Analog Modulation

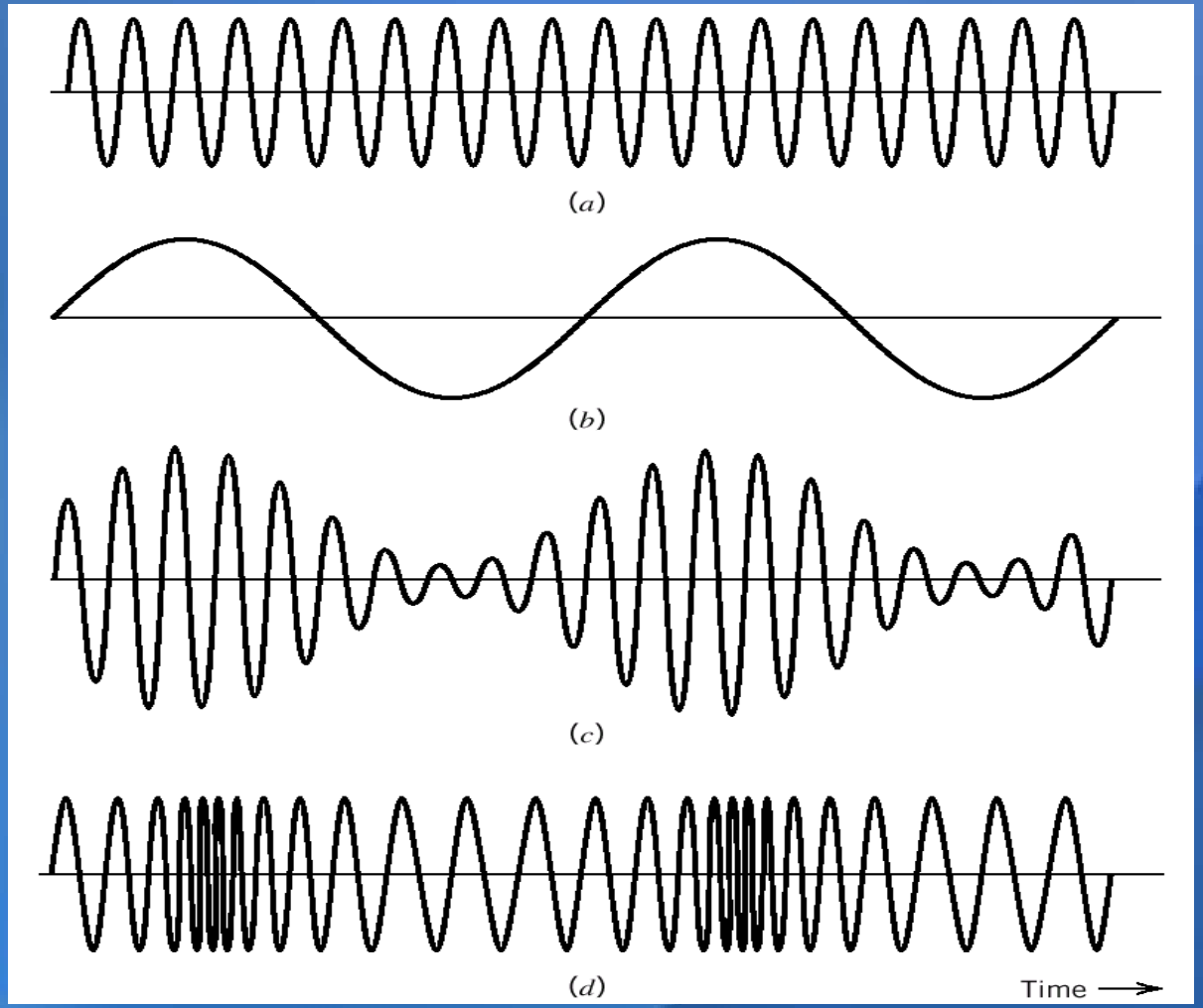
Carrier Signal

$$c(t) = A\cos(2\pi f t + \theta)$$

Message Signal

Amplitude Modulation (AM)

Frequency Modulation (FM)



