



IBM Deskstar

3.5 inch ATA/IDE hard disk drive

Installation and reference manual



Technical support

Troubleshooting and Frequently Asked Questions (FAQ) sections are provided in the Appendix of this manual to aid you in the installation of your IBM Deskstar. If the answer to your installation question is not found in this manual, call technical support. Before calling, please gather as much of the following information as possible:

- IBM drive model number, part number, and serial number
- Operating system
- BIOS manufacturer, version, and date
- Any error codes and when they occurred
- System type and manufacturer
- Motherboard manufacturer
- Chipset manufacturer
- Adapter card manufacturer
- Other devices in systems
- Bus/cable layout (location of device, which device is at the end)
- Applications used (if relevant)

In North America

Web www.ibm.com/harddrive
Voice 888.IBM.5214 or 507.286.5825
Fax 507.253.DRIVE
e-mail drive@us.ibm.com

In the United Kingdom

Voice 44.0870.010.2866
e-mail drive@uk.ibm.com

In Singapore

Voice 65.1800.840.9292 or 65.841.2900
e-mail drive@sg.ibm.com

In Germany

Voice 49.07032.153050
e-mail drive@de.ibm.com

IBM Deskstar

3.5 inch ATA/IDE hard disk drive

Easy installation manual

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Introduction

This manual was prepared to aid you in the installation of your new IBM Desk star hard disk drive. Installation instructions are provided for the following model numbers:

- IC35L020AVER07 (20 GB)
- IC35L040AVER07 (40 GB)
- IC35L060AVER07 (60 GB)
- DTLA-307075 (75 GB)

The IBM Deskstar drive models listed above support Ultra ATA/100 and are backwards compatible with lower bus speeds, allowing it to obtain interface transfer rates of up to 100 MB per second. Your drive will function at the maximum speed supported by your system components.

Ultra ATA/100 performance requires the following components:

- A 40-pin, 80-conductor ATA/IDE cable
- A controller card or motherboard chipset with Ultra ATA/100 or higher capability
- An Ultra ATA/100-compatible BIOS

The IBM Deskstar drives listed above also support the following interface data transfer rates:

ATA Mode 5	100 MB per second
ATA Mode 4	66.6 MB per second
ATA Mode 2	33.3 MB per second
Multi-word DMA Mode 2	16.6 MB per second
Advanced PIO Mode 4	16.6 MB per second

The Frequently Asked Questions (FAQ) section of this manual contains further information on Ultra ATA/100 and Ultra ATA/66.

Getting started

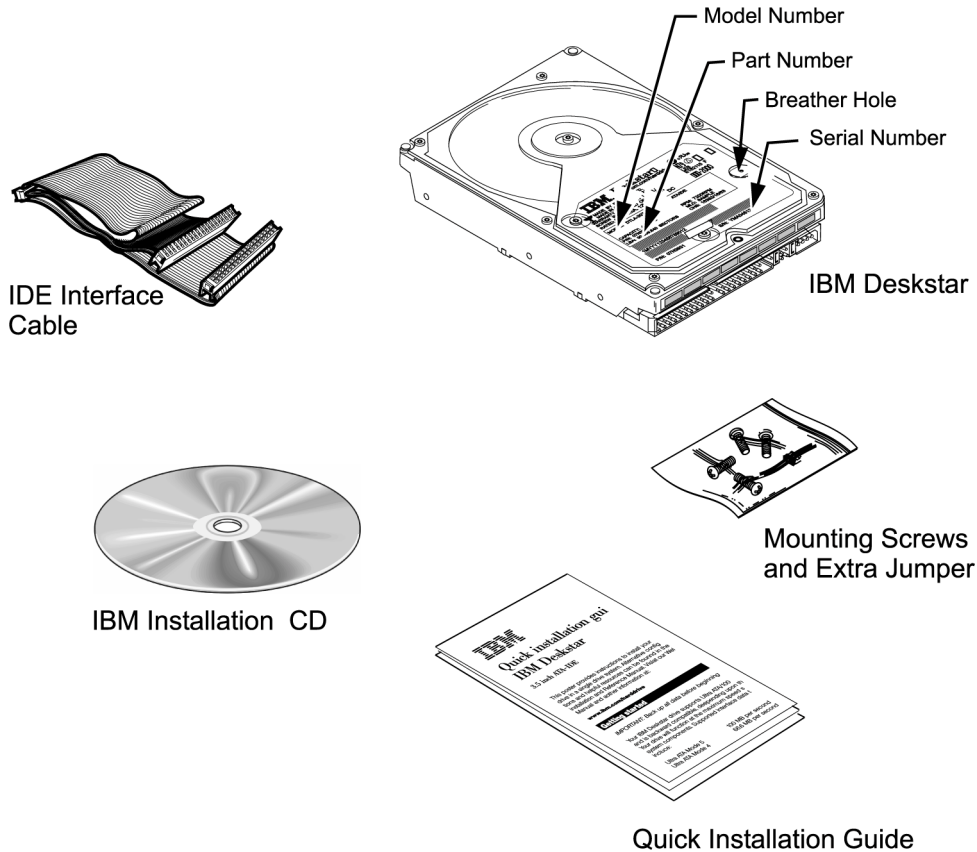
Important: If you have an existing drive in your system, perform a backup to avoid any loss of data during installation. Refer to your operating system manual for instructions on how to use the system's backup utility.

Package contents

The IBM Deskstar retail packaged drive includes:

- Deskstar drive, contained in an electrostatic discharge (ESD) protective bag
- Four mounting screws
- An extra jumper
- 40-pin, 80-conductor ATA/IDE interface cable
- CD-ROM containing:
 - *IBM Deskstar Easy Installation Manual*
 - *Disk Manager 2000 Easy Installation Software*
 - *IBM Deskstar Quick Installation Guide*

Note: It is important to save the original drive packaging for shipping if warranty service is required.



Handling precautions

Caution: Poor handling, physical impact, or electrical shock causes most hard disk drive damage. Heeding the precautions listed below may eliminate the occurrence of such damage.

- To prevent damage from impact or vibration, always set the drive down gently.
- Do not open the ESD bag containing the drive until required.
- Handle the drive carefully by the edges. Do not touch the exposed printed circuit board or any electronic components.
- Do not press on the top or bottom of the drive.
- Do not cover the drive's breather hole.
- Before handling the drive, discharge any static electricity from yourself and your clothing. With one hand, touch an unpainted metal surface on your computer chassis, and then touch the ESD bag with the other hand. Remain in contact with the chassis and the bag for at least two seconds.

Tools for installation

You may need the following items to install the IBM Deskstar drive:

- A flat-blade screwdriver
- A Phillips head screwdriver
- A small needle-nose pliers or tweezers
- Your computer system manual
- Operating system startup diskette (See the FAQ section for instructions to create a startup diskette.)
- Drive rails (You can purchase drive rails for 5.25-inch bays at your local computer store, through your system manufacturer, or by calling the IBM Technology Group Support Center.)

IBM Disk Manager 2000 Easy Installation Software

Overview

Disk Manager 2000 partitions and formats a hard disk drive in less time than traditional partition and format programs. An integral part of *Disk Manager 2000* is the Ontrack Dynamic Drive Overlay (DDO). DDO provides BIOS support for drives larger than 8.4GB, allowing earlier systems to utilize a drive's full capacity.

Compatibility

Disk Manager 2000 is compatible with the following operating systems:

- Windows 95, Windows 98, and Windows Me
- Windows 2000
- Windows NT 4
- Windows NT 3.5x*
- Windows 3.1x and Windows for Workgroups 3.11*
- DOS Versions 5.0 and later*
- OS/2 Warp versions 3.0 and 4.0**

*Disk Manager DOS only

**FAT16 file system support only

Linux, Unix, Apple, and Netware provide their own partitioning and installation software.

Known issues

The following issues may be encountered during *Disk Manager 2000* installation:

- Award BIOS systems may hang during installation of drives larger than 32GB.
- AMI BIOS systems may hang during drive detection.

The Advanced Troubleshooting section of this manual addresses workarounds for the above issues.

Options for installation

You are now ready to begin installing your IBM Deskstar hard disk drive. The following sections present four sets of installation instructions:

- Install a new drive as Master.
- Add a new drive as additional storage.
- Add a new drive as the boot drive, removing the old boot drive.
- Add a new drive as the boot drive, keeping the old boot drive.

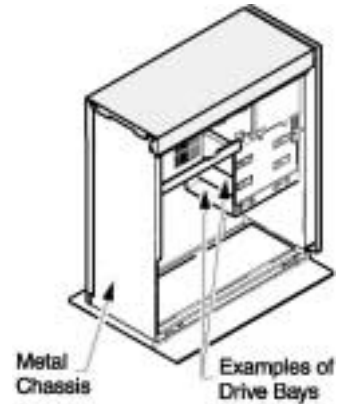
If you want to move your Windows boot drive to a different computer, it is recommended you reinstall your operating system. Please backup your data and refer to the appropriate support documentation at <http://support.microsoft.com> for details specific to your version of Windows.

Install a new drive as Master

The following steps install the IBM Deskstar as the only drive in a system without a Windows operating system.

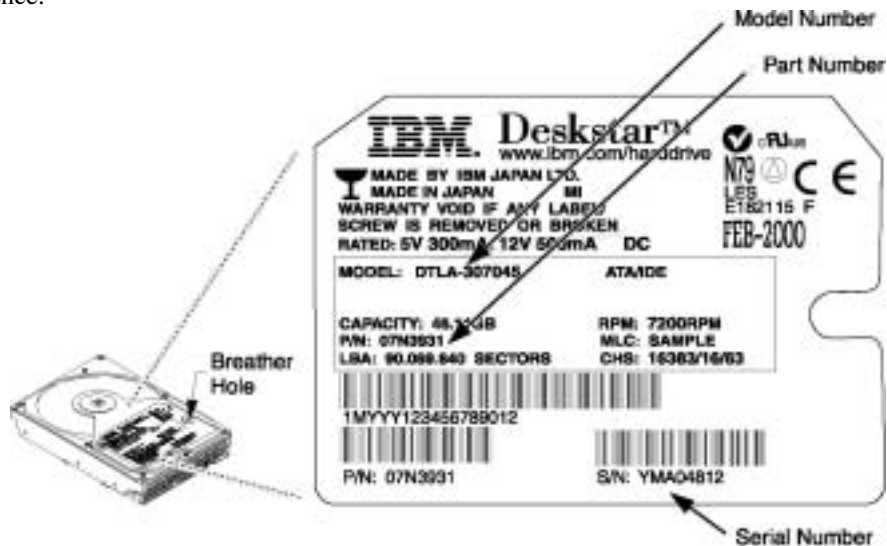
Begin the hardware install

1. Turn off your computer system.
2. Remove cover as instructed by your computer system manual.
3. Discharge static electricity by touching an unpainted metal surface on your computer chassis with one hand. Touch the ESD bag with the other hand. Remain in contact with the chassis and the bag for at least two seconds.
4. Unplug your computer.
5. If replacing a drive or replacing a cable with a 40-pin, 80-conductor ATA/IDE cable, remove it. Store the drive or cable in a safe place in case it should be needed again.



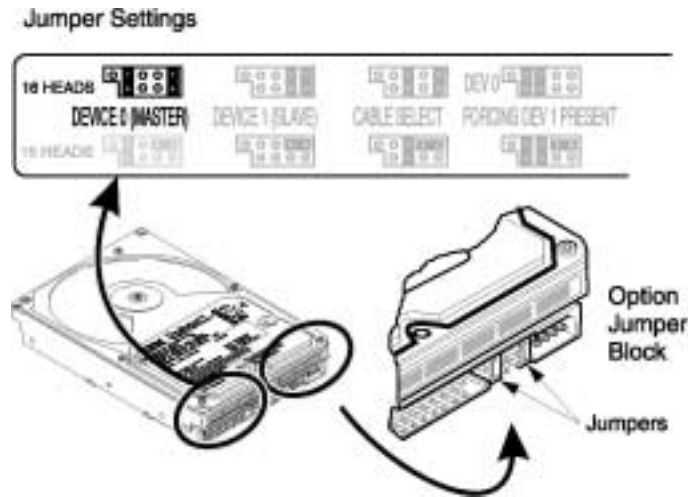
Configure the jumper settings

1. Remove the drive from its ESD bag.
2. Record the serial number, part number, and model number on a separate sheet of paper for future reference.



Note: Placement of model, part, and serial numbers may vary.

3. Leave the jumpers as set. The jumpers are factory set to Master, 16 heads.



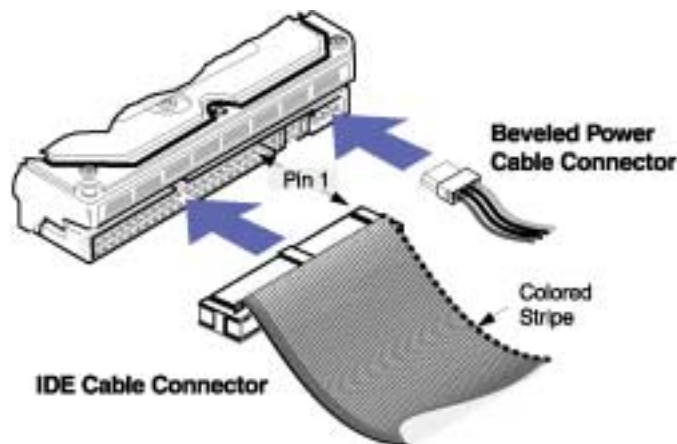
Note: The IBM Deskstar has an option jumper block located next to the interface connector. Setting these jumpers allows you to use the different options of the hard disk drive. See the “Jumpers” section of the Appendix for jumper setting descriptions.

Attach the cables

Note: With some system chassis, it may be more convenient to attach the cable after the drive is mounted. The order of the steps below may change depending upon your system.

Note: The 40-pin, 80-conductor ATA/IDE cable provided with the IBM Deskstar is color-coded for the master, slave, and system connectors. The Master connector is black, the Slave connector is gray, and the system connector is blue.

1. To use the provided ATA/IDE cable, remove the existing cable from the primary ATA/IDE connector of your motherboard or controller card.
2. Attach the blue connector of the ATA/IDE cable to the ATA/IDE connector marked “Primary” or “0” on the motherboard or controller card. The primary ATA/IDE connector controls the first and second ATA/IDE devices in the system.

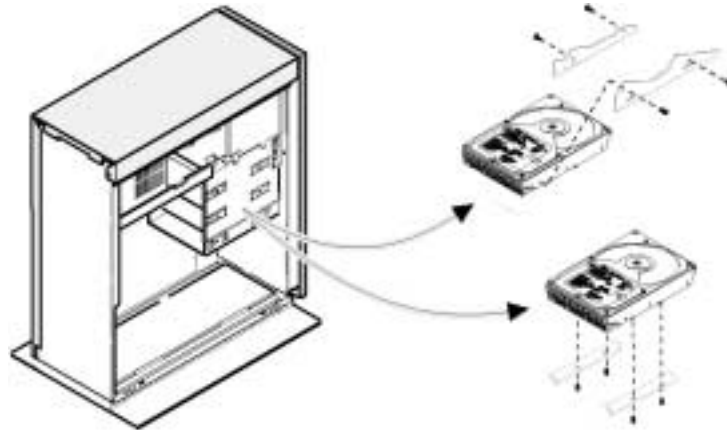


Note: The pin 1 edge of an ATA/IDE cable is marked with a colored stripe. The connectors are also keyed to insert one way only.

3. Attach a power cable to the hard disk drive.
4. Attach the black connector of the ATA/IDE cable to the hard disk drive.

Mount the drive

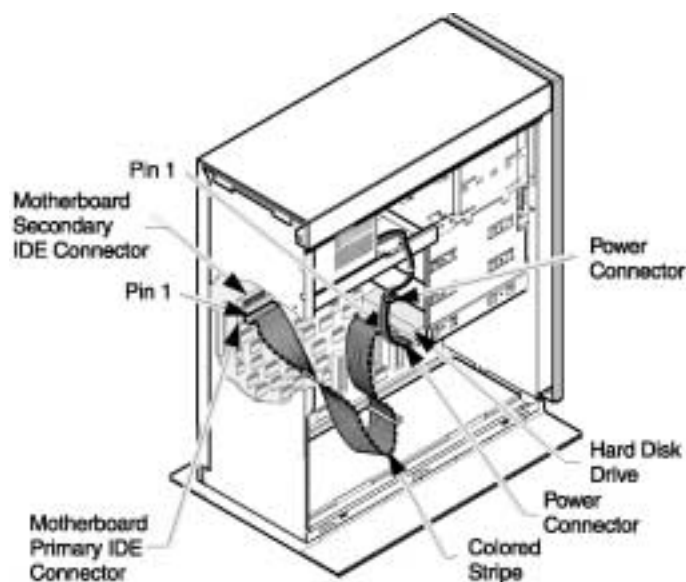
Note: Drive bays and other enclosures vary in size and orientation from system to system. They may be oriented vertically, horizontally, upside down, or sideways. The IBM Deskstar can be mounted with any side or end vertical or horizontal, but must not be mounted in a tilted position.



Mount the drive as instructed by your computer system manual.

Complete the hardware install

1. Check the ATA/IDE cable and power connections.
2. Ensure proper ATA/IDE cable and power cable routing.
3. Recover any loose screws or parts.
4. Replace the computer system cover.
5. Plug in your computer and turn it on.



Set the BIOS/CMOS

Note: BIOS setups vary from system to system, and these instructions are intended only as a guide.

1. **Run the BIOS/CMOS setup utility.** Keystroke sequences for accessing your BIOS are often displayed at boot or can be found in your computer system manual.
2. **Locate disk drive type settings.** Select the option for Autodetect, Primary Master, if available. If your computer autoconfigures itself at boot time, verify drive detection and capacity. If autodetection is unavailable, set the disk drive type to a User Definable Type (UDT) and enter the CHS parameters 1024 cylinders, 16 heads, and 63 sectors. If Autodetect or a UDT is unavailable, select Drive Type 1.
3. **Select translation or LBA options** as provided by your computer system.
4. **Record drive CHS parameters and capacity** as reported by the BIOS on a separate sheet of paper for your records. If the capacity displayed by the BIOS does not match your drive capacity, it is likely your system does not support drives greater than 8.4GB.
5. **Save the settings** and exit.

Partition and format with *Disk Manager 2000 Easy Installation Software*

Note: You may choose to use FDISK to partition and format your hard drive. Refer to the section entitled FDISK and Format in the Appendix for more information.

Due to system and hard drive variations, the *Disk Manager 2000* screens displayed may be different than those presented here.

Note: Many BIOS setups refer to the drives in a system as 0, 1, and so on. Disk Manager 2000 refers to drives as 1, 2, etc.

1. Boot the drive by one of the following methods.

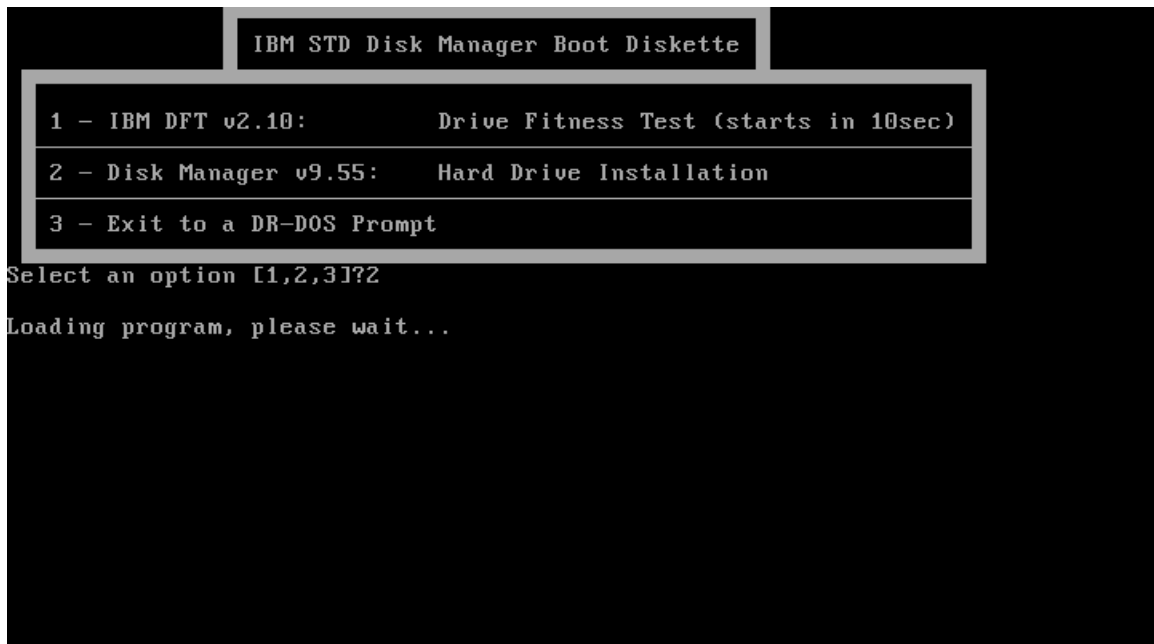
Booting from the CD-ROM (for systems that are configured to boot from a CD)

- a. Begin with your system turned on. (This applies power to the system CD-ROM drive that allows you to open and to insert the CD-ROM disk.)
- b. Insert the self-booting *Disk Manager 2000* CD-ROM into the drive.
- c. Restart your system.
- d. Boot from the CD-ROM.
- e. Skip the following paragraph about booting from a floppy diskette.

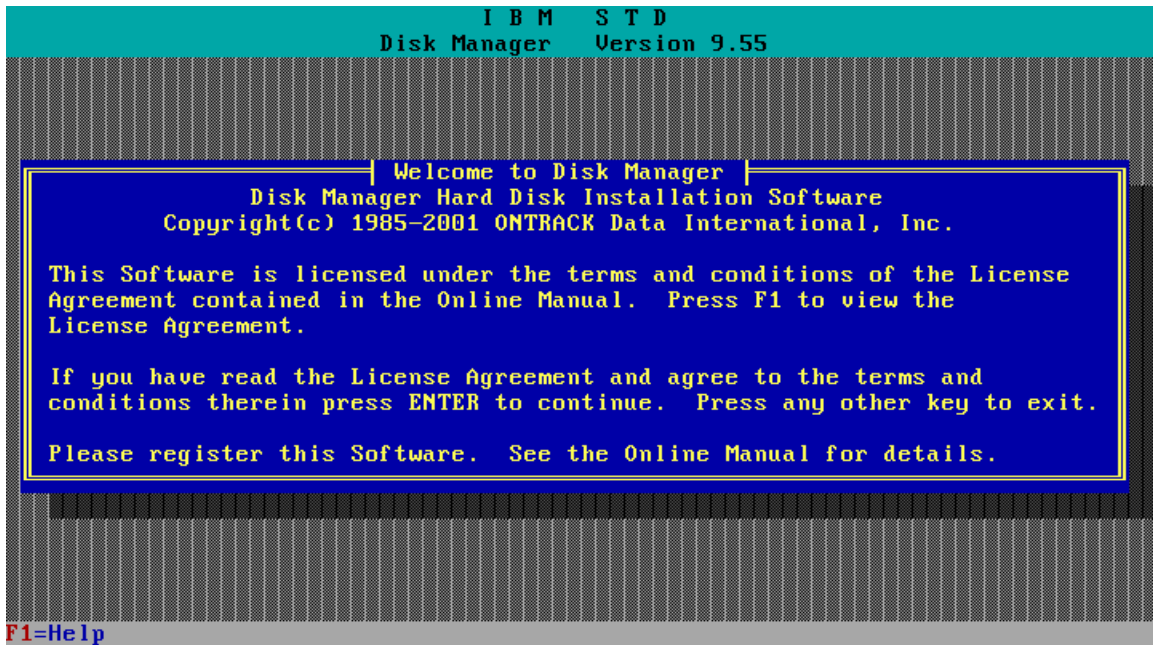
Booting from a floppy diskette containing Disk Manager 2000 (in the case where your system will not boot from a CD-ROM)

- a. Begin with your system turned off.
- b. Insert the self-booting *Disk Manager 2000* floppy diskette into the floppy disk drive.
- c. Turn on your system.

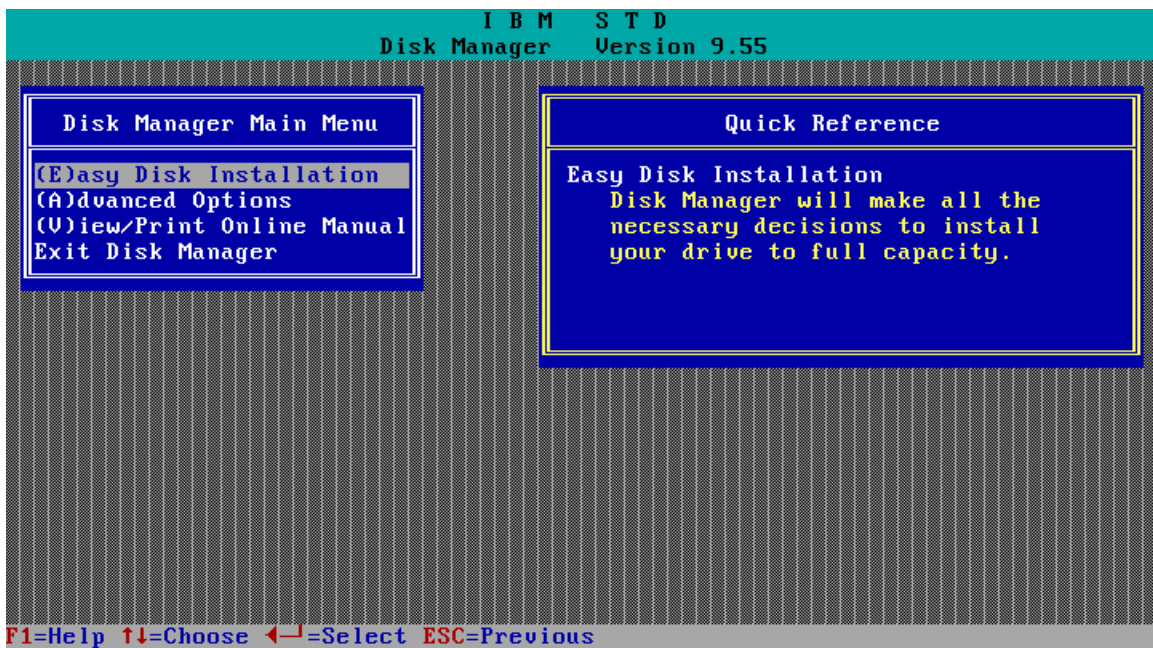
Note: See the FAQ section of this manual for instructions on creating a bootable Disk Manager 2000 diskette.



2. Select "Disk Manager" from the *Startup* menu.

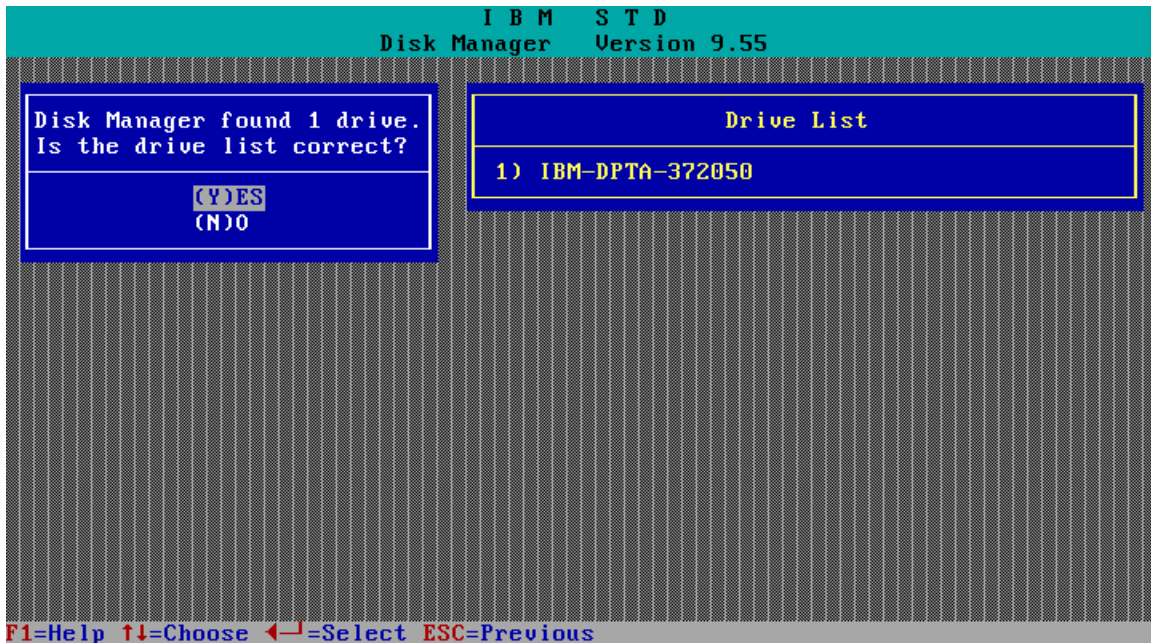


3. Press **Enter** to continue when the *Welcome to Disk Manager* screen is displayed.

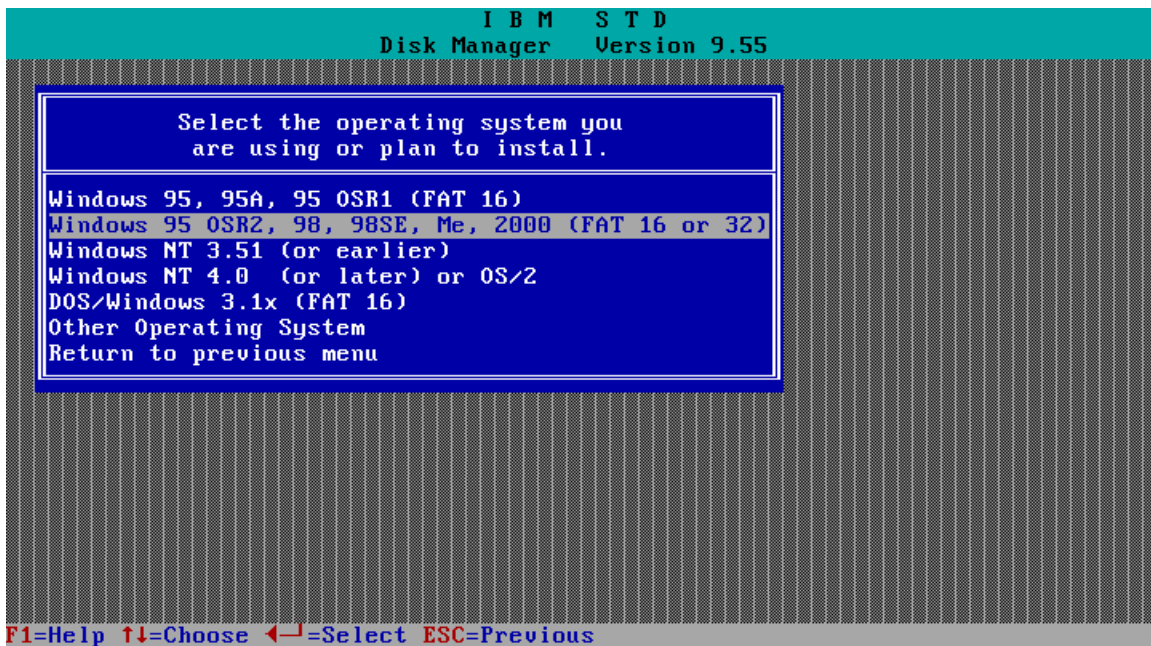


4. Choose "(E)asy Disk Installation" from the *Disk Manager Main Menu*.
5. Press **Enter**.

Disk Manager DOS displays a list of available drives that it found. See “Drive List” in the following illustration.

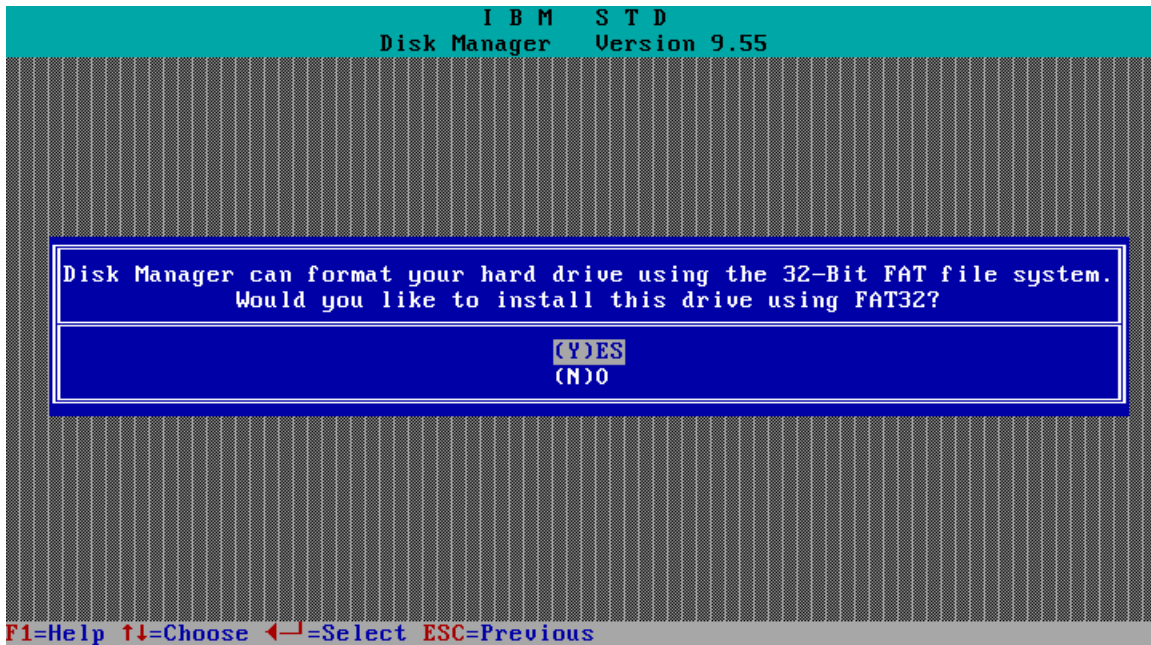


6. Verify the drive list and select “(Y)es” to continue. (In “(Y)es,” pressing the “Y” key means yes.)

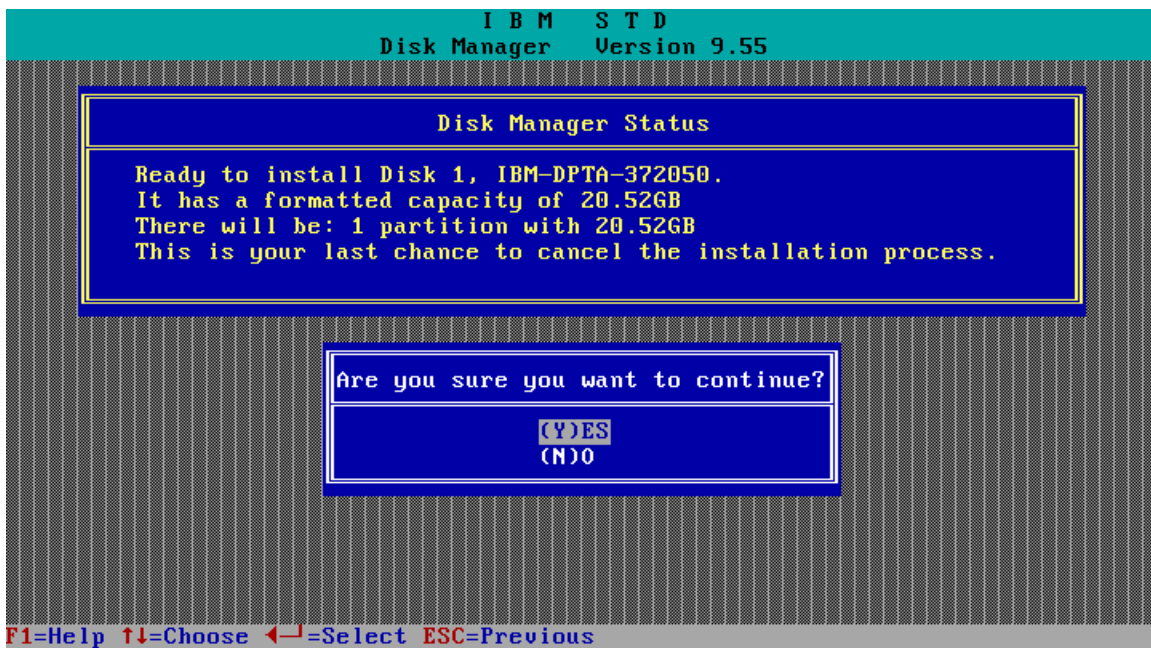


7. Select the operating system you are using or plan to install.
8. Press **Enter** to continue.

If you selected an operating system that supports FAT32, you will be asked if you would like to use it.

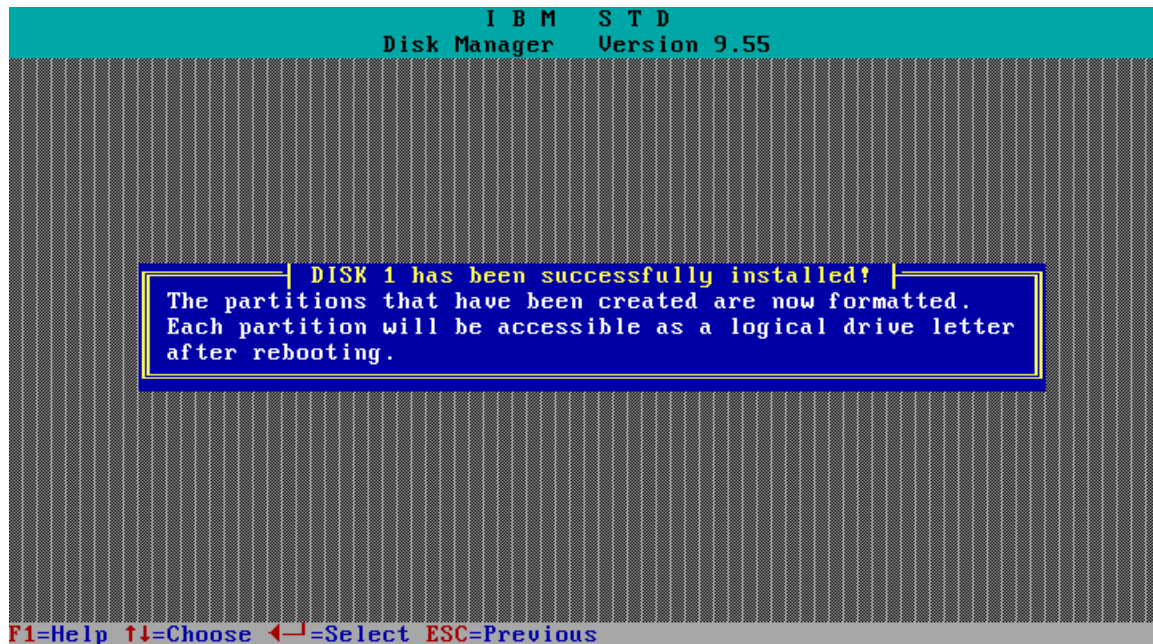


9. Select “(Y)es” if you want the 32-Bit FAT file system or (N)o if not.
10. Press **Enter** to continue.

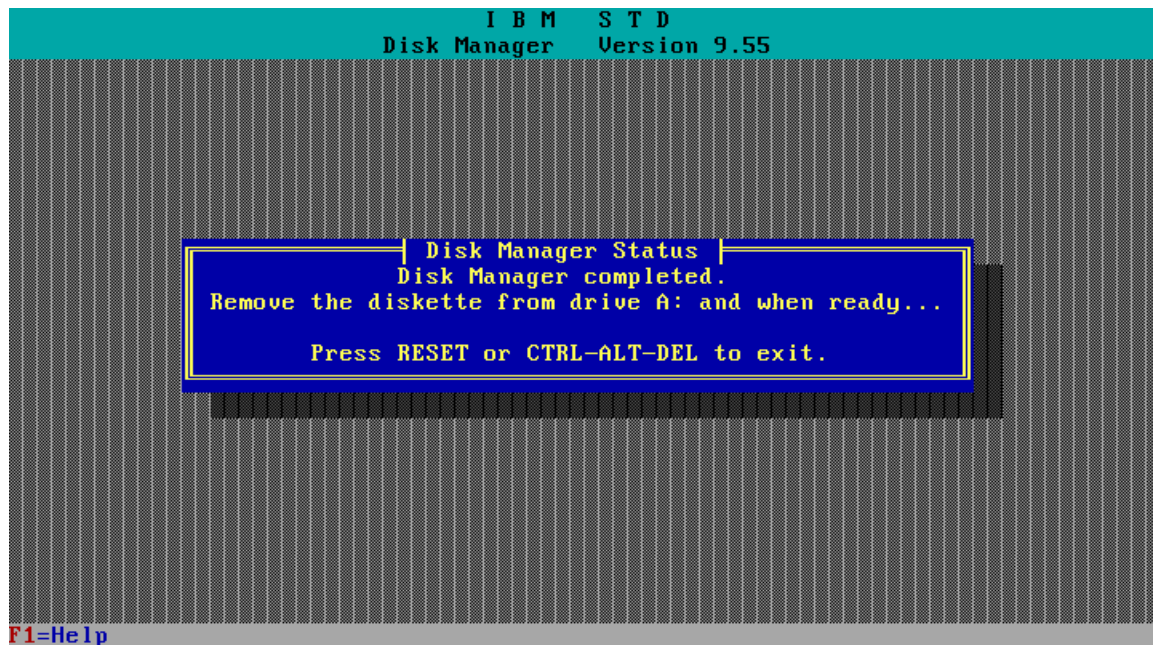


11. Verify all the information. This is the last chance to cancel before writing to the new drive.
12. Select “(Y)es.”
13. Press **Enter** to continue.

