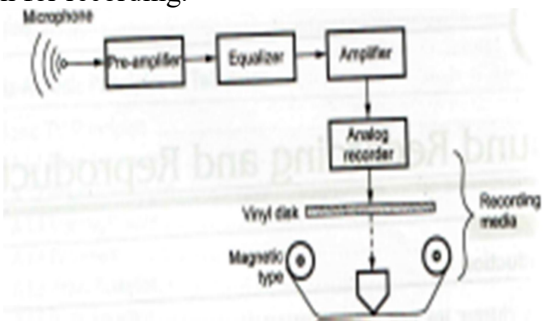
ELECTRONIC GADGETS AND HOME APPLIANCES

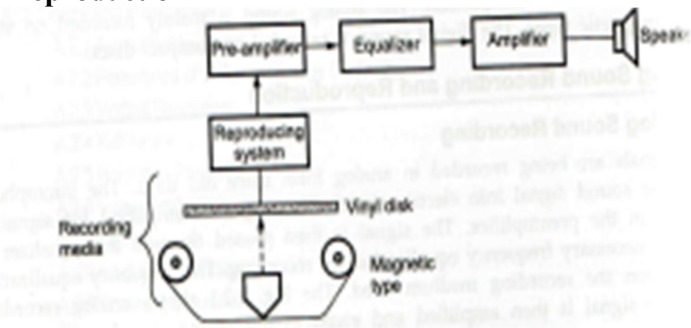
1) Describe Analog Sound Recording & Reproduction with a neat sketch.

The signals are being recorded in analog form since old days. The microphone converts the sound signal into electric signal. This signal is amplified for signal to noise ratio in the preamplifier. The signal is then passed through the equalizer to provide the necessary frequency equalization for recording.



The above figure shows the analog recording system. The signal is then amplified and given to the analog recorder. The analog sound can be recorded with on mediums such as vinyl disc or magnetic tape. the analog sound is recorded on the vinyl disc in the form of wavy groove. this groove is magnetic tape stores sound in the form of magnetic flux. The tiny magnets on the tape are aligned according to the analog sound signal.

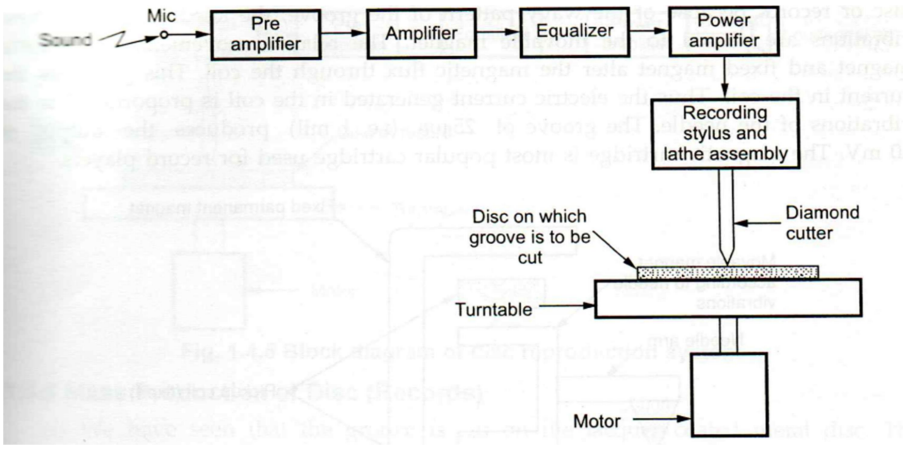
Analog Sound Reproduction



The above figure shows the reproduction of analog sound. The signal on the recording media is converted to an electric signal with the help of reproducing system. the stylus tracks the way groove on the vinyl disc. The vibrations of the stylus are converted to electric signal. The vibrations of the stylus represent the analog sound recorded on the disc. The magnetic flux variations on the tape are converted to electric signal by the magnetic head. The tape passes across the magnetic head. The preamplifier amplifies the weak signal obtained from the recording media. The signal to noise ratio is enhanced and then the signal is given to equalizer. The compensates for recording characteristics of media. The signal is then amplified and given to the speaker.

Thus in analog sound recording and reproduction technique, the sound signal is always in analog form.

2) Draw and explain the Block Diagram of Disc Recording and Reproduction System.

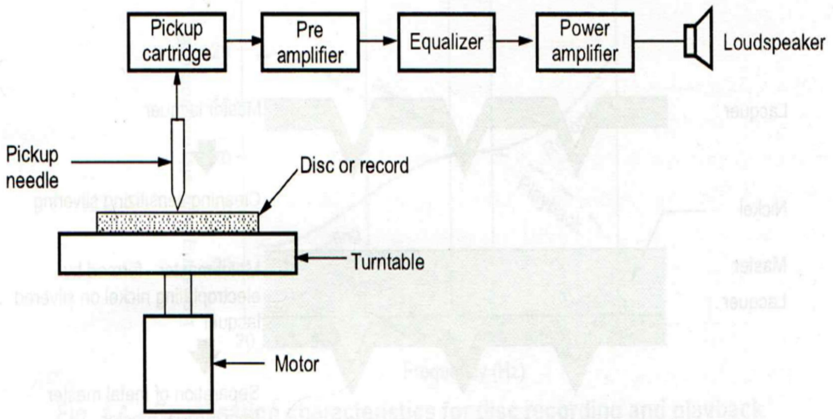


The sound signal is first converted to an electric signal with the help of microphone. A high grade microphone like condenser type of cardioid types is used. The signal from the microphone is very weak. Hence it is amplified by the preamplifier. The preamplifier improves signal to noise ratio and provides sufficient amplitude to the signal. This signal is amplified by the amplifier.

