Experiment No: 01

Name of the Experiment: Study of AM Transmitter

Objectives:

- To know working of AM transmitter
- To know how modulator varied amplitude of carrier signal
- To create amplitude modulated wave with the transmitter and send this signal to receiver
- To check the voltage of different points of the transmitter kit

Theory:

AM (Amplitude Modulation) transmitter is a type of radio transmitter used to send information (voice, music, data, etc.) through radio waves. The method of amplitude modulation involves changing the amplitude of the wave signal before it is broadcast. An AM transmitter is an electronic device that generates and transmits an amplitude-modulated (AM) radio signal with the help of a carrier signal and a message signal.

The AM transmitter I observed consisted of the following components:

Microphone: A device used to convert sound waves into electrical signals.

Audio Amplifier: An electronic circuit used to amplify the electrical signals from the microphone.

Modulator: A device used to modulate (vary) the amplitude of a high-frequency carrier signal with the low-frequency audio signal from the amplifier.

Oscillator: A circuit that generates a high-frequency carrier signal.

RF Amplifier: An electronic circuit used to amplify the modulated carrier signal.

Antenna: A device used to radiate the amplified signal into space.

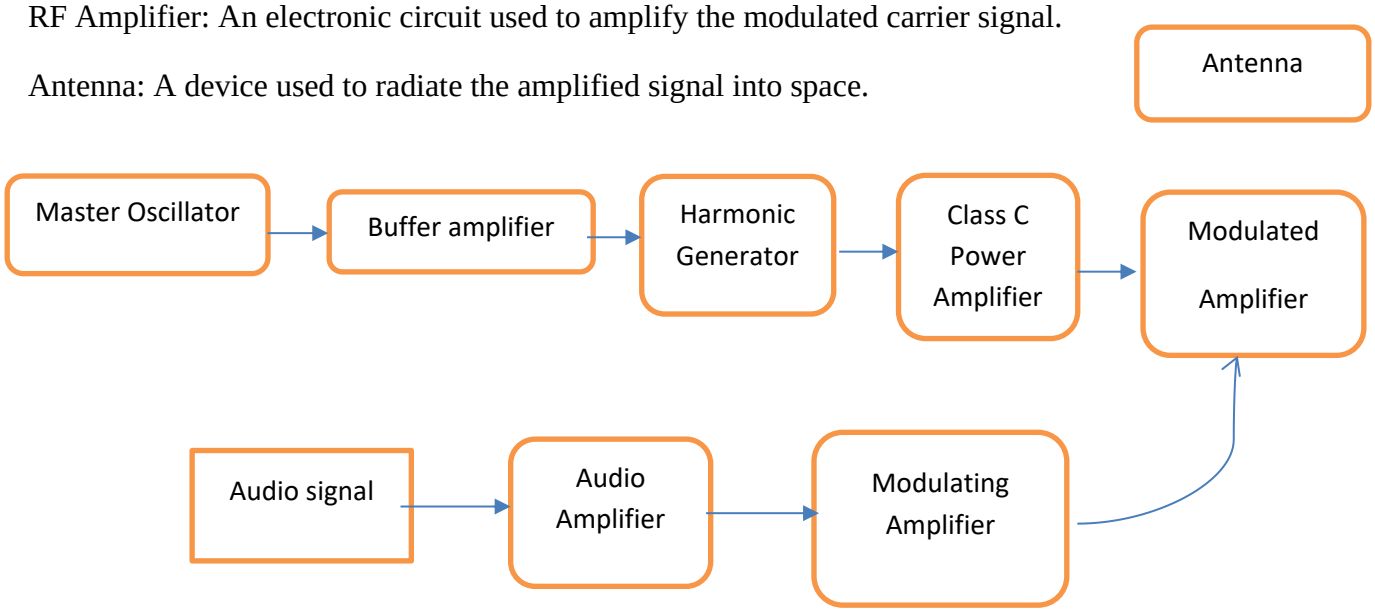

Fig 1.1.Block diagram of a basic AM transmitter.

7. Master oscillator is used to generate high frequency carrier wave and this signal is amplified with a radio frequency amplifier.

Modulating signal is generated by the source and this signal is amplified with AF amplifier after processing.These two signals are mixed in a amplifier and this amplitide modulated signal is sent to antenna.The function of the antenna is to create electromagnetic wave accordind to the AM signal..

Required apparatus:

1. Amplitude modulator transmitter kit (KL-93061)
2. Power supply
3. Multi-meter
4. Probe
5. Connecting wire
6. Power cables

Experimental Setup:

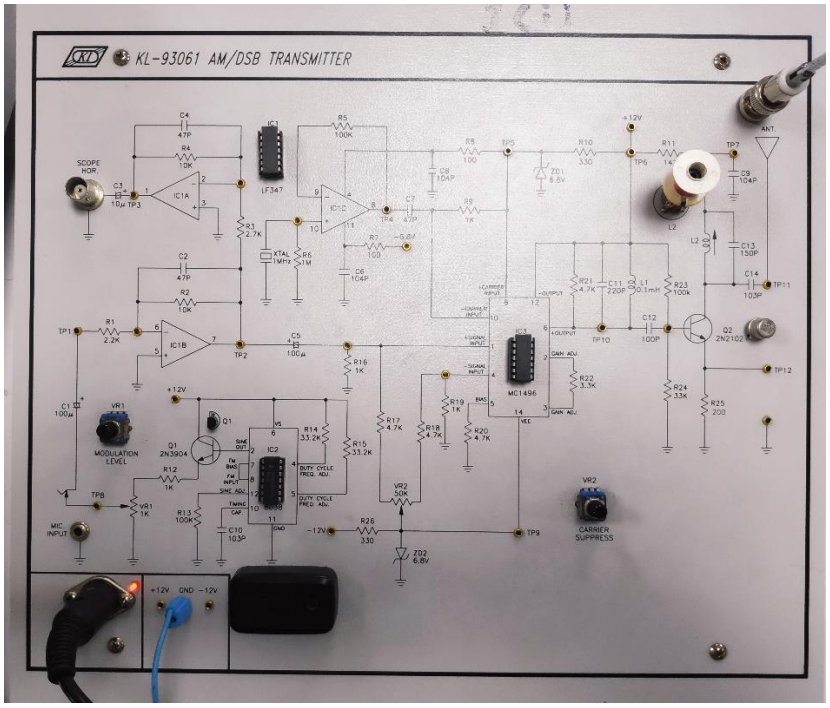

Figure 1: AM/DSB Transmitter Module KL-93061

Figure 2: Experimental setup for AM transmitter module

Output Waveshapes:

