

Computer Fundamental

UNIT : 03

OUTPUT DEVICES

-By Hiral Pandya

OUTPUT DEVICES :

- An output device is a piece of computer hardware that receives data from a computer and then translates that data into another form.
- That form may be audio, visual, textual, or hard copy such as a printed document.
- The key distinction between an input device and an output device is that an input device sends data to the computer, whereas an output device receives data from the computer.
- *There are four different categories of output device: VISUAL, DATA, PRINT, AND SOUND.*

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TYPES OF OUTPUT DEVICES

:

- ✓ Monitor
- ✓ Printer
- ✓ Headphones
- ✓ Computer Speakers
- ✓ Projector
- ✓ GPS
- ✓ Sound Card
- ✓ Video Card
- ✓ Braille Reader
- ✓ Speech Generating Devices

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MONITOR :

- The monitor is the display unit or screen of the computer. It is the main output device that displays the processed data or information as text, images, audio or video.
- **Types of Monitor :**
 - ❖ CRT Monitor
 - ❖ LCD Monitor
 - ❖ LED Monitor
 - ❖ Plasma Monitor

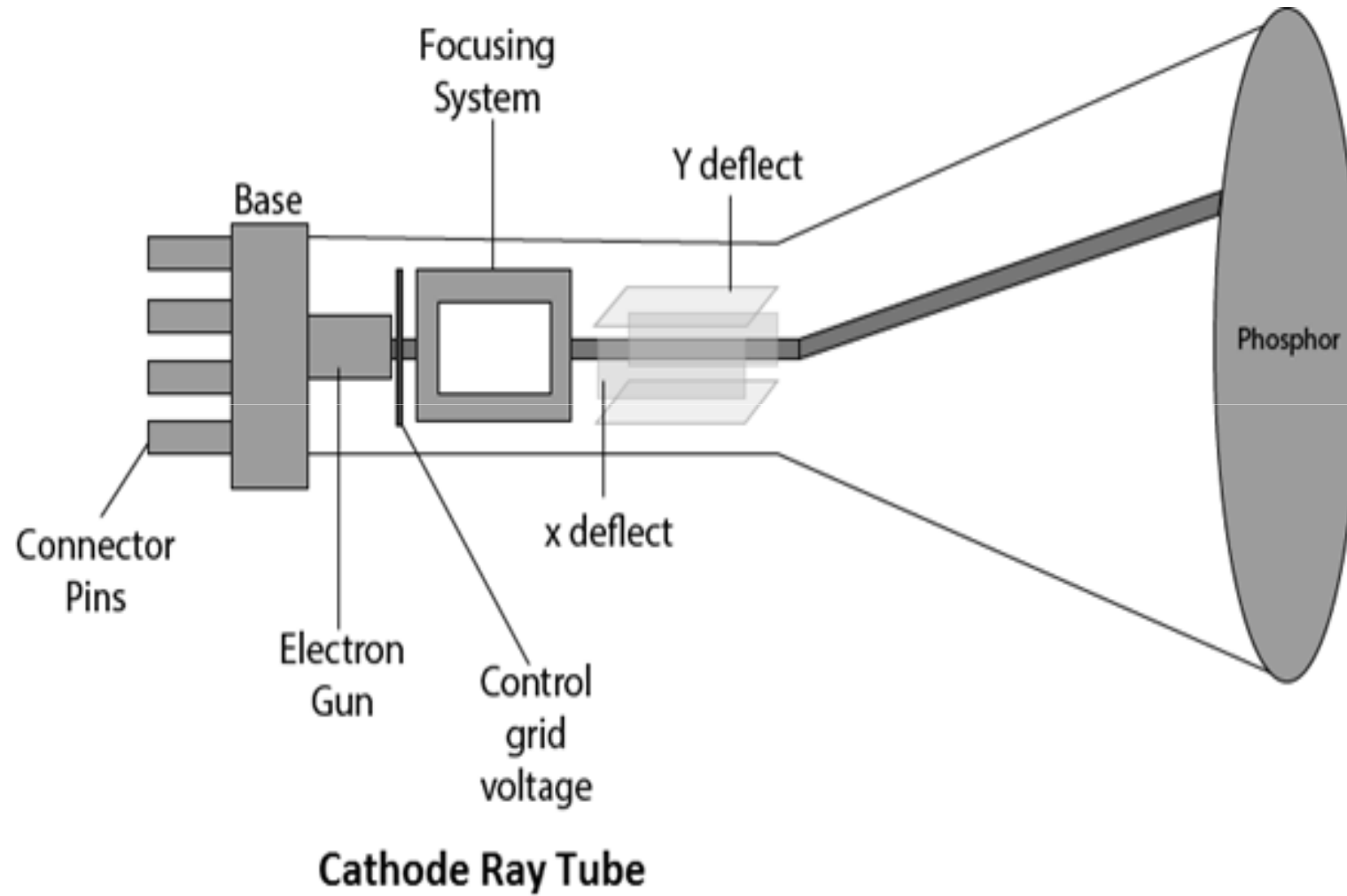
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CRT Display Unit :

