

*The Electronics online
challenge.*

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Team Number 15158A*

All the parts of the computer and how they work.

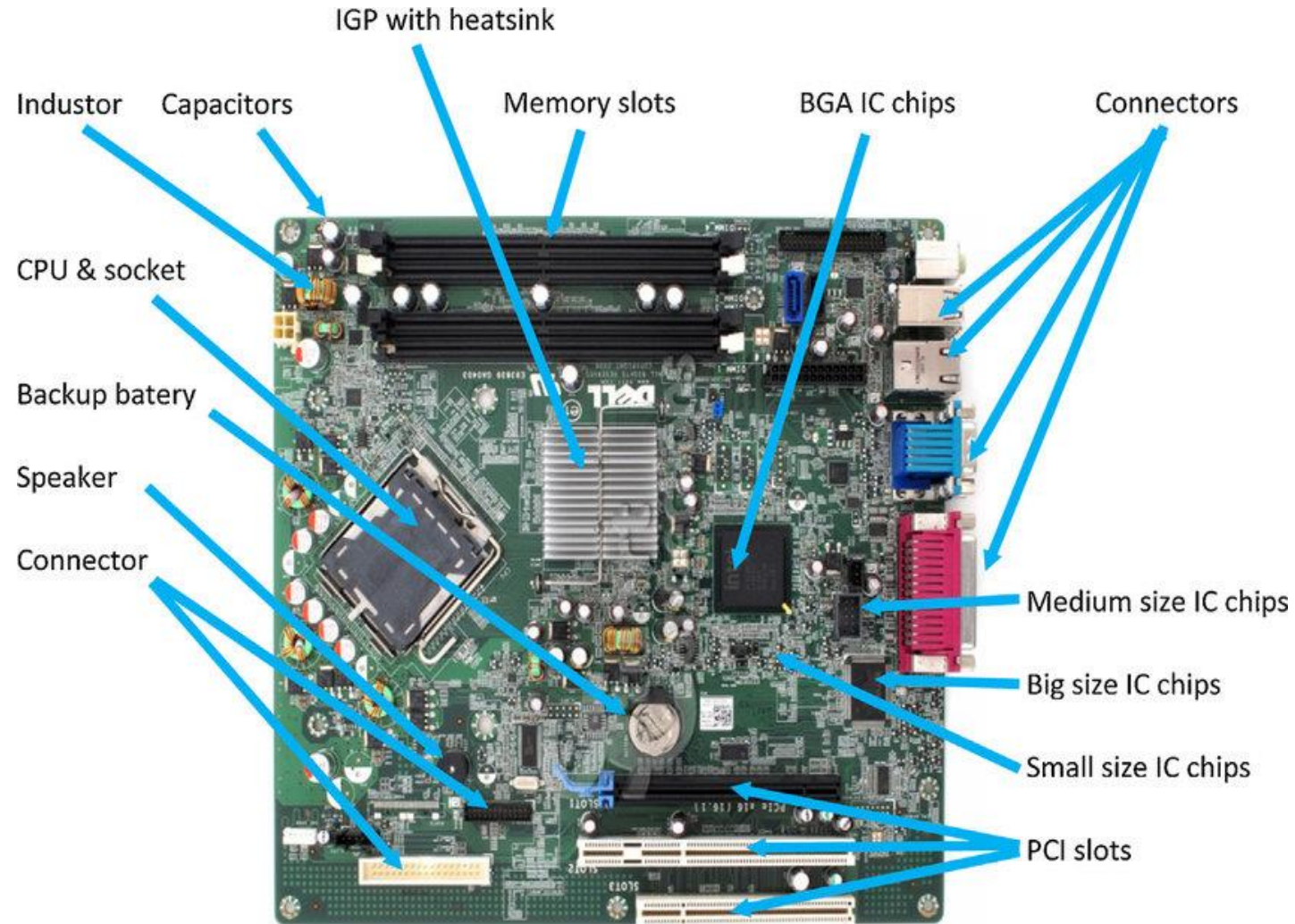
The computer case

This is the part that holds all of the internal components to make up the computer itself. It is usually designed in such a manner to make fitting a motherboard, wiring, and drives as easy as possible. Some are designed so well that it is easy to make everything look tidy and presentable too. Cases come in all different shapes and sizes to accommodate various types of computer components and to satisfy the needs of the consumer. Design elements can vary from being plain to extremely elaborate. You can get a plain grey case or one that has colored lighting everywhere to make it look spectacular.



