SCHOOL OF COMPUTER SCIENCE & IT, DAVV, INDORE

Laboratory Manual

Computer Organization and Hardware Maintenance (CS-2023)

BCA V Semester

Mission:

- *To produce world-class professionals who have excellent analytical skills, communication skills, team building spirit and ability to work in cross cultural environment.*
- *To produce international quality IT professionals, who can independently design, develop and implement computer applications.*
- *Professionals who dedicate themselves to mankind, who are environment conscious, follow social norms and ethics.*

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Computer Organization and Hardware Maintenance (CS-2023)

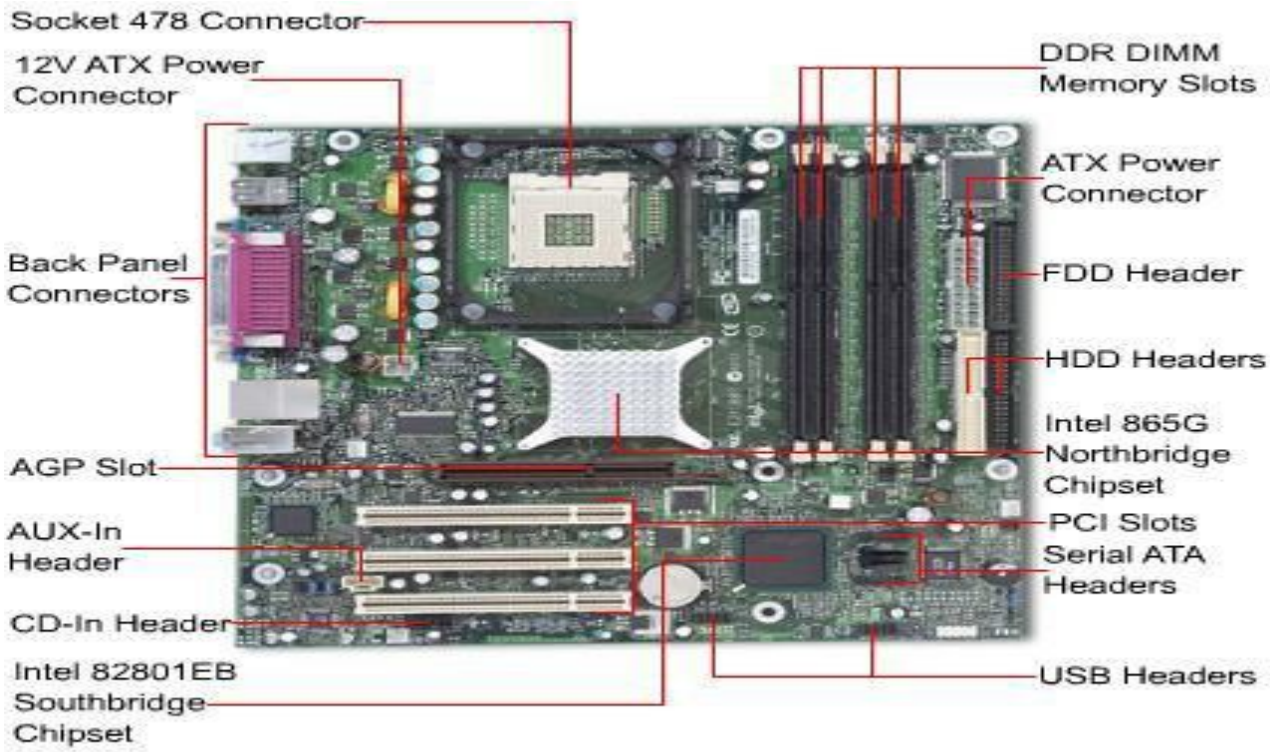
Week	List of Assignment
1.	1. Make the diagram of motherboard and identify its various components.
2	1. Find out various types of motherboard and write comparison between them.
3	1. Make the internal diagram of various types of monitors and compare them.
4	1. What are the various types of hard disk and how they are different?
5	1. What is SMPS? How it works? Find out various types of SMPS available in the market. 2. Write the complete booting process.
6	1. What are ports? How many ports are available on a general motherboard?
7	1. What is device driver? Describe device driver of graphics, sound, printer, LAN etc.
8	1. Write steps for formatting and installing an operating system. 2. Study of features of control panel.
10	1. Find out various RISC processors available in the market and write comparison between them.
11	1. Find out various CISC processors available in the market and write comparison between them.
12	1. Find out the specification of P1, P2, P3, P4 and core processors .Write comparison between them.
13	1. How can you upgrade your computer? 2. Understanding CMOS
14	1. Physical observation of all the hardware components of digital computer through identified symptoms of system problems.
15	1. Identifying Troubleshooting Tools for computer system.

Faculty:

Er. S. L.Dawar

Aim:-To study motherboard.

Motherboard: The main circuit board of a microcomputer. The motherboard contains the connectors for attaching additional boards. Typically, the motherboard contains the CPU, BIOS, memory, mass storage interfaces, serial and parallel ports, expansion slots, and all the controllers required to control standard peripheral devices, such as the display screen, keyboard, and disk drive. Collectively, all these chips that reside on the motherboard are known as the motherboard's chipset. The motherboard is the primary component of the entire system. In addition to hardware the motherboard also contains some software .The system ROM actually contains three small but very critical programs these are post, the BIOS and the setup program. This device provides, even the C.P.U is enabled to function. In addition to hardware the motherboard also contain some software. The following is the picture of motherboard:



1. Mouse & keyboard: Keyboard Connectors are two types basically. All PCs have a Key board port connected directly to the motherboard. The oldest, but still quite common type, is a special DIN, and most PCs until recently retained this style connector. The AT-style keyboard connector is quickly disappearing, being replaced by the smaller mini DIN PS/2-style keyboard connector. You can use an AT-style keyboard with a PS/2-style socket (or the other way around) by using a converter. Although the AT connector is unique in PCs, the PS/2-style mini-DIN is also used in more modern PCs for the mouse. Fortunately, most PCs that use the mini-DIN for both the keyboard and mouse clearly mark each mini-DIN socket as to its correct use. Some keyboards have a USB connection, but these are fairly rare compared to the PS/2 connection keyboards.

2. USB (Universal serial bus): USB is the General-purpose connection for PC. You can find USB versions of many different devices, such as mice, keyboards, scanners, cameras, and even printers. A USB connector's distinctive rectangular shape makes it easily recognizable. USB has a number of features that makes it particularly popular on PCs. First, USB devices are hot swappable. You can insert or remove them without restarting your system.

3. Parallel port: Most printers use a special connector called a parallel port. Parallel port carries data on more than one wire, as opposed to the serial port, which uses only one wire. Parallel ports use a 25-pin female DB connector. Parallel ports are directly supported by the motherboard through a direct connection or through a dangle.

4. CPU Chip: The central processing unit, also called the microprocessor performs all the calculations that take place inside a pc. CPUs come in Variety of shapes and sizes. Modern CPUs generate a lot of heat and thus require a cooling fan or heat sink. The cooling device (such as a cooling fan) is removable, although some CPU manufactures sell the CPU with a fan permanently attached.

5. RAM slots: Random-Access Memory (RAM) stores programs and data currently being used by the CPU. RAM is measured in units called bytes. RAM has been packaged in many different ways. The most current package is called a 168-pin DIMM (Dual Inline Memory module).

6. Floppy controller: The floppy drive connects to the computer via a 34-pin ribbon cable, which in turn connects to the motherboard. A floppy controller is one that is used to control the floppy drive.

7. IDE controller: Industry standards define two common types of hard drives: EIDE and SCSI. Majority of the PCs use EIDE drives. SCSI drives show up in high end PCs such as network servers or graphical workstations. The EIDE drive connects to the hard drive via a 2- inch-wide, 40-pin ribbon cable, which in turn connects to the motherboard. IDE controller is responsible for controlling the hard drive.

8. PCI slot: Intel introduced the Peripheral component interconnect bus protocol. The PCI bus is used to connect I/O devices (such as NIC or RAID controllers) to the main logic of the computer. PCI bus has replaced the ISA bus.

9. ISA slot: (Industry Standard Architecture) It is the standard architecture of the Expansion bus. Motherboard may contain some slots to connect ISA compatible cards. The memory address bus is to 32 bits .The bus speed is 8.33 MHZ and the bandwidth is 16 bits.

10. CMOS Battery: To provide CMOS with the power when the computer is turned off all motherboards comes with a battery. These batteries mount on the motherboard in one of three ways: the obsolete external battery, the most common onboard battery, and built-in battery.

11. AGP slot: If you have a modern motherboard, you will almost certainly notice a single connector that looks like a PCI slot, but is slightly shorter and usually brown. You also probably have a video card inserted into this slot. This is an Advanced Graphics Port (AGP) slot

12. CPU slot: To install the CPU, just slide it straight down into the slot. Special notches in the slot make it impossible to install them incorrectly. So remember if it does not go easily, it is probably not correct. Be sure to plug in the CPU fan's power.

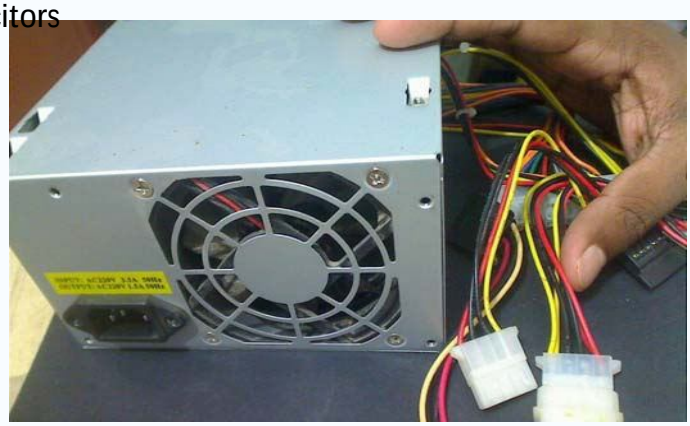
13. Power supply plug in: The Power supply, as its name implies, provides the necessary electrical power to make the pc operate. The power supply takes standard 110-V AC power and converts into +/-12-Volt, +/-5-Volt, and 3.3-Volt DC power.

The power supply connector has 20-pins, and the connector can go in only one direction.

Aim:- To study SMPS and UPS

SMPS A Switched-mode power supply (also Switching-mode power supply, SMPS, or simply Switcher) is an electronic Power Supply Unit (PSU) that incorporates a switching regulator in order to provide the required output voltage. An SMPS is actually a power converter that transmits power from a source (e.g., a battery or the electrical power grid) to a load (e.g., a personal computer) with ideally no loss. The function of the converter is to provide a reliable output voltage often at a different level than the input voltage.

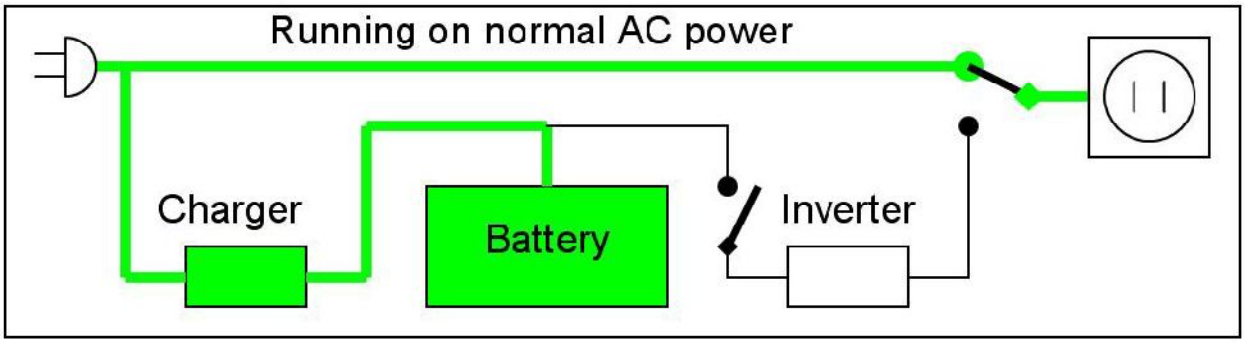
Below A - input EMI filtering
A - Bridge rectifier
B - Input filter capacitors
Between B and C - Primary side heat sink
C - Transformer
Between C and D - Secondary side heat sink
D - Output filter coil
E - Output filter capacitors

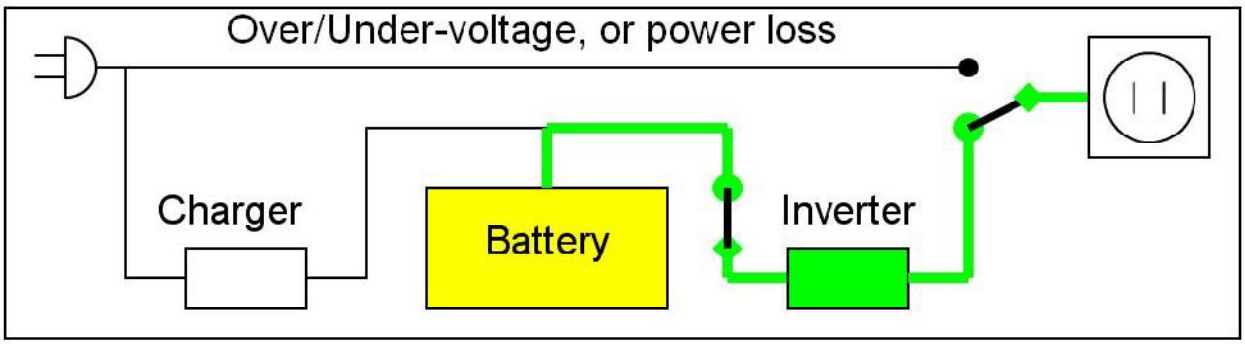


The coil and large yellow capacitor below E are additional input filtering components that are mounted directly on the power input connector and are not part of the main circuit board.

UPS:

An **uninterruptible power supply**, also **uninterruptible power source**, **UPS** or **battery backup**, is an electrical apparatus that provides emergency power to a load when the input power source, typically the utility mains, fails. A UPS differs from an auxiliary or emergency power system or standby generator in that it will provide instantaneous or near-instantaneous protection from input power interruptions by means of one or more attached batteries and associated electronic circuitry for low power users, and or by means of diesel generators and flywheels for high power users. The on-battery runtime of most uninterruptible power sources is relatively short—5–15 minutes being typical for smaller units—but sufficient to allow time to bring an auxiliary power source on line, or to properly shut down the protected equipment.





Technologies

The general categories of modern UPS systems are *on-line*, *line-interactive* or *standby*. An online UPS uses a "double conversion" method of accepting AC input, rectifying to DC for passing through the battery (or battery strings), then inverting back to 120V/240V AC for powering the protected equipment. A line-interactive UPS maintains the inverter in line and redirects the battery's DC current path from the normal charging mode to supplying current when power is lost. In a standby ("off-line") system the load is powered directly by the input power and the backup power circuitry is only invoked when the utility power fails. Most UPS below 1 kVA are of the line-interactive or standby variety which is usually less expensive. For large power units, Dynamic Uninterruptible Power Supply are sometimes used. A synchronous motor/alternator is connected on the mains via a choke. Energy is stored in a flywheel. When the mains power fails, an Eddy-current regulation maintains the power on the load. DUPS are sometimes combined or integrated with a diesel-generator, forming a diesel rotary

uninterruptible power supply, or DRUPS. A Fuel cell UPS has been developed in recent years using hydrogen and a fuel cell as a power source, potentially providing long run times in a small space.

Aim:- To study the CD-ROM and DVD-ROM.

CD-ROM

The *Compact Disk - Read Only Memory* (CD-ROM) drive has gone from pricey luxury to inexpensive necessity on the modern PC. The CD-ROM has opened up new computing vistas that were never possible before, due to its high capacity and broad applicability. In many ways, the CD-ROM has replaced the floppy disk drive, but in many ways it has allowed us to use our computers in ways that we never used them before. In fact, the "multimedia revolution" was largely a result of the availability of cheap CD-ROM drives.

A CD can store up to 74 minutes of music, so the total amount of digital data that must be stored on a CD is:

44,100 samples/channel/second x 2 bytes/sample x 2 channels x 74 minutes x 60 seconds/minute = 783,216,000 bytes

To fit more than 783 megabytes (MB) onto a disc only 4.8 inches (12 cm) in diameter requires that the individual bytes be very small.

CD Drive Components:-

The CD drive has the job of finding and reading the data stored as bumps on the CD. Considering how small the bumps are, the CD drive is an exceptionally precise piece of equipment. The drive consists of three fundamental components:

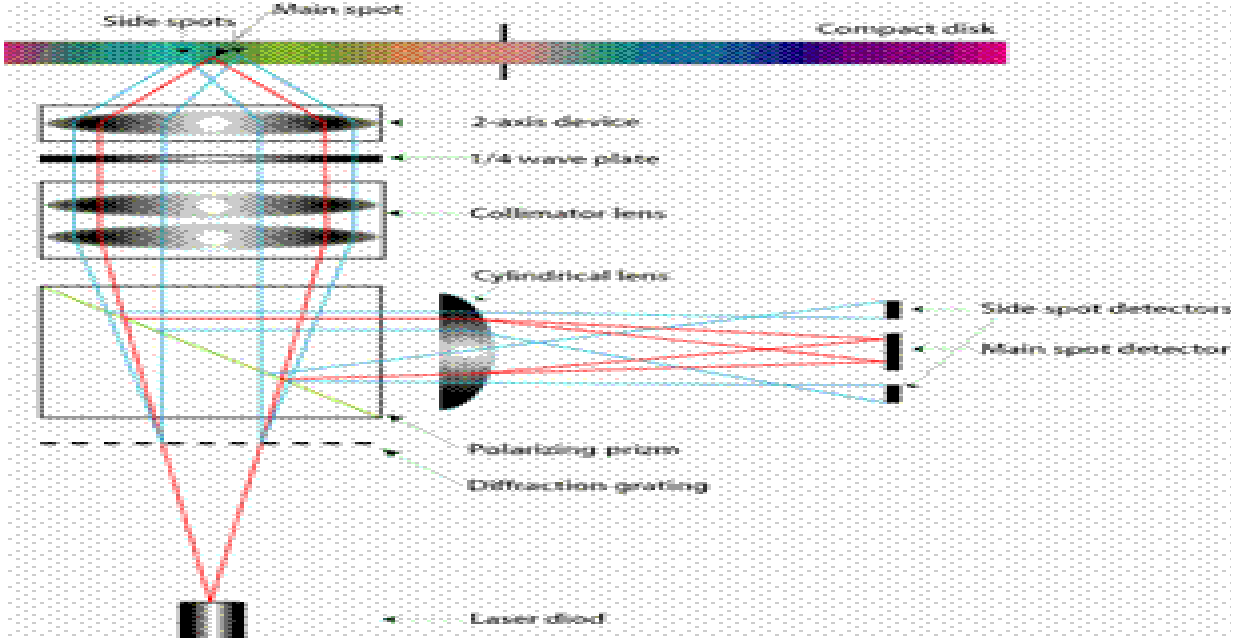
· A **drive motor** spins the disc. This drive motor is precisely controlled to rotate between 200 and 500 rpm depending on which track is being read.

· A laser and a **lens system** focus in on and read the bumps.

· A **tracking mechanism** moves the laser assembly so that the laser's beam can follow the spiral track. The tracking system has to be able to move the laser at micron resolutions.

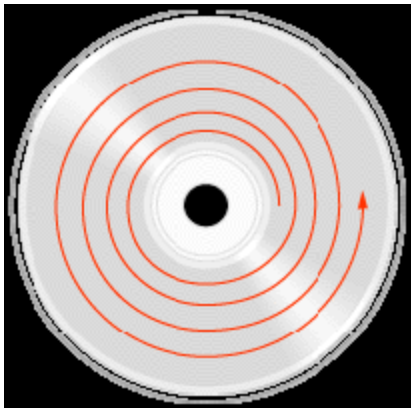
CD Drive- Basic design:-

A schematic of an optical three-beam pick-up of a CD drive is shown in the next figure along with the laser beam route through the system.



Cross-section of a CD

A



A CD has a single spiral track of data, circling from the inside of the disc to the outside. The fact that the spiral track starts at the center means that the CD can be smaller than 4.8 inches (12 cm) if desired, and in fact there are now plastic baseball cards and business cards that you can put in a CD player. CD business cards hold about 2 MB of data before the size and shape of the card cuts off the spiral.

Here's how the CD-ROM works:

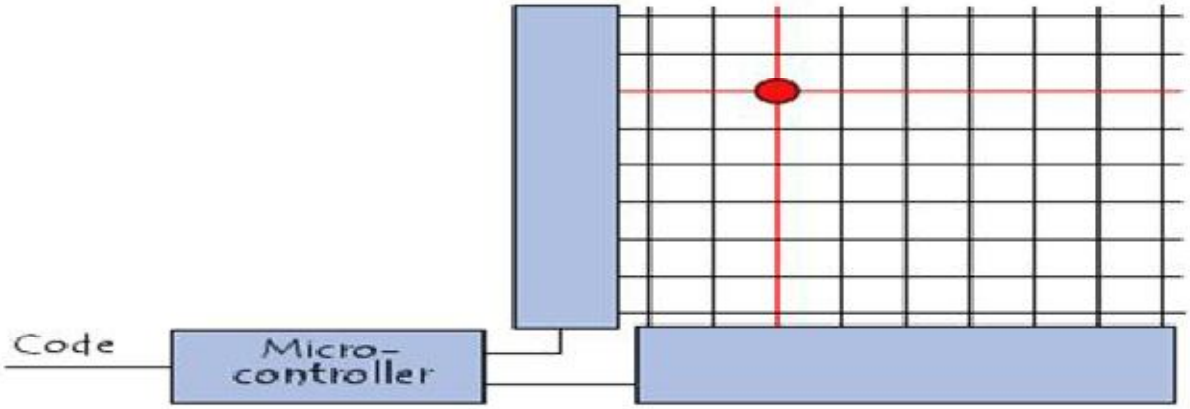
1. A beam of light energy is emitted from an infrared laser diode and aimed toward a reflecting mirror. The mirror is part of the head assembly, which moves linearly along the surface of the disk.
2. The light reflects off the mirror and through a focusing lens, and shines onto a specific point on the disk.

3. A certain amount of light is reflected back from the disk. The amount of light reflected depends on which part of the disk the beam strikes: each position on the disk is encoded as a one or a zero based on the presence or absence of "pits" in the surface of the disk. This is discussed in more detail in the section on CD-ROM media.
4. A series of collectors, mirrors and lenses accumulates and focuses the reflected light from the surface of the disk and sends it toward a photo detector.
5. The photo detector transforms the light energy into electrical energy. The strength of the signal is dependent on how much light was reflected from the disk.

Aim: To study working of keyboard and mouse.

The computer keyboard is the peripheral used to enter data (text and characters) into the computer, manage applications or enter command to be executed. The different types of keyboards contain generally from 83 to 105 keys placed sometimes differently. Most of these keys are known as alphanumeric keys with letters and numbers, others permit to input punctuation.
There are also many special keys used for different functions such as to delete or enter data or command, print screen, escape, etc

Working of keyboard:



1. Keystroke Detection:

The key switches are the devices that are used to actually detect "keystrokes", that is, the finger motions that mean a key has been pressed. The keys witches respond to mechanical motion by creating an electrical signal that tells the keyboard's internal controller that "a key was pressed". From there, the internal circuitry must take over and determine which key, and figure out how to communicate this fact to the system.

2. Scan code detection:

A scan code (or scan code) is the data that *most* computer keyboards send to a computer to report which keys have been pressed. A number, or sequence of numbers, is assigned to each key on the keyboard. The first issue that the circuitry must deal with is figuring out which key was actually pressed. This would seem fairly simple: there's one key switch for each key, and that key switch could be connected to the keyboard controller; it would just send it a signal when that key was pressed.

The key switch sensors are arranged in a *matrix* of rows and columns, not unlike a spreadsheet. When a specific key is pressed, it generates a signal for the row and column assigned to that key. The controller is programmed to know that, for example, the letter "T" is at row # 3 and column #8, and so on, for each key. This design means that instead of, say, 104 signal lines being needed for a 104-key keyboard, 9 row lines and about 12 column lines will suffice, for example. (The number of rows and columns doesn't necessarily correspond to the number of rows and columns of keys on the keyboard, since the wiring of different keys can be changed by the design of the circuit board in the keyboard.)

3. Make and Break Codes

The keyboard scan codes are broken into 'Make' and 'Break' codes. One make code is sent every time a key is pressed. Once released, a break code is sent. For most keys, the break code is a data stream of F0 followed by the scan code for the key. Using this configuration, the system can tell whether or not the key has been pressed, and if more than one key is being held down, it can distinguish which key has been released. Using two codes, the PC system can tell not only what keys were pressed, but for how long, and also which keys have been held down for a period of time. One example of this is when a shift key is held down. While it is held down, the '3' key should return the value for the '#' symbol instead of the value for the '3' symbol. Another thing to note is that if a key is held down, the make code is continuously sent via the typematic rate until it is released, when the break code is sent. The full set of make and break codes is included in the scan code sets available from USAR Systems.

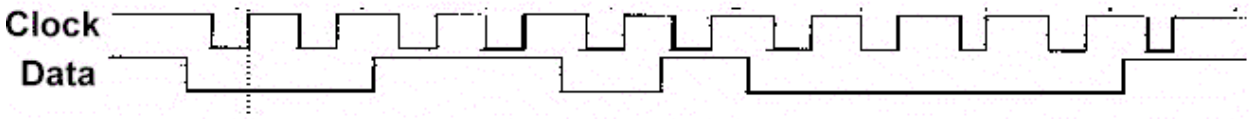
Keyboard Operation

The scan codes are sent serially on the bi-directional data line. When neither the keyboard nor the computer wants to send data, the data line and the clock line are high (inactive). The transmission of a single key or command consists of the following components: start bit ('0') 8 data bits representing the scan code parity bit (odd parity such that the eight data bits plus the parity bit are an odd number of ones)
stop bit ('1') A total of 11 bits

The following describes the sequence of events that occur during a transmission of a command by the keyboard.

