

Computer Systems Servicing NC II

- ***Electronic Sector***



Familiarization with the various computer systems components and peripherals

PS/2 Port

- The PS/2 connector is a 6-pins Mini-DIN connector used for connecting some keyboards and mice to a PC compatible computer system.



Serial Port

- A serial port is a serial communication physical interface with 9 pins through which information transfers in or out one bit at a time (contrast parallel port).



Parallel port

- A parallel port is a type of interface found on computers with 25 pins (personal and otherwise) for connecting various peripherals. In computing, a parallel port is a parallel communication physical interface. It is also known as a Printer port or Centronics port



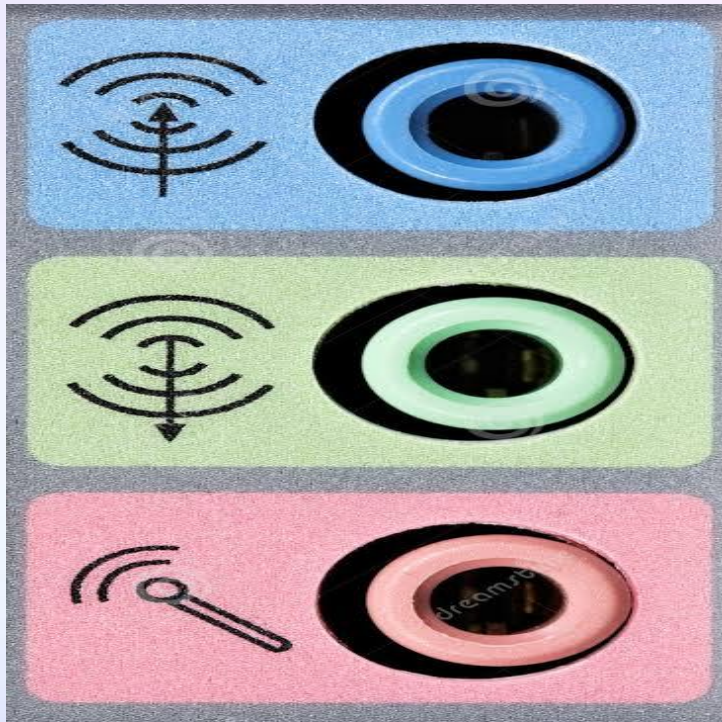
USB Port

- Universal Serial Bus (USB) is a specification to establish communication between devices and a host controller (usually a personal computer), USB has effectively replaced a variety of interfaces such as serial and parallel ports



Sound Port / Audio Port

- Facilitates the input and output of audio signals to and from a computer under control of computer programs.



Mic-in/Digital I/O jack



Line-in jack

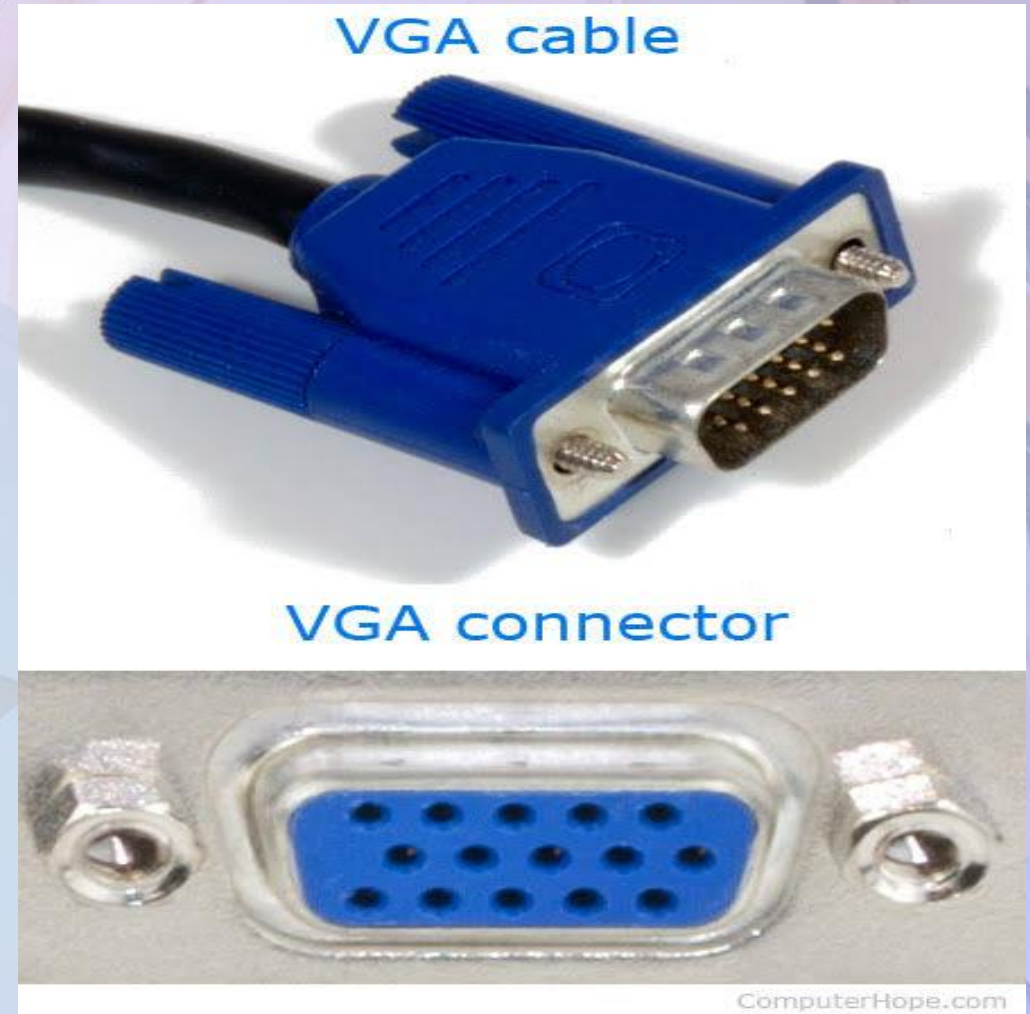


Line-out jack



Video Graphics Array (VGA) Port

- A Video Graphics Array (VGA) connector is a three-row 15-pin DE-15 connector. The 15-pin VGA connector is found on many video cards, computer monitors, and some high definition television sets. On laptop computers or other small devices, a mini-VGA port is sometimes used in place of the full-sized VGA connector.



DVI Port

- The Digital Visual Interface (DVI) is a video interface standard covering the transmission of video between a source device (such as a personal computer) and a display device. The DVI standard has achieved widespread acceptance in the PC industry, both in desktop PCs and monitors. It has 24 pins but some has only 18 pins.



