Following are few of the important output devices which are used in Computer Systems

- Monitors

- Graphic Plotter

- Printer

Monitors

Monitor commonly called as Visual Display Unit (VDU) is the main output device of a computer. It forms images from tiny dots, called pixels, that are arranged in a rectangular form. The sharpness of the image depends upon the no. of the pixels.

There are two kinds of viewing screen used for monitors.

- Cathode-Ray Tube (CRT)

- Flat- Panel Display

Cathode-Ray Tube (CRT) Monitor

In the CRT display is made up of small picture elements called pixels for short.The smaller the pixels, the better the image clarity, or resolution.It takes more than one illuminated pixel to form whole character, such as the letter e in the word help.

A finite number of character can be displayed on a screen at once.The screen can be divided into a series of character boxes - fixed location on the screen where a standard character can be placed.

The most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically. There are some disadvantage of CRT

- Large in Size

- High Power consumption

Flat-Panel Display Monitor

The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement compare to the CRT. You can hang them on walls or wear them on your wrists. Current uses for flat-panel displays include calculators, videogames, monitors, laptop computer, graphics display.

The flat-panel display are divided into two categories

- **Emissive Displays** - The emissive displays are devices that convert electrical energy into light. Example are plasma panel and LED(Light-Emitting Diodes).
- **Non-Emissive Displays** - The Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns.Example is LCD(Liquid-Crystal Device)

Printers

Printer is the most important output device, which is used to print information on paper.

There are two types of printers

- Impact Printers

- Non-Impact Printers

Impact Printers

The printers that print the characters by striking against the ribbon and onto the paper, are called impact printers.

Characteristics of Impact Printers are following

- Very low consumable costs

- Impact printers are very noisy

- Useful for bulk printing due to low cost

- There is physical contact with the paper to produce an image

  These printers are of two types

- Character printers

- Line printers

Character Printers:

Character Printers are printers which print one character at a time.

These are of further two types

- Dot Matrix Printer(DMP)

- Daisy Wheel

Dot Matrix Printer

In the market one of the most popular printer is Dot Matrix Printer because of their ease of printing features and economical price. Each character printed is in form of pattern of Dot's and head consists of a Matrix of Pins of size(5*7, 7*9, 9*7 or 9*9) which comes out to form a character that is why it is called Dot Matrix Printer.

Advantages

- Inexpensive

- Widely Used

- Other language characters can be printed

Disadvantages

- Slow Speed

- Poor Quality

Daisy Wheel

Head is lying on a wheel and Pins corresponding to characters are like petals of Daisy(flower name) that is why it is called Daisy Wheel Printer. These printers are generally used for word-processing in offices which require a few letters to be send here and there with very nice quality representation.

Advantages

- More reliable than DMP's

- Better quality

- The fonts of character can be easily changed.

Disadvantages

- Slower than DMP's

- Noisy

- More expensive than DMP's

Line Printers

Line printers are printers which print one line at a time.

These are of further two types

- Drum Printer

- Chain Printer

Drum Printer

This printer is like a drum in shape so it called drum printer. The surface of drum is divided into number of tracks. Total tracks are equal to size of paper i.e for a paper width of 132 characters, Drum will have 132 tracks. A character set is embossed on track. The different characters sets are available in market 48 character set, 64 and 96 characters set.One rotation of drum prints one line. Drum Printers are fast in speed and speed in between 300 to 2000 lines per minute.

Advantages

- Very high speed

Disadvantages

- Very expensive

- Characters fonts can not be changed

Chain Printer

In this printer chain of character sets are used so it called Chain Printers.A standard character set may have 48, 64, 96 characters.

Advantages

- Character fonts can easily be changed.

- Different languages can be used with the same printer.

Disadvantages

- Noisy

- Do not have the ability to print any shape of characters.

Non-impact Printers

The printers that print the characters without striking against the ribbon and onto the paper, are called Non-impact Printers. These printers print a complete page at a time, also called as Page Printers.

These printers are of two types

- Laser Printers

- Inkjet Printers

Characteristics of Non-impact Printers

- Faster than impact printers.

- They are not noisy.

- High quality.

- Support many fonts and different character size.

Laser Printers

These are non-impact page printers. They use laser lights to produces the dots needed to form the characters to be printed on a page.

Advantages

- Very high speed.

- Very high quality output.

- Give good graphics quality.

- Support many fonts and different character size.

  Disadvantage

- Expensive.

- Cannot be used to produce multiple copies of a document in a single printing.

Inkjet Printers

Inkjet printers are non-impact character printers based on a relatively new technology. They print characters by spraying small drops of ink onto paper. Inkjet printers produce high quality output with presentable features.

They make less noise because no hammering is done and these have many styles of printing modes available. Colour printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.

Advantages

- High quality printing

- More reliable

  Disadvantages

- Expensive as cost per page is high

- Slow as compare to laser printer