Disk Manager has now completed the installation of the new drive.



14. Press **Enter** to continue.



15. When the *Disk Manager Status* screen appears, remove the Disk Manager DOS bootable diskette from the floppy drive.
16. Reboot the computer by pressing the **RESET** button on your system—if one is available on your system—or reboot by simultaneously pressing the **CTRL-ALT-DEL** keys.

Operating system installation

Important: If the operating system presents the option to partition and format your drive, skip this step. IBM Disk Manager has already partitioned and formatted your drive.

If the Ontrack Dynamic Drive Overlay (DDO) was not installed during the installation, proceed to your operating system installation instructions.

If the Ontrack DDO was placed on the drive during the installation—as determined by *Disk Manager 2000* as necessary to support the full capacity of the hard disk drive—you must allow the DDO to load into memory prior to booting to a floppy disk. If you do not perform the floppy boot process below, your drive's capacity and partitions will be unavailable. The following procedure assumes that your system is turned on.

1. Boot from the hard disk drive.
2. Let DDO load into memory. Follow the messages displayed on your system's monitor.

Starting ONTRACK...

Press spacebar to boot from diskette...

3. Press the spacebar. The following message is displayed:

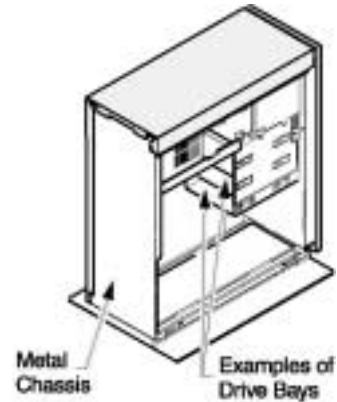
Insert boot diskette in drive A:, press spacebar when ready...

Add a new drive as additional storage

The following steps install the IBM Deskstar as the Primary Slave in a system with an existing drive as Primary Master.

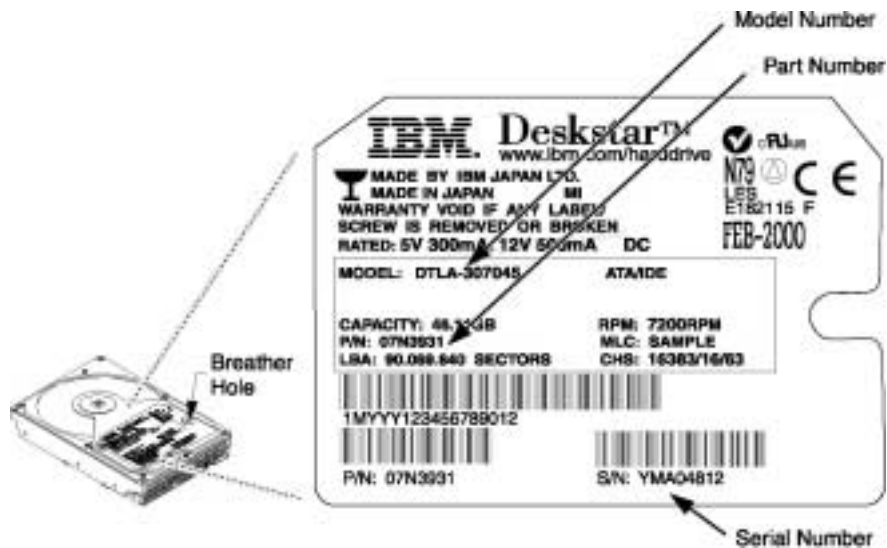
Begin the hardware install

1. Turn off your computer system.
2. Remove the cover as instructed by your computer system manual.
3. Discharge static electricity by touching an unpainted metal surface on your computer chassis with one hand. Touch the ESD bag with the other hand. Remain in contact with the chassis and the bag for at least two seconds.
4. Unplug your computer.
5. Note the mounting position of existing drives and cables.
6. If replacing a drive or replacing a cable with a 40-pin, 80-conductor ATA/IDE cable, remove it. Store the drive in a safe place in case it should be needed again.



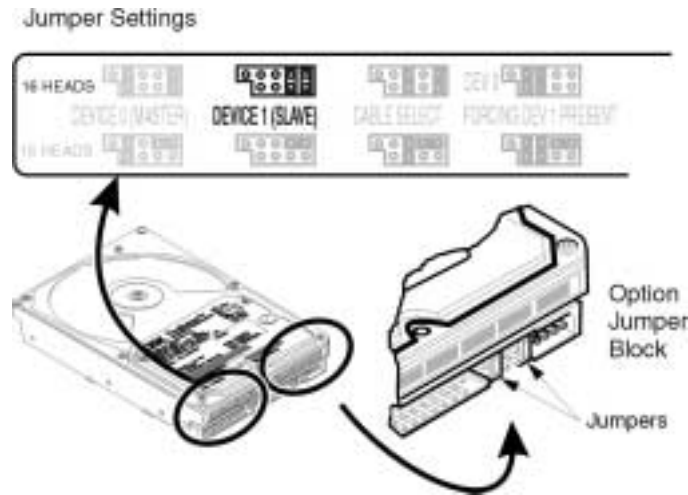
Configure the jumper settings

1. Remove the drive from the ESD bag.
2. Record the serial number, part number, and model number on a separate sheet of paper for future reference.



Note: Placement of model, part, and serial numbers may vary.

3. Set the jumpers to Slave, 16 heads.

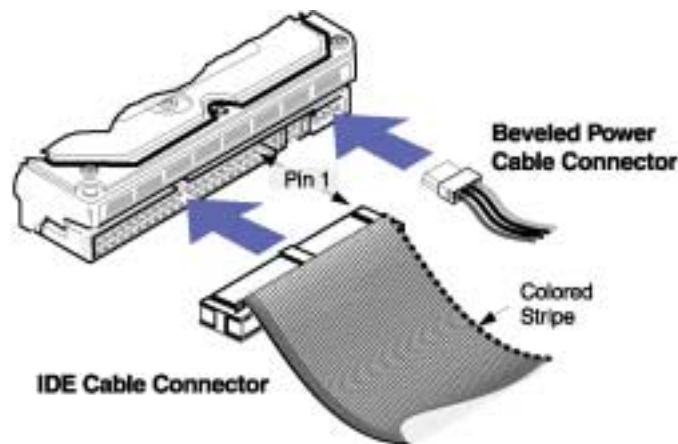


Note: The IBM Deskstar has an option jumper block located next to the interface connector. Setting these jumpers allows you to use the different options of the hard disk drive. See the "Jumpers" section of the Appendix for jumper setting descriptions.

Attach the cables

Note: With some system chassis, it may be more convenient to attach the cable after the drive is mounted. The order of the steps below may change depending upon your system.

Note: The 40-pin, 80-conductor ATA/IDE cable provided with the IBM Deskstar is color-coded for the Master, Slave, and system connectors. The Master connector is black, the Slave connector is gray, and the system connector is blue.



1. To use the provided ATA/IDE cable, remove the existing cable from the primary ATA/IDE connector of your motherboard or controller card.
2. Attach the blue connector of the ATA/IDE cable to the ATA/IDE connector marked "Primary" or "0" on the motherboard or controller card. The primary ATA/IDE connector controls the first and second ATA/IDE devices in the system.

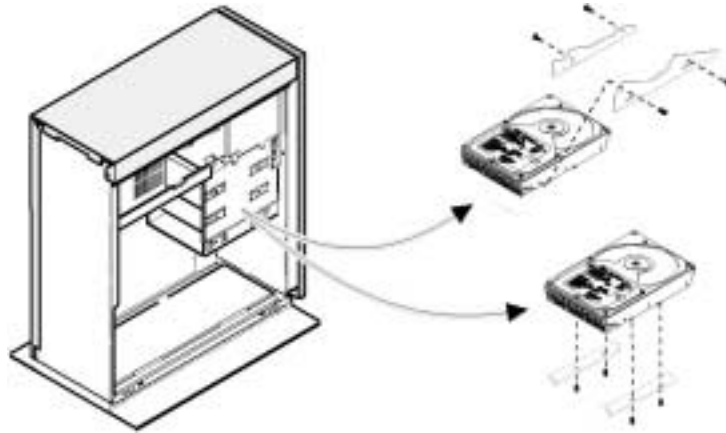
Note: The pin 1 edge of an ATA/IDE cable is marked with a colored stripe. The connectors are also keyed to insert one way only.

3. Attach a power cable to each hard disk drive.

4. Attach the black connector of the ATA/IDE cable to the Master drive.
5. Attach the gray connector of the ATA/IDE cable to the Slave drive.

Mount the drive

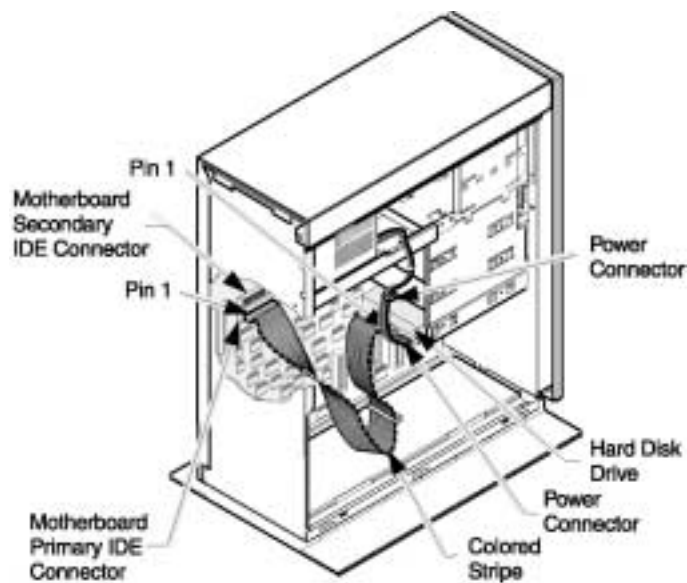
Note: Drive bays and other enclosures vary in size and orientation from system to system. They may be oriented vertically, horizontally, upside down, or sideways. The IBM Deskstar can be mounted with any side or end vertical or horizontal, but must not be mounted in a tilted position.



Mount the drive as instructed by your computer system manual.

Complete the hardware install

1. Check the ATA/IDE cable and power connections.
2. Recover any loose screws or parts.
3. Replace the computer system cover.
4. Plug in your computer and turn it on.



Set the BIOS/CMOS

Note: BIOS setups vary from system to system, and these instructions are intended only as a guide.

1. **Run the BIOS/CMOS setup utility.** Keystroke sequences for accessing your BIOS are often displayed at boot or can be found in your computer system manual.
2. **Locate disk drive type settings.** Select the option for Autodetect, Primary Slave, if available. If your computer autoconfigures itself at boot time, verify drive detection and capacity. If autodetection is unavailable, set the disk drive type to a User Definable Type (UDT) and enter the CHS parameters 1024 cylinders, 16 heads, and 63 sectors. If Autodetect or a UDT is unavailable, select Drive Type 1.
3. **Select translation or LBA options** as provided by your computer system.
4. **Record drive CHS parameters and capacity** as reported by the BIOS in the spaces provided in the Appendix. If the capacity displayed by the BIOS does not match your drive capacity, it is likely your system does not support drives greater than 8.4GB.
5. **Save the settings** and exit.

Partition and format with IBM *Disk Manager 2000* Easy Installation Software

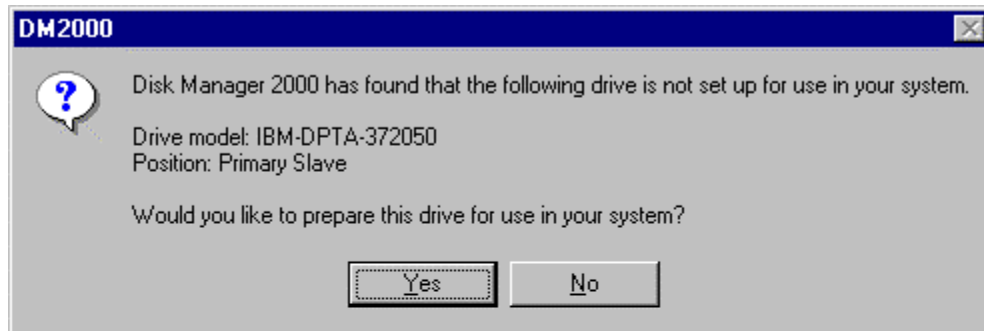
Note: You may choose to use FDISK to partition and format your hard drive. Refer to the section entitled FDISK and Format in the Appendix for more information.

Due to system and hard drive variations, the IBM *Disk Manager 2000* screens displayed may be different than those presented here.

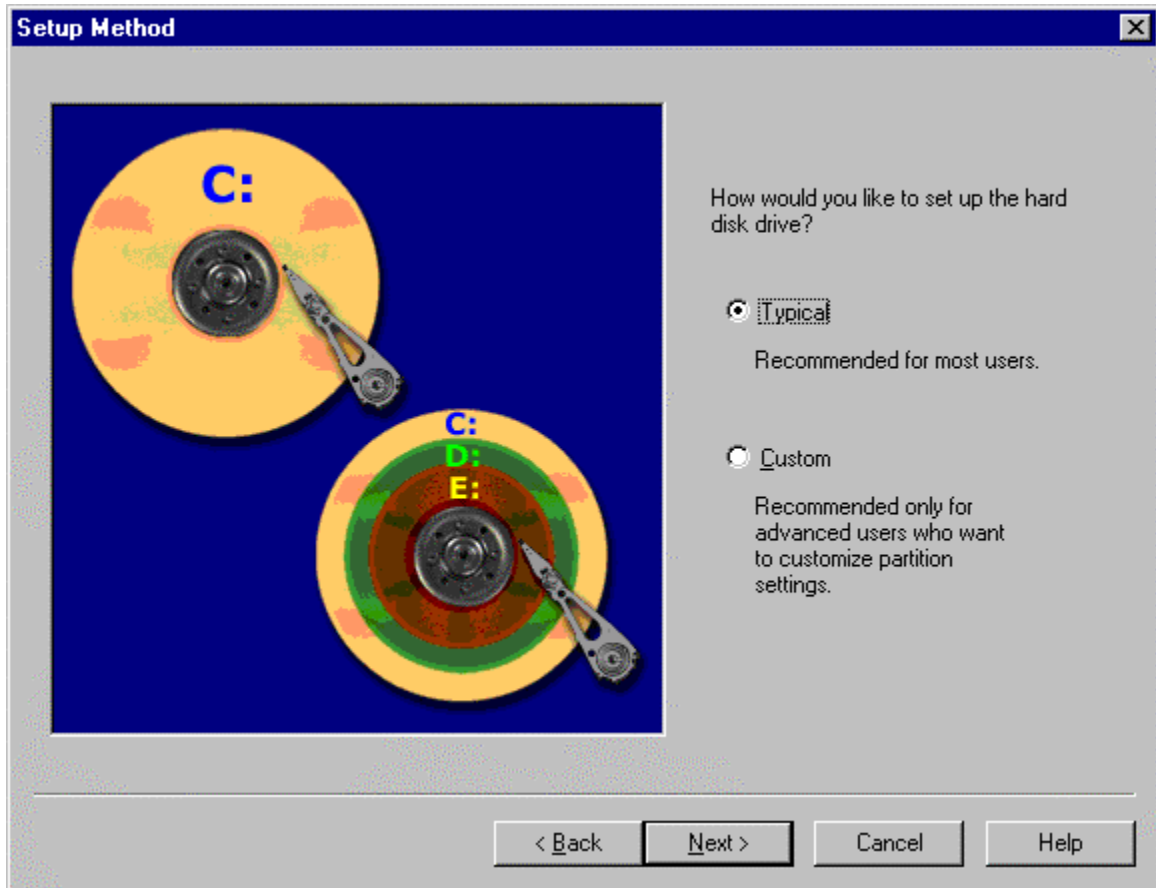
Note: Many BIOS setups refer to the drives in a system as 0, 1, and so on. IBM Disk Manager 2000 refers to drives as 1, 2, etc.

The order and appearance of the screens displayed may vary from system to system. The major screens are presented here as a guide.

