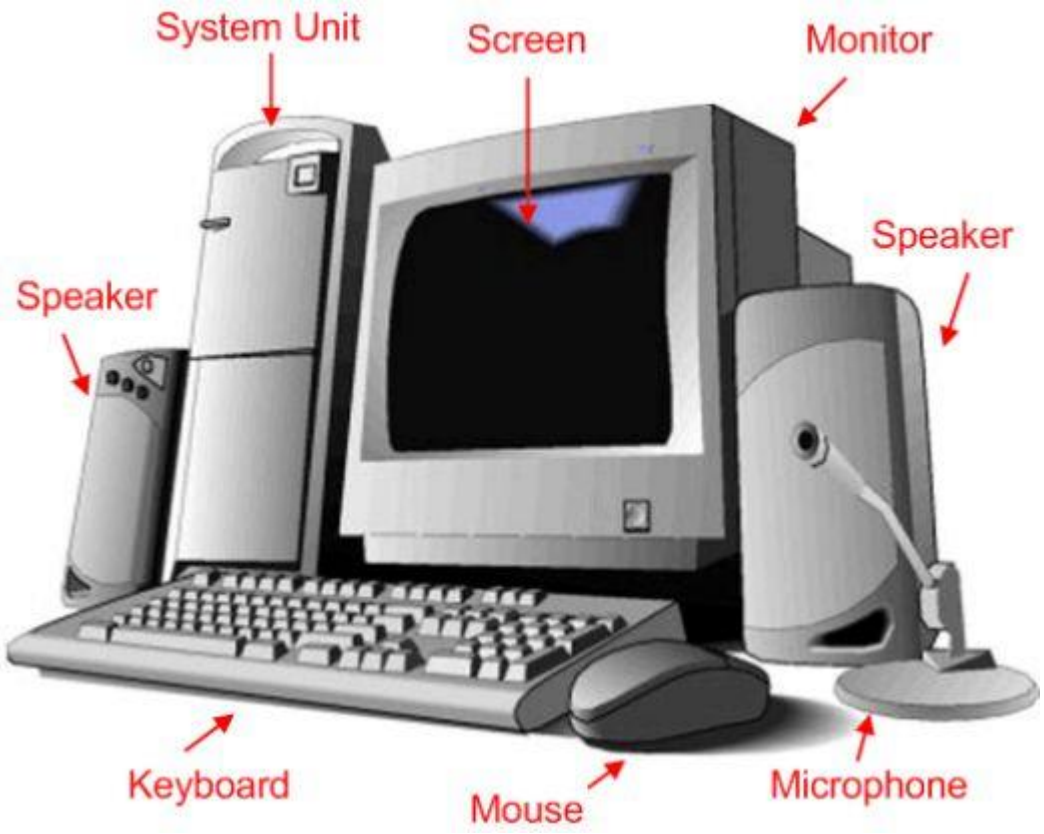
Anatomy of a Personal Computer

External Parts

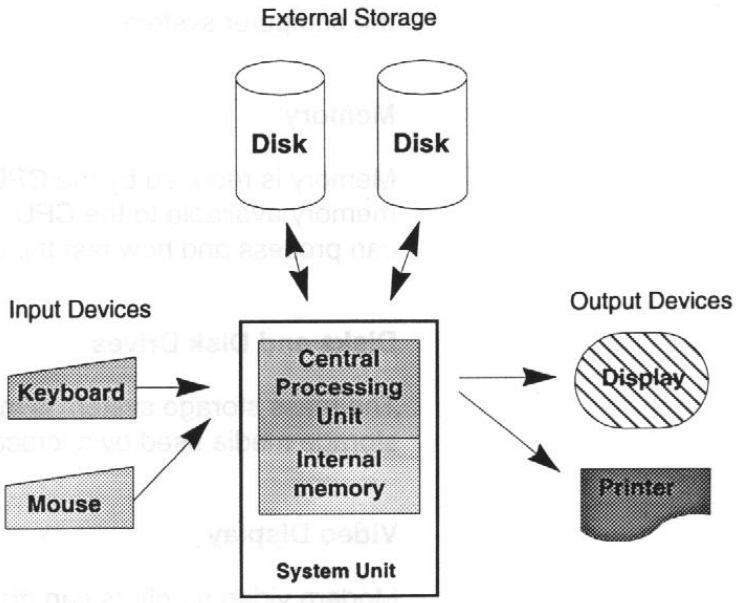


A computer is made up of four essential parts: the system unit, monitor, keyboard, and mouse. It would be very hard, if not impossible, to operate the computer if one of these were missing. You could, of course, still use the computer without a mouse if you memorized all the keyboard shortcuts, but the graphical nature of most programs nowadays has made the mouse an indispensable part of the computer.

