FACULTY OF ENGINEERING & TECHNOLOGY

BCS -504 Computer Graphics & Multimedia

Lecture-04

Mr. Dilip Kumar J Saini
Assistant Professor
Computer Science & Engineering

OUTLINE

➢ **CATHODE RAY TUBE**

➢ **COMPONENTS OF CRT**

➢ **RANDOM SCAN DISPLAY**

➢ **ADVANTAGES & DISADVANTAGES**

➢ **RASTER SCAN DISPLAY**

➢ **RASTER SCAN DISPLAY**

Cathode Ray Tube (CRT)

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.

Cathode Ray Tube
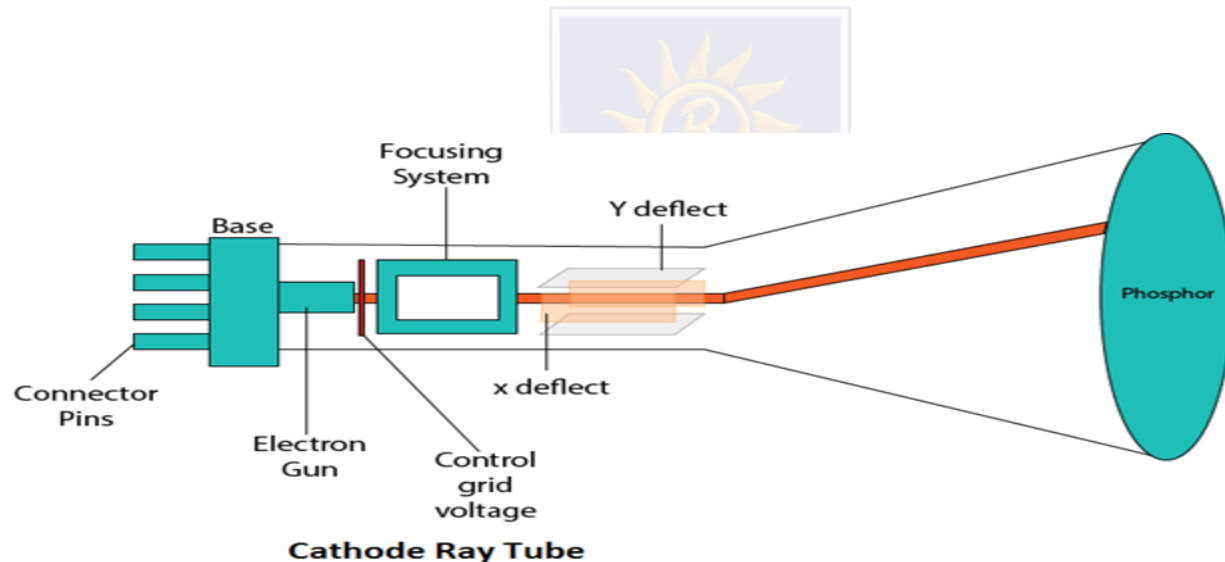
Components of CRT

1. **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.

2. **Control Electrode:** It is used to turn the electron beam on and off.

3. **Focusing system:** It is used to create a clear picture by focusing the electrons into a narrow beam.

4. **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.

5. **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.

Random Scan System uses an electron beam which operates like a pencil to create a line image on the CRT screen. The picture is constructed out of a sequence of straight-line segments. Each line segment is drawn on the screen by directing the beam to move from one point on the screen to the next, where its x & y coordinates define each point. After drawing the picture. The system cycles back to the first line and design all the lines of the image 30 to 60 time each second. The process is shown in fig:
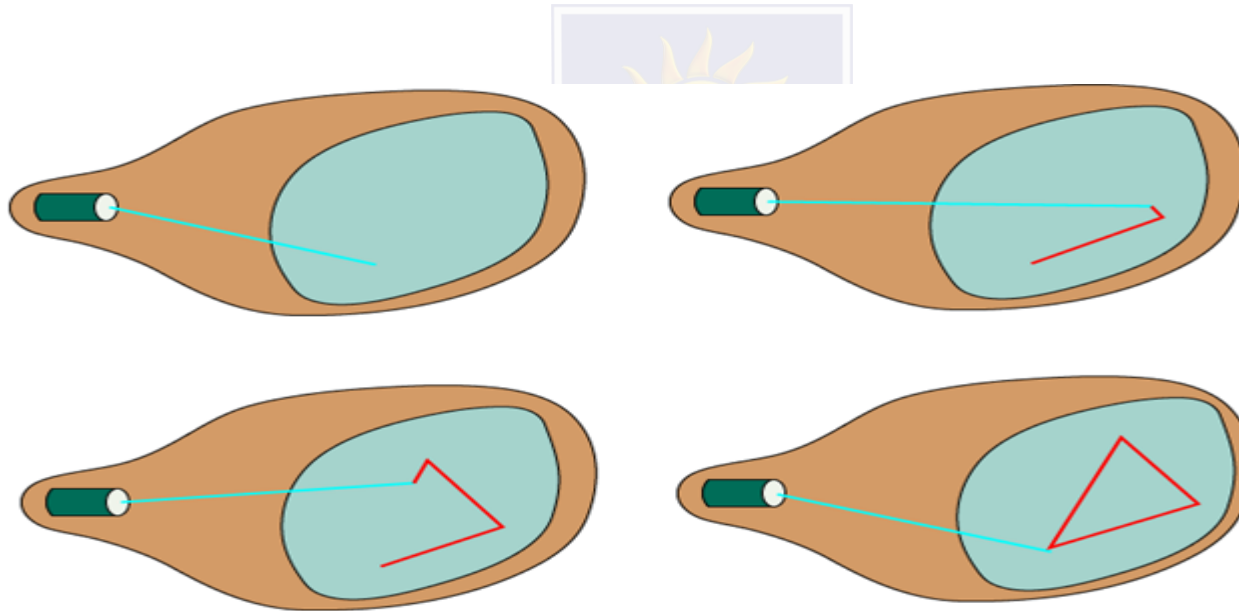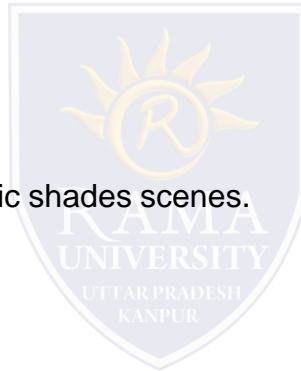
Advantages & Disadvantages

