Changing your Hard Drive

• **Do I need a new hard drive?**

If your PC is more than a year or so old, it probably has a hard drive that is small enough to be swallowed up quite quickly by the huge demands of modern home and office programs.

Your hard drive is used as semi-permanent storage of all of your programs, data files and for the Windows operating system itself. Modern office suites of programs use hundreds of Megabytes of storage at a time, as do the huge graphic and sound files stored on your hard drive by many modern 3D games.

Installation of Windows 2000 requires over 800 Megabytes of hard drive space alone, so you can see that older machines that may have been fitted with just one or two Gigabytes in total will very soon run out of space.

If your hard drive space runs low, Windows has to work harder and harder to find space available for its swap file. This is the clever memory management system that allows your PC to run programs and use datafiles that would add up to far more than your actual RAM memory would hold. It does this by swapping chunks of data that are not actually in use at the time to and fro between your RAM memory and hard drive storage.

How do I tell how much room is left on my hard drive?
It is easy to see how much space remains on your hard drive, simply double click the "My Computer" icon on your desktop and a window will pop open on your desktop showing all your drives and other peripherals. Click on the icon for your hard drive once to highlight it, then a little pie chart will open on the left of your screen showing how much of the drive is used, and how much is free.

If the amount of free space left is under 1000 Mb, it is worth considering fitting a new hard drive. Hard drives with huge capacities are now very inexpensive, so additional storage space has never been more economical. You can either replace your existing hard drive, or, somewhat more simply, add an additional drive and re-install some or all of your programs there, leaving your original C drive for the Windows operating system, and possibly the Windows swap file and some of your own document files.

How do I choose and fit a new hard drive?
It is worth checking any manuals or paperwork that may have come with your PC to look at the hard drive type fitted (watching the start up screens will also give you some details of this).

Most modern machines are fitted with an IDE hard drive, there are other types, and if the machine is fitted with an existing SCSI drive and interface, this slightly complicates matters. However, for the purposes of this guide we will assume that you are going to fit an additional IDE hard drive.

Exact models and sizes of hard drives are changing all the time, but it makes sense to buy the largest hard drive you can find within your budget at the time. Once you have chosen a hard drive and brought it home, all you need to do it fit it!

Fitting an additional hard drive
Before you fit your new hard drive, you will need to open the case of your PC.

Before you start to take screws out of the case, you should unplug everything, especially the mains supply cables. Modern PC power supplies are very well insulated, even once you lift the lid of your PC, but it simply isn't worth taking chances with either your safety, or your PC's! One touch with a screwdriver in the wrong place inside a PC that is inadvertently switched on will easily destroy the fine foil tracks on your motherboard.

Once everything is safely unplugged and you have the base unit standing on a stable well lit surface, turn it around to look at the rear of the case. The screws that hold the lid on should be quite easy to see, usually cross head or Philips screws. Try your best to take off only those that do hold the outer case lid on, or things may fall off inside your PC! There will probably be additional screws in either the sides of the case, or underneath each side rim or flange where it wraps under the chassis.

Once you have undone the screws, you should be able to fairly easily slide the lid back and up to take it off completely, for a normal desktop or slim-line case. Tower and mini-tower cases are often very similar, although some have a separate plate or part lid that may be removed to gain access to the top of the motherboard.

There are also a few case designs where the entire front panel and case surround is like a large sleeve that will need to be withdrawn from the front of the PC once the screws are removed, like a draw. These designs won't have a flanged arrangement at the rear of the case, though screws at the rear and side of the case may well still fix them.

Once you have removed the case lid, take a good look around inside the PC to find the best place to fit your new hard drive. It may well be that there is a spare mounting position next to the existing C drive, which tends to make cabling easier as well. If not, you can use another cable to connect to the new hard drive.

Before you fit the new hard drive, there is something you will need to set up. Most hard drives are fitted with a set of jumpers or links that tell them if another hard drive is fitted to the system, and, if so, whether they are the master drive (which the system boots from) or the slave (supplemental) drive.

Unscrew the existing hard drive and disconnect the broad flat data cable and four way coloured power cable to examine it closely. You may in some cases have to remove the mounting cage from the case to extract the hard drive, or sometimes to unscrew and remove neighbouring CDROM or floppy drives, which should simply slide out through the front of your case one any mounting screws are removed. If you have to remove any power or data cables to do this, note their orientation, although most will only fit one way around anyway.