This signal is amplified by the amplifier. The signal is then passed through the equaliser. The equaliser shapes the signal the signal according to the recording characteristics. Normally de-emphasis at low frequencies and pre-emphasis high frequencies is required. This eliminates the chance of over modulation at low frequencies and improves high frequency response. The Signal is then given to the power amplifier. This increases the power level of the signal so that it can drive the recording stylus assembly. The power amplifier also provides the impedance matching. The recording stylus and lathe assembly cut the disc. The cutter is made up of diamond. It vibrates laterally according to the amplitude variations of the signal. These vibrations are recorded along the spiral groove on the disc. The disc consists of wax or lacquer coating on the metal disc. The grooves are engraved on the disc by diamond cutter. The vibrations of the stylus are lateral and hence they are recorded on the disc in horizontal plane.

The turntable carries the disc. It is driven by the constant speed motor. The lathe assembly moves the recording stylus radially from edge to center of the disc. This creates spiral groove on the disc.

Block Diagram of Disc Reproduction System



Description

The turntable is rotated by the motor. Speed of this motor can be adjusted depending upon the type of disc being played. Normally synchronous motor is used. The turntable carries the disc over itself. The motor rotates the turntable and hence disc is also rotated at constant angular speed.

The disc consists of spiral groove on its surface. This groove has variations in horizontal plane. The pickup needle tracks this wavy groove. The needle vibrates according to the variations are passed on to the pickup cartridge. The pickup cartridge converts the vibrations of the needle into an equivalent electric signal.

The signal output from the pickup cartridge is very weak. Hence it is first amplified by the preamplifier and its signal to noise ratio is also increase. The signal is the passed through an equalizer. The equaliser provides the replay characteristic. It provides pre – emphasis of low frequencies and de – emphasis at high frequencies. The volume controls are provided after the equaliser. The signal from the equaliser is then given to the power amplifier. The power level of the signal is increased and then it is given to the loudspeaker. The loudspeaker then converts the audio signal in to sound.

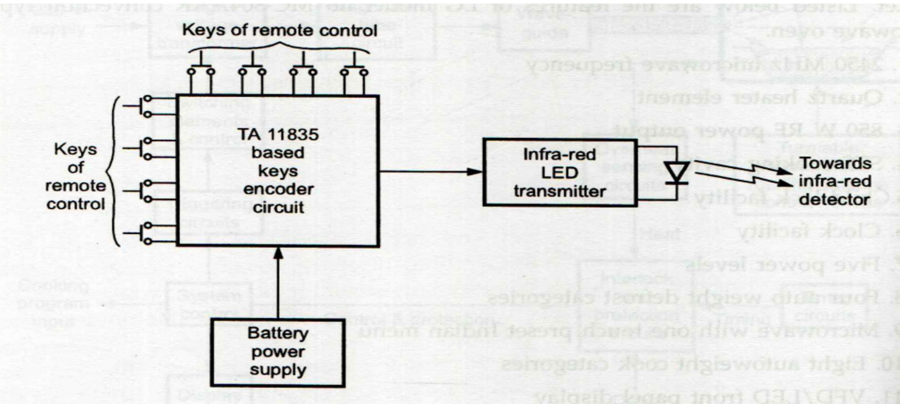
3) Write the principle operation and features of Remote Control with a block diagram.

Operating Principle

Most of the electronic appliances such as TV, VCR, Music systems, Games, toys etc. are operated with the help of remote control. The remote control is based on electronic principles. The remote control has a transmitter, which transmits infra-red waves towards the receiver. This receiver detects the infra-red and produces specific electronic signals. The infra-red signal detectors and receivers are fitted on the front panel of the appliance, which is being controlled by the remote control. The remote control several keys. The pattern of the transmitted signal depends upon the key pressed. The receiver decodes this pattern and decides which key on the remote control is pressed. The appliance then acts accordingly.

Block Diagram

The below figure shows the blockdiagram of a remote control. It is typically used for TV.



Most of the remote controls use single IC to perform all the operations. The ICS like TA 11835 etc are commonly used in remote controls. The circuit operates from small batteries or pencil cells. The remote control has single PCB and keypad. The keys of the remote control are interfaced to the IC based encoder. The contacts of the keys are printed on the PCB of the remote control. These contacts use carbon material. The pushbuttons or switches on the

keypad of the remote control closes the contacts on PCB. The bottom side of the switches is conductive. When the switch is pressed, the contact on the PCB is closed. This is detected by the IC. Every key has different circuit configuration. Hence the encoder detects which key was pressed. The encoder generates the specific code signal and gives it to the infra-red transmitter circuit.

The code signal is in the form of pulses or pattern and it is unique for every key. The infra-red transmitter drives the infra-red LED. The infra-red LED generates the infra-red rays according to the code signal. These infra-red rays are detected by the photodiode on the front panel of the receiver. The photodiode generates the similar code signal which was used at the ransmitter.

The code signal is decoded by the decoder and the pressed key is detected. The receiver then acts according to the key. The range of the remote control is 10 to 15 meters. The remote controls (not TV reote controls) use electromagentic waves. These remote controls are not directional. They can operate the receiver anywhere within the radius of contorl range.

Features of Remote ontrol

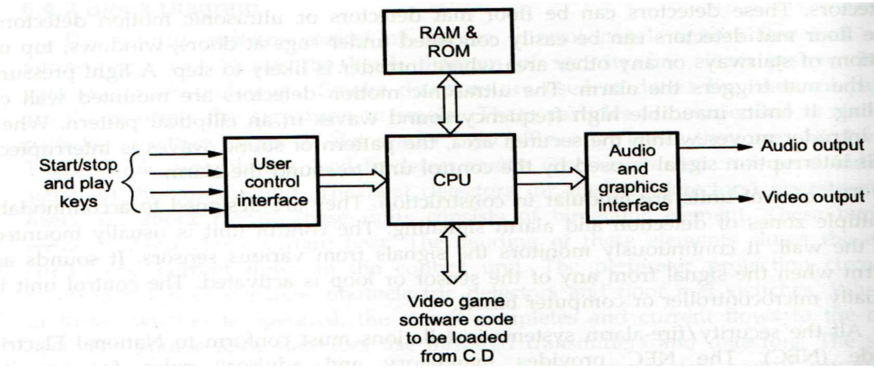
1	Frequencies	Infra-red range or VHF range
2	Range of opreation	10 to 15 meters or radius upto 5 km
3	Power source	Battery Operated
4	Number of Keys	15 to 20 , can be more depending upon applications
5	Controls	Almost all the controls except mains power shutdown
6	Type of keys	Rubber membrane keypad with push button contacts
7	Transmitter	Infra-red LED or VHF transmitting area
8	Detector or Receiver	Infra – red photo-diode or Photo transmitter or VHF antenna / areal

4) Discuss the features of Video Games with a neat block diagram.

