ASSIGNMENT 2: Amplitude Shift Keying

Amplitude Shift Keying

Amplitude Shift Keying (ASK) is similar to amplitude modulation and is a type of Digital Modulation.

- Depending on digital data (amplitude vs time), as carrier wave changes, it is denoted as either 1 or 0.
- Amplitude gets shifted and there is switching between 0 and 1 (which is referred to as Keying)
- Derivative of ASK is ON-OFF Keying

Problem Statement:

Write a MATLAB script to generate an ASK signal for the baseband digital data given below

Consider a sinusoidal carrier of

Q1. Vc*sin(2 * pi *2000* t)

Q2. (Vc/4)*sin(2 * pi *2000* t)

To represent '1' and '0' respectively.

0	0	1	0	1	1	0	1	0	0

MATLAB Script:

Q1.

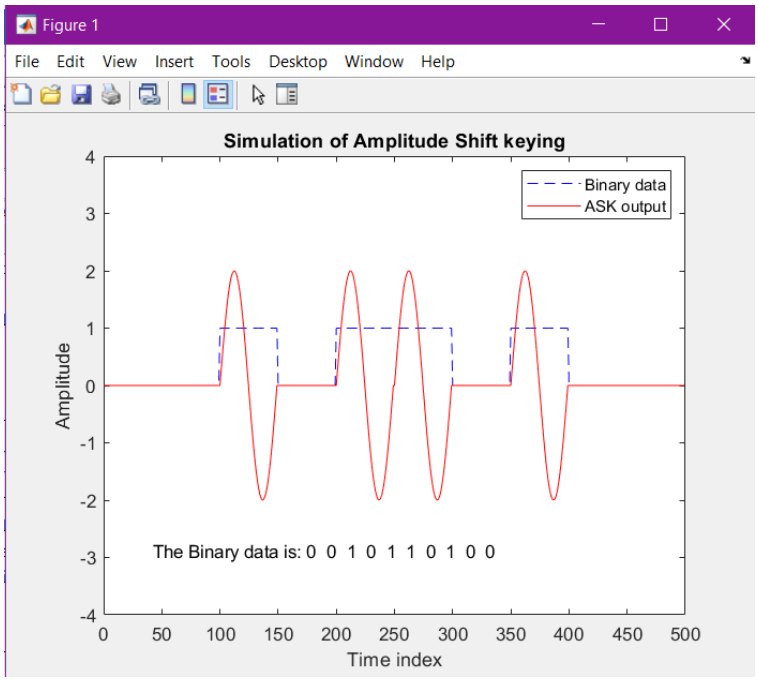
Editor - D:\College\MATLAB\Coms\ASKq1.m

ASKq1.m

```
%%% MATLAB script to simulate ASK :Qn 1
%%% Vc = 2
clear all; close all; clf;
Vc = 2;
fc = 2000;
t = linspace (0, 1/2000, 50);
ec = Vc * sin(2*pi*fc*t);
b = [0, 0, 1, 0, 1, 1, 0, 1, 0, 0];
n = ['The Binary data is: ',num2str(b)];
ask = []; bin = [];
for i = 1 : length(b)
    ask = [ask, b(i)*ec];
    bin = [bin, b(i)*ones(1,50)];
end

tm = [0 : length(ask)-1];
plot(tm, bin, 'b--'); axis([0 length(bin) 0 2]); hold on;
plot(tm, ask, 'r'); axis([0 length(tm) -4 4]); hold off;
xlabel('Time index'); ylabel('Amplitude');
legend('Binary data', 'ASK output');
title('Simulation of Amplitude Shift keying');
gtext(n); %Display the random binary string..
%%% end of simul
```

Output:



MATLAB Script:

Q2.

Editor - D:\College\MATLAB\Coms\ASKq2.m

ASKq2.m

```
%%% MATLAB script to simulate ASK :Qn 2
%%% Vc = 2
clear all; close all; clf;
Vc = 2;
fc = 2000;
t = linspace (0, 1/2000, 50);
ec = (Vc/4) * sin(2*pi*fc*t);
b = [0, 0, 1, 0, 1, 1, 0, 1, 0, 0];
n = ['The Binary data is: ',num2str(b)];
ask = []; bin = [];
for i = 1 : length(b)
    ask = [ask, b(i)*ec];
    bin = [bin, b(i)*ones(1,50)];
end

tm = [0 : length(ask)-1];
plot(tm, bin, 'b--'); axis([0 length(bin) 0 2]); hold on;
plot(tm, ask, 'r'); axis([0 length(tm) -2 2]); hold off;
xlabel('Time index'); ylabel('Amplitude');
legend('Binary data', 'ASK output');
title('Simulation of Amplitude Shift keying');
gtext(n); %Display the random binary string..
%%% end of simul
```

Output: