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Covered Topics Under UNIT-1 of "PPS-PROGRAMMING FOR PROBLEM SOLVING (BCS101 / BCS201)"

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Class Notes

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PPS: UNIT-1

Introduction to Components of a Computer System

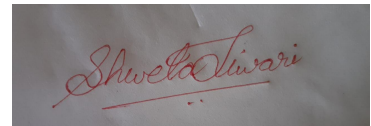
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TOPIC On : UNIT-1: OUTPUT UNITS

By SHWETA TIWARI

Under On: Introduction to Components of a Computer System

PREPARED FOR
Engineering Students
All Engineering College

PREPARED BY
SHWETA TIWARI

TOPIC On : UNIT-1: OUTPUT UNITS

OUTPUT UNITS

I. Output units

Output units are instruments of interpretation and communication between human and computer, that let you see (or here) the result of the commands you enter, the most common output device are a display screen (monitor), printer or other device that let you see what the computer has accomplished.

Following are some of the important output devices used in a computer.

- Monitors
- Printer
- Graphic Plotter

II. Monitors

Monitors, commonly called as **Visual Display Unit** (VDU), are 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 number of pixels.

There are two kinds of viewing screen used for monitors.

1. Cathode-Ray Tube (CRT)
2. Flat-Panel Display

1. Cathode-Ray Tube (CRT) Monitor

The CRT display is made up of small picture elements called pixels. A cathode-ray tube is a display device used in television sets and computer monitors. It is a kind of vacuum tube which contains one or more electron guns, electrostatic deflection plates and a phosphor target which is located at the back of the glass screen. A cathode for which the CRT got its name is a positive terminal at which electrons may enter. In a computer monitor or in a television set, the entire front of the tube is being scanned systematically and rapidly in a fixed pattern which is called a raster. Images and color are produced by shooting and controlling the electron beams representing each additive color light (red, blue and green) using the video signal as the reference.



There are some disadvantages of CRT:

- Large in Size
- High power consumption

2. Flat-Panel Display Monitor

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



The flat-panel display is divided into two categories:

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

III. Printers

Printer is an output device, which is used to print information on paper.

There are two types of printers:

- a) Impact Printers
- b) Non-Impact Printers

a) Impact Printers

Impact printers print the characters by striking them on the ribbon, which is then pressed on the paper.

Characteristics of Impact Printers are the following:

- Very low consumable costs
- Very noisy
- Useful for bulk printing due to low cost

These printers are of two types:

1. Character printers
2. Line printers

1. Character Printers

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

These are further divided into two types:

- A. Dot Matrix Printer(DMP)
- B. Daisy Wheel

A. Dot Matrix Printer

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

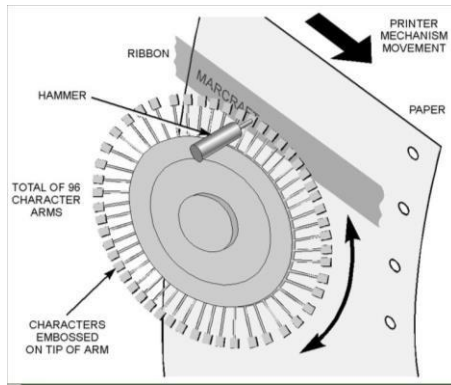
ABCDEFGHIJKLMN
NOPQRSTUVWXYZ



| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none">• Inexpensive• Widely Used• Other language characters can be printed | <ul style="list-style-type: none">• Slow Speed• Poor Quality |

B. Daisy Wheel

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



| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> • More reliable than DMP • Better quality • Fonts of character can be easily changed | <ul style="list-style-type: none"> • Slower than DMP • Noisy • More expensive than DMP |

2. Line Printers

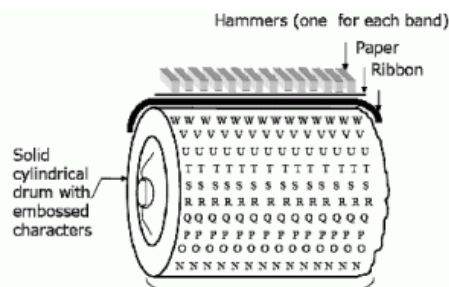
Line printers are the printers which print one line at a time.

