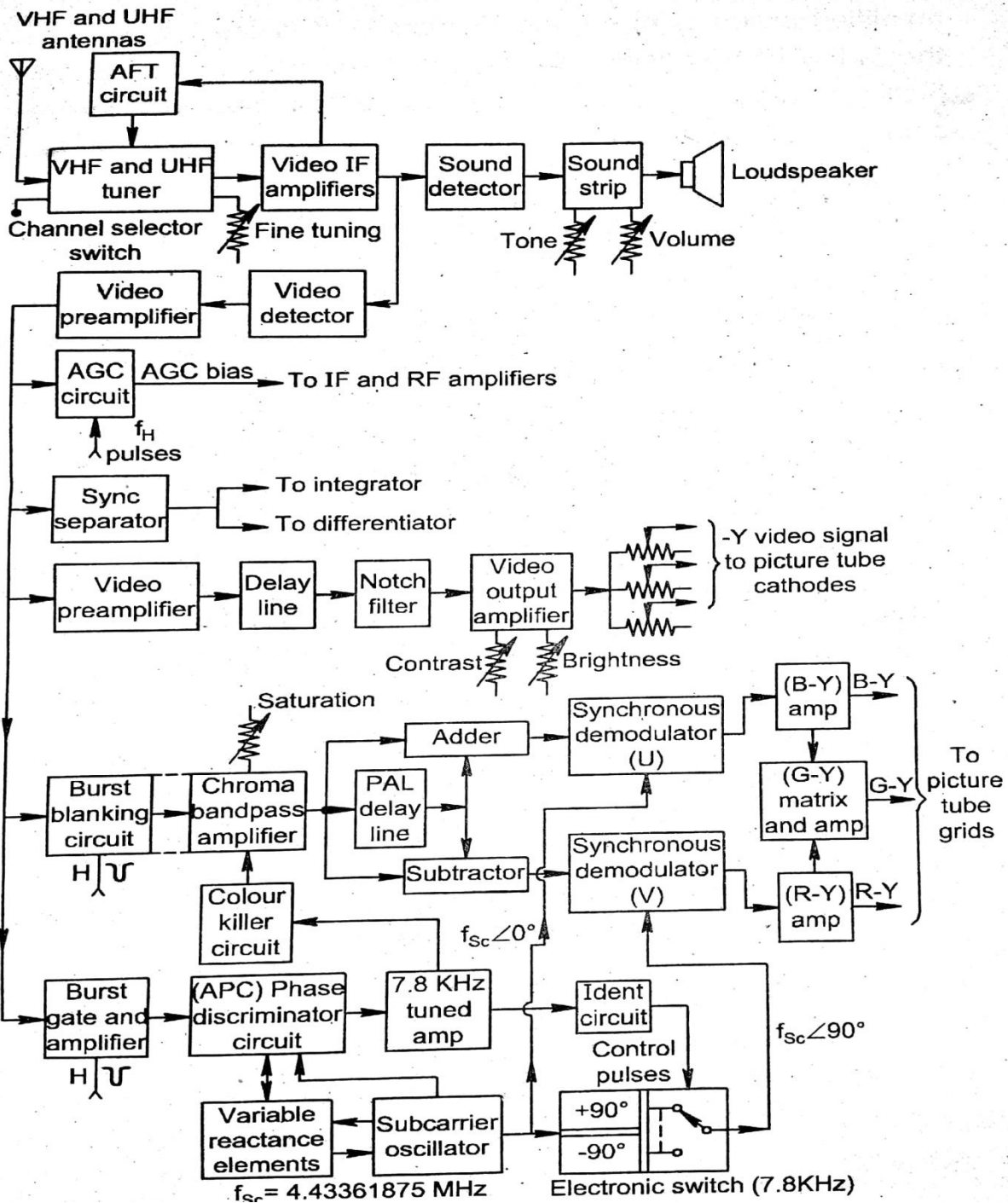


### 4.9 PAL COLOUR RECEIVER:

The colour TV receiver is similar to the monochrome system expect that here we have a colour demodulator section.



