About DiscWizard 2000

DiscWizard 2000 Version 3.00

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Contractor/manufacturer is ONTRACK Data International, Inc., 6321 Bury Drive, Eden Prairie, MN 55346.

DMSDW001

Contents

Install

This is a checklist of the steps that DiscWizard is performing to set up your new hard disc drive. DiscWizard may have to reboot your computer several times throughout these steps to update system information.

Custom Partition

Use the "Size Partition" bar to create a partition of the desired size, and then press "Set". This will update the pie chart and allow you to create additional partitions from any remaining free space.

The "Delete" button will delete all partitions on the current drive.

The "Properties" button will allow you to choose whether you want the partition type to be a FAT 16 or FAT 32 partition. FAT 16 is not a valid option for partitions greater than 2.1 GB and FAT 32 is not a valid option for partitions less than 540 MB. "Properties" will also let you choose the desired cluster size for a FAT 32 partition.

Note: Changes made on this screen are not written to the drive until you click "Next".

Drive In System

Check "Yes, the drive is in my system" if the hard disc drive you wish to set up is already physically attached to your computer; otherwise, just click "Next" to enter the model number of your new hard disc drive.

DiscWizard will create a Custom Installation Manual to assist you with the physical installation of your new hard disc drive.

Main Dialog

The "Main Dialog" presents you with the following options.

Setup New Drive
Select this option to install a new drive into your system.

Maintenance
Select this option to perform maintenance functions. The available functions are:

- Repartition an existing drive
- Update CD-ROM drive letter
- Copy system files
- Uninstall Boot Wizard
- Create Disk Manager diskette
- Create Data Advisor diskette

Help
Select this option for help using DiscWizard. It displays the help file you are currently viewing.

Exit
Select this option to exit DiscWizard.

Select Existing Drive

The device list shows a tree view of the hard disc drives connected to your system. Select the hard disc drive you wish to set up from the device list.

Select New Drive

Enter the model number of the hard disc you wish to install. The model number, as shown in the on-screen example, will start with ST, followed by 5 or 6 digits and possibly another letter.

The model number is used to create a Custom Installation Manual that displays jumper information for your hard disc drives along with the steps to physically attach the drive to your computer. To provide you with the most accurate Custom Installation Manual possible, it is important that the model number be entered correctly.

View Print Manual

The Detailed Manual is recommended for most users. It provides thorough instructions for even a novice to physically install a hard disc drive.

The Brief Manual is recommended for advanced users. It provides a limited set of instructions, expecting the user to be experienced in the process of installing hard disc drives.

To print the manual, simply check the "Print selected manual" box on the Custom Installation Manual screen and click "Next".

Shutdown

Click "Next" to perform one of the following steps depending on which step of the installation you are at.

1. Click "Next" to shut down your computer. Once your computer has shut down, turn the power off and follow the instructions in the Custom Installation Manual. After you reboot your computer, DiscWizard will continue with the setup of your hard disc drive.

2. DiscWizard has completed the setup of your hard disc drive. If you need further assistance, see the Custom Installation Manual or contact Seagate.

3. DiscWizard 2000 has completed the maintenance option. Click "Finish" to return to the main menu.

4. Click "Next" to restart your computer.

   If the CMOS manual instructed you to make changes to your CMOS settings, remember to enter the setup program and make the appropriate changes.

   If you have just finished a maintenance option, simply click "Next" and DiscWizard will restart your computer and return you to the main menu.

Shutdown

Click "Next" to shut down your computer. Once your computer has shut down, turn the power off and follow the instructions in the Custom Installation Manual. After you reboot your computer, DiscWizard will continue with the setup of your hard disc drive.

Finished

DiscWizard 2000 has completed the maintenance option. Click "Finish" to return to the main menu.

Finished

DiscWizard has completed the setup of your hard disc drive. If you need further assistance, see the Custom Installation Manual or contact Seagate.

Restarting

Click "Next" to restart your computer.

If the CMOS manual instructed you to make changes to your CMOS settings, remember to enter the setup program and make the appropriate changes.

If you have just finished a maintenance option, simply click "Next" and DiscWizard will restart your computer and return you to the main menu.

Setup Method

Typical setup is recommended for most users. This is the easiest and quickest installation method. DiscWizard will determine the most optimal settings for you.

Custom setup is for more advanced users who want to choose how many partitions they want, partition type (FAT16 or FAT32), and cluster size for each partition.

Drive Usage

Select "Boot Drive" to make your new hard disc drive your Windows boot drive. This option will copy all data from your old C: partition to your new drive. This option will provide you the most benefit from the performance and reliability of your new hard disc drive.

Select "Additional Storage" to add your new hard disc drive as additional free space. This option is the easiest and quickest installation method; however, you will not benefit from the new hard disc drive's performance advantages.

Boot Wizard

Boot Wizard will allow you to boot Windows from your new hard disc drive without having to change jumpers or move drives again. It requires the use of a software driver called Dynamic Drive Overlay.

If you want to boot Windows from your new drive and don't wish to use BootWizard, DiscWizard will create another Custom Manual to help you move the drives to their correct positions.

After you have used your new drive for a few days, you may want to reformat your old drive to make it available as additional storage.

See About BootWizard for more information.

CD Update

CD Update will modify your system configuration so your applications or games will correctly locate your CD-ROM.

Proceed With Drive Setup?

This is a summary of how your hard disc drive will be set up. If you would like to make changes to these settings, select "Back" three times, and then select the "Custom Installation" method. This will allow you to customize your partition settings including number, size, type and cluster size.

If the drive you are about to set up contains existing partitions, a warning message will appear on this screen telling you that any data on that drive will be lost if you proceed. You must click "Erase" and then click "Next" to proceed.

It will also tell you how many partitions are on the drive that will be erased. If you are uncertain which drive letters correspond to the partitions, go to a DOS prompt and type "fdisk /status". This will list which drive letters are on each drive.