- CRT stands for ***Cathode Ray Tube***.
- CRT is a technology used in traditional computer monitors and televisions.
- The image on CRT display is created by firing electrons from the back of the tube of phosphorus located towards the front of the screen.
- Once the electron heats the phosphorus, they light up, and they are projected on a screen.
- The color you view on the screen is produced by a blend of red, blue and green light.

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CRT Display Unit :



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Components of CRT :

- **Electron Gun :** Electron gun consisting of a series of elements, primarily a heating filament (heater) and a cathode. The electron gun creates a source of electrons which are focused into a narrow beam directed at the face of the CRT.
- **Control Electrode:** It is used to turn the electron beam on and off.
- **Focusing system:** It is used to create a clear picture by focusing the electrons into a narrow beam.

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Components of CRT :

- **Deflection Yoke:** It is used to control the direction of the electron beam. It creates an electric or magnetic field which will bend the electron beam as it passes through the area. In a conventional CRT, the yoke is linked to a sweep or scan generator. The deflection yoke which is connected to the sweep generator creates a fluctuating electric or magnetic potential.
- **Phosphorus-coated screen:** The inside front surface of every CRT is coated with phosphors. Phosphors glow when a high-energy electron beam hits them. Phosphorescence is the term used to characterize the light given off by a phosphor after it has been exposed to an electron beam.

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LCD Monitor :

- LCD stands for ***LIQUID CRYSTAL DISPLAY***.
- The LCD monitor is a flat panel screen that is compact and light-weight as compared to CRT monitors.
- It is based on liquid crystal display technology which is used in the screens of laptops, tablets, smart phones, etc. An LCD screen comprises two layers of polarized glass with a liquid crystal solution between them.
- When the light passes through the first layer, an electric current aligns the liquids crystals. The aligned liquid crystals allow a varying level of light to pass through the second layer to create images on the screen.
- Modern LCDs use ***ACTIVE-MATRIX TECHNOLOGY*** and contain ***THIN FILM TRANSISTORS (TFTS)*** with capacitors. This technology allows pixels to retain their charge.

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LED Monitor :

- LED stands for ***LIGHT-EMITTING DIODE***.
- The LED monitor is an improved version of an LCD monitor. It also has a flat panel display and uses liquid crystal display technology like the LCD monitors.
- The difference between them lies in the source of light to backlight the display. The LED monitor has many LED panels, and each panel has several LED backlight the display, whereas the LCD monitors use cold cathode fluorescent light to backlight the display.
- Modern electronic devices such as mobile phones, LED TVs, laptop and computer screens, etc., use a LED display as it not only produces more brilliance and greater light intensity but also consumes less power.

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Plasma Monitor :

- The plasma monitor is also a flat panel display that is based on **PLASMA DISPLAY TECHNOLOGY**.
- It has small tiny cells between two glass panels.
- These cells contain mixtures of noble gases and a small amount of mercury. When voltage is applied, the gas in the cells turns into a plasma and emits ultraviolet light that creates images on the screen.
- Plasma displays are brighter than liquid crystal displays (LCD) and also offer a wide viewing angle than an LCD.
- Plasma monitors provide high resolutions of up to 1920 X 1080, excellent contrast ratios, wide viewing angle, a high refresh rate and more.