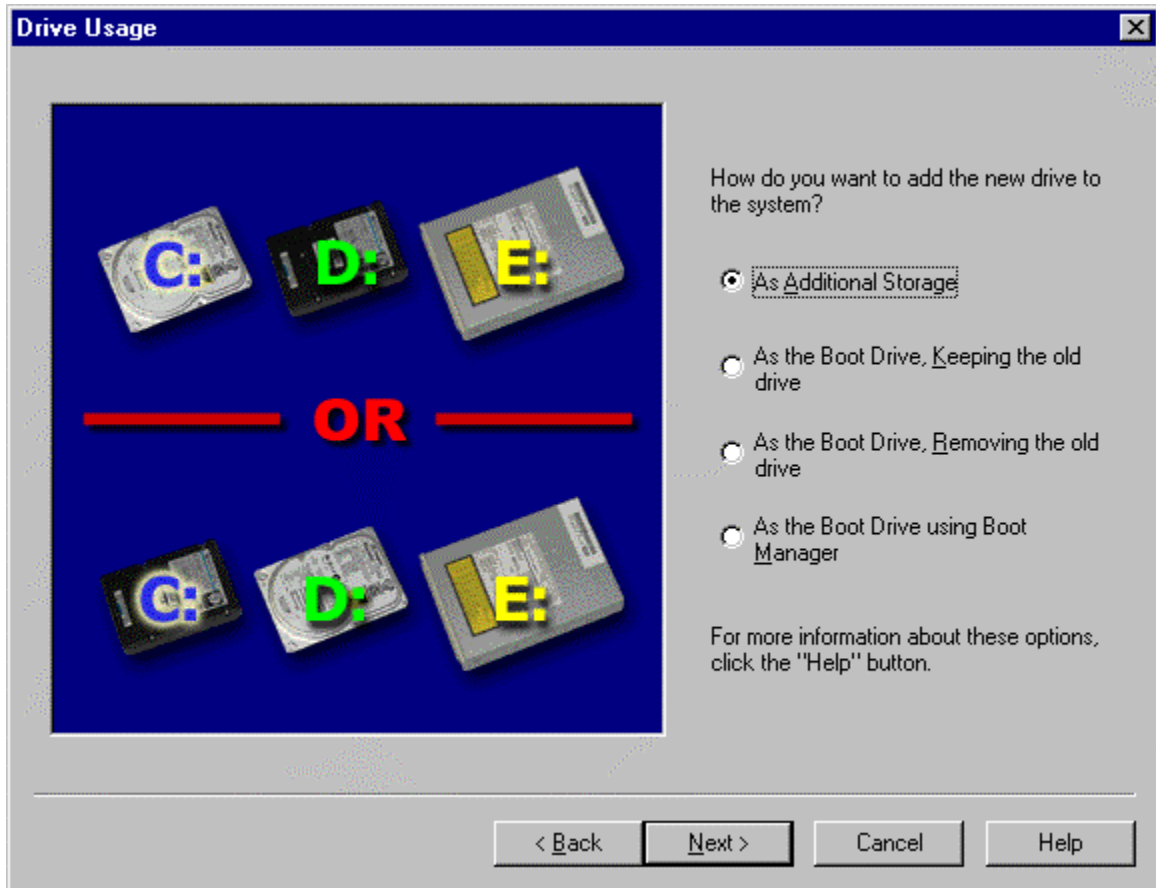
1. Turn on your computer.
2. Boot Windows.
3. Insert the *Disk Manager 2000* CD into the CD-ROM drive.
4. Select "Install *Disk Manager 2000*" from the on-screen menu. You should see the following *DM2000* dialog box on your monitor.



5. Select **Yes** to prepare the new drive.



6. On the *Setup Method* dialog box, select the “Typical” option button.
7. Select the **Next** button. The *Drive Usage* dialog box should appear.



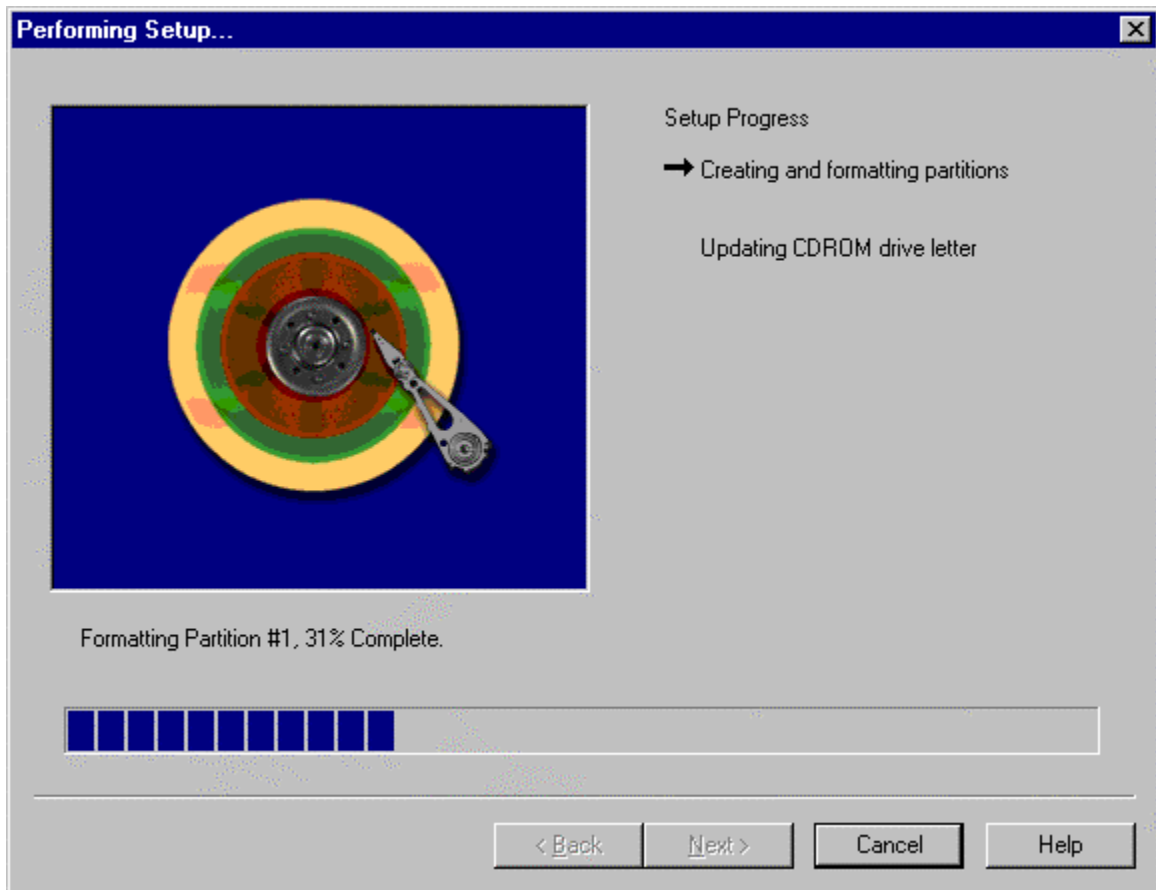
8. On the *Drive Usage* dialog box, choose the “As Additional Storage” option button.
9. Select the **Next** button.

10. Verify the information in the *Proceed with Drive Setup?* dialog box.

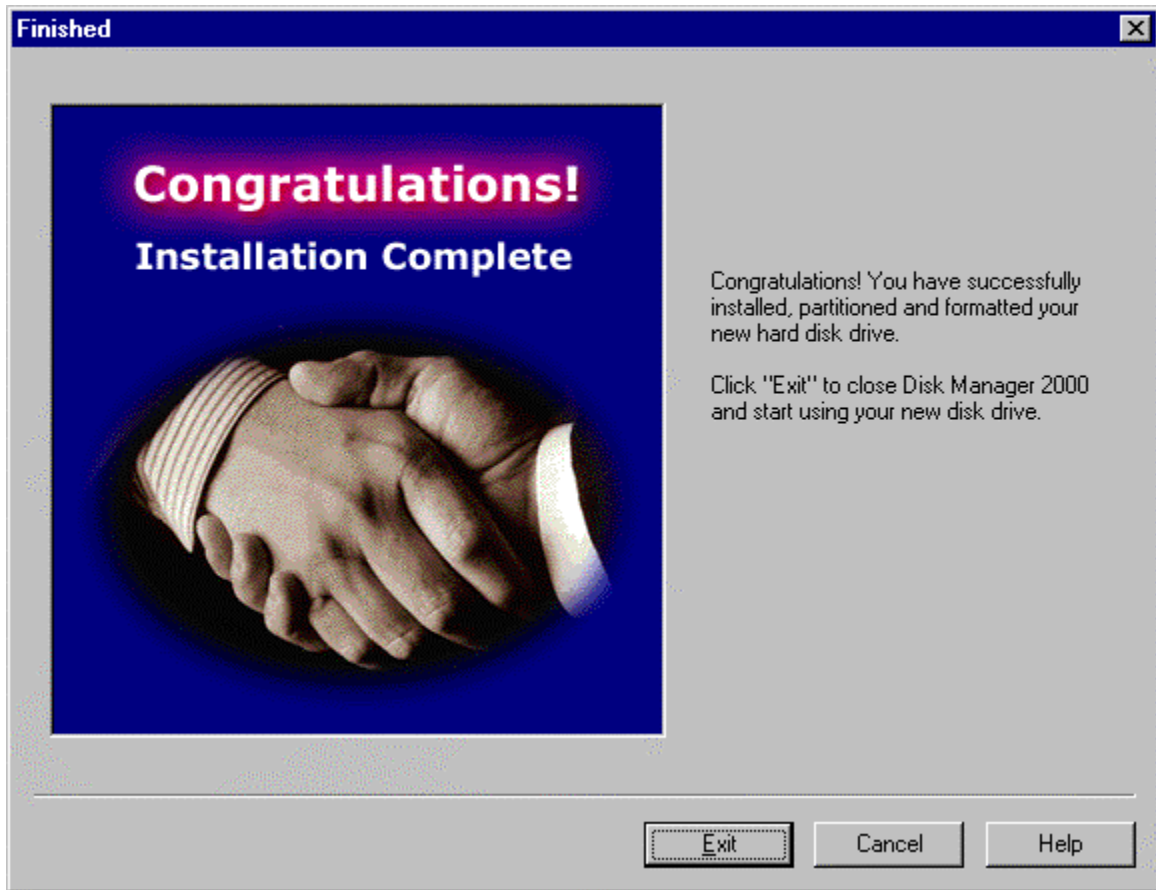


11. Select **Next** to continue *OR* Select **Cancel** if you do not wish to proceed with partitioning the drive. Selecting **Cancel** is the last chance to cancel before writing to the drive.

Disk Manager 2000 displays a list of the steps—not all shown on this guide—required to prepare the new drive and shows the current status. The *Performing Setup* dialog box—using a progress indicator—shows the percentage of partitioning completed.



When you see the *Finished* dialog box the installation is complete.



12. Select **Exit** to close *Disk Manager 2000* and start using your new disk drive.

Important: If the Ontrack Dynamic Drive Overlay (DDO) was installed during the installation, you must allow DDO to load in memory prior to booting to a floppy. If you do not perform the floppy boot process below, your drive's capacity and partitions will be unavailable.

1. Boot from the hard disk drive.
2. Let DDO load into memory. Follow the messages displayed on your system's monitor.

Starting ONTRACK...

Press spacebar to boot from diskette...

3. Press the spacebar. The following message is displayed.

Insert boot diskette in drive A:, press spacebar when ready...

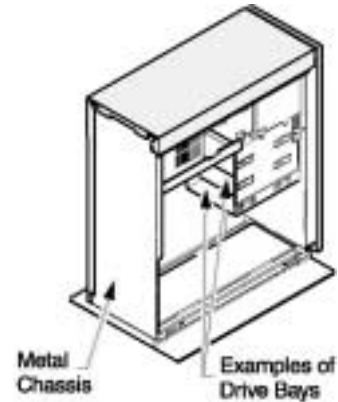
4. Insert the boot diskette in the A: drive.
5. Press the spacebar to boot from the floppy.

Add a new drive as the boot drive, removing the old boot drive

The following steps replace an existing boot drive with the IBM Deskstar. The new drive is temporarily installed as Primary Slave so data can be copied from the old boot drive to the IBM Deskstar before removing the old boot drive.

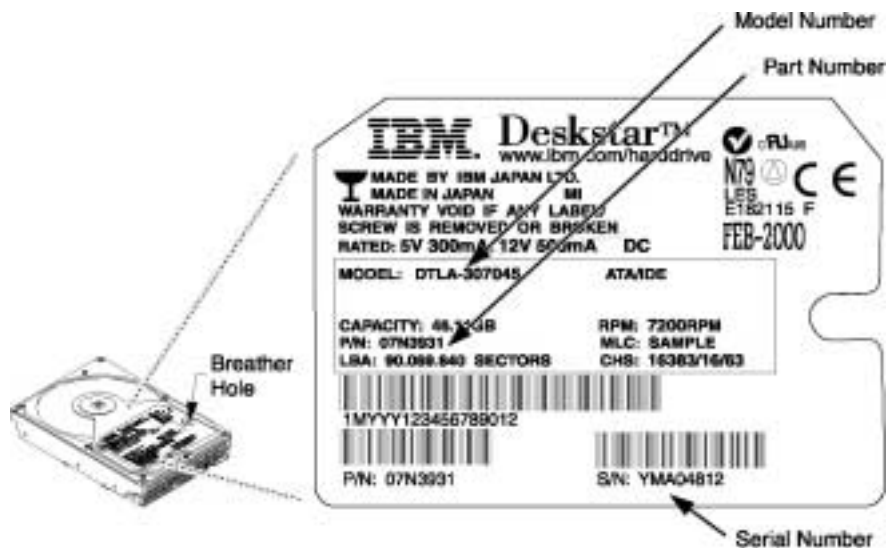
Begin the hardware install

1. Turn off your computer system.
2. Remove cover as instructed by your computer system manual.
3. Discharge static electricity by touching an unpainted metal surface on your computer chassis with one hand. Touch the ESD bag with the other hand. Remain in contact with the chassis and the bag for at least two seconds.
4. Unplug your computer.
5. Note mounting position of existing drives and cables.
6. If replacing a cable with a 40-pin, 80-conductor ATA/IDE cable, remove it now.



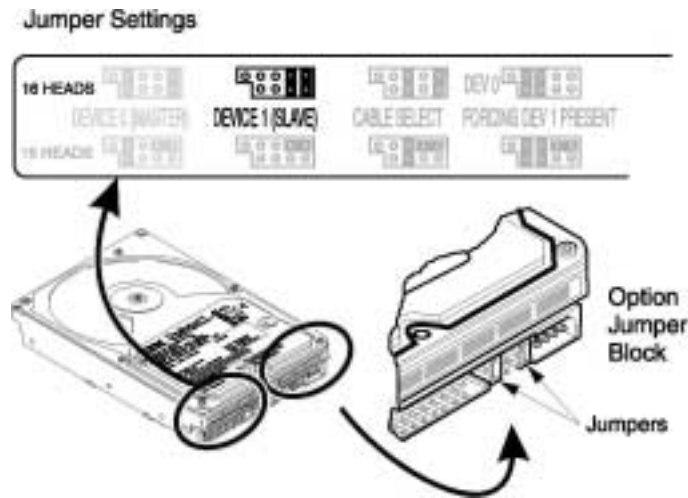
Configure the jumper settings

1. Remove the drive from its ESD bag.
2. Record the serial number, part number, and model number on a sheet of paper for future reference.



Note: Placement of model, part, and serial numbers may vary.

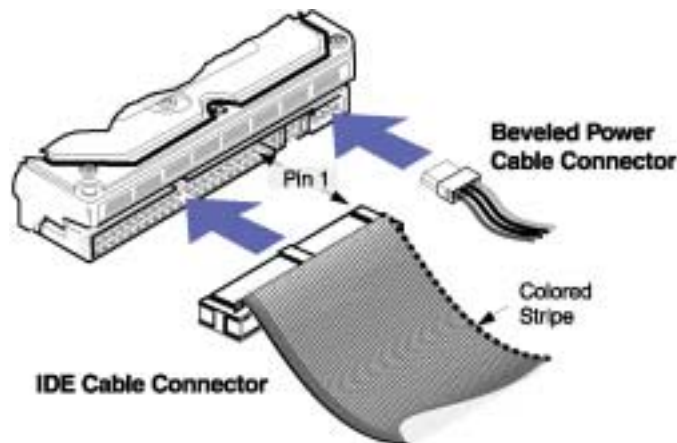
3. Set the jumpers to Slave, 16 heads.



Note: The IBM Deskstar has an option jumper block located next to the interface connector. Setting these jumpers allows you to use the different options of the hard disk drive. See the "Jumpers" section of the Appendix for jumper setting descriptions.

Attach the cables

Note: With some system chassis, it may be more convenient to attach the cable after the drive is mounted. The order of the following steps may change depending upon your system.



Note: The 40-pin, 80-conductor ATA/IDE cable provided with the IBM Deskstar is color-coded for the Master, Slave, and system connectors. The Master connector is black, the Slave connector is gray, and the system connector is blue.

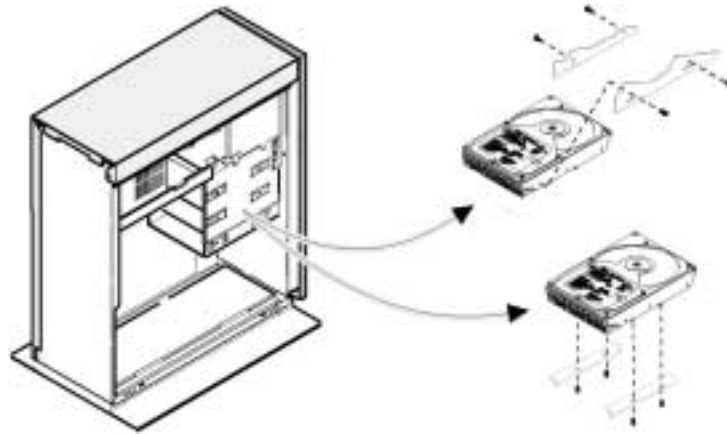
1. To use the provided ATA/IDE cable, remove the existing cable from the primary ATA/IDE connector of your motherboard or controller card.
2. Attach the blue connector of the ATA/IDE cable to the ATA/IDE connector marked "Primary" or "0" on the motherboard or controller card. The primary ATA/IDE connector controls the first and second ATA/IDE devices in the system.

Note: The pin 1 edge of an ATA/IDE cable is marked with a colored stripe. The connectors are also keyed to insert one way only.

3. Attach a power cable to each hard disk drive.
4. Attach the black connector of the ATA/IDE cable to the Master drive.
5. Attach the gray connector of the ATA/IDE cable to the Slave drive.

Mount the drive

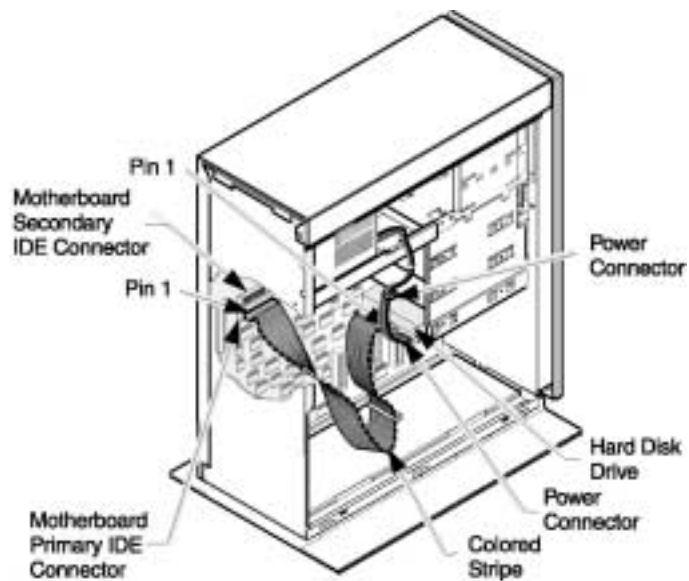
Note: Drive bays and other enclosures vary in size and orientation from system to system. They may be oriented vertically, horizontally, upside down, or sideways. The IBM Deskstar can be mounted with any side or end vertical or horizontal, but must not be mounted in a tilted position.



Mount the drive as instructed by your computer system manual.

Complete the hardware install

1. Check the ATA/IDE cable and power connections.
2. Recover any loose screws or parts.
3. Plug in your computer and turn it on.



Set the BIOS/CMOS

Note: BIOS setups vary from system to system, and these instructions are intended only as a guide.

1. **Run the BIOS/CMOS setup utility.** Keystroke sequences for accessing your BIOS are often displayed at boot or can be found in your computer system manual.
2. **Locate disk drive type settings.** Select the option for Autodetect, Primary Master and Slave, if available. If your computer autoconfigures itself at boot time, verify drive detection and capacity. If autodetection is unavailable, set the disk drive type to a User Definable Type (UDT) and enter the CHS parameters 1024 cylinders, 16 heads, and 63 sectors. If autodetect or a UDT is unavailable, select Drive Type 1.
3. **Select translation or LBA options** as provided by your computer system.
4. **Record drive CHS parameters and capacity** as reported by the BIOS on a separate sheet of paper. If the capacity displayed by the BIOS does not match your drive capacity, it is likely your system does not support drives greater than 8.4GB.
5. **Save the settings** and exit.

Partition, format, and copy with IBM *Disk Manager 2000* Easy Installation Software

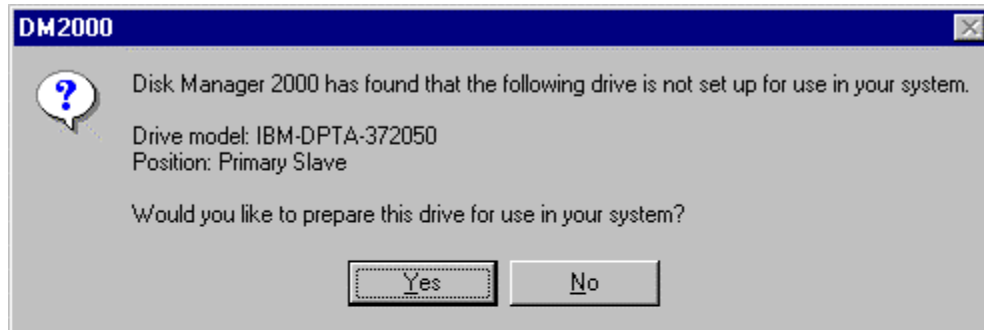
Note: You may choose to use FDISK to partition and format your hard drive. Refer to the section entitled FDISK and Format in the Appendix for more information.

Due to system and hard drive variations, the IBM *Disk Manager 2000* screens displayed may be different than those presented here.

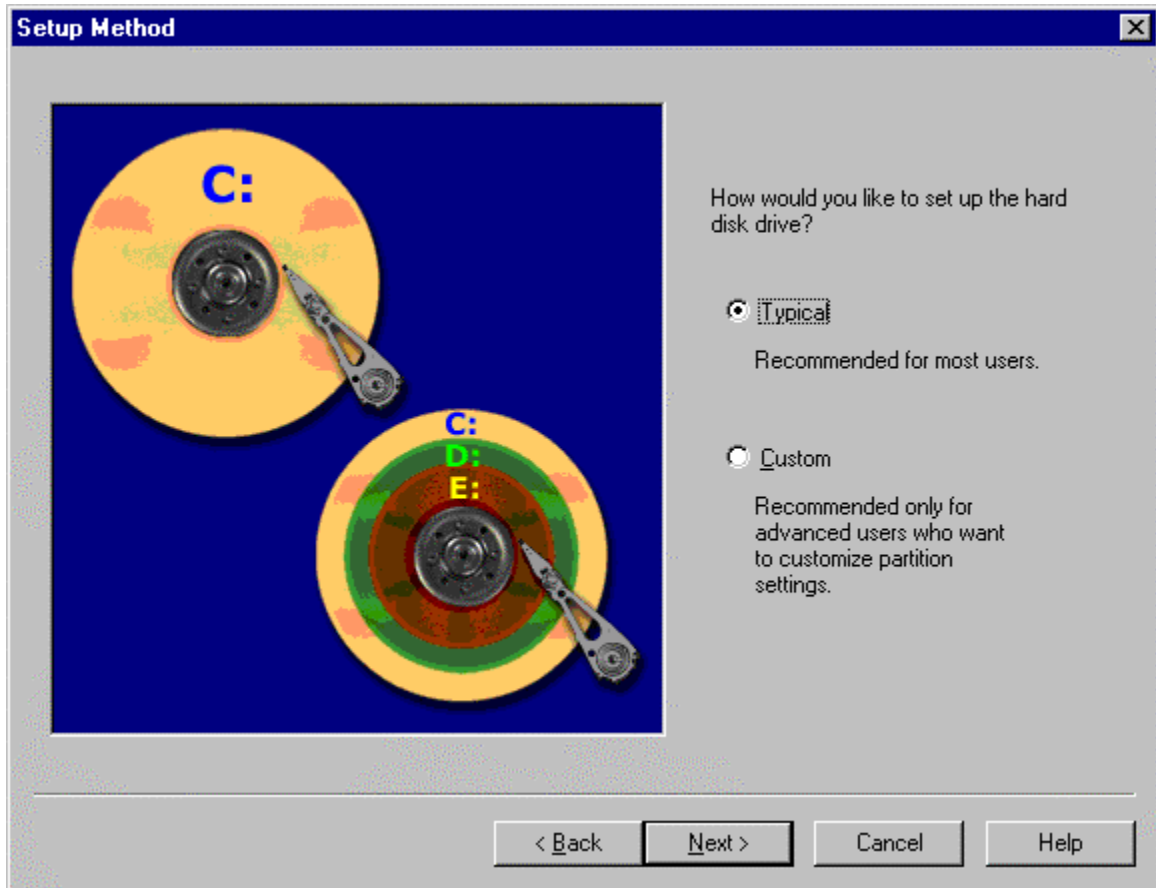
Note: Many BIOS setups refer to the drives in a system as 0, 1, and so on. IBM Disk Manager 2000 refers to drives as 1, 2, etc.

The order and appearance of the screens displayed may vary from system to system. The major screens are presented here as a guide. *Disk Manager 2000* will instruct you on removing the old drive at the appropriate point in this setup.

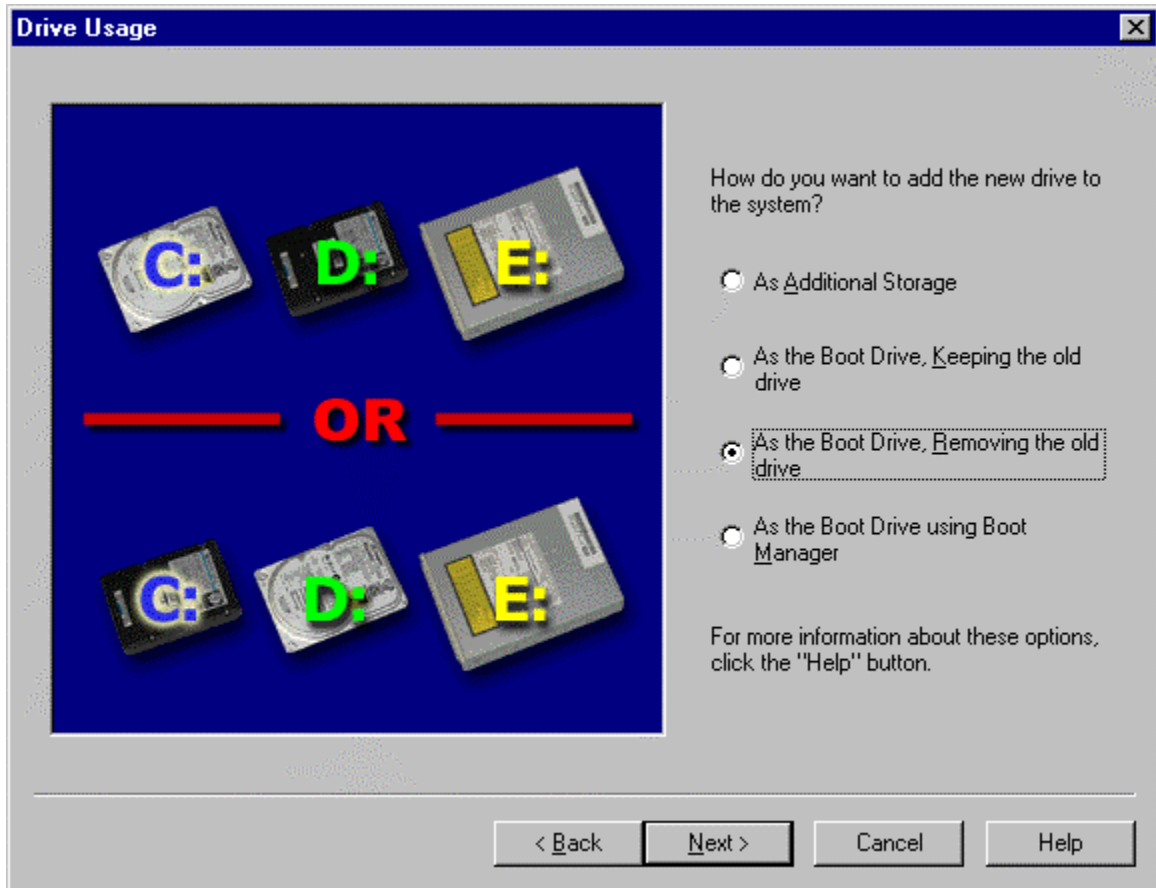
1. Turn your computer on.
2. Boot Windows.
3. Insert the *Disk Manager 2000* CD into the CD-ROM drive.
4. Select "Install *Disk Manager 2000*" from the on-screen menu. You should see the following *DM2000* dialog box on your monitor.



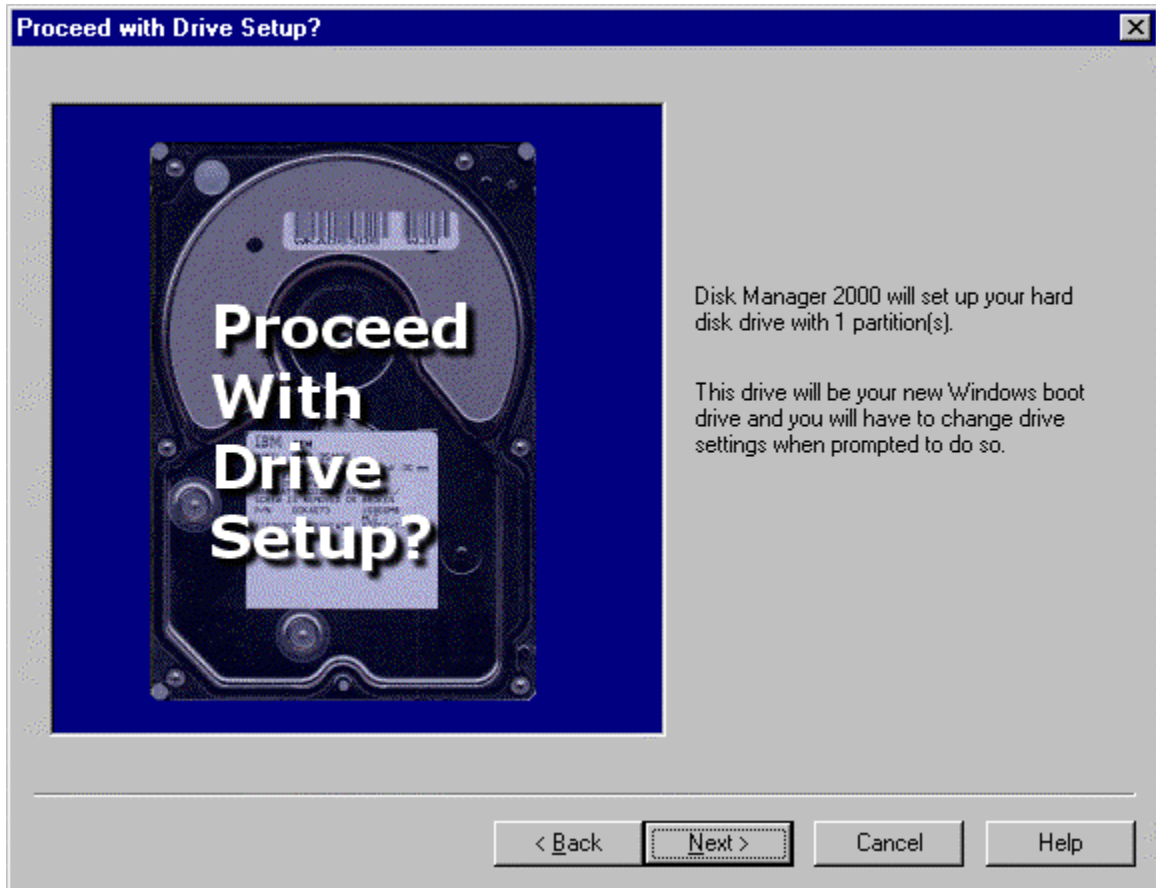
5. Select **Yes** to prepare the new drive.



6. On the *Setup Method* dialog box, select the “Typical” option button.
7. Select the **Next** button. The *Drive Usage* dialog box should appear.



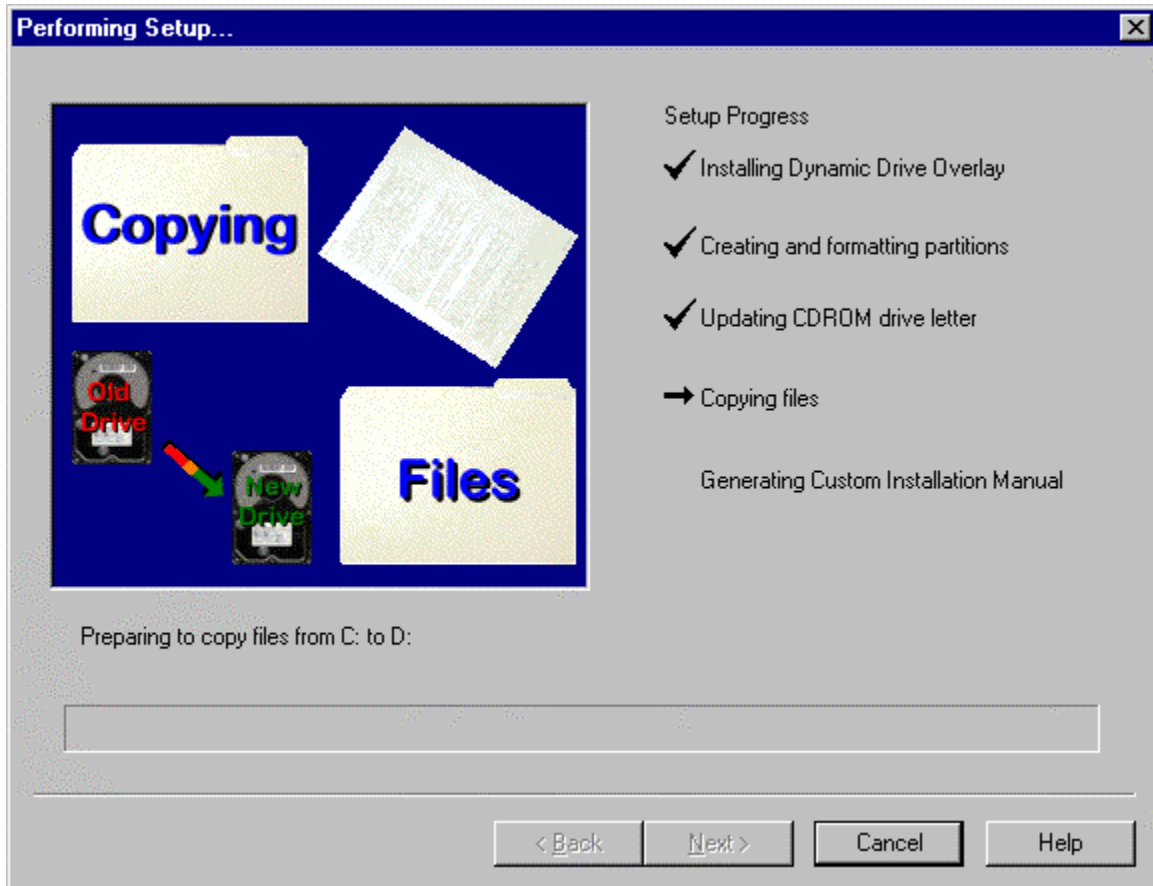
8. On the *Drive Usage* dialog box, choose “As the Boot Drive, Removing the old drive” to setup the new drive as a boot drive removing the old boot drive.
9. Select **N**ext to continue.



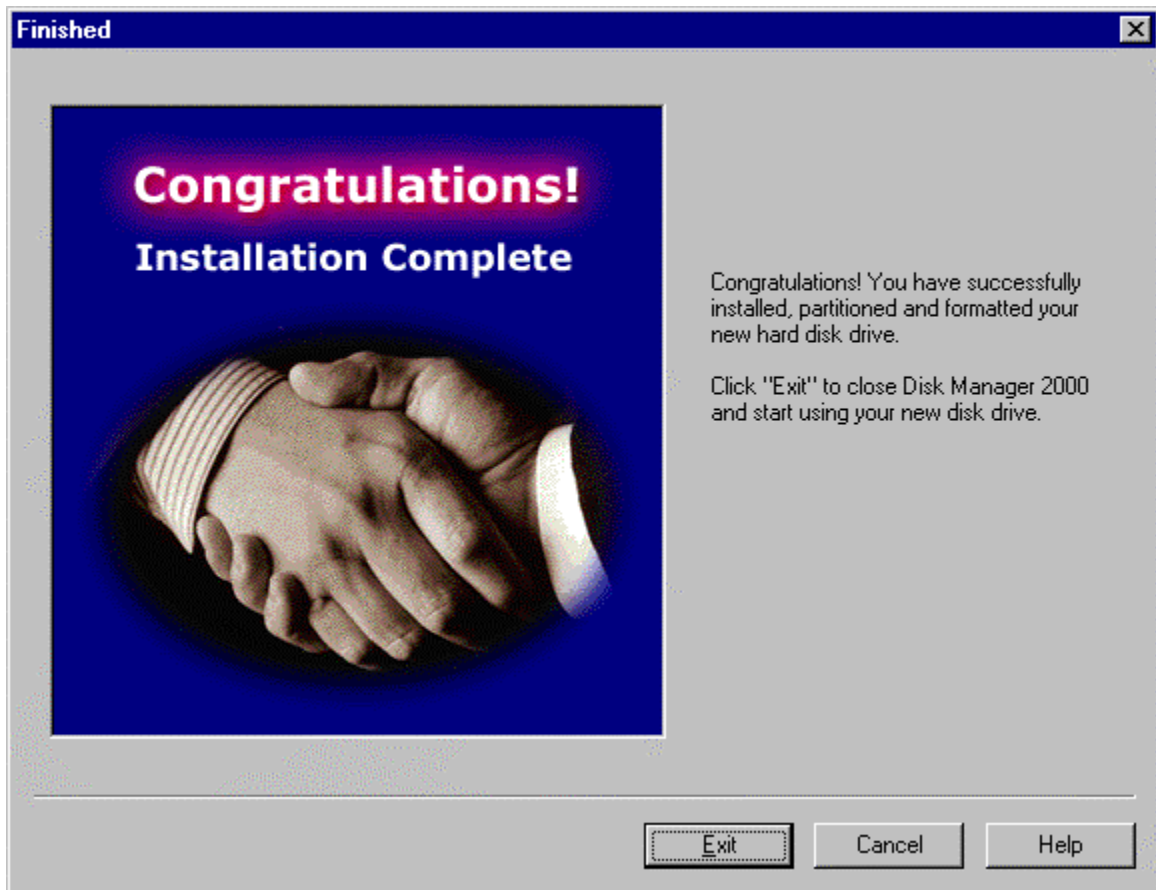
10. Verify the information in the *Proceed with Drive Setup?* dialog box.
11. Select **Next** to continue.

Disk Manager 2000 displays a list of the steps required to prepare the new drive and shows the current status. *Disk Manager 2000* will copy all the data from your old C: boot partition to the new boot drive. A Custom Installation Manual is created for you to tell you how to remove the old drive after the new drive has been prepared.

12. Shut down your system and follow the manual when directed to do so.



The installation is now complete.



13. Select **Exit** to close *Disk Manager 2000* and start using your new disk drive.

Important: If the Ontrack Dynamic Drive Overlay (DDO) was installed during the installation, you must allow DDO to load in memory prior to booting to a floppy. If you do not perform the floppy boot process below, your drive's capacity and partitions will be unavailable.

1. Boot from the hard disk drive.
2. Let DDO load into memory. Follow the messages displayed on your system's monitor.

Starting ONTRACK...