Motherboard

- The motherboard (sometimes called a mainboard for the politically correct), is what ties everything together. It's the huge circuit board that **everything connects to and routes information** to where it needs to go. For example, when you play a song on your computer, here's what happening with the motherboard:-
- You use your mouse or keyboard to a request to load a file from the hard drive.
- - It gets routed into **RAM (memory)** and from there to the processor.
- - The processor then sends the information from that music file to your sound card.
- - Lastly, your sound card is hooked up to your speakers, and thus: Ta da!!! You hear the sound of your favorite song.



Central processing unit (CPU)



- The CPU is basically like the brain of a computer. It processes all the information on a computational level.
- It takes information from the RAM and processes it to perform the tasks required from the computer.
- It is usually seated in a socket that utilizes a lever or a latch with a hinged plate with a cut out in the center to secure it onto the motherboard.
- It has many copper pads underneath it for the contacts of the socket to push up against them to make electrical contact.
- There are other ways CPU's can be attached to the motherboard.

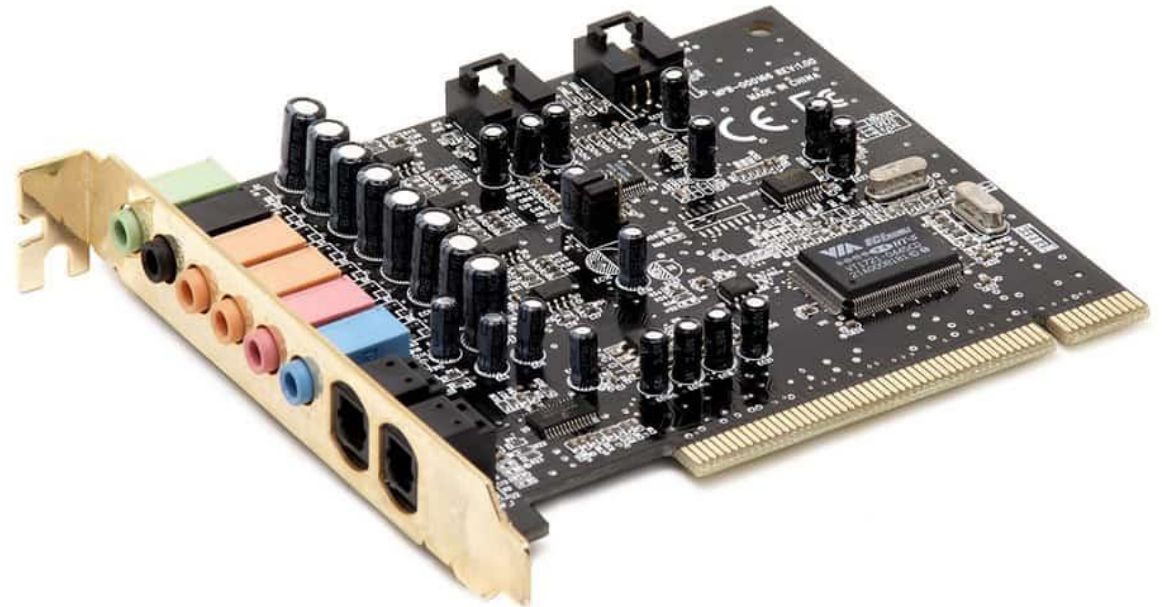
Random access memory

RAM is a data storage device that can provide fast read and write access. RAM is also volatile which means that it loses all the stored data the moment power is lost. The RAM keeps data ready for the CPU to process. The speed of the RAM is a big contributor to the overall speed of a computer. RAM is also a "temporary memory." It does not store things once the computer is turned off. It generally only stores things that are open and running. Whenever you open a program, visit a webpage or do just about anything in the computer, it gets loaded into RAM. When you close the application, then space in the RAM is freed. That is why your computer gets so slow when you have too many applications open; your RAM is probably being used at capacity. The reason RAM exists is because it is significantly faster than the hard drive.



Sound card

The sound card is what produces all the audio you hear. Most of the time this is now integrated into the motherboard, but not always. The sound chip that builds into the motherboard is used for audio output. Without the sound card you hear nothing. But, if you are a sound enthusiast or prefer higher detailed audio while playing a game, you might be inclined to use a sound card. Sound cards plug into a computer in multiple ways. It can be through USB, PCI slot, or PCI Express x 1 slot. A sound processing chip on the card does all of the audio processing and is usually not a very powerful processor. A sound card can offer a wide range of connectivity with various audio equipment. A few examples could be optical audio, 1/4 inch jack, or RCA connectors.