#### 4.9.1 The sections of the PAL colour receiver are

1. Colour chroma section
2. Colour band pass amplifier
3. Burst gate
4. Colour killer circuit
5. Colour subcarrier oscillator
6. PAL delay line and discrimination
7. Matrix network

Signal from antenna is selected by the tuner and converted to video and sound IF. It is amplified by the IF amplifier and detected by video amplifier. Inter carrier sound IF is sent to sound IF section and audio signal is produced. Video is amplified and sent to CRT and vertical & horizontal sync pulses are separated and transmitted to respective sections.

#### 4.9.2 Monochrome and tuner section:

- The RF tuner is used to select the RF signal for different channel from the antenna.
- The sync pulses for horizontal and vertical oscillator are separated by the sync separator and its associated circuit.

#### 4.9.3 Chroma band pass amplifier:

- This section consists of a chroma filter and two stage chroma amplifiers.
- In this section we have a color control. This control adjusts the gain of the band pass amplifier.

#### 4.9.4 Colour burst gate:

- Separates colour burst signal and gives it to phase discriminator.

#### 4.9.5 Colour killer:

- Zero and the output of 7.8 KHZ tuned amplifier also falls to zero.
- The colour killer turns off the chroma amplifier stage.

#### 4.9.6 PAL Delay line stage:

- The purpose of this section is to delay the signal by about 64 micro seconds.
- The normal (U-V) and delayed (U+V) signals are simultaneously available.

#### Separation of U and V signals:

At the adder circuit

$$(U-V) + (U+V) = 2U$$

$$(U+V) + (U-V) = 2U$$

At the subtractor circuit

$$(U-V) - (U+V) = -2V$$

$$(U+V) - (U-V) = 2V$$

For adder and subtractor 64 microns seconds delay signal needed. To provide this PAL delay line is needed.

#### 4.9.7 Colour subcarrier oscillator:

- Keeping colour bunt as reference produce carrier signal of 4.43 MHZ.

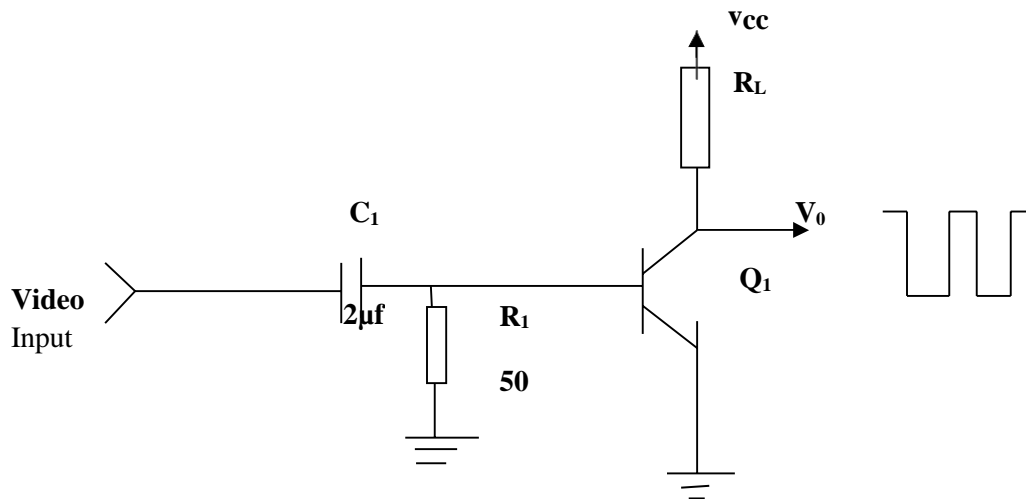
#### 4.9.8 Matrix network:

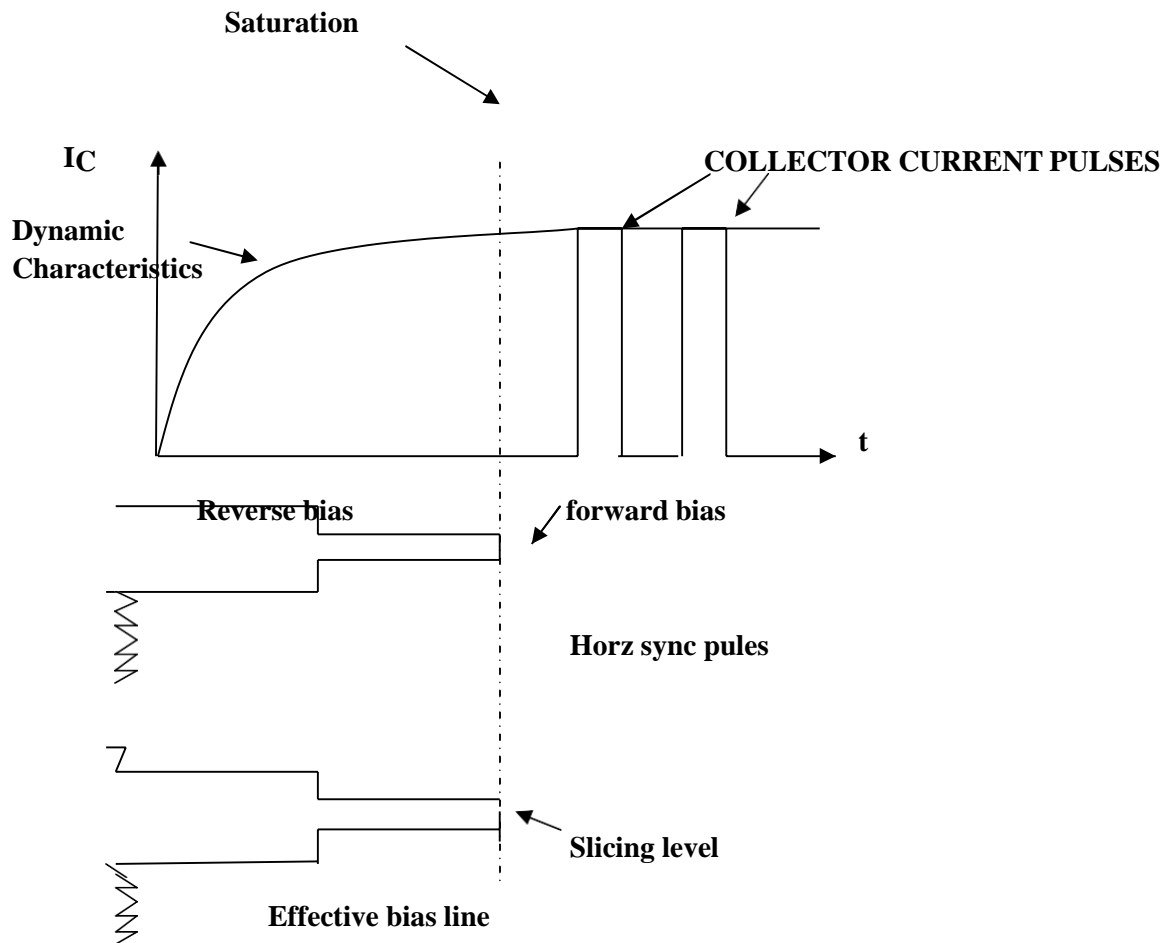
To generate (R-Y) (B-Y) and (G-Y) colour signals from U, V&Y signals matrix network is needed.

#### 4.10 Need for synchronization pulse separator:

- The horizontal and vertical sync pulses exist in the top 25 percent of the composite video signal.
- At the output of video detector we have composite signals that contain video information and sync information for triggering of oscillator only sync pulses are needed.
- The sync separator separates both the horizontal and vertical sync pulses from the composite video signal.
- By using differentiator circuits, horizontal sync pulses (15625 HZ) are separated and by using integrator, vertical sync pulses (50HZ) are separated. They are used for triggering corresponding oscillators.