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PRINTERS :

- A printer is a hardware output device that is used to generate hard copy and print any document.
- A document can be of any type such as a text file, image, or the combination of both.
- It accepts input command by users on a computer or on other devices to print the documents.
- **Based on the printing mechanism there are of TWO TYPES of printers :**
 - ❖ Impact Printer
 - ❖ Non-Impact Printer

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IMPACT PRINTER :

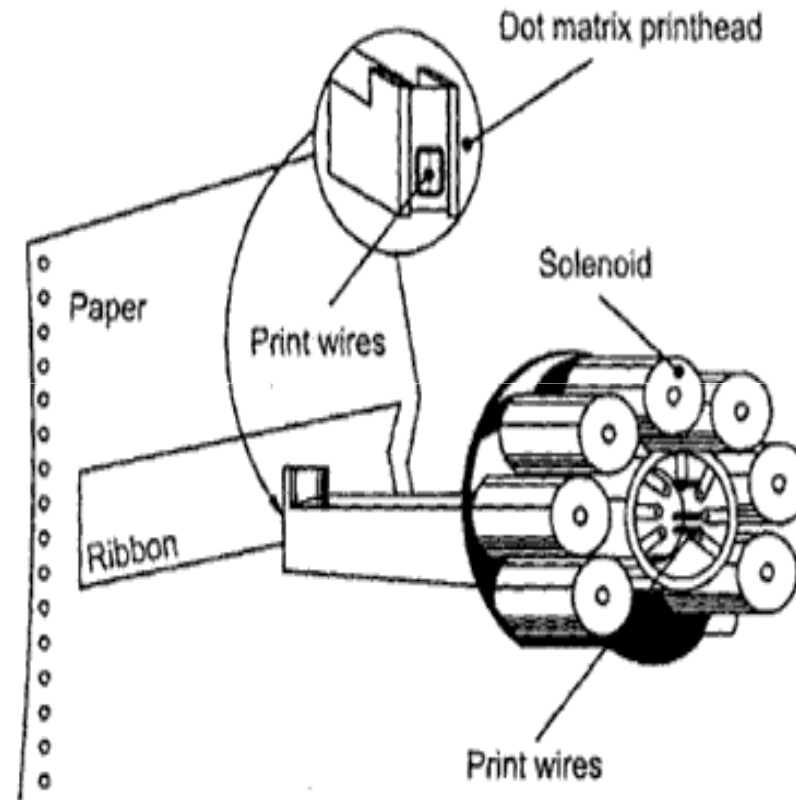
- An IMPACT PRINTER is a type of printer that works by direct contact of an ink ribbon with paper. A metal or plastic head strikes the ink ribbon, whereby the ribbon is pressed against the paper and the desired character (letter, digit, dot, line) impression is printed on the sheet.
- **TWO TYPES OF IMPACT PRINTERS :**
 - ❖ Character Printers
 - ☐ Dot Matrix printers
 - ☐ Daisy Wheel printers
 - ❖ Line printers
 - ☐ Drum printers
 - ☐ Chain printers

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IMPACT PRINTER

DOT MATRIX PRINTERS

- A dot matrix printer is an impact printer that prints using a fixed number of pins or wires. Typically the pins or wires are arranged in one or several vertical columns.
- The pins strike an ink-coated ribbon and force contact between the ribbon and the paper, so that each pin makes a small dot on the paper.

