

# EXPERIMENT

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

**APPARATUS:** MATLAB Simulink.

**BLOCK DIAGRAM:**

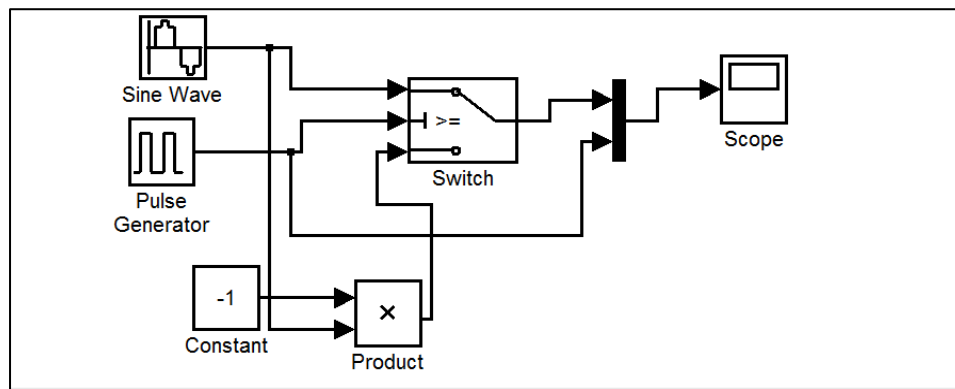


Fig.1: Block Diagram of BPSK Modulator in Simulink MATLAB

**THEORY:**

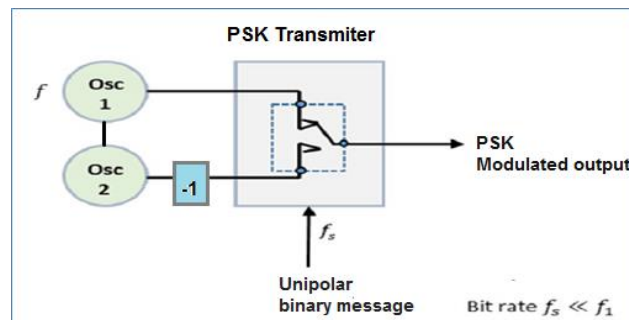
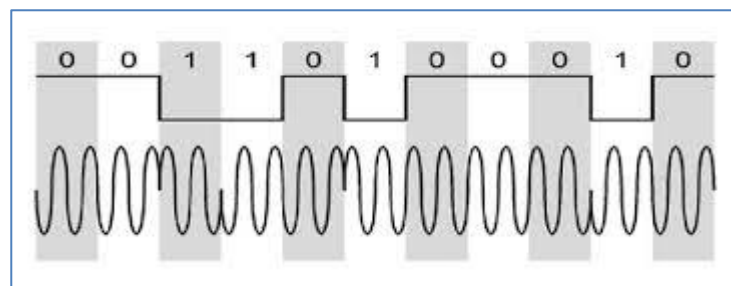


Fig.2: Basic principle of BPSK modulator block

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 out of phase represents logic 1 and logic 0. As the input digital binary signal changes state the phase of the output carrier shifts two angles that are  $180^\circ$  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  $0^\circ$  phase shift. If the bit is 0 then same frequency of carrier signal is sent but first it multiply with -1 so that get  $180^\circ$  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  $180^\circ$  phase shifted. So when input 1 then output is  $0^\circ$  shifted and 0 then  $180^\circ$  shifted.

## PROCEDURE:

### Modulation:

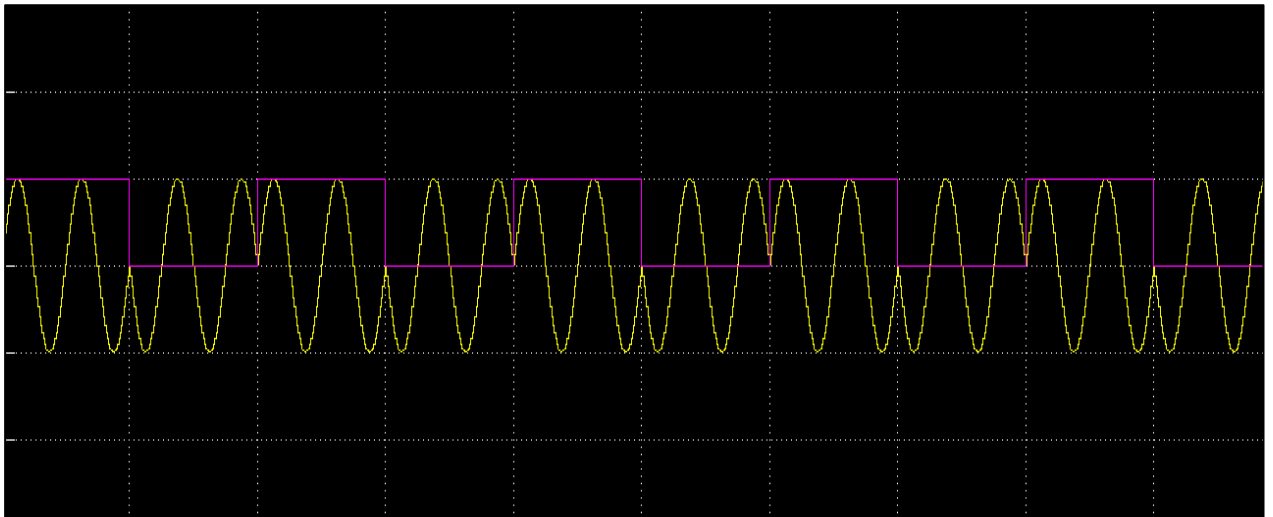
1. Connect all the blocks in Simulink according to given steps.(Which is given in PSK\_designingStep document).
2. After designing entire diagram click on RUN.
3. Observe the waveforms at output of modulator using virtual scope.

## OBSERVATION TABLE:

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

Frequency
100Hz
1KHz
2KHz

## RESULT:



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

## CONCLUSION: