

2) Sync suppression scrambler:

Here the sync details from RF signal is removed and transmitted. So in basic services channels without H and V sync pulses pictures cannot be reproduced. Without sync pulses reference for AGC is also not provided. Without AGC bias contrast is overloaded.

So the picture continuously rolls with horizontal tearing of video signal.

3) Data encryption method:

In this method the audio and video signals are converted to digital forms. They are encoded using digital signal processing method. This is called as data encryption.

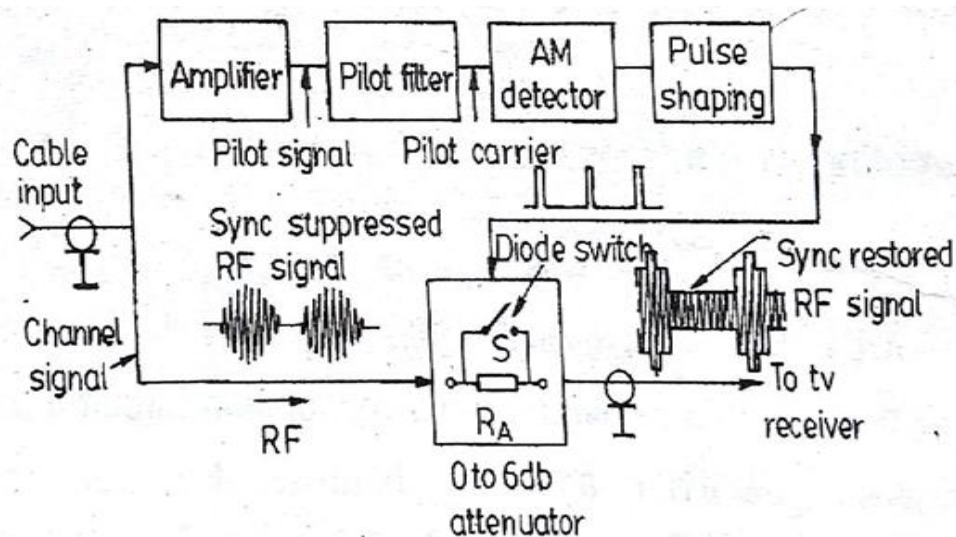
4) Baseband scrambling:

In this method the polarity of the randomly selected H- line is inverted. Line code for that particular H- line is transmitted with the video band.

5.8 Descrambler:

For channels that are scrambled, the signal cannot be reproduced normally. For that descrambler are needed. Signals that are scrambled is descrambled by an equipment is called descrambler. This process is called descrambling.

Descrambler block diagram:



- Descrambler reverses the effect of scrambling at the head end of the cable system. Simple sync suppression scrambling and descrambling method is mostly used.
- In this sync signals from the final output is removed and this information is sent through a pilot carrier.
- for this purpose a pilot carrier signal having a frequency lower than that of the selected channel is used.

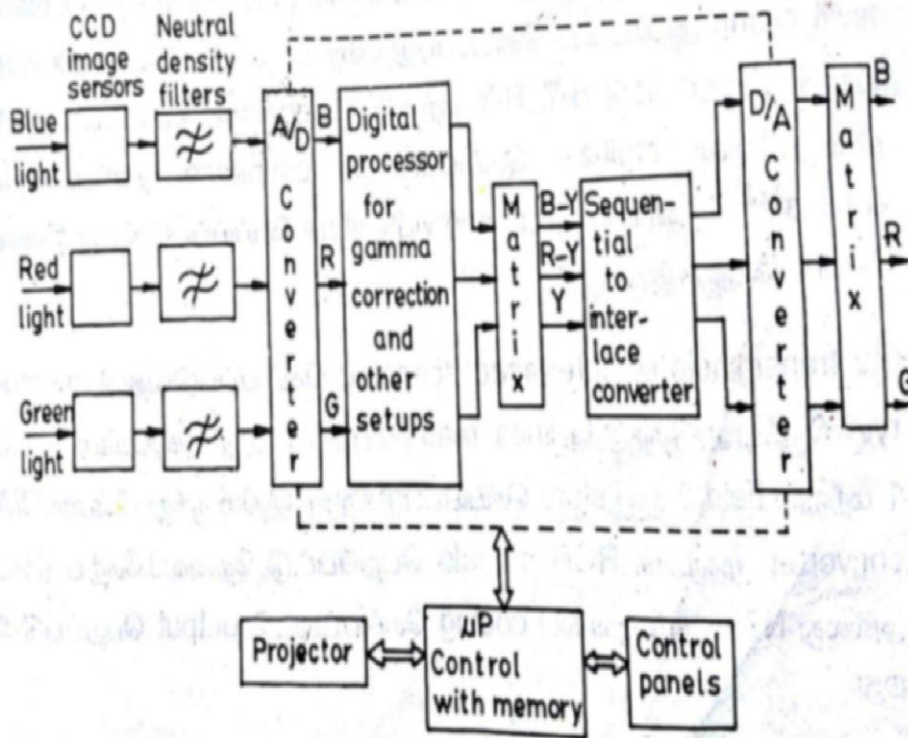
- Channel signal in the pilot signal is separated by the tuned amplifier. Pilot filter, filters the sync details from the pilot carrier. AM detector demodulates this. In the demodulated signal timing information needed for synchronization is available. For proper shaping, pulse shaping is provided. Keyed RF alternator is provided for mixing the sync signal with channel signal. Alternator is represented by resistor R_a . Keying by pass action is provided by diode. This is represented by 's'.

5.9 Telecine equipment:

In cinema cameras 24 frames per second is used. But for television 25 frames / second is used. So the pictures taken by movie camera is used for TV broadcast means, then it should be first converted to TV standards. The equipment used for this purpose is called telecine equipment.

5.10 Digital CCD telecine equipment:

Telecine equipment using CCD sensors that operate digitally is called as digital CCD telecine equipment. Block diagram is shown below.



Cine film is illuminated by slit of light. This represents H- line in TV scanning. By using dichroic prismatic splitters this light is separated to basic colors R,G and B. then it is given to separate CCD image sensors.

To correct the RGB sensitivity from the three CCD sensors, neutral density filters are used. The linear array in each CCD sensors contains 1024 elements. This represents H-line. By charge transfer method, the information's are moved in H – direction. Then H- scanning takes place. Then this is given to A/D converter and converted to digital signal.

Then by digital processing gamma correction and black level clamp is done. Then this is given to matrix network to produce B-Y, R-Y, and Y signals. Then it is digitized and separated to luminance and chrominance signal and stored in memory. This will be in sequential.

In TV transmission interlaced scanning is used. So from memory lines are read and stored in field 1 and field 2. Then this is given to D/A convertor, then the RGB signals are got and coded to required system (PAL and NTSC) and the output is got.

5.11 Introduction to high definition TV:

High definition television (HDTV) provides a resolution that is substantially higher than that of standard definition television. In HDTV, recent digital techniques are used for processing television signals. The aim of this HDTV are given below,

- I. Improvement in both vertical and horizontal resolution of the reproduced picture by approximately 2:1 over existing standards.
- II. Much improved color reproduction.
- III. Higher speed ratio at least 5:3 and
- IV. Stereophonic sound

Their implementation result is a picture quality as clear as obtained from 35mm cine films and sound as good as from digital audio discs.

HDTV may be transmitted in various formats.

- i. 1080p → 1920 x 1080p : - 2.1 megapixel (MPx) per frame
- ii. 1080i → 1920 x 1080i : - 2.1 megapixel (MPx) per frame
→1440 x 1080i: - 1.6 megapixel (MPx) per frame
- iii. 720p → 1280 x 720p : - 0.9 megapixel (MPx) per frame

The letter 'P' stands for progressive scan while 'I' indicates interlaced. Interlaced is fine for still and slow moving images. Progressive is fine for high speed video.