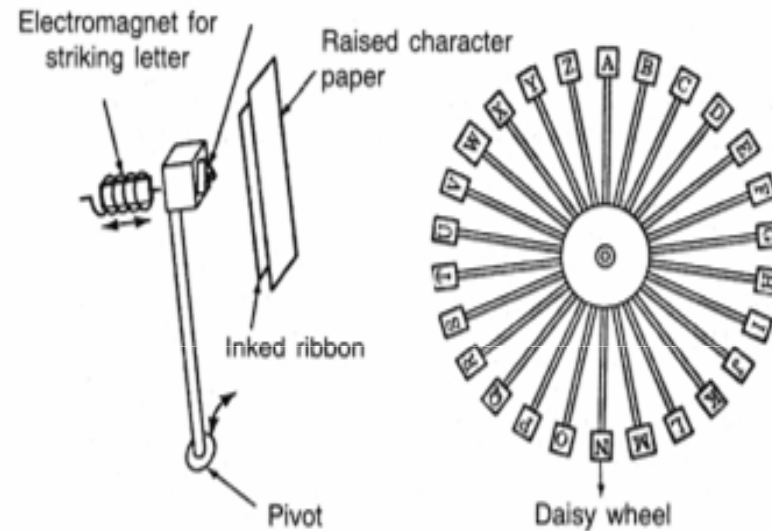


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IMPACT PRINTER

DAISY WHEEL PRINTERS

- The DAISY WHEEL PRINTER uses a metal or plastic disk containing each of the letters, numbers, and other characters it supports.
- When printing, the printer rotates the disk to each character and, using a hammer, strikes each character into an ink ribbon to create characters on paper.



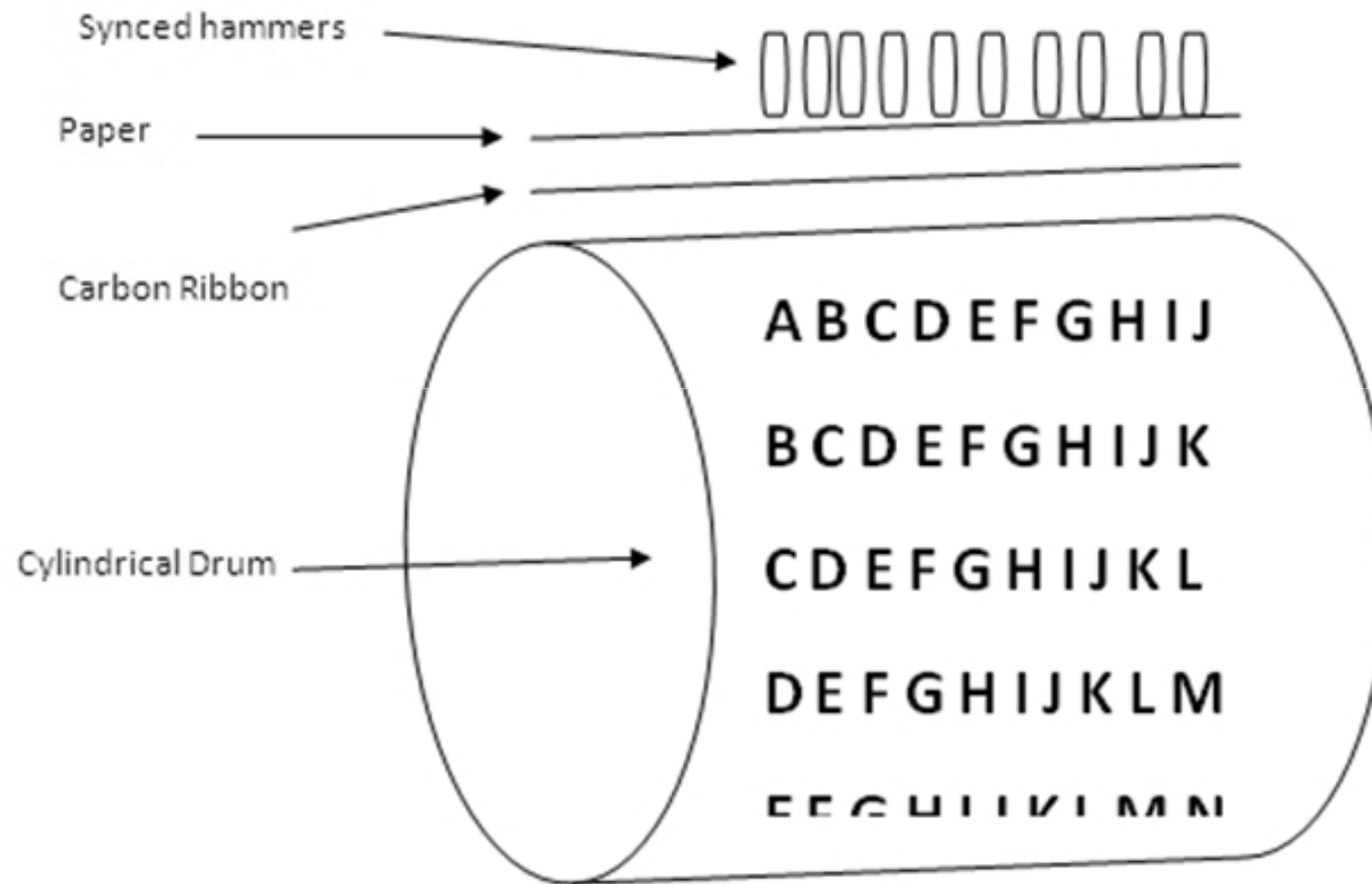
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IMPACT PRINTER DRUM PRINTERS