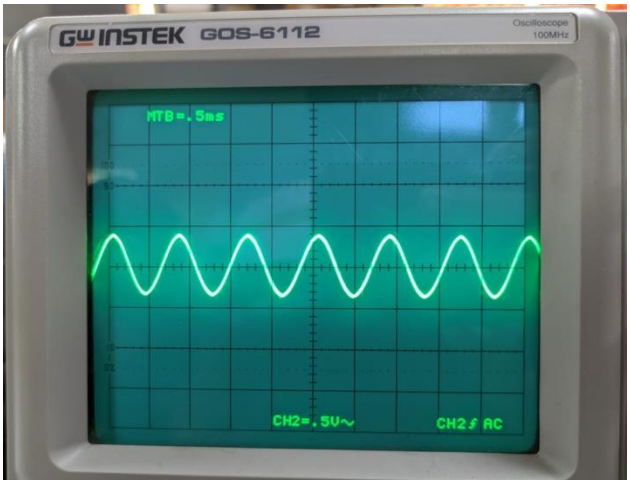

Fig4: Message signal

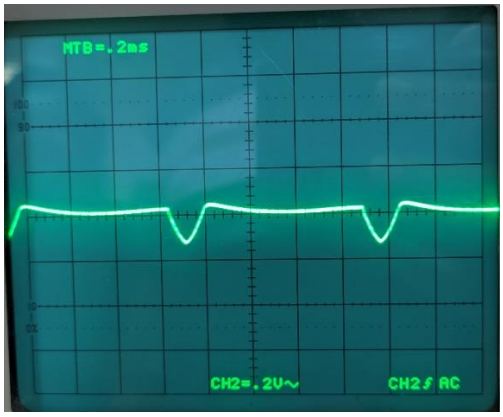

Figure 5: Output signal from tp2

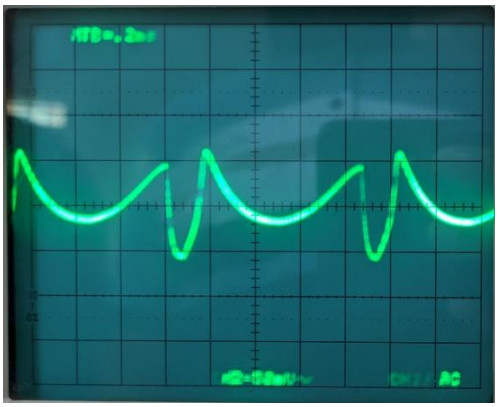

Figure 3: Output signal from tp3

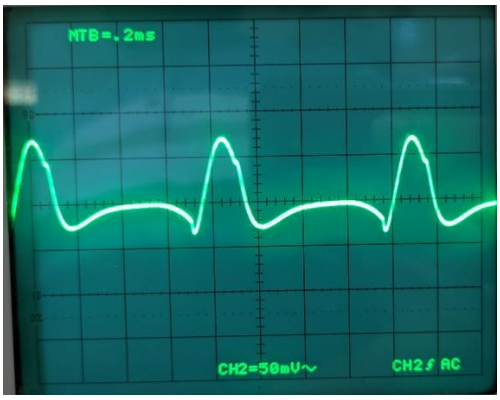

Figure 4: Output signal from tp4

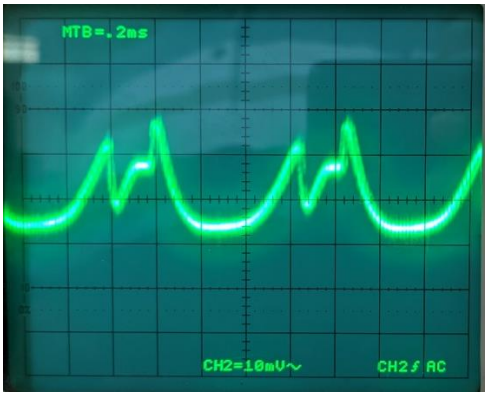

Figure 5: Output signal from tp5

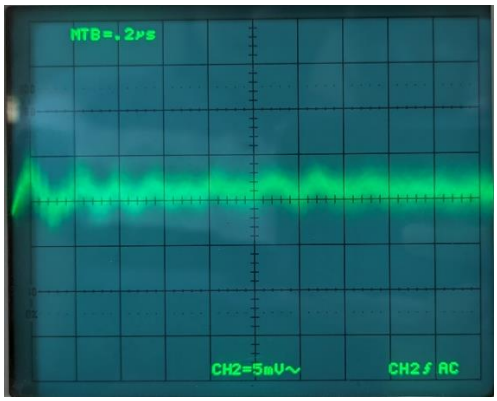

Figure 6: Output signal from tp6

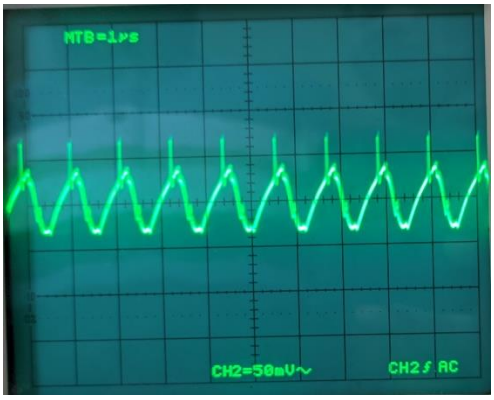

Figure 7: Output signal from tp7

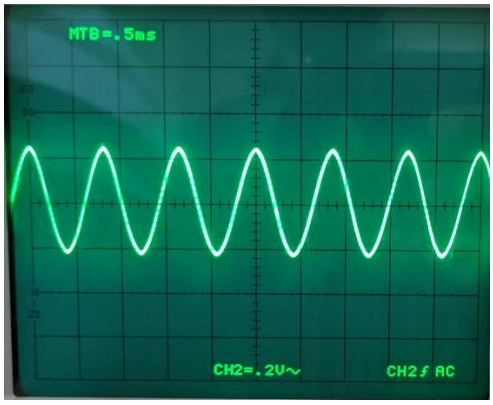

Figure 8: Output signal from tp8

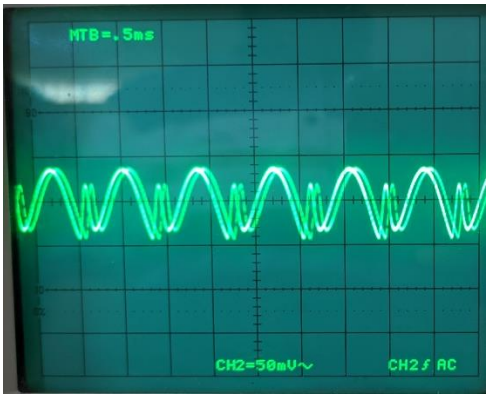

Figure 9: Output signal from tp9

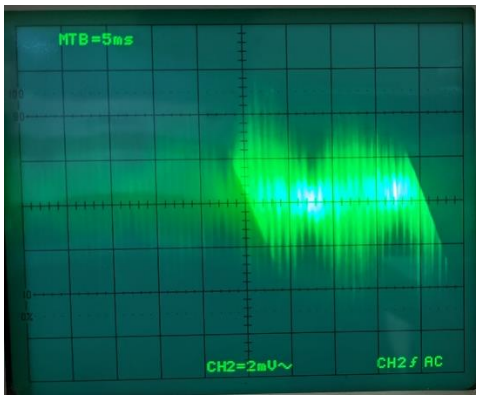

Figure 10: Output signal from tp10

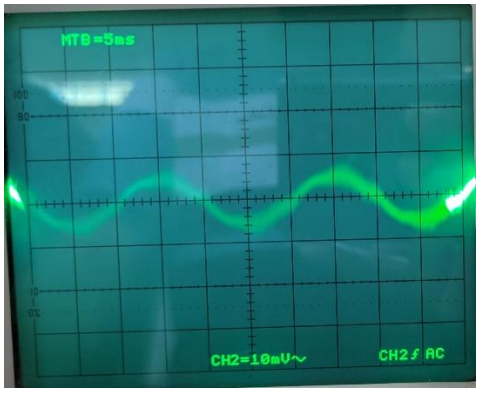

Figure 11: Output signal from tp12

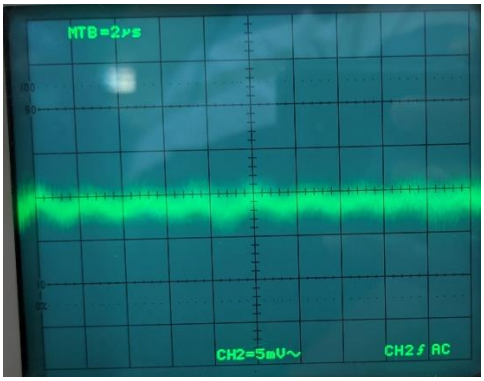

Figure 12: Output signal from tp13

DC Voltage Level at Different Point:

Serial no	**Terminal No**	**Voltage(v)**
1)	TP 1	365.8 mV
2)	TP 2	0.443 V
3)	TP 3	203.1 mV
4)	TP 4	2.227 V

5)	TP 5	1.76 V
6)	TP 6	12.23 V
7)	TP 7	12.23 V
8)	TP 8	2.645 V
9)	TP 9	-6.50 V
10)	TP 10	12.23 V
11)	TP 11	283.7 mV
12)	TP 12	18.8 mV

Discussion & Conclusion:

In this experiment, my observation of an AM transmitter revealed that it is a complex system comprising various components, each with a specific role in transmitting information through radio waves. The microphone, audio amplifier, modulator, oscillator, RF amplifier, and antenna work together to ensure that the modulated carrier signal was efficiently transmitted into space, where it can be received by a radio receiver and demodulated to retrieve the original information. I also observed that the frequency of the carrier signal generated by the oscillator was set to a specific frequency based on the frequency band allocated for AM transmission. In addition, I noticed that the antenna was designed to be a specific length, depending on the frequency of the carrier signal, to ensure maximum efficiency in transmitting the signal.