

EXPERIMENT 7c

AIM: To study Binary Phase Shift Keying (BPSK) Modulation.

APPARATUS: MATLAB Simulink.

BLOCK DIAGRAM:

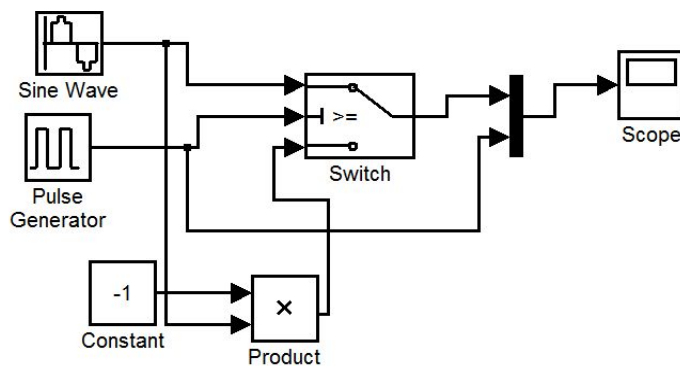


Fig.1: Block Diagram of BPSK Modulator in Simulink MATLAB

THEORY:

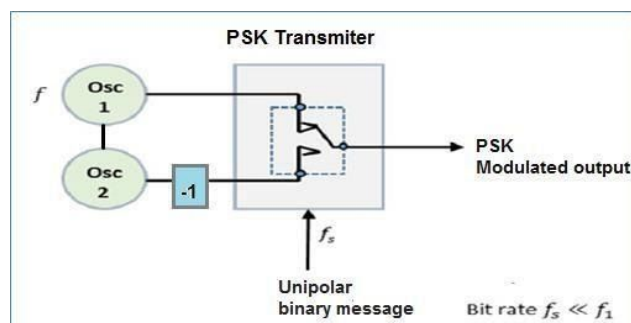


Fig.2: Basic principle of BPSK modulator block

BPSK is a digital modulation scheme which is analogous to phase modulation. Binary Phase Shift Keying (BPSK) is the simplest form of PSK. In binary phase shift keying two output phases are possible for a single carrier frequency one of phase represent logic 1 and logic 0. As the input digital binary signal change state the phase of output carrier shift two angles that are 180° out of phase.

Here input bit stream is unipolar, so instead of multiplication technique use discrete frequency changes technique same as FSK. But here both frequency carrier sources are same but one of it multiplied with -1. If the incoming bit is 1, a signal with frequency f is sent for the duration of the bit & so no phase shift or 0° phase shift. If the bit is 0 then same frequency of carrier signal is sent but first it multiply with -1 so that get 180° phase shift at output.