- Drum printer is a line printer that is made of a rotating drum to print characters.
- The drum has circular bands of characters on its surface.
- It has a separate hammer for each band of characters.
- When print, the drum rotates, and when the desired character comes under the hammer, the hammer strikes the ink ribbon against the paper to print characters.
- The drum rotates at a very high speed and characters are printed by activating the appropriate hammers.
- Although all the characters are not printed at a time, they are printed at a very high speed.
- Furthermore, it can print only a predefined style as it has a specific set of characters.
- These printers are known to be very noisy due to the use of hammering techniques.

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IMPACT PRINTER DRUM PRINTERS



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IMPACT PRINTER

CHAIN PRINTER

- Chain printer is a line printer that uses a rotating chain to print characters.
- The characters are embossed on the surface of the chain.
- The chain rotates horizontally around a set of hammers, for each print location one hammer is provided, i.e., the total number of hammers is equal to the total number of print positions.
- The chain rotates at a very high speed and when the desired character comes at the print location, the corresponding hammer strikes the page against the ribbon and character on the chain.
- They can type 500 to 3000 lines per minute. They are also noisy due to the hammering action.

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NON-IMPACT PRINTER :

- Non-impact printers don't print characters or images by striking a print head or hammer on the ink ribbon placed against the paper.
- They print characters and images without direct physical contact between the paper and the printing machine.
- These printers can print a complete page at a time, so they are also known as ***PAGE PRINTERS***.

