BMS INSTITUTE OF TECHNOLOGY & MANAGEMENT

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DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

Academic Year 2023-24

REPORT

On

"BFSK MODULATION AND DEMODULATION USING SIMULINK"

Submitted By

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Course: Digital Communication

Course Code: 18EC61

Under the guidance of

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INTRODUCTION

- Binary Frequency Shift Keying (BFSK) is a type of digital modulation technique in which we are sending one bit per symbol i.e., '0' or a '1'.
- Hence, the bit rate and symbol rate are the same.
- In BFSK, the information is encoded in the variation of the frequency of the carrier.
- We represent '0' by carrier frequency f1 and '1' by carrier frequency f2.
- For example, we can have the following transmitted band-pass symbols:

$$S_1 = \sqrt{\frac{2E}{T}}\cos(2\pi f_1 t) \rightarrow represents\ '0'$$

$$S_2 = \sqrt{\frac{2E}{T}}\cos(2\pi f_2 t) \rightarrow represents\ '1'$$

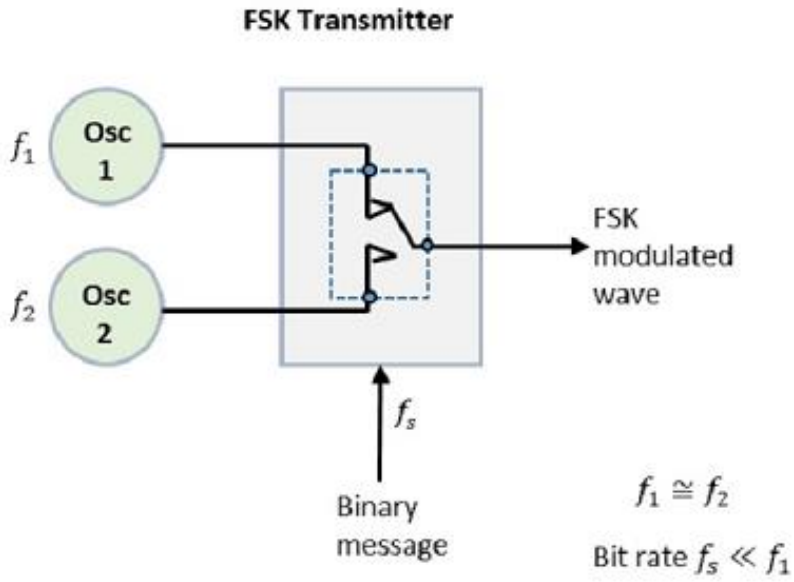
- Where 'E' is the symbol energy, 'T' is the symbol time period.
  Using Gram-schmidt orthogonalization, we get a two orthonormal basis function given as:

$$\psi_1 = \sqrt{\frac{2}{T}}\cos(2\pi f_1 t)$$

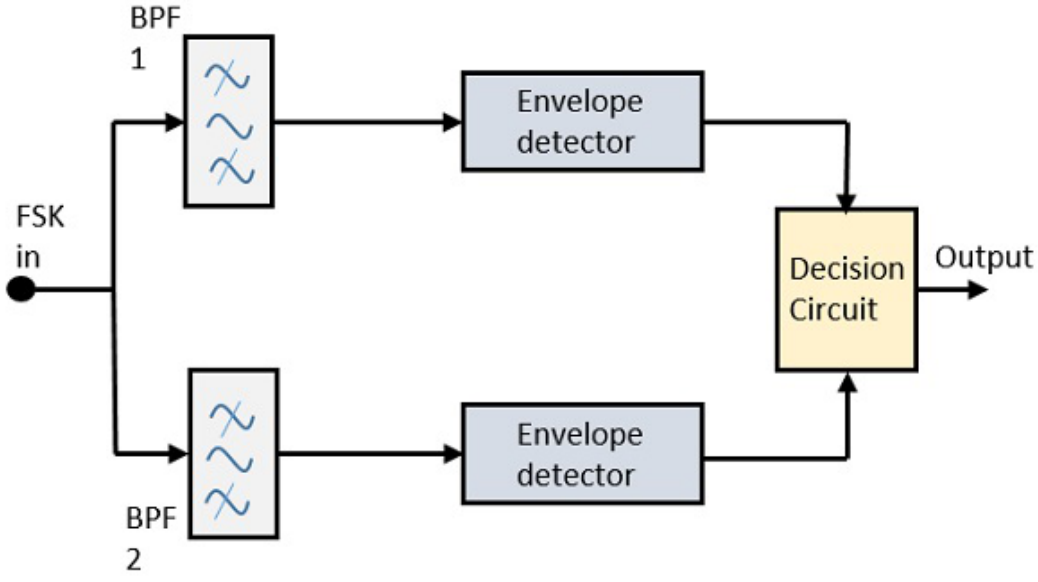
$$\psi_2 = \sqrt{\frac{2}{T}}\cos(2\pi f_2 t)$$

BLOCK DIAGRAM

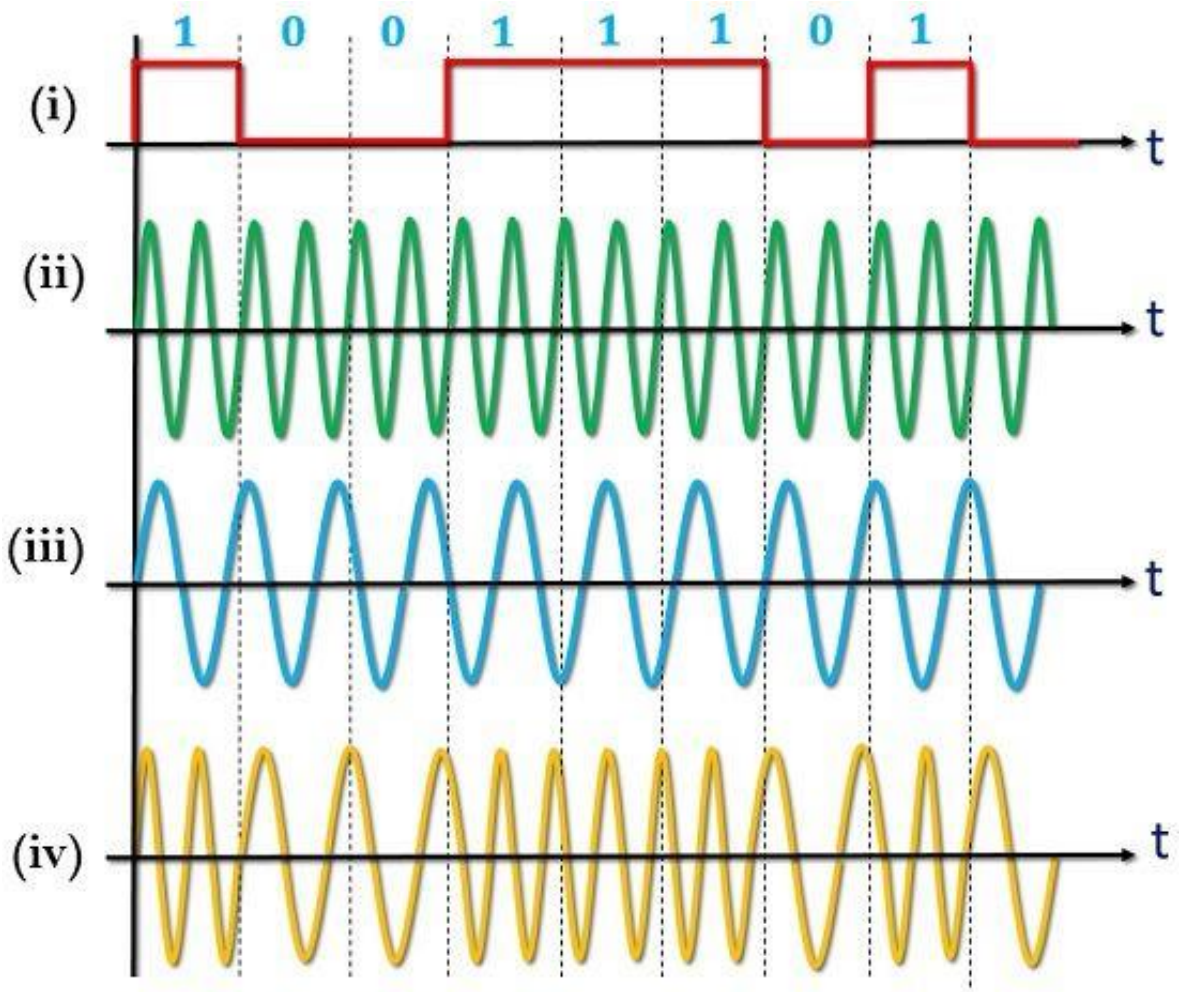
Modulator



Demodulator

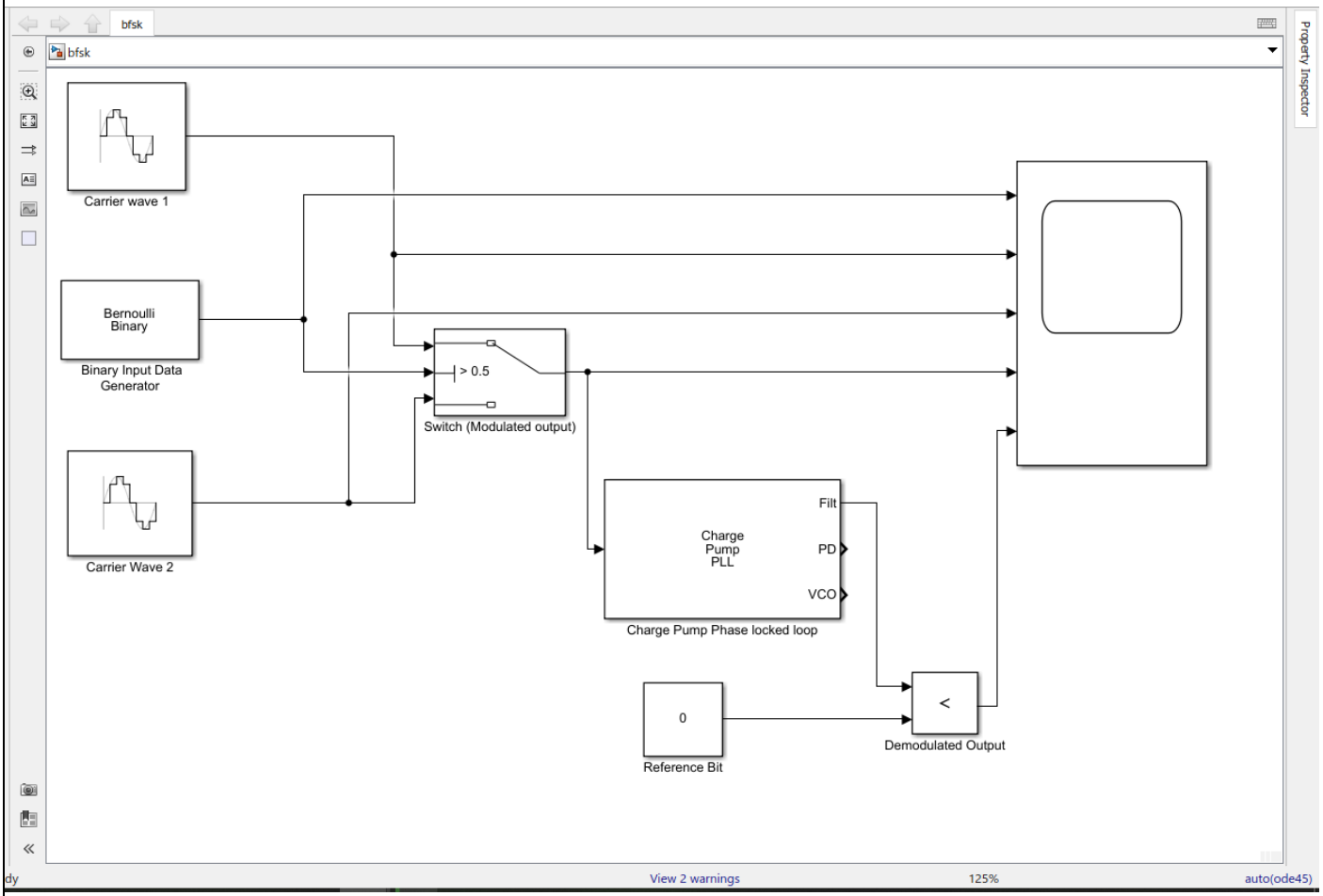


WAVEFORMS



(i) Digital bitstream
(ii) High frequency carrier wave
(iii) Low frequency carrier wave
(iv) FSK modulated wave

SIMULINK MODEL



SIMULINK WAVEFORMS