For an explanation of the various definitions of a Megabyte, see the Great Megabyte Mystery.

Dynamic Drive Overlay

The Ontrack "Dynamic Drive Overlay" (DDO) is a proprietary device driver that enables a system to overcome the limitations of their system BIOS.

DiscWizard has determined that your system needs a DDO to support the full capacity of this drive.

For more information, see About DDO.

Maintenance Options

Select the maintenance operation you wish to perform.

1. Repartition an existing drive. This option will let you partition and format an existing drive in your system.
2. Update CD-ROM drive letter. This option will launch CD Update and allow you to modify your computer configuration so your applications or games will correctly locate your CD-ROM.
3. Copy files. This option will launch FileCopy and will allow you to copy all files from one drive letter to another.
4. Uninstall BootWizard. This option will remove the BootWizard from your system. It will print a Custom Manual to assist you in moving your drives to their new positions.
5. Create Disk Manager diskette. This option will allow you to create an Ontrack bootable diskette containing Disk Manager for DOS.
6. Create Data Advisor diskette. This option will allow you to create an Ontrack bootable diskette containing Data Advisor.

Update CD-ROM Drive Letter

Click "Next" to run CD Update to modify your system configuration so your applications or games will correctly locate your CD-ROM.

When a new hard drive is added to your PC, the operating system automatically reassigns the drive letters. Hard drive partitions are assigned first, while CD-ROM drive letters are assigned last. Applications or games that referenced the CD-ROM will then have the incorrect drive letter assigned to them in their configuration files.

Copy Files

FileCopy will copy all files from one drive letter to another. The destination drive should be empty and at least as large as the source drive.

Select the source ("From") drive letter and the destination ("To") drive letter and click "Next" to proceed with the file copy.

Uninstall BootWizard

Select the method of Uninstall BootWizard you wish to perform.

If you just finished installing your new drive and you wish to "**Undo**" BootWizard and boot from your original boot drive, select "Boot from the original drive". If it has been a while since you installed your new drive, any updates to your system files will be lost when selecting this option.

If you want to continue to boot from the current (new) drive and do not want to use DDO to boot to this drive, select "Boot from the current (new) drive". A Custom Manual will be created to assist you in reconfiguring your drives.

After selecting the method you wish to use, click "Next" to proceed with the removal of BootWizard.

Note: We recommend you create a Disk Manager diskette before performing either of these operations. This diskette can be used as a recovery diskette if you encounter any problems.

CMOS Setup

Select "Generate CMOS Manual" to create a Custom Manual to assist you with the necessary changes to your CMOS. After viewing the manual, the system will shutdown to allow you to make the changes.

Select "Install as Additional Storage" to set up the new drive as additional storage using the capacity supported by the BIOS.

Installing A New Drive

To add a new drive to the system, select "Setup New Drive".

DiscWizard will ask you to enter the model number of your new drive and then will create a Custom Installation Manual to help you install the drive.

Once your drive is attached, DiscWizard will guide you through all the steps necessary to start using your new drive.

About DDO

What is DDO?

The Ontrack "Dynamic Drive Overlay" (DDO) is a proprietary device driver that enables a system to overcome the limitations of their system BIOS. Without a DDO, some systems will not translate your drive properly, barring you from full access to your drive. DiscWizard determines whether your system needs a DDO and installs it if necessary.

DDO and Boot Diskettes

If you want to boot your system from a floppy diskette and DDO is in your system, you must follow the steps below:

1. Make sure your floppy drive does not contain a diskette.
2. Boot your system as usual.
3. When you see the ONTRACK DDO blue banner (see Example DDO Banner below) come up, press the <space> bar.
4. Insert your bootable diskette into the floppy drive and press the <space> bar again. Your system will now boot normally from your bootable floppy diskette.

Boot Sector Virus Detection

When installing DDO, an error message may appear pertaining to a Boot Sector Virus. The boot sector must be modified in order for DDO to work. Select "Accept Changes" in the virus software to allow DDO to run.

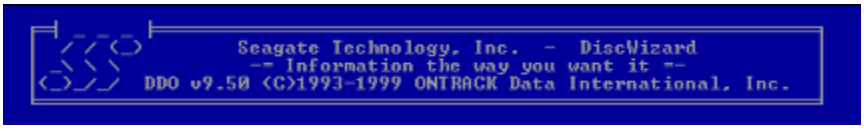
Why is DDO Needed?

Only the latest computers have a system BIOS that is designed for use with today's larger drives. If your system does not have the capability to support the drive you are installing, DiscWizard will automatically install a DDO.

If you have chosen to use BootWizard, a DDO is needed to provide the BootWizard functionality.

Example DDO Banner

If DDO is controlling a drive in your system, when your computer boots you would see something like the example below:



About BootWizard

BootWizard is a feature of the DDO that allows the user to select a boot drive other than the traditional boot drive, the primary master.

Why use BootWizard?

Disc drive upgrade installations, especially those where the new drive becomes the boot drive, are complicated. DiscWizard provides written instructions and jumper diagrams to help make this job a success. The most difficult stage of the installation process occurs after all of your operating system and original data files have been copied to the new drive (which usually sits temporarily in the slave position).

Using traditional upgrade methods, after the data is transferred, both drives would be removed from the system to change jumpers -- Slave (new drive) becomes Master, and Master (old drive) becomes Slave -- and then reinstalled. In addition, the BIOS Setup would be reconfigured to reflect these changes.

With the BootWizard, you simply leave the new drive in the Slave position after all the data has been copied to it. No further changes to jumpers or BIOS Setup are needed -- Simple!! While booting from a Slave drive or a drive other than the Primary Master may be different than legacy systems, it reflects a new trend found in modern BIOS Setup options to select the boot device. Using the Ontrack Dynamic Drive Overlay (DDO) to direct the boot sequence is a software-equivalent solution to these new BIOS Setup options.

Can I try it?

Yes. Since the steps to prepare a new drive as a boot drive, by copying all data, are the same up to the point of turning off the power, dismantling the drive bays and switching the jumpers around, you can see the BootWizard perform its task by selecting it and then just letting the system reboot. To verify the action, go to Explorer or File Manager and select "Properties" for the C: drive letter. C: drive properties should indicate the capacity of your new drive which is still attached in the Slave position to the original Master. The drive letter for the original Master drive usually changes to D:. We recommend that you do NOT delete the data on the original drive until after you are confident with the new setup; this advice applies to all system upgrade scenarios.

If you choose not to use the BootWizard feature and you want to reassemble the system according to the tradition of legacy systems, simply select "Uninstall BootWizard" from the Maintenance Options.

What do I have to be aware of when using BootWizard?

Booting from a different drive will change your drive letter designations. This would also occur if you were to physically reconfigure your drives to change your boot drive.

Why not use BootWizard?

The Dynamic Drive Overlay (DDO) software uses the Master Boot Record sector on the Primary Master disc drive. This special location is also utilized by other software programs, especially those that manage booting to multiple operating systems -- often called Multi-Boot. If you intend to have a system that boots to multiple operating systems, do not select the use of this feature. Instead, place your new boot drive in the traditional Primary Master position or upgrade the system BIOS to provide modern flexible boot device options.

How does the DDO control the boot sequence?

Since the advent of the modern PC, control of the disc drives, both floppy and hard, has been managed by a BIOS subroutine called Interrupt 13 (or INT13). This BIOS code has been updated a few times to support the growing capacity of modern disc drives. In fact, if your BIOS is older than December 1997, your system may need the DDO to support disc drives greater than 8.4GB. Most BIOS options define the floppy as the first boot device with the hard disc drive as the second. Recently, the CD-ROM or Network have been added as BIOS boot choices. Today's desktop systems usually support two ATA (IDE) channels called Primary and Secondary. Two drives, Master and Slave, are allowed on each of these channels. On new systems, these four positions can be redefined as needed. The DDO boot wizard option, in the technique of a modern BIOS, has the ability to redefine the traditional location of the boot hard drive.

Alternate Capacity Settings

2.1 GB Clip Settings or Alternate Capacity (AC) is a term used for a hard drive that has the ability to change its reported size by using jumpers.

- If the 2.1 GB Clip Settings Jumpers ARE installed, the drive will report a cylinder value of less than 4096, or about a 2.1 GB capacity.

- If the 2.1 GB Clip Settings Jumpers are NOT installed, the drive will attempt to report its true CHS values when queried by the system. On some systems, this may cause a 'hang' or lockup.*

* See BIOS Lockup in the troubleshooting section of the Custom Installation Manual for more information about this problem.

Megabyte Mystery

There are two common definitions for a megabyte (MB):

1. Ten to the sixth power or 1,000,000 bytes, the pure decimal value.
2. Two to the 20th power or 1,048,576 bytes, a value commonly used when indicating computer memory size.

DiscWizard, Disk Manager and FileCopy consider a MB to be 1,000,000 bytes. This corresponds to the values you get if you do a DIR command or run CHKDSK.

When viewing the properties on a disc under Windows it considers a MB to be 1,048,576 bytes and it considers a GB to be 1,073,741,824 bytes.

If you view partitions created by DiscWizard with a utility that considers a MB to be 1,048,576 bytes, such as DOS FDISK, the partition size presented will be a lesser number of MB. The actual storage capacity is the same.

Example: If a drive has 1024 cylinders, 16 heads and 63 sectors per track, DiscWizard will show a capacity of 528MB. FDISK will show a capacity of 504MB.

Disk Manager

Disk Manager is a DOS based hard disc drive installation utility that provides the following features.

- Easy Installation for fast, easy hard drive installation using the most commonly installed configuration choices.
- Advanced Installation to satisfy your specific requirements with popular choices or choose your own partition sizes (Advanced installation available under the Advanced Options Menu).
- Break the 8.4GB barrier. Install IDE/ATA drives larger than 8.4MB as a single bootable partition! (SCSI and other types of drives may be installed to BIOS capacity.)
- Make full use of the FAT32 File System if your operating system supports it. Formats drives larger than 2GB with one partition while allowing you to choose your own cluster size for that partition in Advanced Installation Mode or Manual Mode.
- Isolate hardware related problems with your hard disc subsystem by using the Hard Disc Diagnostics.
- Compatible with multiple operating systems including DOS, OS/2, OS/2-Warp, Windows, Windows 95, Windows 98, and Windows NT.
- Fast Format for IDE/ATA/SCSI drives. Completely installs drives in less than one minute in most cases.
- Supports IDE/ATA power management.
- Includes multiple sector read/write support for IDE/ATA drives to speed data transfers.

A bootable Disk Manager diskette may be created by selecting "Create Disk Manager diskette" from the Maintenance Options of DiscWizard.

Data Advisor

Data Advisor is a diagnostic utility that will scan your system for viruses, memory errors, and a wide variety of disk corruptions that can lead to data loss. It uses a self-booting diskette, so it will run even if your whole system has crashed.

Data Advisor will . . .

- Quickly assess the health of your hard disk drive identifying potential problems that could lead to data loss
- Advise you of the various options for recovering lost data
- Help you avoid expensive and unnecessary downtime
- Identify potential problems when used as part of a regular preventive maintenance program

Data Advisor performs the following diagnostic tests.

- Evaluates your hard disk drive capacity, electronics and media integrity
- Analyzes file systems and structures
- Checks critical boot sectors, reads the Master Boot Record and cross-checks partition tables and CMOS.

Custom Installation Manual

The **Custom Installation Manual** provides hard drive installation instructions specifically for you based on the selections you made as well as the capabilities of your system. The manual is provided in a step-by-step format along with check boxes. It is recommended that you print the manual, then check off each step as it is completed.

To print the manual, simply check the "Print selected manual" box on the Custom Installation Manual screen and click "Next".

On the Custom Installation Manual screen you may select whether you wish to view a "Detailed" or a "Brief" Manual.

- **Detailed Manual** - This is recommended for most users. It provides thorough instructions for even a novice to physically install a hard disc drive.
- **Brief Manual** - This is recommended for advanced users. It provides a limited set of instructions, expecting the user to be experienced in the process of installing hard disc drives.

Below are some examples of sections of a Custom Installation Manual.

(example 1)

DiscWizard 2000 **Custom Installation Manual**

DRIVE PREPARATION INSTRUCTIONS

For easy installation, these instructions have been customized for you. Check off each step as you complete it.

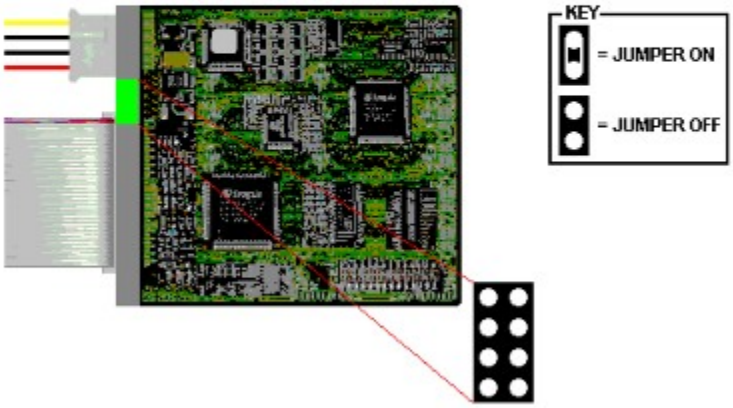
Thank you for purchasing a Seagate drive!

The following instructions have been customized for your system. In addition to these instructions, you may need to refer to your computer owner"s manual for information specific to your system, such as System Setup.

(example 2)

☐ Set the jumpers on the new drive for the following position:

New Drive: ST317242A
Position: Primary Controller
Configuration: Slave Drive



How To Contact Seagate

Seagate Technology Support Services

Online Services

Internet
For online information about Seagate products, visit www.seagate.com or e-mail your disc or tape questions to:

Presales Support:
Disc: http://www.seagate.com/support/email/email_presales.shtml *or* DiscPresales@Seagate.com
Tape: http://www.seagate.com/support/email/email_tape_presales.shtml *or* Tape_Sales_Support@Seagate.com.

Technical Support:
Disc: http://www.seagate.com/support/email/email_disc_support.shtml *or* DiscSupport@Seagate.com
Tape: http://www.seagate.com/support/email/email_tape_support.shtml *or* TapeSupport@Seagate.com.

SeaBOARD® is a computer bulletin board system that contains information about Seagate disc and tape drive products and is available 24 hours daily. Set your communications software to eight data bits, no parity and one stop bit (8-N-1). This service is available worldwide.

Automated Services

SeaFONE® (1-800-SEAGATE) is Seagate's toll-free number (1-800-732-4283) to access our automated self-help services. Using a touch-tone phone, you can find answers to service phone numbers, commonly asked questions, troubleshooting tips and specifications for disc drives and tape drives 24 hours daily. International callers can reach this service by dialing +1-405-936-1234.

SeaFAX® is Seagate's automated FAX delivery system. Using a touch-tone phone, you can obtain technical support information by return FAX 24 hours daily. This service is available worldwide.

Presales Support

Presales Support
Our Presales Support staff can help you determine which Seagate products are best suited for your specific application or computer system.

Seagate Express
You can purchase select tape products and tape accessories through Seagate Express 24 hours daily by calling 1-800-531-0968 or by faxing your order to: +1-972-481-4812.

Technical Support

Technical Support
If you need help installing your drive, consult your dealer. Dealers are familiar with their unique system configurations and can help you with system conflicts and other technical issues. If you need additional help, you can talk to a Seagate technical support specialist. Before calling, note your system configuration and drive model number (ST####*)*.

SeaTDD*™*(+1-405-936-1687) is a telecommunications device for the deaf (TDD). You can send questions or comments 24 hours daily and exchange messages with a technical support specialist from 8:00 A.M. to 12:15 P.M. and 1:30 P.M. to 6:00 P.M. (central time) Monday through Friday.

Customer Service (CSO)

Warranty Repair
Seagate offers worldwide customer support for Seagate drives. Seagate direct OEM, Distribution and System Integrator customers should contact their Seagate service center representative for warranty information. Other customers should contact their place of purchase.

Authorized Service Centers
If you live outside the US, you can contact an Authorized Service Center for service or repair.

USA/Canada/Latin America Support Services

Presales Support
Disc: 1-877-271-3285 or +1-405-936-1210 FAX: +1-405-936-1683
Tape: 1-800-626-6637 or +1-714-641-2500 FAX: +1-714-641-2410

Technical Support (SeaFONE)
1-800-SEAGATE or +1-405-936-1234 (for specific product phone number)
FAX: *Disc:* +1-405-936-1685; *Tape:* +1-405-936-1683

SeaFAX 1-800-SEAGATE
SeaTDD +1-405-936-1687
SeaBOARD *Disc:* +1-405-936-1600; *Tape:* +1-405-936-1630

Warranty Repair

USA	1-800-468-3472	FAX: +1-405-949-6740
Mexico and Latin America	+1-405-949-7758	FAX: +1-405-949-6738
Canada		
*Memofix**	+1-905-660-4936	FAX: +1-905-660-4951
*Adtech**	+1-905-812-8099 or 1-800-624-9857	FAX: +1-905-812-7807
Brazil		
*MA Informatica**	+55-21-516-6649	FAX: +55-21-516-5280

* Authorized Service Centers

European Support Services

For European customer support, dial the toll-free number for your specific country for presales support, technical support, SeaFAX and warranty repair.

If your country is not listed here, dial our European call center at +31-20-316-7222 from 8:30 A.M. to 5:00 P.M. (European central time) Monday through Friday. The European call center is located in Amsterdam, The Netherlands.

Call Center
Austria 0 800-20 12 90
Belgium 0 800-74 876

Denmark	80 88 12 66
France	0 800-90 90 52
Germany	0 800-182 6831
Ireland	1 800-55 21 22
Italy	1 677 90 695
Netherlands	0 800-732 4283
Norway	800-113 91
Poland	00 800-311 12 38
Spain	900-98 31 24
Sweden	0 207 90 073
Switzerland	0 800-83 84 11
Turkey	00 800-31 92 91 40
United Kingdom	0 800-783 5177

SeaBOARD

Germany	+49-89-1409331

Fax ServicesAll European Countries

Presales/Technical Support/ Warranty Repair	+31-20-653-3513

Africa/Middle East Support Services

For presales, technical support, warranty repair and FAX services in Africa and the Middle East, dial our European call center at +31-20-316-7222 from 8:30 A.M. to 5:00 P.M. (European central time) Monday through Friday, or send a FAX to +31-20-653-3513. The European call center is located in Amsterdam, The Netherlands.

Asia/Pacific Support Services

Technical Support

Australia	+61-2-9725-3366	FAX: +61-2-9725-4052
Hong Kong	+852-2368 9918	FAX: +852-2368 7173
Japan		FAX: +81-3-5462-2979
Singapore	+65-488-7584	FAX: +65-488-7528
Taiwan	+886-2-2514-2237	FAX: +886-2-2715-2923

SeaFAX

Australia	+61-2-9756-5170

Warranty Repair

Japan	+81-3-5462-2904	FAX: +81-3-5462-2979
Asia/Pacific and Australia	+65-485-3595	FAX: +65-488-7503

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Troubleshooting

System Lockup Information

If you have added a new drive and your system locks up at boot time (right after turning the power on), or locks up during System Setup, there are several possible causes.

1. Verify that the 40-pin ribbon cable is properly attached, making sure that pin 1 on the cable matches pin 1 on the drive.
2. If your new drive is larger than 2.1Gb, and your System Setup (CMOS) is set to "AUTO", you may have a BIOS with a 4096-cylinder limitation that hangs the system during auto-detection. Your computer manufacturer may have a BIOS upgrade that will support more than 4096 cylinders.

To continue with this installation, your drive may provide an alternate capacity (AC) jumper setting that lowers the cylinder auto-detection to below the BIOS limitation barrier and still provide full drive capacity using the DiscWizard installation utility.

In this case, power off your system and install your drive's AC jumper, or remove your new drive and go to the beginning of these instructions and follow each step.

For drives WITH an alternate capacity (AC) option jumper:

1. Install the AC jumper per drive label instructions.
2. Set the CMOS drive type using ONE of the following methods listed in preferred order:

    a) Select "Automatic Drive Detection". This allows your computer to configure itself automatically for your new drive.
    b) Select "User-defined" or "Custom" drive setting and set to the following:

1024	cylinders
16	heads
63	sectors
0	write precomp (wp)
0	landing zone (lz)

    c) Select Drive Type 1.

For drives WITHOUT an alternate capacity (AC) option jumper, choose method b or c from step 2 above.

Glossary

Access Time

The time required to perform an "Access" procedure. Usage, e.g.:

1. Seek to location on a disc.
2. Amount of time to read or write to a memory location
3. The time to position to the correct location in a disc drive and carry out a read or write operation.

Address Mark

Two-byte address at the beginning of both the ID and the data fields in the track format. The first byte is the "A1" data pattern; the second byte is used to specify either an ID field or a data field.

Alternate Capacity

Alternate Capacity is a term used for a hard drive with an Alternate Capacity (AC) Jumper. Alternate Capacity is sometimes referred to as "2.1 GB Clip Settings".

- If the AC jumper is installed, the drive will report a cylinder value of less than 4096, or about a 2.1 GB capacity.
- If the AC Jumper is not installed, the drive will report its true CHS values when queried by the system. On some systems, this may cause a 'hang' or lockup.*

* See BIOS Lockup in the troubleshooting section of the Custom Installation Manual for more information about this problem.

If the AC Jumper is installed, you must use Ontrack's Dynamic Drive Overlay (DDO) to access the drive's full capacity when using DOS/Windows 95/98.

ATAPI

ATA is the protocol used to transfer data, control, and status information between a PC and a hard drive. The AT Attachment Packet Interface (ATAPI), an extension of ATA, is designed to bring single-command, single-register sets to CD-ROMs and other peripherals.

BIOS

The Basic Input Output System (BIOS) is a set of programs stored in a computer's ROM that provides services for basic operations like console display, keyboard input, disk I/O, etc.

BIOS Parameter Block

The BIOS Parameter Block (BPB) is located at the beginning of the first sector of a primary partition (or logical volume). It contains information describing the partition used by the operating system.

BIOS Standard Format

BIOS Standard Format is recognized by all operating systems for the IBM PC platform as the common method of storing partitioning information on a hard drive. DiscWizard uses this format if your drive does not require the Dynamic Drive Overlay (DDO).

Block

A collection of bytes stored and accessed as a unit (i.e., a file record). Typically, a block is stored as one physical sector on a disc drive.

The term block is also used when referring to a set of jumpers (i.e., drive jumper block).

Boot

Load an operating system from storage on diskette or hard drive into the computer's memory.

Cable Select

Cable Select is a hard drive jumper setting that is used when the drive configuration is determined by how the drives are attached to the interface cable.

CD Update

When a new hard drive is added to your PC, the operating system automatically reassigns the drive letters. Hard drive partitions are assigned first, while CD-ROM drive letters are assigned last. Applications or games that referenced the CD-ROM will then have the incorrect drive letter assigned to them in their configuration files.

CD Update is a Windows program to re-identify your CD-ROM and modify the configuration so your applications or games will correctly locate your CD-ROM. If you have problems accessing any CD-ROM applications or games after running CD Update, you will need to reinstall them.

Clusters and Cluster Sizes

A cluster is the smallest amount of disk space that can be allocated within a FAT partition (or logical volume). The size of FAT16 clusters range from 2K to 32K, depending on the partition size. Larger cluster sizes are used for larger partitions. The size of a FAT32 cluster ranges from 512 bytes to 32K, depending on the partition size or user preference.

Since the operating system must allocate whole clusters, there will be unused space within the last cluster if the size of a file is not an even multiple of the cluster size. This space cannot be used by another file and is, in effect, lost. If a partition has a large number of files smaller than the cluster size, a significant percentage of storage space can be lost.

If you expect to be storing a large number of small files, consider dividing your hard drive into two or more partitions. The smaller partitions will have smaller cluster sizes. The following table lists the cluster size for each partition size range:

Partition Size	**FAT16 Cluster size**	**FAT32 (Minimum) Cluster Size**
0 MB - 16 MB	4 KB	FAT16
16 MB - 128 MB	2 KB	FAT16
128 MB - 256 MB	4 KB	FAT16
256 MB - 512 MB	8 KB	FAT16
512 MB - 1 GB	16 KB	512 bytes
1 GB - 2 GB	32 KB	512 bytes
2 GB - 8 GB	xxxxx	512 bytes
8 GB - 16 GB	xxxxx	512 bytes
16 GB - 32 GB	xxxxx	512 bytes
32 GB - 128 GB	xxxxx	512 bytes
128 GB - 256 GB	xxxxx	1 KB
256 GB - 512 GB	xxxxx	2 KB
512 GB - 1024 GB	xxxxx	4 KB
1024 GB - 2048 GB	xxxxx	8 KB

1 MB = 1,048,576 bytes

CMOS Drive Types

Drives attached to a primary AT (IDE) controller are accessed using BIOS services. The BIOS must know a drive's geometry to communicate correctly with it. This is accomplished by using a drive type. There are three drive types used in AT-compatible computer systems. Your system may have only one or a combination of the following drive types.

1. Automatic drive types (AUTO) are designed specifically to support IDE/ATA drives. Information obtained from the drive is used to automatically set the geometry for this type. If your system has an AUTO type, you should use it. Typically an AUTO type will appear as the first or last drive type option. Most Pentium and newer 486 systems have AUTO drive types.

* See BIOS Lockup in the troubleshooting section of the Custom Installation Manual for important information about setting CMOS.

2. User-definable Drive Types (UDT) are designed to support any type of AT drive (IDE ,ESDI, MFM and RLL). The user-definable drive type allows you to specify the exact geometry of your drive. If your system does not have an AUTO drive type but has a UDT, you should use it. Typically, there will be two UDTs, and they will be the last two drive-type options. Most 486 and newer 386 systems have UDTs.

3. Standard drive types are selected from a table in the computer's BIOS. If your system does not have an AUTO or UDT, choose a drive type from the table that most closely matches your drive or just choose Type 1.

Contiguous

Contiguous refers to a file or area of free space that occupies a sequential series of clusters.

Certain system files must be written to a partition or diskette in a contiguous fashion or they cannot be properly loaded when you boot the system.

Controller

A controller (or host adapter) serves as an interface between the computer's IO bus and the bus used by a peripheral, such as a hard drive. The controller can be an expansion card or it may be embedded in the computer's motherboard. All access to the hard drive is made through the controller.

Cylinders, Heads, and Sectors

Cylinders are concentric regions on the hard disk platters with cylinder 0 usually located at the outer edge. Cylinder numbers start at zero. If your hard disk has 900 cylinders, valid cylinder numbers are 0 - 899.

The heads of a hard disk are used to read and write data. Heads are mounted on an actuator that positions them to a given cylinder location. Head numbers start at zero. If your drive has 9 heads, valid head numbers are 0 - 8.

A sector is the smallest addressable unit of storage on a hard disk. Most hard disks have 512 bytes per sector. Sector numbers start at one. If your drive has 17 sectors, valid sector numbers are 1 - 17.

DIR and SUBDIR

A directory (DIR) is an area inside a partition that is used to record information (name, size, time and date, etc.) about a file. In the FAT file system, there are two kinds of directories, the root directory and subdirectories.

There is only one root directory. When the partition is formatted, the root directory is created and cannot be removed. The root directory's size is fixed. On a hard drive, the root directory can contain 512 files or subdirectories. (SUBDIRs)

There can be any number of subdirectories. Subdirectories can be created and removed at any time using an operating system command (MD/RD in DOS). Clusters, like files, are allocated for subdirectories. Subdirectories grow when files and other subdirectories are added to them.

DMA

Direct Memory Access (DMA) is a method of transferring data between the controller of a peripheral device and the memory of the computer. DMA allows a controller to transfer data directly into system memory. The controller handles the transfer, leaving the processor free to do other tasks. DMA transfers are generally faster than PIO transfers.

IDE/EIDE controllers use PIO to transfer data as do some SCSI host adapters. High-performance SCSI host adapters use DMA.

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.

See the About DDO for a complete description of the Dynamic Drive Overlay and related topics.

Enhanced IDE

Enhanced Integrated Drive Electronics (EIDE) is a technology advancement that improves the existing IDE interface standard. The Enhanced IDE feature set includes:

- Support for IDE hard drives larger than 528MB
- Support for faster data-transfer rates on the IDE bus (Fast-ATA)
- Support for more than two IDE devices (Secondary Controller)
- Support for non-disc devices (i.e., CD-ROM, tape)

Extended Partition

An extended partition is a physical area of the drive that is allocated in the partition table of the MBR. An extended partition may not be made bootable and is not assigned a drive letter. To use the space allocated to an extended partition, one or more logical volumes must be created within the extended partition. A unique drive letter will be assigned to each logical volume within the extended partition.