1. The keyboard checks to ensure that both the clock and keyboard lines are inactive. If both are inactive, the keyboard prepares the 'start' bit by dropping the data line low.

2. The keyboard then drops the clock line low for approximately 35us.
3. The keyboard will then clock the remaining 10 bits at an approximate rate of 70us per clock period.
4. The computer is responsible for recognizing the 'start' bit and to receive the data. The data, which is 8 bits, is followed by a parity bit and finally a stop bit. If the keyboard wishes to send more data, it follows the 11th bit immediately with the next 'start' bit. This pattern repeats until the keyboard is finished sending data at which point the clock and data lines will return to their inactive state. When implementing the VHD code, it will be necessary to filter the keyboard clock to ensure clean signals.



The computer system can also send commands to the keyboard. These include keyboard initialization data request for resend of the last illumination of status lights including caps-lock, scroll-lock, and Num lock LED.
The computer system sends data to the keyboard as follows:
1. System drives the clock line low for approximately 60us (clock line is bi-directional).
2. System drives the data line low and then releases the clock line.
3. The keyboard will generate clock signals in order to clock in the command.
4. The system will send its 8 bit command followed by a parity bit and a stop bit.
5. After the stop bit is driven high, the data line is released.
6. Upon completion of the command, the keyboard will send an ACK signal if it received the data successfully.

Keyboard Connectors:

1. 6 pin DIN Connector
2.5 pin DIN Connector
3. USB pin connector

Working of Mouse:

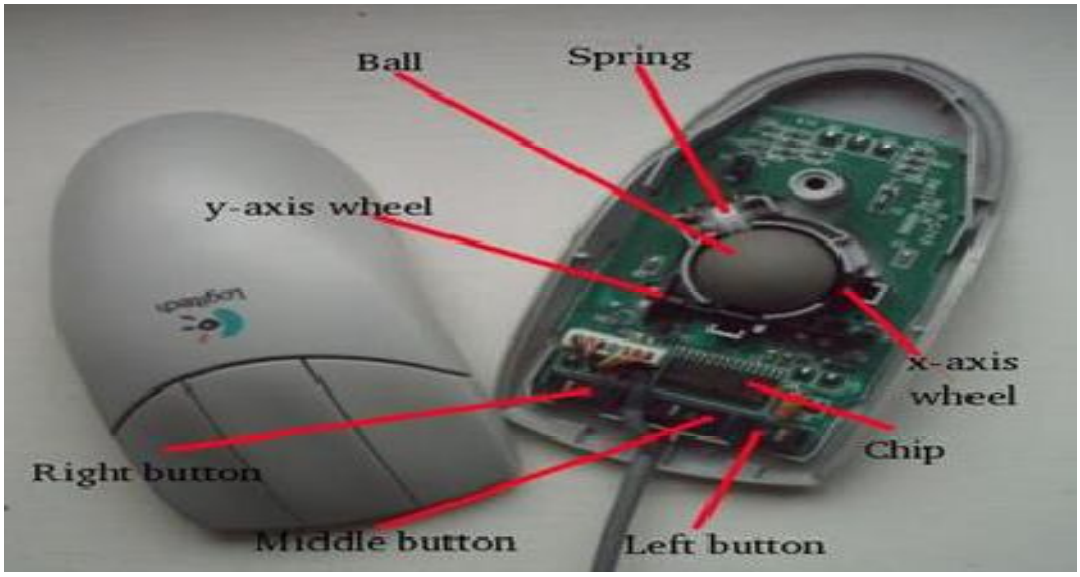
Mouse is a computer's peripheral device used along with the keyboard which allows a user to indicate what function he wants that his computer to carry out by selecting from a list of commands presented as a menu. The first mouse system was introduced for IBM PCs in 1982. With the help of mouse, the user points at a menu selection by physically moving the input device, which causes a core on screen movement of the cursor. One more button at the top of the mouse enables the user to indicate that he can select a menu item. The name *mouse,* originated at the Stanford Research Institute, derives from the resemblance of early models (which had a cord attached to the rear part of the device, suggesting the idea of a tail) to the common mouse.

Types of mouse:

1. Mechanical Mouse: -

The design is based on a small boll that is fixed at the bottom and rotated as the mouse is pushed along the surface. Switches inside the mouse detect the movement in four directions (i.e. cores to two axes of 2-D system) and relay the direction of ball's rotation to the host computer. This mouse requires that the user move it across a surface. The parts of mechanical mouse can break, so care must be taken.

Operation of Mouse:-The main goal of any mouse is to translate the motion of your hand into signals that the computer can use. Let's take a look inside a track-ball mouse to see how it works:

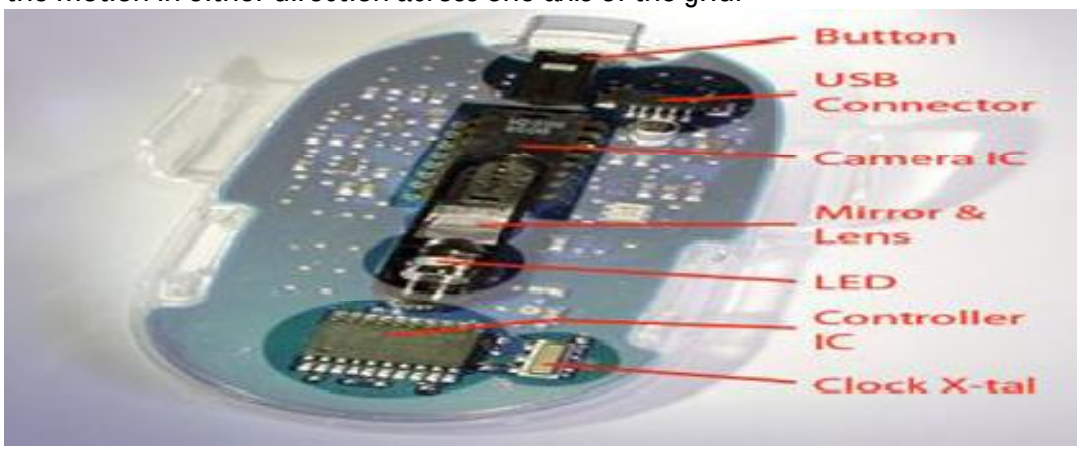
1. 

1. A **ball** inside the mouse touches the desktop and rolls when the mouse moves.
2. **Two rollers** inside the mouse touch the ball. One of the rollers is oriented so that it detects motion in the X direction, and the other is oriented 90 degrees to the first roller so it detects

motion in the Y direction. When the ball rotates, one or both of these rollers rotate as well. The following image shows the two white rollers on this mouse:
3. The rollers each connect to a **shaft**, and the shaft spins a **disk** with holes in it. When a roller rolls, its shaft and disk spin. The following image shows the disk:
4. On either side of the disk there is an **infrared LED** and an **infrared sensor**. The holes in the disk break the beam of light coming from the LED so that the infrared sensor sees pulses of light. The rate of the pulsing is directly related to the speed of the mouse and the distance it travels.
5. An **on-board processor chip** reads the pulses from the infrared sensors and turns them into binary data that the computer can understand. The chip sends the binary data to the computer through the mouse's cord.

