CRT- BASED ON COLOR

COLOR CRT’S

- A CRT monitor displays color pictures by using a combination of phosphors that emit different ***COLOR*** lights.
- By combining the emitted light from the different phosphors, a range of color can be generated.
- Methods:-

    1. Beam Penetration

    2. Shadow Mask

Beam Penetration method

- Used with Random Scan monitors.
- Two layers of phosphor (red and green) are coated onto the inside of the CRT screen.
- The display color depends on how far the electron beam penetrates into the phosphor layers.
- A beam of very fast electrons penetrates through the red layer and excites the inner green layer.
- At intermediate beam speeds, combinations of red and green light are emitted to show two additional colors, orange and yellow.
- The speed of the electrons, and the screen color at any point, is controlled by the beam acceleration voltage.

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- Only 4 colors are possible (red, green, orange, and yellow).
- Quality of pictures is not as good as with other methods.

Shadow Mask Method

- Commonly used in raster-scan systems (including color TV).
- The color CRT has:-
- Three color phosphor dots (red, green and blue) at each point on the screen.
- One phosphor dot emits a red light, another emits green and the third one emits blue light.
- Three electron guns, each controlling the display of red, green and blue light
- 2 Methods for Implementation:-

    1. Delta Method.
    2. Inline Method.

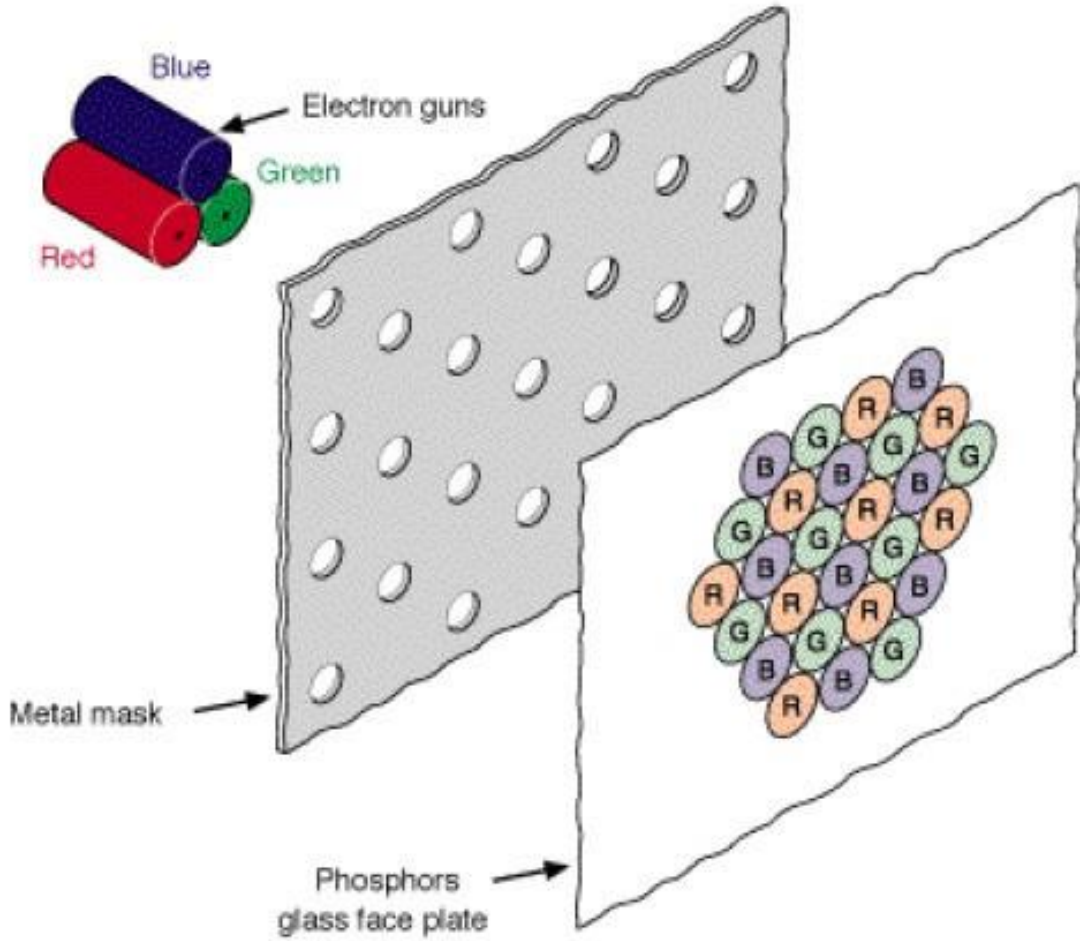
Contd..

- We obtain color variations by varying the intensity levels of the three electron beam.

- Designed as RGB monitors.

- High quality raster graphics system have 24 bits per pixel in the frame buffer (a *Full Color System* or a *True Color System*)

Shadow Mask-Delta method



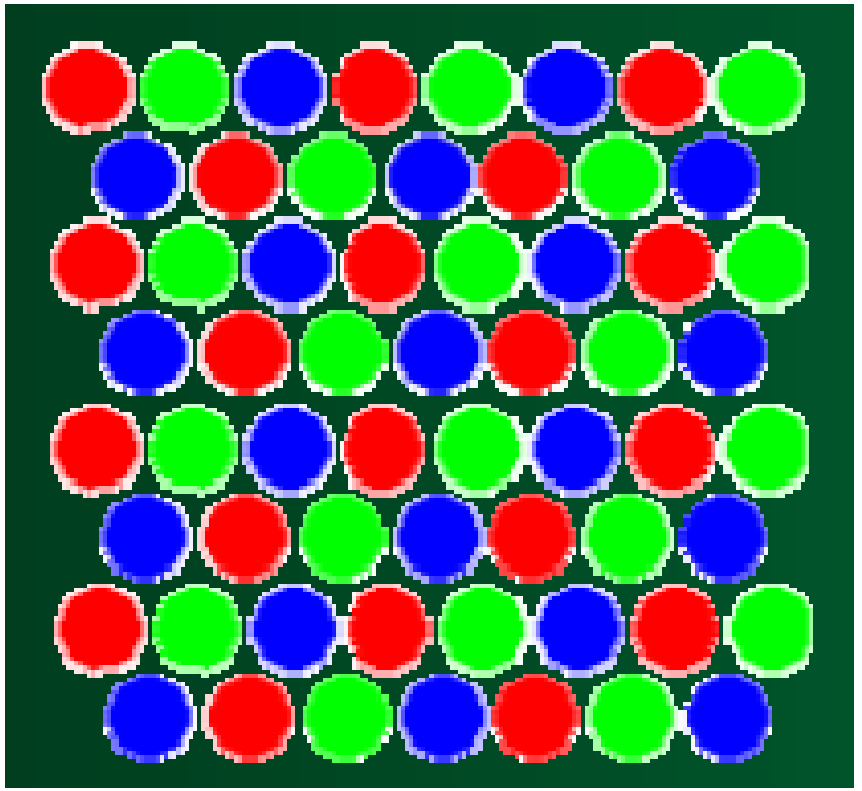
Contd..

- Three electron beams are deflected and focused as a shadow mask, which contains a series of holes aligned with the phosphor dot patterns.

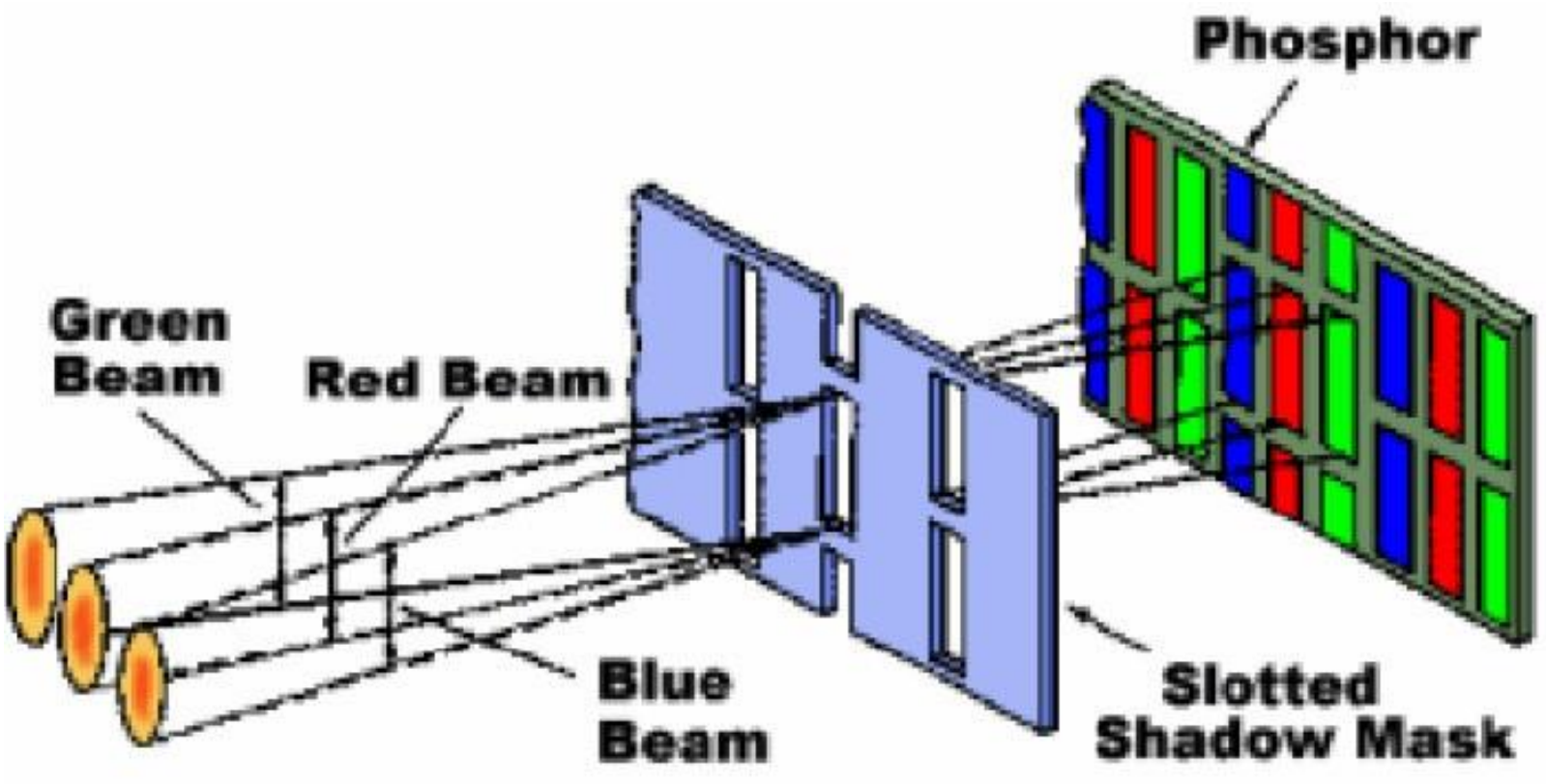
- When the three beams pass through a hole in the shadow mask, they activate a dot triangle, which appears as a small color spot on the screen.

- The phosphor dots in the triangles are arranged so that each electron beam can activate only its corresponding color dot when it passes through the shadow mask.

Delta method



Shadow Mask-Inline Method



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- Three electron guns is an in-line arrangement in which the three electron guns and the corresponding red-green-blue color dots on the screen are aligned along one scan line instead of in a triangle pattern.

- It is commonly used in high-resolution color CRTs.

- We obtain color variations by varying the intensity levels of the three electron beams. By turning off the red and green guns, we get only the color coming from the blue phosphor.

- The color we see depends on the amount of excitation of red, green and blue phosphors.

- Colors produce with the combination: white (result of activating all three dots with equal intensity).

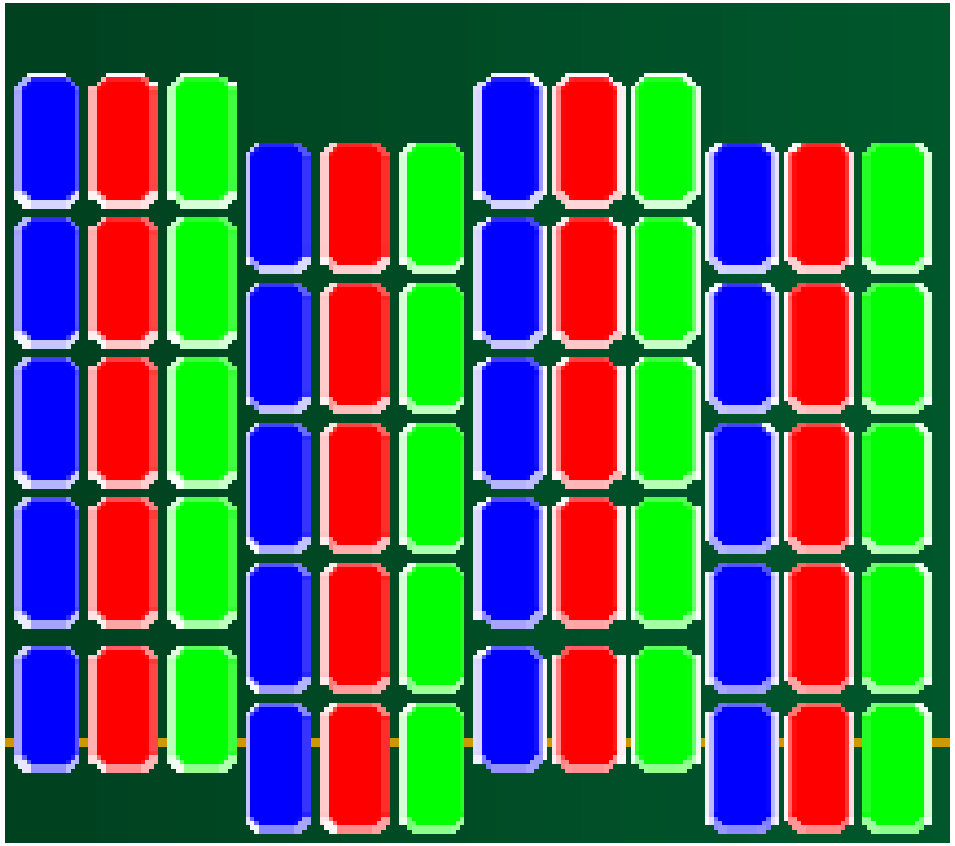
Contd..

- Yellow (produced with red and green dots)
- Magenta (produced with blue and red dots)
- Cyan (shows up with blue and green dots)

- High quality raster-graphics system have 24 bits per pixel in the frame buffer, allowing 256 voltage settings for each electron gun and nearly 17 million color choices for each pixel

- An RGB color system with 24 bits of storage per pixel is generally referred to as full-color system or a true-color system

Inline Method



THANKS