The graphics card/video card

A graphics card processes the data from the motherboard and sends the appropriate information to the monitor in order for it to be displayed. A graphics card can also be referred to as a video card or a display card. *The video card* is a dedicated component that hands the images output by your monitor display. They come with their own RAM, dedicated to this singular purpose. If your work involves highly visual work at very high definitions, then you should get yourself a video card to take the load off your RAM. Sometimes, the computer may have integrated graphics, where some of the RAM is borrowed for graphics processing. This happens frequently on laptops, because there is a need to save space. Using integrated graphics is much less expensive using a graphics card, but is not sufficient for intense graphics functions.



Hard drive

A hard drive is found in most computers. It's usually a mechanical drive that stores all the data. Apart from storing data, it can also be used as a boot drive in order to run the operating system from it. An operating system is a software program that makes a computer useable. Like Microsoft Windows for example. The biggest vulnerability of a mechanical drive is the physically fragile nature of it. One bump the wrong way can destroy a whole drive. A mechanical hard drive contains one or more platters that spin anywhere between 5200 to 10000 RPM (revolutions per minute). The read and write heads are spaced only about 0.002 (51 micro M) of an inch away from the platter.



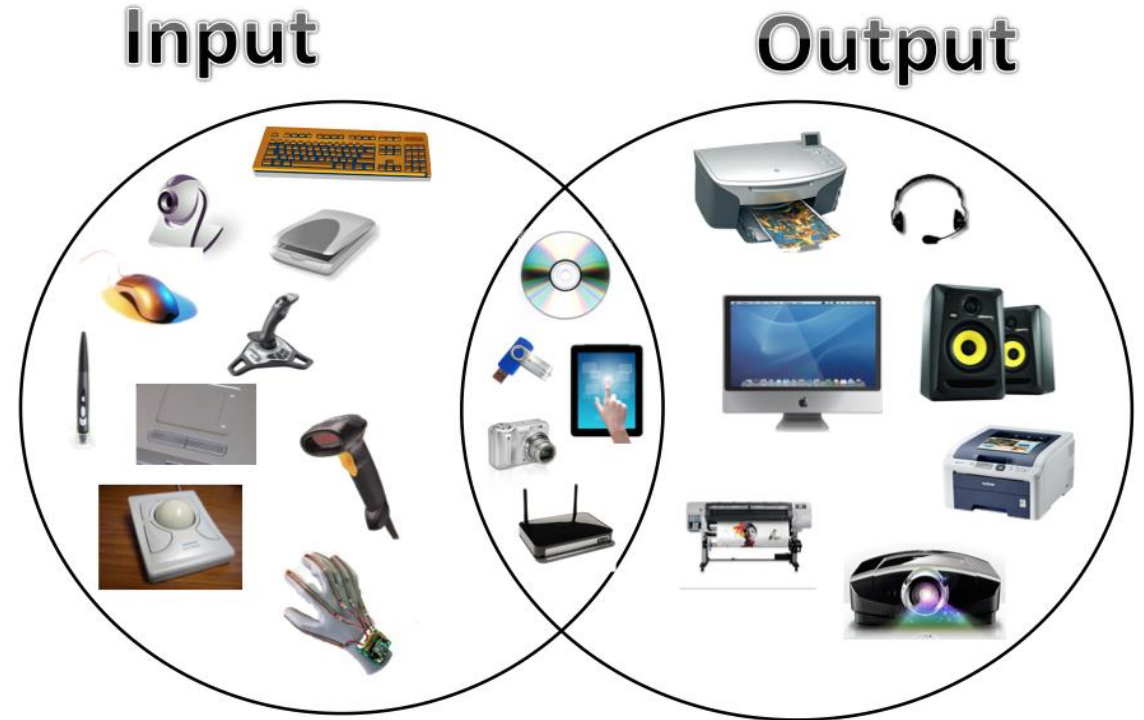
The optical drives

These have become a lot less common today, with many machines doing away with them altogether. An *optical drive* is used to read CDs and DVDs, which can be used to listen to music or watch movies. They can also be used to install software, play games, or write new information into a disk. Some common types of optical drives include CD-ROM, CD-RW, DVD-ROM, DVD-RW, and Blu-ray drives. CD and DVD writers, such as CD-R and DVD-R drives use a laser to both read and write data on the discs. The laser used for writing the data is much more powerful than the laser that reads the data, as it "burns" the bumps and dips into the disc. While optical drives can spin discs at very high speeds, they are still significantly slower than hard drives, which store data magnetically. However, because optical media is inexpensive and removable, it is the most common format used for distributing computer software.