• **TWO TYPES OF IMPACT PRINTERS :**

❖ INKJET PRINTER

❖ LASER PRINTER

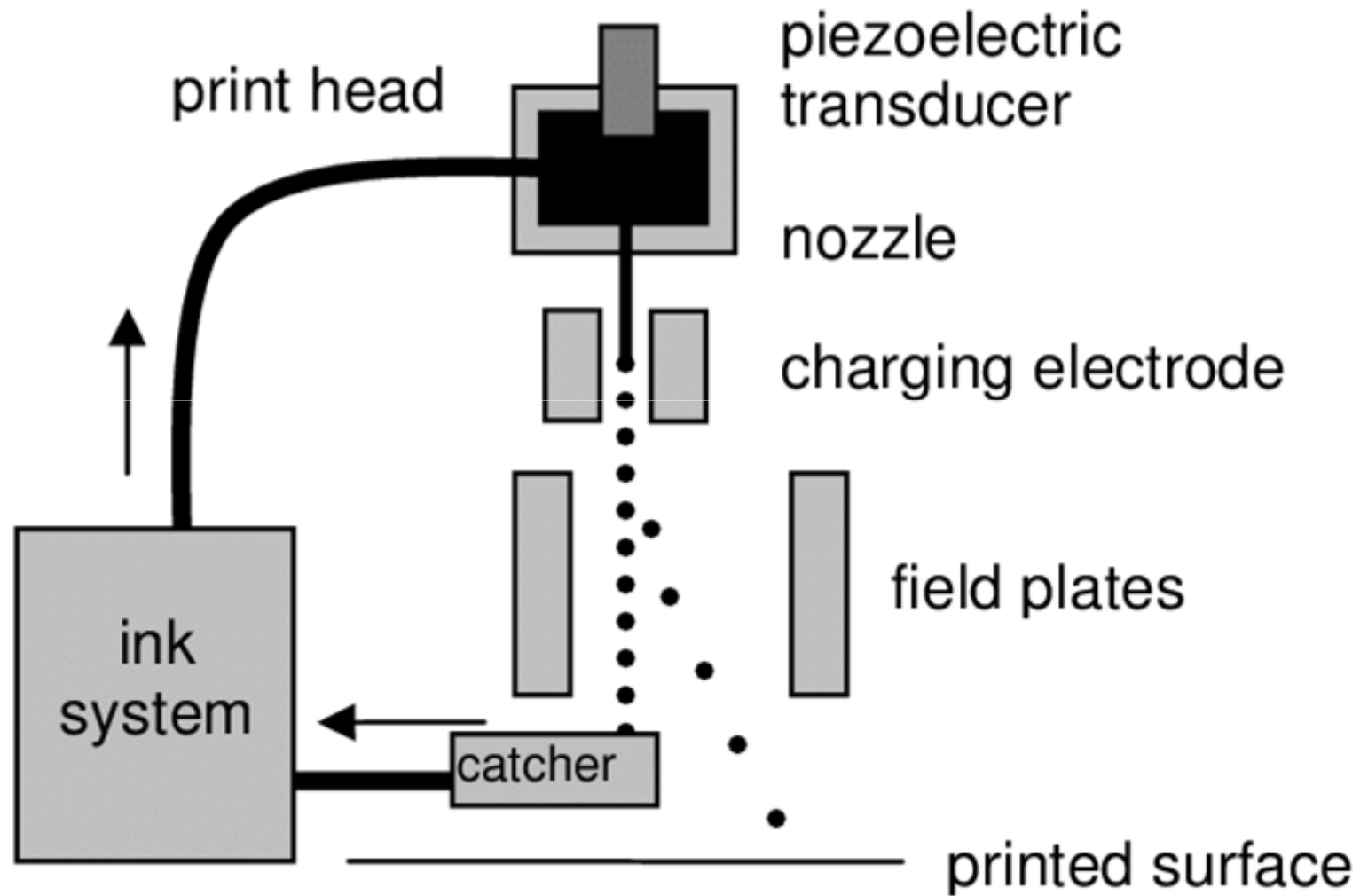
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NON-IMPACT PRINTER INKJET PRINTERS

- The INKJET printer is a non-impact printer that prints images and characters by spraying fine, ionized drops of ink.
- The print head has tiny nozzles to spray the ink. The printer head moves back and forth and sprays ionized drops of ink on the paper, which is fed through the printer. These drops pass through an electric field that guides the ink onto the paper to print correct images and characters.
- An INKJET printer has cartridges that contain ink.
- Modern inkjet printers are color printers that have four cartridges containing different colors: Cyan, Magenta, Yellow, and Black.
- It is capable of printing high-quality images with different colors. It can produce print objects with a resolution of at least 300 dots per inch (dpi).

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NON-IMPACT PRINTER INKJET PRINTERS



