

Hardware and Software

Computer Basics

Internal Components

The **motherboard** is the main printed circuit board (PCB) of the computer into which all other components are connected.

The **processor** is the brain of the computer often called the CPU; it is where all of the calculations being asked of the computer occur.

System memory is temporary storage which is often simply called RAM; it is where data is held temporarily while the processor works on it to complete tasks. For example, it is where an open document is held.

Long term storage comes in two forms. One is a **hard disk drive** which is a disk or set of multiple disks that rotate at high speed that magnetically store data. The other is a **solid state device** which uses integrated circuit assemblies to store data like a USB flash drive. Both forms are “permanent” storage as compared to RAM but neither is truly permanent as anything can fail and a failure results in lost data so both are more accurately termed long term storage. This is why everyone should back up their data preferably to the cloud.

Optical drives read and usually can write data to disks such as DVD’s using a laser.

The **case** is a box into which all the internal components are placed.

The **power supply** converts the household wall electricity from alternating current (AC) to direct current (DC) which is the type of electricity that a computer requires.

The **sound device** sends information to the speakers. It is usually built into the motherboard. If better performance is desired, an expansion sound card can be installed.

The **video device** sends information to the monitor. It is usually built into the motherboard. If better performance is desired, an expansion video card can be installed.

The **networking device** allows a computer to communicate with other computers including web servers on the internet. It is usually built into the motherboard. If better performance is desired, an expansion network interface card can be installed.

Acronyms

Expanding the acronym PCB yields Printed Circuit Board.

Expanding the acronym CPU yields Central Processing Unit.

Expanding the acronym RAM yields Random Access Memory.

Expanding the acronym HDD yields Hard Disk Drive.

Expanding the acronym SSD yields Solid State Device but many people say Solid State Drive or Disk.

Expanding the acronym DVD yields Digital Versatile Disk but many people say Digital Video Disk.

Expanding the acronym GUI yields Graphical user Interface.

Malware

Antivirus software is software that protects a computer from being infected by viruses and other types of malware. No one should use a computer without having antivirus software installed. There are many free options. Often ranked as the best free option is the software from AVAST.

Malware is short for malicious software and is any software used to disrupt computer operation, gather sensitive information, or gain access to private computer systems. It includes computer viruses, worms, Trojan horses, spyware, ransomware, scareware and dishonest adware.

A **virus** is a malware program that, when executed, replicates by inserting copies of itself into other computer programs, data files, or the boot sector of the hard drive. When this replication succeeds, the affected areas are then said to be "infected". It often performs some type of harmful activity on infected hosts, such as stealing hard disk space or CPU time, accessing private information, corrupting data, displaying political or humorous messages on the user's screen, spamming their contacts, or logging their keystrokes.

A computer **worm** is a standalone malware computer program that replicates itself in order to spread to other computers. Often, it uses a computer network to spread itself, relying on security failures on the target computer to access it. Unlike a computer virus, it does not need to attach itself to an existing program. It almost always causes at least some harm to the network, even if only by consuming bandwidth, whereas viruses almost always corrupt or modify files on a targeted computer.

A **Trojan horse**, or simply a Trojan, in computing is a generally non-self-replicating type of malware program containing malicious code that, when executed, carries out certain actions, typically causing loss or theft of data, and possible system harm. The term is derived from the story of the wooden horse used to trick defenders of Troy into taking concealed warriors into their city, because they often employ a form of social engineering, presenting themselves as routine, useful, or interesting (often an e-mail attachment disguised to be unsuspecting, e.g., a routine form to be filled in) in order to persuade victims to install them on their computers. Affected computers may appear to run slower due to heavy processor or network usage.

Ransomware is a type of malware which restricts access to the computer system that it infects, and demands a ransom paid to the creator(s) of the malware in order for the restriction to be removed. Some forms of ransomware encrypt files on the system's hard drive while some may simply lock the system and display messages intended to coax the user into paying.

Spyware is software that aids in gathering information about a person or organization without their knowledge and that may send such information to another entity without the consumer's consent, or that asserts control over a computer without the consumer's knowledge. It is mostly used for the purposes of tracking and storing Internet users' movements on the Web and serving up pop-up ads to Internet users. Whenever it is used for malicious purposes, its presence is typically hidden from the user and can be difficult to detect. Some types, such as keyloggers, may be installed by the owner of a shared, corporate, or public computer intentionally in order to monitor users.

Adware is a type of spyware which automatically renders advertisements in order to generate revenue for its author. The advertisements may be in the user interface of the software or on a screen presented to the user during the installation process of other software. The functions may be designed to analyze which Internet sites the user visits and to present advertising pertinent to the types of goods or services featured there. The term is sometimes used to refer to software that displays unwanted advertisements.

Scareware is software that usually has limited or no benefit that is sold to consumers via certain unethical marketing practices. The selling approach uses social engineering to cause shock, anxiety, or the perception of a threat, generally directed at an unsuspecting user. A tactic frequently used by criminals involves convincing users that a virus has infected their computer, and then suggesting that they download (and pay for) fake antivirus software to remove it. Usually the virus is entirely fictional or malware itself.

Windows Shortcuts

Ctrl +c is the windows shortcut to copy something like some text to the clipboard.

Ctrl +v is the windows shortcut to paste something like some text from the clipboard.

Ctrl +s is the windows shortcut to save a file.

When using Windows/File Explorer, if you want to select multiple files that are in a continuous list, you can click the beginning of the list and then **shift click** the end of the list and this will select the file at the beginning of the list, the file at the end of the list and ALL the files in between.

When using Windows/File Explorer, if you want to select multiple files that are NOT in a continuous list, you **ctrl click** each file to select it.

When using Windows 7 or above, if you want to **snap** an open window to the right half of the screen, you hold down the Windows key while you press the right arrow key.

Computer Peripherals

The **keyboard** is the main manual device used to input information into a computer.

Speakers allow the user to hear sound produced by the computer.

Computer speakers need to be **powered** because they do not have strong magnets in them to amplify sound because strong magnets can damage computers.

The **monitor** allows the user to see images produced by the computer.

Monitors are typically **connected** using either HDMI, DVI or VGA cables.

The **mouse** is the main device used to navigate a GUI type operating system such as Windows.

Computer People, Companies and Terms

Binary code is the language of computers consisting of sequences of ones and zeroes.

Bit is short for binary digit; it is the smallest unit of data.

One **byte** equals eight bits.

Bill Gates founded Microsoft with Paul Allen and even though he no longer actively runs the company, he is still the person most people associate with Microsoft.

Steve Jobs founded Apple with his friend Steve Wozniak and even though he is dead, he is still the person most people associate with Apple.

Intel and AMD are the two brands of CPU's presently available for home computers.

MAC's are only made by Apple.

PC's are made by numerous companies and can also be made by just about anyone.

The **operating system** is the software that runs your computer, allows you to open files and save new files in an organized way; the most common one is Windows.

Internet Explorer is a browser used to display internet content. **Windows/File Explorer** is used to browse for files and folders on a hard drive of a computer using the Windows operating system.