Press spacebar to boot from diskette...

3. Press the spacebar. The following message is displayed.

Insert boot diskette in drive A:, press spacebar when ready...

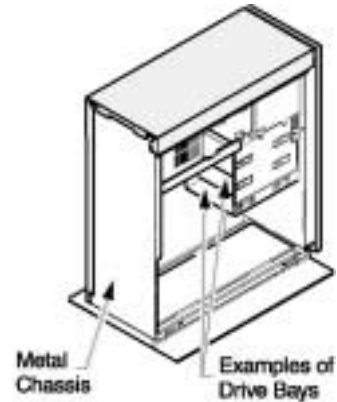
4. Insert the boot diskette in the A: drive.
5. Press the spacebar to boot from the floppy.

Add a new drive as the boot drive, keeping the old boot drive

The following steps exchange an existing boot drive with the IBM Deskstar. The new drive is installed as Primary Slave so data can be copied from the old boot drive to the IBM Deskstar before booting to the new drive.

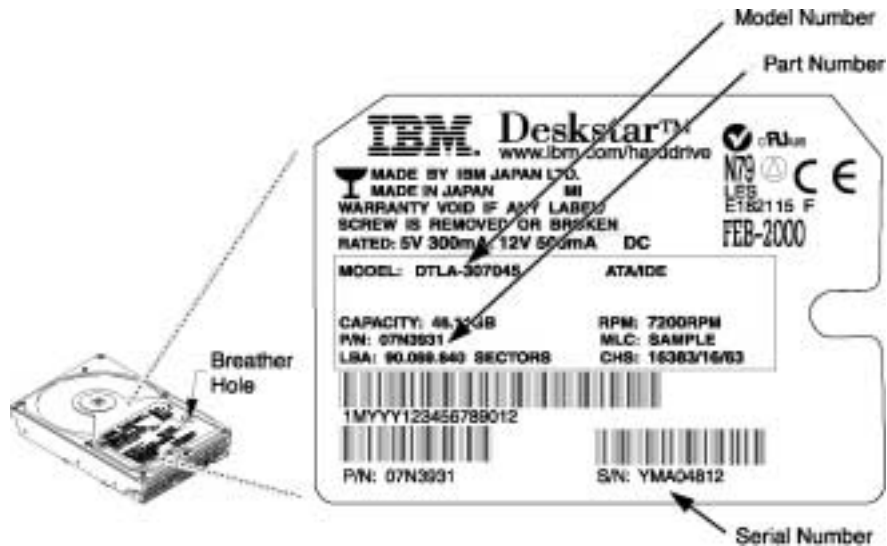
Begin the hardware install

1. Turn off your computer system.
2. Remove cover as instructed by your computer system manual.
3. Discharge static electricity by touching an unpainted metal surface on your computer chassis with one hand. Touch the ESD bag with the other hand. Remain in contact with the chassis and the bag for at least two seconds.
4. Unplug your computer.
5. Note mounting position of existing drives and cables.
6. If replacing a cable with a 40-pin, 80-conductor ATA/IDE cable, remove it now.



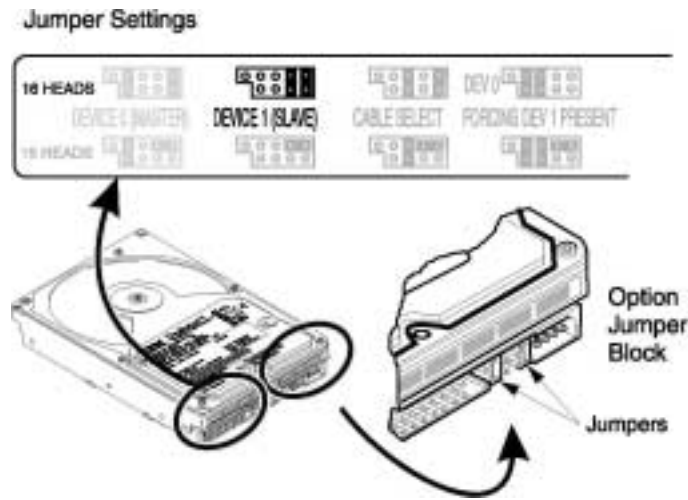
Configure the jumper settings

1. Remove the drive from its ESD bag.
2. Record the serial number, part number, and model number in the spaces provided in the Appendix for future reference.



Note: Placement of model, part, and serial numbers may vary.

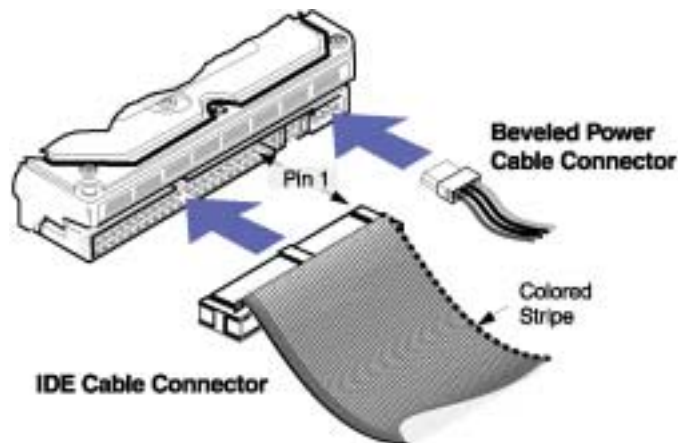
3. Set the jumpers to Slave, 16 heads.



Note: The IBM Deskstar has an option jumper block located next to the interface connector. Setting these jumpers allows you to use the different options of the hard disk drive. See the "Jumpers" section of the Appendix for jumper setting descriptions.

Attach the cables

Note: With some system chassis, it may be more convenient to attach the cable after the drive is mounted. The order of the following steps may change depending upon your system.



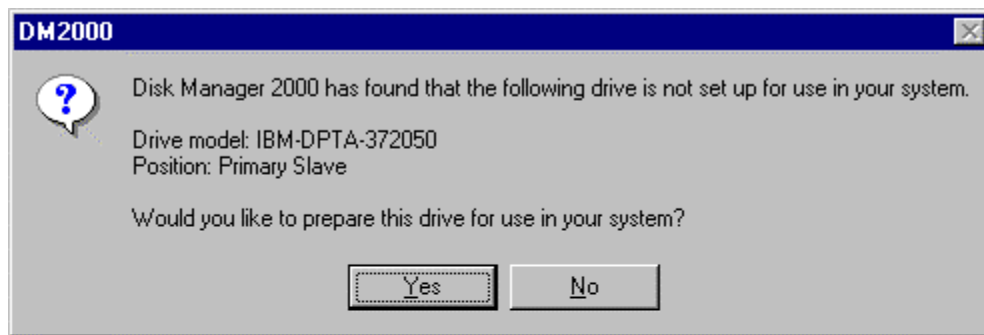
Partition, format, and copy with IBM *Disk Manager 2000* Easy Installation Software

Note: You may choose to use FDISK to partition and format your hard drive. Refer to the section entitled FDISK and Format in the Appendix for more information.

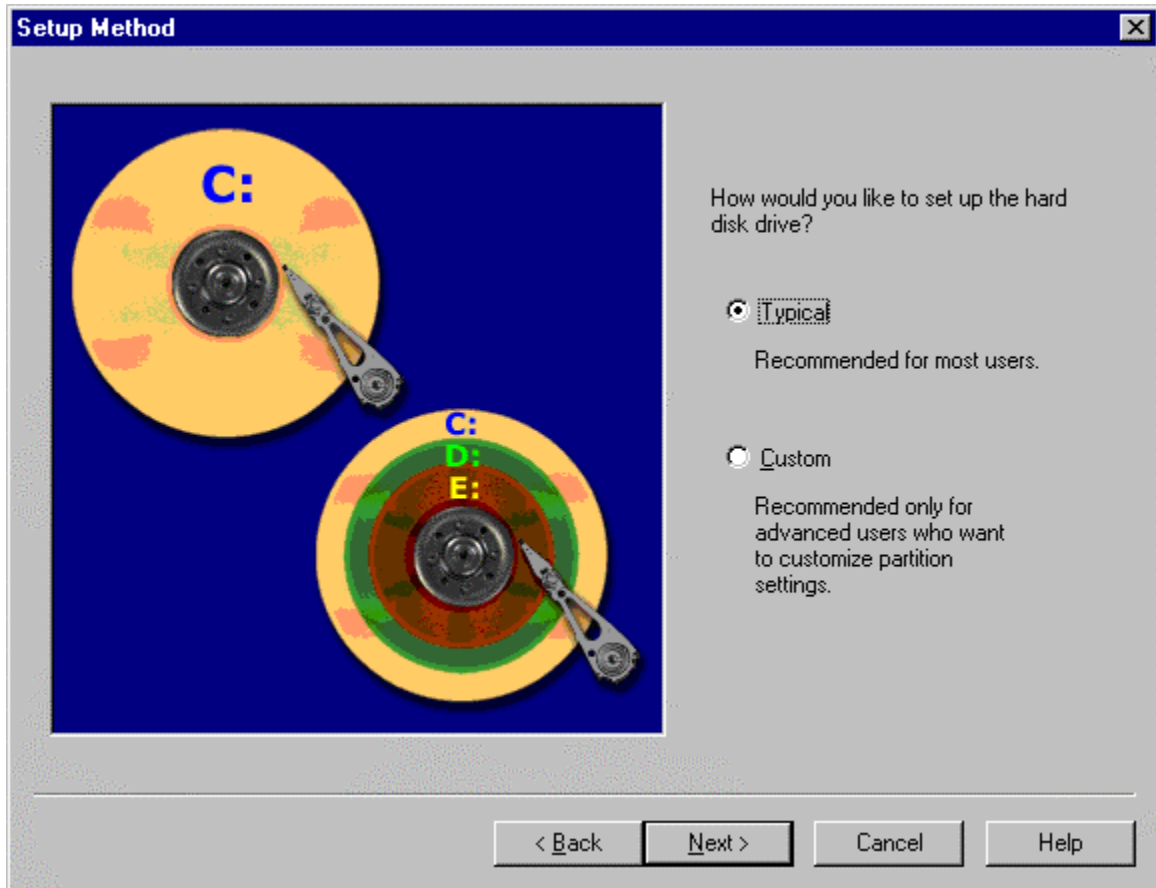
Due to system and hard drive variations, the IBM *Disk Manager 2000* screens displayed may be different than those presented here.

Note: Many BIOS setups refer to the drives in a system as 0, 1, and so on. IBM Disk Manager 2000 refers to drives as 1, 2, etc.

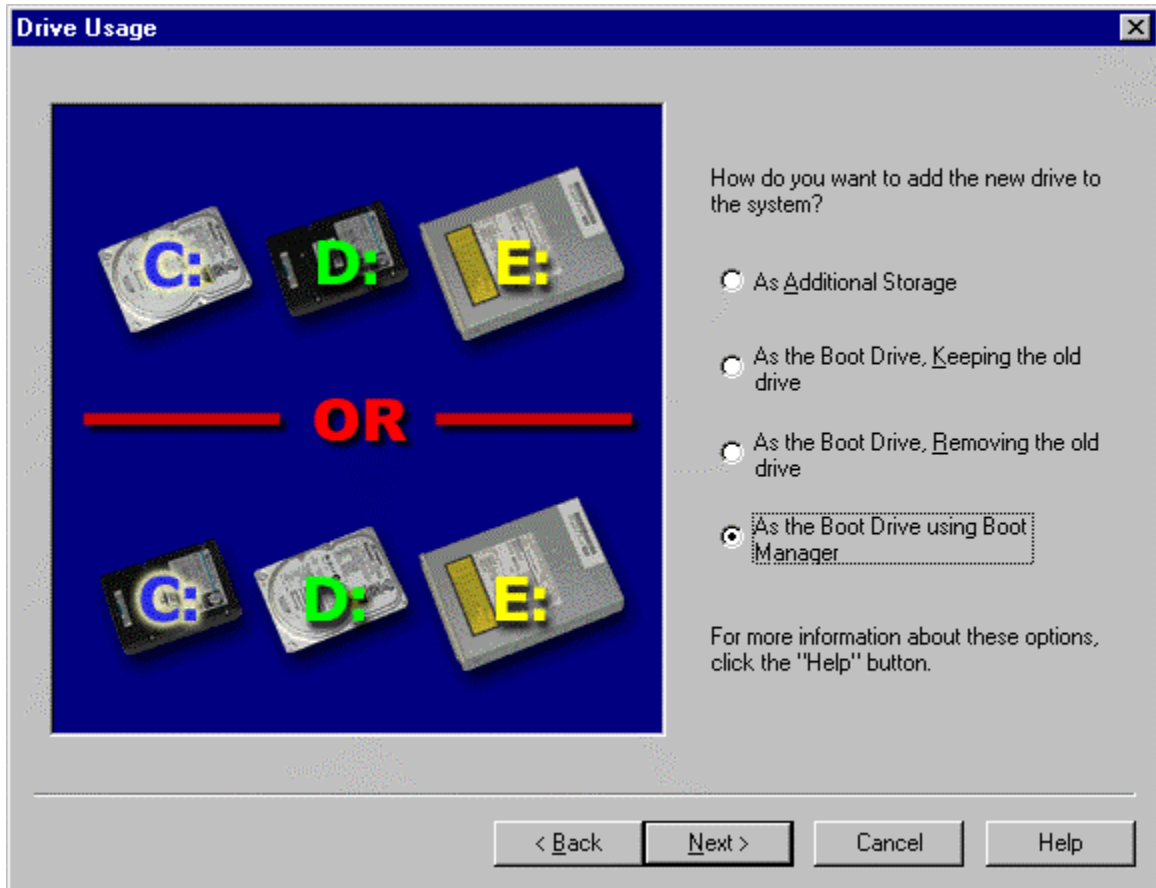
1. Turn on your computer.
2. Boot Windows.
3. Insert the *Disk Manager 2000* CD into the CD-ROM drive.
4. Select "Install *Disk Manager 2000*" from the on-screen menu.



5. Select **Yes** to prepare the new drive.



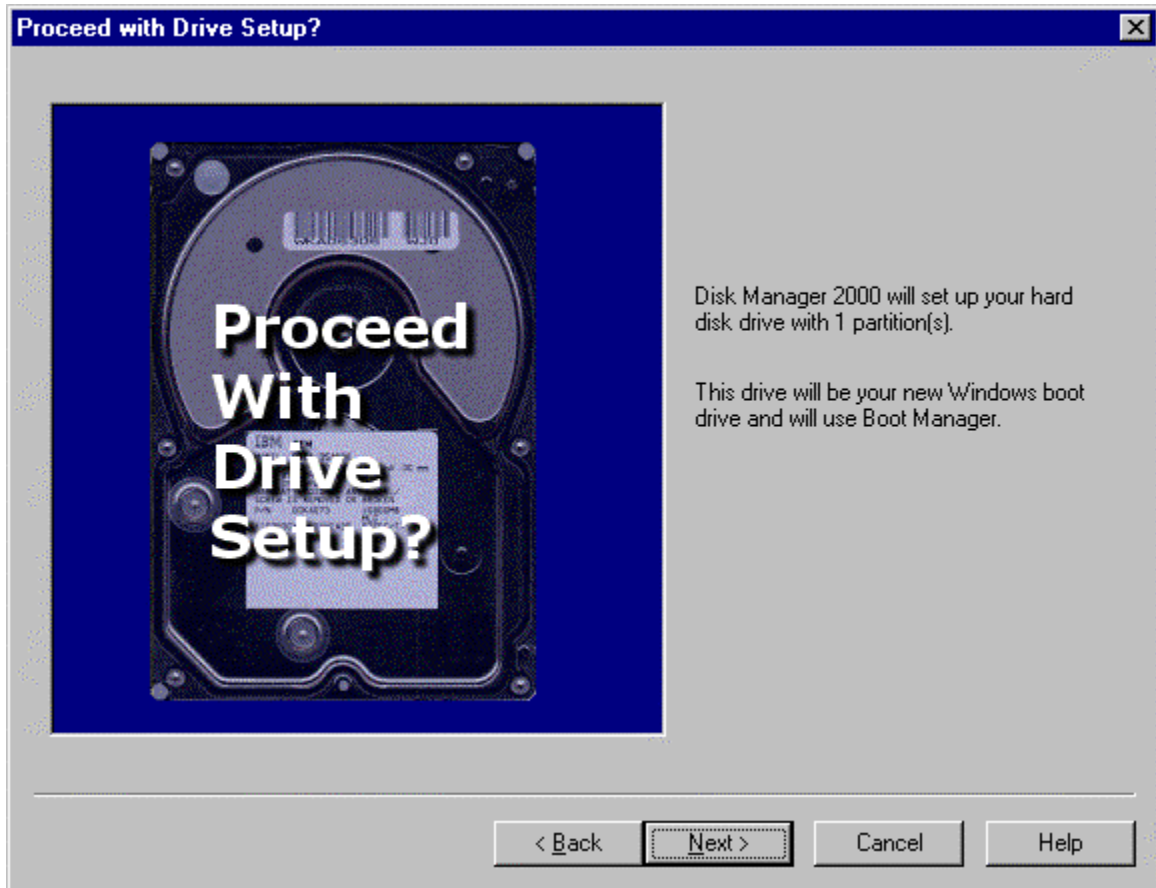
6. Select "Typical."
7. Select **Next** to proceed with setup of new drive.



8. Choose "As the Boot Drive using Boot Manager" to set up the new drive as a boot drive keeping the old drive.

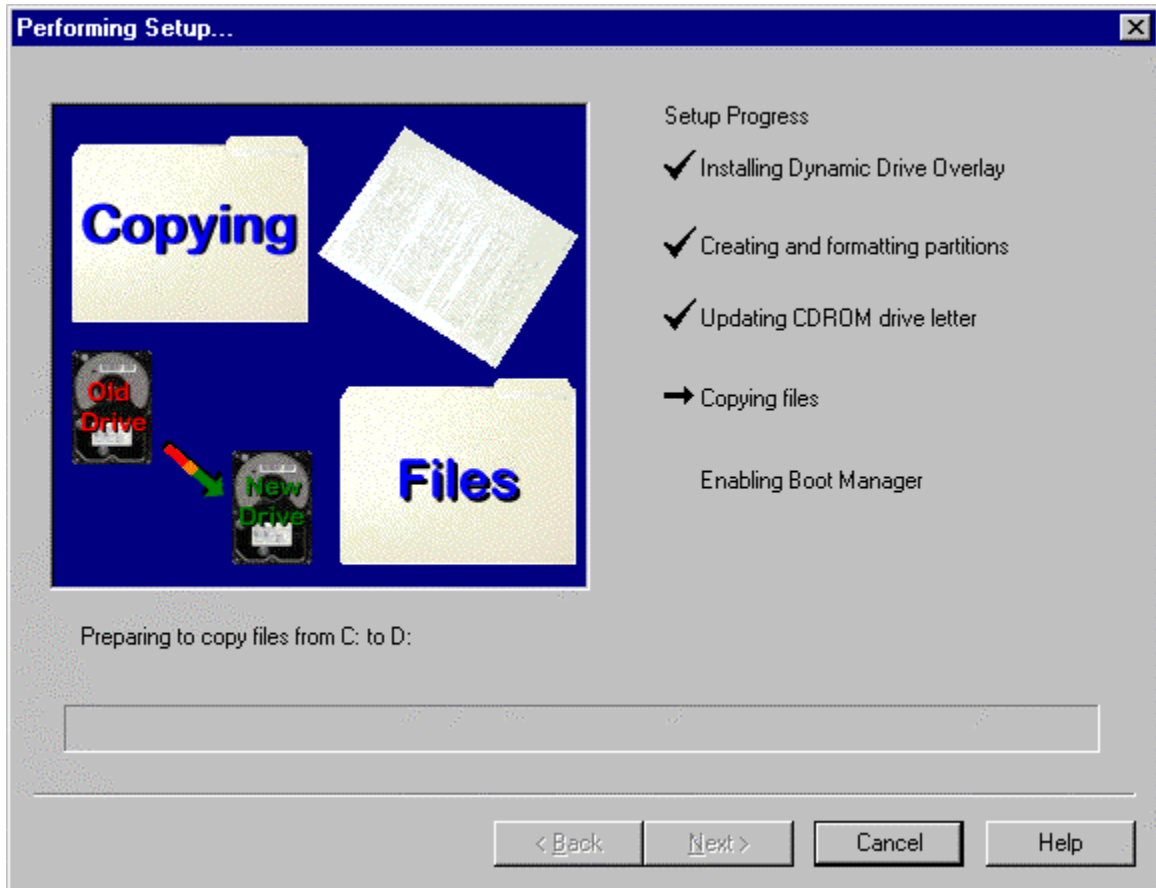
Note: Boot manager is not available in Windows NT or Windows 2000.