The present day video ganes have a console. This console is a hoghly specialized computer. It consists of CPU, Ram, Kernel software and audio and video control units. the operating code of the game is loaded In the RAM. The CPU acts accordingly and drives the audio and video contorl to TV. we can play the game with the help of paddles or keys availabe on the console. The console can accept variety of games depending upon the software on the CDs.

Block Diagram

Figure shows the block diagram of the console of the video game. The player interacts with the video game through user control interface. The user control interfce has paddles having start / stop and play keys or joy sticks. The CPU controls all the functioning of the video game. The CPU is a specialized high speed processor. The software kernel is the consoles operating system.

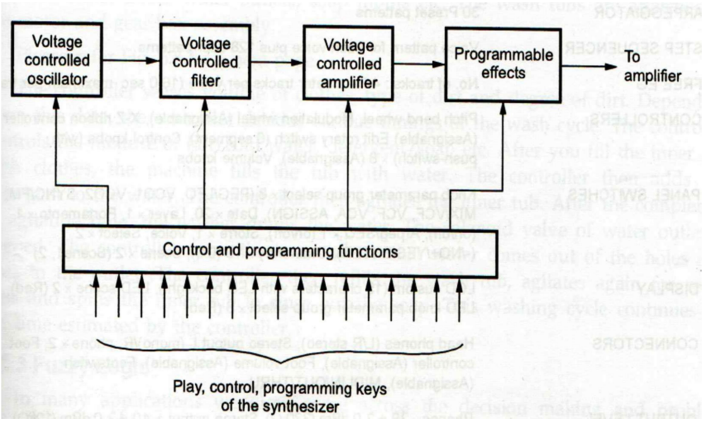


The software kernel is loade from ROM to operate CPU. The video gane software code is the loaded from the CD. The CPU then operates according to this game program. The audio and video signals are genearted by the audio and graphics interface. This interface is controlled by the CPU. The audio and video outputs are connected to the TV. The video output can be compatible with NTSC, PAL or SECAM. Most of the consoles have have dedicated graphics processor which performs specialized mapping, texturing and geometric functions, in addition to controlling video output.

There can be one more dedicated chip for processing audio signal. The audio and graphics processors intract with CPU. Normally the CPU is a RISC (Reduced instructon set Computer) processor. These RISC processors are superscalar. They perform multiple instructions at the same time. Such processors operate fast.

5) Analyze the Block Diagram of Music Synthezier and mention its features.

The figure shows the simplified block diagram of the music synthezier. There are three basic elements which prepare a sound. They are pitch , tone and timbre. The pitch decides high / low levels of the sound. The tone decides overall quality of sound and timbers deides loudness or volume level of the sound.



As shown in the figure the signal is originated by the voltage controlled oscillator (VCO). The frequency of VCO determines the pitch of the sound. it generates basic sawtooth, square etc waveforms. The signal is then passed through voltage controlled filter (VCF). The tone of the sound is deided by this VCF. The loudness or timbre of the sound is decided by the voltage controlled amplifier (VCA), Various sound effects are then added to this generated sound. These effects include equalizer, variation effecs , delay effects, reverb effects etc.

The parameters of VCO, VCF, VCA and effects are controlled by the control and programming block. These parameters depend upon the setting / operation of keys by the operator. Normally music syntheziers have built in amplifier to increase the signal level to sufficient amplitude. The final output is stereo which can be amplified further.

Features of Music synthezier

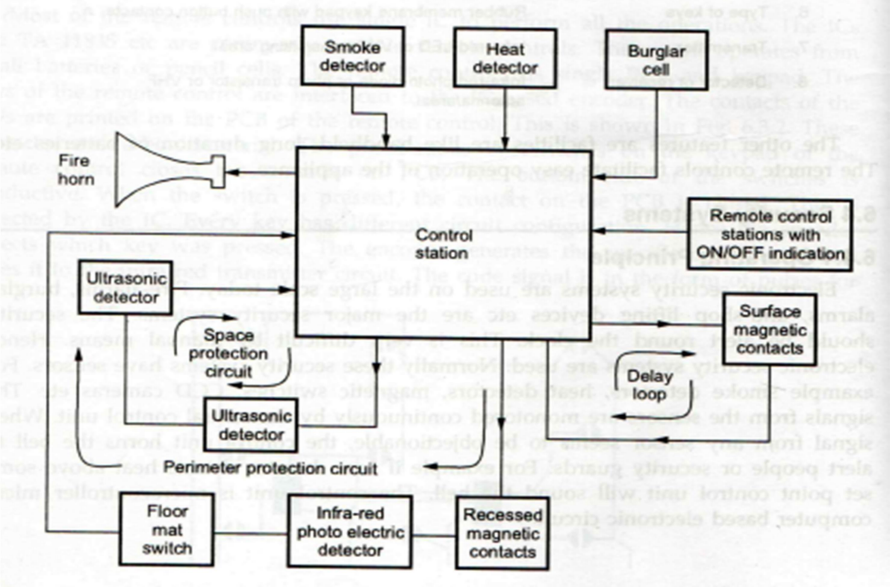
1	keyboard	61 keys (Initial / after touch)
2	Tone Generator	Analog physical modeling 2 VCOs(Sync FM) / Ring mod / Noise/2LFOs/PEG/VCF/(FEG)/VCA (AEG)
3	Polyphony	10 notes (maximum)
4	Multi Timbers	2 timbers maximum (with polyphony of 5 + 5 notes)
5	Effect	Variations : 14, EQ : 1 (stereo 3 – band). delay : 5, Reverb : 8

6) Examine the opration of Secutity Systems with a neat diagram.

