

- Q. Suppose a RIB raster system is to be designed using a  $8 \times 10$  inch screen with a resolution of 100 ppi in each direction. If we want to store 6 bits per pixel in the frame buffer. Calculate the size of frame buffer.

$$\begin{aligned} \text{Size} &= 800 \times 1000 \times 6 \\ &= 4800000 \text{ bits} \\ &= 600000 \text{ bytes} \\ &= 600 \text{ KB} \end{aligned}$$

$$\text{Aspect ratio} = 800/1000 = 4/5$$

- Q. Consider 3 diff raster systems with resolution of a)  $640 \times 480$   
b)  $1280 \times 1024$  c)  $2560 \times 2048$ .

What size of frame buffer in bytes is needed for each of this systems to store 12 bits per pixel. or

$$\begin{aligned} \text{a) Size} &= 640 \times 480 \times 12 \text{ bits} \\ &= 640 \times 60 \times 12 \text{ KB} \\ &= 450 \text{ KB} \end{aligned}$$

$$\begin{aligned} &640 \times 480 \times 12 \\ &= (640 \times 480) / 1024 \text{ KB} \\ &= 300 \text{ KB} \end{aligned}$$

$$\begin{aligned} \text{b) Size} &= (1024 \times 1280 \times 12) / 8 \text{ bytes} \\ &= 1920 \text{ KB} \\ &= 1.9 \text{ MB} \end{aligned}$$

$$\begin{aligned} &(1024 \times 1280 \times 12) / 8 \\ &= (1024 \times 1280) / 1024 \text{ KB} \\ &= 1280 \text{ KB} \end{aligned}$$

$$\begin{aligned} \text{c) Size} &= 2560 \times 2048 \times 12 / 8 \\ &= 7680 \text{ KB} \\ &= 7.6 \text{ MB} \\ &= 1680 \text{ KB} \end{aligned}$$

$$\begin{aligned} &(2560 \times 2048 \times 12) / 8 \\ &= 5120 \text{ KB} \\ &= 5.1 \text{ MB} \end{aligned}$$

Q. Find the size of the raster having resolution  $1024 \times 1024$  where each pixel needs 4 bits.

$$\text{Size} = \frac{1024 \times 1024 \times 4}{8} = \cancel{2048 \text{ KB}} \quad (512 \text{ KB})$$

Q. What is the resolution of  $2 \times 2$  inch image with  $512 \times 512$  pixels. (in ppi)

$$\frac{512}{2} = (256 \text{ ppi})$$

Q. An image has a height of 3 inches and aspect ratio of 2.5 : 1.

$$\frac{5}{2} = \frac{x}{3}$$

$$\frac{5}{2} \times 3$$

$$\Rightarrow x = \frac{5 \times 3}{2} = (7.5 \text{ inches})$$

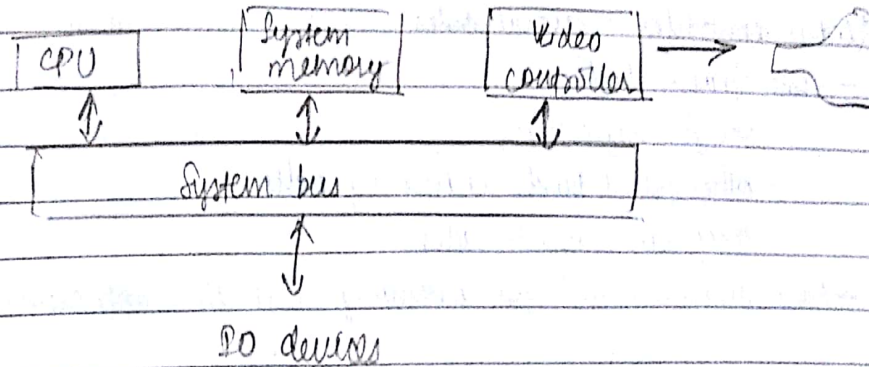
Q. How long would it take to load a  $640 \times 480$  frame buffer with 12 bits per pixel. if  $10^5$  bits can be transferred per sec.

$$\text{time} = \frac{640 \times 480 \times 12}{8 \times 10^5} = (36.86 \text{ sec})$$

Q.

