

Experiment No. – 5				
Date of Performance:	9/10/25			
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Program Execution/ formation/ correction/ ethical practices (06)	Timely Submission (01)	Viva (03)	Experiment Total (10)	Sign with Date

Experiment No: 5

Aim: To study Amplitude Shift Keying technique and plot the modulated and demodulated waveforms

Course Outcome: Acquire knowledge about digital modulation systems.

Learning Objective: To discuss the basic concepts of digital amplitude modulation systems

Requirement: ASK trainer kit, DSO, Connecting wires.

Theory:

BASK is a digital carrier technique. In this technique the digital signal is used to change the amplitude of the carrier sinusoidal wave. When the digital signal is at '1', the output has some fixed amplitude and when the digital signal is at '0', the output has zero amplitude. Hence the modulated carrier shifts between amplitude 0 and 1 depending on the digital signals.

The technique is also known as on-off keying due to the nature of the modulated output. The general equation for the modulated output is,

$$E_c(t) = A \sin(\omega_c t + \phi) \quad \text{.....for binary 1}$$

$$= 0 \quad \text{..... for binary 0}$$

Due to the on-off nature of the average received the power is $A/2$.

In the present circuit, NRZ data is used as a modulating signal and a locally generated carrier is used.

ASK Modulator: Balanced modulator is used to generate ASK signals. Digital data and RF carrier is given as input to the balanced modulator. The output of the balanced modulator is amplified and available at the output terminal.

ASK Demodulator: Diode detector is used to demodulate the ASK signal. It works as an envelope detector circuit. The low pass filter at the output reduces the carrier frequency ripple in the output. Smooth demodulated signal is available at the output of data squarer.