The system unit is the main part of the computer where all the action takes place. It houses all the components that make your computer run. Many people mistakenly refer to it as the CPU when in reality the CPU is just a small chip inside the system unit.

Internal Parts

Conceptually a computer can be viewed as a number of linked building blocks, as shown below:



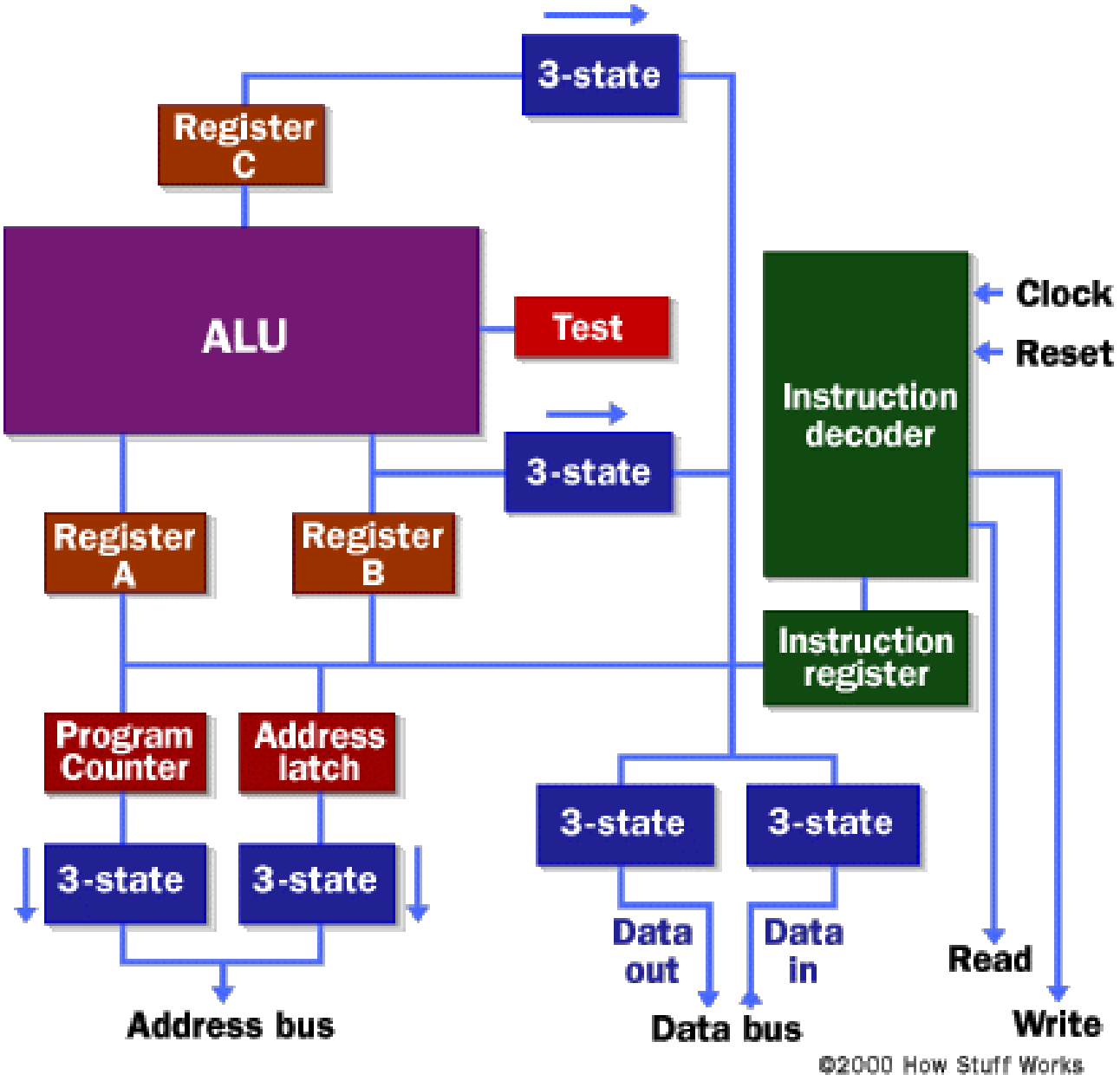
The term "computer" has also been loosely used to refer to the system unit. The system unit is composed of the following main components:

Central Processing Unit (CPU)

The CPU or processor is the "brain" of the computer. It performs all the operations that the computer does, from simple encoding of text to complex rendering of video. So, the faster the speed of your processor, the faster your computer will run.

The most well-known processors are probably the Intel Celeron family, Intel Pentium family, and now the Intel Core family. To put it simply, the Celeron series is for those who use their computers mainly for word processing, using programs such as Microsoft Word or Excel; the Pentium series is for those who are into multimedia such as music and video; and the Core series is for computer users who do a lot of multitasking.

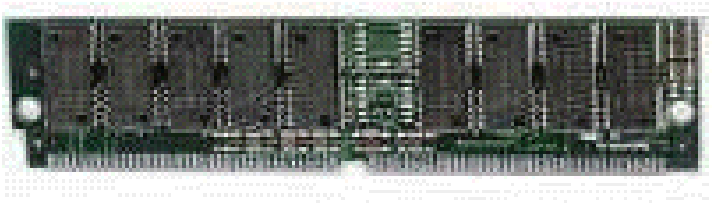
Internal architecture of a simple Microprocessor



Random Access Memory (RAM)

Usually referred to as "memory", RAM is second to the CPU in determining your computer's performance. It temporarily stores your computer's activities until they are transferred and stored permanently in your hard disk when you shut down or restart.

Memory cards can be 128MB (rare nowadays), 256MB, 512MB, 1GB, or 2GB. A lot of older computers can hold up to 1GB of RAM only. Newer ones however, can have as much as 2GB and even 4GB (by using two 2GB memory cards). The more memory your computer has, the faster it will respond. But not all motherboards are equipped to hold large memory cards so read the manual first and check the maximum RAM your motherboard can support.



Hard Disk Drive (HDD)