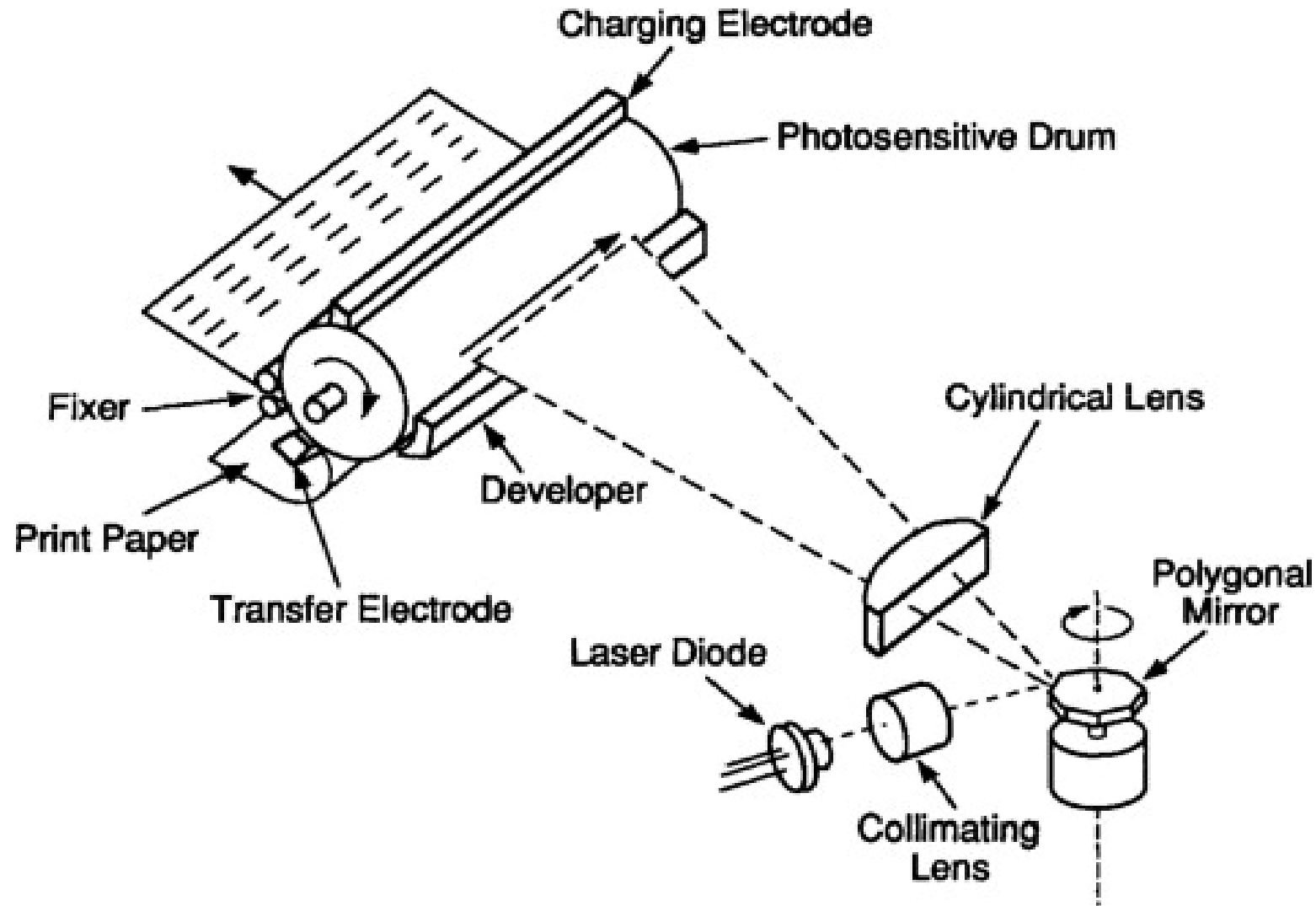
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NON-IMPACT PRINTER LASER PRINTERS

- A LASER PRINTER is a non-impact printer that uses a laser beam to print the characters.
- The laser beam hits the drum, which is a photoreceptor and draws the image on the drum by altering electrical charges on the drum.
- The drum then rolls in toner, and the charged image on the drum picks the toner. The toner is then printed on the paper using heat and pressure.
- Once the document is printed, the drum loses the electric charge, and the remaining toner is collected.
- Printers use powdered toner for printing instead of liquid ink and produce quality print objects with a resolution of 600 dots per inch (dpi) or more.

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NON-IMPACT PRINTER LASER PRINTERS



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PLOTTER

- A plotter is a computer hardware device much like a printer that is used for printing vector graphics.
- Instead of toner, **PLOTTERS USE A PEN, PENCIL, MARKER, OR ANOTHER WRITING TOOL** to draw multiple, continuous lines onto paper rather than a series of dots like a traditional printer.
- Though once widely used for computer-aided design, these devices have more or less been phased out by wide-format printers.
- Plotters produce a hard copy of schematics and other similar applications.

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PLOTTER

ADVANTAGES OF PLOTTER

- Plotters can work on very large sheets of paper while maintaining high resolution.
- They can print on a wide variety of flat materials including plywood, aluminum, sheet steel, cardboard, and plastic.
- Plotters allow the same pattern to be drawn thousands of times without any image degradation.

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PLOTTER

DISADVANTAGES OF PLOTTER

- Plotters are quite large compared to a traditional printer.
- Plotters are also much more expensive than a traditional printer.