Operating Principle

Electronic security systems are used on the large scale today. Fire – alarms, burglar alarms , anti-shop lifting devices etc are the major security systems. The security should be alert round the clock. This is very difficult by manual means. Hence electronic security systems are used. Normally these security systems have sensors. For example smoke detectors , heat detectors, magnetic switches, CCD cameras etc.

Block Diagram



The security system consists of sensors, control panel, annunciator and related wiring. Figure shows the block diagram of security / Fire alarm system. It uses various devices and loops. Smoke detectors are used to detect fire. Aerosol particles are the principle fire signatures in smoke. These particles are suspended in air. These particles less than 0.3 µm do not scatter light efficiently, hence they are called visible. These visible aerosols are used to detect smoke. The smoke detectors send indicating signal to the control unit. The heat detectors operate at high heats, i.e. about 135˚F. This unit consists of bimetallic element. These bimetallic elements bend above certain heat. The bending of these elements closes the electric the electric circuit and current flows to the control unit. The perimeter protection circuit use recessed magnetic contacts, photoelectric detectors and floor mat switches. When any of these switches is operated, the circuit completes and current flows to the control unit. The photoelectric detectors use infra-red transmitters and detectors.

The surface magnetic detectors are used for entry detection. They are used to protect any movable door or window. Recessed magnetic detectors are also used for entry detection. The surface mounted detectors can be easily seen, hence recessed can be used in place of them. These recessed magnetic contacts fit inside the doors and windows and they are not easily visible to external people. When it is difficult to protect the doors or windows, the inside area can be protected by interior space detectors.

These detectors can be floor mat detectors or ultrasonic motion detectors. The floor mat detector can be easily concealed under rugs at doors, windows, top or bottom of stairways or any other area where intruder is likely to step. A light pressure on the mat triggers the alarm. The ultrasonic motion detectors are mounted wall or ceiling. It emits inaudible high frequency sound waves in an elliptical pattern. When an intruder moves within the secured area, the pattern of sound waves is interrupted. The interruption signal is used by the control by the control unit to sound the alarm.

The control units are modular in construction. They are designed to accommodate multiple zones of detection and alarm signalling. The control unit is usually mounted on the wall. It continuously monitors the signals from various sensors. It sounds an alarm when the signal from any of the sensor or loop is activated. The control unit is usually microcontroller or computer based.

7) Write about the Digital Diaries with a neat sketch.

Operating Principle

The digital diaries are basically small pocket computers. The digital diaries have a central processor or CPU, keyboard, display and memories. They have wireless port as well as serial port. These diaries manage personal information like names, address, telephone numbers, e-mail addresses etc. These diaries are also used to make task lists, taking notes to keep track of appointments, remind you of appointments, to do calculations, to send or receive e-mail etc.

Block Diagram

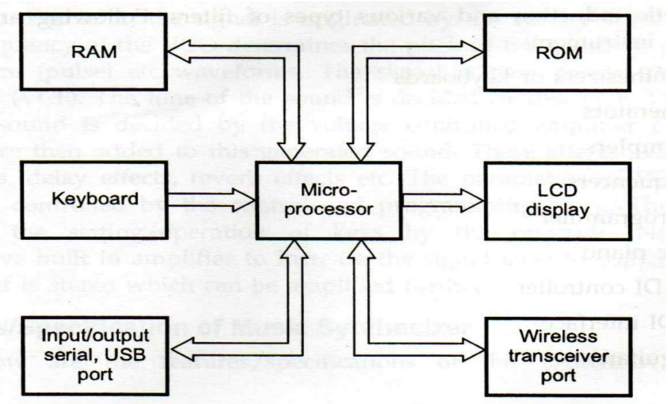


Figure shows the block diagram of a digital diary. The complete functioning is controlled by the microprocessor. These microprocessors operate at the speed of 16 – 75 MHz. The operating system of the microprocessor is stored in the ROM. These operating systems take less memory and simple to use. The various programs of the diary such as address book, calculator etc is also stored in ROM along with the operating system. The data and any programs which are added later are stored in RAM. The diaries normally use solid state memories. Modern digital diaries have 2 MB of minimum memory. 1 MB of memory can store up to 4,000 addresses and 100 e-mail messages. Some advanced models have memories up to 5 to 32 MB. The digital diaries are operated from batteries (Pencil cells).

These diaries have LCD displays. The resolution of these LCD displays is 160 x 160 or 240 x 320, with 16 gray scale levels. The digital diaries have serial or USB port for exchanging data with the PC. The keyboard is used to enter data in the diary or making calculations. The wireless transceivers port is used to send / receive e-mails.

Features

1. Hitachi's SH7709a or Motorola Dragon ball or similar microphones
2. 16-75 MHz operating speed
3. 3com or pocket PC high speed operating systems
4. 160 x 160 or 240 x 320 pixel resolutions of the display with 16 grayscales
5. 10 cm (4 inch) LCD display

8) Elaborate on the principles of Digital Calculators with a neat diagram.

Principle of Operation

Everybody of us is using calculators for a long time. The calculators can be classified as general purpose, scientific, programmable and commercial calculators. The pocket calculators are operated from solar power or small batteries. They normally have LCD display. The calculators have a CPU that performs all the calculations. The CPU accepts data from the keyboard and displays the results on the LCD display.