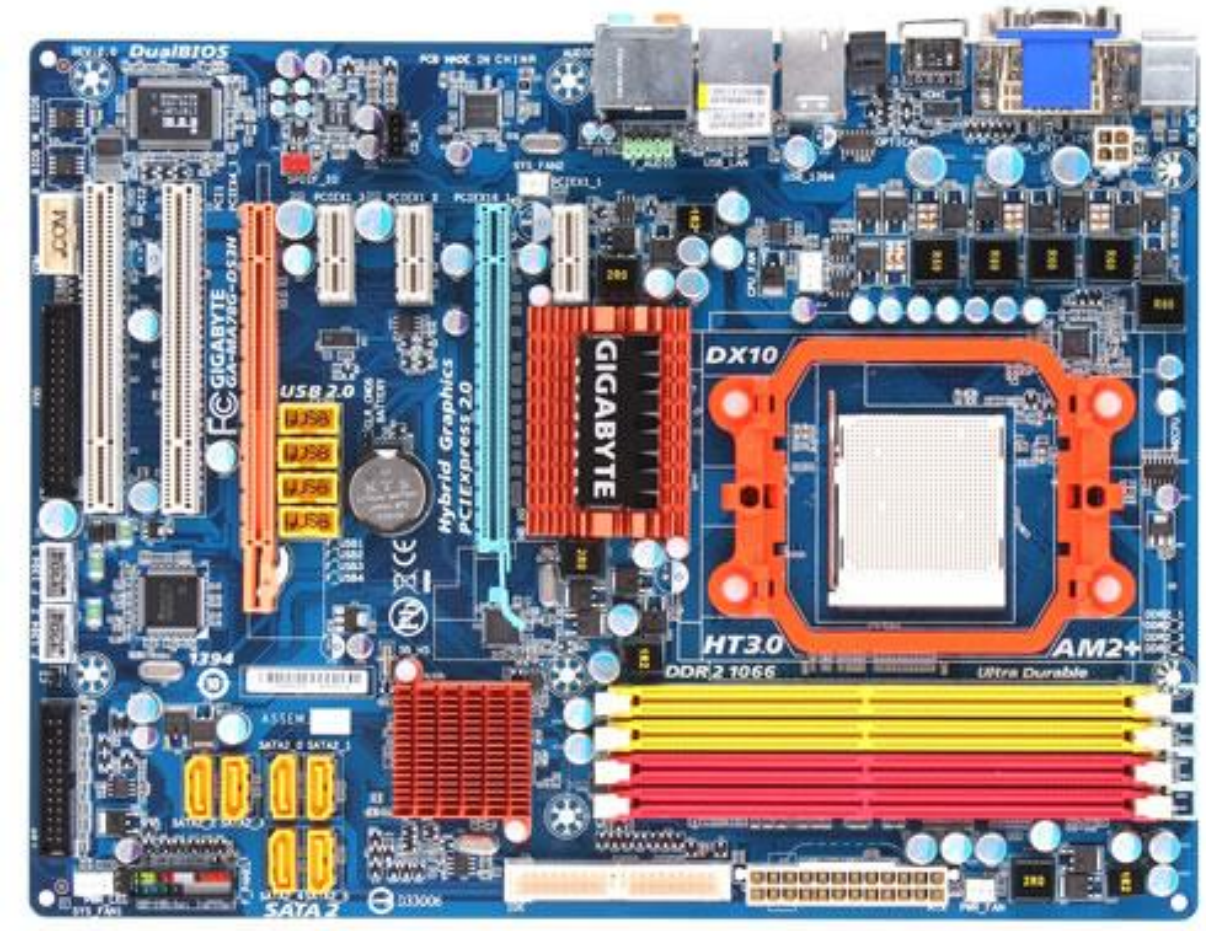
The hard disk drive, more commonly known as the hard drive or hard disk, is where all data and programs are stored in your computer permanently, unless you delete them. Generally speaking, a hard disk with a higher capacity is always better.

The more common hard disk storage capacities are 40GB, 80GB, 120GB, 160GB, 250GB, 400GB, and 500GB. It's always a good idea to choose a hard disk with a large capacity especially if you want to download and store movies - an average high quality DVD movie can take up more than 4GB of hard disk space!

Motherboard

The motherboard is where all the other devices in your computer such as the processor, memory, hard disk, and CD/DVD drives are connected. To prevent problems that may lead to loss of data in the future, choose a good quality motherboard.

Motherboards usually have a LAN port for networking and internet, an internal modem for internet connectivity, and built-in USB ports for your USB devices such as printers and flash drives. Newer motherboards also have 4-6 SATA ports for your SATA devices such as hard drives and one IDE port for your CD/DVD drive.



A word (or two) on Safety

It is worth mentioning here before starting to delve further into the workings of the PC that you need to take care not to either electrocute yourself or others or damage the PC.

As there is mains electricity going into the PC it is not a good idea to have the PC powered up while doing any work within it. If you are going to insert new or replace any internal cards into the machine make sure firstly that the PC is switched off from the main on/off switch.

If you have a new ATX style PC you may also find that there will be a smaller on/off switch at the back of the unit. Make sure this is also OFF. And thirdly make sure the power cord is plugged into the PC and also plugged into a SWITCHED MAINS SOCKET, with the socket supply SWITCHED OFF.

This is important as PC components can be damaged by static electricity, having the machine plugged into the mains with the mains turned off still allows the PC to be connected to the mains earth. Doing this stops any static from building up in the PC and also if you make sure you touch a part of the grounded metalwork of the PC before you start to work in it, this will also ensure that any static charge built up in your body or clothes will be discharged to ground before it can do any damage to the PC.

There may be times when you will need to be working on the inside of the PC while it is powered up. For instance if you have a faulty internal cable connection and the only way to isolate the fault is to start tapping individual connectors and cables to force the problem to occur. Make sure you are not wearing any metallic rings, cufflinks or jewellery that may cause shorting also if you are wearing a tie, either tuck it into your shirt or take it off as this could get sucked into to one of the many fans inside a modern PC.

General Maintenance

For the most, maintaining your PC in good working order is a matter of common sense.

Please Note – when undertaking any operation, which involves taking the lid off a computer, it is essential that simple safety measures are taken to ensure the good health of both you and the computer (see “A word on Safety” above).

1) The first thing to be aware of after buying or getting hold of a PC is where to put it. Location is quite an important factor where life expectancy and reliability of a PC is concerned. It is a good idea to locate the PC so that it is easily accessible and allows for an unimpeded airflow from its rear fan. Enclosing or surrounding the PC so that heat cannot escape will cause overheating and eventually lead to damaged components, and hence a faulty machine. Locating a PC near to a radiator is also a bad move.
2) Once in a while (depends on how dusty the environment is and how many cats/dogs you have) take the lid off the PC and use “Dust Chaser” (a can of compressed air) to blast out all the cobwebs, dust etc., from the inside of your machine. A build-up of dust can cause both heat and bad electrical contact connection problems. DO NOT use a vacuum cleaner (especially with a metal nozzle) directly inside the PC as this may cause static electricity to build up within the machine which could cause damage to components. Make sure the PC is turned off before attempting to clean the inside.
3) Ensure that if you have removed any of the rear metal blanking plates for whatever reason, - maybe you have moved the location of or installed a new PC card, - that this is replaced so as not to leave large holes in the back of the machine. These also effect internal airflow and cooling of components inside of the PC.
4) Check the operation of the power supply, CPU and any other fans at regular intervals. One of the most common causes of PCs failing is over-heating caused by faulty fans. It is not

recommended to try and replace a **P**ower **S**upply **U**nit's fan, even if the PSU is unplugged from the mains. It is a much better, safer and probably cheaper idea to just replace the whole PSU unit. CPU fans can normally be replaced by the simple means of unclipping/unscrewing them from the CPU's heat-sink and replacing with a new fan. With regards to the Pentium II and III machines the fan usually comes fitted to the CPU assembly but can be removed and replaced with a suitable working fan.

5) Make sure that there are no bits of paper or any other items capable of blocking the escape of heat from the top of your PC's monitor.
6) Don't put a vase with flowers and water, however pretty on top of or near to the PC and monitor.
7) Make sure all cables are as neatly as possible tucked away behind the machine and not laying around in the path of people, children, animals etc.
8) If you have a CD/DVD ROM drive, ensure that the sliding drive tray is not obstructed, as damage to the drive may occur if it is unable to open/close properly.
9) A good tip for parents of younger kids. Check the floppy disk drive and your CD/DVD ROM drives for "letters", before loading disks.
10) Ensure all media is kept in a clean and dry environment and at a comfortable temperature. In other words don't leave CDs, diskettes etc. lying around or they may be damaged and especially where CD/DVDs are concerned sticky stuff on them may be transferred to the optical system and be impossible to clean.
11) Try not to touch the data area of diskettes and CD/DVDs with your fingers. Hold CD/DVDs either in the centre or by the rim.
12) Don't switch the PC/Screen off and on quickly. If the PC locks up and you need to cold boot the system, either try the reset button (if it exists) or switch the PC off and count to 10 before switching back on again.
13) Run Scandisk and Defrag at regular intervals.
14) Empty the Recycle bin regularly.
15) Clear out temporary Internet files regularly
16) Run Disc Clean-up regularly, especially when things start to slow down a bit.
17) And lastly, make sure you carry out regular backups of your data. Currently most Hard Disc Drives are electro-mechanical devices which contain spinning discs and movable magnetic read/write heads. These will become faulty at some time, and when this happens you will unfortunately lose all of your data, unless you have made a backup on another separate device.

New Computing Concepts

What is Cloud computing?

And why is it important?