Binary Digital Modulation

Tx Bits: 1 0 1 1 0 1

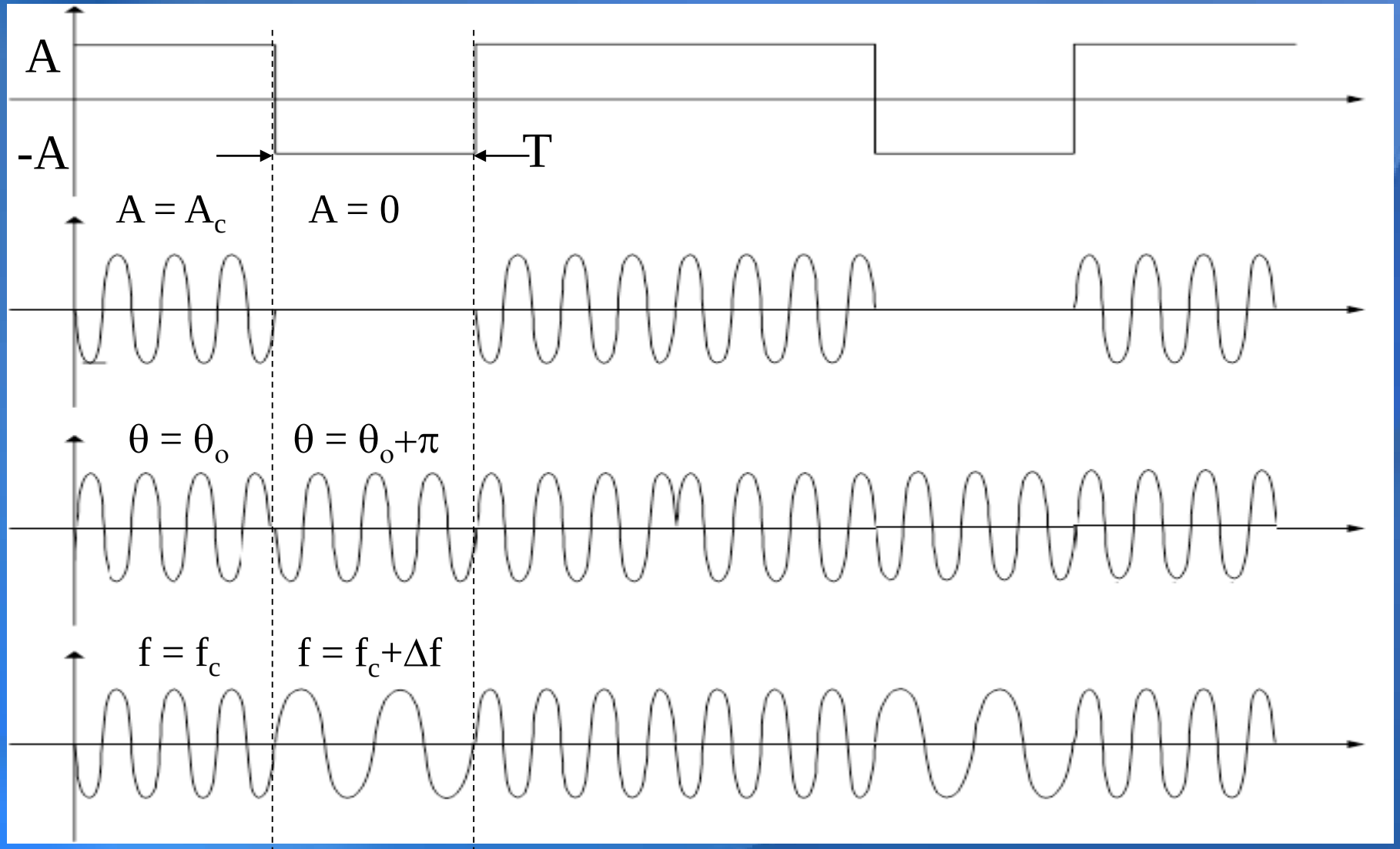
Baseband Signal

$$c(t) = A\cos(2\pi f t + \theta)$$

ASK

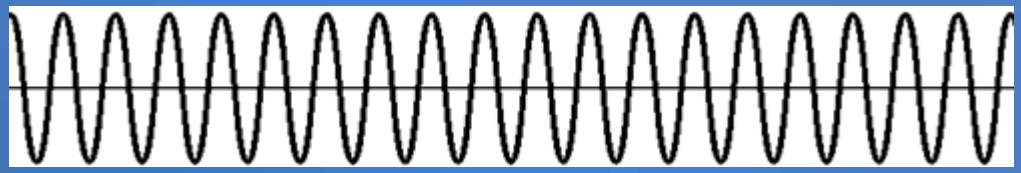
PSK

FSK



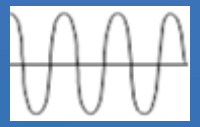
BPSK

Carrier Signal $c(t) = A\cos(2\pi f t - \theta)$

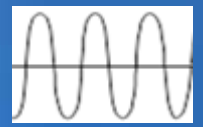


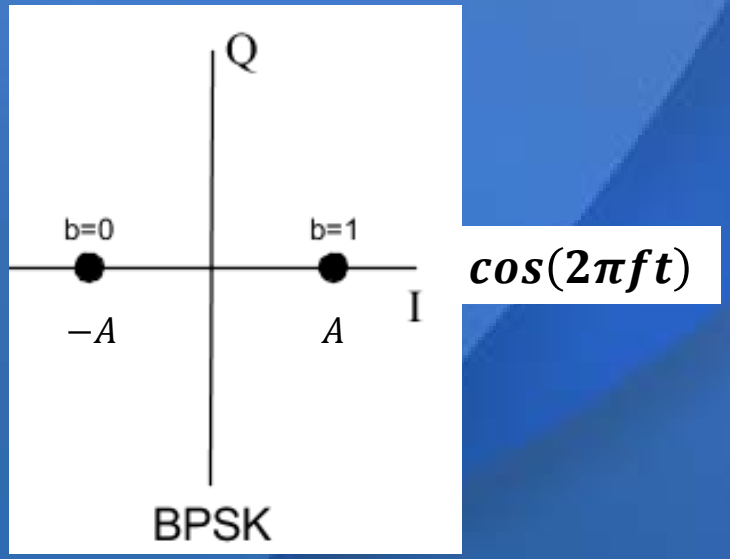
BPSK:

Bit 1: $c(t) = A\cos(2\pi f t - 0) = A\cos(2\pi f t)$