#### 4.11 Basic principle of synchronization pulse separator:



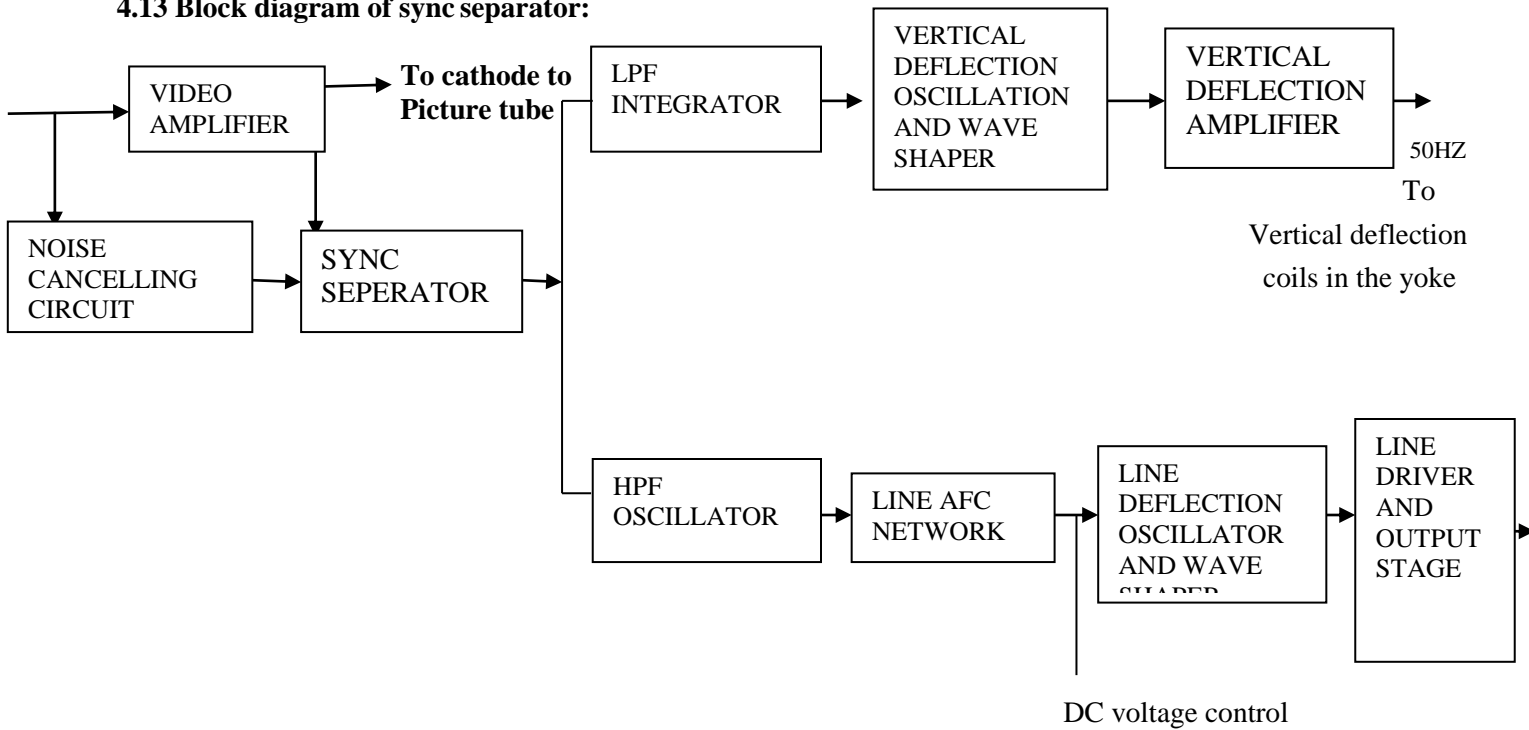


- The basic principle of merely biasing the devices used in sync separator the composite video signal makes current flow in the device.
- In self biasing the DC bias voltage is produced by the input AC signal itself.
- The transistor is operating the class 'C' mode. Input stage provides necessary DC bias voltage.
- R&C is used to provide the self bias between base and emitter of the transistor.
- Emitter circuits conduct heavily and charges the capacitor 'C'. This negative voltages then reverse bias the emitter bias base junction.
- The peaks of consecutive input video signal discharge through RC .discharge only 10% between the peak input signals.
- So the output of transistor we have only the separated sync pulses. These are shown clearly.

#### 4.12 Condition must be satisfied

- $\beta$  of the transistor should be large.
- Output leakage current must be small.
- The time constant RC must be long.
- A low power transistor can be used, since the transistor is off for most of the period.

#### 4.13 Block diagram of sync separator:



The video signal from the video amplifier is fed to the sync separator circuit.

- At the output of sync separator we have a train of horizontal and vertical sync pulses.
- After the proper amplification they are fed to vertical deflection coil.
- Similarly the horizontal deflection oscillator is triggered by the differentiator output.
- To maintain the horizontal frequency at constant value an automatic frequency circuit is used in horizontal deflection section.