9. Select **N**ext to continue.

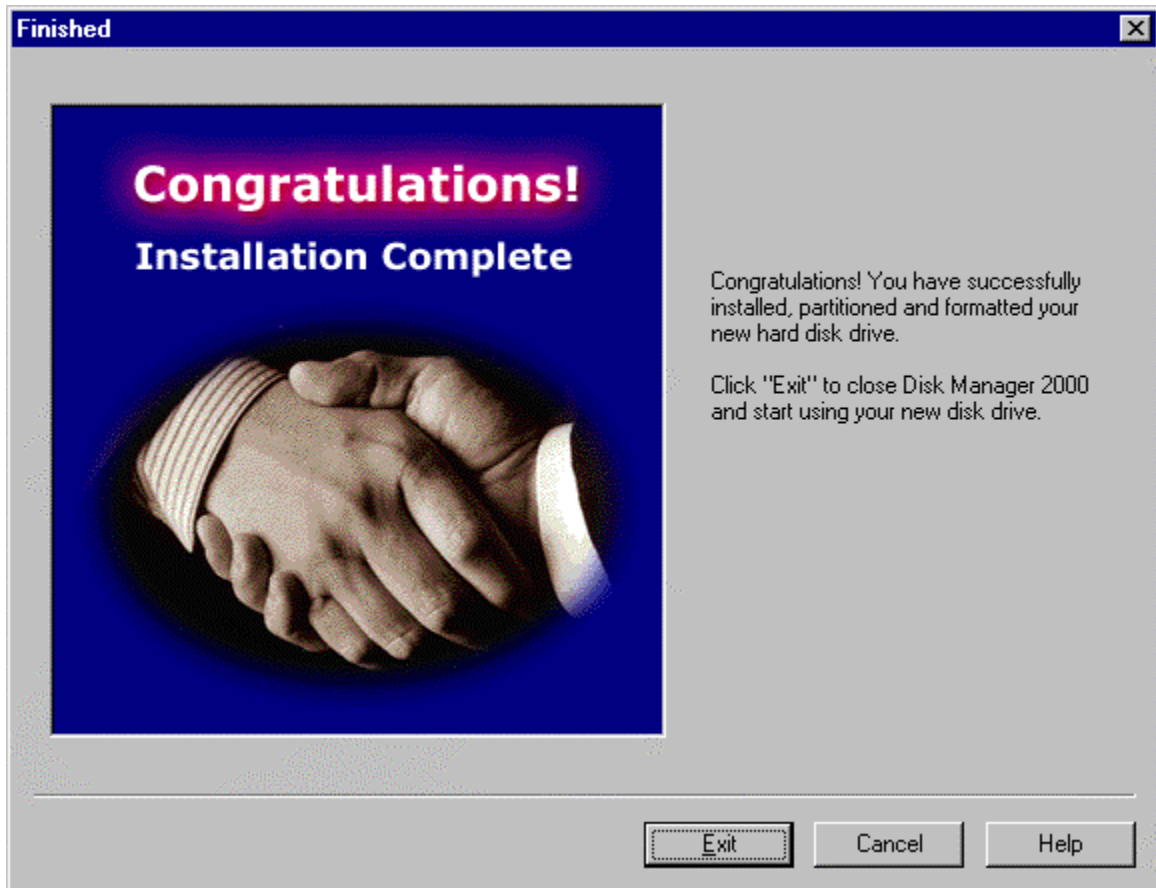


10. Verify the information. This is the last chance to cancel before writing to the drive.
11. Select **Next** to continue.

Disk Manager 2000 displays a list of the steps required to prepare the new drive and shows the current status and will copy all the data from your old C: boot partition to the new boot drive.



The installation is now complete.



12. Select **Exit** to close *Disk Manager 2000* and start using your new disk drive.

Important: If the Ontrack Dynamic Drive Overlay (DDO) was installed during the installation, you must allow DDO to load in memory prior to booting to a floppy. If you do not perform the floppy boot process below, your drive's capacity and partitions will be unavailable.

1. Boot from the hard disk drive.
2. Let DDO load into memory. Follow the messages displayed on your system's monitor.

Starting ONTRACK...

Press spacebar to boot from diskette...

3. Press the spacebar. The following message is displayed.

Insert boot diskette in drive A:, press spacebar when ready...

4. Insert the boot diskette in the A: drive.
5. Press the spacebar to boot from the floppy.

Appendix

Record your IBM Deskstar drive information here:

Serial number	
Part number	
Model number	
Cylinders	
Heads	
Sectors	
Capacity	

Cables

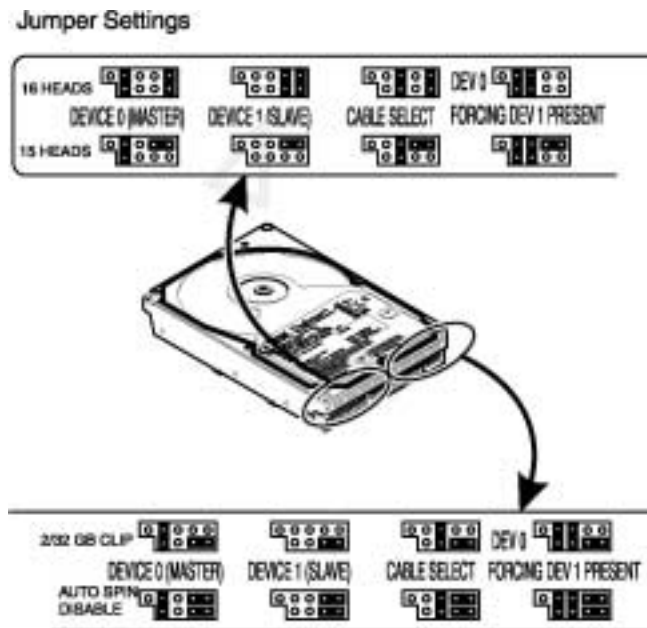
40-pin, 40-conductor ATA/IDE cables

This cable type will support up to and including ATA/33 (UDMA mode 2). Cables cannot be in excess of 18 inches and are limited to the attachment of 2 ATA devices plus the system board connector. The jumper settings designate a Master or Slave drive, not the position of the drive on the cable.

40-pin, 80-conductor ATA/IDE cables

This cable type is constructed using the Cable Select configuration. It will support Ultra ATA/100 and Ultra ATA/66 interface transfer rates and is backward compatible. The extra 40 conductors are grounded shields to improve signal quality and reduce cross talk. The connectors of the 80-conductor cable are color-coded. The black connector specifies Master drive connection, gray specifies Slave drive connection, and blue specifies connection to the ATA/IDE port of the motherboard or controller card.

Jumpers



Master

If the IBM Deskstar is the only drive on the cable or the Master drive on a two-drive cable, set the jumpers for Master.

Slave

If the IBM Deskstar is the Slave drive on a two-drive cable, set the jumpers for Slave.

Cable Select

The 40-pin, 80-conductor ATA/IDE cable included with your drive is constructed using the Cable Select configuration. If your motherboard or controller card supports Cable Select, you can set the drive address jumper to Cable Select. Attach the drive to the black connector for Master or the gray connector for Slave. Attach the blue connector to the system ATA/IDE port on the motherboard or controller card.

Slave Present (Device 0 Forcing Device 1 Present)

If your Slave drive is an older drive that may not signal its presence on the bus, set the jumpers on your Master drive to Slave Present.

2/32 GB Clip

For a DJNA model drive:

If your BIOS is incompatible with cylinder values higher than 4,096 cylinders, the 2/32 GB clip jumper truncates the cylinder and LBA count of your drive to 4,096 cylinders (2 GB capacity).

For a DTLA or DPTA model drive with a capacity lower than 34GB:

If your BIOS is incompatible with cylinder values higher than 4,096 cylinders, the 2/32 GB clip jumper truncates the cylinder count of your drive to 4,096 cylinders (2 GB capacity). The LBA value of the drive is unchanged.

- For a drive with a capacity of 34GB or higher:
If your BIOS is incompatible with LBA values higher than 66,055,248 sectors, the 2/32 GB clip jumper truncates the LBA value to 66,055,248 sectors (32 GB capacity).
- 16 Head/15Head
The default configuration of the drive is 16 heads. Some systems may require the drive to be jumpered to 15 heads. This does not reduce the capacity of the drive. See the Frequently Asked Question section of this manual for more information.

Auto Spin Disable

This jumper allows the drive to be powered up in Standby mode.

FDISK and format

Important: If you have already used IBM Disk Manager 2000 to partition and format your drive, FDISK and Format are not required.

Partitioning with FDISK.EXE

You may choose FDISK.EXE or similar partitioning software from your operating system to partition your hard disk drive. Follow the instructions provided with your operating system to partition the hard disk drive.

Note: If your drive is larger than 8.4GB and FDISK.EXE recognizes only 8.4GB of the full capacity, your BIOS may not be supporting Interrupt 13 Extensions. Refer to the section entitled Set the BIOS/CMOS in the appropriate installation option.

Formatting with FORMAT.COM

Follow the instructions provided with your operating system to format the hard disk drive. Formatting will verify the hard disk media and create File Allocation Tables for the partition.

Troubleshooting

If you are having difficulties with your IBM Deskstar, the following checklist may help solve the problem.

1. Can you hear or feel the drive spinning up?

Hint: Listen when you first turn on the system power. A spinning drive will produce a whining noise when power is first applied. The noise is easier to hear when you first start the system. If you do not hear the drive spinning, ensure the power connector is plugged into the drive. If possible, try another power connector or try the drive in another system. You can also feel a spinning drive vibrate slightly when it is first powered up.

If the drive does not spin up, ensure that the jumpers and cables are connected correctly. If they are connected correctly, skip to the Advanced Troubleshooting section.

2. If the drive spins, does the BIOS see the drive?

Hint: With Autodetection selected, your BIOS displays the recognized capacity of your hard drive.

If the BIOS does not see the drive, ensure the BIOS is set to Autodetect and ATA/IDE ports are enabled. If they are set correctly, skip to the Advanced Troubleshooting section.

3. If the BIOS sees the drive, does FDISK recognize the drive?

Hint: FDISK is a utility used to partition and format hard disk drives. The FDISK program can be found on your operating system startup diskette or in the operating system directory on your C: drive. Use option 4 to Display the active partition or option 5 to select a different drive if the system has more than one drive.

If FDISK does not see the drive, skip to the Advanced Troubleshooting section.

4. If FDISK sees the drive, does it see the full capacity?

Hint: Option 4 in FDISK displays the drive capacity and partition sizes.

If FDISK does not see the drive's full capacity, IBM Drive Manager 2000 may be required to partition and format the drive. Refer to the section of this manual entitled *IBM Disk Manager 2000 Easy Installation Software*.

Note: The FDISK function shipped with Windows 95 and Windows 98 contains a bug that causes the DTLA-307075 drive to be reported with a maximum capacity of 7768MB. This is only a display error and does not affect correct operation of, or access to, the full capacity of the drive. Contact Microsoft for more information.

5. If FDISK sees the full capacity, partition and format the drive.

Warning: Partitioning and formatting will destroy data. If the data on the drive must be recovered, call the IBM Hard Disk Drive Technical Support Center.

Advanced troubleshooting

The following tips may help you resolve installation problems.

- If the computer system won't boot:
Set the jumpers for 15 heads or jumper the drive for 2/32GB clip.
- If the drive is the only device on the bus:
Place the drive at the end of the cable and jumper it as Master.

- If the drive is one of two devices on the bus:
One device must be Slave and one must be Master.
- Systems using Cable Select:
Systems using Cable Select have a unique ATA/IDE cable. The position on the cable can determine whether the drive is the Master or Slave drive. To determine if the system uses Cable Select, refer to your system documentation. Jumpering a drive to Master or Slave overrides the Cable Select function of a Cable Select cable.
- Ensure all connectors are seated correctly.
Pin 1 (striped conductor) is located nearest to the power connector. Power connectors are beveled to insert one way only.
- Check for bent pins.
If possible, try replacing the cable. Total cable length should not exceed 18 inches.
- For drives greater than 8.4GB (or 512MB/2GB/4GB in some older systems):
Upgrade BIOS to latest version, install a controller card capable of supporting large drive capacities, or install IBM Disk Manager if necessary.
- Try running the drive with all other devices removed.
- If the drive is in a removable carrier, try removing the drive from the carrier and attaching it directly to the bus.
- Microsoft Windows NT, 95A, and DOS must be installed within the first 1024 cylinders.
- When attaching a drive that supports Ultra ATA/100 or Ultra ATA/66 to a compatible controller or motherboard, make sure you are using a 40-pin, 80-conductor ATA/IDE cable and the devices are attached to the correct connectors:
 - o Blue - Motherboard or controller
 - o Black - Master device
 - o Gray - Slave device
- If you are attaching a drive that supports Ultra ATA/100 or Ultra ATA/66 to an Ultra ATA/33 or lower controller or motherboard and experience the following problems:
 - o System hangs during boot with DMA enabled in Windows 95 or 98.
 - o System runs, but is transferring all data in PIO mode 4 in Windows 95 or 98.
 - o System refuses to boot with a bus-mastering driver added in Windows 95 SR2 or NT

Obtain a new BIOS from your BIOS manufacturer. IBM also provides the IBMFTOOL.EXE utility to enable or disable Ultra ATA/100 or Ultra ATA/66 support on the drive. When Ultra ATA/100 or Ultra ATA/66 support is disabled, the drive operates in Ultra ATA/33 mode, compatible with Ultra ATA/33 capable controllers. The utility can be downloaded from the IBM Web site at:

<http://www.storage.ibm.com/techsup/hddtech/welcome.htm>

- If you are using IBM *Disk Manager 2000* to install a drive with a capacity of greater than 32GB in a system with Award BIOS and the system hangs during drive detection:

The solution involves two steps:

1. Use the Disk Manager utility "Set Drive Size" to command the drive to report its size (in total sectors) as less than 33.8GB (each boot). This step allows the computer to boot with the drive installed, but the BIOS will only support the reported drive size.
2. Install the drive using Disk Manager DOS diskette v9.55. Disk Manager will install a DDO on the drive. The DDO will take control of the drive from the BIOS each time you boot and support the drive to its full capacity.

To use the "Set Drive Size" utility, you must first be able to boot with the drive in question installed in the system. You can find further help for this solution in the Disk Manager F1 Help Menu under Maintenance Options/Utilities/Set Drive Size.

Procedure

1. Do not jumper the drive for the limited capacity. Disk Manager will be unable to provide full size support if the 32GB clip jumper is fitted.
2. Attach the drive to the problem computer and enter SYSTEM SETUP. Select "None" for the drive in question. Save settings and shut down.
3. Boot using the Disk Manager DOS diskette.
Note: Depending on system configuration, Disk Manager may take a minute or two to boot. Please be patient.
4. From the Main Menu, select Advance Options->Maintenance Options->Utilities->Your Drive->Set Drive Size.
5. At the "Set Drive Size" screen, press "Enter" to accept the suggested Total Sectors value.
Note: You have the option of entering any value you wish. This provides a robust solution for any future BIOS lock-up problems. The suggested value is for the 33GB lock-up.
6. Reboot.
7. Enter SYSTEM SETUP.
8. Change the settings for the drive to "Auto."
9. Save changes.
10. Exit SYSTEM SETUP.
11. Reboot.
12. Run *Disk Manager 2000* to complete the drive installation.

- If you are using *IBM Disk Manager 2000* to install a drive in a system with AMI BIOS and the system hangs during drive detection:

1. Access the BIOS setup screen by pressing the DEL key when prompted during the system startup.
2. When the system BIOS screen is displayed, change the setting for the drive you have added from "AUTOdetect" to USER Defined".
3. Change the default setting for the number of logical cylinders for your new drive from 16,383 to 1,023.
4. Exit the BIOS setup and save your changes.
5. Once in *Disk Manager 2000*, proceed through a partition and format and allow Ontrack's DDO to be installed.

- If you are trying to install *Disk Manager 2000* and you receive an error saying, "The InstallShield Engine (iKernel.exe) could not be installed," verify that you don't have more than one InstallShield application running and that you have administrator privileges on the computer.

If the answer to your installation question is not found here, call the IBM Technology Group Support Center. Before calling, please gather as much of the following information as possible:

- IBM drive model number, part number, and serial number
- Operating system
- BIOS manufacturer, version, and date
- Any error codes and when they occurred

- System type and manufacturer
- Motherboard manufacturer
- Chipset manufacturer
- Adapter card manufacturer
- Other devices in systems
- Bus/cable layout (location of device, which device is at the end)
- Applications used (if relevant)

Frequently asked questions

1. Do I have to use IBM *Disk Manager 2000 Easy Installation Software*?

No. You may use FDISK and Format or similar partitioning software from your operating system to partition and format your hard disk drive. Refer to the section of the Appendix titled FDISK and Format.

2. How can I obtain full capacity from my IBM Deskstar?

If LBA or Large options are not available in your system's BIOS, you can:

- Contact your BIOS manufacturer for an upgrade.
- Install an ATA/IDE controller card with an onboard BIOS that supports larger drive capacities.
- Use *Disk Manager 2000* to complete the installation of your IBM Deskstar.

3. How do I know if my system has the components necessary to obtain Ultra ATA/100 or Ultra ATA/66 interface transfer rates?

The following system components are required to obtain Ultra ATA/100 or Ultra ATA/66 interface transfer rates:

- *40-pin, 80-conductor ATA/IDE cable*
The connectors of this cable are color-coded. The black connector is for Master, gray is for Slave, and blue is for the ATA/IDE connector of the motherboard or controller card. The 40-pin, 80-conductor ATA/IDE cable is the same width as a standard IDE cable, however, each individual conductor is half the diameter of a standard IDE cable conductor.
- *A controller card or motherboard chipset with Ultra ATA/100 or Ultra ATA/66 capability*
Refer to your controller card or system manual, or contact your controller card or motherboard manufacturer, to determine if your system is Ultra ATA/100- or Ultra ATA/66-compatible.
- *Ultra ATA/100 or Ultra ATA/66 compatible BIOS*
Refer to your system manual or contact your BIOS manufacturer to determine if your BIOS is compatible.

4. Why is a 40-pin, 80-conductor ATA/IDE cable necessary for attachment of an Ultra ATA/100 or Ultra ATA/66 device?

The added ground cables provide shielding and reduce cross talk for higher frequency interfaces. If an Ultra ATA/100 or Ultra ATA/66 motherboard does not detect a 40-pin, 80-conductor cable and an Ultra ATA/100 or Ultra ATA/66 drive, the higher transfer rates provided by these interfaces are not available.

5. How will a drive that supports Ultra ATA/100 or Ultra ATA/66 run in a slower system?

The IBM Deskstar drive is capable of Ultra ATA/100 or Ultra ATA/66 (UDMA mode 4) operation. Your drive will function at the maximum speed supported by your system components.

Certain BIOS and motherboard chipset combinations function incorrectly when the drive reports a UDMA mode higher than the motherboard was designed for. Following is a list of problems and solutions related to specific operating systems.