HDMI Port

- HDMI (High-Definition Multimedia Interface) is a compact audio/video interface for transmitting uncompressed digital data. It is a digital alternative to consumer analog standards, such as radio frequency (RF) coaxial cable, composite video, S-Video, SCART, component video, D-Terminal, or VGA



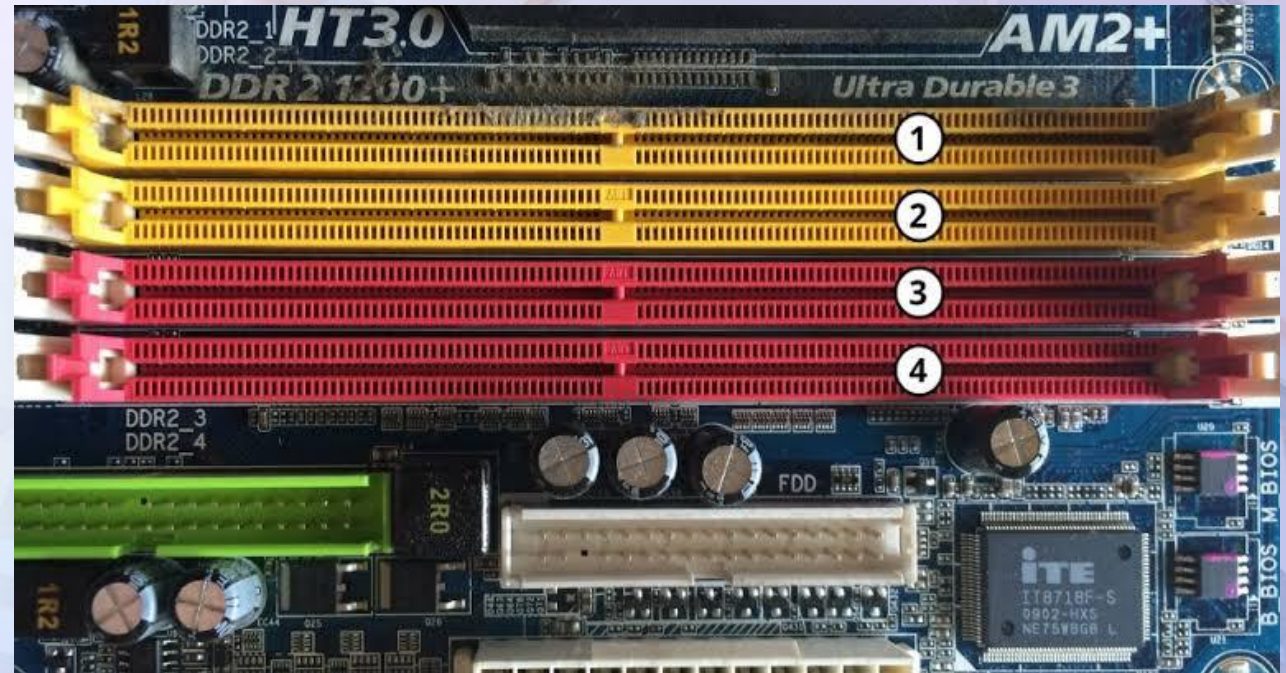
Ethernet Port / LAN Port

- Ethernet is the most common type of connection computers use in a local area network (LAN). An Ethernet port looks much like a regular phone jack, but it is slightly wider. This port can be used to connect your computer to another computer, a local network, or an external DSL or cable modem.



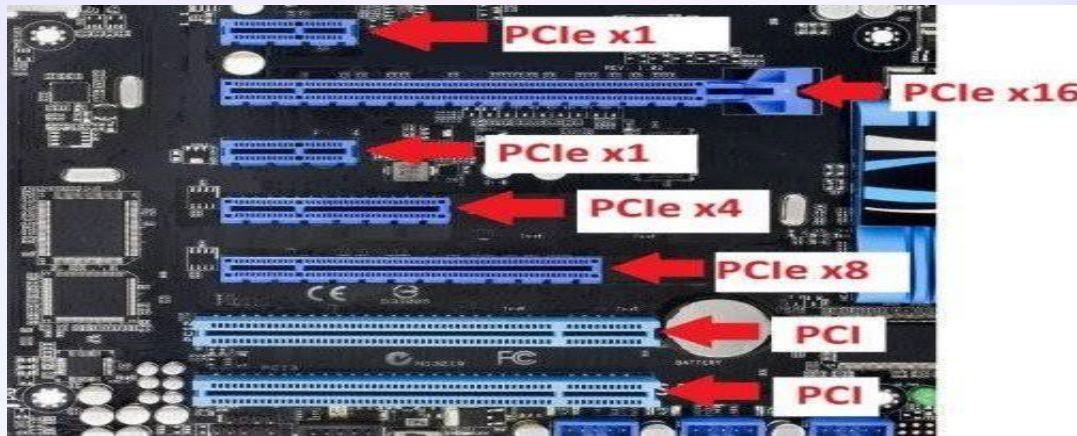
DIMM Slot/Memory Slot/RAM Slot

- A slot where RAM (Random Access Memory) is inserted or place. SDR SDRAM, DDR1 SDRAM, DDR2 SDRAM, DDR3 SDRAM, DDR4 SDRAM.



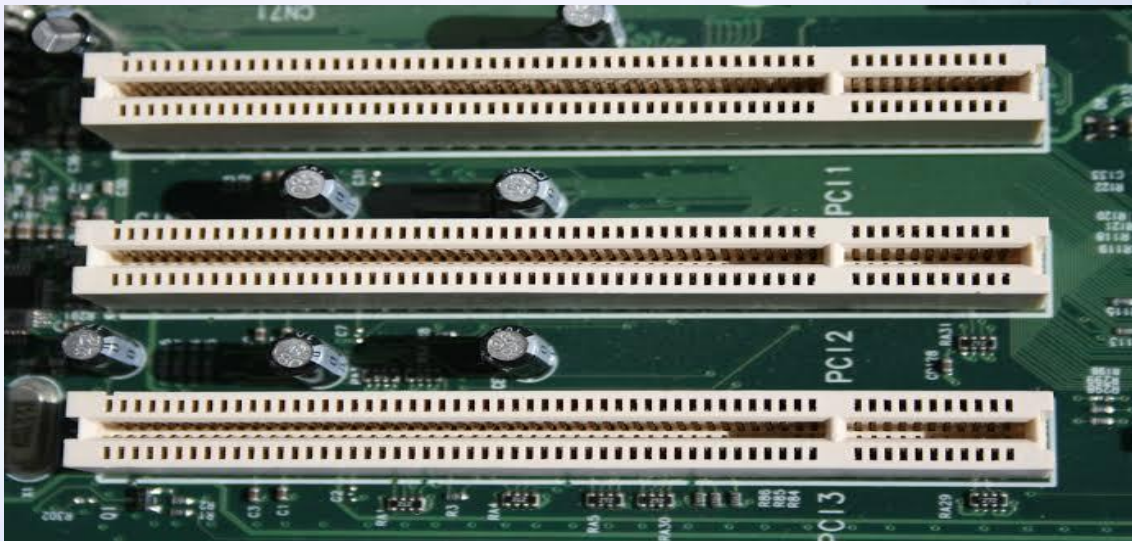
PCIe x 16 Slot

- PCI Express (Peripheral Component Interconnect Express), officially abbreviated as PCIe, is a computer expansion card standard designed to replace the older PCI, PCI-X, and AGP bus standards. Dedicated to serve a PCIe x16 Video Card only.