Block Diagram

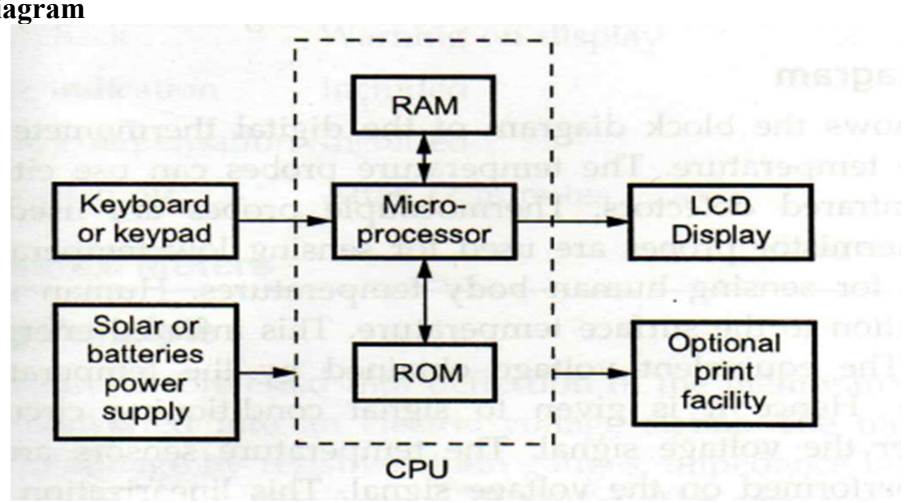


Figure shows the block diagram of the digital calculator. The keyboard or keypad is interfaced to the CPU or microprocessor. Most of the calculators have single chip that includes RAM, ROM, display / keyboard interface. It is also called CPU. The microprocessor within the chip (CPU) performs all the arithmetic and scientific functions. The onchip RAM and ROM decides the calculating power. The chips are specially designed to include memories and interface so that overall cost and size is reduced . Calculators normally use LCD display to reduce power consumption. The calculators are operated from small batteries or solar cells. Some calculators have attached printer. This printer prints the series of calculations being done. Because of this printing facility, it is easier to understand about what calculations are performed.

Features

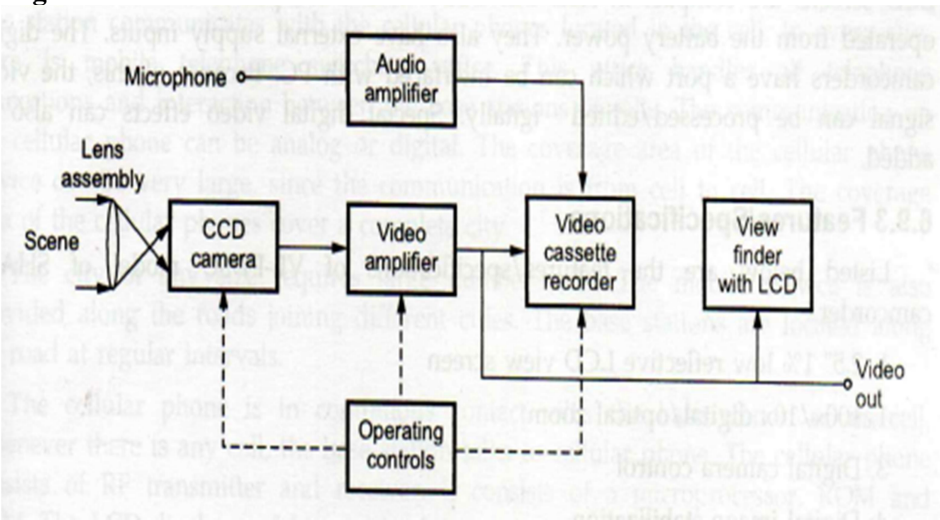
1. 8 digits LCD display
2. Solar power
3. Floating negative sign appears to the left of then number displayed
4. Function signs in displays
5. Hard, plastic tamper proof keys

9) Sketch the Block diagram of Camcorders and assess its significances.

Principle of Operation

The camcorder is basically a single unit which consists of video camera, video recorder and display or view finder. The camcorders are portable devices. They operate from their batteries or external power supply. The camcorders can be analog or digital. In analog camcorders the video signal and audio signals are analog. In digital camcorders, the audio and video signals are digital. The camcorder normally provide video signal as the output signal. Digital camcorders have a port which can be connected to computer. The digital video signal can be accessed by computer through this port.

Block Diagram



The lens assembly consists of zoom and focusing lens. This assembly is normally fitted with CCD camera. The CCD camera has auto focus facility. There id infrared transmitter and receiver in the camera. The infrared signals strike the scene / object in front of the camera. Based on the travelling time of the infrared signal, the distance of the scene / object is calculated. Then based on this distance, the focus is adjusted. The zoom lens is normally operated by the user.

The light from the scene is made incident on the CCD target sensor. The CCD sensor has light sensitive diodes. 1 cm panel of CCD consists of 300,000 to 500,000 such light sensitive elements or diodes. These diodes are called photosites. Each photosites measures the amount of light or photons that hit a particular point. It then translates this information into electrons or electrical or electrical charges. For colour image three separate colours are sensed: Red, Green and Blue.

Beam splitters are normally used for this purpose. Separate photosites are used to sense the three separate colours. The electrical charge on each photosites is then read by the electron beam to create the video signal.

The video amplifier amplifies the video signal. The video cassette recorder (VCR) records the video signal on the tape. The microphone pick up the sound and corresponding audio signal is also recorded along with the video. In case of digital camcorder the digital video signal is recorded on the tape. A video signal is provided as the output. Various recording formats are used in camcorder. For analog camcorders standard VHS, VHS-C, super VHS, super VHS-C 8 mm and Hi-8 formats are used. For digital camcorders digital video (DV) and digital – 8 formats are used.

The operating controls are used to operate the camcorder. Start / stop, record , play, fade, zoom, audio etc. Controls are used by the operator. The view finder shows the scene being focused. The viewfinders have colour or monochrome LCD screens. the LCD screens are compact in size. But LCDs need more power. The camcorders are operated from the

battery power. They also have external supply inputs. The digital camcorders have a port which can be interfaced with PC. Because of this, the video signal can be processed / edited digitally. Special digital video effects can also be added.

