Experiment No: 02
Experiment Name: Study of AM Receiver
Objectives:

- To know working of AM receiver
- To check the voltage of different points of the receiver kit
- To receive a electromagnetic wave of AM signal by proper tuning
- Highlights the importance of adjusting the local oscillator frequency to ensure the IF frequency is constant, simplifying the design of the IF amplifier and detector circuits

Theory:
An AM (Amplitude Modulation) receiver is a device that receives and demodulates radio waves that are modulated with information such as voice, music, or data.

The AM receiver I observed consisted of the following components:

1. Antenna: A device used to receive the modulated carrier signal.
2. RF Amplifier: An electronic circuit used to amplify the received signal.
3. Mixer: A device used to mix the received signal with a local oscillator signal to produce an intermediate frequency (IF) signal.
4. IF Amplifier: An electronic circuit used to amplify the IF signal.
5. Detector: A device used to demodulate the AM signal and extract the original information.
6. Audio Amplifier: An electronic circuit used to amplify the demodulated signal and produce an audible output.

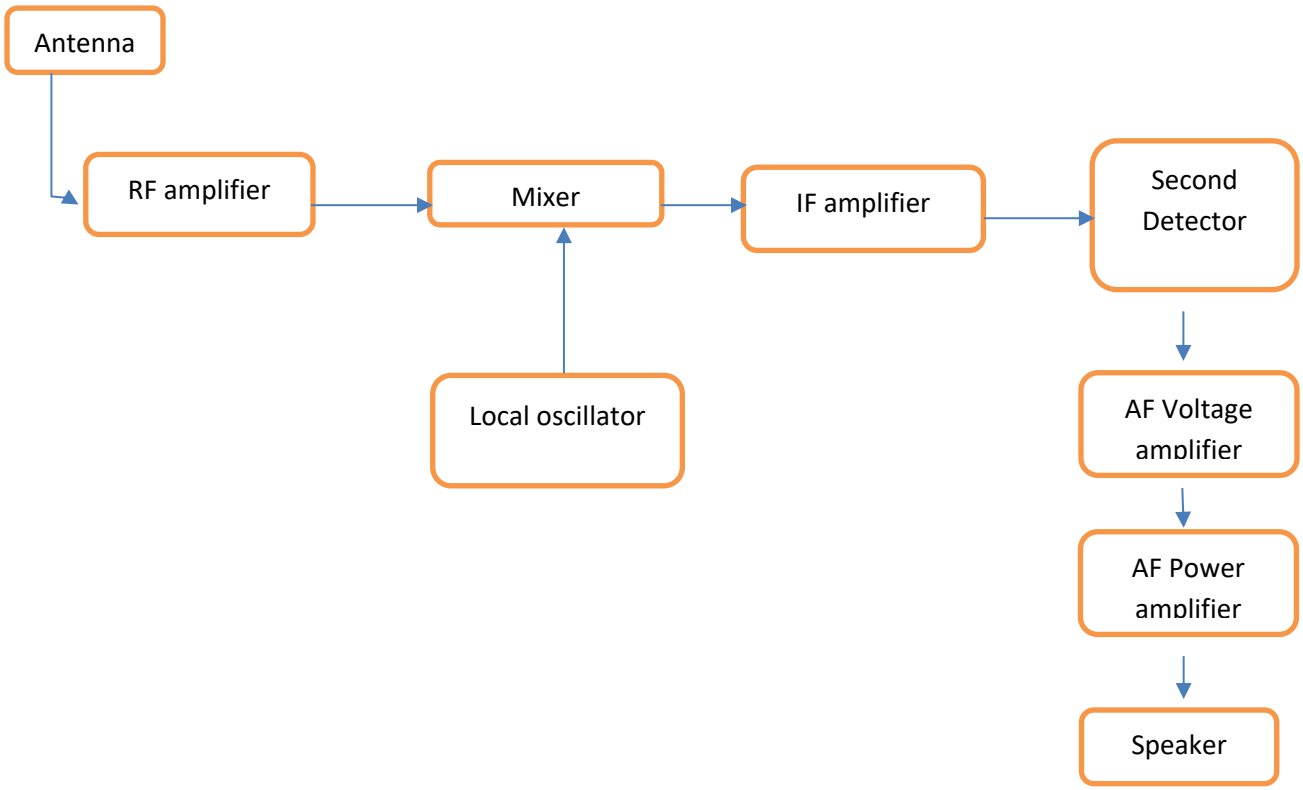

Fig 2.1. Block diagram of a basic AM receiver.

The antenna picked up the modulated carrier signal and passed it to the RF amplifier, which amplified the signal to a level suitable for further processing. The mixer then combined the received signal with a local oscillator signal to produce an IF signal. The IF amplifier amplified the IF signal, which was then passed to the detector.

The detector demodulated the AM signal and extracted the original information. The demodulated signal was then passed to the audio amplifier, which amplified the signal to a level that could be heard through a speaker or headphones

Required Apparatus:

1. AM Receiver Module KL-93062
2. DC Supply Module Cl-18001
3. Oscilloscope (IWATSU)
4. RF Signal Generator
5. Digital Multimeter

Experimental Setup:

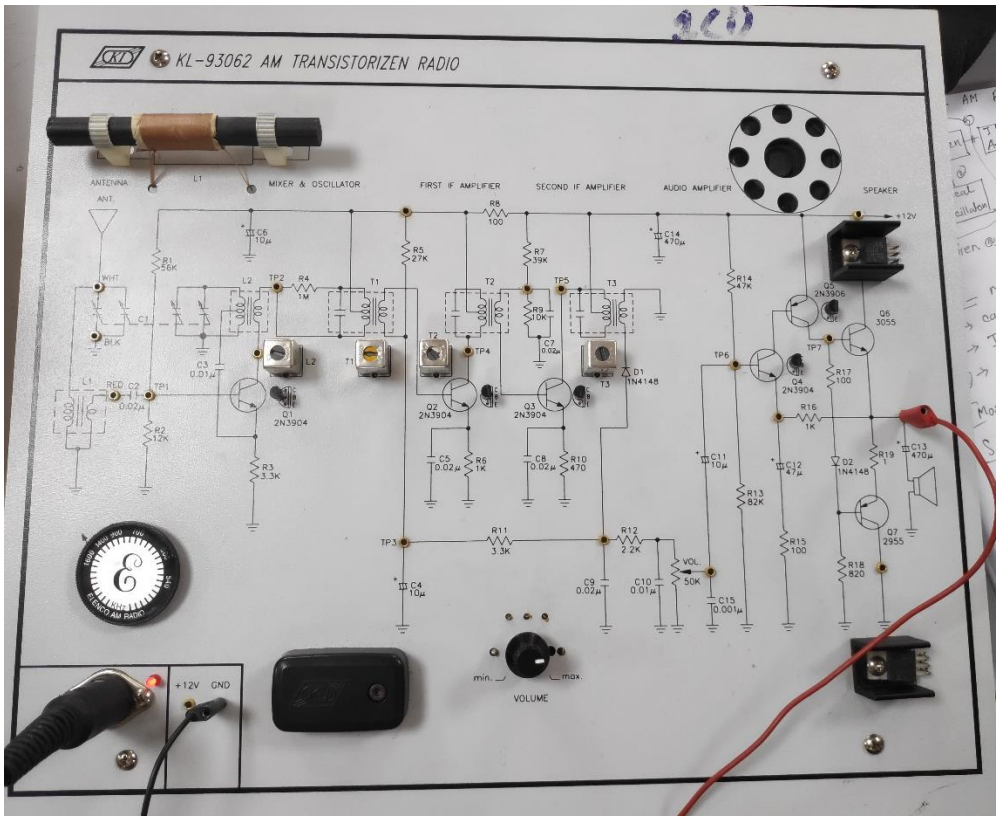

Figure 1: AM Receiver Module KL-93062

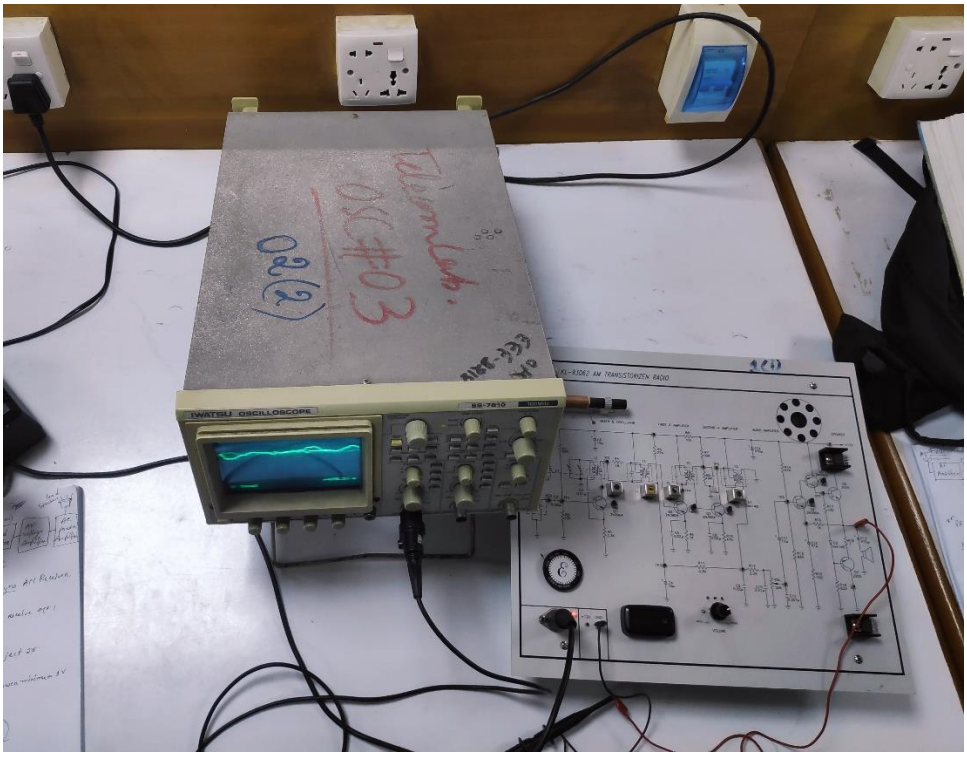

Figure 2: Experimental setup for AM receiver module

Output Waveshapes:

