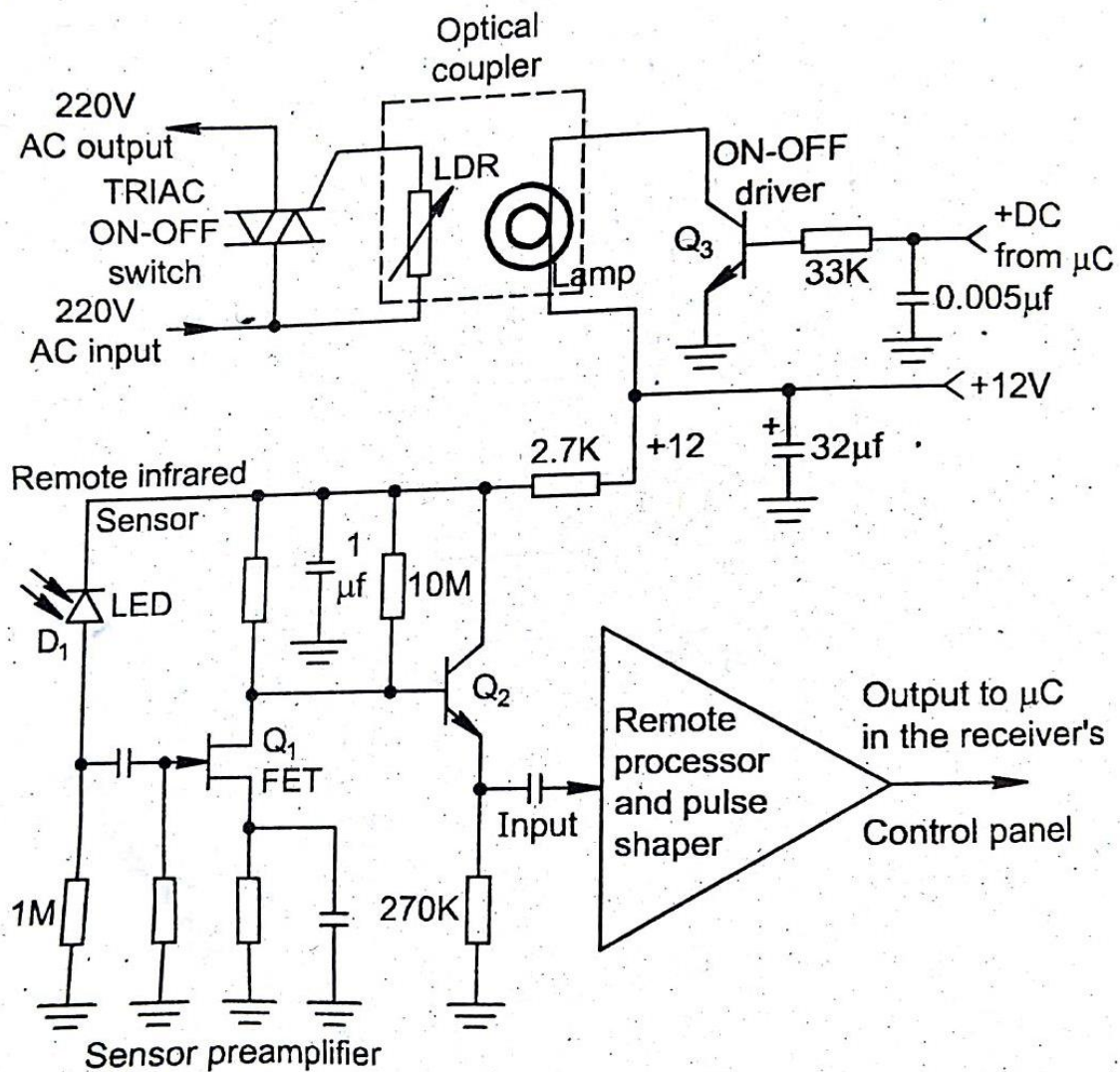


- The waves are modulated through a 480 KHZ carrier by one of the 24 pulse pattern.
- If any one of the key is pressed, it produces a distinctive pulse train which modulates the crystal controlled 480KHZ carrier.
- After proper amplification, it is fed to LED driver (Q1).The output of the Q1 drives the infrared LED D1 and D2 then the IR signal is transmitted.
- Then the function indicates LED D3 comes to ON state.
- If the LED is not glow on depression of a button then it indicates that the battery is to be replaced.

5.4 Remote control IR receiver:



- A simplified circuit diagram used for the synthesis of remote control receiver.
- The remote infrared sensor D1 is used to pick up the pulse modulated infrared signals send by the IR transmitter.

- The A.C signal picked up by D1 is fed to the FET Q1 for some amplification.
- The output of Q1 is given to emitter follower Q2 through remote processor and given to pulse shaper. Here signal is amplified and then demodulated.
- Demodulated distinct pulses belong to distinctive function.
- This is given to microcontroller.
- This microcontroller on receiving different pulses produces different output necessary to perform the ordered function.