Look at your existing hard drive and see if there is a little chart showing the options for jumper settings. There are usually different jumper positions for the following options;

Master, no slave present.
Master, slave present.
Slave.

If this is the case and you wish to continue to boot your machine up from the original hard drive (much the easiest option) then change the linking arrangements on your hard drive to the "Master, slave present" option.

If you are unlucky enough to have a hard drive where the jumper arrangements are not so conveniently described, the best thing to do is to take the make and model number of the drive from the sticker on it, and find a way to go online to the Internet. Type the model number in on any search engine along with the words "jumper links". This will most probably return any number of sites that will give you the jumper information you need for your drive.

Having reconfigured your original Hard drive, you need to look at the information that came with your new hard drive, which was probably supplied with default settings identifying it as a master drive, and reconfigure it as a slave.

You may now fit both hard drives back in the case and fit the data and power cables to them. PC cases always have several spare power leads so you should be able to find and route a spare connector to your new drive quite easily.

Some data cables are already fitted with a second hard drive connector, and the cable provided with your new hard drive may well have this extra connector fitted. If your cables do not have the required extra data connector, you may do one of two things, depending on your system configuration.

You may choose to purchase a new IDE data lead with the extra connector (such as the Maplin DG40T), which is the only possible option with older PC's with only a single IDE channel unless you buy an extra IDE interface card.

Alternatively, as most modern PC's are fitted with two IDE channels, you may simply use the extra lead provided with your need hard drive to connect the new drive to IDE channel 2. Please note that if you do choose to do this, you should set both drives to their "Master, no slave present" jumper configuration. IDE hard drives are often fitted as either slaves to the main hard drive, or as Secondary Master drives on channel 2, so you may need to juggle drives and jumper setting around to find the best combination.

Once the hard drives are securely mounted and wired into your system, reassemble the case and refit all peripheral connections. You are now ready to start the software reconfiguration to use your new hard drive.

Please note at this stage that there can be some complications in using a very large hard drive, especially if you have a rather elderly motherboard in your PC. BIOS programs in older PC's could not cope with very large hard drives unless they were partitioned into smaller and more manageable "virtual" drives.

There are various pieces of software that will help you set up and partition a new hard drive, and it is beyond the scope of this guide to go into them in detail here. However, Maplin stock several different programs that you may find useful if you need to do this, such as Partition Magic (order as GM93B).

When you first power your PC up after fitting your new hard drive, you will need to hit the "Del" key when prompted in order to enter the BIOS configuration program. The main menu should contain an item called "Auto detect hard drives" or something similar. Note that very old PC BIOS software did not have this option, but if your PC is this old, you should really consider a more radical upgrade or replacement of the entire unit.

Selecting the auto detect option should rapidly result in a complex set of numbers being displayed. Check that the BIOS seems to have correctly identified the size of your original hard drive (which should have been identified first) and type "y" and return to accept the choice.

If you have fitted your new hard drive as a slave to the original master, the BIOS should then detect it as a Primary Slave, hit "y" and return to accept this setting. Otherwise, you may find the new drive as the Secondary Master. Do not expect your BIOS to see an IDE CDROM drive at this point.

If either your master or slave drive did not auto-detect at this stage, you need to double check all jumper settings and data cable connections before continuing. If all seems correctly connected, there may just be some sort of compatibility problem between the different drives on your machine.

Sometimes, hard drives of different makes don't work happily together in a master / slave configuration. Fortunately, with 2 IDE channels, you usually have the option to swap things around, reset the jumpers and try the BIOS auto-detect again until all drives appear.

Once you have saved your BIOS settings and rebooted the machine, check that the IDE CDROM drivers load and initialise correctly, and that Windows starts up as usual. Double clicking the "My Computer" icon should now result in the new drive being displayed and ready to use.

Please note that your CDROM drive letter may have shifted up because of the new drive being assigned the letter D, for example. It may be possible to reconfigure the CDROM drive letter using Control Panels "System" utilities, or you may opt to re-install any CD dependant software on your new hard drive, which will automatically reconfigure the settings for that program.