Output Devices

An output device is an electro-mechanical device, which converts machine-readable information into human-readable form and display onto the screen.

The output devices display the processed information by converting them into graphical, alphanumeric or audio-visual form.

Printers

Printers are divided into two basic categories

- Impact printers
- Non-Impact printers

Impact printers

Printers in which the print heads are in physical contact with the paper to make a mark onto it.

An impact printer uses pins or hammers that press an inked ribbon against the paper to make a mark on the paper.

Most commonly used impact printers are,

- Dot matrix printers
- Daisy wheel printers
- Line printers

Dot Matrix Printers

Dot matrix printer prints one character at a time. It prints characters and images as pattern of dots. These dots are the result of striking of pins located at the tip of the print head. These pins are arranged in a matrix form. Hence, the name dot matrix.

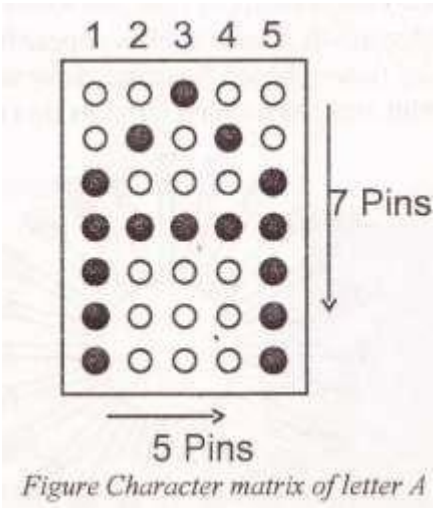

Figure Character matrix of letter A

Working of a Dot Matrix Printer

- There is an inked ribbon between the print head and the paper.
- When the print head strikes against inked ribbon, the corresponding activated pins leave their impression on the paper. Above figure illustrates the dot matrix for letter A.

Daisy Wheel Printer

- The daisy wheel printer is an impact printer. It is a solid character printer.
- It has a wheel of 96 spokes or print arms for both upper case and lower case alphabets, digits, punctuations and other special symbols. These spokes appear like an arrow.
- All these arrows look like petals of a daisy flower, hence the name, daisy wheel printer. As shown in the below figure.
- Each spoke or print arm has a character at its tip.

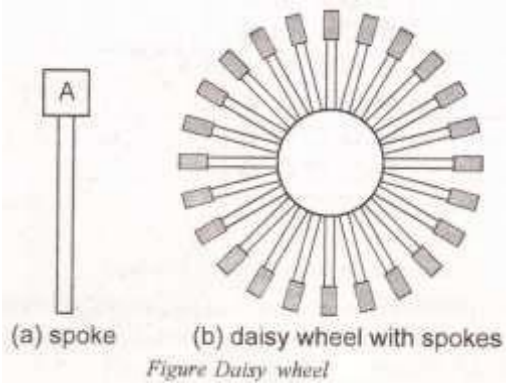

Figure Daisy wheel

Working of Daisy Wheel Printer

- The daisy wheel is as shown in the above Figure (b).
- All spokes are fixed around the wheel hub.
- The wheel hub rotates at a high speed and an activated spoke strikes against an inked ribbon and then the corresponding character is printed on the paper.

Line printers

Line printers print one line at a time. The speed of line printers is measured in terms of lines per minute (lpm). Normally, the speed of a line printer ranges from 300 to 3000 lpm.

There are three types of line printers.

1. Drum printer
2. Band printer

3. Chain printer

Non-Impact Printer

Printers in which the print heads are not in physical contact with the paper to make a mark onto it.

Most commonly used impact printers are,

 Laser printers Inkjet printers

Laser printer

- Laser printers are non-impact printers.
- Laser printers are used to produce high quality output.
- These are used for producing both text and graphical output.
- Generally, they are called **page printers** because they **print one page at a time**.

Working of Laser printer

- Laser printing technology uses a laser beam to produce an image of print character, on a photosensitive drum.
- The laser beam moves across the drum. The movement of laser beam is controlled by the control characters sent by the computer.
- A portion of the drum exposed to the laser beam attracts toner particles and forms an image.
- Then, the inked image so formed is transferred from the drum on to the paper.

Laser printers can be interfaced with microcomputers. The speed of the laser printer is measured in terms of page per minute (ppm). Low speed laser printers can print about 8-15 ppm, while high speed laser printers can print up to as 250 ppm.

Inkjet Printers

- Inkjet printers are the non-impact printers
- Inkjet printers use ink-filled cartridges and tiny nozzles to spray ink onto the paper in a series of dots that make the characters and graphics.

Working of Inkjet printers

- A print head scans the paper in horizontal strips, using a motor assembly to move it from left to right and back, as another motor assembly rolls the paper in vertical steps.
- A strip of the image is printed, and then the paper moves on, ready for the next strip.

Plotter

It is another type of output device used to produce graphical output. They are employed for plotting graphs, charts and other designs on paper.

There are 2 types of plotters

- Flat Bed plotters
- Drum plotter.

Flat Bed plotters

- In flatbed plotter, the paper on which graphs have to be plotted is fixed on a flat rectangular surface.
- Paper does not move but the pen-holding mechanism moves across the paper and plots the corresponding graphical information.

Drum Plotter

- In a drum plotter, the paper on which graphs have to be plotted is placed over the drum.
- The drum rotates back and forth and pen-holding mechanism, which moves only in the horizontal direction, writes on the paper.

Drum Plotter

Monitors

The monitor most frequently used output device for producing soft copy output. A computer monitor is a TV-like display attached to the computer on which the output can be displayed and viewed.

Cathode Ray Tube Monitors

Nowadays, most computer monitors are based on cathode ray tube (CRT) technology.

Liquid Crystal Display Monitor
(LCD) Light Emitting Diode
(LED)