10) Analyze the characteristics of Microphone and explain Output level Characteristics.

A microphone is a device of the class called transducers which converts sound in air into electrical waves of the same frequency and shape. In the process of conversion, the microphone must make use of either the pressure of the air waves, or the velocity at which the air moves. So, we have two types of microphones, the pressure –operated types, and the velocity-operated types.

Characteristics of Microphone

There are many types of microphones available. Each has certain advantages. The choice of a microphone depends upon the type of material to be reproduced, the placement of the microphone, whether it is to be used indoors or outdoors, the frequency response desired, and a number of other factors.

The basic types of microphones, grouped according to their principle of operations are: Carbon, crystal, dynamic, ribbon and capacitor

Each of these has its own characteristics with respect to

1) output level 2) frequency response 3) output impedance 4) directivity

Output Level

The output level of a microphone governs the amount of amplification that must be available for use with the microphone. The output level of microphones is usually given dB preceded by a minus sign. The minus sign means that the output level is so many dB the reference level of 1 mill watt for a specified sound pressure.

The unit of sound pressure used for ratting microphones is referred to as bar. A bar is equal to a sound pressure of 1 dyne per square centimetre. Speech provides sound pressures between 0.4 and 15 bars. For music the pressure ranges from 0.5 bars to 1250 bars.

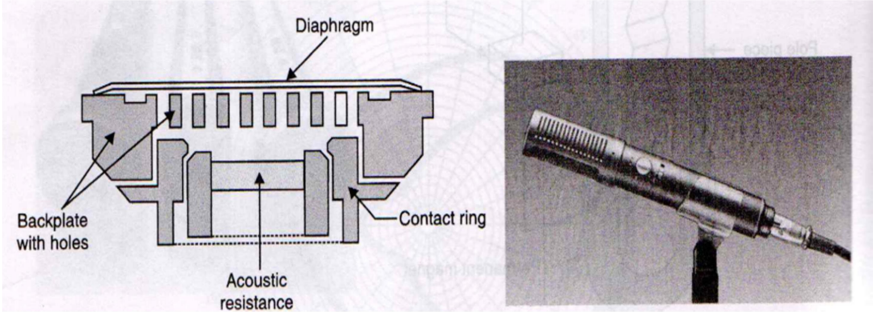
Microphones are rated in a number of different ways, and this often causes confusion. if ratings are given in any manner other than in bars, it is a good idea to convert their output level rating to dB below 1 milli watt for a sound pressure of 1 bar.

Rating Given	Correction Factor
dB below 1 m W/1 bar	0dB
dB below 1 mW / 10 bars	-20 dB
dB below 1 volt/ 1bar	2 dB
dB below 1 volt/10bars	-18 dB

11) Write a detailed note on the Capacitor Microphones with a neat diagram.

A capacitor (or to give it is original name, condenser) microphone shown in the figure, is one that depends for its operation on the variation of capacitance between a fixed plate and a tightly stretched metal diaphragm. Its development represents a milestone in the history of modern electro acoustics and for a number of years this type of microphones was the accepted standard for high quality sound systems.

In this case the movable plate is the diaphragm which serves as the sound pressure sensing element. In order that it will respond well to transient and high frequency sound waves, the diaphragm is made very light by forming it from a thin film of plastic material coated with a fine layer of metal.



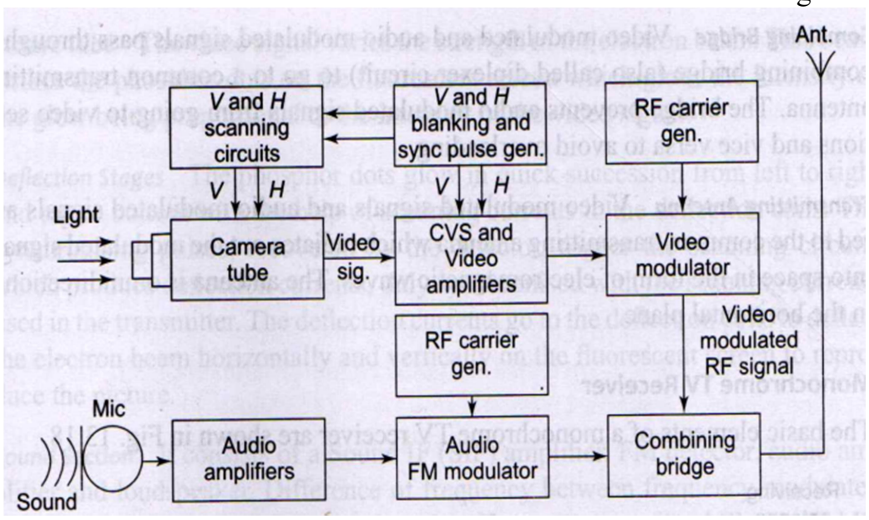
The fixed plate is mounted rigidly behind the diaphragm and in order to achieve as a high capacitance as possible very close to it. Capacitance can vary from 5 – 75 pF, but between 20 – 30 pF is most common.

For the capacitor microphone to function a voltage must be applied across it, and this also has the effect of pulling the diaphragm back towards the fixed plate by means of electrostatic attraction. Thus it is kept taut and rigid a necessary characteristic if it is to respond faithfully to the incoming pressure waves, yet without any penalty in the form of increased mass.

The total capacitance of the unit is small, and therefore the capacitance variations are minute. In order to produce current flows of usable proportions, the applied voltage must be high. In some cases it can be over 100 V, but around 50 V is common. Some models are designed to work well down to 9 V, and thus receive power from a standard radio battery. These will work with even lower voltages but the sensitivity tends to fall off.

12) Provide the basic elements of a Monochrome TV Transmitter with a neat sketch.

The basic elements of a monochrome TV transmitter are shown in the figure.



