4.0 COMMUNICATION SYSTEMS (Amp. Modulation & Demodulation circuits)

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1. Amplitude Modulator in the amplifier circuit

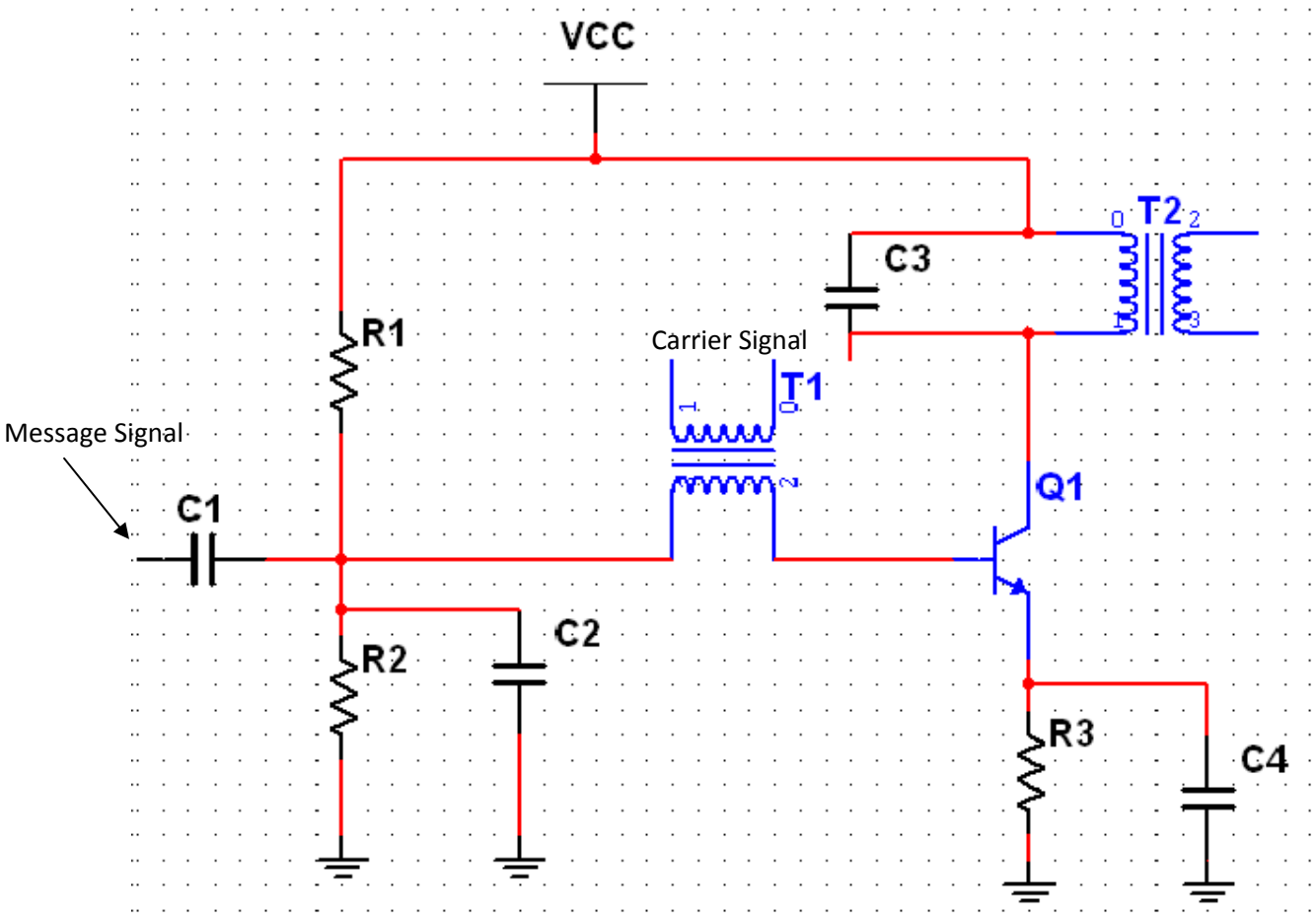

Fig. 1 Amplitude Modulated transistor amplifier with base injection

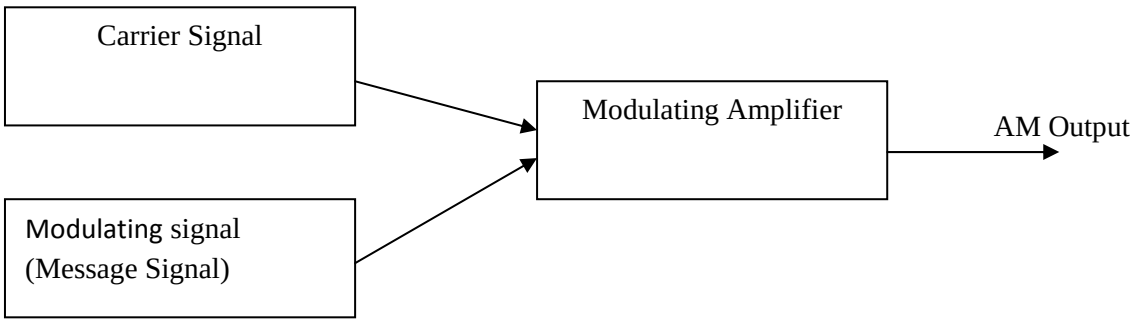

Fig 2.Block Diagram of Amplitude Modulation in the Amplifier Circuit

- The above fig. shows amplitude modulated transistor amplifier with base injection in the common emitter configuration.

- The transistor is powered by V_{cc} through the voltage divider network. The carrier signal is coupled to the base of the transistor by transformer T1 and modulating signal is coupled through C_1.
- The modulating signal causes the bias to increase and decrease.
- The transformer T_2 couples the modulated signal to the load of the amplifier.

2. Amplitude Modulator in the Oscillator circuit

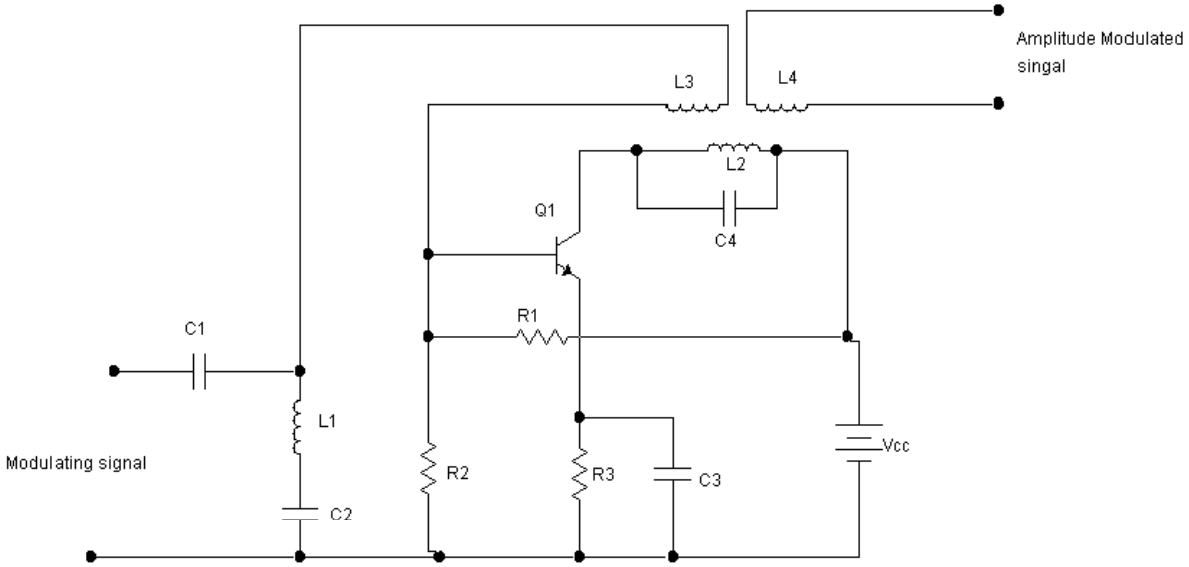

Fig. 3 Amplitude Modulated transistor Oscillator with base injection

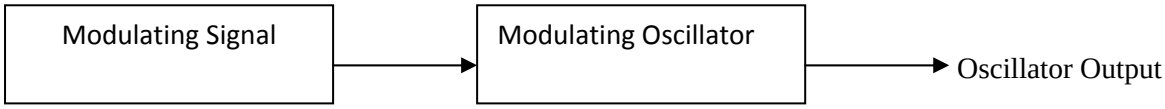

Fig. 4 Block Diagram of Amplitude Modulation in the Oscillator Circuit

- Carrier wave is generated by an LC tank circuit of the oscillator. (i.e. the combination of L_2 and C_4)
- Modulating signal is directly fed in along with the fed-back carrier wave
- The transistor in CE configuration
- Secondary winding L3 provides positive feedback for transistor Q1
- Secondary winding L4 couples the modulated output to oscillator load
- R1 & R2 provides biasing for the transistor
- L1 & C2 are made resonant to carrier frequency thereby providing low impedance path
- The impedance of L1 & C2 for relatively low frequency modulating signal is very high. This has negligible loading effect to the modulating source
- Fixed bias R1 & R2 , supply, the feedback voltage from L3 and the modulating signal voltage varies the bias increasing the gain thereby increasing the amplitude of the carrier signal (couples to output)