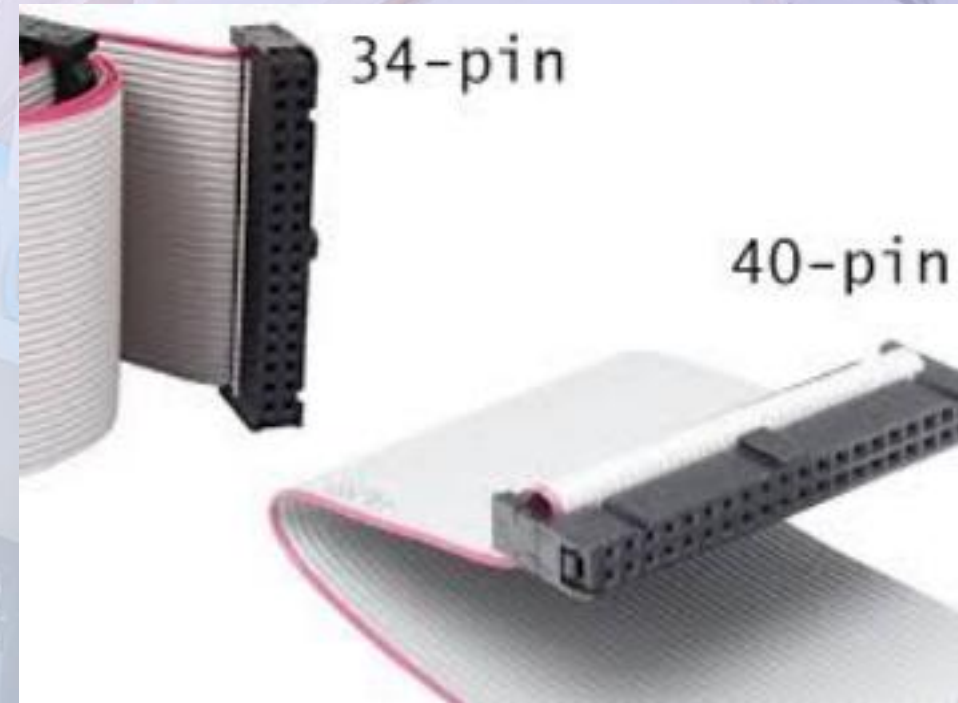
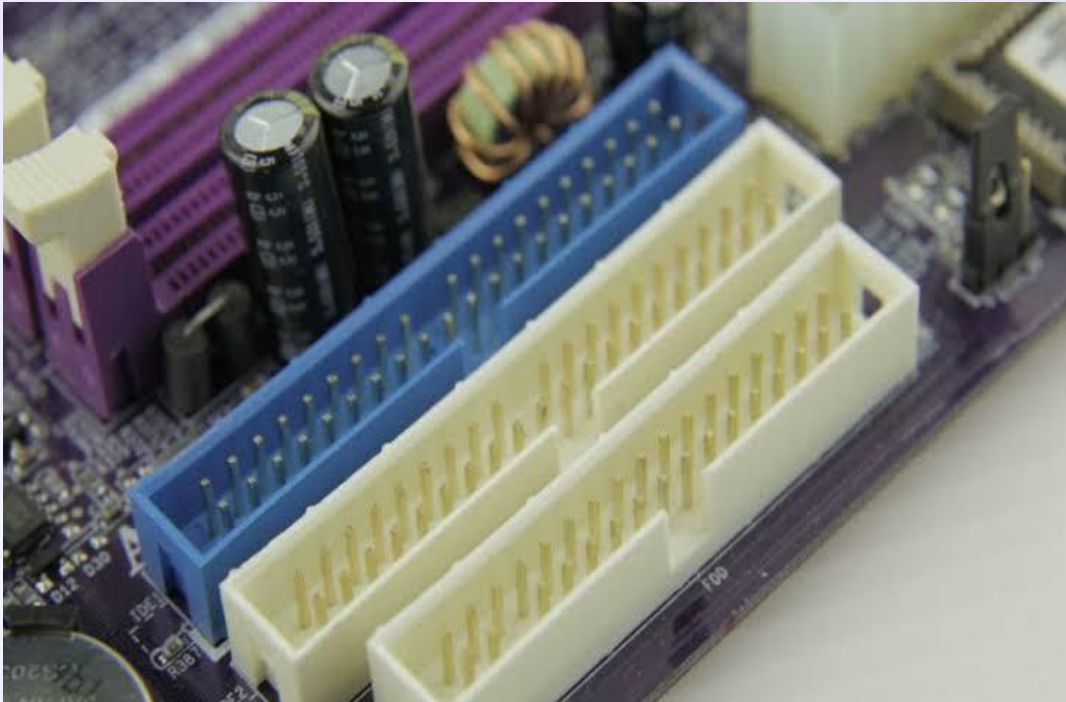
PCI Slots

- Conventional PCI (PCI is an initialize formed from Peripheral Component Interconnect part of the PCI Local Bus standard and often shortened to PCI) is a computer bus for attaching hardware devices in a computer.



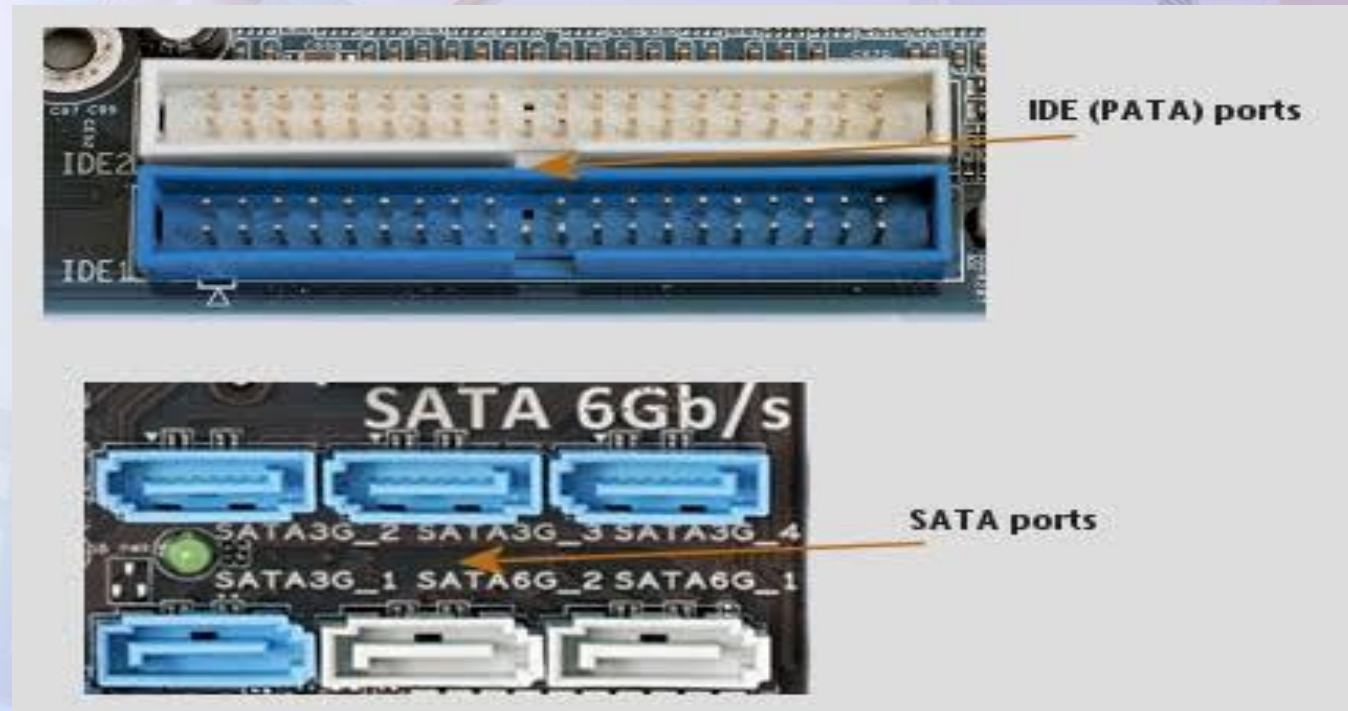
IDE Connector

- The port where the PATA / IDE (Parallel Advance Technology Attachment / Integrated Device/Drive Electronic) Connector is inserted or placed.



