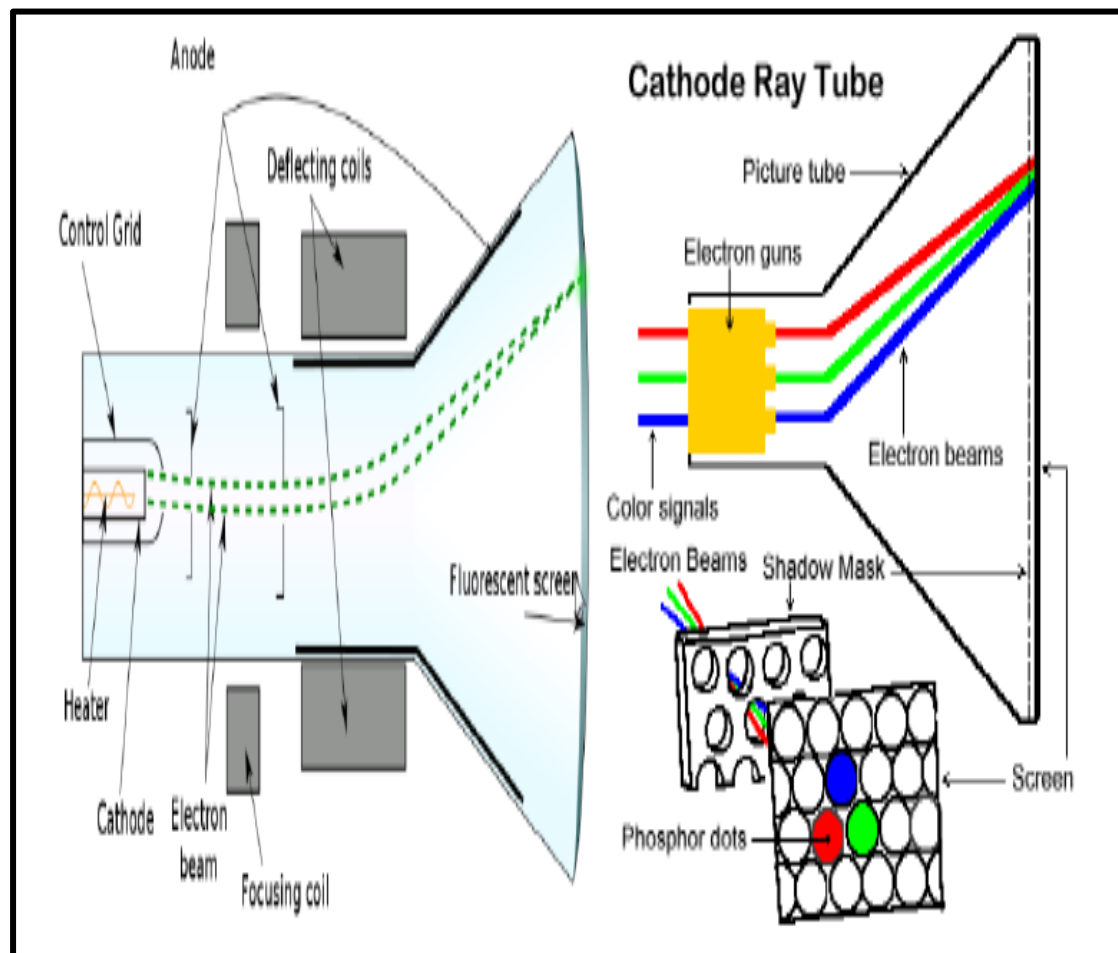


VIDEO

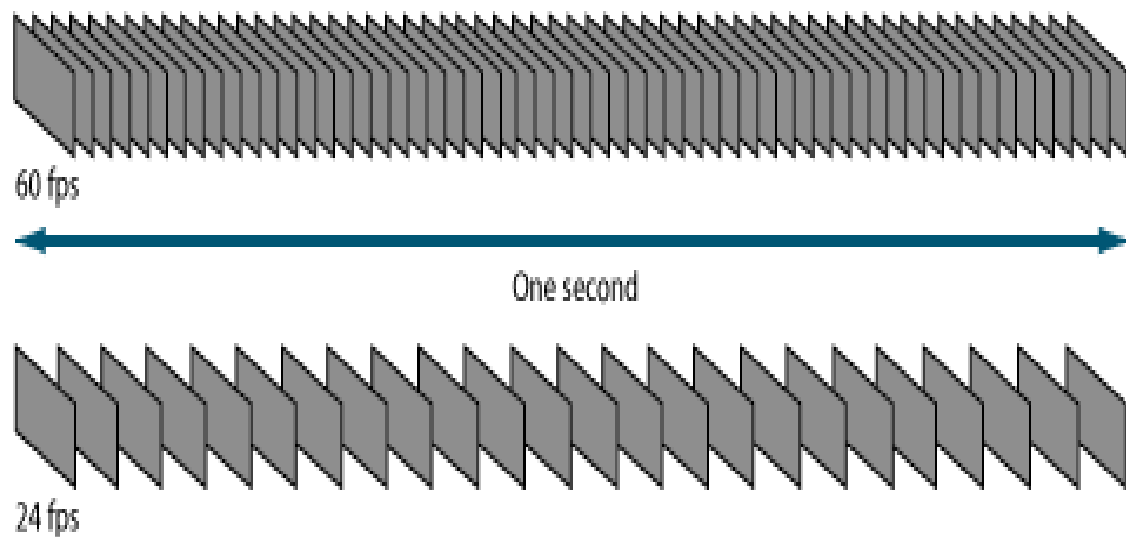
Video Display

In conventional TV sets or monitors, the video signal is displayed using a CRT (Cathode Ray Tube). An electron beam sweeps the screen from top to bottom beam carrying the corresponding pattern information, such as intensity in a viewed scene.



Frame of video

- In film and video recording and playback, a frame is a single image in a sequence of images that are recorded and played back.
- In computer video display technology, a frame is the image that is sent to the display image rendering devices. It is continuously updated or refreshed from a *frame buffer*, a highly accessible part of video RAM.



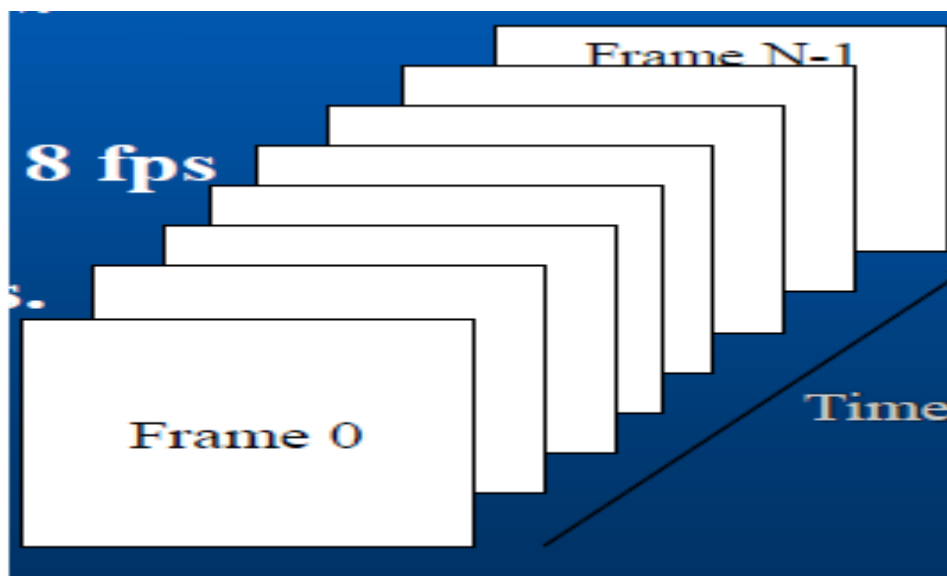
Characteristics of video streams

It is possible to describe the characteristics of the video by many parameters, some of them are:

Number of frames per second, Aspect ratio, Color space and bits per pixel, video quality, formats (analog or digital), and video compression method (for digital only).

1- Number of frames per second (Frame rate)

- Frame rate, the number of still image per unit of time of video, ranges from 6 or 8 frames per second (fps) for old mechanical cameras to 120 or more frames per second for new professional cameras.



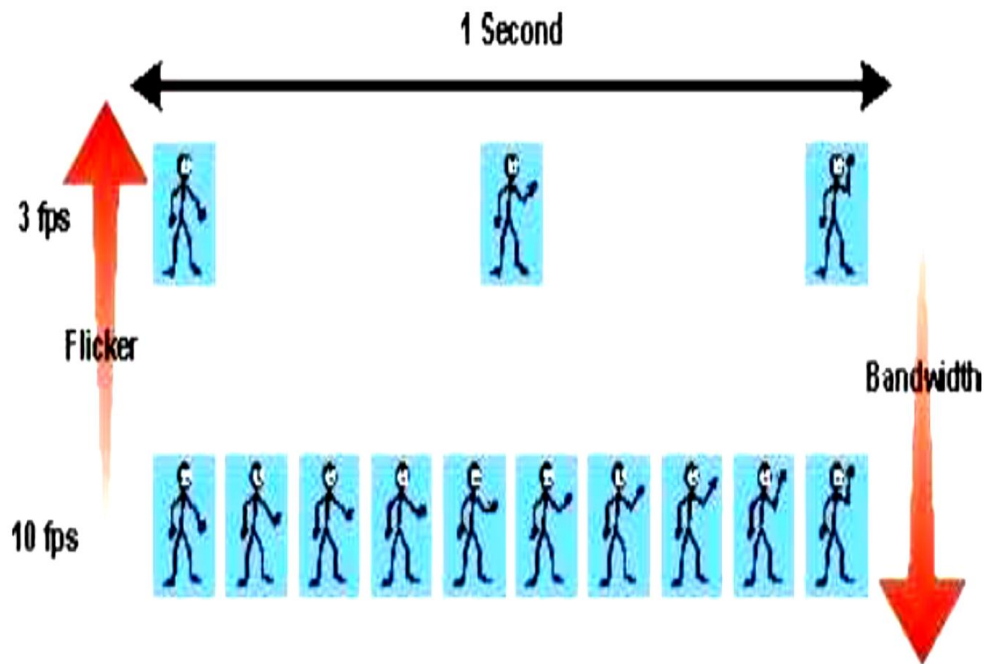
- PAL standards (Europe, Asia, Australia, etc.) and SECAM (France, Russia, parts of Africa etc.) specify 25 frame/s,
- while NTSC standards (USA, Canada, Japan, etc.) specify 29.97 frames.
- The minimum frame rate to achieve a comfortable illusion of a moving image is about 16 frames per second.

2- Aspect ratio

The **aspect ratio** describes the dimensions of video screens or the proportional relationship between its width and its height. It is commonly expressed as two numbers separated by a colon (W:H), for example; the screen aspect ratio of a traditional television screen is 4:3 and high definition televisions use an aspect ratio of 16:9.

3- Interlaced vs progressive

Flicker: is a visible fading between cycles displayed on video displays, especially the refresh interval on cathode ray tube (

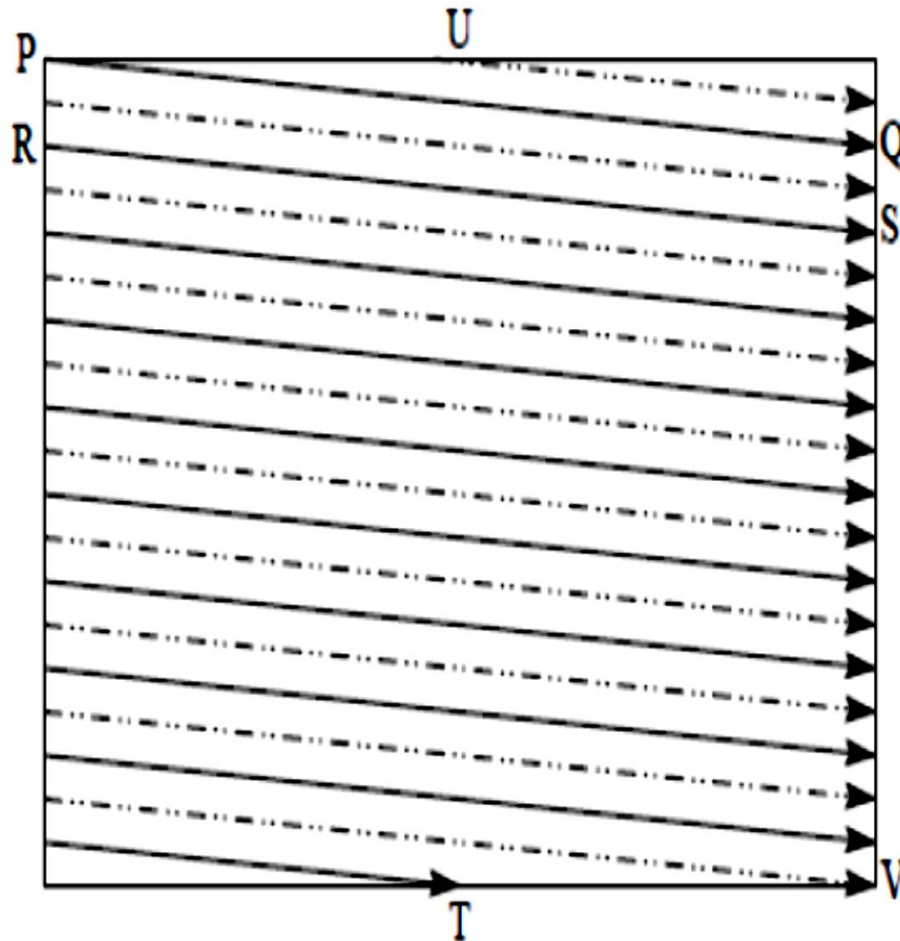


CRT) based computer screens. There are two common methods for "painting" a video image on an electronic display:

a- Interlaced video is a technique for doubling the perceived frame rate of a video display without consuming extra bandwidth. The interlaced signal contains two fields to create a frame. One field contains all odd-numbered lines in the image; the other contains all even numbered lines. This enhances motion perception to the viewer, and reduces flicker.

Interlacing was invented because, when standards were being defined, it was difficult to transmit the amount of information in a full frame quickly enough to avoid

flicker. The double number of fields presented to the eye reduces perceived flicker.



Interlaced raster scan

Because of interlacing, the odd and even lines are displaced in time from each other - generally not noticeable except when very fast action is taking place on screen, when blurring may occur. Initially the odd-numbered lines are scanned and then the process is

repeated for even-numbered lines -this time starting at the second row.

- For example, in the video in Fig. 1, the moving helicopter is blurred more than is the still background.



Fig. 1: Interlaced scan produces two fields for each frame.
At top: The video frame, at left: odd field, at right: even field,

A Phase Alternating Line (PAL)-based television set display, for example, scans 50 fields every second (25 odd and 25 even). The two sets of 25 fields work together to create a full frame

NTSC, PAL and SECAM are interlaced formats. Abbreviated video resolution specifications often include an i to indicate interlacing. For example, PAL video format is often specified as 576i50, where 576 indicates the total number of horizontal scan lines, i indicates interlacing, and 50 indicates 50 fields (half-frames) per second.

b- Progressive scanning (alternatively referred to as noninterlaced scanning, is a way of displaying, storing, or transmitting moving images in which all the lines of each frame are drawn in sequence.



progressive scan



interlace

So interlacing is in fact a clever way to compress a movie when one cannot use digital compression methods. Interlacing reduces the bandwidth (= storage space) by half, without losing vertical resolution in quiet areas.