

AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH



Course: DATA COMMUNICATION
Session: Fall 2022-2023

Experiment No: 06

Experiment Title: Study of Digital to Analog Conversion
using MATLAB

Section: I
Group No: 07

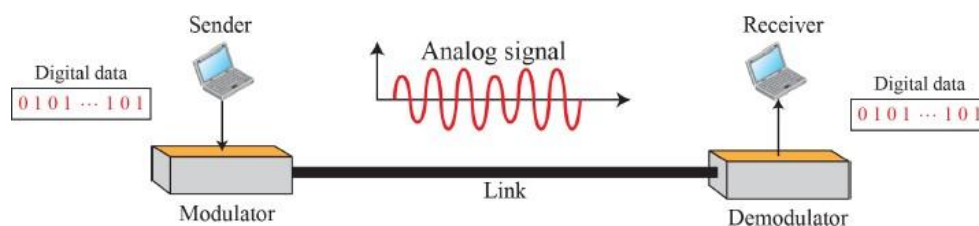
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Abstract:

This experiment is designed to understand the use of MATLAB for solving communication engineering problems and to develop an understanding of Digital to Analog conversion using MATLAB.

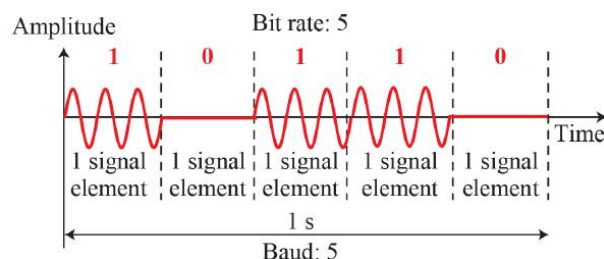
Introduction:

DIGITAL TO ANALOG CONVERSION: Digital to analog conversion is the process of changing one of the characteristics of an analog signal based on the information in digital data. Figure below shows the relationship between the digital information, the digital-to-analog modulating process, and the resultant analog signal.

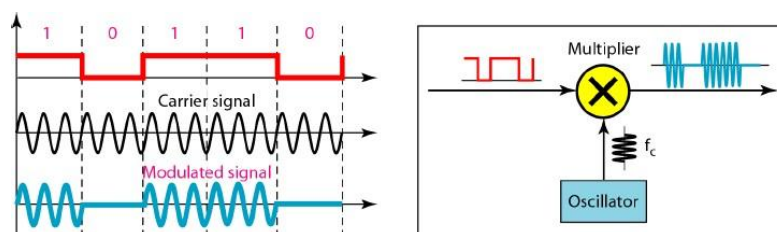


ASK: In amplitude shift keying, the amplitude of the carrier signal is varied to create signal elements. Both frequency and phase remain constant while the amplitude changes.

Binary amplitude shift keying

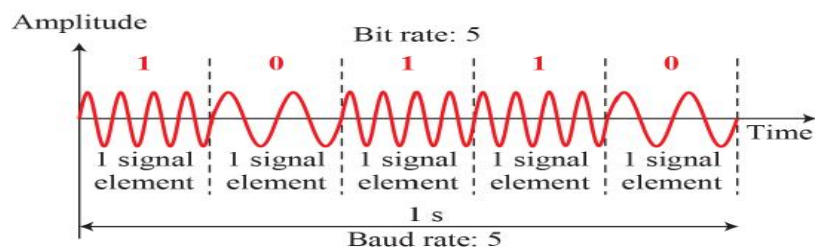


Implementation of binary ASK:



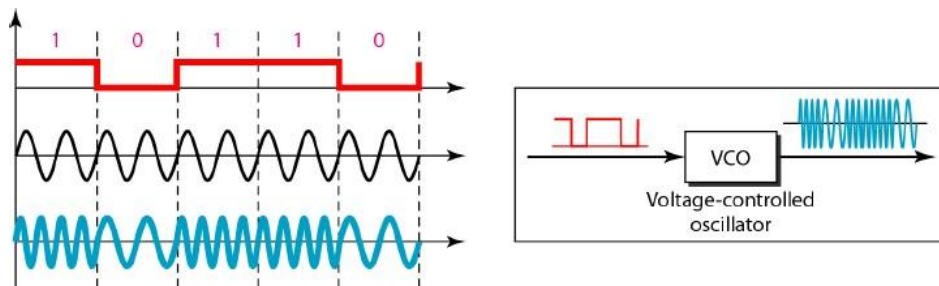
FSK: In frequency shift keying, the frequency of the carrier signal is varied to represent data. The frequency of the modulated signal is constant for the duration of one signal element, but changes for the next signal element if the data element changes. Both peak amplitude and

