada	1-800-565-3344
U.S.A. / Puerto Rico	1-800-772-2227

Additional Technical Support Resources

Online technical support is available during the life of your product. Online assistance can be obtained through the IBM Automated Fax System, the Personal Computing Web page, and the PSG Electronic Bulletin Board System.

Online Technical Support	
IBM Personal Computing Web Page	www.pc.ibm.com
IBM PSG BBS	1-919-517-0001
IBM Automated Fax System	1-800-426-3395 1-800-465-3299 (in Canada)

Step 4. Placing the Call to Computer and BIOS Manufacturers

Use the following table for computer manufacturer information. For manufacturers not in the table, contact your IBM reseller.

AST	1-800-727-1278
Compaq	1-800-652-6672
Dell	1-888-560-8324
Digital	1-800-354-9000
Gateway 2000	1-800-846-2301
HP	1-208-323-4663
IBM	1-800-772-2227
NEC	1-800-388-8888
Packard Bell	1-800-733-4411

Use the following table for BIOS manufacturer information. For manufacturers not in the table, contact your IBM reseller.

AMI	1-770-246-8645
Award	1-650-237-6800
Micro Firmware (Phoenix systems only)	1-405-321-8333
Phoenix	1-617-551-4000
Unicore	1-978-686-6468

Step 5. Placing the Call to Hard Disk Drive Manufacturers

Use the following table for disk manufacturer information, as needed. For manufacturers not in the table, contact your IBM reseller.

Manufacturer	Telephone	BBS	Fax	Internet Address
IBM Corporation (U.S.A.)	1-800-772-2227	1-919-517-0001	1-800-426-3395	http://www.pc.ibm.com http://www.ibm.com
Maxtor Corporation (U.S.A.)	1-800-2MAXTOR	1-303-678-2222 (2400 baud)	1-800-2MAXTOR 1-303-678-2260	http://www.maxtor.com
Quantum Peripherals (U.S.A.)	1-800-344-4001	1-408-894-3214	1-800-434-7532	http://www.quantum.com
Seagate Technology, Inc. (U.S.A.)	1-800-SEAGATE	1-408-434-1080	1-800-SEAGATE 1-408-456-4496	http://www.seagate.com
Western Digital Corporation (U.S.A.)	1-714-932-4900 1-507-286-7900	1-714-753-1234	1-714-932-4900 1-507-286-7900	http://www.wdc.com

Appendix C. Notices

This appendix contains the product notices and trademarks information.

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