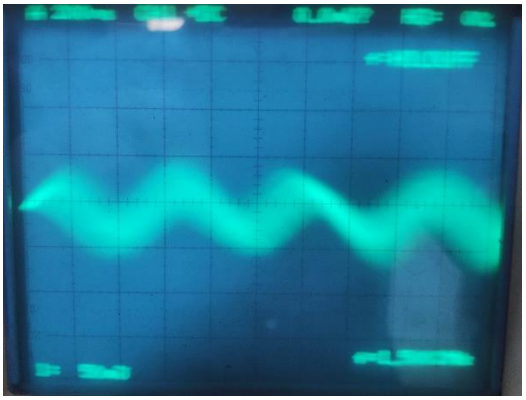

Figure 3: Output signal at WHT

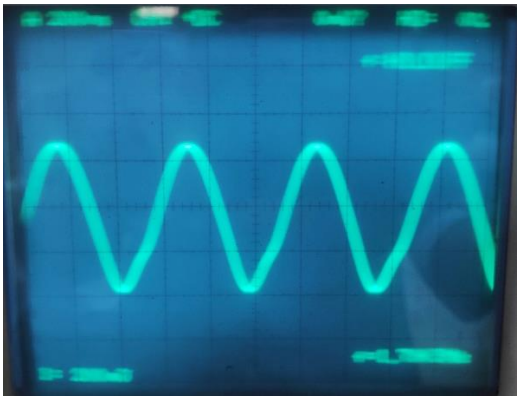

Figure 4: Output signal from mixer

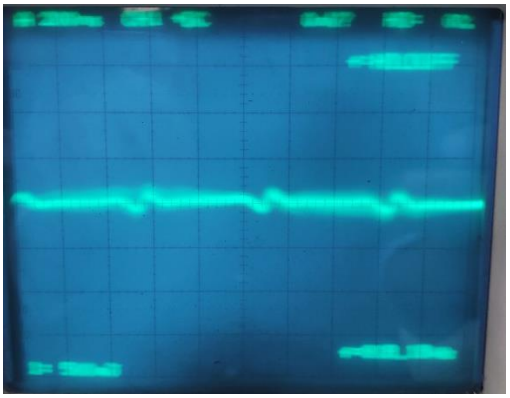

Figure 5: Output signal at tp4

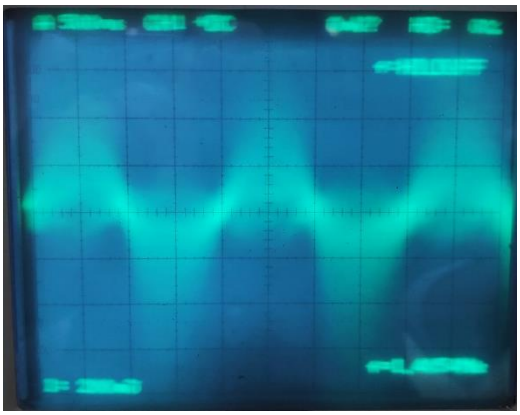

Figure 6: Output signal at tp5

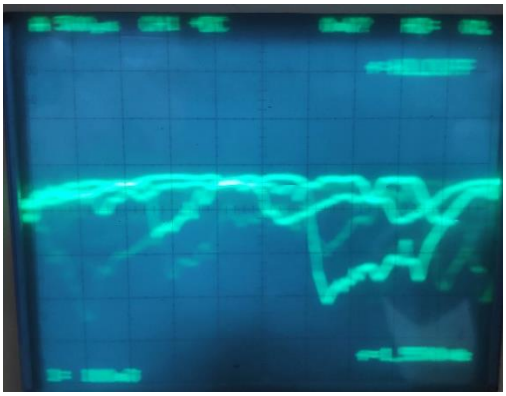

Figure 7: Output signal at tp6

Figure 8: Output signal at tp7

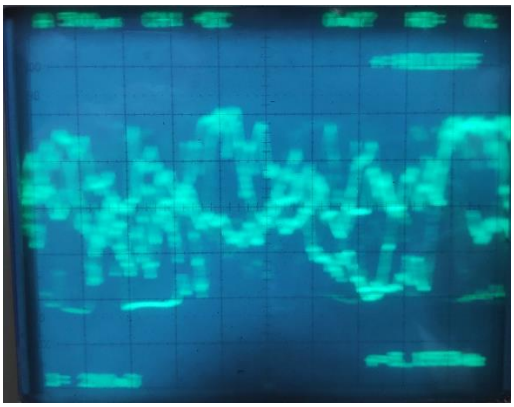

Figure 9: Output signal at tp8

DC Voltage Level at Different Point:

Point	Voltage
tp1	2.08 V
tp2	12.04 V
tp3	1.754 V
tp4	11.9 V
tp5	12.16 V
tp6	1.917 V
Tp7	1.77 V
Tp8	1.356 V

Discussion & Conclusion:

My experimental observation of an AM receiver revealed that it is a complex system comprising various components, each with a specific role in receiving and demodulating the modulated carrier signal to retrieve the original information. I also observed that the local oscillator frequency was adjusted to ensure that the IF frequency was always the same. This was done to simplify the design of the IF amplifier and detector circuits. The antenna, RF amplifier, mixer, IF amplifier, detector, and audio amplifier work together to ensure that the modulated signal is efficiently demodulated and converted into an audible output.

As the receiver circuit was faulty, we can't demodulate the original message signal. But we got a distorted signal.