Camera Tube

Converts intensity of light from a scene into electrical variations , called video signal by using a photosensitive target plate

Scanning and sync circuits

Electrical current is extracted from the photosensitive target of the camera tube with the help of a scanning beam which is produced by saw tooth currents trough horizontal and vertical deflection coils

Blanking and sync pulse Generators

The start of a saw tooth or sweep current signal is triggered by pulses called sync pulses. the retrace is blanked by blanking pulses and these pulses are periodic and appear for the specified time by using a monostable multivibrator.

Video Amplifiers

Video signals along with blanking and sync pulses, called composite video signals are amplified by using wideband RC coupled amplifier circuits.

The RF carrier generator and video modulator are radio frequency modulated by the video signal. Modulation is of vestigial sideband (VSB) type AM to save the bandwidth. In this type of modulation, one sideband is vestige to a small fraction of the whole band. In a TV, the lower sideband is vestige and the upper sideband and carrier are sent in full.

Microphone

It converts sound pressure variations into electrical variations, called audio signals.

Audio Amplifiers

These amplify the weak audio signals

RF carrier Generator and Audio Modulator

A radius frequency carrier is generated and is frequency modulated by the audio signals at low level. The radio frequency is then multiplied and to the full level for transmission.

Combining Bridge

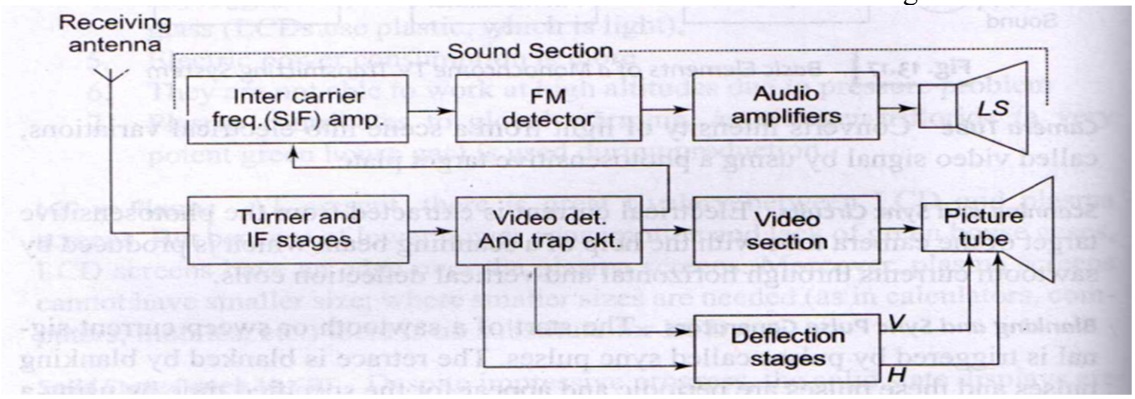
Video modulated and audio modulated signals pass through a combining bridge (also called diplexer circuit) to go to a common transmitting antenna. The bridge prevents audio modulated signals from going to video sections and vice versa to avoid overloading.

Transmitting Antenna

Video modulated signals and audio modulated signals are fed to the common transmitting antenna which radiates out the modulated signals into space in the form of electromagnetic waves. The antenna is omnidirectional in the horizontal plane.

13) Draw and Explain the Monochrome TV Receiver

The basic elements of a monochrome TV receiver are shown in figure



Tuner and IF stage

The receiver is a superherodyne receiver to achieves high selectivity and high gain. In a superheterodyne receiver, the radio frequency signal, duly amplified by a pre-amplifier, is mixed nonlinearly with the oscillations of higher frequency but of fixed amplitude, generated by a local oscillator. The output of the mixer consists of several intermodulation products (due to non-linear mixing), one of which is a signal having a frequency equal to the difference of frequencies of the two signals. The difference frequency is called intermediate frequency, which is selected and amplified. The advantages of the superheterodyne technique are better selectivity and higher gain.

Video Detector and Trap Circuit

The amplified IF goes to the video detector which recovers video signal the modulated wave and feeds it to the video amplifier for amplification through the trap circuit, which prevents the video signal from entering into audio channel

Video Amplifiers

These are wideband RC coupled amplifiers. The amplified video signal goes to the picture tube.

Picture tube.

The video signal varies the strength of the electron beam. This beam strikes the phosphor dots on the fluorescent screen which glows, the intensity of the glow being proportional to the intensity of the video signal.

Deflection stages

The phosphor dots glow in quick succession from left to right and top to bottom with the help of scanning currents in the deflection coils. The synchronising pulses. , recovered by the detector, trigger the scanning circuits which produce deflection currents, duly synchronised with the scanning currents used in the transmitter. the deflection currents go to the deflection coils to deflect the electron beam horizontally and vertically on the fluorescent screen to reproduce the picture.