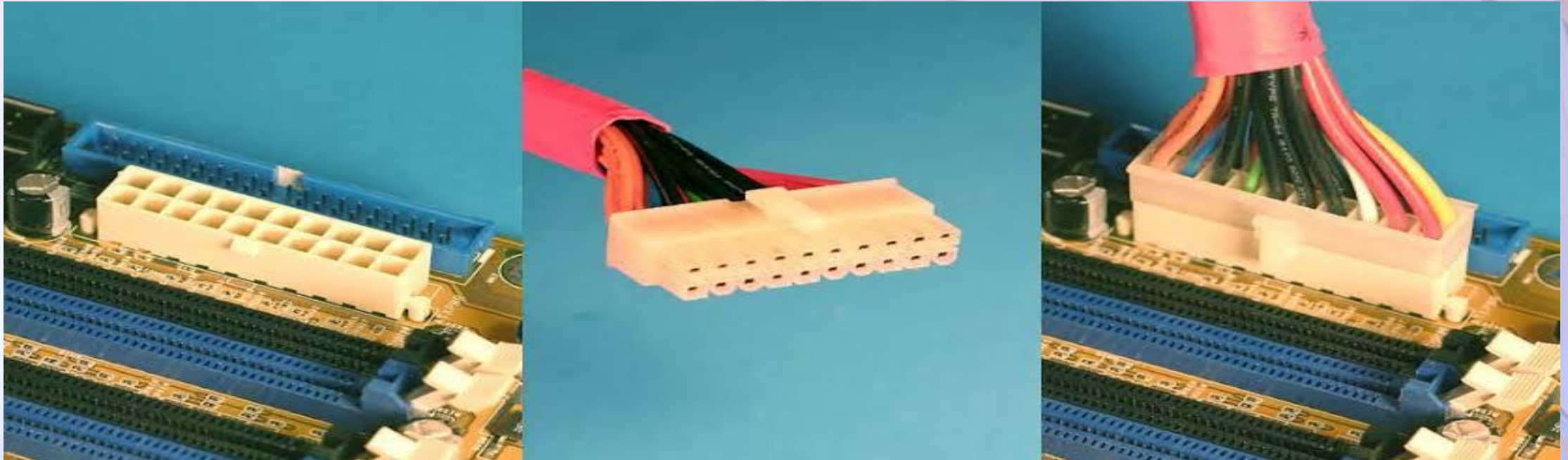
SATA Connector

- Serial ATA (SATA or Serial Advanced Technology Attachment) is a computer bus interface for connecting host bus adapters to mass storage devices such as hard disk drives and optical drives.



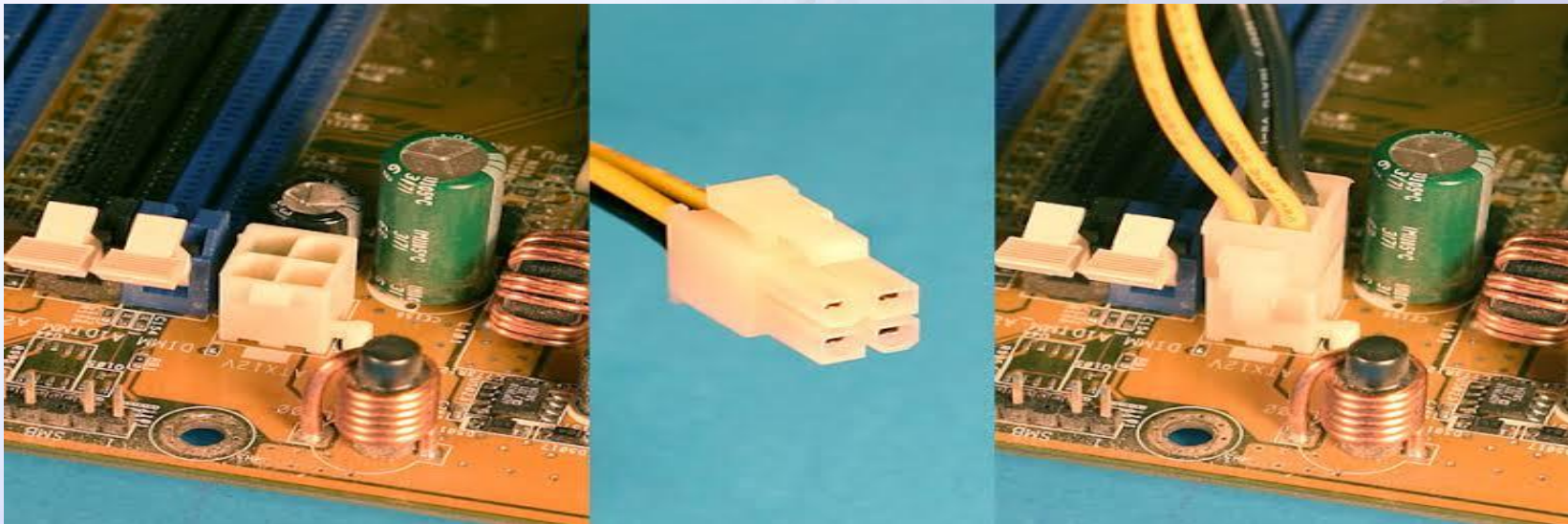
ATX Power Connector 24pins/20 pins

- ATX (Advance Technology Extended) power connectors are the specific types of connectors designed to connect a computer's power supply to an ATX motherboard.



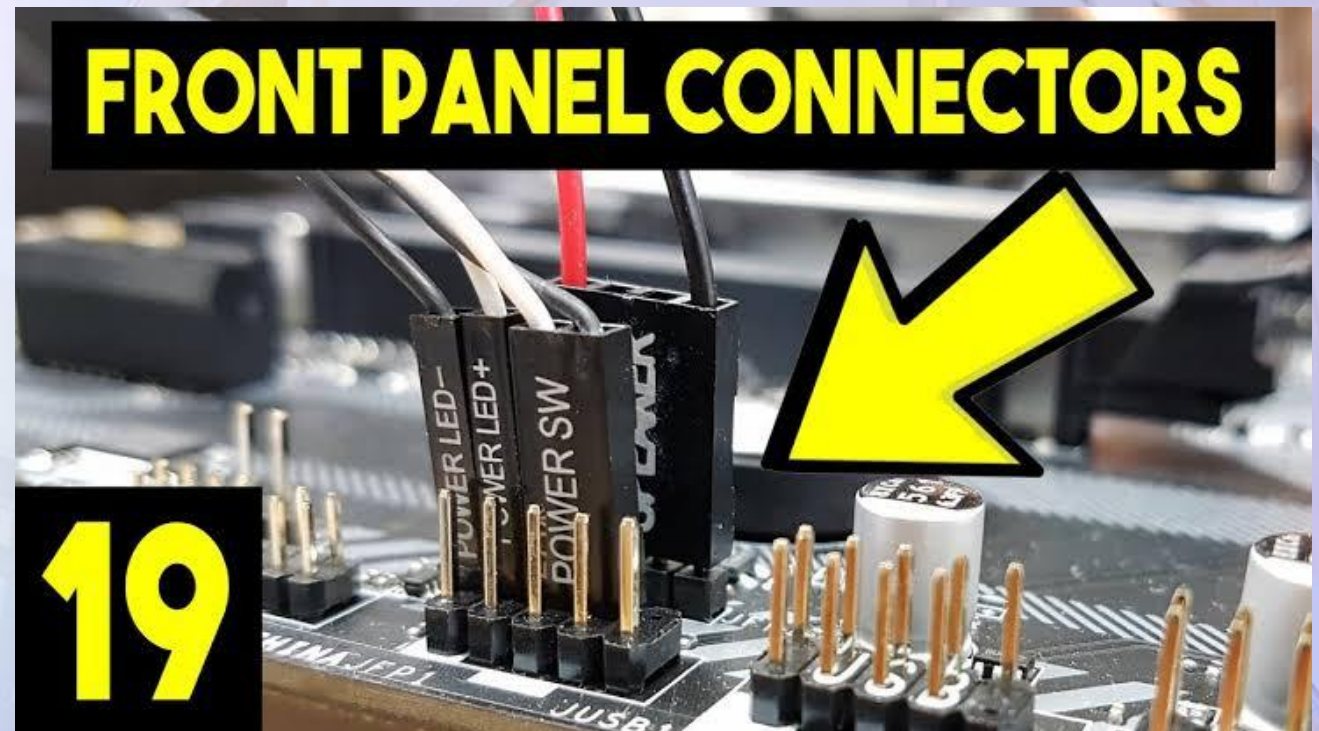
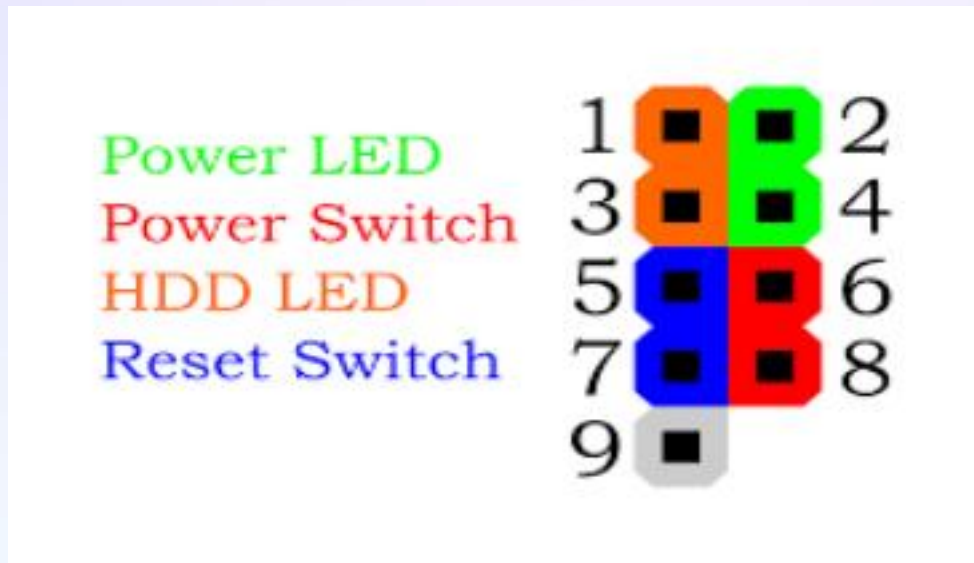
Auxiliary Power Connector / 4 pin 12 volt