2. Optical Mouse:

In this type of mouse, instead of rotating the ball, a right-beam is used to detect movement across a specially designed mouse pad. The mouse uses two pairs of LEDs and photodiodes at its bottom. One pair is oriented at the right angles with the other. The matching mouse pad is coated with an overlapped pattern of blue & yellow grids. Each pair of LED and photodiode detects the motion in either direction across one axis of the grid.



Aim: To study different ports and slots.

These are situated on the backside of the cabinet to connect I/O devices. There are following types of ports in a computer.

PORTS

1. Serial Port: -It is nine pin connector used for connecting peripheral devices.
2. Parallel Port: - It is a twenty five-pin connector used for connecting peripheral devices. The parallel port may transfer data at more speed than a serial port because of 25 pins.
3. USB Port: - It is the Universal Serial Bus used for connecting peripheral devices. It is a fourpin connector.
4. RJ-45(Register Jacket) port: RJ-45 jacks and plugs have 8 pins. If you have a computer patch cable laying around, you can see them on the plug. (Those shiny metal lines on the end.) RJ-45's are sometimes referred to as 8P8C connectors. This stands for 8 Position (which describes the width) 8 Conductor (or 8 Connector depending on who you talk to).

5. Sound port: Commonly, It includes Line In, Line Out and MIC Socket.
6. VGA Port: It is 15 pin VGA connector use for connecting monitor/LCD/TFT with Cabinet.
7. Keyboard & Mouse port: It is a 9 PIN PS/2 connector use for connecting keyboard & mouse only.
8. The Infrared Data Association (IrDA) defines physical specifications communications protocol standards for the short-range exchange of data over infrared light, for uses such as personal area networks (PANs).
9. RF PORT: Radio frequency (RF) is the range of electromagnetic frequencies above the audio range and below infrared light (from 10kHz to 300GHz).

Common Peripherals

LPT PORT:

LPT is Commonly known as the parallel port and typically used as the printer connection device. For distances limited to 20 feet or less. Faster than serial COM ports but more expensive. A typical LPT port reaches a speed of 150kb/sec.. It is most common to have only one for the printer called LPT1. It is shaped as a trapezoid with the short end in the bottom and 2 rows of pins, one 13 and other with 12 pins.

LPI PORT

A Plug forLPT port

COM PORT

COM is not an acronym unlike many of the other ports; it simply stands for the "com" in communications. It is commonly known as the serial port because it was the first port to use that type of communication. Like the LPT port it is shaped like a trapezoid, but smaller, with the short end in the bottom and has 9 pins divided in 2 rows, one with 5 and other with 4 (be careful not to confuse it with the monitor port which is similar in size and shape but it has more pins and it is use only for monitors.)

COM Port-Socket

COM Port-Plug

SCSI PORT

SCSI stands for "Small Computer System Interface" and is usually known by the way it's pronounced "scuzzy". It's a generalpurpose male and parallel port for connecting many different devices to a computer. It's a fast port that was available before USB and FireWire. Usually used with CD-ROM drives and scanners.

Port

Plug

USB PORT

USB or Universal Serial BUS is a serial and female port that can be use for any peripheral available in both Macs and PCs. It is one of the newest and faster computers available. It is slower than a FireWire port but is more than adequate for the type of peripherals for which it was designed for.

Ports

PCI

PCI types

The PCI world is somewhat of a mess right now.

There are at least **five** different types of PCI socket in use!

1. Original PCI.
2. Wide PCI.
3. Fast/wide PCI.
4. Fast/wide 3.3-volt PCI.
5. PCI-X.

ISA

Industry Standard Architecture (in practice almost always shortened to ISA) was a computer bus standard for IBM compatible computers.

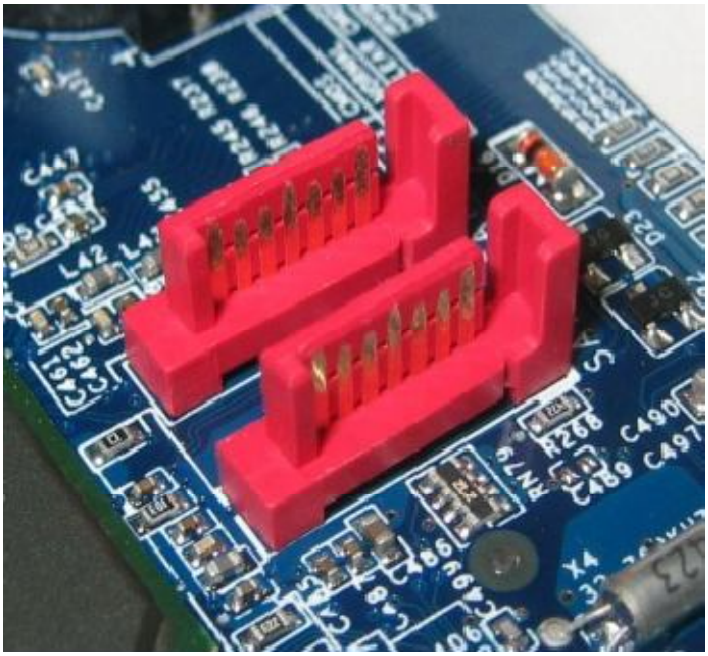
Year created: 1981
Created by: IBM
Superseded by: PCI (1993)
Width in bits: 8 or 16
Number of devices: Up to 6 devices
Capacity 8 MHz
Style: Parallel

IDE

Short for Integrated Drive Electronics or IBM Disc

Electronics, IDE is more commonly known as ATA and is a standard interface for IBM compatible hard drives. IDE is different from the Small Computer Systems Interface (SCSI) and Enhanced Small Device Interface (ESDI) because its controllers are on each drive, meaning the drive can connect directly to the motherboard or controller.

