

Electronic Equipments

Practical - I & II

Vocational Education
HIGHER SECONDARY - SECOND YEAR

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TAMILNADU
TEXTBOOK CORPORATION
College Road, Chennai - 600 006.

CHAIR PERSON

Dr.R.S.D. Wahida Banu

Professor and Head,
Department of Electronics & Communication Engineering,
Government College of Engineering,
Salem - 636 011.

AUTHORS

Dr. M. Chandrasekar

Associate Professor,
Department of Electronics &
Communication Engineering,
Government College of Engineering,
Salem - 636 011.

Miss. S. Salma Mehajaben

Lecturer,
Department of Electronics &
Communication Engineering,
Government College of Engineering,
Salem - 636 011.

Mr. C.Amirdalingam

Vocational Teacher,
Govt.Hr.Sec.School,
Yethapur- 636 117
Salem District.

Mrs. G.Umamaheswari

Vocational Teacher,
Govt.Hr.Sec.School,
Mettupatty- 636 111
Salem District.

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Experiment No : 3	Study and Verification of Logic Gates.
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- Experiment No : 4 Rectification of No Colour fault and operation of a TV Receiver.
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PRACTICAL - I

EXPERIMENT NO - 1

STUDY OF RF SIGNAL GENERATOR AND CRO

Aim

To study the basic operations of a RF signal generator and a CRO.

Components required

S.no	Name of Component/Apparatus	Quantity
1.	RF signal generator	1
2.	CRO 20 MHz	1

1.Signal Generator Working Principle

It is an electronic equipment which is used to generate Audio Frequency and Radio Frequency waves. Signal generator generates 150KHz to 30MHz radio frequency and 400Hz audio frequency, and also it modulates the waves that transmits to about 100kms.



Fig.1 (a) : Signal Generator Front panel

2. Front Panel of Signal Generator

1. **ON - OFF Switch** : It is used to activate (ON - OFF) the generator.
2. **Mode Selector** : It is a control switch, which is used to select three types of waves, they are i) Carrier wave (ii) Modulated wave (iii) AF waves are obtained in the o/p.
3. **Band Selector** : It is used to select the bands in the scale. It is also known as Range selector. It is used in radio receiver to select the various bands.
4. **Frequency Selector** : It is used to select the required particular frequencies. In the front panel the frequency ranges A, B, C, D, E, G are given in KHz and MHz ranges tuning the selector the particular frequency is obtained.
5. **Gain Control** : It is used to control the gain of RF & AF waves. It is a variable resistor i.e., potentiometer.
6. **Output** : The wave which is selected from the mode Selector is obtained in the o/p. It is connected through a cable to the radio receivers and RF, AF, IF wave ranges are verified.

3. Uses of signal Generator

1. It is used to transmit the small ranges of waves. It is also called as AM Transmitter.
2. It is used to correct the RF, IF, AF wave ranges in the Radio Receiver and used to get the noise less sound.

CRO - (Cathode Ray Oscilloscope)

It is used to generate the waveforms for various frequencies of the O/P circuit.

1. Structure of CRO

It has three important parts.

Electron Gun : It consist of a filament and cathode, Cathode is heated by the filament, and electrons are emitted from the cathode.

2. Neck Part : It has three grids and two sets of movable discs x and y.

(i) **First grid** : It is used to control the electron beam which is generated by the cathode.

(ii) **Second grid** : It accelerates the electron beam.

(iii) **Third grid** : It takes the electron rays to the centre of the screen.

(iv) **Moving Plates** : It is called as x, y plates. Electron beam can be oscillated by giving voltages. This process is called electrostatic deflection.

(a). **X- Plates** : It is connected to the time base circuit and generates the saw tooth waveform. It is used to move the beam from centre to Horizontal direction. It is a X-axis in the display.

(b). **Y- Plates** : It is connected to the outer circuit of the the vertical deflection. It is used to move the beam from centre to the vertical direction. It is a y- axis in the display.

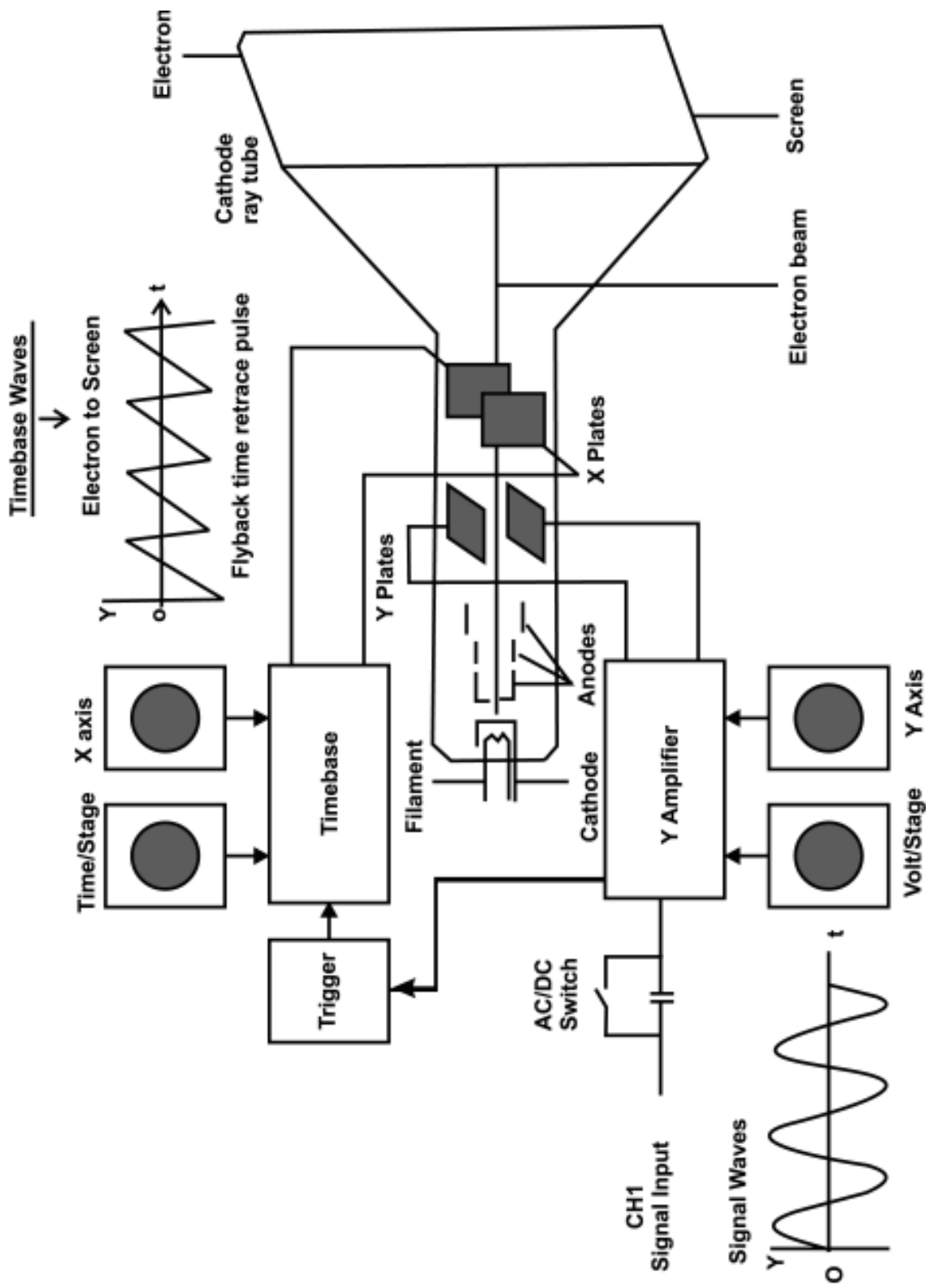


Fig.1 (b) : Block Diagram of CRO

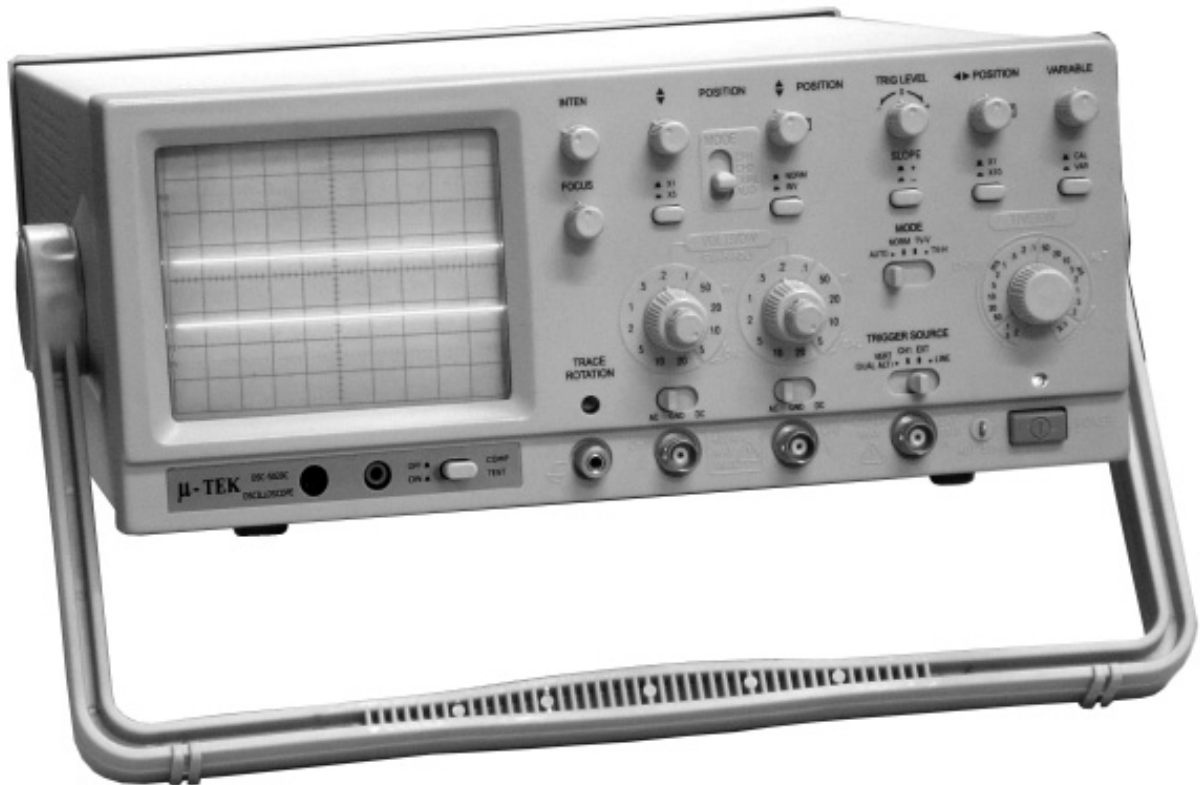


Fig.1 (c) : Front Panel of CRO

3. **Screen** : CRO has a screen. It is a vacuum tube which is like a picture tube in television.

 1. **AC/DC Switch** : Inputs are given at the OFF position. Amplified waves are given to the Y-plate.
 2. **Volts / Div** : Using this controlling button, change the size of the waveform as low or high.
 3. **Trigger Circuit** : The wave displayed on the screen keeps on oscillating. So using time delay circuit and keep the wave form stable. So that amplitude, frequency and phase are measured.

4. USES OF CRO

1. It is used to see time varying waveforms
2. We can align all blocks in the TV receiver
3. It is used to measure signal voltage
4. To measure signal frequency
5. We can find out the faults in DVD, VCD, VCP using CRO.

FRONT PANEL CONTROL OF CRO

1. **ON - OFF** : The ON-OFF switch control used to operate the CRO in ON-OFF position.
2. **INTENSITY** : This knob controls the intensity or brightness of the light produced by beam spot. It actually controls the number of electrons per second that are bombarding the screen. The potentiometer which is connected to the control grid voltage varies the intensity.
3. **FOCUS** : This controls the sharp of the spot. This is obtained by varying the voltage applied to the focussing anodes.
4. **SCREEN** : It is a some sort of plastic screen in front of the cathode ray tube. This screen has engraved like graph paper. This is called graticule this scale facilitates the measurements of the oscilloscope.
5. **V. POSITION** : With the help of this control the pattern obtained on the screen can be shifted a whole to vertically upward and downward. This is achieved by adding DC voltages to input signals.
6. **H. POSITION** : This is used to shift the display as a whole to left or right.
7. **VET - SET - ATTENUATOR** : This makes the gain of the vertical amplifier 10 times greater than normal.
8. **GROUND** : The input of the amplifier is grounded. There will be no vertical deflection. It is used for measuring voltage with respect to ground.
9. **SYNC LEVEL** : To obtain the standard pattern on the screen. There are various signals which can be applied to the trigger circuit. The signals can be selected using a sync selector switch. 1. Internal 2. Line 3. External.
10. **SWEEP SELECTOR** : The horizontal amplifier receives an input from saw tooth sweep generator which is triggered by sync. Amplifier.

RESULT

Thus the basic operation of a signal generator and CRO were studied.

EXPERIMENT NO - 2

CONSTRUCTION AND TESTING OF MULTIVIBRATORS USING IC 555

AIM

To test the multivibrators using IC 555.

COMPONENTS REQUIRED

S. No	Name of Component/Apparatus	Range	Quantity
1.	IC 555		1
2.	Resistance	1k Ω , 5k Ω , 100k Ω	2 3 1
3.	Capacitor	0.01 μ F	2
4.	Transistor	NPN	2
5.	Bread Board	-	1
6.	CRO with Probe	-	1

ASTABLE MULTIVIBRATORS

This type of Multivibrators generate different types of wave forms. Using IC 555 the circuit is assembled. It has no stable output. That is variation of output takes place accordingly. So we get a square wave forms. We can find the output and voltage range of the capacitor using the table.

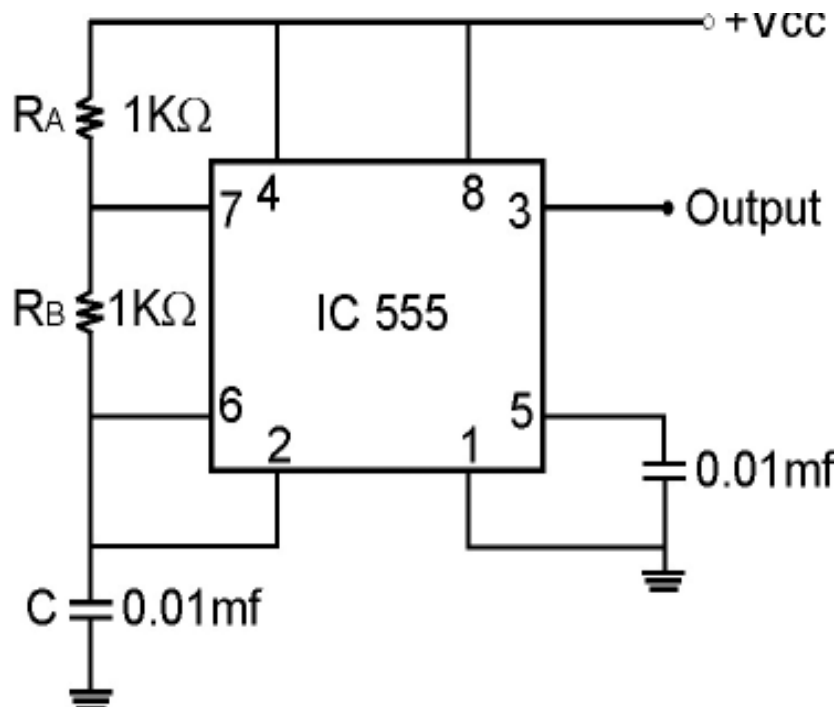


Fig. 2 (a) : Astable Multivibrator

CALCULATIONS

- The charging time of the capacitor is given by

$$T_c = \text{Charging time} = 0.693 (R_A + R_B) C \text{ ms}$$
- While discharging time is given by,

$$T_d = \text{Discharging time} = 0.693 (R_B) C \text{ ms}$$
- Hence the Total time for one cycle.

$$T = T_c + T_d$$

$$= 0.693 (R_A + R_B) C + 0.693 (R_B) C \text{ ms}$$

$$= 0.693 (R_A + 2R_B) C$$
- The Frequency of oscillators is given by

$$F = 1/T = \frac{1}{0.693(R_A + 2R_B)C} \text{ OR } \frac{1.44}{(R_A + 2R_B)C} \text{ KHz}$$

ASTABLE MULTIVIBRATOR

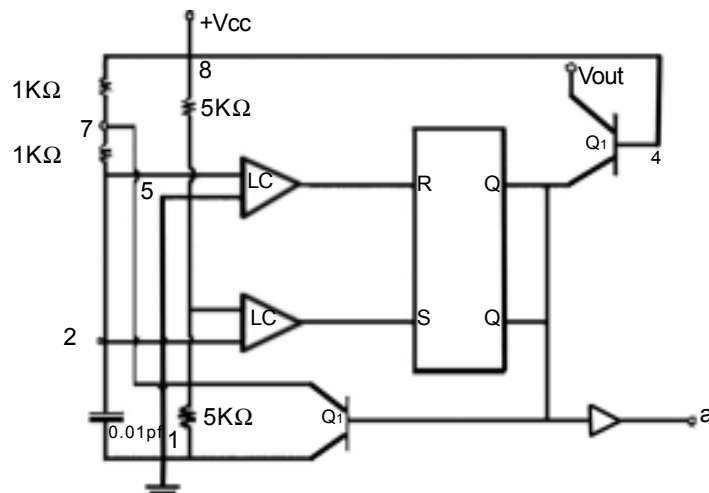


Fig. 2 (b) : Astable Multivibrator

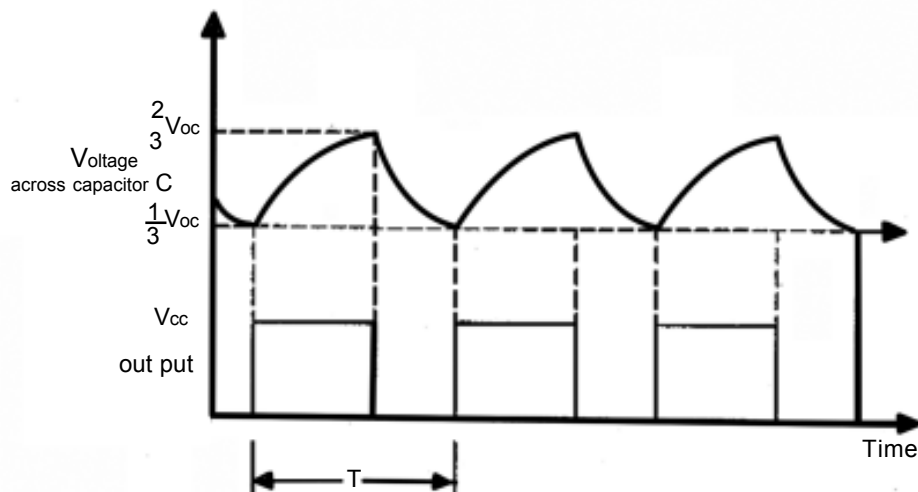


Fig. 2 (c) : Output Wave form

3. At first it has low level output. When trigger is applied, it produces high level output and returns back to stable stage.
4. The graph shows the waveform of the monostable multivibrator.

CALCULATION

Time of high level O/P.

$$T = 1.1 (R \times C) \text{ Seconds}$$

R in Ohms and C in farads.

RESULT

Thus the given astable and monostable multivibrators tested by using IC 555.

EXPERIMENT NO - 3

STUDY AND VERIFICATION OF LOGIC GATES

Aim

To study two inputs basic gates such as NOR, NAND, EX-OR, using TTL and IC and verify the truth tables.

Components Required

S.no.	Name of Components/Apparatus	Quantity
1.	DC regulated Power supply (0-5V)	1
2.	NOR Gate 7402	1
3.	NAND Gate 7400	1
4.	EXOR Gate 7486	1
5.	LED	10
6.	Bread board	1

Procedure

1. Fit the IC on the bread board
2. Switch on the power supply.
3. Inputs are given to the IC Input pins as per the schematic diagram and outputs are observed and tabulated for various logic gates.
4. 5V DC is set as 1 and 0 volt is 0. The inputs are mentioned as A and B.
5. Switch off the supply and remove the connections

1. NOR GATE

It is a combination of NOT and OR gate and the operation of NOR gate is inverse of the OR gate.

1. Boolean equation for NOR gate is $Y = A+B$
2. If both the inputs of A or B = 0 then the O/P of Y = 1.
3. We can verify the operation by the truth tables and also by glowing of LED.
4. If the I/p is low then the o/p will be high.
5. Operation of the NOR gate is verified from the truth table.