WAVE FORM

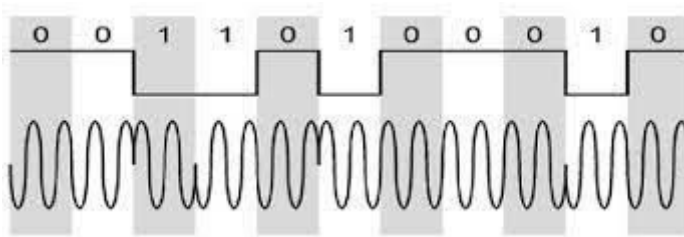


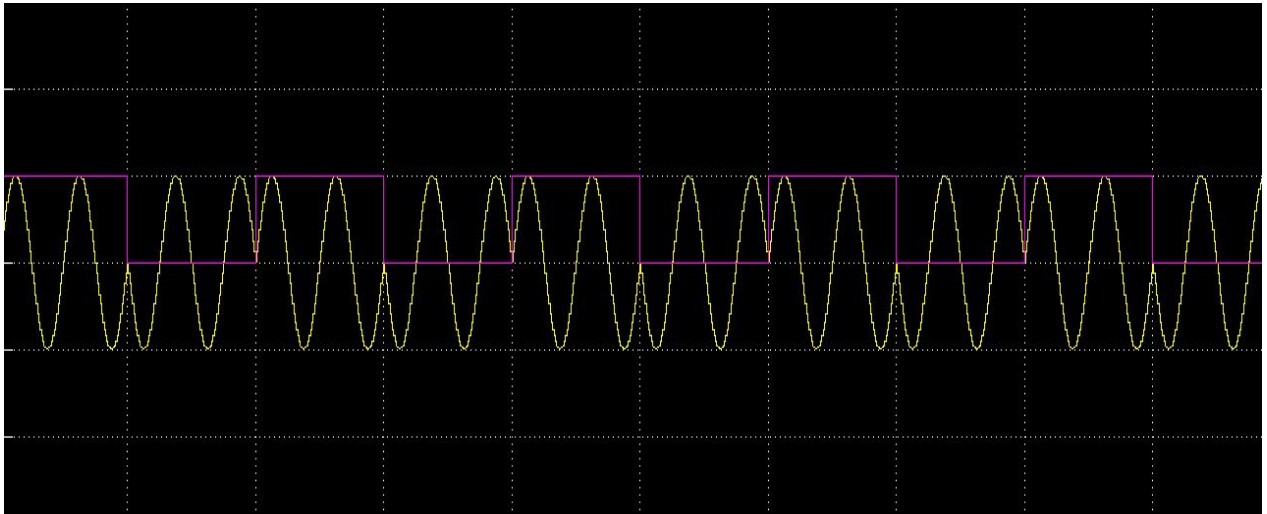
Fig.3: Waveform of BPSK Modulator

First waveform is Digital bit stream according to it switching process will be proceed. Second is BPSK modulation wave, here when input bit stream is 1 then get direct signal wave at output without shifting. But when 0 is come then carrier signal multiply with -1 so that whatever amplitude of carrier signal has that reverse its value; and output of such signal shows 180° phase shifted. So when input 1 then output is 0° shifted and 0 then 180° shifted.

PROCEDURE:

Modulation:

1. Connect all the blocks in Simulink according to given steps.(Which is given in PSK_designingStep document).
2. After designing entire diagram click on RUN.
3. Observe the waveforms at output of modulator using virtual scope.

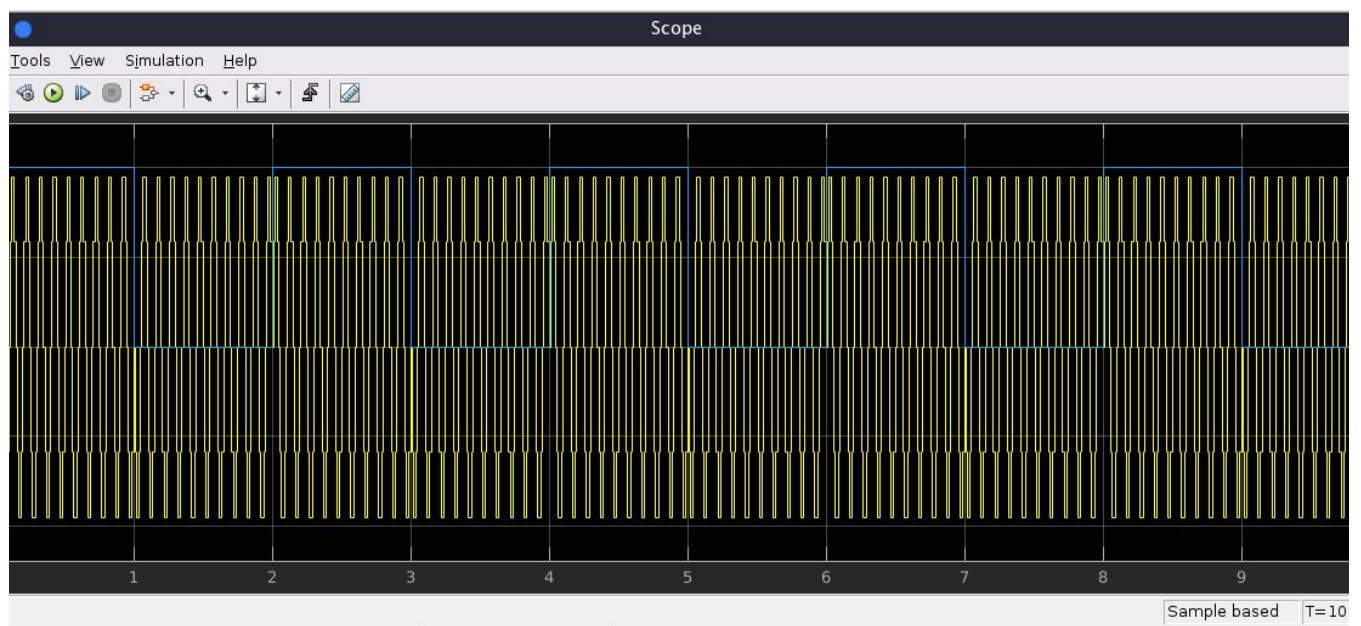


OBSERVATION TABLE:

