

## OUTPUT DEVICES

Output devices are devices that enable the computer to communicate the results of data processing carried out by it to the user. These devices enable the computer to display text, graphics (pictures and images) and produce sound. Examples of computer output devices include monitor, printer, speaker, plotter, braille embosser etc.

### Features and uses of output devices

**1. Monitor:** The monitor, also called Visual Display Unit (VDU) is a TV-like structure attached to the System Unit through the VGA cable. It displays text and graphics (pictures and images). The content showing on the monitor is called a soft copy.

**2. Printer:** A printer is a device attached to the System Unit through the USB cable or other types of cable. It is used to produce the information (text, graphics, images, illustrations) showing on the monitor on paper, transparencies, and plastic. Such a printout is called a hardcopy.

**3. Speaker:** A speaker is a device used for producing sound captured by the microphone or music in mp3, wav, etc. formats. Speakers come in different forms such as headphones, earphone, canalphones, headset etc. and can also be used with portable devices such as mp3 player, mobile phones etc.

**4. Plotter:** A special type of printer used for printing drawings, charts, maps etc. using multi-coloured automated pens. It is usually used by architects, engineers and surveyors. They are rarely used now and are being replaced by wide-format conventional printers, which can produce high-quality graphics.

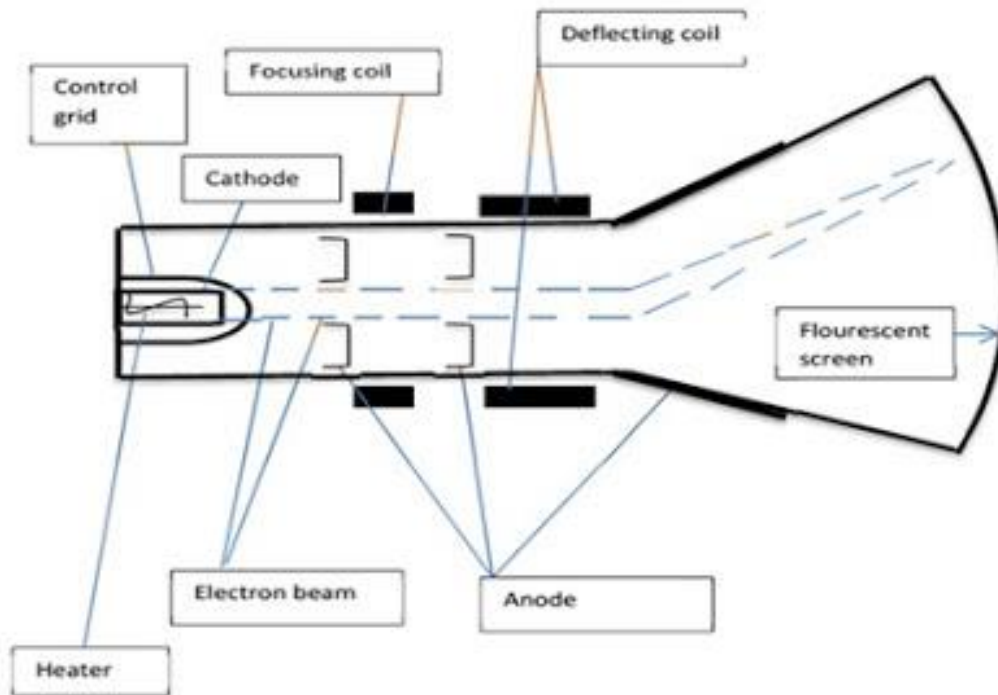
**5. Projector:** A device that helps direct the content on a display screen (monitor) onto a particular flat surface.

### 6. Braille Embosser

#### Structure and type of CRT monitor

The Cathode Ray Tube (CRT) used as a computer monitor was invented by Karl Ferdinand Braun. This monitor employs the CRT technology used most commonly in the manufacturing of television screens. In this, a stream of intense high energy electron is used to form images on a fluorescent screen. A cathode ray tube is basically a vacuum tube containing an electron gun at one end and a fluorescent screen at another end. From this electron gun, a process called thermionic emission generates a strong beam of electrons. These electrons travel through a narrow path within the tube with high speed using various electro-magnetic devices and finally strike the phosphor points present on the fluorescent screen, thus creating an image.

Today, CRT monitor are being replaced with flat Plasma screen, Liquid Crystal Display (LCD).



## CRT monitor

### Types of monitor

There are two types of monitor, namely:

**1. Monochrome monitor:** This monitor displays its characters in only one colour. The colour could be white, green or amber. Looking at the monochrome monitor, one can see two colours; one colour for the background and one for the foreground. The two colour combinations can therefore be black and white, green and black or amber and black.

**2. Colour monitor:** This monitor displays information in colours. It is similar to a colour television but it handles data more quickly and has a sharper output.

### Types of printer

There are two types of printer, namely impact and non-impact printers.

**I. IMPACT PRINTERS:** This type of printer behaves like a typewriter whereby a character is printed when a metal slug strikes on a carbon ribbon. Impact printers have contact with the surface of the paper. Examples of impact printer include the following:

**A. DOT MATRIX printer:** This prints characters and graphic images by impacting a ribbon and transferring dots of ink onto the paper. It prints dot matrix characters by pressing the end of selected wires against ribbon and paper. The dots are used to form the characters and images on the paper.

**B. LINE printer:** This prints a line of characters at a time. The output speed is between 200 to 3000 lines per minute (LPM)

**C. CHARACTER printer:** This prints one character at a time moving across the paper. The output speed range from 200 to 400 characters per second (cps)

### II. NON-IMPACT PRINTER

Non-impact printer creates images on paper in a manner similar to that of a photocopying machine. They do not have contact with the surface of the paper. Examples include:

**A. INK JET printer:** This prints by spraying small streams of quick-drying ink onto the paper and using it to form characters, shapes and images. The ink is stored in disposable ink cartridges, which can be black or coloured. They are found in homes and offices.

**B. LASER printer:** This uses an electrically charged drum to transfer toner or dry ink onto paper like the photocopier does. It traces an image by using a computer-controlled laser beam.

**C. THERMAL printer:** This prints by transferring dots of ink or dye from a ribbon onto paper and passing the ribbon and the paper across a line of heating elements. The characters are produced with a print head containing a matrix of small heating elements. This printer is very quiet in operation because the printer head does not strike the paper.

#### **DIFFERENCES BETWEEN IMPACT AND NON-IMPACT PRINTER**

<b>IMPACT PRINTER</b>	<b>NON-IMPACT PRINTER</b>
Makes noise while printing	Does not make noise while printing
Produces low quality images	Produces high quality images
Uses ribbon to print	Uses ink (dry and wet) to print
Does not have heating element	Has heating element that dries the ink on paper
Prints only one colour at a time	Can print more than one colour at a time
Has striking pins/heads that strike the characters or dots on paper	Does not have striking pin heads to strike characters on paper

#### **DIFFERENCES BETWEEN THE MONITOR AND THE PRINTER**

<b>MONITOR</b>	<b>PRINTER</b>
Has screen	Has no screen
Uses no ribbon, ink, cartridge or toner	Uses ribbon, cartridge, ink or toner
Uses no paper	Uses paper and printable medium
Display texts, images and pictures	Prints text, images and pictures on paper
Some have vacuum tubes or a liquid crystal	Has no vacuum tube or a liquid crystal
Has no paper tray	Some have paper tray