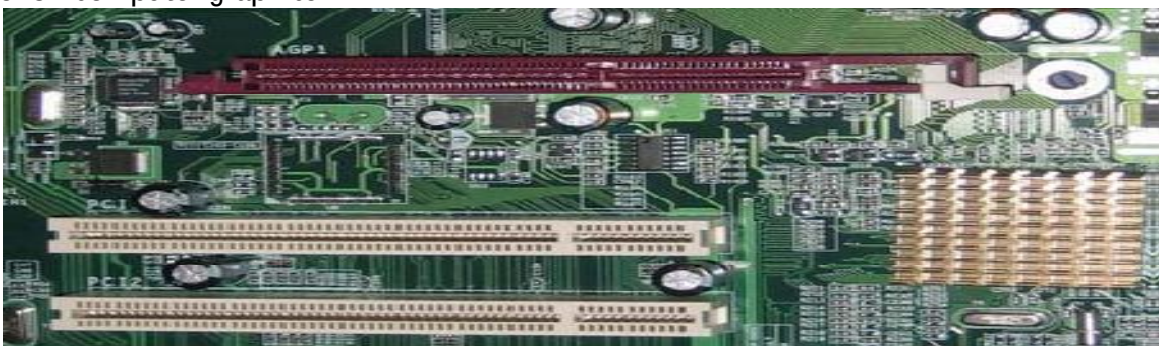
SATA



Year created: 2003
Supersedes: Parallel ATA (PATA)
Capacity 1.5, 3.0, 6.0 Gbit/s
Style: Serial
Hotplugging? Yes
External? Yes (eSATA)

AGP

The Accelerated Graphics Port (often shortened to AGP) is a high-speed point-to-point channel for attaching a video card to a computer's motherboard, primarily to assist in the acceleration of 3D computer graphics.



Year created: 1997
Created by: Intel
Superseded by: PCI Express
(2004)
Width in bits: 32
Numberof
devices: 1 device/slot
Capacity up to 2133 MB/s
Style: Parallel
Hotplugging? no
External? No

USB

USB (Universal Serial Bus) is as its name suggests, based on serial type architecture. However, it is an input-output interface much quicker than standard serial ports. Serial architecture was used for this type of port for two main reasons: Serial architecture gives the user a much higher clock rate than a parallel interface because a parallel interface does not support too high frequencies (in a high speed architecture, bits circulating on each wire arrive with lag, causing errors); serial cables are much cheaper than parallel cables. USB standards So, from 1995, the USB standard has been developed for connecting a wide range of devices. The USB 1.0 standard offers two modes of communication:

1. 12 Mb/s in high speed mode,
2. 1.5 Mb/s in low speed.

Aim: To study various types of Cables & Connectors.

Cables

USB cables can be used to connect most new devices to your computer including flash memory sticks, portable media players, internet modems and digital cameras. Computer accessories like mice, keyboards, webcams, portable hard-drives, microphones, printers, scanners and speakers can also be connected to the computer through USB ports. Additionally, USB cables are also used for charging a variety of gadgets including mobile phones or for transferring data from one computer to another.

1. Audio Cables and Connectors

1. 

2. Video Cables

Pin A standard VGA connector

3. Audio and Video Cables

1.
2. **RCA Conne**

HDMI Cables

Display Port

1. **Data Cables**

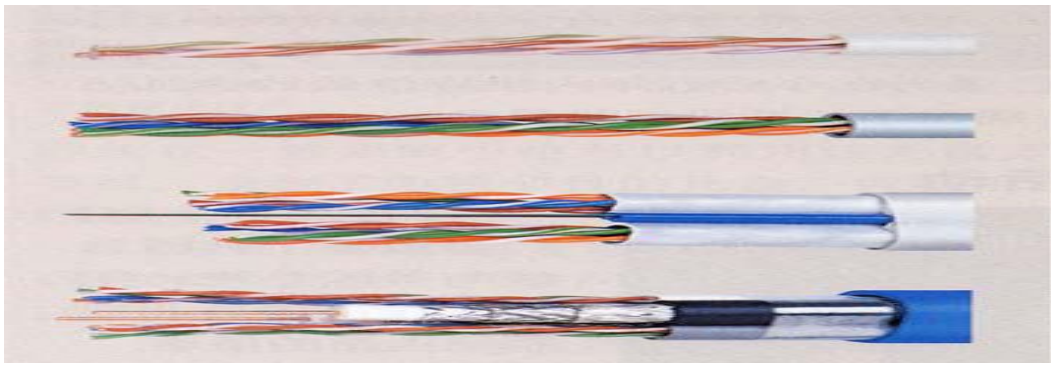
eSATA Cables

Networking Related Cables

Phone RJ11 Cable

Ethernet Cable

2. Twisted pair cable



Connectors

There are various types of connectors are used in a computer system. These connectors support various cables required for a number of operations. The connectors provided are:

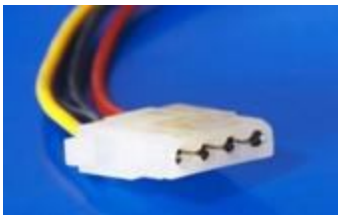
1. Power Connector
2. Data Interface Connector

1. POWER CONNECTOR:

A power connector is an electrical connector designed to carry a significant amount of electrical power, usually as DC or low-frequency AC. Some types of *RF connector* may also carry large amounts of power, but are considered as a separate category. Connectors carrying small amounts of power are known as *signal connectors*.

Personal computer power supply connectors

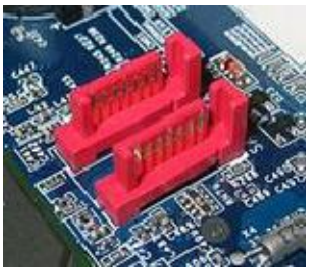
Molex



Berg

ATX motherboard

SATA



Aim-Study of monitor.

MONITOR

Monitor Display Technology: -Often referred to as a **monitor** when packaged in a separate case, the display is the most-used output device on a computer. The display provides instant feedback by showing you text and graphic images as you work or play. Most desktop displays use liquid crystal display (LCD) or cathode ray tube (CRT) technology, while nearly all portable computing devices such as laptops incorporate LCD technology. Because of their slimmer design and lower energy consumption, monitors using LCD technology (also called **flat panel** or **flat screen** displays) are replacing the venerable CRT on most desktop.

LCD

Stands for "Liquid Crystal Display." LCDs are super-thin displays that are used in laptop computer screens and flat panel monitors. Smaller LCDs are used in handheld TVs, PDAs, and portable video game devices. The image on an LCD screen is created by sandwiching an electrically reactive substance between two electrodes. This color of this substance can be changed by increasing or reducing the electrical current. Since LCD screens are based on the principle of blocking light (rather than emitting it), they use up much less power than standard CRT (Cathode-Ray Tube) monitors.

LED

Stands for "Light-Emitting Diode." An LED is an electronic device that emits light when an electrical current is passed through it. Early LEDs produced only red light, but modern LEDs can produce several different colors, including red, green, and blue (RGB) light. Recent advances in LED technology have made it possible for LEDs to produce white light as well. LEDs are commonly used for indicator lights (such as power on/off lights) on electronic devices. They also have several other applications, including electronic signs, clock displays, and flashlights. Since LEDs are energy efficient and have a long lifespan (often more than 100,000 hours), they have begun to replace traditional light bulbs in several areas.