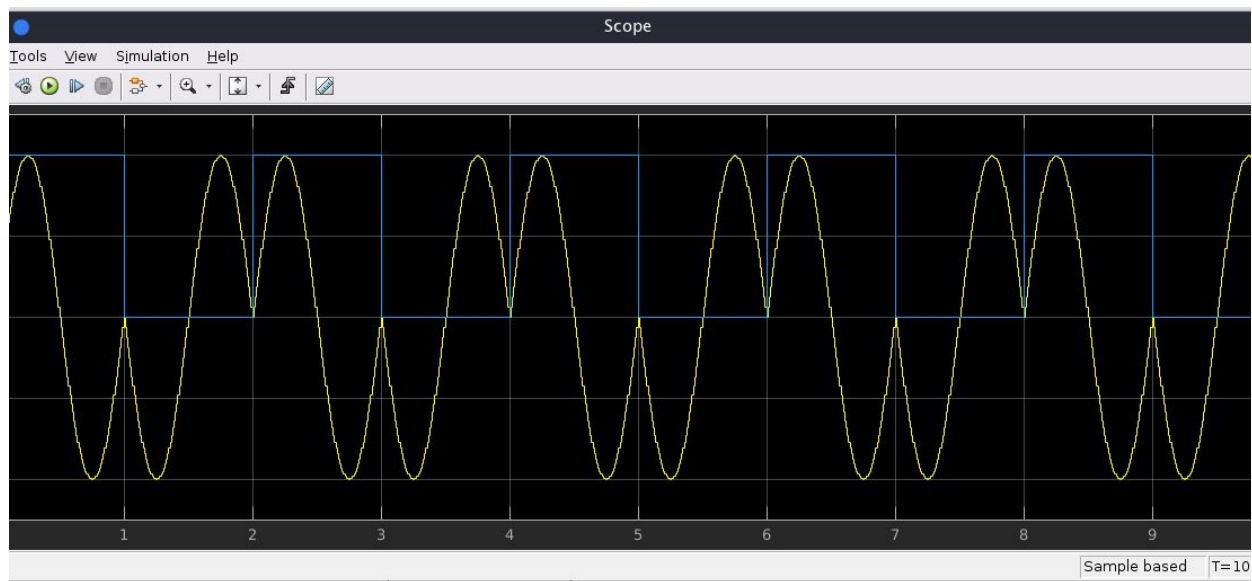
To observe waveform in Simulink by selecting different frequencies as per given Table.

Frequency
10Hz
1Hz
2Hz

RESULT:



Simulink Waveform of BPSK Modulator for 10Hz frequency



Simulink Waveform of BPSK Modulator for 1Hz frequency

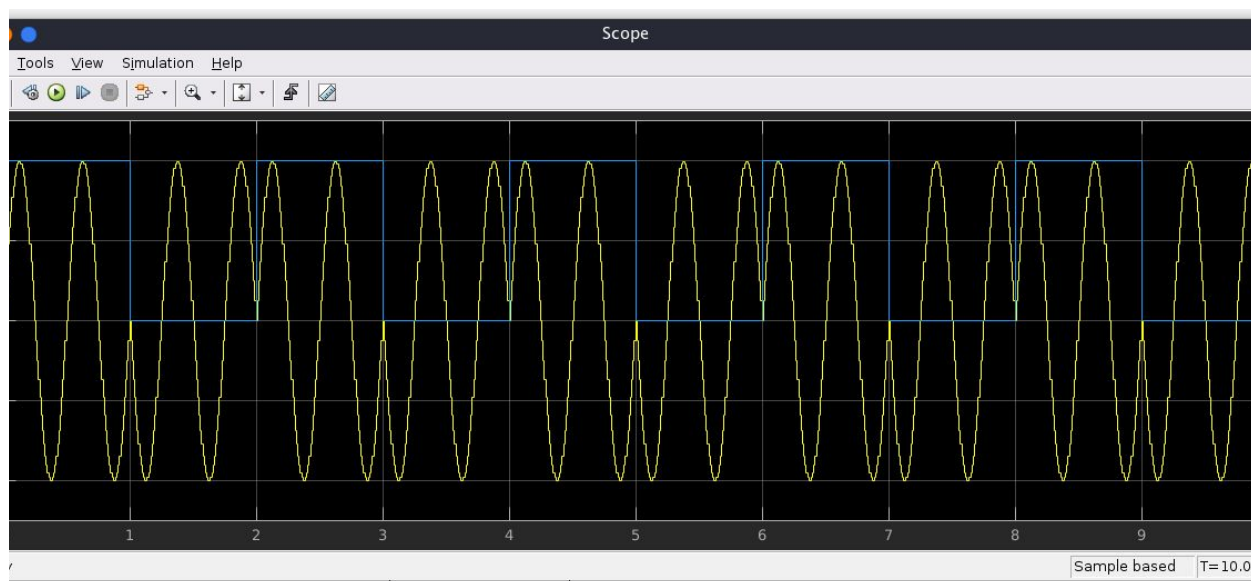


Fig.4: Simulink Waveform of BPSK Modulator for 2Hz frequency

CONCLUSION:

In this experiment we performed Binary phase shift keying(BPSK) modulation using MATLAB simulink for various frequencies.

Remarks:

Signature: