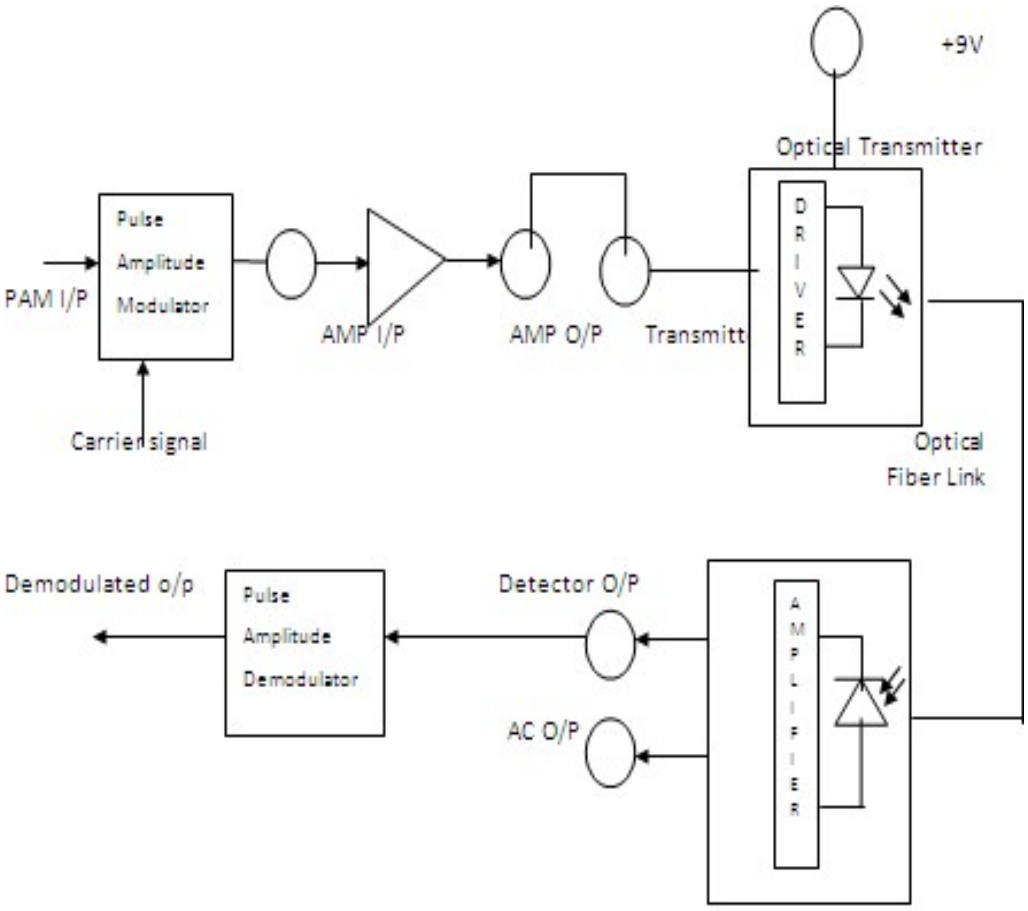
Experiment No. 3

Aim: To Transmit and receive Pulse Amplitude Modulated (PAM) signal using OF.

Objectives: i) To observe transmission and reception of PAM signals through OF. ii)To represent modulating, carrier, PAM and demodulated signals graphically.

Equipments/ Components: kit No.1 & 2, CRO, Function Generator, 1 Meter Fiber Cable, etc.

Circuit/Block Diagram:



BLOCK DIAGRAM FOR PAM SIGNAL TRANSMISION & RECEPTION

Theory: Pulse Amplitude Modulation is a technique of communication in which the high frequency square wave is modulated by the low frequency signal. The modulating signal is sampled by the pulses. The PAM signal is nothing but high frequency square wave in which the amplitude of each pulse is equal to that of the information signal at the respective sampling instant.

Procedure:

1. Concept the power supply cable with proper polarity to kit 1 & kit 2. while connecting this ensure that the power supply is off.
2. Connect the signal generator between the PAM input and GND post for PAM circuit in kit 1.
3. Keep the signal generator in sign wave mode and select the frequency = 1 KHz with amplitude = 1V P-P.
4. Switch on the power supply and signal generator.
5. Check that the clock circuit is properly working by connecting the oscilloscope probe at CLK output post.

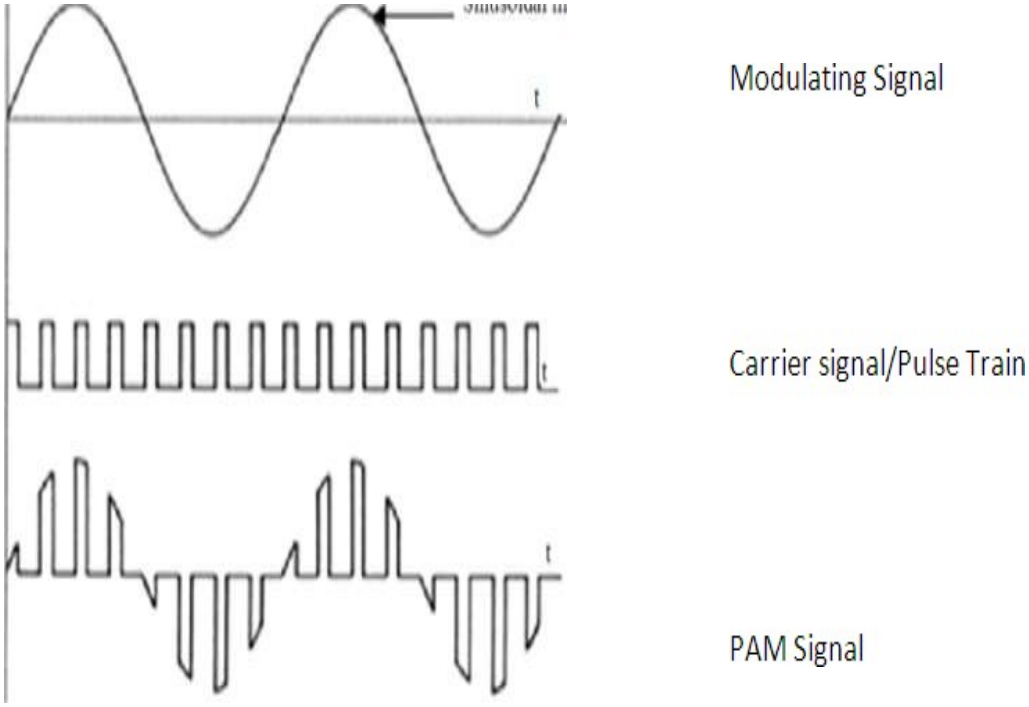
You will find the square wave output with frequency = 32KHz

6. Now observe the output waveform at post PAM output. You will find fantastic pattern of square wave whose amplitude (i.e. pulse height) is varying according to the sine wave input.
7. Now vary the frequency of input sine wave. You will notice that at the output. The frequency is changing, still the output is pulse amplitude modulated. Further, increase the input frequency and notice the change. Try to understand why such angles are occurring in output waveform.
8. Slightly unscrew the cap of IR LED SFH 450V on kit 1. Do not remove the cap from the connector. Once the cap is loosened, insert the fiber into the cap and assure that the fiber is properly fixed. Now tighten the cap by screwing it back. Similarly connect the other end of fiber to detector SFH 250V on kit 2.
9. Connect output of PAM circuit at PAM output post to the AMP input post with the shorting links provided in kit 1.
10. Now establish the link between the posts marked as AMP output and transmitter input. Let the signal be transmitted through optical fiber. While doing this, please ensure that both the +9V posts are shorted by the shorting link.

11. Observe the output of the detector at detector output post in kit 2. Adjust the gain control pot P)below the power supply connector in kit 1 to obtain the same amplitude as the transmitted signal connect this output of receiver to the input of pulse amplitude demodulator circuit by shorting detector output post & PAM Input post in kit 2

12. Observe the output at PAM output in kit 2, You will receive the same sinewaveattheoutput.Inthiswaythesignalispulseamplitudemodulated,transmitted,received andagaindemodulatedsuccessfully.

Observations:



Result:

Conclusion