- It supplies power to the CPU Voltage Regulator Module or VRM, sometimes called PPM (processor power module), is a buck converter that provides a microprocessor the appropriate supply voltage, converting +5 V or +12 V to a much lower voltage required by the CPU, allowing processors with different supply voltage to be mounted on the same motherboard.



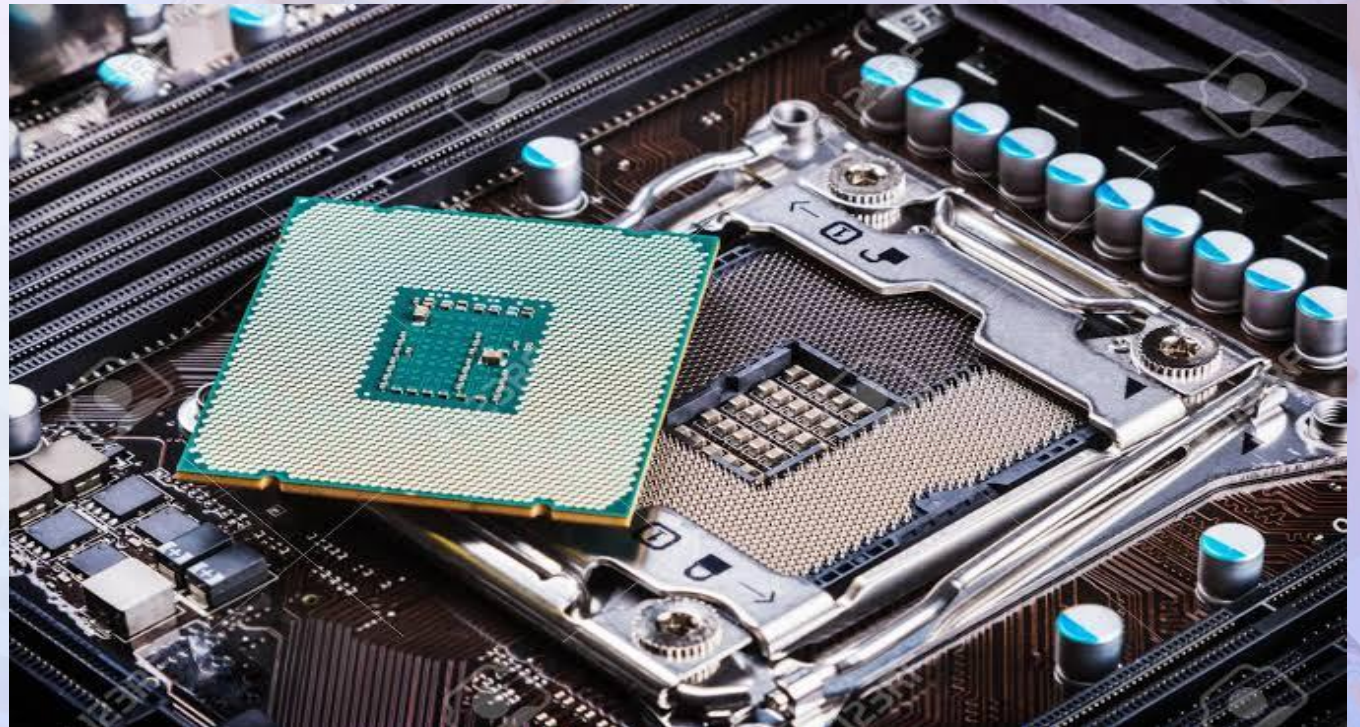
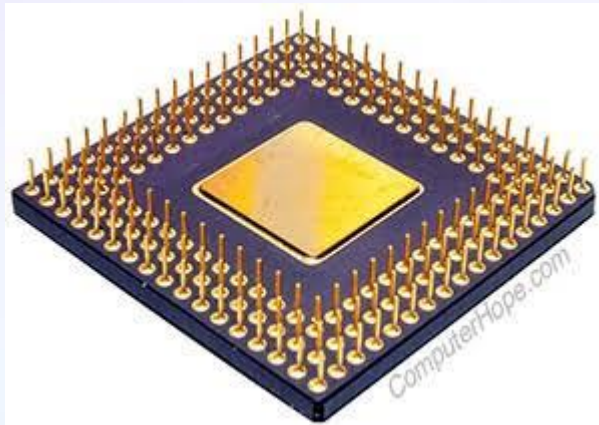
Front Panel Connectors

- Connection between the button and the Led lights of the front panel to the motherboard to activate them.



CPU Socket

- In computer hardware, a CPU socket or CPU slot contains one or more mechanical components providing mechanical and electrical connections between a microprocessor and a printed circuit board.