Fast ATA

Fast ATA is a subset of the Enhanced IDE feature set that provides a standard for high-speed data transfers. The data-transfer rates available are represented by modes. Standard IDE hardware can support PIO Modes 0 - 2. PIO Mode 3 and Mode 4 are supported only by Fast ATA drives and controllers. Although Fast ATA is only a subset of Enhanced IDE, devices that support only Fast ATA are commonly referred to as Enhanced IDE devices. The following is technical information for each supported Fast ATA mode:

PIO Mode 3: An advanced host transfer that supports 11.1 MB/s PIO transfer as defined by the Small Form Factor (SFF) 8011 and ATA-2 standards.

PIO Mode 4: An advanced host transfer that supports 16.6 MB/s PIO transfer as defined by the SFF 8033 standard.

FAT

A File Allocation Table (FAT) is an area inside a partition that is used to record which clusters are assigned to each file in that partition. The DOS file system uses FATs. Therefore, it is referred to as a FAT file system.

The FATs (DOS uses 2 copies) are created, along with other structures, when a partition is formatted.

FAT32

FAT32 is an improved version of the File Allocation Table (FAT16) file system used by DOS and Windows. The FAT32 system allows disks with a capacity greater than 2GB to be formatted as a single partition. Also, in FAT32, you can create small clusters on partitions and custom cluster sizes.

A FAT32 partition can be created only when booting with an operating system that supports FAT32 (i.e. Windows 95 with FAT32 support). If you booted from an Ontrack Standalone Operating System diskette and wish to make a FAT32 partition, reboot to an operating system or boot diskette that supports FAT32.

FileCopy

FileCopy is a DOS program that copies all files from one drive letter to another. It is supported by DOS, Windows 3.x, Win95, and Win98. It can also run on DOS 3.31 or greater, on Windows or the Win95 MS-DOS window.

Running FileCopy is a critical step in making the new drive the boot drive. When used with DiscWizard, FileCopy streamlines the task of adding a new hard drive as the boot drive in your system. To make the new drive the boot drive, copy all your existing files and directories from your old drive to the new hard drive.

FileCopy flags invalid drive letters in the following cases:

- If source or destination drive letter is something other than C - Z.
- If source or destination drive letter is a CD-ROM drive letter.
- If source and destination drive letters are the same.
- If FileCopy is unable to analyze the size and contents of the source drive.
- If the destination drive is C: (you will be prompted to confirm before continuing)
- If the space available on the destination drive is not of equal or greater capacity.

Note: FileCopy does not check to see if the destination drive is blank. Therefore, be careful when you have duplicate file names. If the same file(s) exists on the source drive, FileCopy will prompt you to overwrite the destination file(s). FileCopy checks that there are enough free clusters on the destination drive. This feature is there to allow multiple drive letters to be copied to a single destination.

File System

A collection of logical structures, written within a partition (or logical volume), that allow data to be stored and retrieved by an operating system.

Formatting

A partition must be formatted before it can be used. Formatting is the process of defining and creating the BPB, FATs, and root directory within the partition.

DiscWizard automatically formats all partitions for you.

IDE (Also Called ATA)

Integrated Drive Electronics (IDE) or AT Attachment (ATA) is a drive technology designed for use in AT-compatible computers. IDE/ATA drives offer flexibility and high performance and are generally less expensive than comparable SCSI drives. Most newer computer systems ship with installed IDE/ATA drives and embedded IDE controllers in their motherboards.

Lastdrive

Specifies the maximum number of drives you can access. The value you specify represents the last valid drive MS-DOS is to recognize.

LBA

Logical Block Addressing (LBA) allows sectors on the drive to be accessed via a single "logical block address" rather than a specific cylinder, head and sector. Most new IDE/ATA drives support LBA. LBA support is also included in advanced device drivers to support large-capacity drives and to avoid unnecessary translations within the device driver and drive firmware.

Local Bus

The local bus is the I/O bus that connects the CPU with system memory. Its width in bits is the same as the processor's memory bus and runs at a higher speed than the ISA bus used to attach peripherals. In some systems, peripherals also may be connected to the local bus to provide improved performance.

Two different interface standards are commonly used to connect peripherals to the local bus, the VESA (Video Electronics Standards Association) local bus (VLB) and the PCI (Peripheral Component Interconnect) local bus. The VESA local bus is used most frequently in 486-based systems. The PCI local bus is used in Pentium systems and in a few 486 designs.

Logical Volume

A logical volume can be created only within an extended partition. Each logical volume will be assigned a unique drive letter. You can use a logical volume like a primary partition. However, you cannot make a logical volume bootable. Multiple logical volumes may be created within a single extended partition. However, no more than a total of 24 drive letters (C: - Z:) can be accessed.

Operating systems other than DOS support additional or different logical volume types. You can create any type of logical volume using Manual Mode in Disk Manager.

Note: The Disk Manager program can be found on the DiscWizard CD.

Master/Slave

Two IDE/ATA drives may be attached to the primary controller via a single cable. The first drive (the boot drive) is called the "master"; the second drive is called the "slave". The same relationship applies to drives attached to a secondary controller, if present.

If only one drive is attached to the controller, it should be configured as the master with no slave present.

If two drives are attached to the controller, one drive must be configured as the master with slave present, and the other drive must be configured as slave.

Use jumper settings to configure a drive as master or slave.

MB

There are two common definitions for a megabyte (MB):

1. 10^6 or 1,000,000 bytes, the pure decimal value.
2. 2^20 or 1,048,576 bytes, a value commonly used when indicating computer memory size.

DiscWizard considers a MB to be 1,000,000 bytes. This corresponds to the values you get when you use a DIR command or run CHKDSK. However, some utilities consider MB to be 1,048,576.