NOR

LOGIC SYMBOL

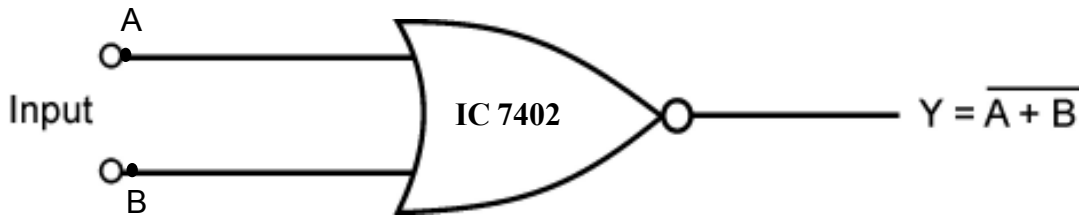


Fig. 3(a)

NOR GATE CIRCUIT DIAGRAM

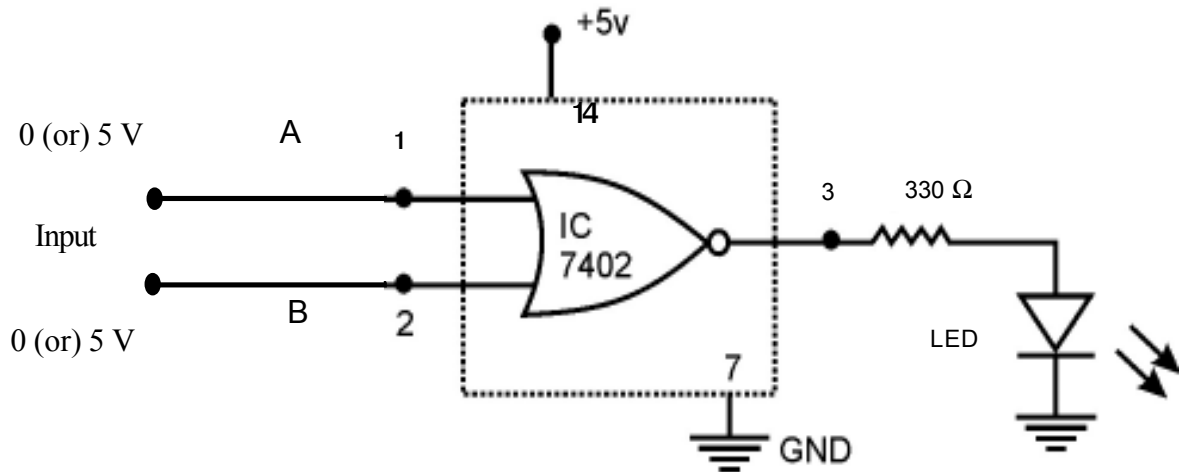


Fig. 3(b)

NOR GATE PIN DIAGRAM OF IC - 7402

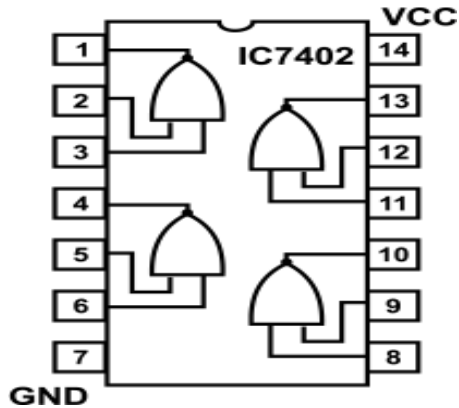


Fig. 3(c)

TRUTH TABLE OF NOR GATE

Logic inputs		Logic output
A	B	$Y = A+B$
0	0	1
0	1	0
1	0	0
1	1	0

NAND GATE

LOGIC SYMBOL

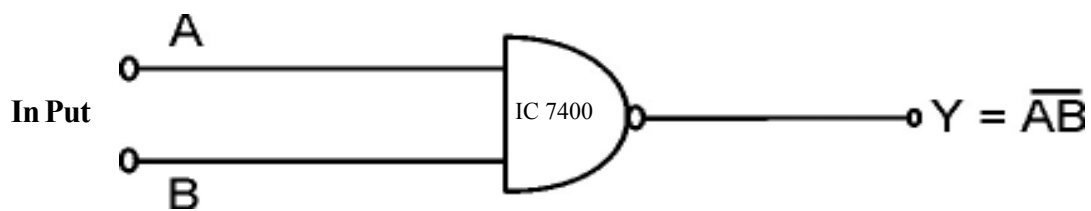


Fig. 3(d)

NAND GATE CIRCUIT DIAGRAM

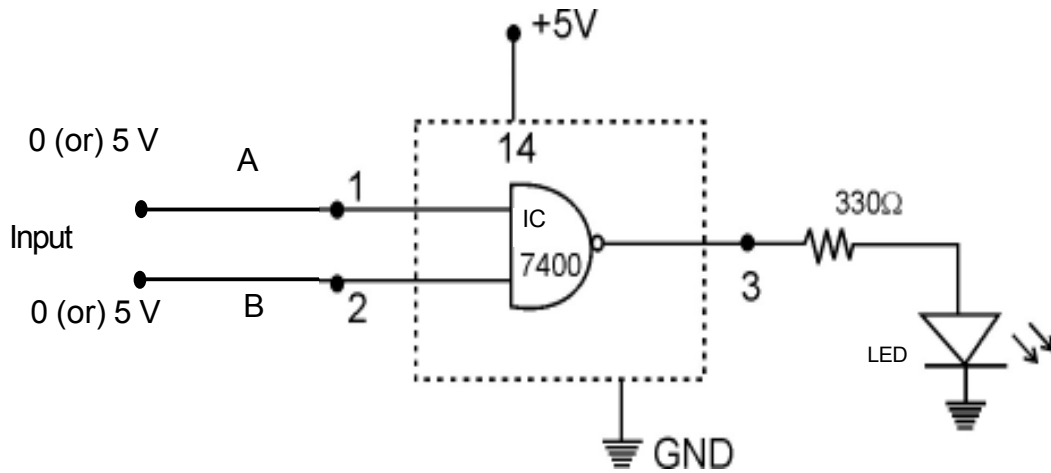


Fig. 3(e)

IC 7400 PIN DIAGRAM: NAND GATE

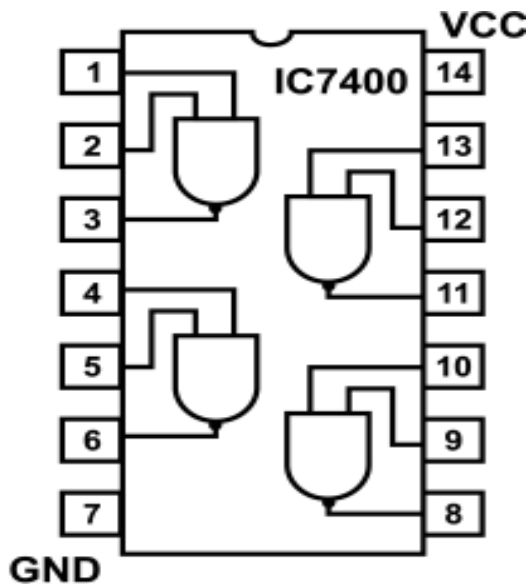


Fig. 3(f)

TRUTH TABLE OF NAND GATE

Logic inputs		Logic output
A	B	$Y = AB$
0	0	1
0	1	1
1	0	1
1	1	0

EX - OR GATE

LOGIC SYMBOL

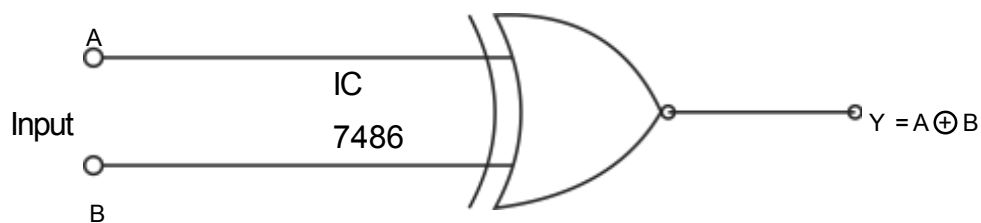


Fig. 3(g)

CIRCUIT DIAGRAM EX - OR GATE

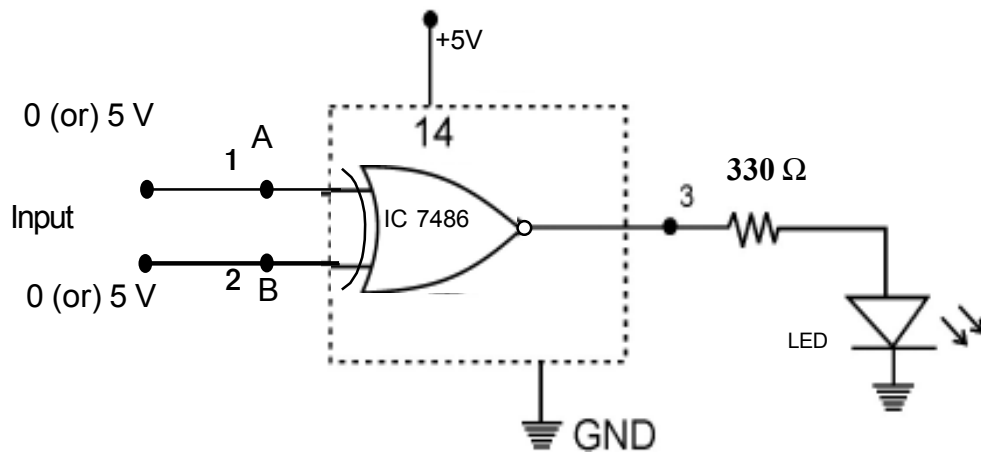


Fig. 3(h)

IC 7486 PIN DIAGRAM OF EX - OR GATE

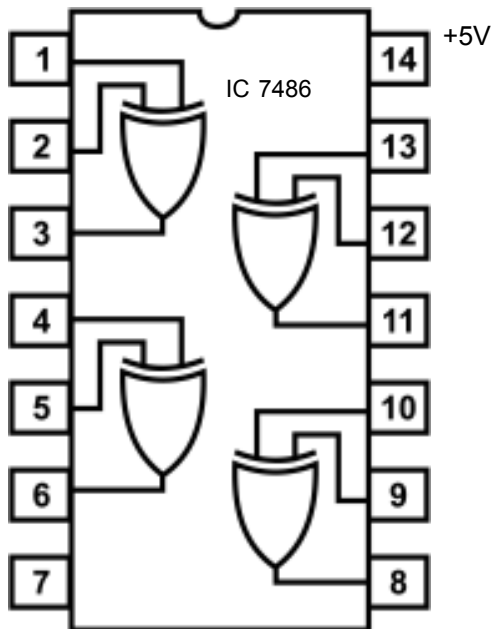


Fig. 3(g)

TRUTH TABLE OF EX-OR GATE

Logic inputs		Logic output
A	B	$Y = A + B$
0	0	0
0	1	1
1	0	1
1	1	0

NAND GATE

Combination of Nor and AND gate is called NAND gate. It is a Reverse operation of AND gate.

1. Boolean equation of NAND gate is $Y = \overline{AB}$
2. Inputs of A, B is 0 (or) any one of the input is one and another is 0 means the o/p will be 1.
3. Operation of the NAND gate is verified from the truth table

EX - OR GATE

- i) Diagram of Ex - OR gate shown using IC7486
- ii) Boolean equation for Ex- or gate $Y = A + B = AB + AB$
- iii) Any one of the I/P is high mean o/p will be high.
- iv) It is verified from the truth table

RESULT

Thus the study of logic gates NOR, NAND, EX-OR were done and the truth table is verified.

EXPERIMENT NO - 4

CONSTRUCTION AND TESTING OF HALF ADDER FULL ADDER AND FLIP - FLOPS

Aim

To study the two inputs of the arithmetic circuits of Half adder, Full adder and Flip flops using ICs.

Components Required

S.no	Name of Component/Apparatus	Quantity
1.	IC 7486	2
2.	IC 7408	2
3.	IC 7432	1

Half adder

1. A single logic circuit is used for adding two single bit binary numbers and the outputs are obtained as sum and carry.
2. Sum is got from the output of EX - OR gate and carry is obtained from the output of AND gate.
3. Here A and B are the inputs and sum (s) and carry (c) are the outputs.
4. Half adder can take only two inputs it doesn't take the third carry.

Full adder

1. A logic circuit that can be used for adding three single bit binary numbers and give the output of sum and carry
2. It takes three inputs including the output of EX-OR gate and carry is from the input of AND gate.
3. It is the form of two half adder with OR gate
4. It has three inputs A, B, and C and two outputs S and C.
5. The o/p sum is doing $A+B+C$ and the other o/p carry is doing $A.B + B.C + C.A$

Flip Flop

Flip Flop is doing the action with the help of logic gates. It has one and more inputs and only two outputs. The inputs are 1 and 0 and it is stable while there is no change.

There many types of Flip -Flops, some are

1. SR Flip Flop
2. CSR Flip Flop
3. T - Type Flip Flop
4. D - Type Flip Flop
5. J.K Flip Flop

1. S-R Flip Flop (SET-RESET)

1. It is a basic circuit.
2. It has two inputs are set (s) and Reset (R) and has two outputs Q and Q
3. The diagram and the truth table shows the action.

2. CSR FLIP - FLOP : (Clock Set Reset)

1. It is not possible for changing the input at once. So a clock pulse is used as clock SR Flip - Flop
2. It has three inputs S, R and C and outputs are obtained as Q and Q.
3. It is a combination of four NAND gates which is verified by using truth table.

3. T-TYPE FLIP FLOP :

It is used for calculation. So it is called Toggling flip-flop. By the input J and K are obtained the outputs as Q and Q which is verified by truth table.

4. D- TYPE FLIP FLOP :

It is the next stage of CSR Flip flop. It is used for memory the data's. so It is called Data flip flop we came to know the flip - flop by using the diagram and truth table.

5. J.K FLIP FLOP

1. CSR not allowed the input $R = S = 1$ so we can do it through by J.K flip flop
2. It has four NAND gates.
3. Inputs are given and functional state diagrams are verified.

1. Half Adder

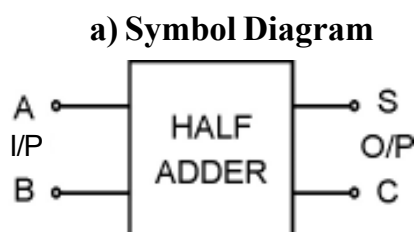


Fig. 4(a)

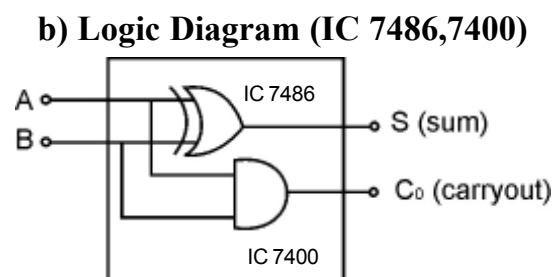


Fig.4(b)

2. Full Adder

a) Symbol Diagram

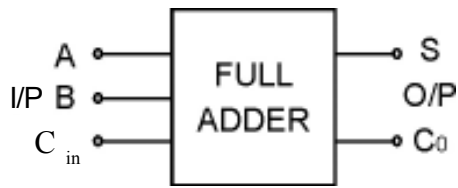


Fig :4(c)

b) Logic Diagram (IC 7486,7400,7402)

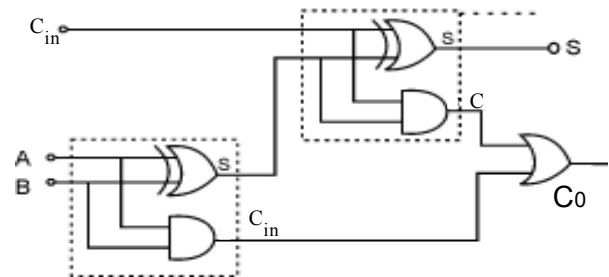


Fig :4 (d)

Truth Table of HALF ADDER

LOGIC INPUTS		LOGIC OUTPUTS	
A	B	S	C ₀
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

$$S = A \oplus B$$

$$C_0 = A \cdot B$$

Truth Table of FULL ADDER

LOGIC INPUTS			LOGIC OUTPUTS	
A	B	C _{in}	S	C ₀
0	0	0	0	0
0	1	0	1	0
1	0	0	1	0
1	1	0	0	1
0	0	1	1	0
0	1	1	0	1
1	0	1	0	1
1	1	1	1	1

$$S = A + B + C$$

$$C_0 = A \cdot B + B \cdot C + C \cdot A$$

FLIP-FLOP

1. SR Flip-Flop

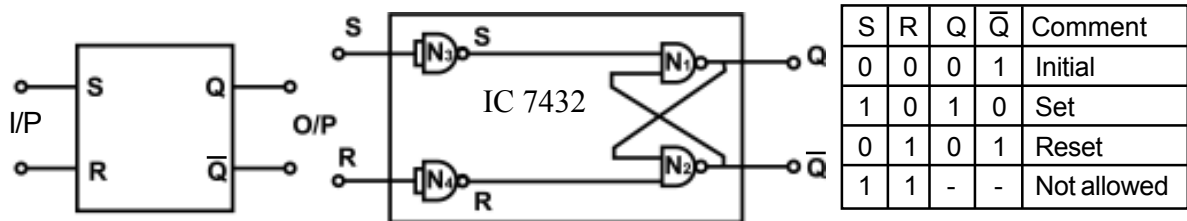


Fig. 4(e)

State diagram

S	R	Q	Q̄	Comment
0	0	0	1	Initial
1	0	1	0	Set
0	1	0	1	Reset
1	1	-	-	Not allowed

2. CSR Flip-Flop

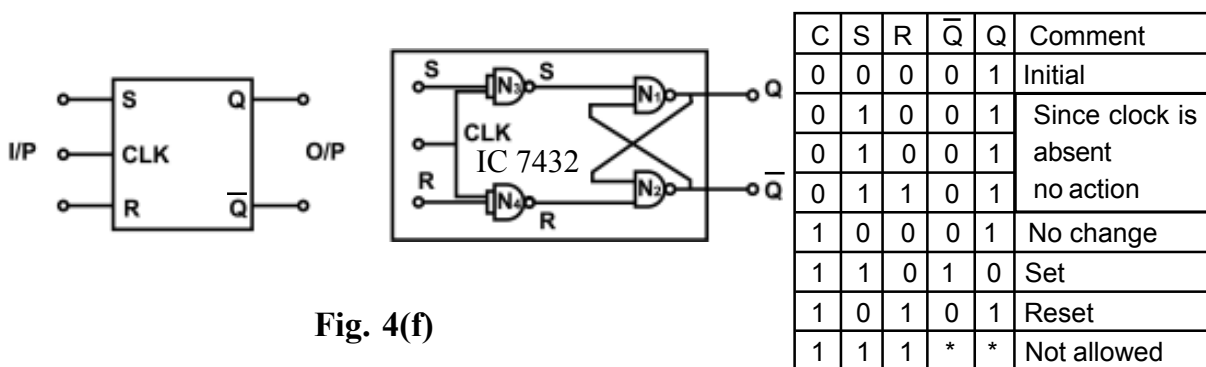
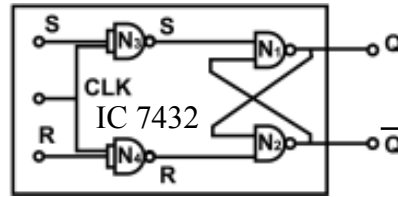
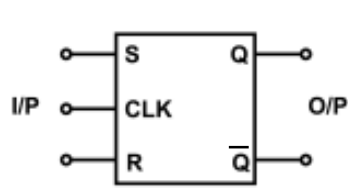


Fig. 4(f)

State diagram

C	S	R	Q̄	Q	Comment
0	0	0	0	1	Initial
0	1	0	0	1	Since clock is absent no action
0	1	0	0	1	
0	1	1	0	1	No change
1	0	0	0	1	No change
1	1	0	1	0	Set
1	0	1	0	1	Reset
1	1	1	*	*	Not allowed

2. CSR Flip-Flop

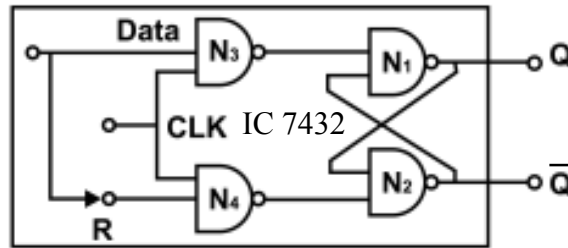
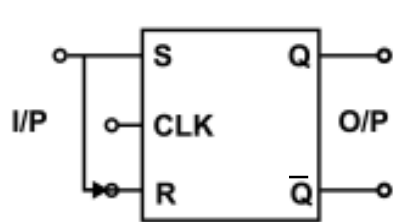


State diagram

C	S	R	\bar{Q}	Q	Comment
0	0	0	0	1	Initial
0	1	0	0	1	Since clock is absent no action
0	1	0	0	1	
0	1	1	0	1	
1	0	0	0	1	No change
1	1	0	1	0	Set
1	0	1	0	1	Reset
1	1	1	*	*	Not allowed

Fig. 4(f)

3. D-Type Flip-Flop

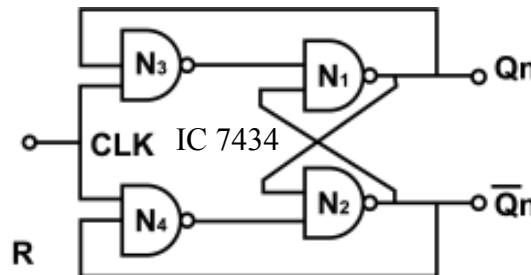
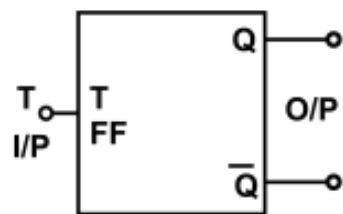


Logic Input	Logic Output	
D	Q	\bar{Q}
0	0	1
1	1	0

State diagram

Fig. 4(g)

4. T-Type Flip-Flop



Logic Input	Logic Output
T	Q_{n+1}
1	\bar{Q}_n
1	Q_n

State diagram

Fig. 4(h)

JK - FLIP FLOP

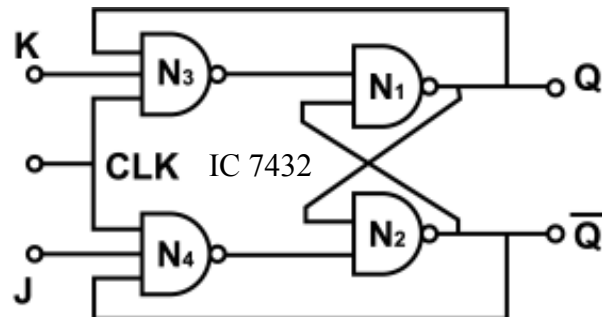
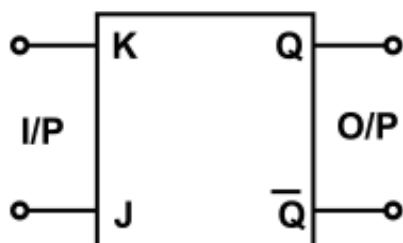


Fig. 4(i)

State diagram

Logic input					Output
C	J	K	Q	\bar{Q}	Comment
0	0	0	0	1	Initial
0	1	0	0	1	Since clock is absent no action
0	0	1	0	1	
0	1	1	0	1	
1	0	0	0	1	No change
1	1	0	1	0	Set
1	0	1	0	1	Reset
1	1	1	1	0	Toggling
1	1	1	0	1	

Result

Thus we study the circuits of half adder and full adder by using truth table. Flip-Flops are verified using the state diagrams.

EXPERIMENT NO - 5

ERECTION AND TESTING OF DISH ANTENNA

Aim

To study the installation and testing of dish antenna.

Components required

S.No.	Name of Components/Apparatus	Quantity
1.	DTH Antenna(Direct-To-Home)	1
2.	LNB(Low Noise Blockdown converter)	1
3.	Satellite receiver	1
4.	RG6 co-axial cable	25 metre
5.	TV	1 set

Dish Antenna

It is a receiver antenna which receives the signals propagated by the satellite and give to the T.V. Receiver.

Procedure for the Installation of Antenna

I. Choosing the correct place : First we should select the correct place for installation.

1. It must be an open place. Objects like trees, hills, buildings should be avoided because signals will be weak.
2. It should be visible and must be fixed in the direction of the satellite.
3. The place selected, must be 20 feet along the power line.
4. It can be installed on a terrace, upstairs, outwalls or pillar.

II. Ground

A good grounded minimise the bad reactions.

1. The bad effects from, lightning and thunder affects the receiver. It may be shocked when operation, even death will also be happen. So it must be grounded properly.
2. We can make the ground with parallel to EB ground. Otherwise we can ground separately by using pipes.

III. Assembling of Antenna

1. The antenna must be fixed very strong, even should not disturbed by any natural calamities such as strom, rain etc.
2. We can use the RG6 cable wires to connect the TV and the antenna.
3. The cable must be 25m length.
4. We can take the transmission line via walls or ground.

IV. Fixing and testing of antenna

1. First choose the direction of the satellite and then fix the stand of dish antenna. After fixing, the antenna stability and strength must be checked.
2. Angle(AZ-EL) of the dish antenna must be checked and then it must be fixed with screws and bolts. [AZ side angle left to right, EL-up and down angle].
3. Then fix LNB with V shape bolt-nut at the opposite side of the dish.
4. Cable wire must be connected between T.V and antenna.

Testing

1. Switch ON the T.V. and check the screen for clear vision and turn the antenna till clear vision is obtained.
2. Even if the picture is not clear, adjust the dish AZ(Azimuth) and EL (Elevation) correct position to get clear image.
3. If all channels are screened clear, stop the adjustment, Note the noise level in LNB which must be in high level.
4. If all the adjustments are done correctly, note the angle of the dish (EL and AZ) at the back side which is used in future purpose.
5. It is an important point, there is no iron objects while adjusting the angle. Because it make wrong deflection in the meter.
6. If all are correct again check the strength of dish.

Some standard angles given

Place	Latitude	Longitude	AZ	EL
Mumbai	18.93N	72.85E	128.56	56.37
Delhi	28.67N	77.23E	146.26	51.24
Chennai	13.08N	80.30E	130.79	67.03
Salem	11.63N	78.13E	123.63	66.09

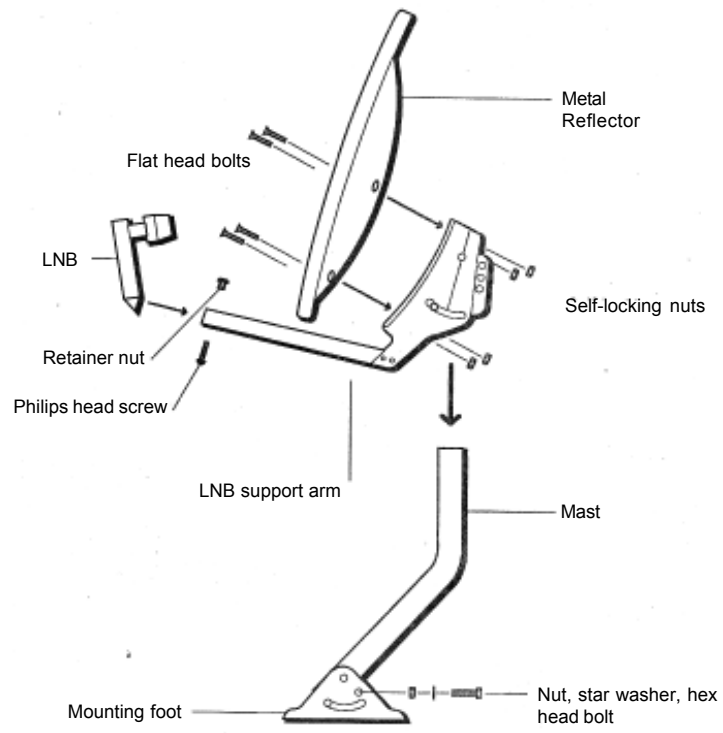


Fig. 5(a) : Separate parts of Dish antenna



Fig. 5(b) : Dish antenna

ROUTING CABLE THROUGH THE MAST

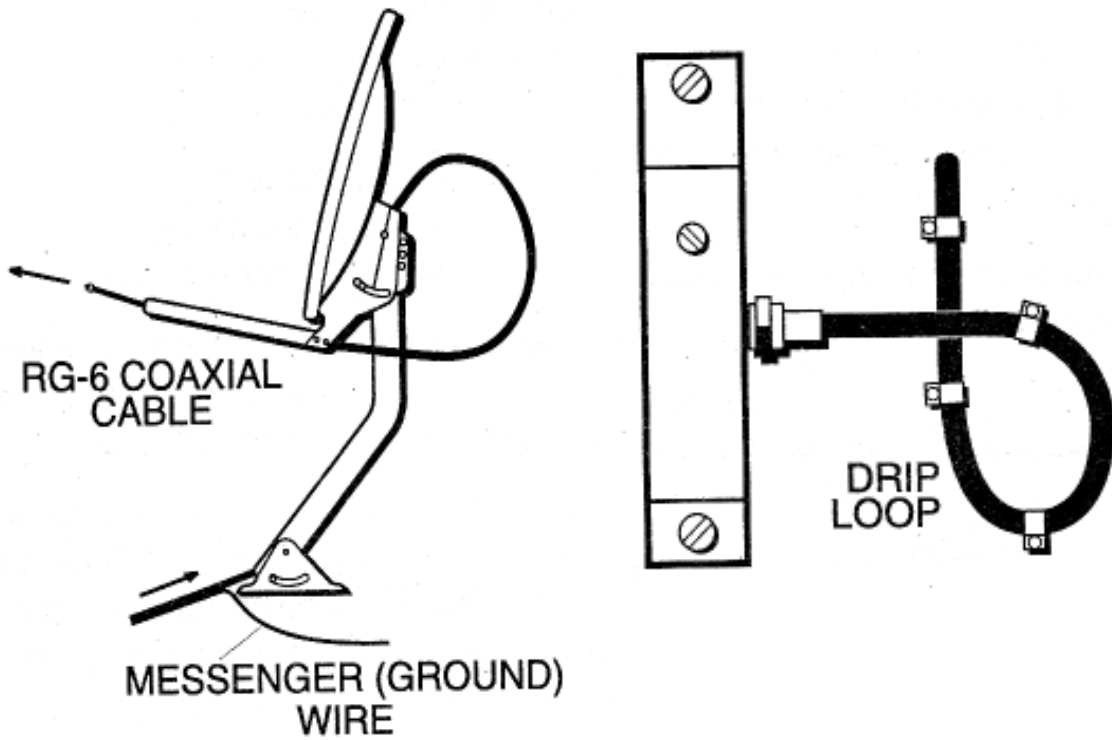


Fig. 5(c)

Result

Thus, a dish antenna is installed and tuned the picture obtained clearly in the screen.

EXPERIMENT NO - 6

CONSTRUCTION OF AUDIO AMPLIFIER USING TBA 810 IC.

Aim

To construct an audio amplifier using TBA 810 IC.

Components required

S.No.	Name of Components/ Apparatus	Range	Quantity
1.	IC	TBA 810	1
2.	Speaker	4"8W	1
3.	Volume control	10k Ω	1
4.	Resistor	100k Ω	1
		150 Ω	1
		56 Ω	1
		1 Ω	1
5.	Capacitor	0.1 μ f	1
		0.01 μ f	1
		0.0047 μ f	1
		330pf	1
		220 μ fd/12V	3
		100 μ fd /12V	2
6.	DC Power supply	6V	1
7.	Multimeter		1

Procedure

1. Assemble the circuit with the given components.
2. 0.1mf capacitor is conned to pin 8 and volume control centre point are connected.
3. Pin 9 and 10 are grounded.
4. Connect the speaker between pin 12 and ground.

After completing the arrangements, +6v power supply line is given to pin 1 as in the circuit. Then operate the amplifier and note down the voltage in every pins of the IC.

Results

Thus the audio amplifier is assembled using TBA 810 IC and voltages are noted down.

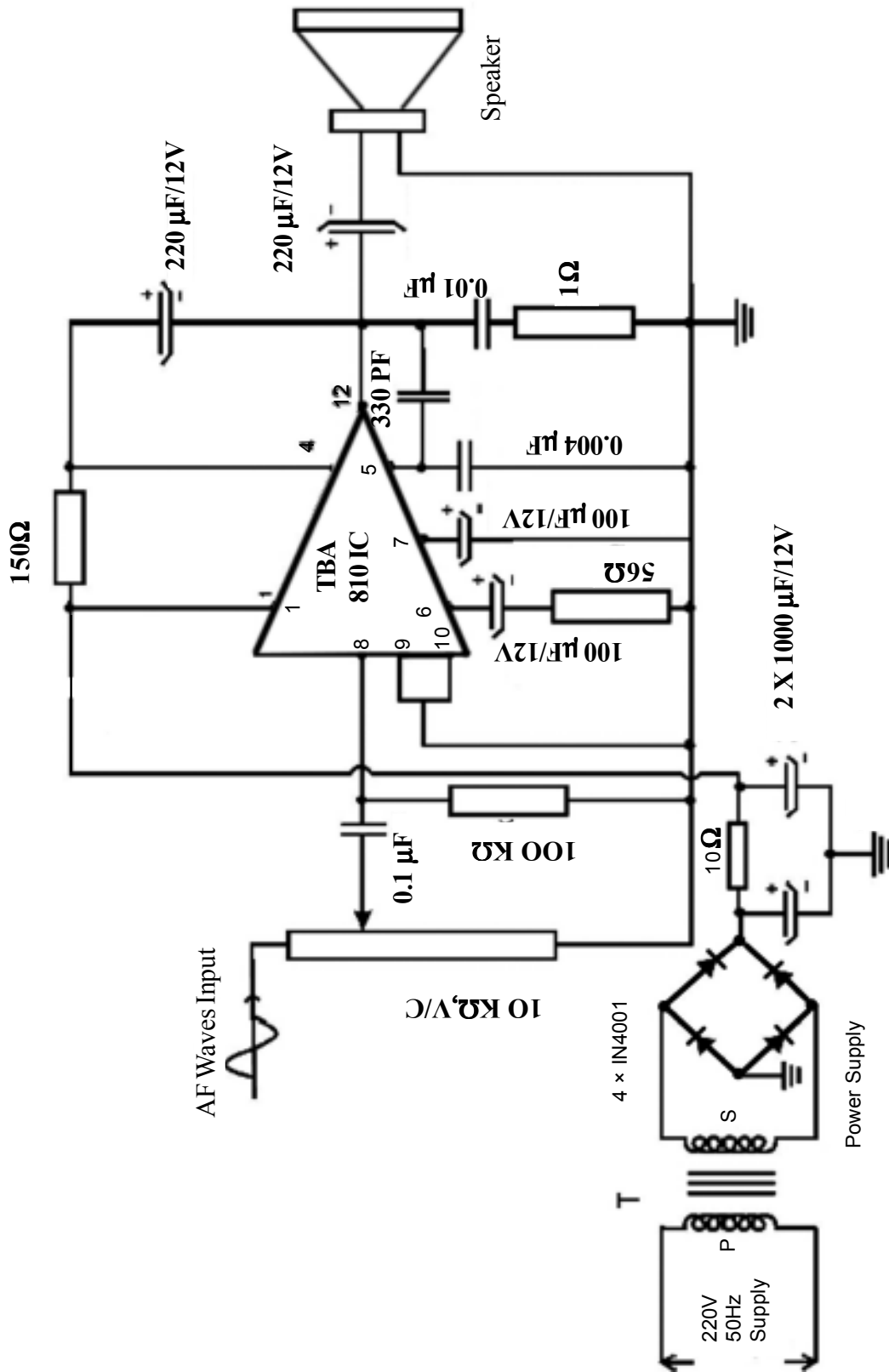


Fig. 6 : Audio amplifier and Output stage using TBA 810 IC

EXPERIMENT NO - 7

CONSTRUCTION AND TESTING OF ENCODERS AND DECODERS

Aim

To study the function of Encoder and Decoder.

Components Required

S.no	Name of Component/Apparatus	Quantity
1.	IC 74147	1
2.	IC 74148	1
3.	IC 7442 or 7447	1
4.	7 segment display	1
5.	Resistor 330W	4
6.	LED	10

1. Encoder

Encoder is a circuit, which connect the human codes into machine code. It is used for switching purposes in numerical code devices.

Decimal - BCD Encoder

When we press the (0-9) switches. It is converted as corresponding BCD code. (i.e Decimal to Binary) for that NAND gates is used with IC 74147. Table shows the decimal to four digital binary.

0	0000
1	0001
—	----
—	----
9	1001

Example : While pressing switch 3, the o/p is shown as 0011.

Octal to Binary Encoder

1. It uses IC 7448 and NAND gate.
2. It is used to convert octal number into binary number. Example, the number 537 is convert to binary code as 1101101011.
3. This circuit is used to save and give the binary numbers.
4. In this we can also get output for least value of the input.

2. Decoder

Decoder is a digital mixer type circuit. It converts the given digital code into necessary corresponding number.

BCD to 7 segment Decoder

Seven segment display is most popular one. It converts BCD into numerical form. Using Ic 744 the inputs and outputs are shown in figure.

1. Encoder - IC - 74147 with LED-2

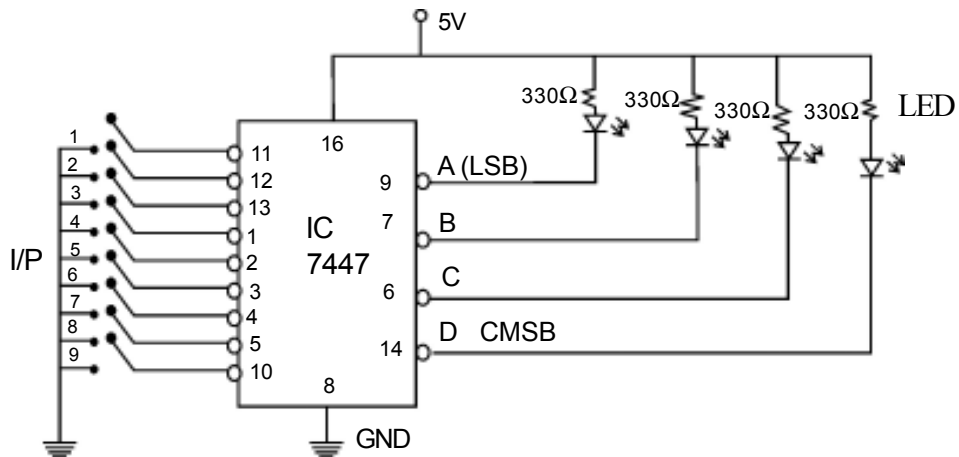


Fig. 7(a) BCD - to 7 Segment D-Coder (2 digits - 7 pieces)

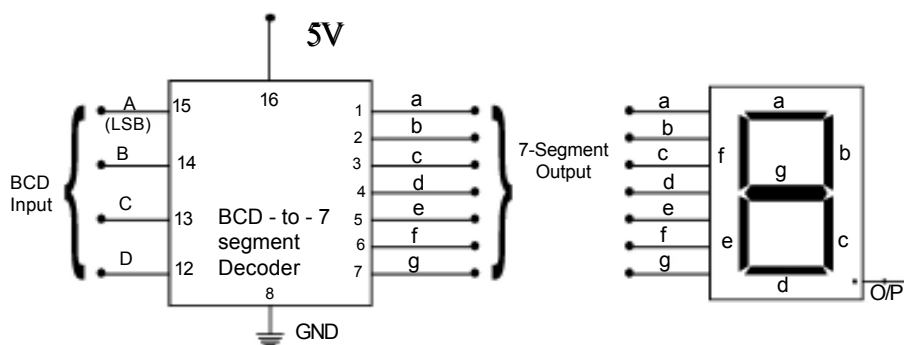


Fig. 7(b) Decimal - BCD - Encoder (Decimals - Digits)

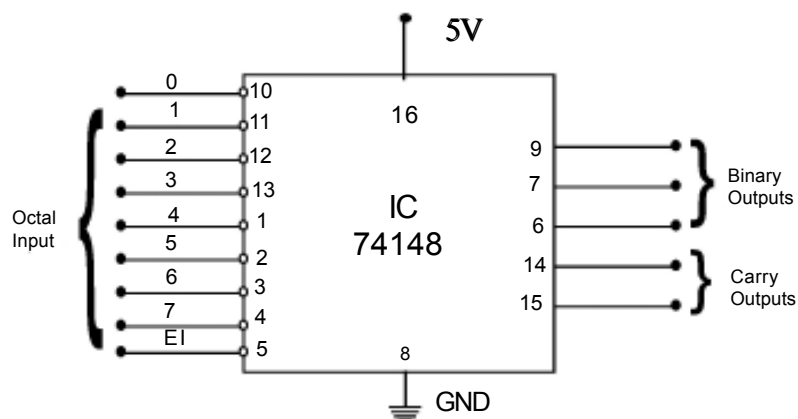


Fig. 7 (c) Octal - BCD - Encoder(Eight digits - Digits)

1. There are four inputs A,B, C, D and a to g seven outputs.
2. a to g outputs are connected to 7 segment LED.
3. 7 segment LED anodes are considered same cathodes.

Result

Thus the functions of the Encoder and Decoder using IC were understood.

EXPERIMENT NO - 8

CONNECT AND MEASURE THE VOLTAGES OF VARIOUS STAGES IN AM RADIO RECEIVER

Aim

To construct an A.M radio receiver and measure the voltages at various stages.

Components required

S.No	Name of Component/Apparatus	Quantity
1.	AM radio receiver	1
2.	6V DC power supply	1
3.	AVO meter or multimeter	1

Procedure

- 1) Connections are given as per the block diagram.
- 2) A power supply (6V DC) is given to the radio receiver.
- 3) Using multimeter (or) AVO meter. Measure the potentials of transistor at various stages as follows
 - a) Converter stage
 - b) IF amplifier stage
 - c) Audio amplifier and
 - d) Audio output stage

Tabulation

S.No	Name of the Transistor	Section	Voltage(in v)		
			B	E	C
1.	BF 194 B	Convertor	0.5	0	5.8
2.	BF 195 C	IF Amplifier	0.8	0	5.7
3.	BF 195 D	IF Amplifier	0.8	0	5.8
4.	BC 548 B	Audio Amplifier	0.5	0	5.5
5.	BELL 188 I	Audio output	3.8	6	3
6.	BELL 188 II	Audio output	1.2	3	0

Result

Thus, the voltages at various stages in a A.M radio receiver is checked for its normal operation.

EXPERIMENT NO -9

ASSEMBLE A F.M RADIO RECEIVER AND DETERMINE ITS POTENTIAL AT VARIOUS STAGES

Aim

To study the functional block diagram of F.M radio receiver and measure its potential at various stages.

Components required

S.No	Name of Components/Apparatus	Quantity
1.	FM radio receiver	1
2.	6V DC power supply	1
3.	AVO meter or multimeter	1

Procedure

1. Connections are given as per the block diagram.
2. 6v DC power Supply is given to FM receiver.
3. Multimeter (or) AVO meter is used to measure the potential of transistor at various stages as follows
 1. Converter stage
 2. IF amplifier stage
 3. Audio amplifier and
 4. Audio output stage

S.no	Stages	Voltage	
1.	CAX1619 IC I/P Voltage	6Vdc	
2.	Audio amplifier and O/P IC TBA810	Pin no	Voltage (in v)
		1	+ 6 VDC
		2	0
		3	0
		4	+ 5.9
		5	+ 1
		6	+ 1.2
		7	+ 3.8
		8	0
		9	0
		10	0
		11	0
		12	+ 3.2

Result

Thus the potentials at various stages of an F.M. Radio receiver is measured and verified with the table for its normal operation.

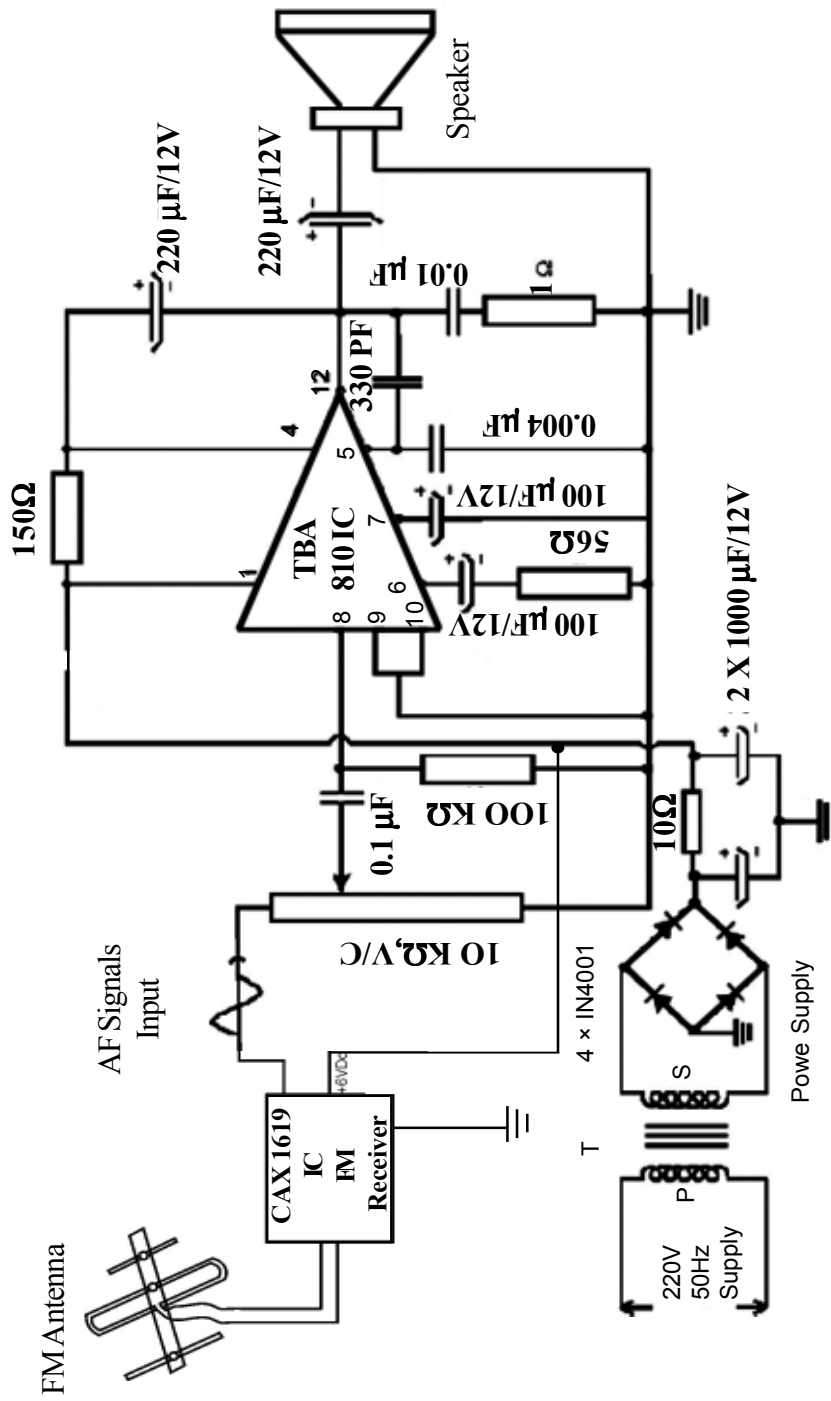


FIG. 9 : FM RADIO RECEIVER

EXPERIMENT NO - 10

TROUBLE SHOOTING AND RECTIFICATION OF THE FAULT IN A AM RECEIVER

Aim

To identify and rectify the faults in a AM receiver.

Components Required

S.No	Name of Components/Apparatus	Quantity
1.	AM receiver under fault condition	1
2.	Multi meter	1
3.	RF/AF Singal Generator	1

Fault Detection

Generally two types of faults are occurred in radio receiver. They are

1. Live fault
2. Dead fault

First we have to find that, which type of fault is present in the receiver.

1. Live fault

Switch on the receiver, and tune the receiver to a particular channel programme. The fault when there is no programme and on hearing only distortion sound is live fault.

Type of Live faults

1. Low volume, 2. Hum sound or noisy sound, 3. Motor boating sound,
4. Whistling sound , 5. Intermittent fault

2. Dead fault

On switching the power supply of receiver ,if there is no sound in the speaker of radio receiver;the fault is known as dead fault.

Procedure

1. When there is no sound in the speaker, while switching on the power supply,the fault is confirmed as dead fault.
2. Set the input voltage as 6v
3. And measure the voltage at audio amplifier and output of the receiver check for the correct refernce voltages.
4. Check the speaker, there is a open fault made at voice coil of the speaker, it is conformed.
5. So, faulty speaker is removed,and new speaker is connected by soldering process.
6. Now switch on the receiver, It is working correctly.

Result

Thus the fault of AM radio receiver is detected and approximately is rectified successfully.

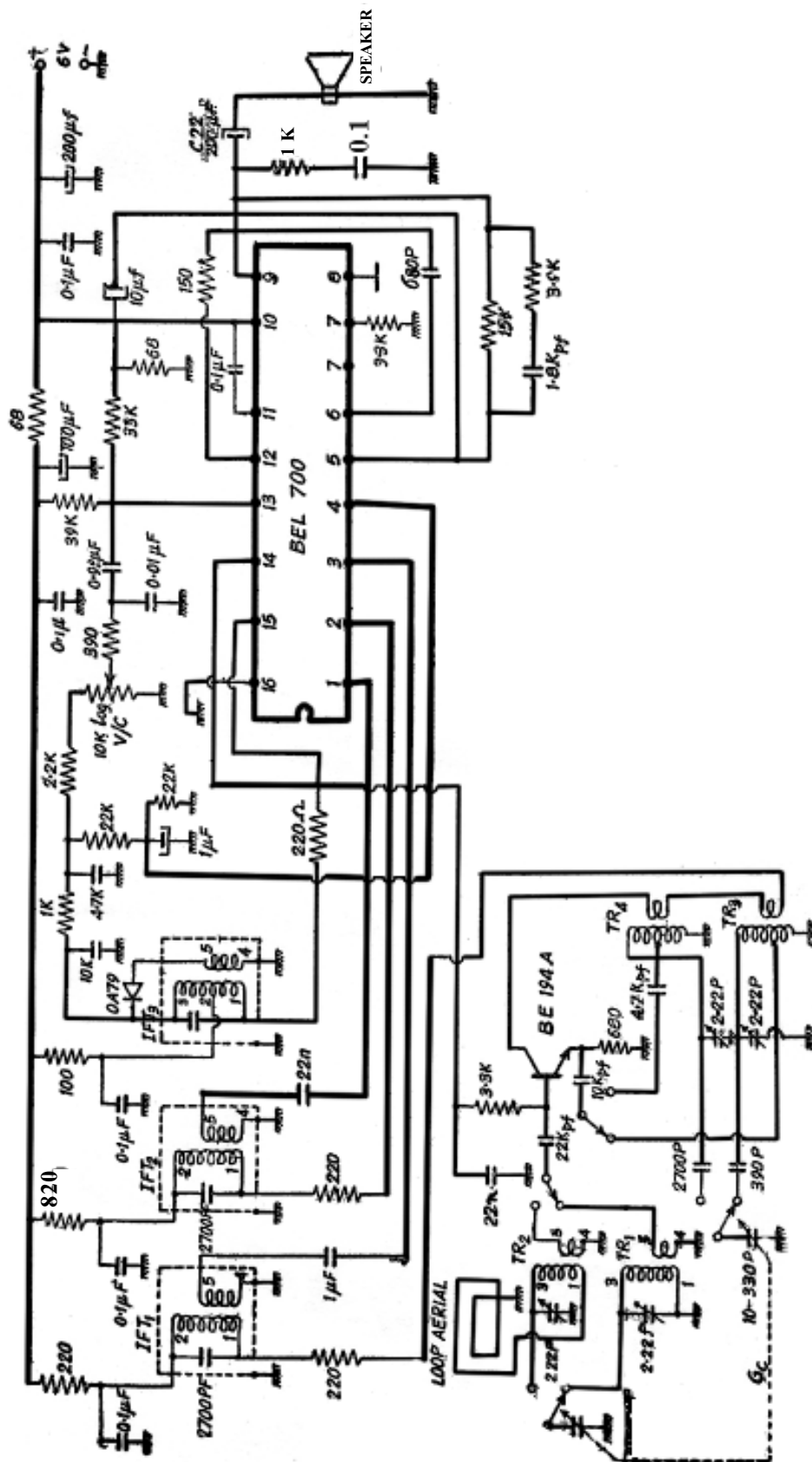


FIG. 10 : AM RADIO RECEIVER USING BEL 700IC

EXPERIMENT NO - 11

FIND THE FAULT IN FM RADIO RECEIVER AND REPAIR IT

Aim

To find the fault in FM radio receiver and rectify it.

Components Required

S.No	Name of Components/ Apparatus	Quantity
1.	Faulted FM radio receiver	1
2.	Multimeter	1
3.	RF/AF signal generator	1

To find the fault which occurred in Radio receiver

There are two type of fault in radio receiver.

1. Live fault
2. Dead fault

We have to find which one of the above fault occurred in radio receiver.

Live fault

We have to switch on the radio and to select a program channel. In this, there is only noisy sound in the speaker without any programme, this fault in radio receiver is called live fault.

Types of live fault in FM receiver

1. Low volume
2. Hum sound noisy sound
3. Intermittent fault
4. Whistling sound
5. Motor boating sound

Dead fault

If there is no sound when we switch on the radio receiver, then the fault is called dead fault.

Test

1. Switch on the radio receiver and select the programme, while hearing the programme, the volume is low from the speaker.
2. The volume is low, even we raise the volume control. So there is low volume fault.
3. Then measure the voltage of the power supply, but it is showing correct value.
4. Then measure the voltage in TBA810 IC while seeing the voltage is being low.
5. Then decided that the fault is in TBA810IC, so replace the IC with new one.
6. Then switch on the receiver, it functions normally.

Result

Thus the fault in the radio receiver is found out and it has been rectified successfully.

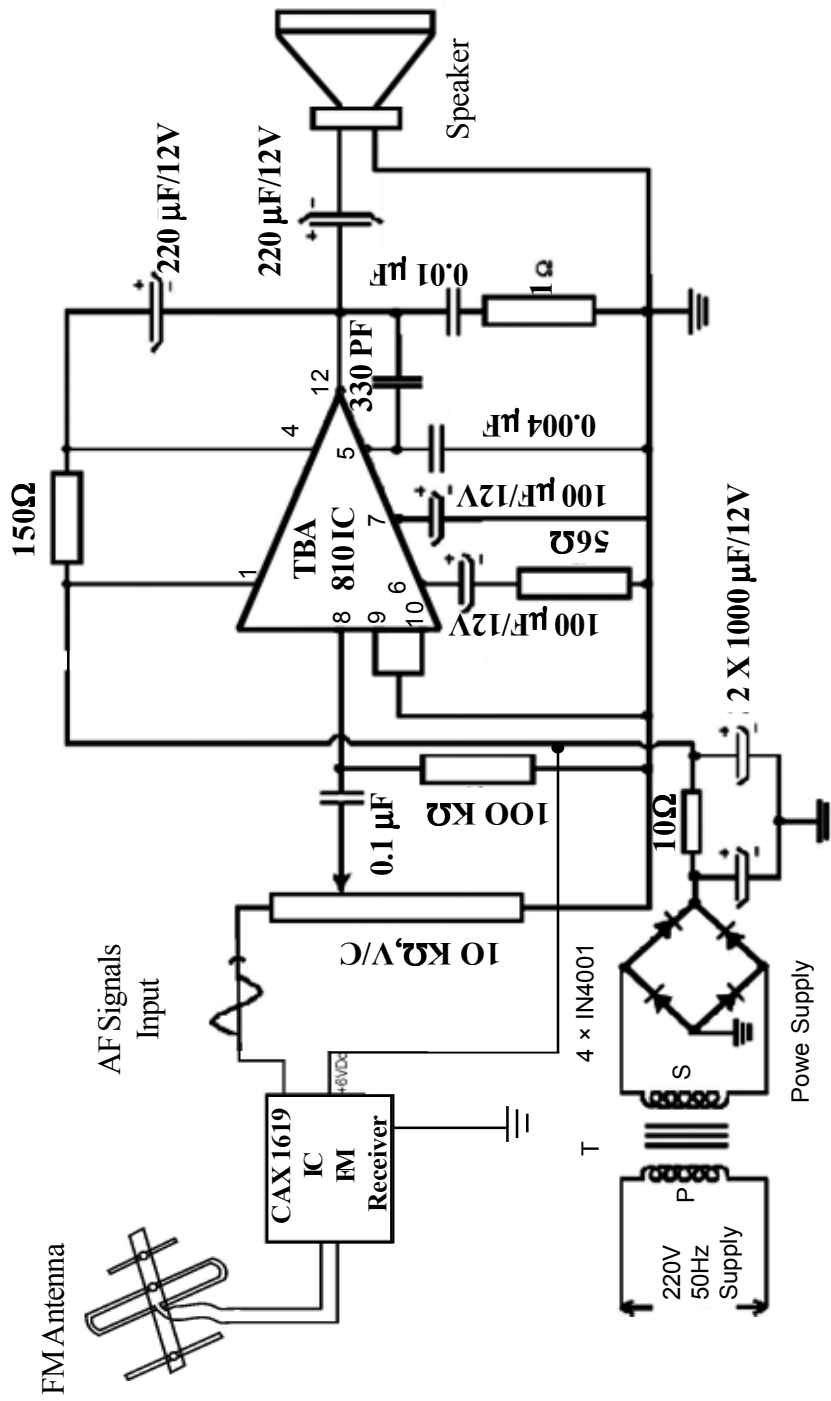


FIG. 11 : FM RADIO RECEIVER

EXPERIMENT NO - 12

CONSTRUCTION OF FM RADIO USING CAX 1619 AND TBA 810 IC AND OPERATE IT

Aim

To construct the circuit of FM radio receiver using CAX 1619 and TBA 810 IC and operate it.

Components Required

S.No	Name of Components/Apparatus	Quantity
1.	FM circuit board CAX-1619 IC	1
2.	Audio circuit board TBA 810 IC	1
3.	FM Antenna	1
4.	Speaker 8W/5W	1
5.	6V DC power supply	1
6.	Multi meter	1

Experiment

1. Connect all the electronic components by using soldering Iron, as per the circuit diagram.
2. FM Antenna is connected with corresponding to CAX 1619 IC.
3. IN CAX 1619 circuit board, upper end of the volume control is connected to output and Hot end is connected to input of TBA 810 IC.
4. Earth end of volume control is connected to ground.
5. Speaker is connected to the audio circuit boards and connected it to the power supply.
6. Switch on the power supply, and adjust the gang condenser, select FM station programme.

Result

Thus the FM radio receiver has been checked and operated successfully.

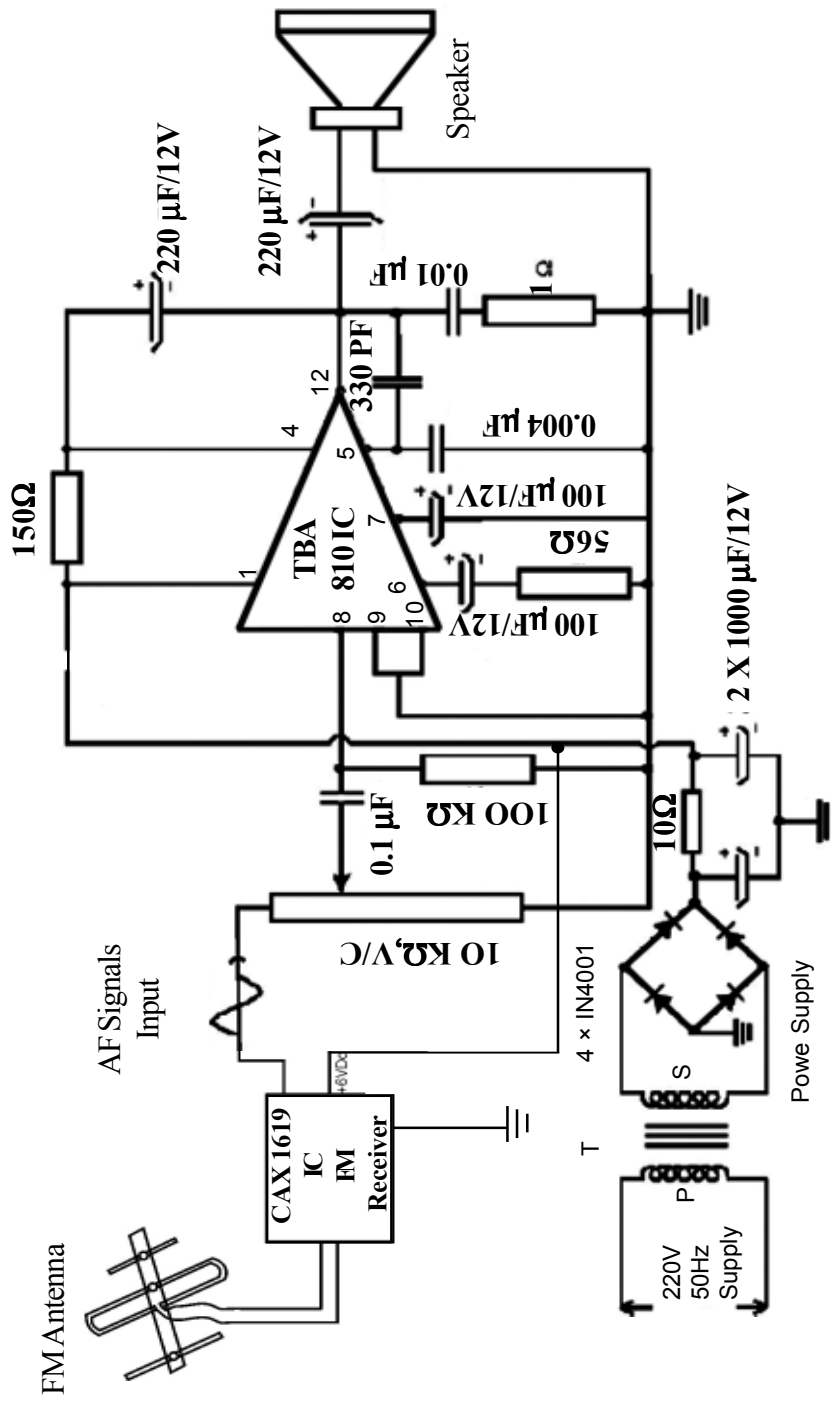


FIG. 12 : FM RADIO RECEIVER USING CAX 1619 IC & TBA 810 IC

EXPERIMENT NO - 13

RECTIFY THE WEAK SOUND (LOW VOLUME) IN AM RADIO RECEIVER.

Aim

To find the fault occurred (low sound) in a AM radio receiver and rectify.

Components Required

S.No	Name of Component/Apparatus	Quantity
1.	AM radio receiver under fault condition	1
2.	AVO meter or Multimeter	1
3.	RF / AF signal generator	1

Procedure

1. Switch ON the receiver.
2. There is low volume in the speaker.
3. Even on raising the position of the volume control knob, the volume will not increase.
4. So it is confirmed, that the fault is low volume which is the live fault.

Possible Stages

1. Power supply.
2. Audio amplifier and output.
3. IF amplifier and detector.

Testing

1. To measure the voltage of the power supply.
2. The voltage is below 6V DC. So disconnect the power supply separately and then measure the voltage again. Now it shows the correct voltage.
3. It is confirmed that the fault is occurred in audio amplifier and output stage.
4. To check the coupling condenser, it is in leakage condition. So disconnect the condenser and connect a new one with same value.
5. Now check the radio receiver, it will function with the high volume.

Result

Thus the fault is rectified and bringing to the normal operation of the receiver successfully.

EXPERIMENT NO - 14

IDENTIFY THE FAULT OCCURED IN AM RADIO RECEIVER (50 Hz HUM SOUND) AND RECTIFIED IT

Aim

To identify and repair the fault (50 Hz Hum sound) occurred in AM radio receiver.

Components Required

S.No	Name of Component / Apparatus	Quantity
1.	AM radio receiver	1
2.	AVO or Multi meter	1

Test the receiver

1. Switch on the receiver.
2. Hear the programmes with 50 Hz hum sound.
3. So conform the fault must be 50 Hz hum sound.

Stages where the fault occur

1. Power supply
2. Audio amplifier and output
3. IF Amplifier

Test

1. Switch ON the receiver and hearing the hum sound.
2. First testing the power supply part, the transformer gets heated.
3. Then switch OFF the receiver and test the Transformer.
4. On seeing the core of the transformer coiled loosely.
5. Decided the fault is present in the transformer.
6. Then changed the new transformer instead of faulted one.
7. Then switch ON the receiver and hear the programme without hum sound.

Result

Thus identify the fault (50 Hz Hum sound) occurred in AM radio receiver and rectified successfully.

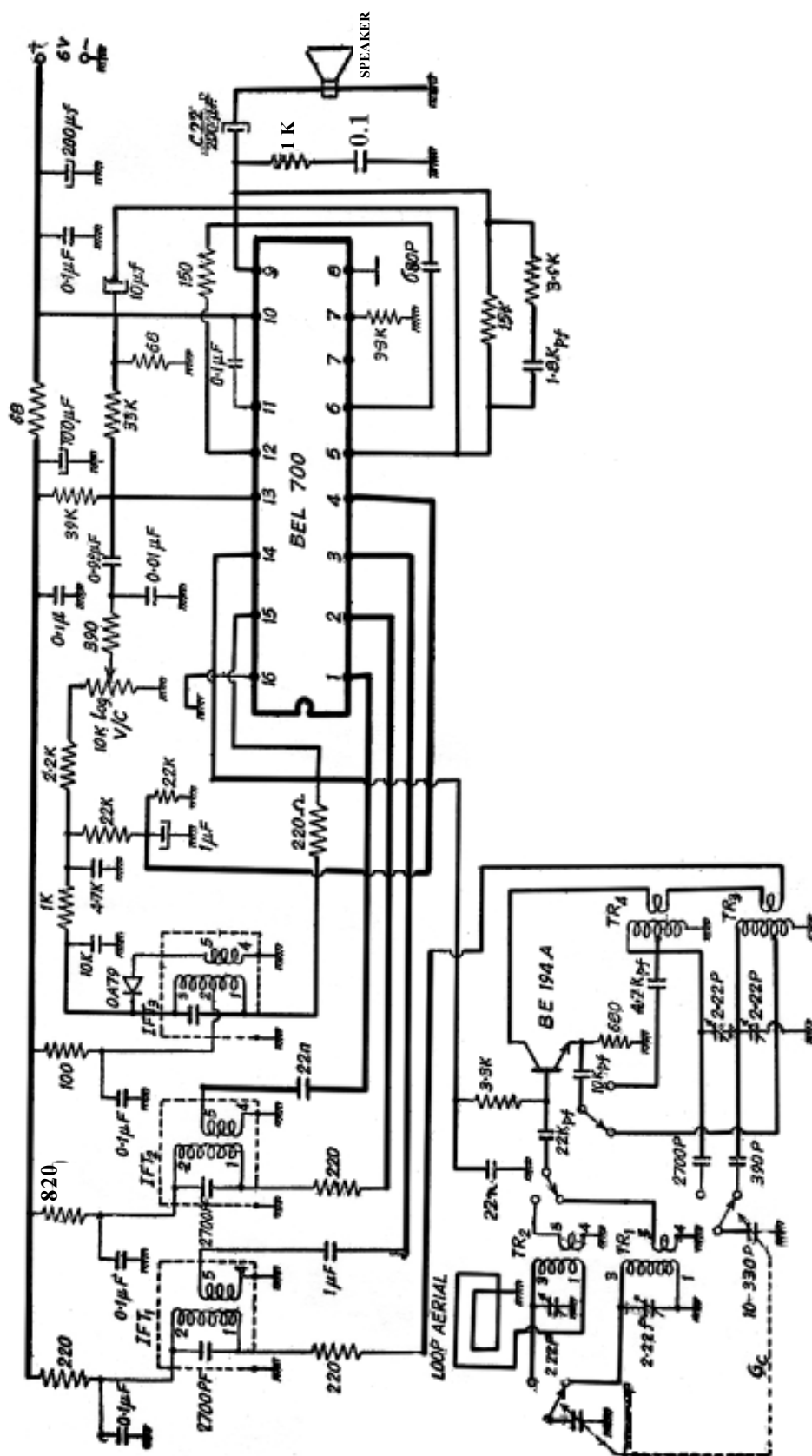


FIG. 14: AM RADIO RECEIVER USING BEL 700IC

EXPERIMENT NO - 15

RECTIFY THE FAULT IN FM RECEIVER - NOISY RECEPTION

Aim

To find the fault occur in a FM radio receiver (Noisy reception).

Components Required

S.No	Name of Component / Apparatus	Quantity
1.	FM receiver under fault condition	1
2.	AVO meter or Multi meter	1

Procedure

1. First switch ON the receiver, hearing the programme with noisy sound.
2. So it is conform, the fault is noisy reception.

Fault occur in possible stages

1. Antenna and Tunner stage
2. Oscillator
3. Detector and filter
4. Audio Amplifier and output.

Testing

1. When switch ON the receiver, there a noisy reception is heard.
2. While tuning the gang capacitors the noisy reception did not change.
3. Even aligning the trimmers the noise is not decrease.
4. Now adjust the core of oscillator coils, the noise is decrease. Then sealed the oscillator coils with wax.

Result

Thus the fault of noisy reception in a FM radio receiver is rectified.

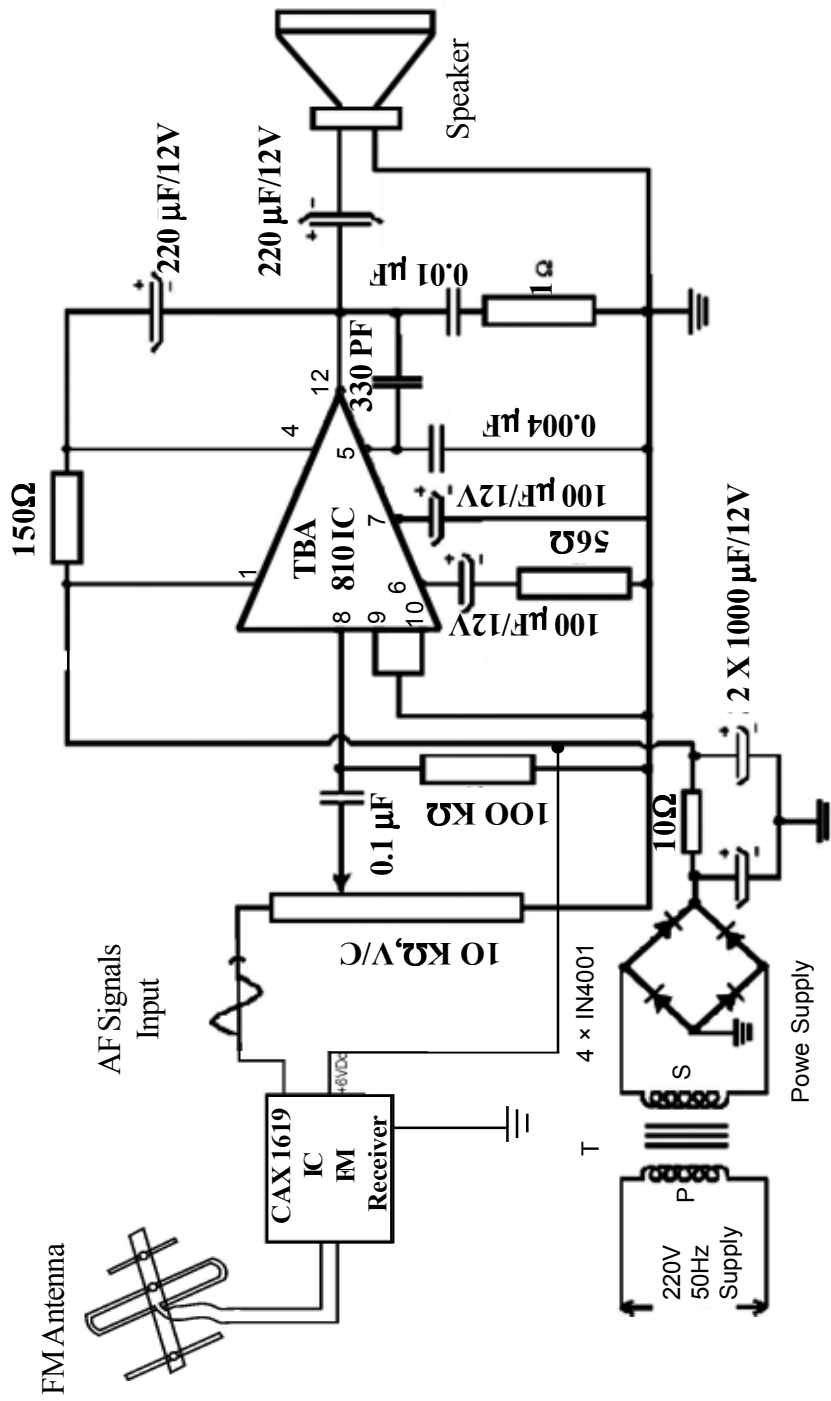


FIG. 15. FM RADIO RECEIVER USING CAX1619, TBA 810 IC

PRACTICAL - II

EXPERIMENT NO - 1

STUDY OF PATTERN GENERATOR AND FUNCTION GENERATOR (WITH COUNTS)

Aim

To study the basic working of pattern generator and function generator (with counts).

Components Required

S.No.	Name of Components / Apparatus	Quantity
1.	Pattern generator	1
2.	Function generator	1

Pattern Generator

It is an electronic equipment used for tuning and aligning the Television receivers. So it produce various kinds of bars, lines and sounds.

Procedure of using a Pattern generator front Panel Controls

1. Using co-axial cables connect R.F out and television receiver. Then adjust the R.F attenuator simultaneously.

2. Horizontal Bar Pattern

Using this control, we can adjust the vertical size, linearity of the picture.

3. Vertical Bar Pattern

Using this control, we can adjust horizontal, size, linearity of the picture.

4. Cross Hatch Pattern

Using this control, we can adjust the align, the horizontal and vertical stages. Also we can adjust focusing.

5. Dot Pattern

In colour television we can do convergence using this control.

6. Pure white Pattern

Using this control, we can adjust the black level and white level in colour television.

7. We can align or sync the sound section also.

Application of Pattern Generator

1. Vertical and horizontal linearity and height of the picture can be adjusted.
2. Aspect ratio, Pincushion adjustment and centering of the picture can be done, using pattern generator.
3. Contrast, brightness, and focusing can also be adjust correctly.

PATTERN GENERATOR

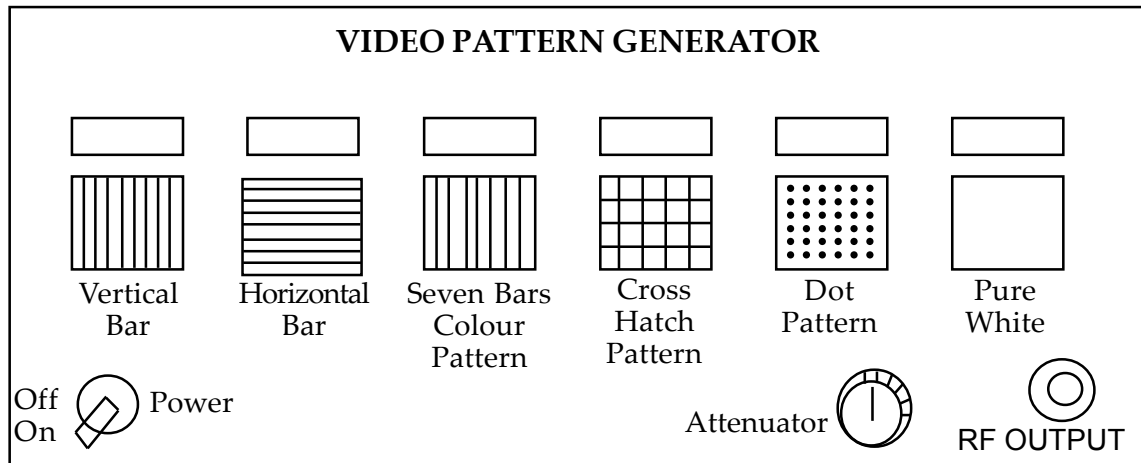


Fig.1 (a) Front view of Pattern Generator

4. R.F. stage and I.F stage in sound section can be aligned using this generator.
5. In colour TV, Tuning the colour perfectly, convergence and purity can be done using this generator.
6. When there is no programme, we can service the TV receiver using pattern generator.

Function Generator

The function generator is an instrument which generates different type of the wave forms which are sine, square and triangular.



Fig. 1 (b) FUNCTION GENERATOR

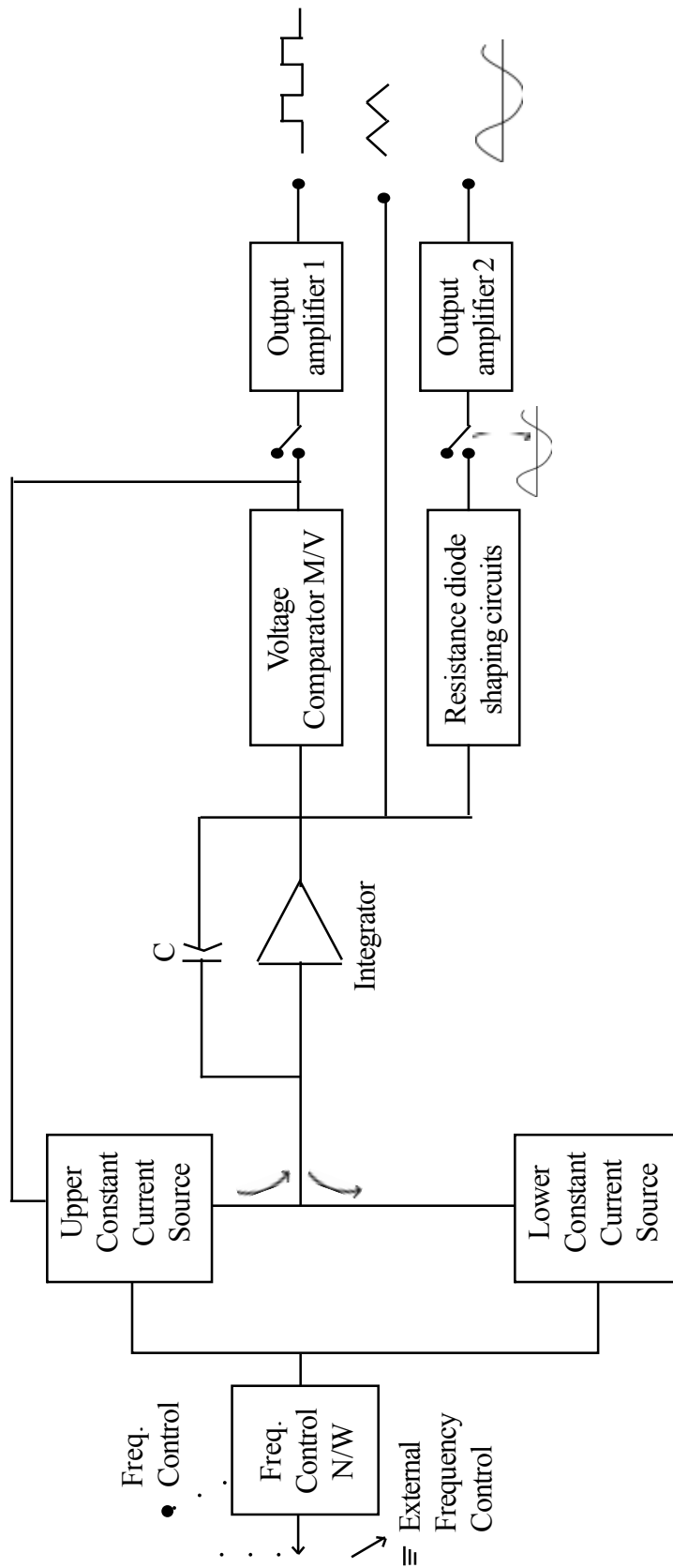


Fig. 1 (c) : BLOCK DIAGRAM OF FUNCTION GENERATOR

Front panel controls and its operation

1. The frequency control is used to regulate two current sources namely,
 1. Upper current source
 2. Lower current source
2. The upper current source supplies current to an Integrator. The output voltage of integrator then increases changing the linearity with time. If the current, changing the capacity increases or decreases the slope of the output voltage increases or decreases respectively.
3. The voltage comparator multivibrator circuits changes the state of the network. This change in state, the upper is removed and the lower is 'ON'. The voltage comparator multivibrator stage is changing the condition of the network by switching 'OFF' the lower current and switch 'ON' the upper current source.

4. Different types of waveforms

1. The output voltage of integrator has a triangular waveform which supplies by upper and lower current source.
2. To get square wave the output of the integrator is passed through comparator.
3. The sine wave is derived from triangular wave. The triangular wave is synchronized into sine wave using diode resistance network.

5. Amplifiers

The two output amplifiers provide two simultaneous individually selected outputs of any of the wave form functions.

6. Features of function generator

1. The frequency range is about 0.01 HZ to 100 KHZ.
2. It can provide various wave forms such as sine wave, saw tooth wave, triangular wave and square wave.
3. The accuracy is with in $\pm 1\%$ in low frequency range.

Result

Thus the various functions of pattern generator and function generator, were studied.

EXPERIMENT NO - 2

RECTIFICATION OF THE FAULT AND OPERATION OF A TV RECEIVER

Aim

To rectify the fault and operate the given TV Receiver (Dead Fault)

Components required

S.No.	Name of Component/Apparatus	Quantity
1.	TV Receiver	1
2.	Multimeter	1

Identify the Fault given on TV Receiver

1. Switch ON the TV Receiver
2. There is no picture, raster and sound effects in it.
3. So it confirms the receiver is under dead fault condition.
4. Switch OFF the TV Receiver immediately.

Test the stages of the TV Receiver (referring to block diagram fig. 2)

1. First switch ON the TV receiver and measure the AC input 220V/50HZ supply if it is Correct.
2. Check the ON-OFF switch if it is correct.
3. Then Check AC Fuse, Bridge rectifier diodes section, DC filter condenser and resistors related to power supply stage, If the voltage at the power supply is correct, proceed to next step.
4. Then measure voltage at horizontal output transistor if it is low switch OFF the receiver immediately and check the horizontal output transistor if it is correct go to next step.
5. To Confirm the LOT (Line Output Transformer) is under fault condition. Remove the Fault LOT and Solder New one.
6. Then Switch ON the TV receiver, TV operates as dead fault is rectified.

Result

Thus the dead fault was rectified in a TV and normal operation was ensured.

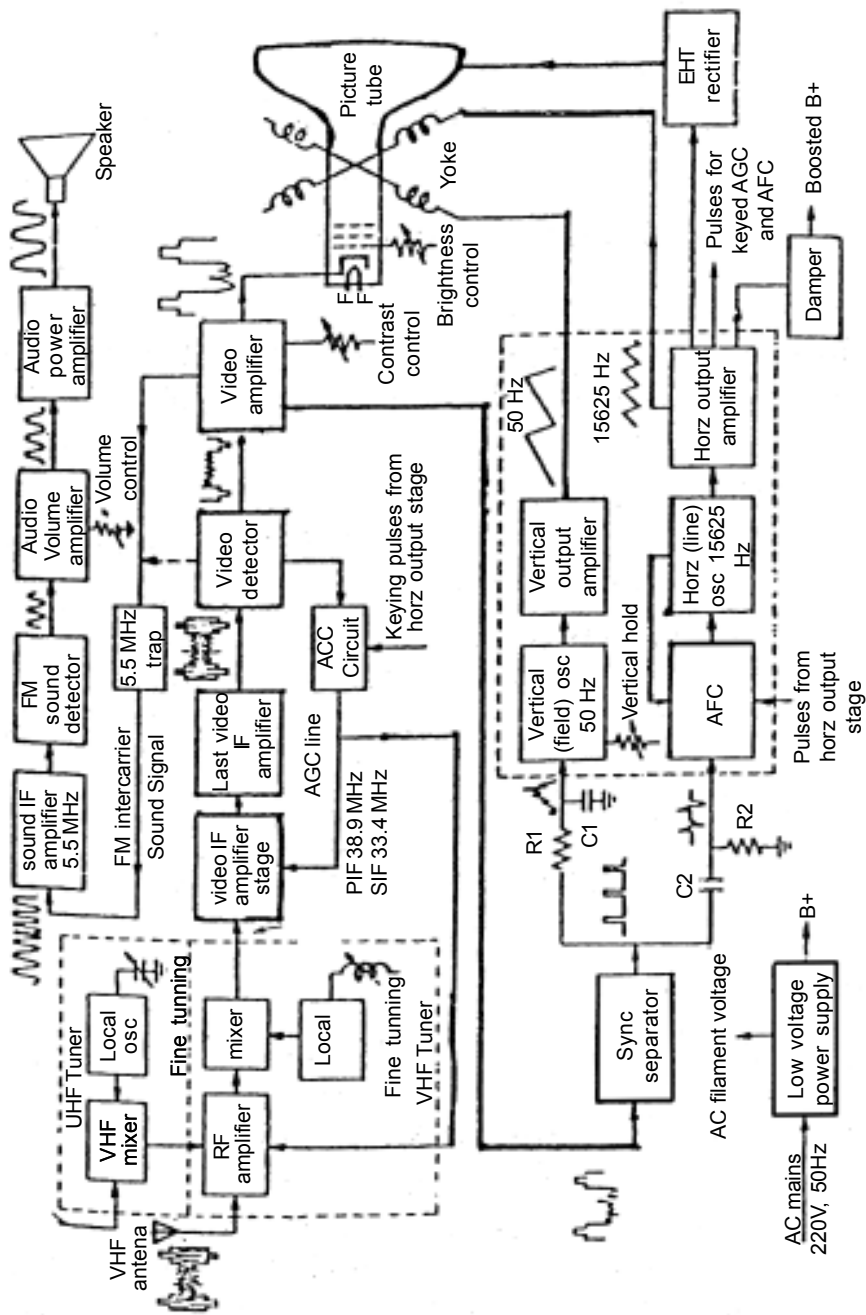


Fig.2. BLOCK DIAGRAM OF TELEVISION RECEIVER

EXPERIMENT NO - 3

RECTIFICATION OF SNOW PICTURE FAULT AND OPERATION OF A TV RECEIVER

Aim

To rectify the fault of snow picture and operate the given TV Receiver

Components Required

S.No.	Name of the Component/ Apparatus	Quantity
1.	TV Receiver	1
2.	Multimeter	1

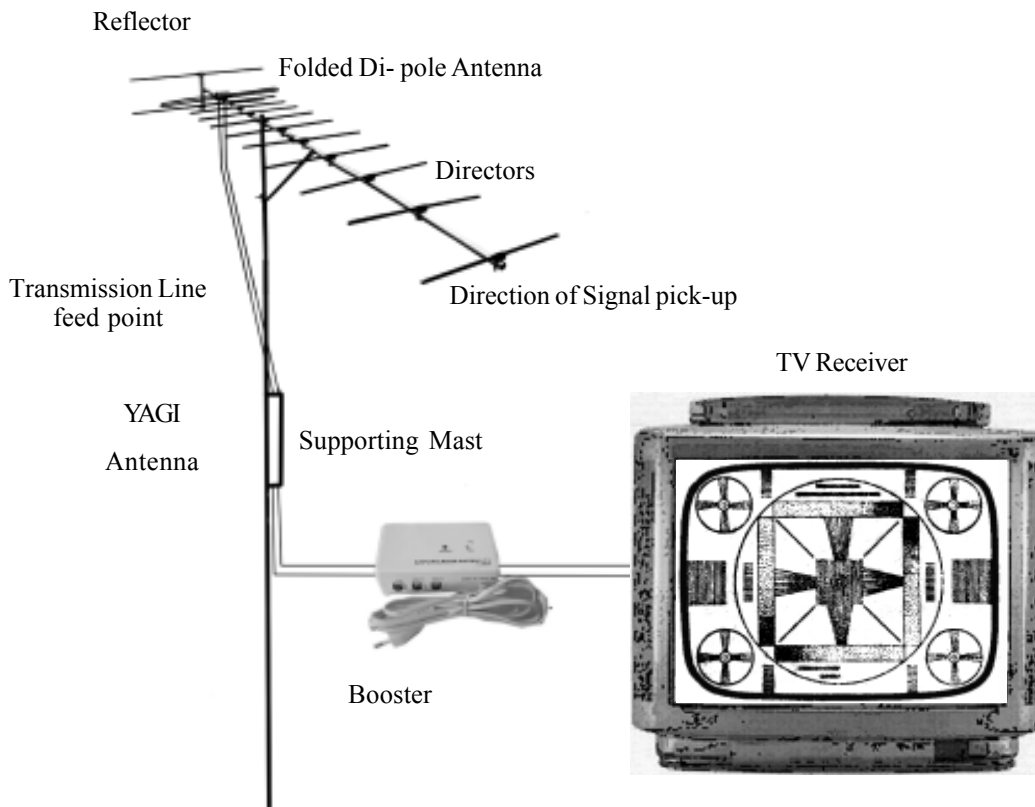


Fig.3 : TV Screen show the snow picture

Identification of the Fault in given TV Receiver

1. Switch 'ON' the TV receiver.
2. If, the picture on the screen is with Snow and noisy Sound, go to the next step.
3. It confirms the receiver has Snow picture fault.

Test the stages of the TV Receiver

1. First switch ON the TV receiver. The Picture on the screen is Snowy one.
2. First check the TV antenna and its related parts, whether it is in correct direction.

3. Then, check the feeder wire and booster for their functionalities.
4. Check the input and output pins of the TV receiver, for their correctness.
5. Check the tuner connection and measure the voltage at B+, AGC (Automatic Gain Control)
6. If the tuner is under fault, remove the tuner and solder a new one.
7. Then Switch ON the TV Receiver The Picture on the Screen is in good Condition with Normal Sound.

Result

Thus rectification of the given Snow picture fault in the receiver was done and normal operation was ensured.

EXPERIMENT NO - 4

RECTIFICATION OF NO COLOUR FAULT AND OPERATION OF A TV RECEIVER

Aim

To rectify the no colour fault and operate the given colour TV Receiver.

Components Required

S.No.	Name of Component/Apparatus	Quantity
1.	Colour TV Receiver	1
2.	Multimeter	1

Identification of the Fault given in a TV Receiver

1. Switch ON the TV receiver.
2. The picture on the screen with no colour.
3. Adjust the colour Control. There is No Colour picture on the screen.
4. Switch OFF the TV Receiver immediately and confirm No Colour Picture fault on the Receiver, with colour control adjustment.

Test the stages of the TV receiver (Referring to the figure 4)

1. Switch ON the TV receiver
2. There is no colour on the picture
3. First check the antenna and its parts
4. Check the RF socket and related parts
5. Check the fine tuning control in the tuner
6. Check the chromo band pass amplifier
7. Check the working condition of colour killer circuit

Result

Thus the 'no colour' fault in a Colour TV Receiver was rectified bringing it to the normal operation.

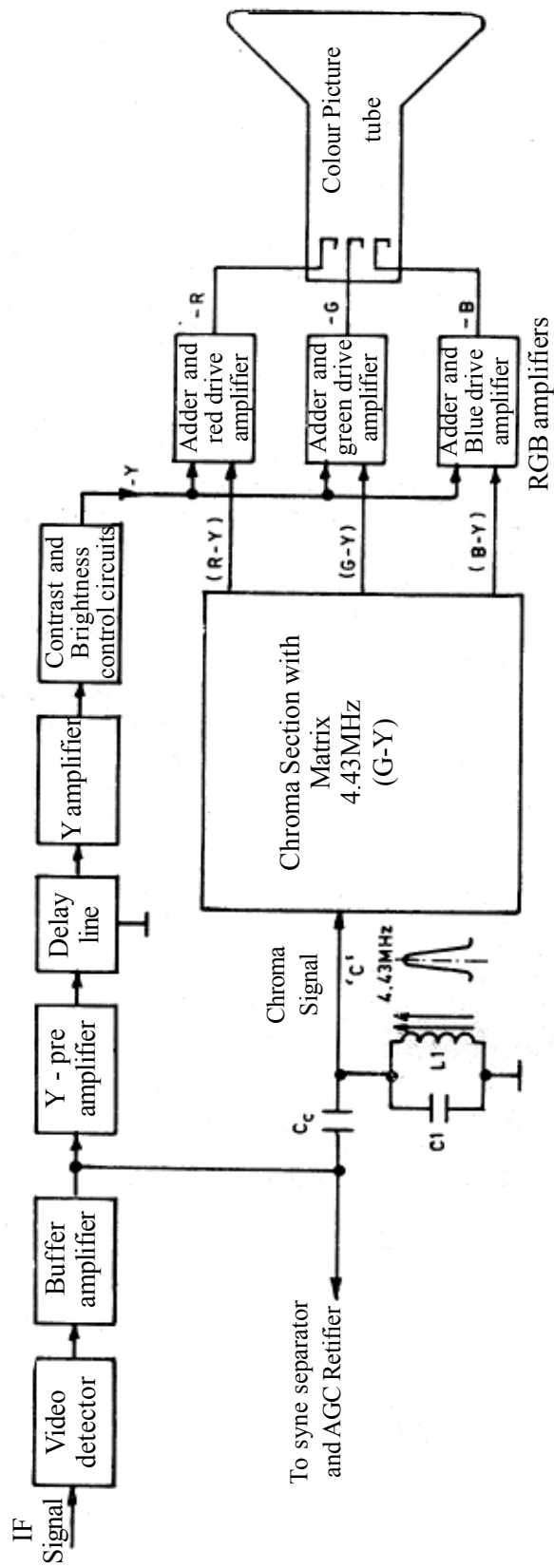


Fig.4 : BLOCK DIAGRAM OF COLOUR PICTURE STAGE

EXPERIMENT NO - 5

RECTIFICATION OF THE RED RETRACE LINE FAULT AND OPERATION OF A COLOUR TV RECEIVER

Aim

To rectify the Red Retrace line fault and operate the colour TV Receiver.

Components Required

S.No.	Name of Component/ Apparatus	Quantity
1.	Colour TV Receiver	1
2.	Multimeter	1

Identification of the fault in given TV receiver

1. Switch ON the TV receiver.
2. There is no picture on the screen but red retrace lines appear on the screen.
3. Switch OFF the receiver immediately and confirm red retrace lines fault on the receiver.

Test the stages of the TV Receiver (Referring to figure 5)

1. Switch ON the TV receiver.
2. Only red retrace lines appear on the Screen.
3. Measure the voltage at the red cathode if the voltage is low.
4. Check the components related to red cathode.
5. Check the IC and transistors related to red cathode.
6. Check the picture tube base.
7. If the base of the picture tube is fault, remove and solder the new one.

Result

Thus the fault in a colour TV receiver was rectified (Red Retrace Lines) and bringing it to the normal operation.

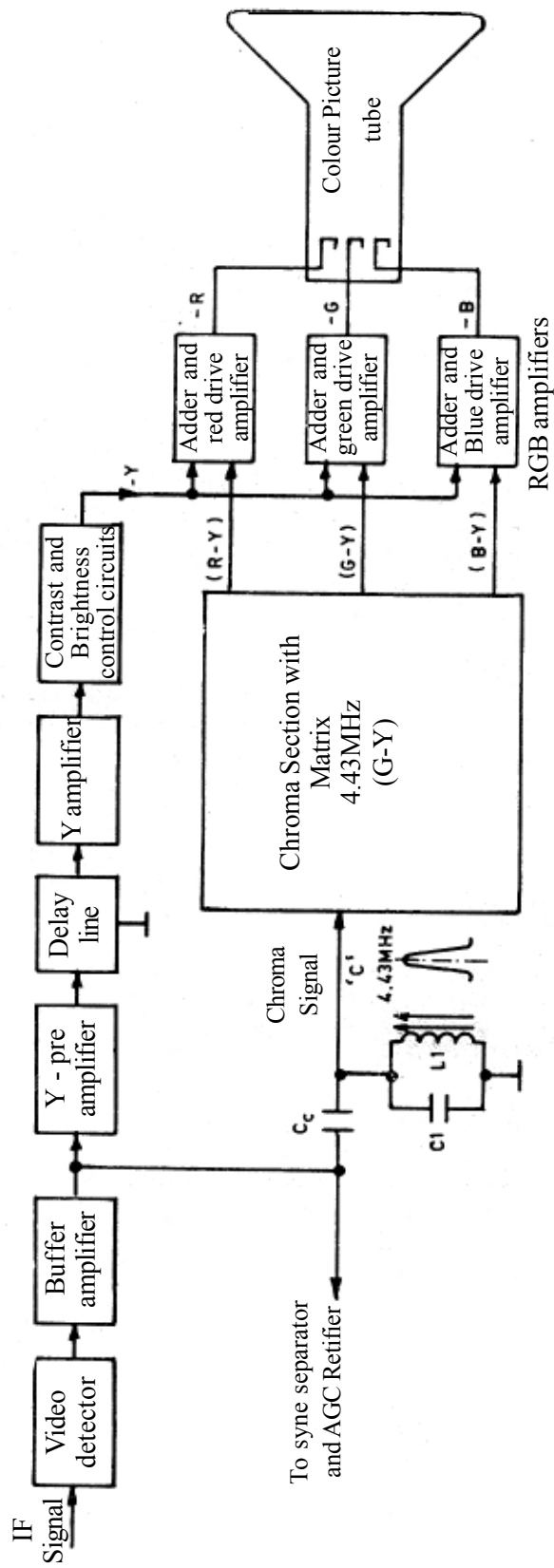


Fig.5: BLOCK DIAGRAM OF COLOUR PICTURE STAGE

EXPERIMENT NO - 6

RECTIFICATION OF THE GREEN RETRACE LINES FAULT AND OPERATION OF A COLOUR TV RECEIVER

Aim

To rectify the Green Retrace lines fault and operate the Colour TV receiver.

Components Required

S.No.	Name of Component/Apparatus	Quantity
1.	Colour TV Receiver	1
2.	Multimeter	1

Identification of the fault in given TV receiver

1. Switch ON the TV receiver.
2. There is no picture only green retrace lines on the screen.
3. Switch OFF the receiver immediately and confirm green retrace lines fault in the given Receiver.

Test the stages of the TV receiver (Referring to the figure 6)

1. Switch 'ON' the TV receiver
2. Only green retrace lines on the Screen.
3. Measure the voltage at the green cathode if it is correct.
4. Check the components related to green cathode.
5. Check the IC and transistors, related to green cathode
6. Check the picture tube base.
7. If the base of the picture tube is fault, remove and solder the new one.

Result

Thus the fault in a colour TV receiver was rectified (Green Retrace Lines) and bringing it to the normal operation.

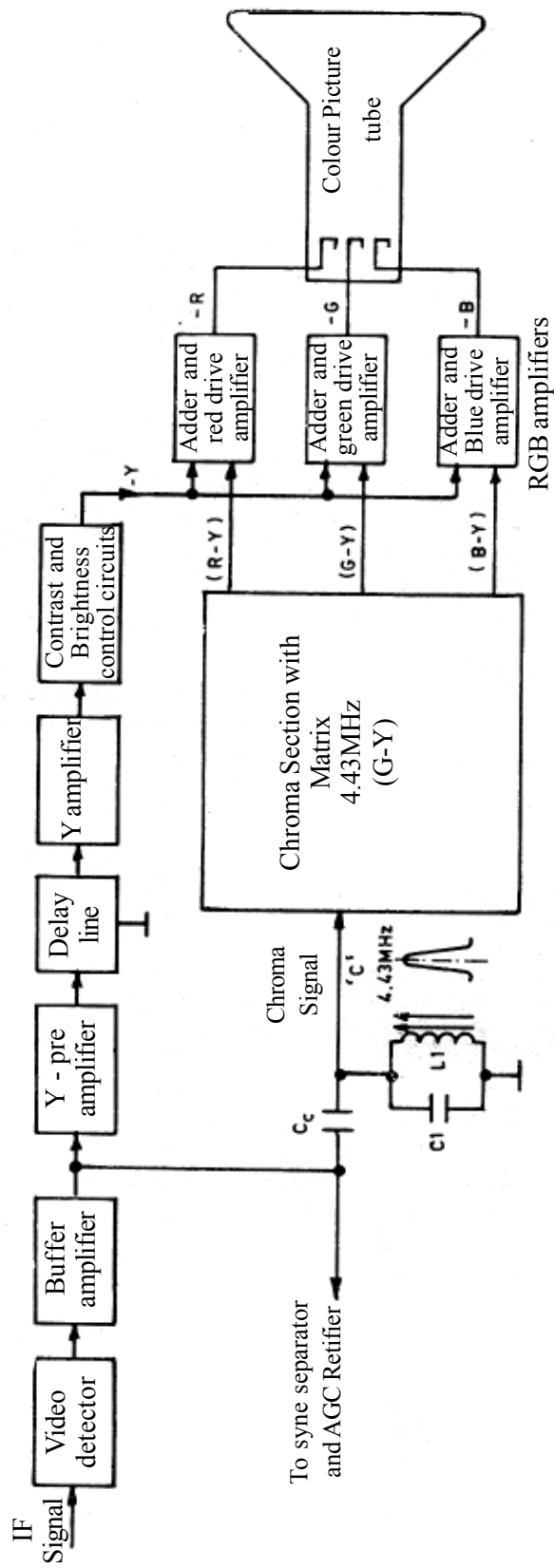


Fig. 6 : BLOCK DIAGRAM OF COLOUR PICTURE STAGE

EXPERIMENT NO - 7

RECTIFICATION OF BLUE RETRACE LINES FAULT AND OPERATION OF A COLOUR TV RECEIVER

Aim

To rectify the blue retrace lines fault and operate the Colour TV receiver.

Components Required

S.No.	Name of Component/Apparatus	Quantity
1.	Colour TV Receiver	1
2.	Multimeter	1

Identification of the Fault in a given TV receiver

1. Switch ON the TV receiver.
2. There is no picture only blue retrace lines on the screen.
3. Switch OFF the receiver immediately and confirm blue retrace lines fault given TV receiver.

Test the stages of the TV Receiver (Referring to the figure 7)

1. Switch 'ON' the TV receiver
2. Only blue retrace lines on the screen.
3. Measure the voltage at the blue cathode if it is low
4. Check the components related to blue cathode.
5. Check the IC and Transistors, related to blue cathode
6. Check the picture tube base.
7. If the picture tube base is fault remove and solder the new one.

Result

Thus the fault in a colour TV receiver (Blue retrace lines) and bringing it to the normal operation.

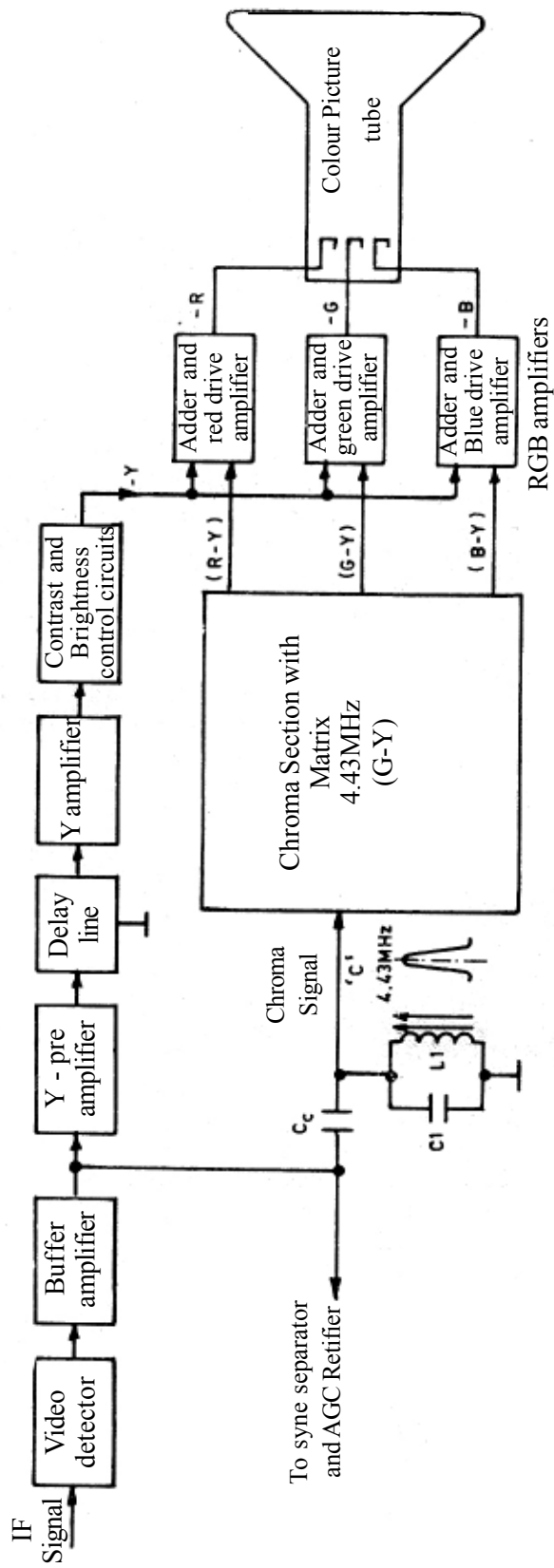


Fig. 7 : BLOCK DIAGRAM OF COLOUR PICTURE STAGE

EXPERIMENT NO - 8

RECTIFICATION OF THE HORIZONTAL LINE FAULT AND OPERATION OF A TV RECEIVER

Aim

To rectify the Horizontal line fault and operate the TV Receiver.

Components Required

S.No.	Name of Component/Apparatus	Quantity
1.	TV Receiver	1
2.	Multimeter	1

Identification of the fault in given TV receiver

1. Switch ON the TV receiver.
2. There is no picture but only horizontal line on the screen.
3. Switch OFF the receiver immediately and conform horizontal line fault on the TV receiver.

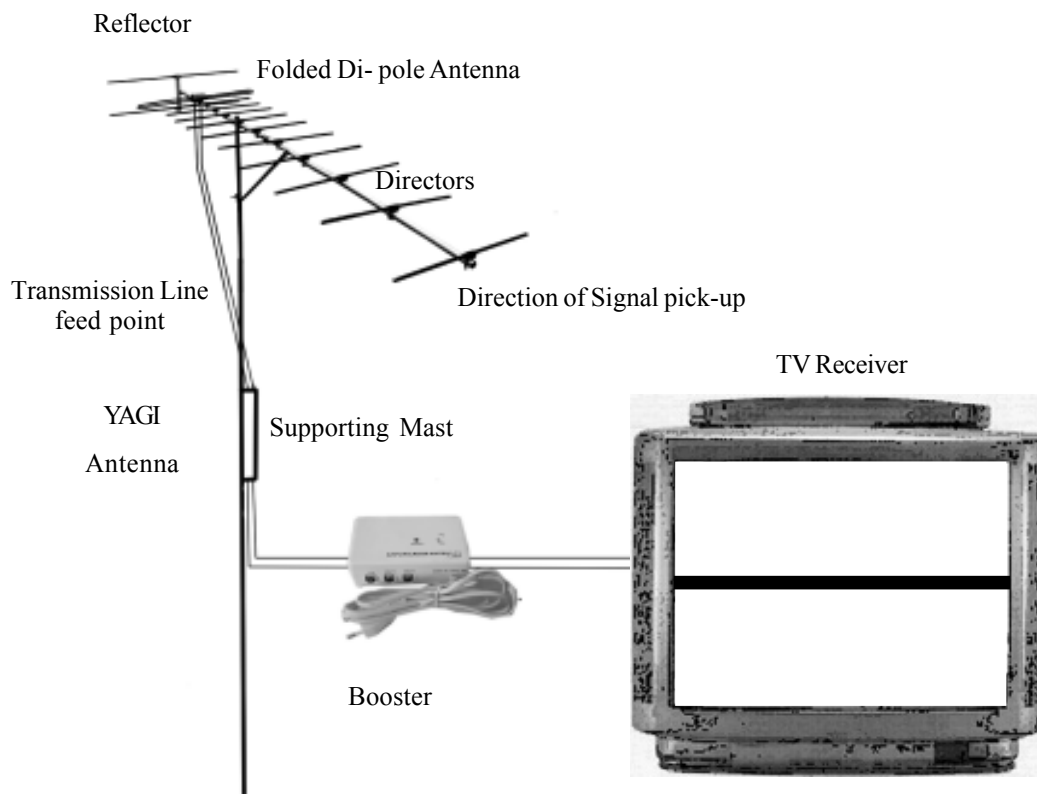


Fig.8 : TV Screen shows the horizontal line

Test the stages of the TV receiver

1. Switch ON the TV receiver

2. There is no picture only horizontal line on the screen.
3. Confirm the fault is in the vertical sweep section.
4. Touch the vertical preset with a screw driver the horizontal line on the screen to be oscillate or expand, confirm the fault is at vertical oscillator. Measure the voltage at vertical oscillator stage if it is correct.
6. Check the vertical output stage and check the connection at vertical deflection yoke coil then the check the condenser, if it is short or open, remove the condenser and solder new one.
7. Switch ON the TV receiver. The raster on the screen is normal.

Result

Thus the horizontal line fault in the TV receiver was rectified and bringing it to the normal operation.

EXPERIMENT NO - 9

RECTIFICATION OF A VERTICAL LINE FAULT AND OPERATION OF A TV RECEIVER

Aim

To rectify the vertical line fault and operate the given TV receiver.

Components required.

S.No.	Name of Component/Apparatus	Quantity
1.	TV Receiver	1
2.	Multimeter	1

Identification of the fault in a given TV receiver.

1. Switch ON the TV receiver.
2. There is no picture, only vertical lines are present on the screen.
3. Switch OFF the receiver immediately and confirm vertical line fault on the TV receiver.

Test the stages of the TV receiver

1. Confirm the fault is in the Vertical sweep section.
2. Check the connection of vertical deflection yoke coil if it is correct
3. Check the vertical deflection coil with multimeter if it is correct.
4. Check the vertical linearity coil. if it is correct. Check the condenser connected series to vertical deflection coil, If the condenser is under short or open remove it and solder with new one of same value.
8. Switch ON the TV receiver. The raster on the screen is normal.

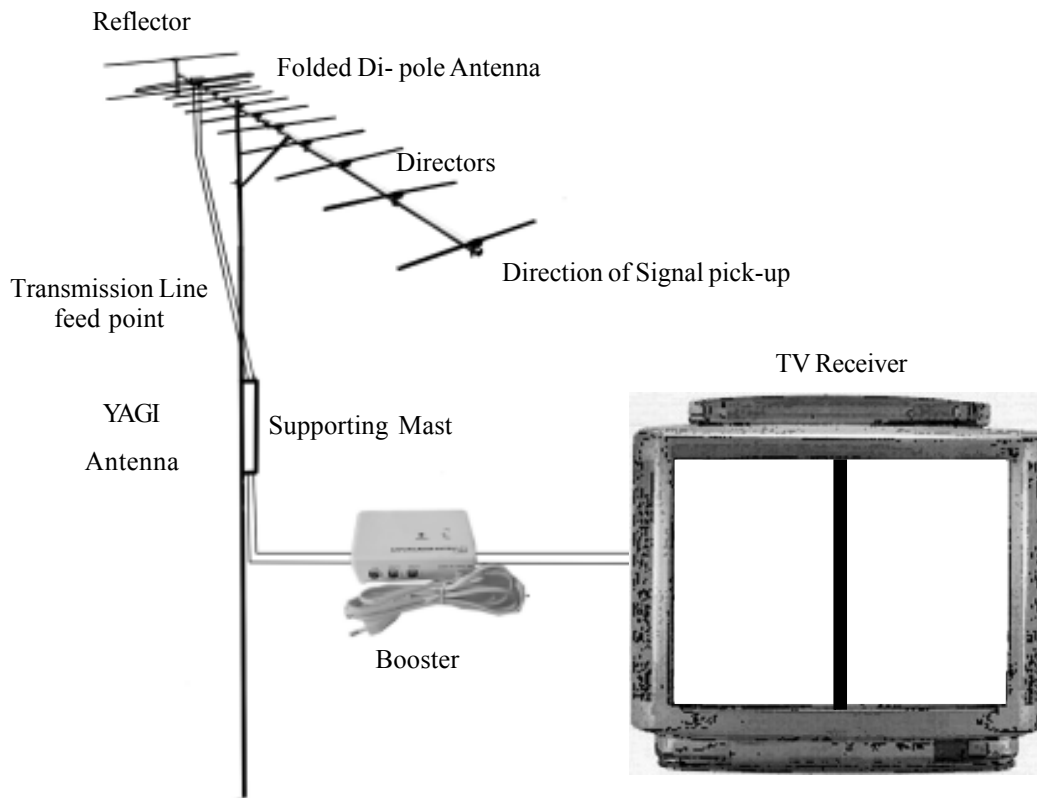


Fig.9 : TV Screen shows the vertical line

Result

Thus the vertical line fault in the given TV receiver was rectified and bringing it to the normal operation.

EXPERIMENT NO - 10

RECTIFICATION OF THE HEIGHT LESS PICTURE FAULT AND OPERATION OF A TV RECEIVER

Aim

To rectify the heightless picture fault and operate the TV Receiver.

Components Required

S.No.	Name of Component/Apparatus	Quantity
1.	TV Receiver	1
2.	Multimeter	1

Identification of the fault in the given TV receiver

1. Switch ON the TV receiver.
2. The picture shown in the screen is heightless.
3. Switch OFF the receiver immediately and conform the fault is in the vertical stage.

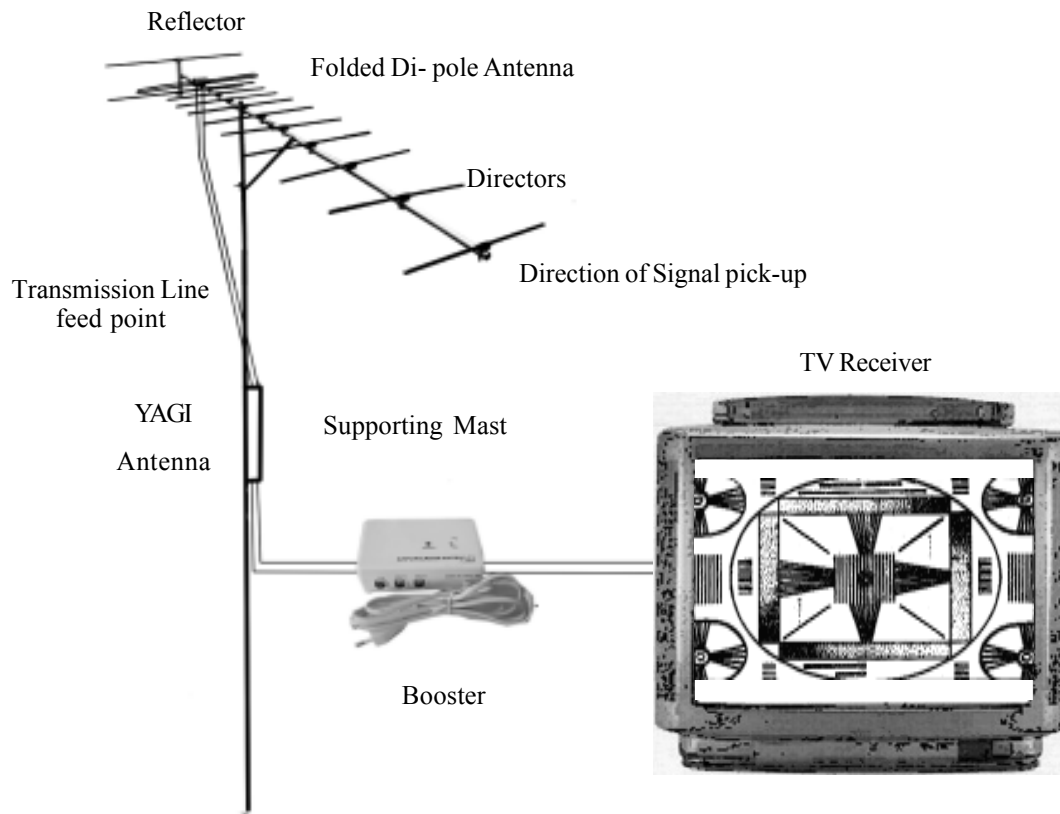


Fig.10 : TV Screen shows the heightless Picture

Test the stages of the TV receiver

1. Height less picture on the screen confirms the fault is in the vertical stage.
2. Measure the voltage at the Vertical stage. If it is correct,
3. Adjust the vertical height control preset if there is no change in the picture height,
4. Check the condenser connected series to vertical deflection yoke coil if it is correct
6. Check the transistors, condensers and resistor connected at vertical output stage if it is correct,
7. Measure the voltage at IC pins connected in the vertical output stage. If the voltage is low remove it and solder the new one.
8. Switch ON the TV receiver. The picture on the screen is in normal height.

Result

Thus the heightless picture fault in a TV receiver was rectified and bringing it to the normal operation.

EXPERIMENT NO - 11

RECTIFICATION OF THE NO SOUND WITH NORMAL PICTURE FAULT AND OPERATION OF A TV RECEIVER

Aim

To rectify the No Sound with normal picture fault and operate the TV Receiver.

Components Required

S.No.	Name of Component/Apparatus	Quantity
1.	TV Receiver	1
2.	Multimeter	1

Identification of the fault in a given TV receiver

1. Switch ON the TV receiver.
2. Picture on the screen is normal but no sound.
3. Switch OFF the receiver and confirm. The fault is in sound section.

Test the stages of the TV receiver

1. The picture on the screen is normal but no sound, confirms the fault is in the audio stage.
2. Measure the voltage at the audio amplifier and output stages if it is correct, go to next step.
3. Check the connection at the speaker and check the voice coil with multimeter, If it is correct,
4. Measure the voltage at IC pins connected in audio amplifier and output stage, if it is correct,
5. Check the volume control if it is defective remove it and solder new one.
6. Now the receiver screen shows the clear picture with sound.

Result

Thus the no sound fault in a given TV receiver was rectified and bringing it to the normal operation.

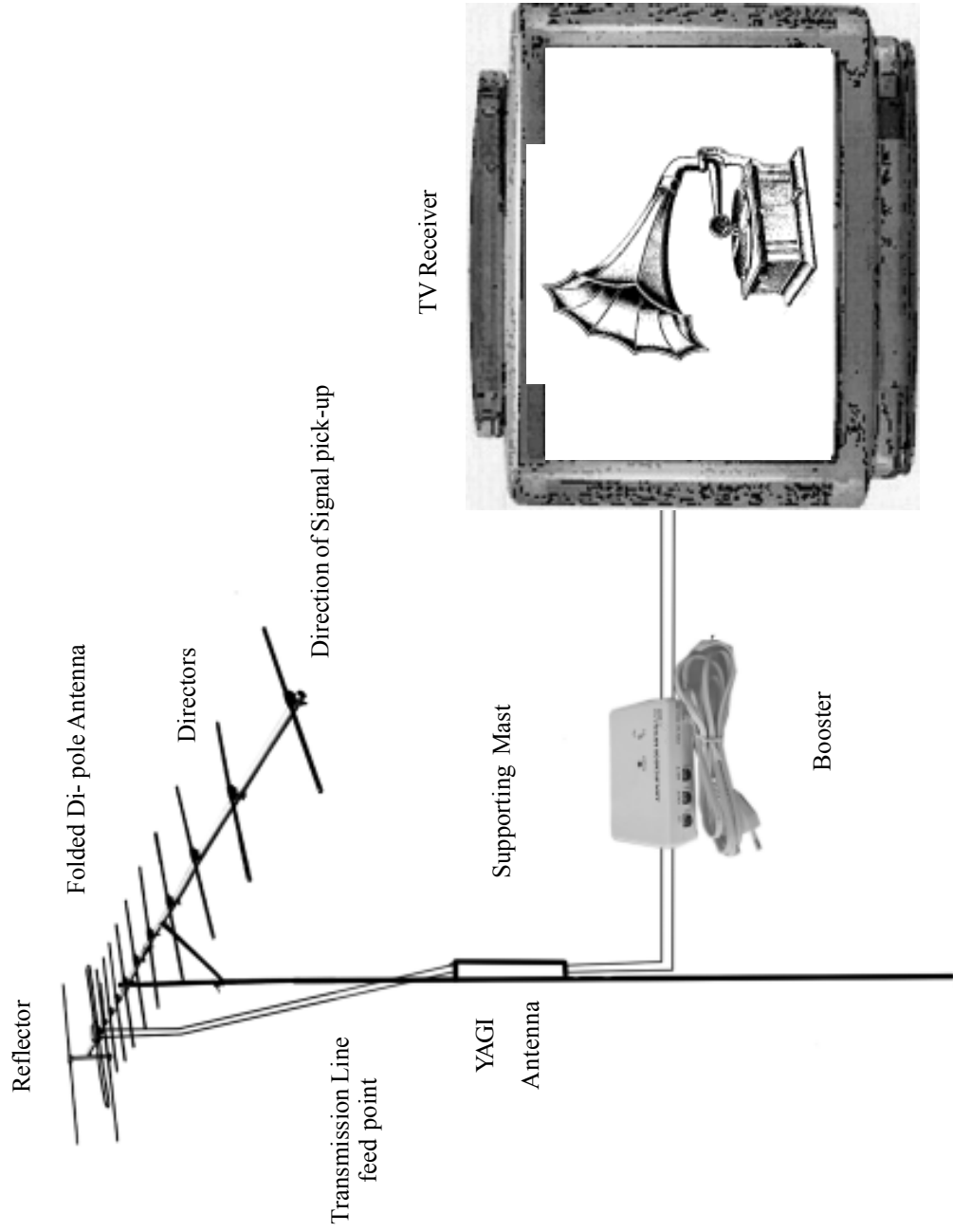


Fig. 11 : No Sound with a normal picture in a TV receiver

EXPERIMENT NO - 12

RECTIFICATION OF THE RETRACE LINES FAULT AND OPERATION OF A TV RECEIVER

Aim

To rectify the retrace lines fault and operate the given TV Receiver.

Components Required

S.No.	Name of the Component/Apparatus	Quantity
1.	TV Receiver	1
2.	Multimeter	1

Identification of the fault in a given TV receiver

1. Switch ON the TV receiver.
2. There is no picture only retrace lines on the screen.
3. Switch OFF the receiver immediately and confirm retrace lines fault is in the receiver.

Test the stages of the TV receiver

1. There is no picture only retrace lines on the screen.
2. Check the video output transistor and related parts and measure the voltage if it is correct. measure the voltage at picture tube grid G1 and G2, if it is correct,
5. Check the picture tube filament and cathode if it is short circuited remove it with proper way.

Result

Thus the retrace lines fault in a given TV receiver was rectified and bringing it to the normal operation.

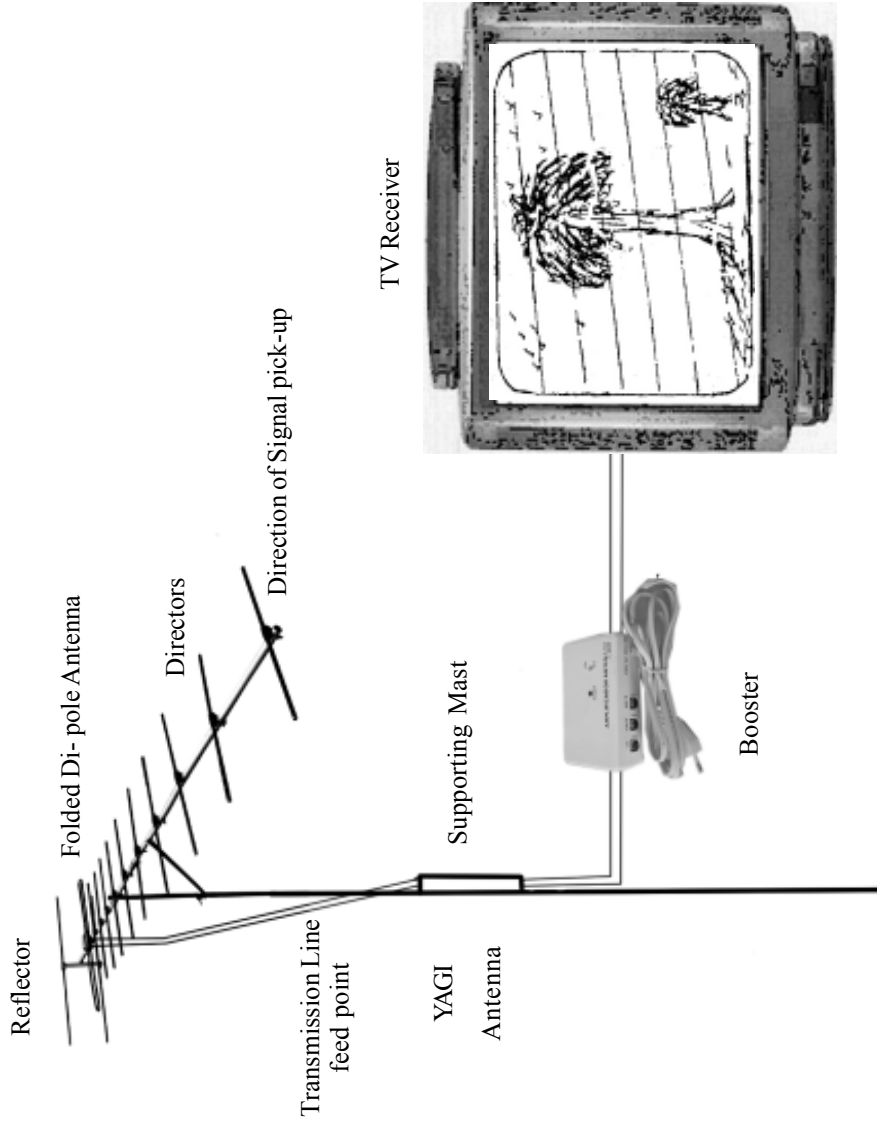


Fig. 12 : RETRACE LINES FAULT IN A TV RECEIVER

EXPERIMENT NO - 13

FIND AND RECTIFY THE DEAD FAULT- IN A DVD PLAYER

Aim

To find the dead fault in a DVD player and rectify.

Components required

S.No.	Name of Component/Apparatus	Quantity
1.	TV Receiver	1
2.	DVD player	1
3.	MP3 disc	1
4.	Multimeter	1

Identification of the fault in a DVD Player.

1. First connect the DVD player with TV receiver and switch ON.
2. There is no motion in the DVD Player. It seems to be dead.
3. So it is confirm dead fault is occur in the DVD player.

Testing

1. Check the main cords with multimeter, if it is correct,
2. Check the power supply transformer, if it is correct,
3. Check the bridge diodes, filters and regulator Ic.
4. It is conform the regulator Ic is fault.
5. So replace the Ic with new one.
6. Now operate the player.
7. The player function successfully.

Result

Thus the fault the DVD Player was rectified and bring it to the normal operation.

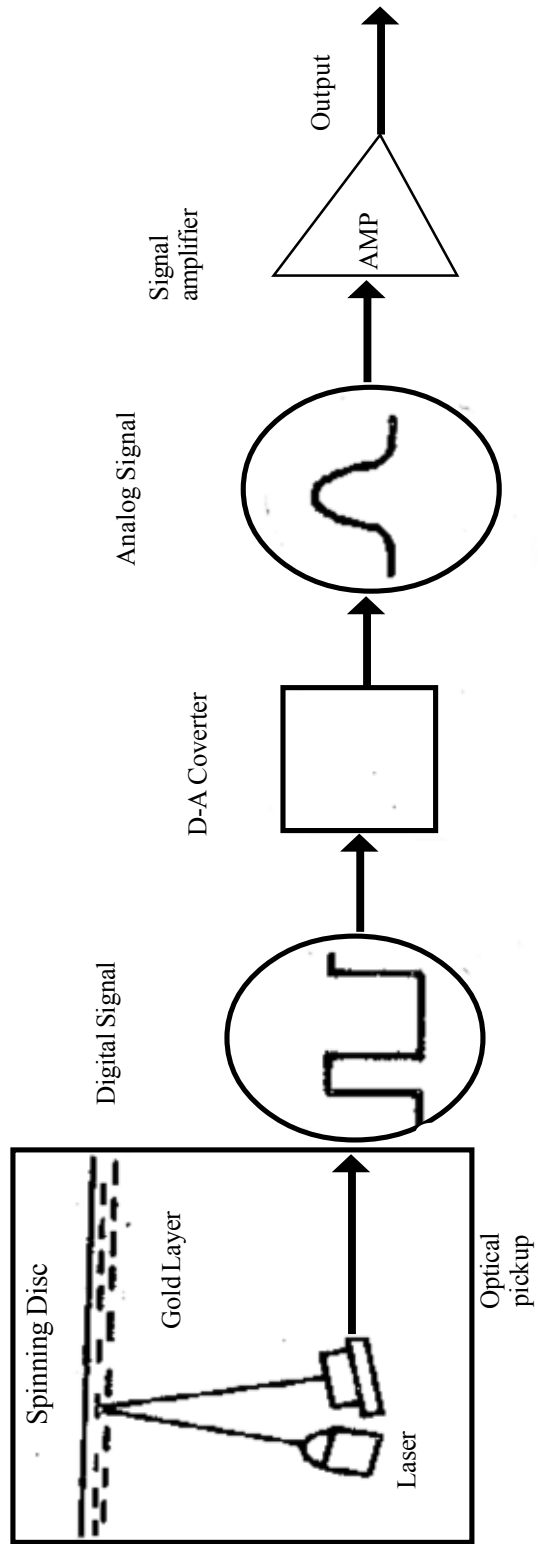


Fig. 13 : Block diagram of DVD player

EXPERIMENT NO : 14

IDENTIFICATION OF THE NO DISC FAULT AND OPERATION OF A DVD PLAYER

Aim

To Identify the no disc fault of in a DVD player and rectify.

Components required

S.No.	Name of the Component/Apparatus	Quantity
1.	DVD Player	1
2.	MP3 disc	1
3.	Television	1
4.	Multimeter	1

Identification of the fault in a given DVD player

1. Connect a required power supply with DVD player and television.
2. Make the connection with suitable probes between DVD and with television.
3. Switch ON both the T.V and DVD.
4. Open the DVD disc door and keep a MP3 disc.
5. DVD and TV shows "No-disc" in the screen.
6. So confirm the fault is "No-disc".

General reason for this type of fault

1. In DVD player the disc is in wrong position (up and down).
2. Driver (or) motor speed is not enough.
3. In DVD player, the laser beam is not fall on the disc.
4. The optical lens in the player does not focus the laser beam which fall on the disc.
5. So it is confirm the optical lens is fault.

Procedure of rectifying the faults

1. It is found that only the optical lens is fault.
2. So replace the fault lens with new (same power) lens.
3. Now the disc is playing and the screen shows the picture.

Result

Thus the "No-disc" fault was identified and rectified.

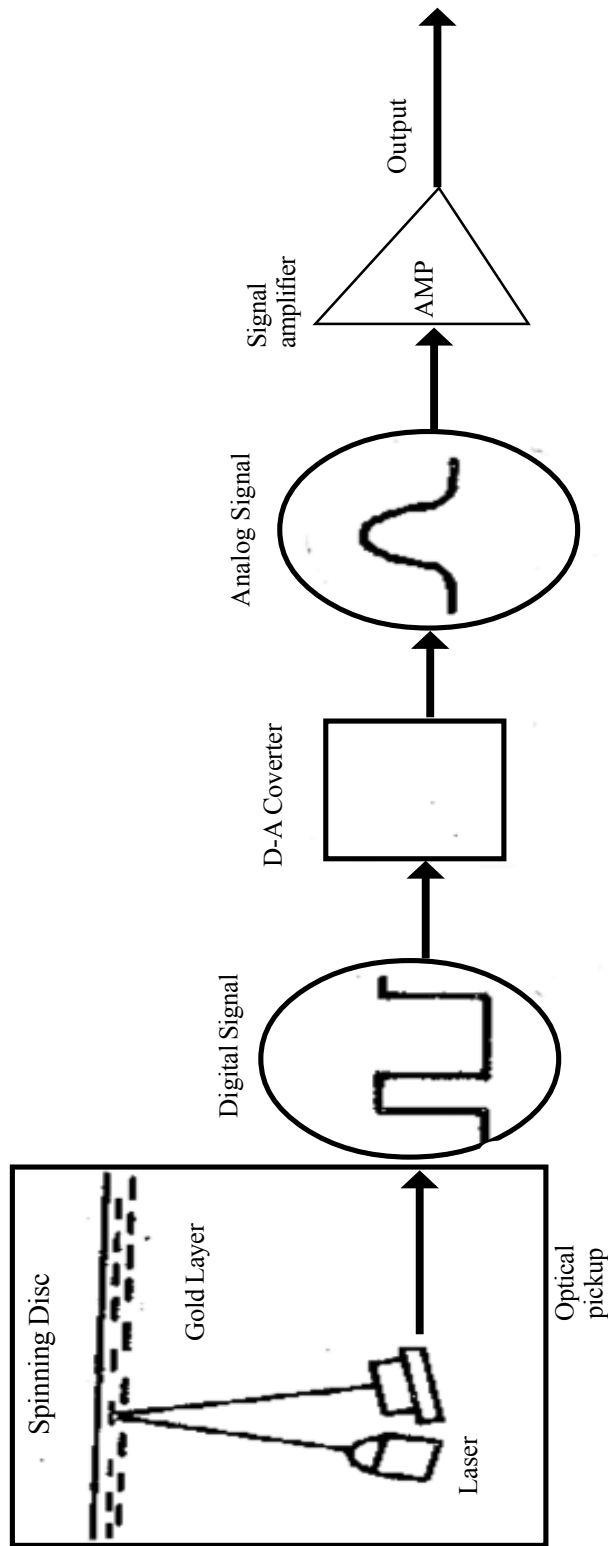


Fig. 14 : Block diagram of a DVD player

EXPERIMENT NO -15

STUDY OF CELL PHONES AND ITS MAINTENANCE

Aim

To know about the working of the cell phone and its maintenance.

Components required

S.No.	Name of Component/ Apparatur	Quantity
1.	Cell phone	1

Principle of Cell phone

Cell phone provides a wire less service which is hand held phone with built in antennas while we talk in a cell phone, it registers our voice and converts the sound into radio waves. The waves travel through the air and reach the base station which send the call though the network and makes the contact with the person whom we want to speak.



Keys and parts of the Cell phone

1. ON and OFF

To switch the phone ON/OFF, Press and hold the power key.

2. Display

When we switch on the phone we get the configuration settings on the display like

1. Singal strength 
2. Battery change status 
3. Indicators (Message, Lock, alarm etc..)
4. Name of network
5. Time and Date
6. Function of left, right and middle Navigator (Navi) Key.

3. Key pad

Press the numbers in the key pad to call the person

4. Call key

When we want to make a call to a person, select the number from key pad an call register which we already kept in the save mode. then press the call key.

5. Navikey

It is a 4-way scroll key and middle set section key. Using this we can assign the other function from a predefined list.

Select menu > Settings > My Shortcuts > Navigation

6. Left and right selection key

To select a function from the list, Select menu > Settings > My Shortcuts > left selection key or right selection key. To Select add or remove left key is used, To exit the function right key is used.

7. END key

After the speech ends we press the end key at once. we also switch off the phone using this key.

8. Microphone

We Speak through the micro phone which is in the lower side of the cell phone. It convert the sound wave into electrical wave or radio wave.

9. Charger Connector

We can charge the cell phone battery using this provision the cell phone battery using provision kept on the sides. We connect the charge wire.

10. FM Connector

FM radio depends on antenna other than the wireless device antenna. A Compatible head set a enchcement needs to attached, for the FM radio to function properly.

11. Ear piece Speaker

We can hear the speech through the speaker which is kept on the upper side of phone.

12. Camera Lens

Take images or video clips with the built in cameras. To use the still picture function select menu - media - camera. Cell phone can capture picture resolution up to given data. The phone saves the video clips on the memory card or in the phone memory.

Install SIM card and battery

To remove the back cover of the device, press and slide the cover. open the SIM card holder, insert the SIM card with backside and close the SIM card holder. The same way, observe the battery contacts and insert the battery. slide the back cover into its place.

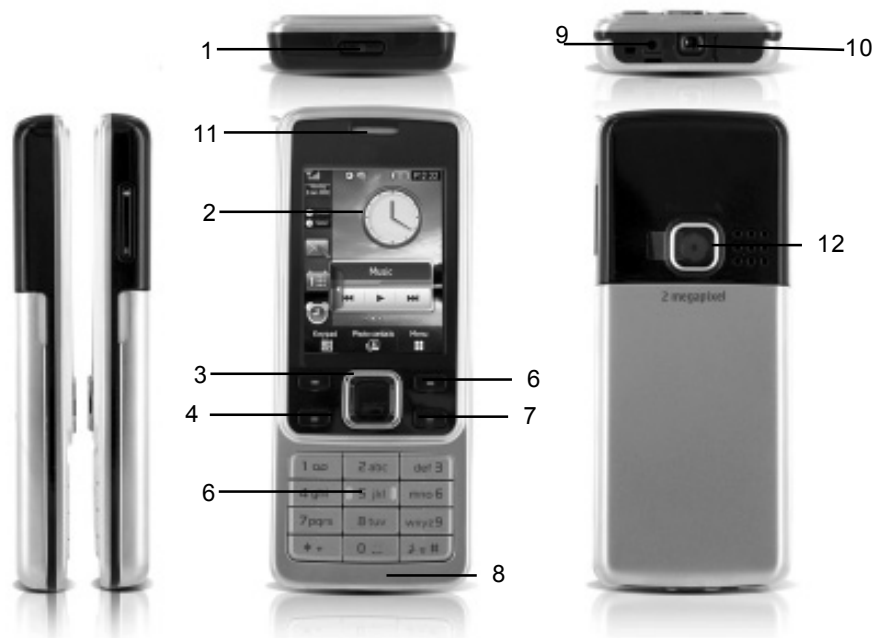


Fig. 15 : Keys and Parts of Cell Phone

- 1 On/Off
- 2 Display
- 3 Left and right selection key
- 4 Navi Key: 4-way scroll key and middle selection
- 5 Cell key
- 6 Keypad
- 7 End key
- 8 Microphone
- 9 Charger connector
- 10 Audio connector
- 11 Speaker
- 12 Camera

Maintenance of Cell phones

The following suggestions will help to protect the cell phones.

1. Keep the cell phone in a dry place, If it does get wet remove the battery and allow the device to dry completely.
2. Do not use or store the device in dusty and dirty areas.
3. Do not store the device in hot or cold area.
4. Do not attempt to open the device unless it is instructed.
5. Do not drop, knock, or shake the device, rough handling can break internal circuit and bounds the fine mechanics.
6. Do not use hard chemicals, cleaning solvents or strong detergents to clean.
7. Do not paint the device.
8. Use a soft, clean, dry cloth to clean.
9. Use only approved replacement antennas.
10. Always power off the device then connect and disconnect the charger.
11. Do not talk while charging the mobile.

Result

Thus we studied about the cell phones and its manitenance.

EXPERIMENT NO - 16

STUDY OF TV AND DVD REMOTE AND ITS MAINTENANCE

Aim

To study of TV and DVD remote control and how to maintain it.

Components required

S.No.	Name of Component/Apparatus	Quantity
1.	DVD Player	1
2.	DVD remote control	1
3.	TV remote control	1
4.	TV receiver	1

Introduction

TV and DVD are operated by remote controls. Once it is switched on the screen is played. It controls the powers of the players with a certain distance.

Structure of TV and DVD remote .

It is in the shape of slim cuboids and is made of plastic.

Important controls of TV Remote

1. Power ON / OFF
2. Menu
3. Channel (+ , -)
4. Time
5. Zoom
6. Games
7. Colour
8. Auto scanning
9. 0-9 Buttons
10. Volume (+ , -)

1. Power ON / OFF

It is a red colour round button which is used to switch ON / OFF the set. When it is in ON position screen is displayed.

2. Menu

On pressing the menu button, we can also select, channel, sound, picture using + or - buttons.

3. Channel (+, -)

There is two buttons + and - , pressing + button, the next channel can be set. Pressing - button the previous channel can be set.

4. Time

We can miss some important programme in such times. So we can store the time using the sleep button, automatically the programme is screened. Also we store the off time also itself the set is off.

5. Zoom

We can adjust the picture on screen maximum level and minimum level using this button.



TV Remote



DVD Remote

6. Game

There must be a game in a TV memory. We can select the game using this button.

7. Colour

We can adjust the colour of picture which screened using this button.

8. Auto Scanning

Using this button we can identify the numbers of the channels.

9. 0-9 Buttons

We can select a particular channel using these 9 buttons one at a time.





10. Volume (+, -)

We can increase or decrease the volume by this + / - buttons.

Procedure for Maintenance

1. We must use the remote control to switch ON/ OFF the TV.
2. The Distance between the remote and TV is minimum 7m.
3. We should not press two channel buttons at the same time.
4. Don't operate the remote at the backside of the T.V.
5. Often we change the channels and the volume, the remote will attained fault.
6. only DC supply must be used.
7. We must change the low power batteries at once.
8. Two batteries which we can use in the remote must be same (same company).
9. Don't use one is new and the other is old.
10. We could not put down the remote often and don't keep in wet places.

IMPORTANT CONTROLS OF DVD REMOTE

1.  : We can switch on and off the system by using this button.
2. **DISPLAY** : It can screened the programmes which we want.
3. **DISC MENU** : It can send in or out of the selected programmes.
4. **OK** : It can allow the programmes.
5. **PRE**  : We can select the previous screen using this.
6. **RETURN / TITLE** : We go throw the previous stage or title.
7. **■STOP** : We could stop the play using this button.
8. **▶||PLAY / PAUSE** : We could temporarily stop or play the screen using this.
9. **SUBTITLE** : We can choose the language using this.
10.  : It has used to fast forward the play on the screen is ie. 2x,4x,8x,16x,32x.
11.  : We can screen the play slowly ie. 1/2,1/4,1/8,1/16 using this button.
12. **SET UP** : It can send out, and come back the menu system.
13. **NEXT** : We can change the play to next screen.
14. **MUTE** : We can switch off the sound temporarily.
15. **AUDIO** : It can select the voice of audio on channel

Procedure for Maintain the Remote

1. We can operate the remote straightly with sensor.
2. Don't keep any objects between player and remote while operate.
3. We must use only standard batteries.
4. Batteries are connect with correct position of + and - .

Result

Thus, we study the operation of the TV and DVD remote controls and also know how to maintained it.

EXPERIMENT NO - 17

STUDY OF SMPS

Aim

To study the SMPS power supply.

SMPS Power Supply

Monochrome and colour TV receiver has so many types of power supplies. SMPS power supply is one of it. It convert the AC input voltage to DC regulated power. SMPS power supply may be divided into five stages.

1. Input rectifier and filter.
2. High frequency switch.
3. Power Transformer
4. Output rectifier and filter
5. Control circuit.

1. Input rectifier and filter

The input rectifier stage rectify the AC 220 v, 50HZ to DC supply with bridge rectifier.

2. High Frequency Switch

In this stage MOSFET's are used as High Frequency switch the DC voltage is converted to square waves using chopper principle.

3. Power Transformer

This stage transformer is used to step up or step down the AC Voltage.

4. Output rectifier and filter

This stage rectify the AC voltage to required value of DC regulated power supply.

5. Control Circuit

This stage is used a feed back network which is connected to the output stage and high frequency switch.

Result

Thus we studied the working principle of SMPS power supply.

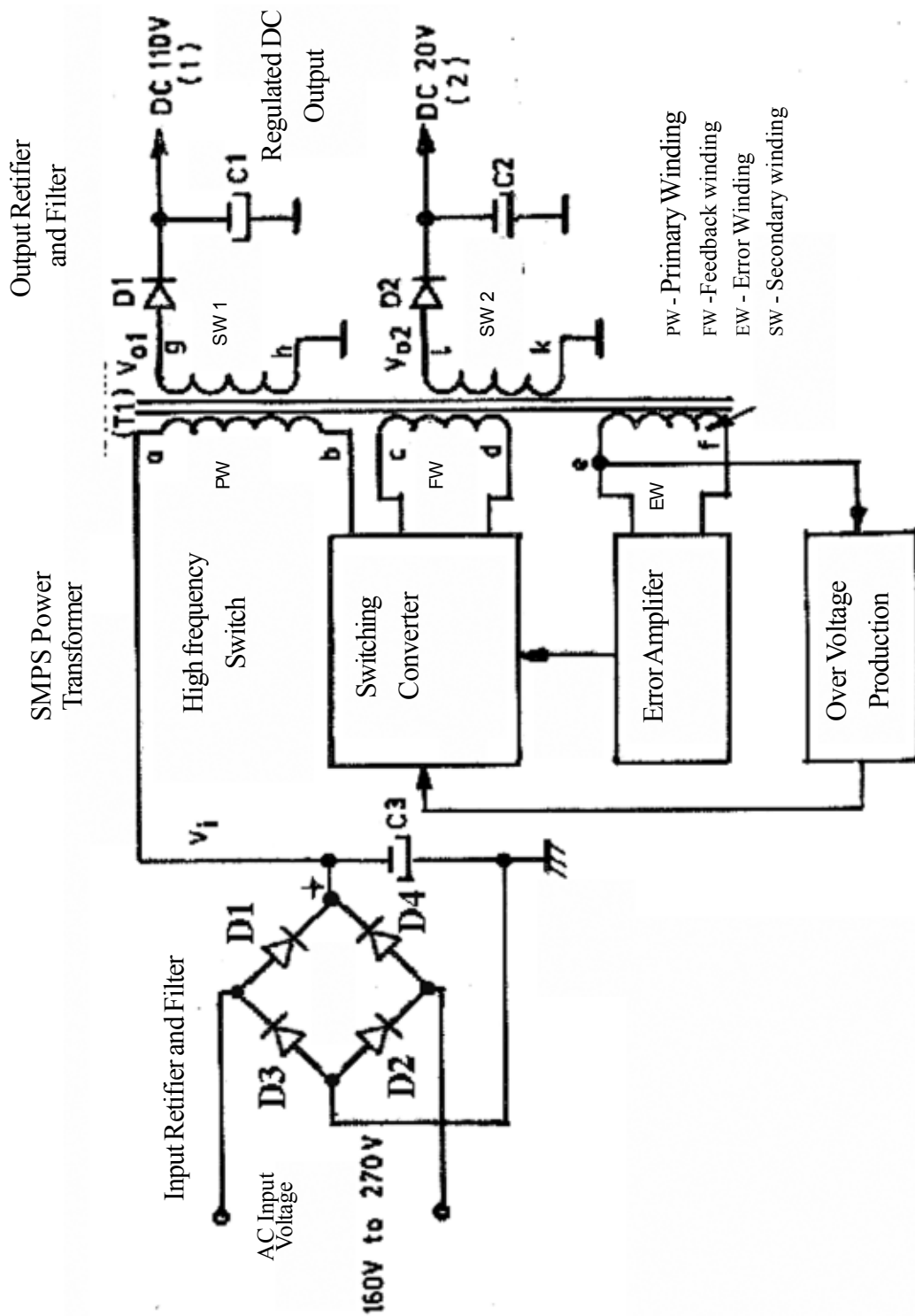


Fig. 17 : SMPS Power Supply