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PLOTTER



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FACSIMILE (FAX)

- A facsimile, more commonly referred to as a FAX.
- It is the transmission of scanned printed text or images (in the form of documents) from one telephone to another where telephone numbers are connected either to a printer or to other output devices. In order to send a fax, we use fax machines.
- These fax machines are connected to the telephone lines. We place the destination number in the fax machine where we want to transmit the document and use the phone line to do so.
- The documents which are to be transmitted are scanned via a fax machine known as telecopier.

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FACSIMILE (FAX)

- The TELECOPIER process the contents of the document as a single and fixed graphic image, then convert it into a bitmap and finally transmit the document in the form of audio-frequency tones using the telephone system.
- On the other side, the person who receives the fax scans it and converts it into a digital file that can be easily read.

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OLED

- OLED stands for ***ORGANIC LIGHT-EMITTING DIODE***.
- OLED is an LED that is used in flat-panel displays, is much thinner than LCD, and requires less power to run. OLED uses an organic semiconductor material in the emissive electroluminescent later.
- In addition to flat-panel displays, OLED is used in mobile phones and smartphones, and handheld gaming devices.
- The first OLED device was developed in 1987 by ***Ching W. Tang and Steven Van Slyke*** at ***Eastman Kodak Company***.
- Since then, OLED technology has continued to improve, further reducing the power required to run an OLED device, making them more efficient.

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HEADPHONE

- Headphones are a hardware device that can be plugged into a computer, laptop, smartphone, mp3 player or other device to privately listen to audio without disturbing anyone in the vicinity.
- They are plug-and-play devices and do not require any sort of installation before use.
- Headphones are also known as earphones, or depending on the style, earbuds.

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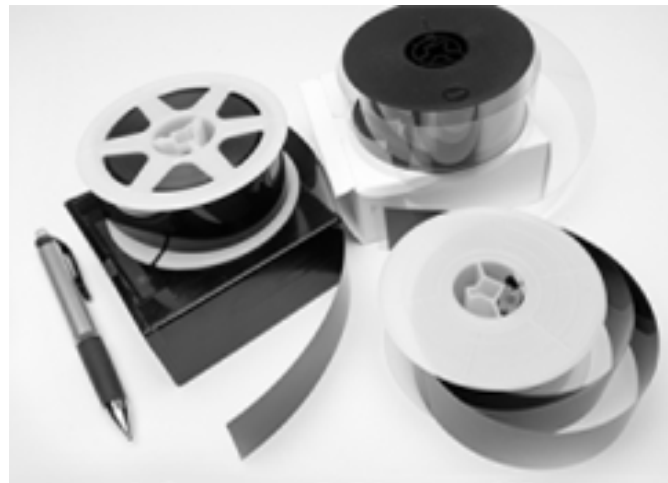
SGD

- SGD Stands for ***SPEECH-GENERATING DEVICE***.
- Speech Generating Device are kind of output device that help generate voice output from the text displayed of screen.
- These can be accessed by keypads of various sizes, optical pointers, or with single-switch scanning strategies.
- To keep the device in reach, they are typically mounted on a swing-away arm that attaches to the wheelchair frame. The control input method must be positioned so that the user can readily reach it, which can require additional wheelchair-mounting hardware.
- The placement of the speech-generating device is predicated on the type of wheelchair and seating system.

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COM

- COM Stands for **COMPUTER OUTPUT MICROFILM**.
- Computer-Output-on-microfilm (COM) (also computer output microfilm) is a process for copying data from storage media on a computer onto microfilm.
- COM can be produced as microfiche or as 16mm-roll microfilm.
- A technology enabling the output of computers be recorded directly on microfilm rather than on paper.



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GOOGLE GLASS

- Google Glass is a wearable, voice- and motion-controlled Android device that resembles a pair of eyeglasses and displays information directly in the user's field of vision.
- Google Glass offers an augmented reality experience by using visual, audio and location-based inputs to provide relevant information.
- The Google Glass operating system (OS) is based on a version of Android. The OS can run application virtualization tools called Glassware that are optimized for the device.
- Glassware allows the device to deliver an app to the user, instead of a full desktop. The glasses have built-in Wi-Fi and Bluetooth connectivity and a camera for taking photographs and videos.

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GOOGLE GLASS



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