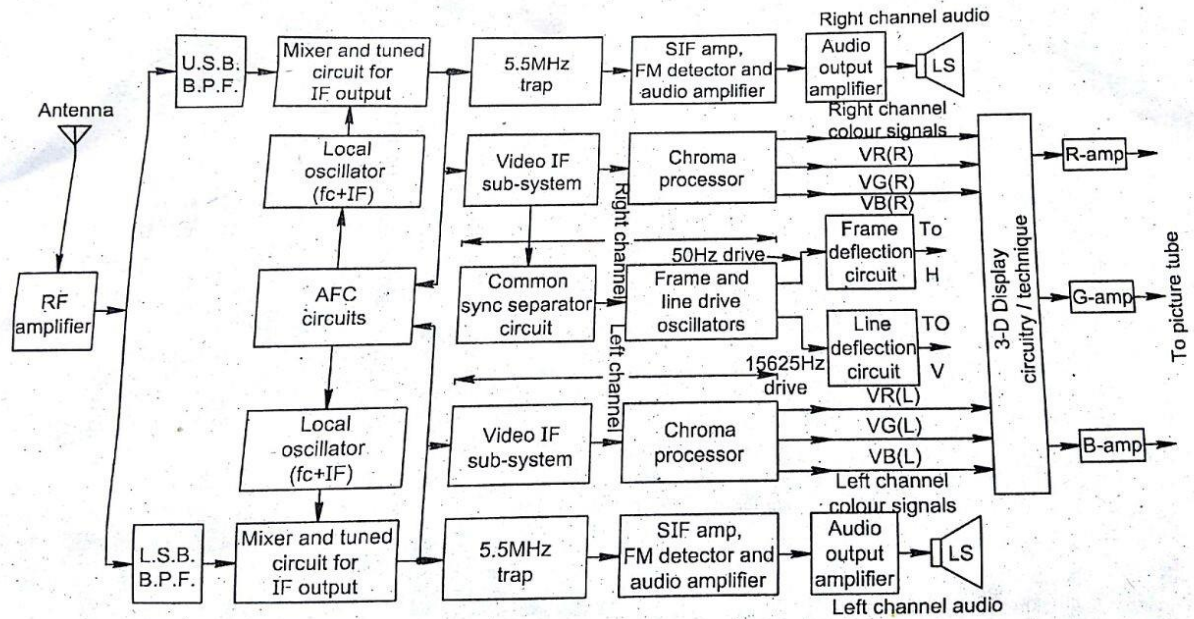
5.12 3D TV:

The two dimensional (length and breadth) pictures as we see on the television receiver screen look flat because these lack depth. However in three dimensional (3-D) appears to have all the qualities of a live scenes as viewed with natural vision. The 3-D picture scenes to extend beyond the screen at its back and also in the front.

The block schematic of a possible 3D picture and stereo sound receiver is shown in figure.

The RF amplifier in the tuner has a bandwidth of over 12 MHz and enough gain to feed sufficient amplitude of RF signal to the mixer (converter) circuits for easy separation of USB and LSB modulation components. The two RF sideband signals are separated by BP filters for feeding to corresponding mixer circuits. The USB IF signal is derived from the RF LSB signal by beating with the carrier equal to $(f_c - IF)$ MHz. From this stage onwards the two IF signals are processed separately, as in a conventional colour TV receiver to obtain the right and left channel RGB video signals.

The sync pulses are obtained from the composite video signal produced through video IF subsystems. On clipping and processing, these are fed to the vertical and horizontal (line) oscillator circuits for synchronizing, to obtain a steady raster. The right and left channel 5.5 MHz SIF signals are separated by trap circuits and demodulated in the usual way to feed the two stereo sound loudspeakers.



5.13 BLUE RAY:

5.13.1 Introduction:

Blue ray (or) Blue Ray disc is a next generation digital video disc. It is optical disc storage medium. It was introduced in 1996. It can, record, store, rewrite and play back high definition(HD) video and digital audio as well as large amounts of data.

A single layer BD can store up to 25GB of data and a double layer can store up to 50GB of data.