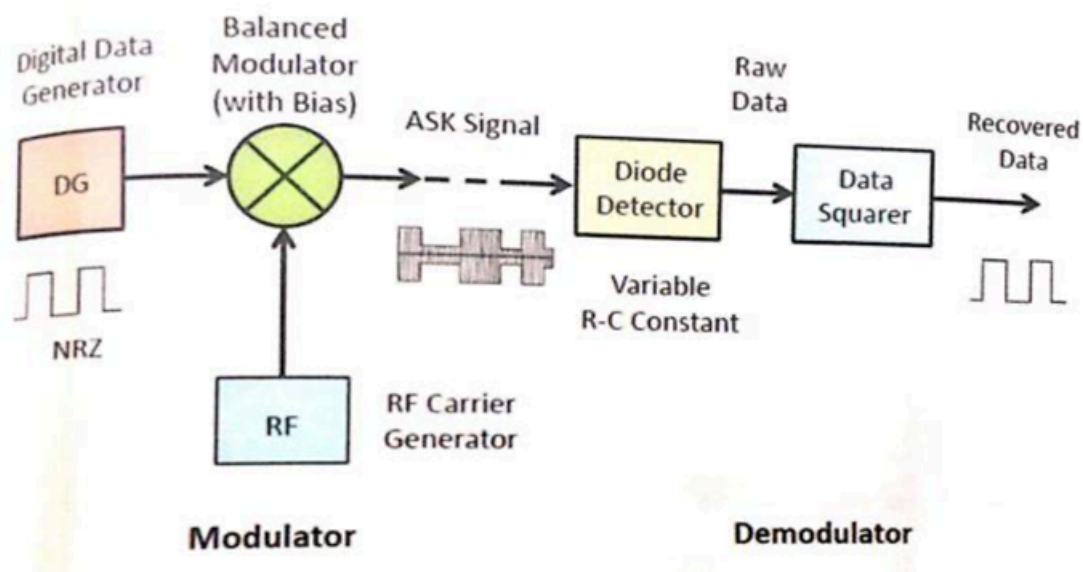


Figure 1: Block diagram of ASK modulation/Demodulation

Waveforms

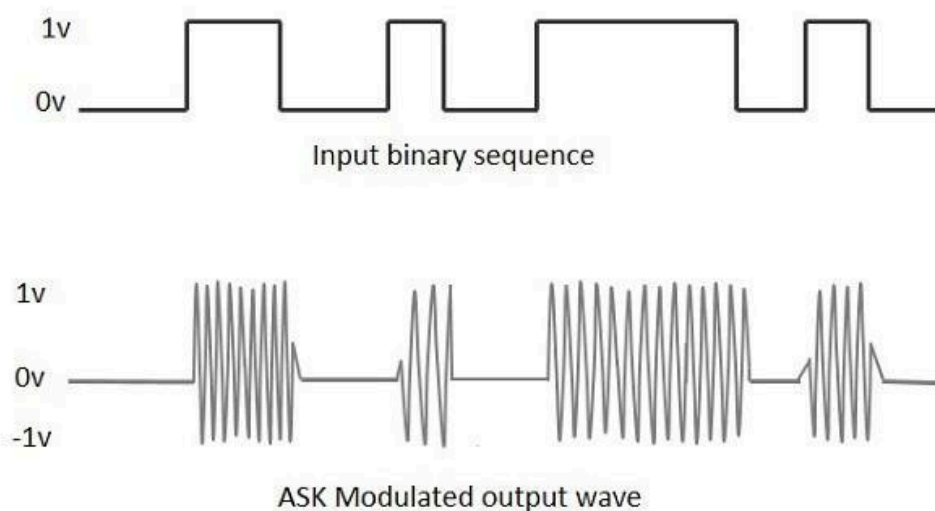
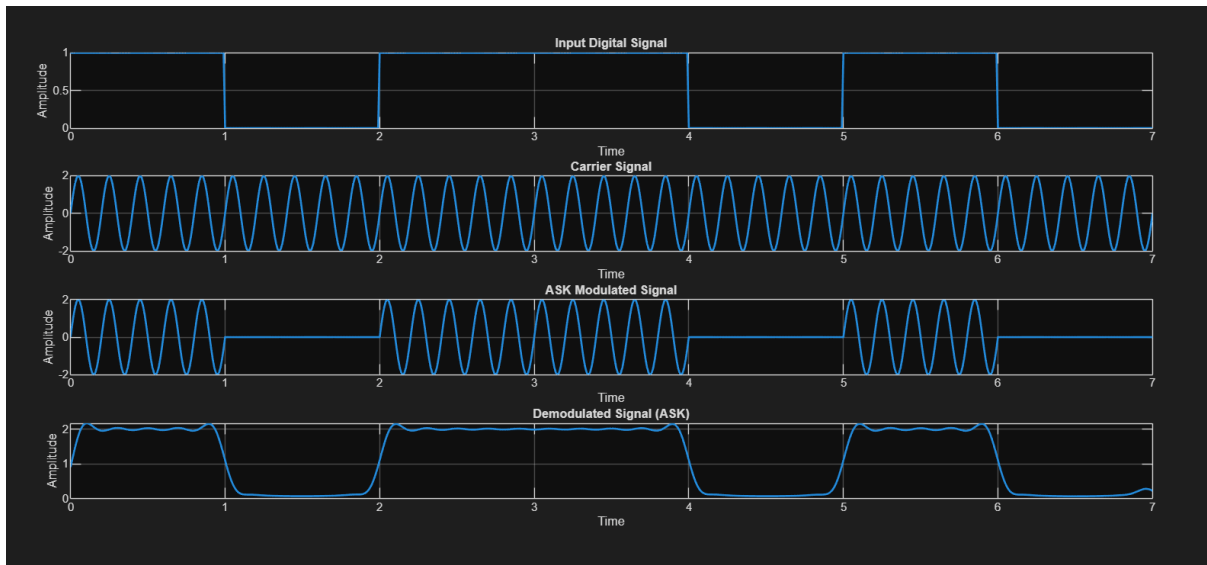


Figure 2: Typical waveforms of ASK modulation

Procedure:

1. Design the circuit as shown in the diagram.
2. Connect DSO to output terminal of ASK output signal.
3. Observe the modulating, carrier and ASK waveforms.



Conclusion:

Amplitude Shift Keying (ASK) was successfully simulated using MATLAB. The modulated and demodulated waveforms were plotted and verified that the carrier amplitude varies according to the digital input signal.