Binary frequency shift keying



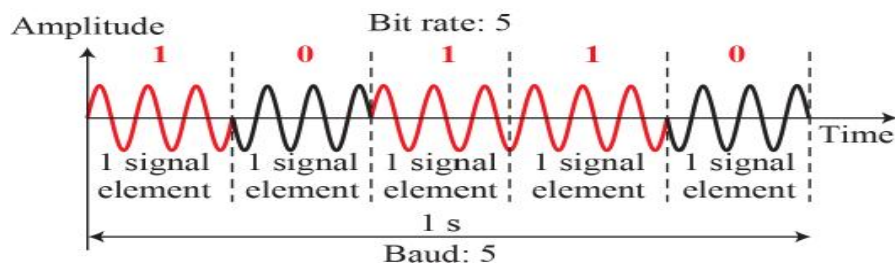
phase remain constant for all signal elements

Implementation of BFSK:

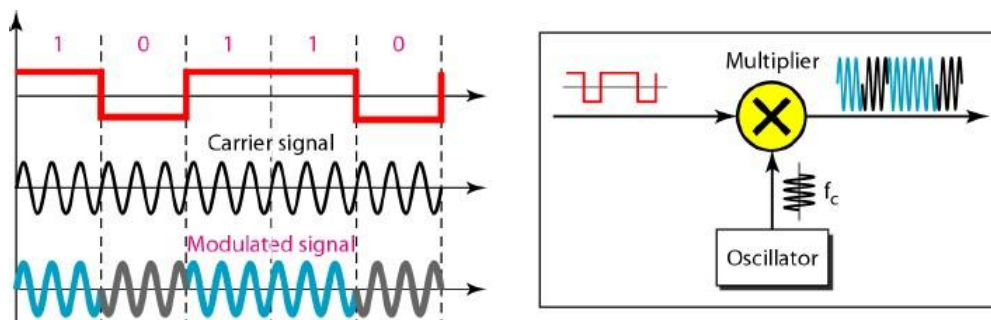


PSK: In phase shift keying, the phase of the carrier is varied to represent two or more different signal elements Both peak amplitude and frequency remain constant as the phase changes Today, PSK is more common than ASK or FSK. However, we will see shortly that QAM, which combines ASK and PSK, is the dominant method of digital-to-analog modulation.

Binary phase shift keying



Implementation of BPSK



Results:

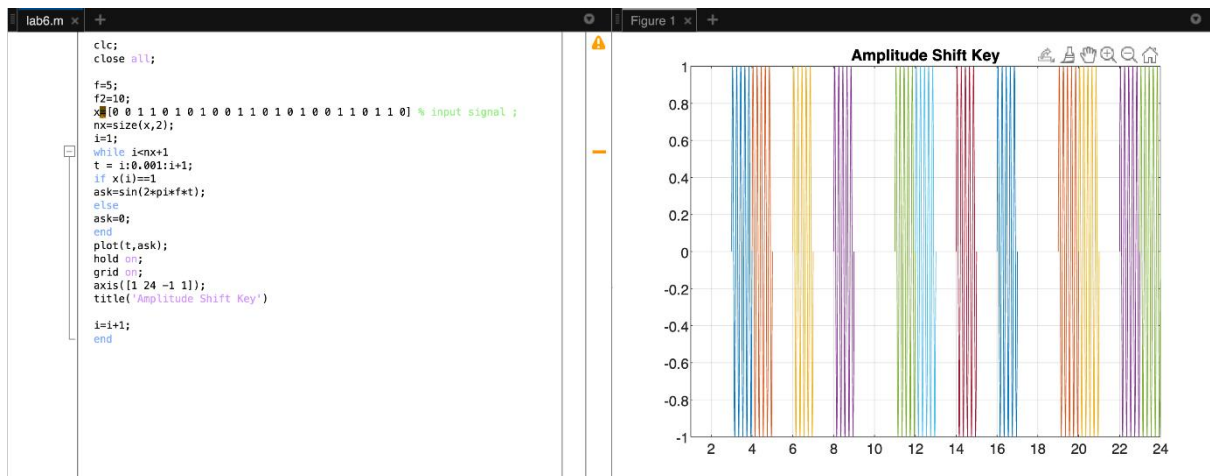


Figure: ASK

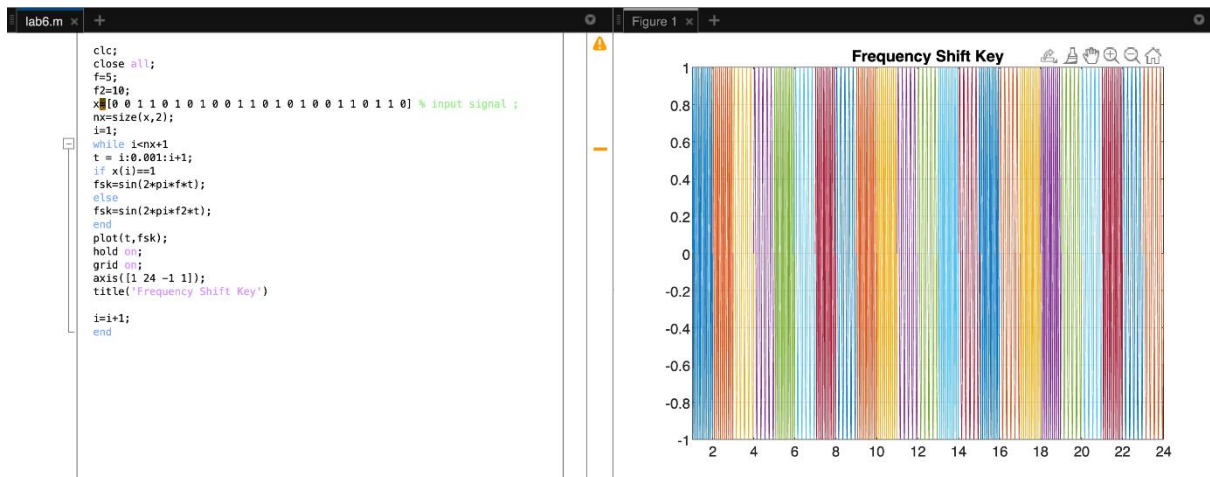


Figure: FSK

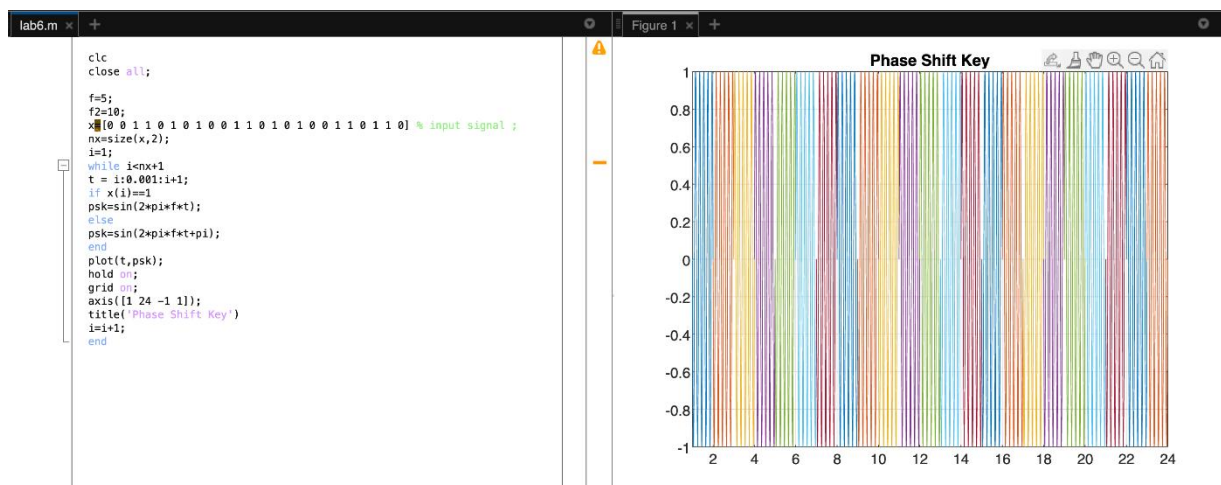


Figure: PSK

Discussion and Conclusion:

MATLAB was used in this experiment to solve communication engineering problems and also to understand solving communication engineering problems. In this experiment, we use ASK, FSK, and PSK to convert the bit stream to an analog signal. While working on this experiment, some grammatical errors occurred. Expect that everything will be in its proper place and that absolute value show up.

References:

1. Forouzan, B. A. "Data Communications and Networking", 4th edition.
2. Agarwal, Rajneesh "Data Communication and Computer Networks."
3. Prakash C. Gupta, "Data communications", Prentice Hall India Pvt.