

An Inside Look at Hard Disk Drives (HDD)

The HDD Buying Guide

- **Hard Drives - Bigger is Better**
- **But Size (GB's) Does Matter and So Does Speed (RPM)**
- **When 2 Drives Are Better than One**

Purchasing a hard drive (HDD) is an important buying decision. That's because all your data is saved on it. If you buy a low quality hard drive it may crash on you and you'll lose all your games and all your digital data. In the end, though, hard drives are all about capacity. And, far more often than not, your biggest hard drives are the costliest. However, once the new models hit the market you will be able to purchase the earlier generation models for less cash. Additionally, the higher-performance (7200-rpm) drives are usually pricier than the more pedestrian (5400-rpm) drives at the same capacity.

Choosing a Top-Notch Hard Drive

- **Capacity** - We recommend at least 60 to 80GB; but the more the merrier!
- **RPMs** - Go for 7200RPM - it gives you faster read and write speed.
- **Interface Speed** - To get the max from your HDD the interface speed must match the interface speed of your PC.
- **Seek Speed** - Not a huge deal. It's how fast drives can pick a particular piece of data. 8ms or lower is an exceptional seek speed, but 8ms to 9ms is just fine.
- **Buffer Size** - Go for at least 2MB

Bigger is Better

It's generally a smart move to purchase the biggest hard drive capacity your budget will bear, even if you won't need all that drive space right away. Of course, larger hard drives cost more than smaller ones, but the cost per GB doesn't work out byte for byte. For example, the difference in cost between a 60GB and an 80GB HDD isn't much, but a huge HDD could cost quite a bit more. Hard drives are able to handle larger amounts of data all the time. And it's a good thing, because programs are getting more complex, graphics-intensive. You can now hold an amazing 400GB of data on a single drive. For those of you who hoard vast amounts of digital media or edit videos this ever-burgeoning hard drive capacity is a gift from cyber heaven. The proliferation of extra-large hard drives takes away some of the mystery out of HDD shopping. However, determining what size hard drive you need is a subjective matter. It really depends on how much data you need to store. Some folks can get by with 60GB on a desktop; others prefer the huge hard drives ranging from 120Gb all the way to 250GB or more. Size requirements, of course, differ for notebook computers. Before you get too involved in the GB numbers, though, you will need to check your motherboard's manual or with your computer manufacturer to see how big a hard drive your PC can support. We recommend that you start off with at least an 80GB hard drive.

The Need for Speed

The speed of a hard drive is expressed in revolutions per minute (RPM) and it refers to how fast the computer can read data from the hard drive. We recommend that your hard drive moves at a clip of at least 7200 RPM. At less than 7200RPM your

data-intensive applications, such as games, might slow down because it takes too long access the data.

You need at least 5400 RPM for fast data read and write speed. High RPM is especially critical if you use your computer for multimedia or video applications. Faster RPM doesn't make much difference for word processing or surfing the Net.

Secondary Considerations: Interface and Seek Speeds, as well as Buffer Size

Secondary considerations that taken together should have an impact on your buying decisions include Interface Speed, Seek Speed and Buffer Size.

Interface Speed

Interface speed is measured in ATA/100 or ATA/133. There isn't much noticeable difference between the two values. To get the maximum performance from your hard drive, its interface speed must match the interface speed of your PC. If not, you must install an interface card that matches the speed of the new drive.

Seek Speed

Average seek speed is how fast your drive can find a particular piece of data. This should not be a huge factor in your hard drive buying decision unless you need to copy large folders full of many small files, which makes it necessary for your PC to assemble small, scattered bits of data.

Buffer Size

The buffer is a memory cache on the drive. This cache is a repository for the temporary storage of data awaiting the next likely request of your computer's CPU. Because random-access-memory (RAM) is much faster than mechanical rotating storage, the buffer can speed up performance. Most new desktop hard drives have buffers of at least 2MB, which is perfectly acceptable for most uses.

Other Considerations:

- RAID
- SATA
- Moving Data to Another Drive

RAID!! What is it? Do You Need it?

In case you are interested, RAID stands for Redundant Array of Independent Disks. Simply stated, RAID allows you to use more than one hard drive to ratchet up your disk speed or retain a backup of your data in case a drive fails. In either circumstance, you will need more than one identical drives, and it's not particularly easy to configure them. More and more systems use RAID 0, which can markedly increase system speeds for reading and writing data. If you want to go for RAID you will need to choose a couple of drives that match the storage capacity you're looking for. Now that you can purchase 120GB hard drives for less than \$100, you can easily go for the RAID advantage. Making this decision easier is the fact that most new motherboards support Redundant Array of Independent Disks.

Take Serial ATA Seriously?

Serial ATA, known as SATA is definitely the way to go if you are building your own PC from the ground up. Even the most inexpensive mobos support SATA, and if you go with a SATA drive your PC system will be easier to set up. Plus, you'll have a much easier time moving your drive to a future PC. Now if you want to boost the storage

capacity of an older PC, choosing SATA is not such a simple proposition. In order to use a SATA drive you're going to have to add a SATA controller card, which can be costly. However, many of the new SATA controller cards have built-in options to add RAID support to your system. If you're a video editor or the kind of person who stores tons of digital data, it just might be worth your while. In the alternative, it's a wise choice to simply add a second parallel ATA drive. Some manufacturers are adding new wrinkles to SATA technology to enhance hard drive performance. For example, Seagate's Native Command Queuing (NCQ), which requires a native Serial ATA drive, accompanies one of its 160GB hard drives, improves performance by packing good aerial density, meaning it has more data than ordinary into a small space. NCQ allows the drive to master multiple outstanding commands simultaneously and utilizes an internal queue that can store up to 32 commands at once to allow the drive to quickly reorganize the commands so they can be written and read more efficiently. This particular Seagate drive with NCQ also uses 8MB of cache to help overall performance by caching sequential data hits.

Moving Your Data to Another Drive

When it comes time to add a new hard drive to your older PC, the new addition will almost always be faster than your existing drive. However, if all you do is install the new drive on your PC, you're going to maroon your operating system on the slower drive. In committing such an act of abandonment, you will forfeit some of the benefits of upgrading. So, make sure you use the newer, speedier hard drive as your boot drive. Hard-drive upgrade kits generally include software that will clone your existing drive to the new one, thus turning your faster drive into your boot drive.