Bit 0: $c(t) = A\cos(2\pi f t - \pi) = -A\cos(2\pi f t)$

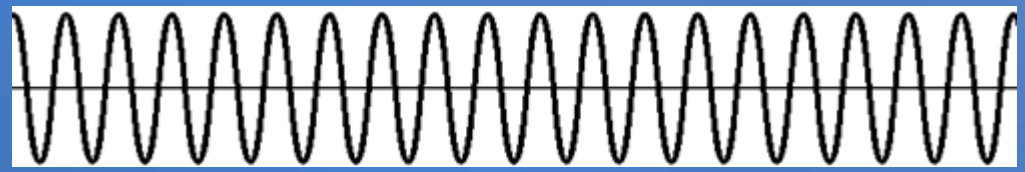




$\cos(2\pi f t)$

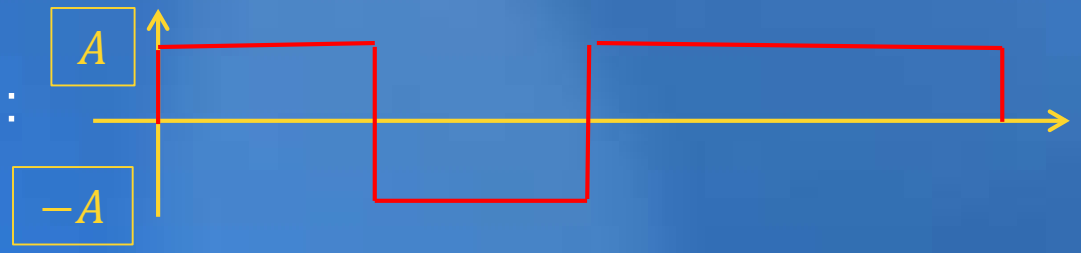
BPSK Implementation

Carrier Signal: $c(t) = A\cos(2\pi f t - \theta)$

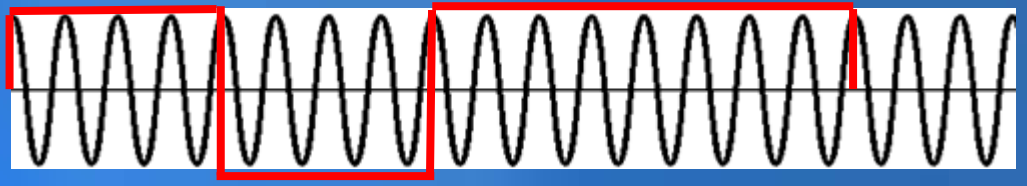


Binary Message: 1 0 1 1

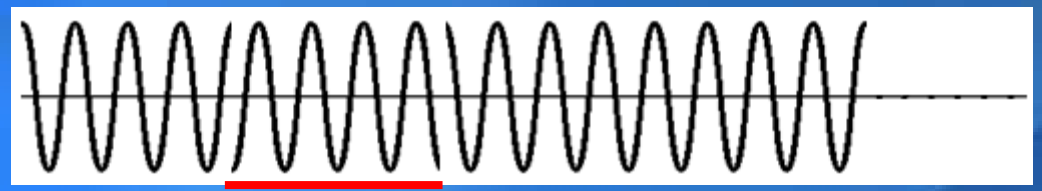
Baseband Signal:



Modulation:



Modulated Signal:



MATLAB Program