- **Windows 95**
When the system does not correctly switch to a compatible speed (i.e., ATA/33), complete startup of Windows 95 may fail after enabling the Direct Memory Access (DMA) feature in the Windows Control Panel.

- Windows 98
When the system does not correctly switch to a compatible speed (i.e., ATA/33), complete startup of Windows 98 may fail after enabling the DMA feature in the Windows Control Panel.
- Windows NT 4.0
The most common symptom is a failure to boot after a bus-mastering driver has been added and loaded.

Solutions

- Obtain a new BIOS for the motherboard to correct the Ultra ATA/100 or Ultra ATA/66 detection problem.
- Alter the Deskstar drive to report ATA/33 capability. IBM offers a tool called IBMFTOOL.EXE to perform this alteration. Contact the IBM Hard Disk Drive Technical Support Center for more information.

6. What is the difference between ATA/33 and Ultra ATA/66?

Ultra ATA/66 is an extension to the Ultra DMA interface. It doubles the ATA/33 interface data transfer rate from 33MB to 66MB per second.

7. What is ATA/100?

ATA/100 is an extension of the Ultra DMA interface that enables data transfers as fast as 100MB per second.

8. What is the difference between FAT16 and FAT32?

FAT16 is limited to 2.1GB per partition. This file system is widely compatible with OS/2, Windows NT 3.5 and 4.0. FAT32 allows a single partition to utilize the full drive capacity. Some disk utilities and virus scanners published before 1997 are incompatible with FAT32.

9. Do I need to create more than one partition on my IBM Deskstar?

Partition sizes are limited to 2GB in DOS, Windows 3.11 and Windows 95A due to the FAT 16 file system design. You need to create multiple partitions to utilize full drive capacity. If you are using Windows 95 SR2 or Windows 98 and FAT32, you may create one partition to utilize the full drive capacity. FAT 32 partitions may be incompatible with disk utilities and virus scanners published before 1997.

10. When I create partitions using IBM *Disk Manager 2000* Easy Installation Software, my partitions are smaller than the size I entered.

Partitions begin and end on cylinder boundaries, IBM *Disk Manager 2000* must allocate partitions that may be a few megabytes smaller than the size you entered. IBM *Disk Manager 2000* adds these megabytes to free space for later partitions.

11. I copied files from my old drive to my new IBM Deskstar. Why do the files take up more space on the new drive?

Partitions are divided into units called clusters. The size of a cluster is based on the size of a partition. Because partitions on large capacity drives are bigger, the cluster sizes are bigger. The files take up more space because the partitions they're stored in are larger.

12. Why is the capacity of my IBM Deskstar less than the capacity listed on the drive label?

Some programs measure the capacity of a hard disk drive based on a kilobyte of 1,024 and a megabyte of 1,048,576 (1,024 x 1,024). Drive manufacturers state the capacity of a hard disk drive based on the decimal numbering system. For example:

$$\begin{aligned}
 10,000,000,000 \text{ bytes} &\div 1,024 = 9,765,625\text{KB} \\
 9,765,625\text{KB} &\div 1,024 = 9,536.74\text{MB} \\
 9,536.74\text{MBs} &\div 1,024 = 9.31\text{GB}
 \end{aligned}$$

13. Why doesn't my operating system show the full capacity of my drive?

Few systems built before 1997 support drive capacities greater than 8.4 GB, because the CHS (Cylinders, Heads, Sectors) method of translation uses ID words 1, 3, and 6 of the Identify Drive Command. The maximum values for words 1, 3, and 6 are 16,383 cylinders, 16 heads and 63 sectors for a capacity of 8.4 GB. A new extended interrupt 13 function was defined to get beyond this boundary. By mid-1998, most new systems had introduced this support. Problems with systems that do not support greater than 8.4 GB can be solved with one of the following options:

- Obtain a BIOS upgrade from your system vendor that includes Extended Interrupt 13 support.
- Use IBM *Disk Manager 2000* to install your IBM Deskstar.
- Purchase an IDE controller card with an onboard BIOS that supports Extended Interrupt 13.

14. What capacity limitations should I be aware of when installing my operating system?

Windows 95A supports Extended Interrupt 13. Windows 95 can see drives greater than 8.4 GB, but uses the FAT16 file system. The drive needs to be partitioned into 2047MB partitions.

Windows 95 SR2 and Windows 98 support Extended Interrupt 13 and offer an option to use a FAT32 File System (Large Mode) and partitions larger than 2047MB.

Novell Netware v3.12 does not support drives larger than 8.4 GB. If a drive larger than 8.4GB is attached, Netware will see only 8.4GB of the drive's capacity. Novell (IWSP6.exe) has provided more recent drivers for this release of Netware.

Windows NT 4.0 Service Pack 1 and 2 do not support IDE drives larger than 8.4 GB. Microsoft has added greater than 8.4 GB support with NT Service Pack 3, 4, 5, or 6.

15. Why did my drive letter assignments change after installing my IBM Deskstar?

Drive letters are assigned by the operating system, not by the BIOS, hard drive, or IBM *Disk Manager 2000* Easy Installation Software. The operating system assigns drive letters with each boot. The floppy drives are assigned first, then the hard drives, starting with the Primary Master ATA/IDE hard disk drive, followed by remaining devices in the system.

16. When do I configure my drive for 15 heads rather than 16 heads?

The default configuration of the IBM Deskstar is 16 heads. Your system may require the drive to be jumpered to 15 heads. Some computer systems translate a drive greater than 4 GB by multiplying the head count by 16. The result ($16 \times 16 = 256$) is interpreted as 0 heads with 0 capacity and is an illegal head count. Jumpering the drive to 15 heads ($16 \times 15 = 240$) produces a legal translation. The translated cylinder count varies to achieve the drive's full capacity.

17. How do I create a Windows 95 or 98 startup diskette?

If you have a bootable Windows operating system, follow the directions below to create a Windows 95 or 98 startup diskette.

1. Insert a blank floppy disk into drive A.
2. From Windows 95 or 98, double-click *My Computer*.
3. Double-click *Control Panel*.
4. Double-click *Add/Remove Programs*.
5. Select Startup Disk tab.
6. Click *Create Disk*. Follow the prompts.

18. How do I create a DOS startup diskette?

If you have a bootable DOS OS, follow the steps below to create a DOS startup diskette.

1. Insert a blank floppy disk into drive A.
2. At the C:\ prompt, type FORMAT A:/S and press ENTER.
3. Follow the instructions displayed.

19. When do I use the 2/32 GB clip jumper?

- *For a DJNA model drive:*
If your BIOS is incompatible with cylinder values higher than 4,096 cylinders, the 2/32 GB clip jumper can be used to truncate the cylinder and LBA count of your drive to 4,096 cylinders (2 GB capacity).
- *For a DPTA model drive with a capacity lower than 34GB:*
If your BIOS is incompatible with cylinder values higher than 4,096 cylinders, the 2/32 GB clip jumper can be used to truncate the cylinder count of your drive to 4,096 cylinders (2 GB capacity). The LBA value of the drive is unchanged.
- *For a drive with a capacity of 34GB or higher:*
If your BIOS is incompatible with LBA values higher than 66,055,248 sectors, the 2/32 GB clip jumper can be used to truncate the LBA value to 66,055,248 sectors (32 GB capacity). Alternatively, BIOS upgrades may be available to overcome this limitation. Contact your BIOS manufacturer for more information.

20. How do I create a bootable *Disk Manager 2000* diskette?

1. Boot to Windows.
2. Insert the *Disk Manager 2000* CD into the CD-ROM drive.
3. Insert a blank floppy disk into drive A. Use caution to ensure that your diskette is free of any viruses.
4. Choose Disk Manager DOS from the main CD menu.

This creates a Disk Manager DOS bootable diskette.

21. How do I create a Dynamic Drive Overlay (DDO) boot diskette?

A DDO bootable diskette is generally only used in technical support.

1. Boot Disk Manager DOS from the CD or from a Disk Manager DOS bootable diskette (see FAQ 20).
2. Select *Advanced Options*.
3. Select *Maintenance Options*.
4. Select *Create Ontrack Boot Diskette*.

Glossary

ATA (Advanced Technology Attachment)

ATA (also known as IDE) is the bus interface that replaced the controllers in original IBM compatible PCs.

ATA/33 (Ultra ATA/33)

ATA/33 is also known as Ultra DMA Mode 2. ATA/33 is a 33MB per second data transfer protocol for DMA commands.

ATA/66 (Ultra ATA/66)

ATA/66 is also known as Ultra DMA Mode 4. ATA/66 is a 66MB per second data transfer protocol for DMA commands.

ATA/100 (Ultra ATA/100)

ATA/100 is a 100MB per second data transfer protocol for DMA commands.

Autodetection

A process that uses an IDE command called Identify to read disk parameters directly from a hard drive for use in the BIOS/CMOS settings.

BIOS (Basic Input/Output System)

The BIOS is the first level of software contained in a computer. It provides basic, low-level control and program routines for keyboards, video, hard disk drives, and floppy drives. The BIOS provides the initial intelligence allowing the computer system to find an operating system to run.

Chipset

The motherboard chipset controls the flow of information from the bus to memory and the processor.

CHS (Cylinders, Heads, and Sectors) Addressing

Three values indicating a coordinate location of a data sector on a hard disk drive.

CMOS (Complimentary Metal Oxide Semiconductor)

CMOS is a memory chip for storing a data record of the components installed in a computer. A small battery powers CMOS and allows it to retain data, even when the computer's main power is turned off.

Configuration

Configuration refers to the type or quantity of devices in a computer system.

Controller Card

A controller card is an add-on electronic adapter for controlling hard drives. Controller cards can be ATA or SCSI and are sometimes called adapters.

Cylinder

A cylinder is the set of tracks accessible by the magnetic heads in a given position without repositioning the head stack assembly.

DDO (Dynamic Drive Overlay)

This Ontrack software driver eliminates BIOS limitations in a system, allowing installation of large drives that otherwise could not be installed to full capacity.

DMA (Direct Memory Access)

Direct Memory Access is a protocol for transferring data to and from main memory without passing it through the processor. DMA improves speed and efficiency by allowing processing to continue while new data is retrieved from the drive.

Electrostatic Discharge

The rapid discharge of electricity caused by static buildup that can damage or destroy electronic equipment.

FAT (File Allocation Table)

The File Allocation Table is a group of sectors in a partition containing a map to address chains for files in a partition. There are two FAT copies in a partition.

FAT16

FAT16 uses a 16-bit field to address clusters in a logical partition. FAT16 is limited to approximately 2.1 gigabytes and 65000 clusters. FAT16 is compatible with DOS, Windows 3.1, 3.11 and 95 A, Windows NT 3.5 and 4.0, and OS/2.

FAT32

FAT32 uses a 32-bit field to address clusters in a logical partition. FAT32 allows partitions larger than 2.1 gigabytes and provides millions of clusters. FAT32 is compatible with Windows 95 SR2 and 98.

FDISK

FDISK is a DOS program used to partition a hard disk drive.

Format

A process that creates FAT tables for a partition.

Head

A head is an electromagnetic coil and metal pole that write and read back magnetic patterns on a disk.

IDE (Integrated Drive Electronics)

IDE (also known as ATA) is the bus interface that replaced the controllers in original IBM compatible PCs.

Interface Data Transfer Rate

The interface data transfer rate is the speed at which a hard disk drive transmits and receives data from the interface.

Interrupt 13 and Interrupt 13 Extensions

Interrupt 13 is the BIOS program routine for handling hard disk commands and data. The original interrupt 13 BIOS program supported capacities up to 8.4 gigabytes. Interrupt 13 extensions are new BIOS routines added to support drive capacities greater than 8.4 gigabytes.

Jumpers

Jumpers are small pieces of plastic with a conductive center. Jumpers connect pins on a hard drive to set device options.

LBA (Logical Block Addressing)

Logical Block addressing is a mode of accessing a location on a hard disk drive. LBA sequentially numbers the sectors on a disk, eliminating the need to calculate the cylinder, head, and sector coordinates of a data sector.

Linux

Linux is a UNIX operating system variant for the PC.

Master

Master is used in the original ATA specification for the first addressed drive (Device 0) on an ATA/IDE channel.

Novell Netware

Netware is a Novell network operating system and file server platform. Netware has several proprietary file systems.

OS/2

OS/2 is an IBM operating system. OS/2 supports HPFS (High Performance File System).

Parameters

Parameters (also known as geometry) are the cylinder, head, and sector values for defining the capacity of a hard disk drive.

Partition

A partition is a portion of a hard drive allocated to a particular file system and accessed as a single logical volume or drive letter. To partition a drive is to allocate an area to a drive letter or logical volume.

PIO (Programmed input/output)

PIO is a data transfer protocol using the processor to transfer the data from a hard disk drive to memory.

Primary

Primary indicates the first ATA/IDE channel of a computer. The Primary channel controls the first and second hard disk drives or ATA/IDE devices in a computer.

Secondary

Secondary indicates the second ATA/IDE channel of a computer. The secondary channel controls the third and fourth hard disk drives or ATA/IDE devices in a computer.

Sector

A sector is the minimum segment of track length that the hard disk drive can assign to store information. Sectors are 512 bytes in length on a PC compatible formatted hard disk drive.

Setup

Setup is a BIOS utility to specify values, parameters, and modes stored in battery powered CMOS memory for use by the system BIOS.

Slave

The term slave is used in the original ATA specification for the second addressed drive (Device 1) on an ATA/IDE channel.

SR2 (Service Release 2)

Service Release 2 is also known as Windows 95b, a later release of Windows. SR2 supports Fat32.

Track

A track is a logical group of sectors that can be accessed by a single magnetic head in a given position without repositioning the head stack assembly.

Translation

Translation is the process of redefining the physical parameters of a hard disk drive to parameters compatible with the BIOS and operating system of a computer.

Ultra ATA

Ultra ATA (also known as Ultra DMA) is a data transfer protocol for transferring data to and from main memory without passing it through the processor. Ultra ATA differs from traditional DMA by using a strobe signal to latch data at twice the data rate. Ultra ATA improves speed and efficiency by allowing the processor to perform other operations while data is retrieved from the drive.

UNIX

UNIX is an operating system developed for multitasking in a multi-user environment. The UNIX operating system was originally developed for use on minicomputers but has been adapted for mainframes, microcomputers, and PCs.

Windows NT

Windows NT is Microsoft's 32-bit New Technology operating system. Windows NT 3.5 and 4.0 support FAT16 and NTFS (New Technology File System). Windows NT 4.0 does not support FAT32.

Warranty

Statement of Limited Warranty

Part 1 - General Terms

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. The warranties provided by IBM Corporation ("IBM") in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from an authorized IBM Distributor and returned from the countries listed in the Extent of the IBM Warranty section below. 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. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine - IBM HDDs purchased from or supplied through an authorized IBM Distributor. The term "Machine" includes an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software program, whether pre-loaded with the Machine, installed subsequently, or otherwise.

Warranty Period - Ultrastar Products - 5 years

Deskstar Products - 3 years

Travelstar Products - 3 years

Microdrive Products - 1 year

See www.ibm.com/harddrives for more details regarding the warranty period for your particular product.

To obtain warranty service information for the Machine, contact the appropriate IBM Call Center.

IBM Call Center information

United States

Help Desk 1-507-286-5825
Toll Free 1-888-426-5214
Fax 1-507-253-3748

English

United Kingdom (+44) 0870 010 2866
Eire (+353) 01 815 9408
Sweden (+46) 08 793 1081
Norway (+47) 066 998432
Denmark (+45) 233178
Finland (+358) 09 458 5698
Fax (+44) 01475 898 228

Italiano

Italia (+39) 02 5962 2122

Singapore

Help Desk 65.840.9292
Singapore 1800.840.9292
Fax 65.841.2900

Deutsch

Deutschland (+49) 07032 153050
Osterreich (+43) 01 21145 4474
fax (+49) 06131 84 6442

Francais

France (+33) 02 3855 7490

Nederlands

(+31) 020 513 2440

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. (See <http://www.ibm.com/storage> for details) The warranty period for a Machine is a specified, fixed period commencing on the date of sale from IBM to the authorized IBM Distributor.

If, during the warranty period, the Machine is not in good working order, IBM will, at its option, repair or replace it at no additional charge, except as is set forth below. A refund may also be available from your point of purchase.

In some cases, the replacement Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

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 THAT 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.

The warranty described in this statement applies only to drives returned from the United States, Canada, Mexico, the European Union, Australia, Hong Kong, Japan, Malaysia, New Zealand, Singapore, Taiwan, and Thailand.

For warranty service in other countries, contact your point of purchase.

Items Not Covered by Warranty

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

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

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

Warranty Service

Warranty service may be obtained from IBM by returning an IBM Returns Material Authorization and the Machine to the IBM logistics center during the warranty period. You may be required to present proof of purchase or other similar proof of warranty entitlement. You are responsible for any associated transportation charges, duties and insurance between you and the IBM Logistics Center. You must ship Machines in IBM approved packaging. Information on packaging guidelines can be found at: <http://www.ibm.com/storage/warranty>. IBM will ship repaired or replacement Machine Delivery Duty Prepaid (DDP) and will pay for return shipment. You will receive title to the repaired or replacement Machine at the Logistic Center and will be the importer of record.

The following Logistic Centers will accept returned Machines for IBM:

Europe

IBM European Logistics Centre
C/O UPS Worldwide Logistics Centre
Velweg 3
6075 NL Herkenbosch
The Netherlands.

Asia/Pacific

IBM Asia Pacific Logistics Center
C/o UPS Worldwide Logistics
19 Loyang Way, #01-10
Singapore 508724
Singapore

North America

IBM Corporation
c/o UPS Worldwide Logistics
Alvarado Business Park
OEM/end user Returns Department
30336 Whipple Road, Bldg. F
Union City, Ca 94587
United States

Taiwan

Taiwan Logistics Center
c/o United Parcel Service, Co.
201, SEC. 1, Tatung Road
221 Hsichih, Taipei
Taiwan, Republic of China

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 may obtain an RMA by contacting the appropriate IBM Call Center or at <http://www.ibm.com/storage/warranty>. You represent that all removed items are genuine and unaltered. In some cases, the replacement Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

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

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

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and

3. where applicable, before service is provided
 - i. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
 - ii. secure all programs, data, and funds contained in a Machine,
 - iii. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and
 - iv. 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 that you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status

Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

Limitation of Liability

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

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of U.S. \$10,000 (or equivalent in local currency) or the charges for the Machine that is the subject of the claim.

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

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 (INCLUDING LOST PROFITS OR 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.

Statement of Limited Warranty

Part 2 - Country-unique Terms

EUROPE

The following terms apply to all EMEA countries.

The terms of this Statement of Warranty apply to Machines purchased from or supplied through an IBM distributor. If you purchased this Machine from IBM, the terms and conditions of the applicable IBM agreement prevail over this warranty statement.

Warranty Service

If you purchased an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or the 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 purchased an IBM 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.

The applicable laws, Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided. However, the laws of Austria govern this Statement if the warranty service is provided in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Hungary, Kazakhstan, Kirghizia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine.

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).

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 are 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.

Production Status: The following paragraph replaces this Section:
Each Machine is newly manufactured. It may incorporate in addition to new parts, re-used parts as well.

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

In item 2, replace "U.S. \$10,000" with "10.000 DEM."

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

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 the greater of Irish Pounds 75,000 or 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: (item 1 unchanged) 2) as to any other actual damage arising in all situations involving non-performance 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 second 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.

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 the greater of Pounds Sterling 150,000 or 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 will be limited to damages.

ASIA-PACIFIC

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 legislation and are only limited to the extent permitted by the applicable legislation.

Extent of Warranty: The following replaces the first and second sentences of the Extent of Warranty Section:

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.

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, 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, and then none of the limitations in this paragraph apply.

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 that 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.



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