Thus, the partition size displayed by DiscWizard will be more than the partition size displayed by a Utility such as DOS FDISK. The actual storage capacity is the same.

For example, if a drive has 1024 cylinders, 16 heads and 63 sectors per track, DiscWizard will show a capacity of 528MB, but FDISK will show a capacity of 504MB.

MBR

The Master Boot Record (MBR) is located on the first sector of a hard disc. It contains a small amount of code that is used, if the hard disc is bootable. It also contains the partition table for the hard disc. The MBR is critical; you cannot access hard disc drives without the MBR.

Memory

Several terms refer to computer memory. The following paragraphs define the most common memory terms.

RANDOM ACCESS MEMORY (RAM) is a type of memory that can be read from and written to in any order. The contents of RAM are lost when power is removed. The majority of addressable memory in a computer is random access memory.

READ ONLY MEMORY (ROM) is a type of memory that can be read but not written to by the computer. ROM is used to store information that must not be changed or lost when power is removed. Special hardware is used to write to the ROM chip before it is installed in the computer. A common use of ROM is to store the computer's BIOS.

Ontrack Proprietary Format

Ontrack Proprietary Format is a method of storing partitioning information on a hard drive that prevents access to the partitions unless the Dynamic Drive Overlay is loaded. Ontrack Proprietary Format is the default for drives requiring the Dynamic Drive Overlay and eliminates a possible risk of data loss on drives using BIOS Standard Format.

Only operating systems that support Ontrack Proprietary Format will be able to access the partitions. The following operating systems support Ontrack Proprietary Format:

- MS-DOS, PC-DOS and Novell DOS, and Windows 3.x
- OS/2 V3.0 (Warp Full Pack)
- OS/2 V2.0-3.0 (requires upgrade drivers on this diskette)
- Windows NT 3.51/4.0
- Windows NT 3.50 (requires upgrade drivers on this diskette)
- Windows 95/98

If you are installing some other operating system, you must use BIOS Standard Format.

Operating System

An operating system (OS) is a program that provides a user interface, controls system resources, and permits the execution of other programs.

Partition Table

The partition table is contained in the last part of the MBR. Information describing partitions that allocate space from the physical drive, primary partitions, and extended partitions is stored in the partition table.

If your system has an extended partition, information for each logical volume in the extended partition is stored in a separate partition table located in an XMBR.

PIO

Programmed input/output (PIO) is a method of transferring information between the controller of a peripheral device and the memory of the computer. A PIO controller is configured to occupy one or more processor resources called I/O ports. A BIOS or software driver running on the processor writes or reads data, to or from the controller, through the I/O port. PIO is generally not as fast as DMA.

IDE/EIDE controllers use PIO to transfer data.

Primary Channel/Controller

A primary controller is an AT (IDE) controller installed in a computer system and accessed through BIOS services. Some systems provide primary IDE controllers on the motherboard.

The BIOS in some systems will not allow a large IDE/ATA drive to be installed to full capacity. DiscWizard can take over the primary controller and provide support to install the drive if the following conditions are met:

- The controller is AT-register-set compatible. (IDE controllers are AT-register-set compatible.)
- The controller is set to I/O port 1F0H and interrupt 14. These are the standard settings for an AT-compatible controller.
- All drives attached to the primary controller support the identify command. IDE/ATA drives support this command.

Primary Partition

A primary partition resides within the physical area of the drive and is allocated in the partition table in the MBR. A primary partition may be made bootable and is assigned a drive letter by the operating system. All systems that boot from their hard drives have a primary partition. Most DOS versions can access only one DOS primary partition per drive.

Operating systems other than DOS support additional or different partition types.

SCSI

Small Computer Systems Interface (SCSI) drives are accessible to DOS only if supported by a host-adapter BIOS. Disk Manager can install these drives only to the capacity represented by the host-adapter BIOS.

Secondary Channel/Controller

A secondary controller is an AT (IDE) controller installed in a computer system in addition to the primary controller. Some systems provide primary and secondary IDE controllers on the motherboard and have support for secondary controllers in their BIOS.

When there is no BIOS support for a secondary controller, DiscWizard can provide it if the following conditions are met:

1. The controller is AT-register-set compatible. (IDE controllers are AT-register-set compatible.)
2. The controller is set to I/O port 170H and interrupt 15. Refer to your controller documentation to see if your controller can meet these requirements.
3. All drives attached to the secondary controller support the identify command. IDE/ATA drives support this command.

Translation

An IDE/ATA drive is a collection of sectors numbered 1 - n where n is the total number of sectors on the drive. Most new IDE/ATA drives are "universal translators", which means the drive can emulate any CHS geometry (up to 65535x16x63) that does not exceed the capacity of the drive. This allows IDE/ATA drives to be installed in a computer that does not have a UDT or AUTO type, even though there is not an exact match in the drive type table.

Note: DiscWizard can install IDE/ATA drives to full capacity, even if they are not universal translators.

UDT

User-definable Drive Type.
See CMOS Drive Types for further information.

XBIOS

XBIOS is an overlay, which is loaded when you run Disk Manager. XBIOS provides support for important features of Disk Manager. The following is a list of these features:

- The ability to automatically identify IDE/ATA drives.
- The ability to support a secondary AT (IDE) controller in systems without BIOS support.
- The ability to install IDE/ATA drives larger than 528MB.

XMBR

Extended Master Boot Records (XMBRs) store information about the logical volumes that exist within an extended partition. There is one XMBR for each logical volume. Each XMBR is written just before the logical volume it describes and contains a partition table entry for that logical volume. If there is additional space in the extended partition, there is a second partition table entry in the XMBR describing that space. If there is another logical volume in the extended partition, the first record of this space is the XMBR for that logical volume. This pattern repeats until there are no more logical volumes in the extended partition. Thus the XMBRs form a chain that links each volume to the next. If one of the XMBRs cannot be read, the chain is broken and the rest of the logical volumes are inaccessible.