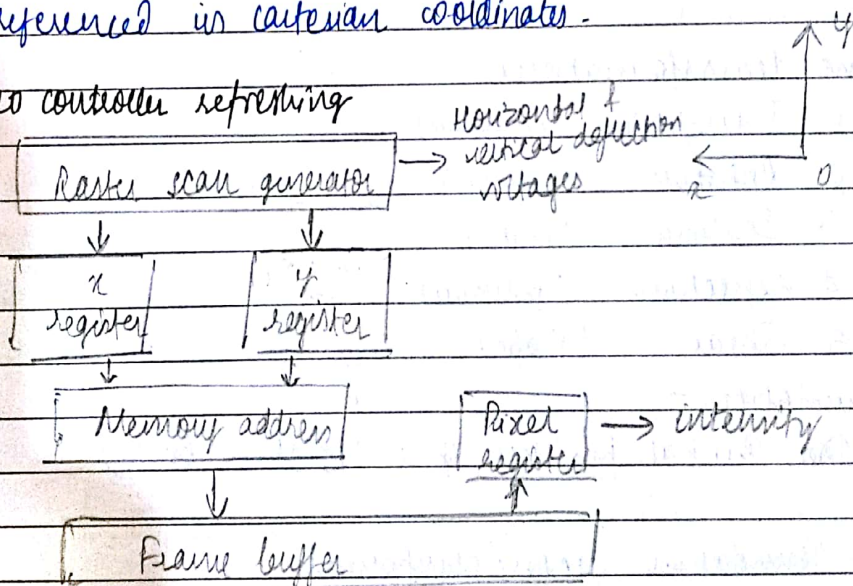


## # Raster scan system

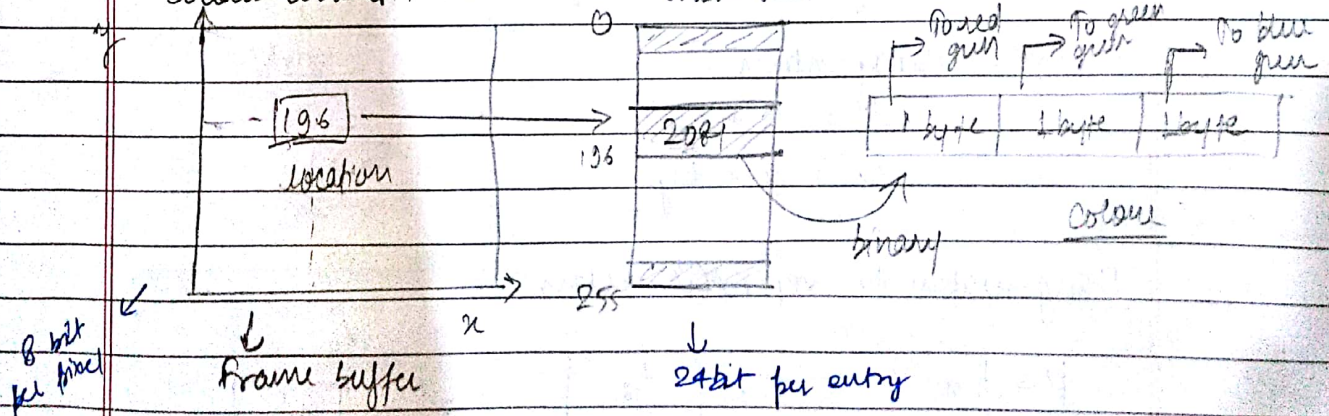


- A fixed area of the system memory is reserved for the frame buffer.
- The video controller is given direct access to the frame buffer memory.
- Pixel values are stored in row major fashion.
- Frame buffer loc<sup>n</sup>s and the corresponding screen positions are referenced in cartesian coordinates.

## Video controller refreshing



## Colour look-up table



\* Video controller - several roles

- Two frame buffers

- one for refreshing

- other filled with intensity values

- they can switch roles.

- Fast mechanism for generating real time ~~application~~ animations.

lecture 5  
A11  
02/02/18

Two dimensional geometric transformation

changes in -

- shape