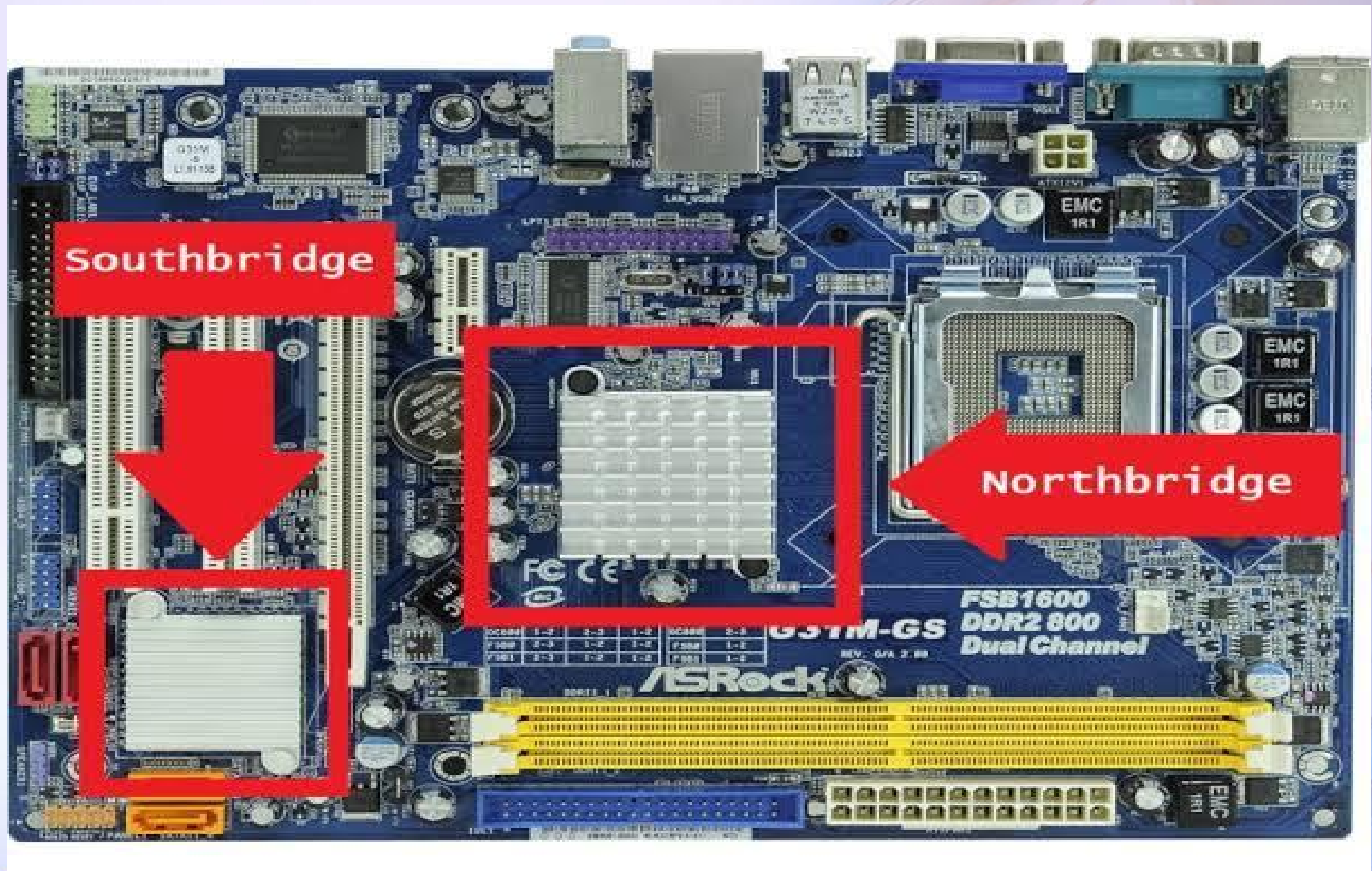
CMOS Battery

- (Complementary Metal Oxide Semiconductor). It maintains primarily the values inside our CMOS in our BIOS chipset. It also provides power to the Flash Bios chip, even while the computer is turned off. This chip contains information about the system configuration where we can change them anytime by entering its set up process.



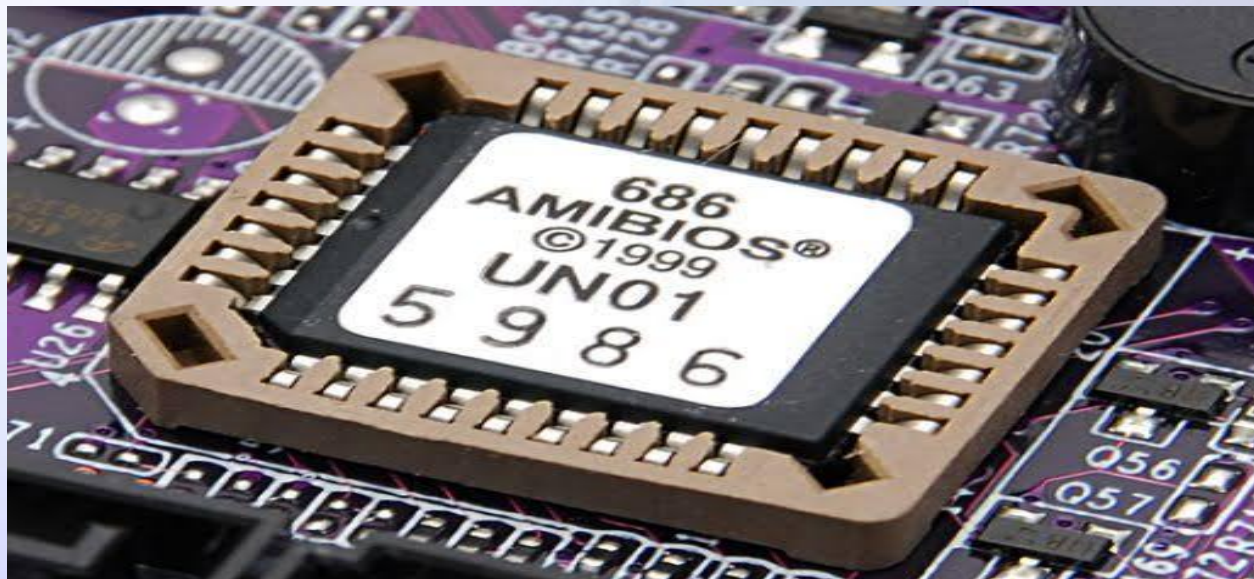
- **Northbridge Chipset NB** -The Northbridge has historically been one of the two chips in the core logic chipset on a PC motherboard, the other being the Southbridge. Increasingly these functions have migrated to the CPU chip itself, beginning with memory and graphics controllers.
- **Southbridge Chipset SB** -The Southbridge is one of the two chips in the core logic chipset on a personal computer (PC) motherboard, the other being the Northbridge. The Southbridge typically implements the "slower" capabilities of the motherboard in a Northbridge/Southbridge chipset computer architecture.