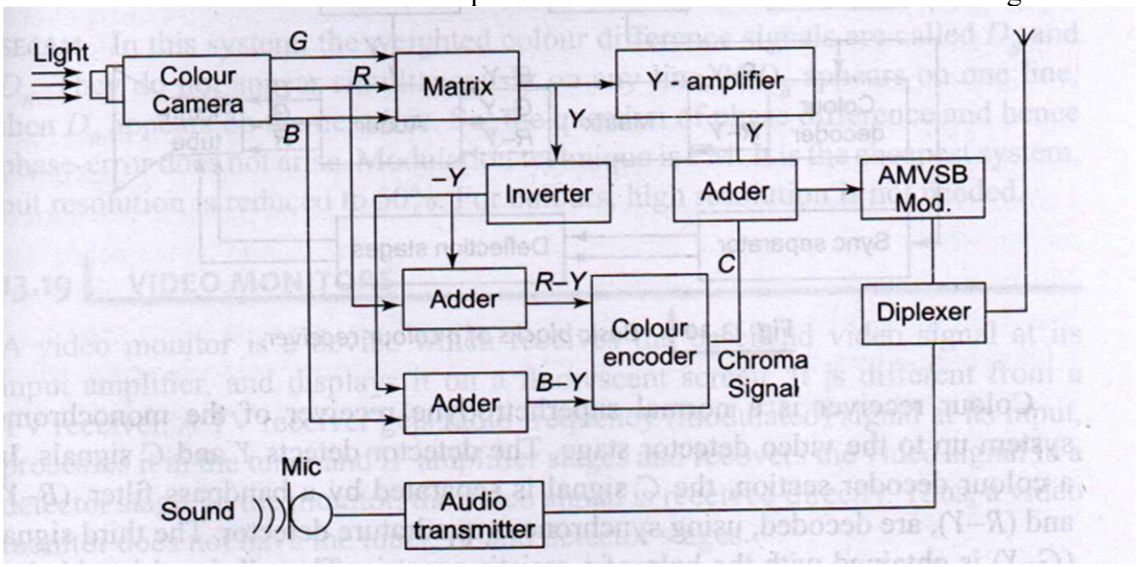
Sound section

It consists of a sound IF (SIF) amplifier, FM detector, audio amplifier and loudspeaker. Difference of frequency between frequency modulated IF and video carrier IF is called intercarrier frequency, or second IF or Sound IF. It is received from the video detector and passes to the SIF amplifier through a trap circuit, which prevents SIF signal from going into vide amplifier. The FM detector detects the audio signal which is then amplified by audio amplifiers. The amplified signal goes to the loudspeaker which converts it into sound. Thus, the original sound is reproduced.

14) Explain the features of a Colour TV Transmitter with a neat diagram.

Transmission and reception of a colour picture is more complex than a monochrome picture because of the requirement of compatibility with black and white pictures.

The basic features of a compatible colour transmitter are shown in the figure



For Colour transmission, colours from a picture are separated into three primary colours, red, green and blue with the help of prisms or dichroic mirrors and colour filters. The brightness present in each colour is converted by colour camera tubes into three electrical signals.

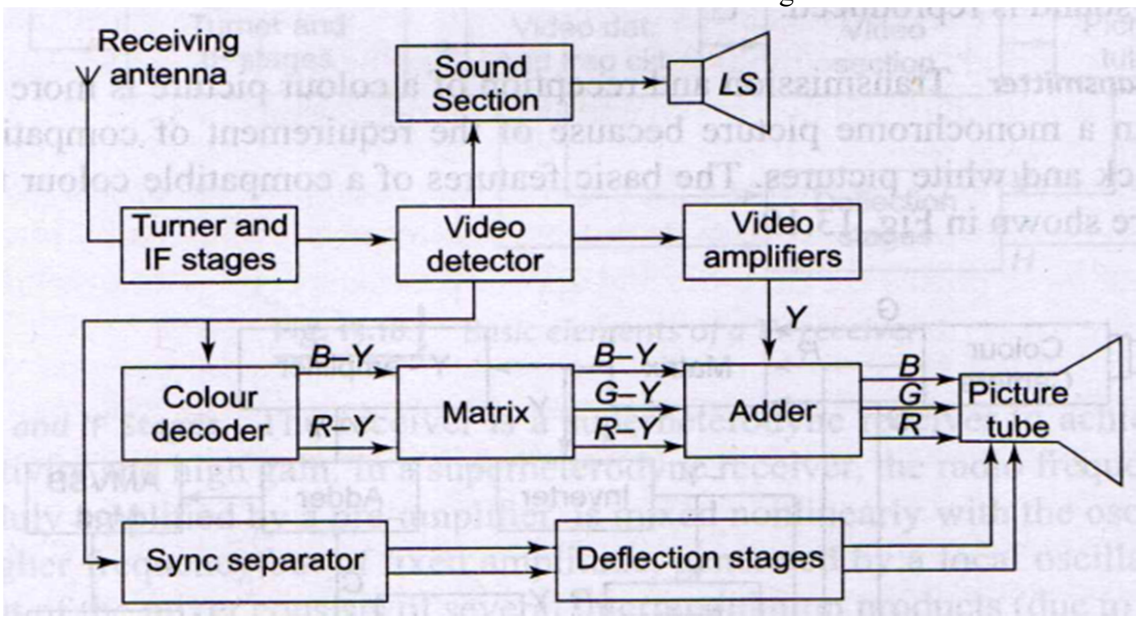
The three colour signals are passed through a resistive matrix to obtain resultant luminance signal (called Y signal), using Grossmann's law (Y = 0.59G + 0.3R + 0.11B). Colour signals are sent in the form of colour – difference signals.

A colour subcarrier (4.43 MHz in European system and 3.58 MHz in American System) is modulated by two weighted colour difference signals (B – Y and R – Y), using synchronous quadrature modulation. This is called Colour encoder. The colour difference signals when multiplied by suitable factors to prevent over modulation are called weighted colour difference signals. Its output is called Chroma signal (or C signal)

Then luminance signal Y and Chroma signal C are added and modulate the remain video carrier signal,, using AMVSB technique. This modulated RF carrier is transmitted along with an audio modulated RF carrier through a common transmitting antenna with the help of a diplexer.

15) Assess the basic elements of a Colour Receiver with a neat sketch.

Basic elements of a colour receiver are shown in the figure



Colour receiver is a normal superheterodyne receiver of the monochrome system up to the video detector stage. The detector detects Y and C signals. In a colour decoder section, the C signal is separated by a band pass filter, (B – Y) and (R – Y), are decoded, using synchronous quadrature detector. The third signal (G – Y) is obtained with the help of a resistive matrix. Then Y signal is added to each of the colour difference signals to get original camera signals pertaining to red, green and blue colours. These three colour signals are converted into coloured lights by making phosphor elements of the colour picture tube glow red, green and blue for every pixel. the eye integrates these primary colours by additive mixing and sees the resultant original colour. All the pixels on the screen are made to glow in quick succession with the help of deflection circuits which produce horizontal and vertical deflection currents for scanning the screen. Thus the coloured pictures is reproduced on the screen of the picture tube.

Sound is reproduced from the loudspeakers in the same manner as in case of a monochrome receiver.