

# Hard Drive Capacity Barriers

## 3.5-inch EIDE Hard Drives

The amount of space available to store information on hard drives is constantly increasing. Computer operating systems and system BIOSs have limitations that are related to specific hard drive capacities. Three capacity points that can affect how your operating system and system BIOS support your hard drive are 8.4 GB, 2.1 GB, and 528 MB.

There are several PC components that have an EIDE drive capacity limitation at approximately 8.4 GB. The BIOS limitations at the 2.1 GB and 528 MB capacity barriers do not occur in newer systems. They are addressed here solely for the benefit of those who may be experiencing issues with an older system.

### 8.4 GB Barrier

There is an 8.4 GB hard drive limitation on some traditional system BIOSs. The following is required to access the full capacity of an 8.4 GB or larger hard drive:

- A system BIOS that supports extended functions
- An operating system that recognizes extended BIOS functions

Operating systems that recognize extended BIOS functions:

- Windows 95
- Windows 98

Operating systems that do not recognize extended BIOS functions:

- DOS 6.xx and earlier
- Windows 3.1x
- Windows NT (See note in table below.)
- Novell NetWare
- OS/2 Warp

Operating System	Limitation
DOS 6.xx and earlier	8.4 GB maximum capacity limit.
Windows 3.1x	Hard drive capacities larger than
Windows NT 4.0, 3.x, and earlier	8.4 GB are recognized as 8.4 GB.
Novell NetWare	<i>Note:</i> Windows NT 4.0 with Service Pack 3 recognizes hard drive capacities larger than 8.4 GB.
OS/2 Warp	Currently cannot be installed when using 8.4 GB or larger hard drives.

The limitations of your system BIOS and your operating system combined determine your overall

system limitation. For example, if your operating system recognizes extended BIOS functions, but your system BIOS has a 2.1 GB drive barrier, you are limited to your system BIOS's 2.1 GB drive barrier. Conversely, if your operating system does not recognize extended BIOS functions, but your system BIOS supports 8.4 GB hard drives, you are limited to your operating system's capability. Your system limitation is based on the lowest functioning barrier.

Since it is difficult to determine if your system BIOS supports 8.4 GB or larger hard drives, we recommend using EZ-Drive 9.06W or later. EZ-Drive 9.06W or later determines whether or not your system BIOS provides extended BIOS support. If it does not, EZ-Drive installs EZ-BIOS on the boot sector of the hard drive to support the full capacity of your 8.4 GB or larger hard drive. If your system supports extended BIOS functions, EZ-Drive does not install EZ-BIOS. EZ-Drive software can be downloaded from Western Digital's web site at: [www.westerndigital.com](http://www.westerndigital.com).

If you do not use EZ-Drive, another option is to upgrade your system BIOS. A properly upgraded system BIOS will support the full capacity of your hard drive if used with an operating system that recognizes extended BIOS functions. Contact your system manufacturer for more information.

Refer to the following tables for a list of common system manufacturers and BIOS upgrade sources.

Common System Manufacturers	USA Phone Numbers
ACER	408-432-6200
Apple	888-APL-VALU
AST	817-232-9824
Compaq	800-652-6672
Dell	512-338-4400
Digital	603-884-5111
Gateway 2000	605-232-2000
HP	208-323-2511
IBM	800-IBM4YOU
Micron	208-893-3434
NEC	650-528-6000
Packard Bell	800-733-1919

BIOS Sources	USA Phone Number	Internet Address
Micro Firmware (Phoenix BIOS only)	405-321-8333	www.firmware.com
Phoenix	781-551-4000	www.phoenix.com
Unicore (Award and AMI BIOS)	978-686-6468	www.unicore.com

## 2.1 GB Barrier

Hard drives larger than 2.1 GB have more than 4095 cylinders. Some computer systems built before early 1996 do not support hard drives with more than 4095 cylinders (hard drives larger than 2.1 GB), unless you update the system BIOS, install an EIDE controller card with onboard BIOS, or install third-party software such as EZ-Drive.

You will know if your system BIOS has this limitation after installing your drive if:

- Your operating system shows a much smaller drive capacity than the actual drive capacity.
- Your system locks up on initial boot, preventing you from accessing CMOS setup.

### *Operating System Shows a Much Smaller Capacity*

If your operating system shows a much smaller drive capacity, use EZ-Drive to overcome the 2.1 GB BIOS limitation.

### *Your System Locks Up on Initial Boot*

If you cannot access the CMOS setup because your system locks up on initial boot, follow these instructions:

1. Turn off your system power, check the IDE interface cable and power supply cable.
2. Check jumper settings.
3. Turn on your system power.
4. Try to enter your CMOS setup and set the drive type to auto config.

If your system still does not respond, your system BIOS may not support drives with more than 4095 cylinders. If this is the case, consider these solutions:

1. Use EZ-Drive installation software.  
If the system locks up and prevents entry to CMOS, you must turn off your system power and disconnect the IDE interface cable from the system.
- Enter your CMOS setup.
- Select the Hard Disk Type option for your new Western Digital hard drive. Select a user

defined drive type and enter: 1023 cylinders, 16 heads, and 63 sectors. If your system does not have a user defined drive type, select Type 9.

- Reconnect your IDE interface cable to the system.
  - Use EZ-Drive installation software.
- These new settings allow your system to boot so that you can install EZ-Drive to access the full capacity of your drive.

- **OR** -

If you do not have a user defined or Type 9 drive type, use option 2, 3, or 4 below to change the parameters reported to the BIOS.

2. Upgrade your system BIOS  
A properly upgraded system BIOS will support the full capacity of your hard drive. Contact your system manufacturer.
3. Install an EIDE controller card with an onboard BIOS that supports hard drives larger than 2.1 GB. For 8.4 GB or larger hard drives, the EIDE controller card must support extended BIOS functions.
4. Rejumper the drive using alternate jumper settings and install EZ-Drive. With these alternate jumper settings, you MUST install EZ-Drive.

## 528 MB Barrier

Most computer systems built before August 1994 do not support hard drives larger than 528 MB, unless you update the system BIOS, install an EIDE controller card with onboard BIOS, or install third-party software such as EZ-Drive.

To determine if your system supports drives with a capacity larger than 528 MB, we suggest the following:

1. Enter your CMOS setup, look for options such as "LBA", "Large Disk Access", or "Translating BIOS," and enable these options.
2. Frequently, but not always, you must select an auto config drive type. If you see a value greater than 16 heads, you probably have a translating BIOS.
3. Contact your system or BIOS manufacturer and verify that your system recognizes drive capacities over 528 MB.

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949.932.4900 USA  
949.932.5000 Outside USA  
949.932.4300 DocuFAX  
www.westerndigital.com

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Western Digital Corporation  
8105 Irvine Center Drive  
Irvine, California 92618

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