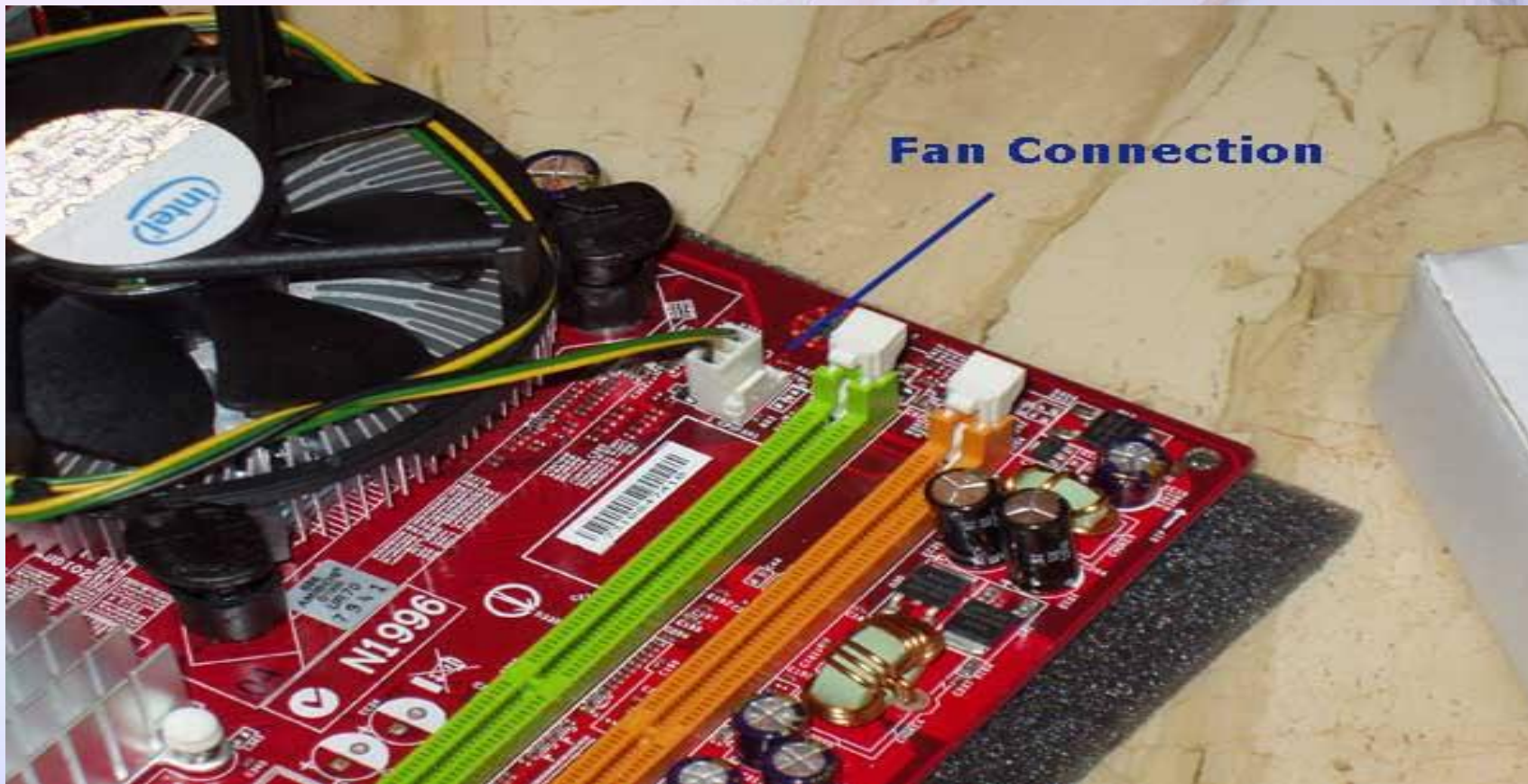
Bios Chip

- The BIOS software is built into the PC, and is the first code run by a PC when powered on ('boot firmware'). The primary function of the BIOS is to set up the hardware and load and start an operating system. When the PC starts up, the first job for the BIOS is to initialize and identify system devices such as the video display card, keyboard and mouse, hard disk drive, optical disc drive and other hardware.



CPU Fan Power Connector

- This is where the power connector of the CPU fan with heat sink is inserted



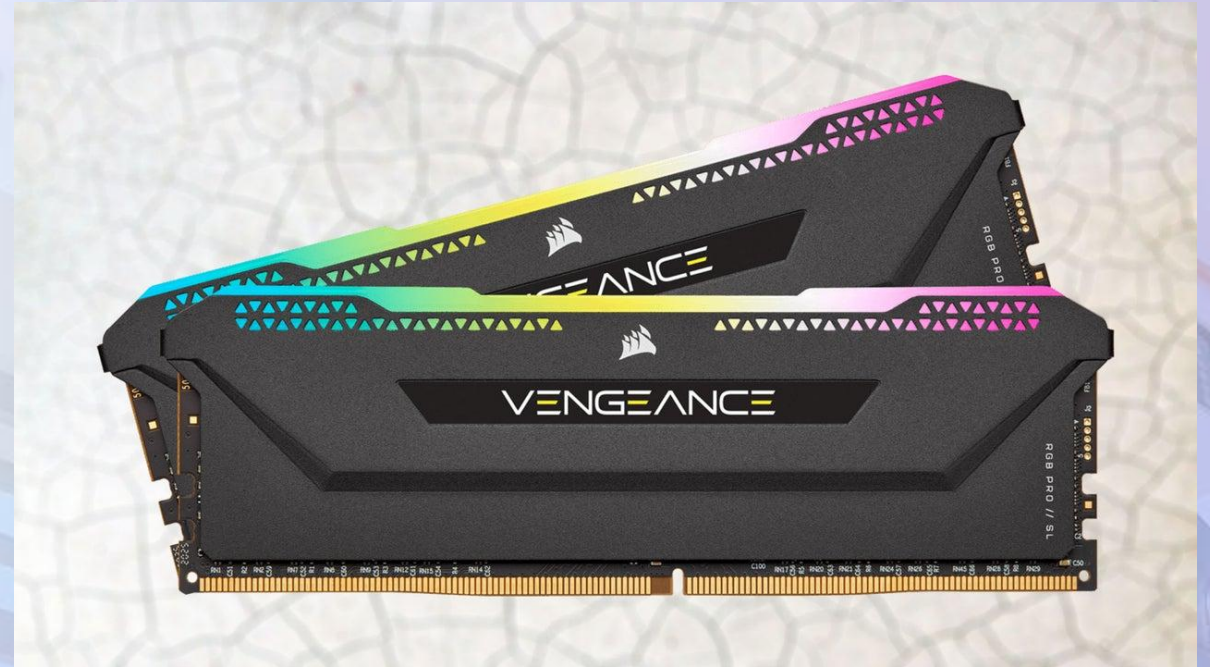
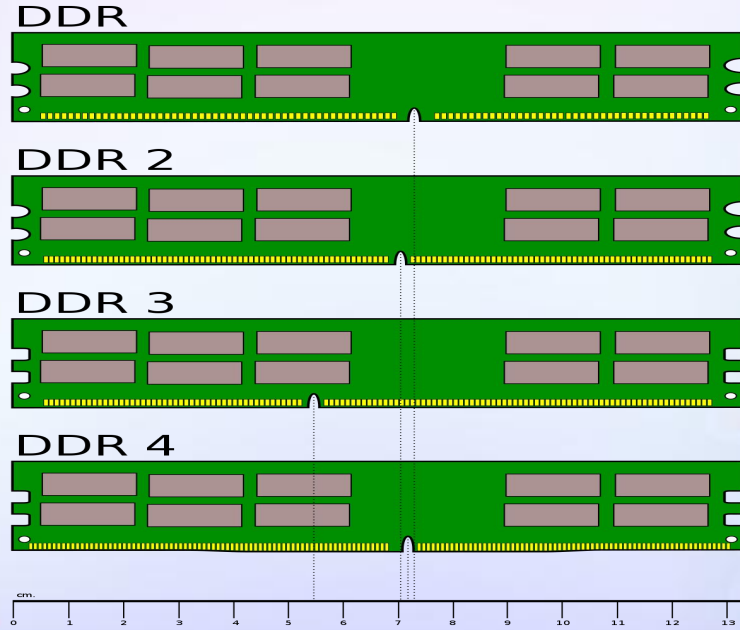
Optical Drive

- A CD-ROM an acronym of "Compact DiscRead-only memory") is a pre-pressed compact disc that contains data accessible to, but not writable by, a computer for data storage and music playback.
- Digital Versatile/Video Disk is an optical disc storage format, invented and developed by Philips, Sony, Toshiba, and Panasonic in 1995. DVDs offer higher storage capacity than Compact Discs while having the same dimensions.



Random-access memory (RAM)

- Random-access memory is a form of computer memory that can be read and changed in any order, typically used to store working data and machine code. A random-access memory device allows data items to be read or written in almost the same amount of time irrespective of the physical location of data inside the memory.