Input or output devices

Depending on the type of computer you have, there are lots of devices you can connect to your computer to input information and also output it. Some examples of *input devices* are the mouse, the keyboard, and the webcam. Examples of *output devices* include monitors, speakers, and monitors. There are also removable devices, such as SD cards and flash drives, which can be used to transfer data to and from your computer.



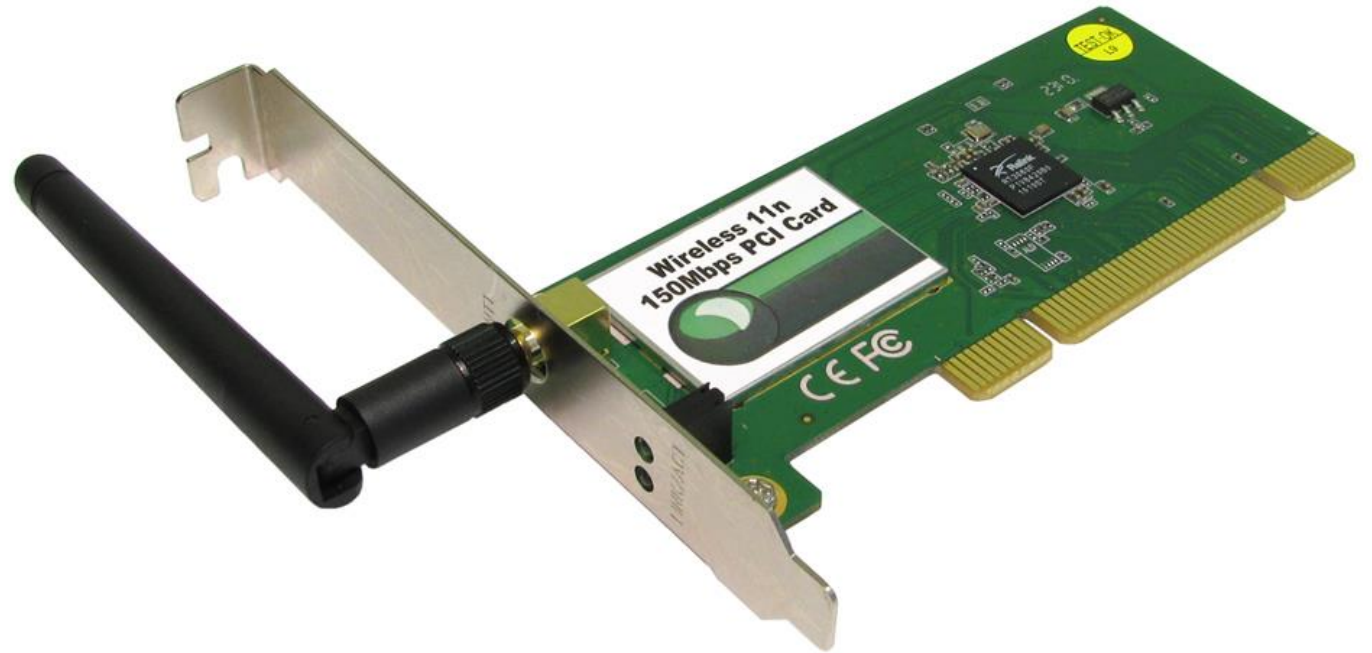
Power supply unit



- A power supply mounts inside the computer case. This converts the AC mains supply from the wall socket and supplies the correct DC voltages to all the components inside the computer.
- A computer power supply supplies the following voltages:
- **+3.3v**: This voltage is supplied to the motherboard.
- **+5V**: This voltage is supplied to the motherboard and other internal components.
- **+12V**: This voltage is supplied to the motherboard and other internal components.
- **-12V**: This voltage is supplied to the motherboard.
- You get different wattage ratings for power supplies. The higher the wattage, the higher the amount of electrical current can be made available to parts that need it.
- The higher you go in Watts, the more the power supply will be likely to cost.
- A power supply also comes with its own cooling fan. This helps all the internal components to stay cool when the power supply is subjected to bigger loads.

Networking Card/ Wifi

The Internet and our "modern era" wouldn't exist without this wonderful device! It, like the sound card, is nearly always integrated into the motherboard. This component is what is responsible for sending and receiving information to and from your computer. When you pull up a website, you can thank the network card for getting that information for you. When you are watching Netflix - again it's the network card getting that information from Netflix. Basically any communication outside of your computer is done with this device. If it weren't for your network card, you wouldn't be reading this article!



Operating system



Work cites

<https://smallbusiness.chron.com/parts-computer-uses-54052.html>

<https://www.pccomputerguy.com/Tech-Tips-Podcast-Parts-of-a-Computer>

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