Advantages:

1. A CRT has the electron beam directed only to the parts of the screen where an image is to be drawn.

2. Produce smooth line drawings.
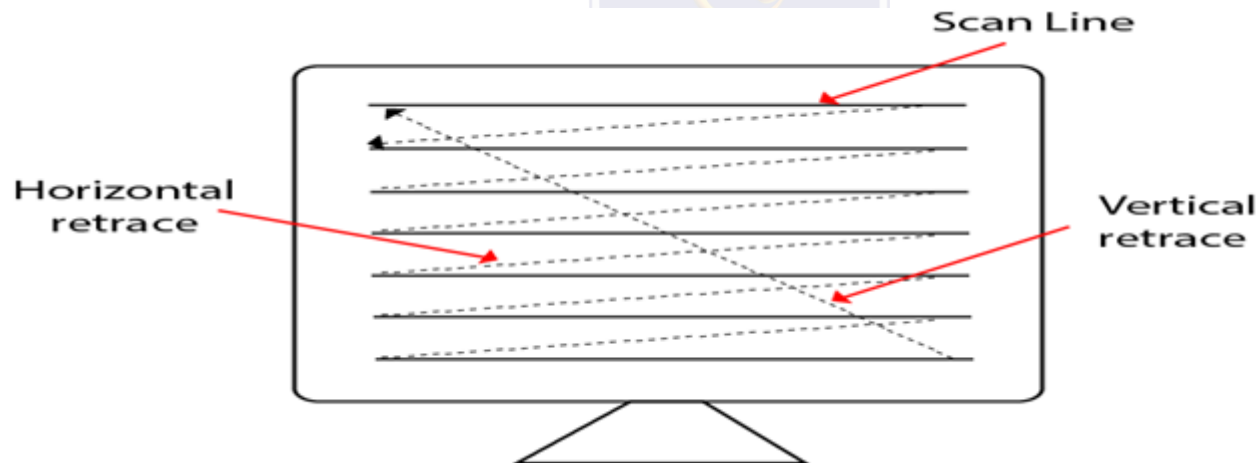
3. High Resolution

Disadvantages:

Random-Scan monitors cannot display realistic shades scenes.

Raster Scan Display

A Raster Scan Display is based on intensity control of pixels in the form of a rectangular box called Raster on the screen. Information of on and off pixels is stored in refresh buffer or Frame buffer. Televisions in our house are based on Raster Scan Method. The raster scan system can store information of each pixel position, so it is suitable for realistic display of objects. Raster Scan provides a refresh rate of 60 to 80 frames per second.

Frame Buffer is also known as Raster or bit map. In Frame Buffer the positions are called picture elements or pixels. Beam refreshing is of two types. First is horizontal retracing and second is vertical retracing. When the beam starts from the top left corner and reaches the bottom right scale, it will again return to the top left side called at vertical retrace. Then it will again more horizontally from top to bottom call as horizontal retracing shown in fig:
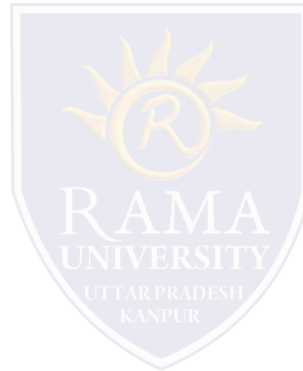
Advantages:

1. Realistic image

2. Million Different colors to be generated

3. Shadow Scenes are possible.

Disadvantages:

1. Low Resolution

2. Expensive

MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	Which process will be an evacuated glass tube?	Cathode-ray-tubes	Simulation	both	none
2	Deflection system directs beam which decides the……... where beam strikes the screen	pixel	point	position	all of these
3	How many techniques used for producing images on the CRT screen?	2	3	4	1
4	Display controller interprets and sends digital and point co-ordinates to a vector generator	query	command	order	direction
5	Display controller is connected as an ………...to the CPU	output	I/O peripheral	input	none

REFERENCES

- http://www.engppt.com/search/label/Computer%20Graphics