These are of two types:

- A. Drum Printer
- B. Chain Printer

A. Drum Printer

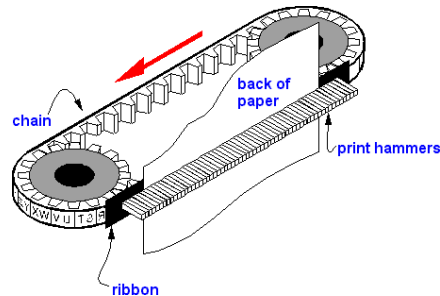
This printer is like a drum in shape hence it is called drum printer. The surface of the drum is divided into a number of tracks. Total tracks are equal to the size of the paper, i.e. for a paper width of 132 characters, drum will have 132 tracks. A character set is embossed on the track. Different character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



| Advantages | Disadvantages |
|---|--|
| <ul style="list-style-type: none"> • Very high speed | <ul style="list-style-type: none"> • Very expensive • Characters fonts cannot be changed |

B.Chain Printer

In this printer, a chain of character sets is used, hence it is called Chain Printer. A standard character set may have 48, 64, or 96 characters.



| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none">• Character fonts can easily be changed.• Different languages can be used with the same printer. | <ul style="list-style-type: none">• Noisy |

b) Non-impact Printers

Non-impact printers print the characters without using the ribbon. These printers print a complete page at a time, thus they are also called as **Page Printers**.

These printers are of two types:

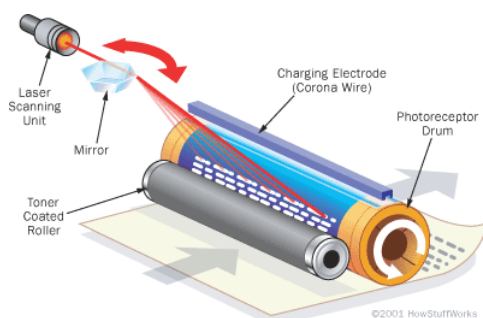
1. Laser Printers
2. Inkjet Printers

Characteristics of Non-impact Printers

- Faster than impact printers
- They are not noisy
- High quality
- Supports many fonts and different character size

1. Laser Printers

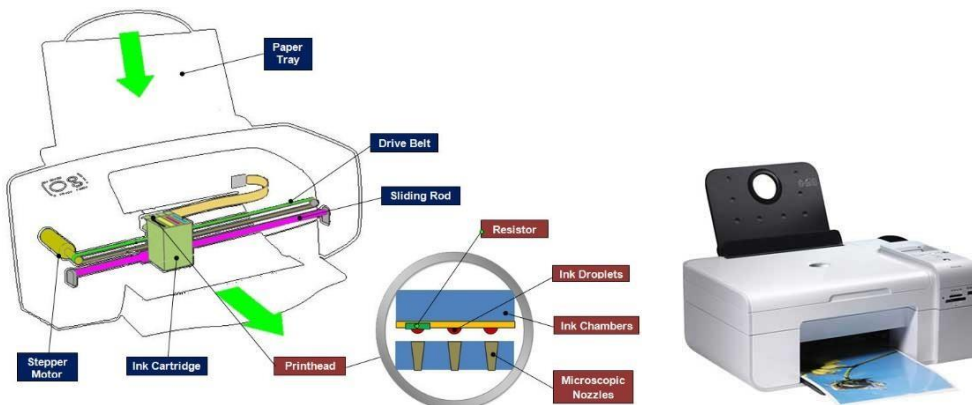
These are non-impact page printers. They use laser lights to produce the dots needed to form the characters to be printed on a page.



| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> • Very high speed • Very high quality output • Good graphics quality • Supports many fonts and different character size | <ul style="list-style-type: none"> • Expensive • Cannot be used to produce multiple copies of a document in a single printing |

2. 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. Color printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.

| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> • High quality printing • More reliable | <ul style="list-style-type: none"> • Expensive as the cost per page is high • Slow as compared to laser printer |

IV. Plotter

A plotter is used for vector graphics output to draw graphs, maps, blueprints of ships, buildings, etc. Plotters use pens of different colors (cyan, magenta, yellow and black) for drawing. Plotters draw continuous and accurate lines, in contrast to printers where a line is drawn as closely spaced dots. Plotter is a slow output device and is expensive.

Plotters are of two kinds:

- Drum plotter.
- Flatbed plotter.

In a ***drum plotter***, pens mounted on the carriage are stationary and move only horizontally; for vertical movement, the drum on which the paper is fixed moves clockwise and anti-clockwise.



In a ***flatbed plotter***, the paper is fixed on a flat bed. The paper is stationary and the pens mounted on the carriage move horizontally and vertically to draw lines. Plotters are mainly used for drawings in AUTOCAD (computer assisted drafting), Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) applications.