For example:

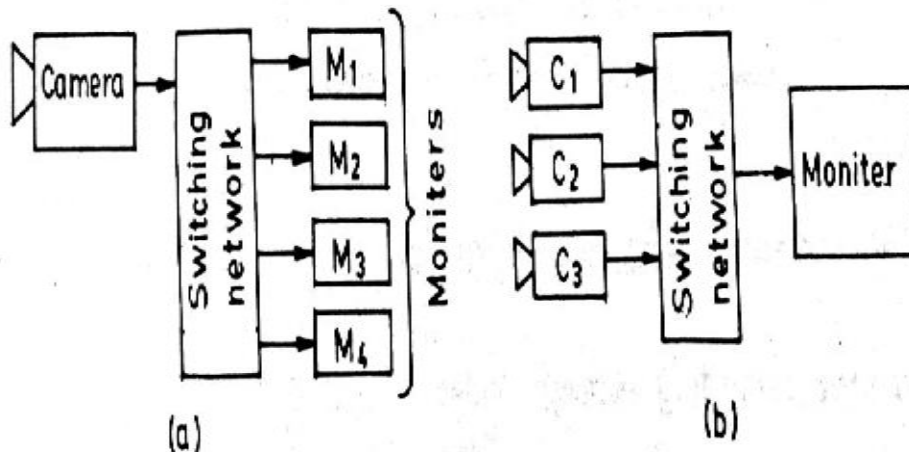
- The power ON/OFF button is pressed it is demodulated by the receiver then the micro computer output at the receiver is a positive voltage.
- Positive voltage through a 33k resistor turns 'ON' the transistor Q3 and operates the opto coupler and lamp is now glowing.
- The resistance of LDR decreases. Due to the resistance 220 V A.C applied to the gate of the transmitter, the TRIAC comes to ON state, so the TV receiver is switched ON.
- To turn the receiver OFF the ON button of the transmitter is pressed once again.
- The positive voltage to the base of Q3 is removed the TRIAC is deactivated and so the lamp goes OFF in the opto coupler unit.
- So the AC supply to the receiver is cutoff. The above sequence is repeated for successive depression of the ON/OFF button.

Similarly several different circuits are employed at the output of microcontroller to achieve different functions like volume control, color control and contrast control etc.

5.5 CCTV (closed circuit television system):

If a single camera output is given to TV receiver through cable or the output of many cameras is connected to a TV monitor, then the system is called CCTV system.

Two types of switching network are made possible between the camera and TV monitor. This makes us to select the camera / monitor. Both CCTV systems is shown,



In diagram (a) a single camera(C) is connected to many monitors (M) through switching network (SN).in this we can see a single program in monitors at many places.

In diagram (b) many cameras(C) are connected to single monitor (M) through switching network. In this at single place, we can see many programs happening at different places.

5.5.1 Application of CCTV:

1. **Education** – lecture classes and demonstration experiments.
2. **Business** - used to keep on eye over customer and sales personal
3. **Home** – seeing the caller before opening the door.
4. **Industries** – for remote inspection of objects in place where human resources cannot be used.
5. **Aerospace & oceanography:** To see the inaccessible objects or places.
6. **Medicine:** To visualize the surgery.

5.6 Scrambler-Necessity-Basic Principles

This channel provided by the cable TV owners to its customers is of two types.

They are

1. Basic services
2. Premium services

Several basic channels and local TV programmes offered by cable companies for a minimum charge level is called basic services.

For new movies, sports etc., separate channels are provided with additional charges called as premium services.

Cable TV connections provided for viewing premium services with additional charges is called as Conditional Access System (CAS).

In TVs provided with CAS connection only premium service programmes to be received.

For TVs provided with basic services connections premium services channel follow certain methods different from basic services. This is called scrambling. Equipments used for scrambling is called as scrambler.

5.7 Types of scrambling:

1) TRAP:

Here the signal is blocked by inserting and interfering carrier in the pay channel and notching it out.

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.

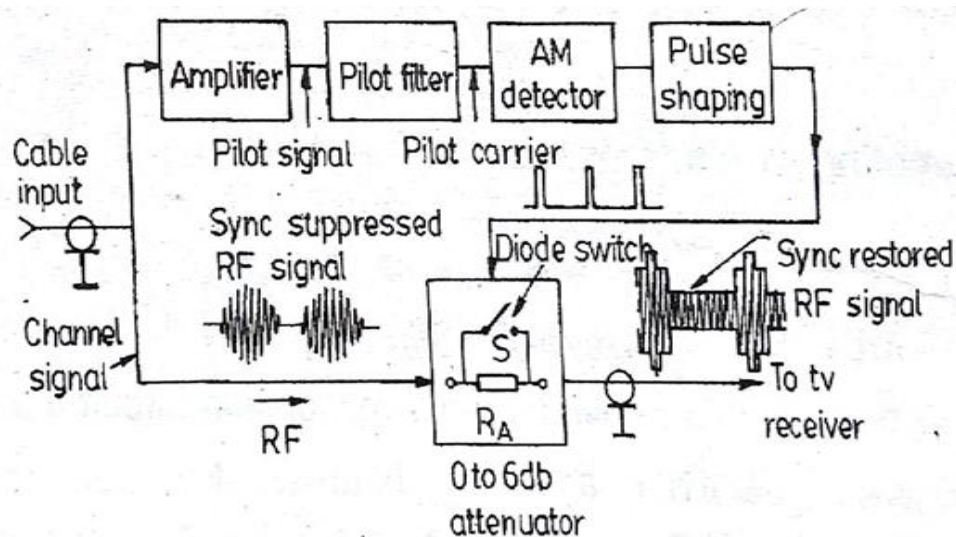
4) Baseband scrambling:

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.