Hardrive / Hard Disk Drive / Disk Drive

- HDD it is the permanent or Main Storages of a Computer. A device for storing and retrieving digital information, primarily computer data, including our Operating System



Power supply unit

- A power supply unit converts mains AC to low-voltage regulated DC power for the internal components of a computer. Modern personal computers universally use switched-mode power supplies. Some power supplies have a manual switch for selecting input voltage, while others automatically adapt to the mains voltage.



Commonly Used Expansion Cards

- **Video Card** -is an expansion card that allows the computer to send graphical information to a video display device such as a monitor or projector.



LAN Card or Network Interface Card

- With the increasing use of the computers and the networking the local area network of the LAN is one such network type which links the two computers in a connection.
- For this connection a Local area network card or the LAN card is required which enables the connection of the computers in a network. It is a piece of hardware which is connected inside the PC linking the computer network.



Sound card

- A sound card is an internal computer component that processes audio files in order to provide high-quality playback through computer speakers. A sound card plays voice as well as music files, and can handle various audio file formats including .wav and .mp3 to name but a few.



Basic Hand Tools, Testing Devices, and Equipment

Driving of Tools

- **Screwdrivers** - is a device specifically designed to insert and tighten, or to loosen and remove screws? A screwdriver comprises a head or tip, which engages with a screw, a mechanism to apply torque by rotating the tip, and some way to position and support the screwdriver. A typical hand screwdriver comprises an approximately cylindrical handle of a size and shape to be held by a human hand, and an axial shaft fixed to the handle, the tip of which is shaped to fit a particular type of screw. The handle and shaft allow the screwdriver to be positioned and supported, when rotated, to apply torque.





- **Slotted Screwdriver** - used to drive or fasten negative slotted screws.



- **Phillips Screwdriver** – used to drive or fasten positive slotted screws. It is a screwdriver that could take greater torque and could provide tighter fastenings.



- **Torx Screwdriver Set**-used to drive or fasten six pointed star screws. In modern electrical appliances, they use screws with heads of non-standard shape to prevent users of the device from easily disassembling them.



- **Hex (Allen Wrench)** – used to drive or fasten hexagonal screws. The head has a hexagonal hole turned by an allen key. An Allen key is a hexagonal shaped wrench bent in letter-L. The Allen key may have been invented by American, Gilbert F. Heublein



- **Jeweler's Screwdriver Set** – is a set of small screw drivers composed of slotted and Philips screwdrivers. Also known as Precision Screwdrivers.



Soldering Tools

- **Soldering Iron** - is a hand tool used in soldering. It supplies heat to melt solder so that it can flow into the joint between two work pieces. A soldering iron is composed of a heated metal tip and an insulated handle. Heating is often achieved electrically, by passing an electric current (supplied through an electrical cord or battery cables) through a resistive heating element



- **Soldering Tool Stand** – is a place of the soldering iron to keep them away from flammable materials. The stand often also comes with a sponge and flux pot for cleaning the tip.



- **De-soldering Sucker** – is the removal of solder and components from a circuit for troubleshooting, repair purposes and to salvage components. Electronic components are often mounted on a circuit board and it is usually desirable to avoid damaging the circuit board, surrounding components, and the component being removed.



Splicing Tools (Pliers)

- **Mechanical Pliers** – also known as Linesman Pliers or combination pliers are a type of pliers used by electricians and other tradesmen primarily for gripping, twisting, bending and cutting wire and cable. Linemen's pliers owe their effectiveness to their pliers design, which multiplies force through leverage
- **Long Nose** – is used for holding, bending and stretching the lead of electronic component or connecting wire.



- **Wire Stripper** - is a pair of opposing blades much like scissors or wire cutters. The addition of a center notch makes it easier to cut the insulation without cutting the wire. This type of wire stripper is used by rotating it around the insulation while applying pressure in order to make a cut around the insulation. Since the insulation is not bonded to the wire, it then pulls easily off the end.



Viewing tools

- *Magnifying Glass* - (called a hand lens in laboratory contexts) is a convex lens that is used to produce a magnified image of an object. The lens is usually mounted in a frame with a handle.



- ***Flash light*** - A flashlight (torch in Commonwealth English) is a portable hand-held electric light. Usually, the source of the light is a small incandescent light bulb or light-emitting diode (LED). A typical flashlight consists of a light bulb mounted in a reflector, a transparent cover (sometimes combined with a lens) to protect the light source and reflector, a battery, and a switch. These are supported and protected by a case.



Cleaning tools

- ***Paint Brush*** – made of bristles set in handle, use for cleaning dirty parts of a circuit or an object.
- ***Power Blower*** – is a powerful blower capable of cleaning different types of electrical appliances in few time.



Testing Tool

- *Multimeter or a Multitester* - also known as a VOM (Volt-Ohm meter) is an electronic measuring instrument that combines several measurement functions in one unit
- Analog multimeter- use a micro ammeter whose pointer moves over a scale calibrated for all the different measurements that can be made. Digital multimeter (DMM, DVOM) display the measured value in numerals, and may also display a bar of a length proportional to the quantity being measured.
- Digital multimeter are now far more common but analog multimeter are still preferable in some cases, for example when monitoring a rapidly varying value.





Materials

- *Solder Paste* - is essentially powdered metal solder suspended in a thick medium called flux. Flux is added to act as a temporary adhesive, holding the components until the soldering process melts the solder and makes a stronger physical connection. The paste is a gray, putty-like material. The composition of the solder paste varies, depending upon its intended use.



- *Soldering Lead/wire* - is a fusible metal alloy used to join together metal work pieces and having a melting point below that of the work piece(s). Soft solder is typically thought of when solder or soldering is mentioned, with a typical melting range of 90 to 450 °C (190 to 840 °F)
- It is commonly used in electronics, plumbing, and assembly of sheet metal parts.



- *Thermal Paste/Grease* -is a kind of thermally conductive (but usually electrically insulating) adhesive, which is commonly used as an interface between heat sinks and heat sources (e.g., high-power semiconductor devices). The grease gives a mechanical strength to the bond between the heat sink and heat source, but more importantly, it eliminates air (which is a thermal insulator) from the interface area.



- *Contact Cleaner* - Electrical contact cleaner is simply compressed air with a cleaning agent that evaporates, such as isopropyl alcohol. It is useful for cleaning electric components that have food, grease, or oils on them. It can dislodge foreign elements and clean components.



- *Eraser* – can erase dirt from different pins of computer devices



Safety Procedures

- To prevent static electricity from damaging vital components of your computer, remember to always attach an anti-static wrist strap/bracelet from your wrist to your computer case or you can discharge static energy by holding or grabbing.
- Computer cases were not meant to be opened by the everyday user and thus are not made with the safety of the user in mind. Be careful for sharp edges in the casing that can cut your fingers and/or hands



- Never remove a component or open a computer case while the power is on and the power cable attached. Always remove all connecting cables before opening your case.
- Do not work on equipment or cables during periods of lightning activity
- Be careful when using the Crimping tool it has sharp parts that can cut your skin
- Wear a Protective eye when working with wires

- Wear Shoes with rubber sole to prevent ground electricity because rubber is a good Electric Insulator
- Always follow the instructions given
- Be sure you are in your normal state of mind before working.
- Always check the cables/wire attached to the computer for any damages before turning the unit it on to prevent any untoward incident.
- Use the right tools for specific tasks
- Be sure you are in your normal state of mind when working



EYE PROTECTOR



RESPIRATOR



EAR PROTECTOR



SAFETY GLOVES

SAFETY FIRST



HARD HELMET



HIGH VISIBILITY
JACKET



SAFETY BOOT



ID CARD

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