Aim: To study different types of printers.

The machine through which any type of data in the computer can be print on a paper is called Printer.

Different Types Of Printers

A printer can make a great addition to any home or office. Printers can be used for used for numerous reasons in a household, or and office. Having a printer is great for individuals, families and businesses because they can be used to print off directions, emails, work papers, charts, student papers, research, photos and much more. Printers are a great way to get the information you have on your computer onto a piece of paper in a very quick amount of time. There are many makes and models of printers making it hard to even know where to start from.

Types of Printers

1. **Laser Printer**

A laser printer rapidly produces high quality text and graphics on a regular piece of computer paper, and it is the most common computer printer used today. Laser printers can vary in speed with some of the fastest models being able to print over 12,000 pages per hour

2. **Inkjet Printer**

Inkjet printers operate by propelling variably sized droplets of liquid or molten ink onto a piece of computer paper. Ink jet printers are the most common type of printers used by the general consumer due to their low cost, high quality printing, and capability of printing in different colors

3. **Multifunctional Printer**

Multifunctional printers are also known as an MFP which is a printer that incorporates the ability to function multiple devices in one. The advantage to this is to one save money from buying all kinds of office devices when you can buy a printer capable of doing all these tasks.

. Solid Ink Printer

Solid ink printers are also known as phase change printers can produce excellent results. They are a type of thermal transfer printer that uses solid sticks of colored ink that are very similar to candle wax. The sticks of ink are melted and fed into a crystal operated print head, which sprays the ink on the rotating oil coated drum

4. Dye Sublimation Printer

A dye Sublimation printer is a printer that uses a printing process of heat to transfer dye to a medium plastic, paper or canvas. The process is usually done to lay one color at a time using a ribbon that has color panels.

5. Thermal Printer

Thermal printers work by selectively heating regions of special heat sensitive paper. Monochrome thermal printers are used in cash registers, ATMs, gasoline dispensers and some older inexpensive fax machines. The color on the paper can be achieved with special papers and different heating temperatures.

6. Dot Matrix Printer

7. 

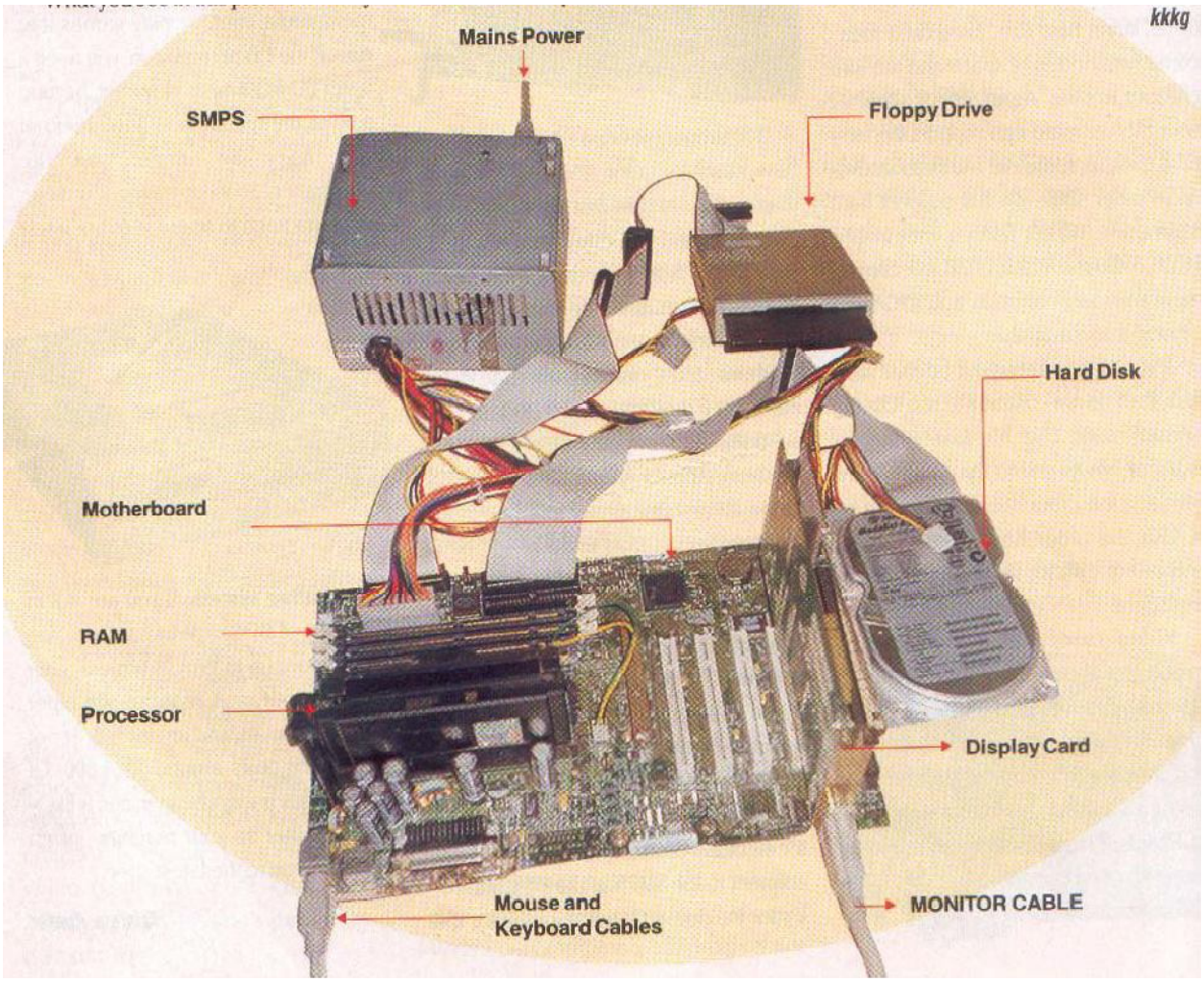
8.

A Dot matrix printer is an impact printer that produces text and graphics when tiny wire pins one a print head strike a ink ribbon. The print head runs back and forth on the paper like a type writer.

Aim:- To assemble a PC.

The main components required to assemble a PC are as follows:

- Mains Power
- Floppy Drive
- SMPS
- Motherboard
- Hard Disk
- RAM
- Processor
- Display Card
- Mouse and Keyboard cables
- Monitor cables


kkkg
Mains Power
SMPS
Floppy Drive
Hard Disk
Motherboard
RAM
Processor
Display Card
Mouse and
Keyboard Cables
MONITOR CABLE