Introduction to Communication Systems

ASSIGNMENT 2
DIGITAL MODULATION

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Introduction

On–off keying (OOK) denotes the simplest form of amplitude-shift keying (ASK) modulation that represents digital data as the presence or absence of a carrier wave.

Presence of a carrier for a specific duration represents a binary one, while its absence for the same duration represents a binary zero.

On–off keying is most commonly used to transmit Morse code over radio frequencies

Assignment-II

Write a MATLAB script for Binary ON-OFF shift keying modulation.

- Consider the sinusoidal carrier frequency of 5KHz.
- An 8-bit random binary bit pattern as the base band modulating signal.
- Display the modulated signal and the information bit pattern

Formulas used

ec=sin(2*pi*fc*t)

b=mod(randperm(8),2)

```
for i=1:length(b)
    ook=[ook, b(i)*ec];
    bin=[bin, b(i)*ones(1,50)];
end
```

Code

```
clear all;
clf;
fc=5000;
t=linspace(0,1/5000,50);
ec=sin(2*pi*fc*t);
b=mod(randperm(8),2)
n=['The binary data is\t' num2str(b)];
nl=num2str(b)
ook=[];
bin=[];
for i=1:length(b)
    ook=[ook, b(i)*ec];
    bin=[bin, b(i)*ones(1,50)];
end
tm=[0:length(ook)-1];
plot(tm,bin,'b--');
axis([-5 length(bin)+10 0 2]);
hold on;
plot(tm,ook,'r');
axis([-5 length(tm)+10 -2 2]);
text(150,-1.5,nl);
hold off;
xlabel('Time index');
ylabel('Amplitude');

legend('Random binary','OOK output');
title('Simulation of On-Off keying');

```

Output

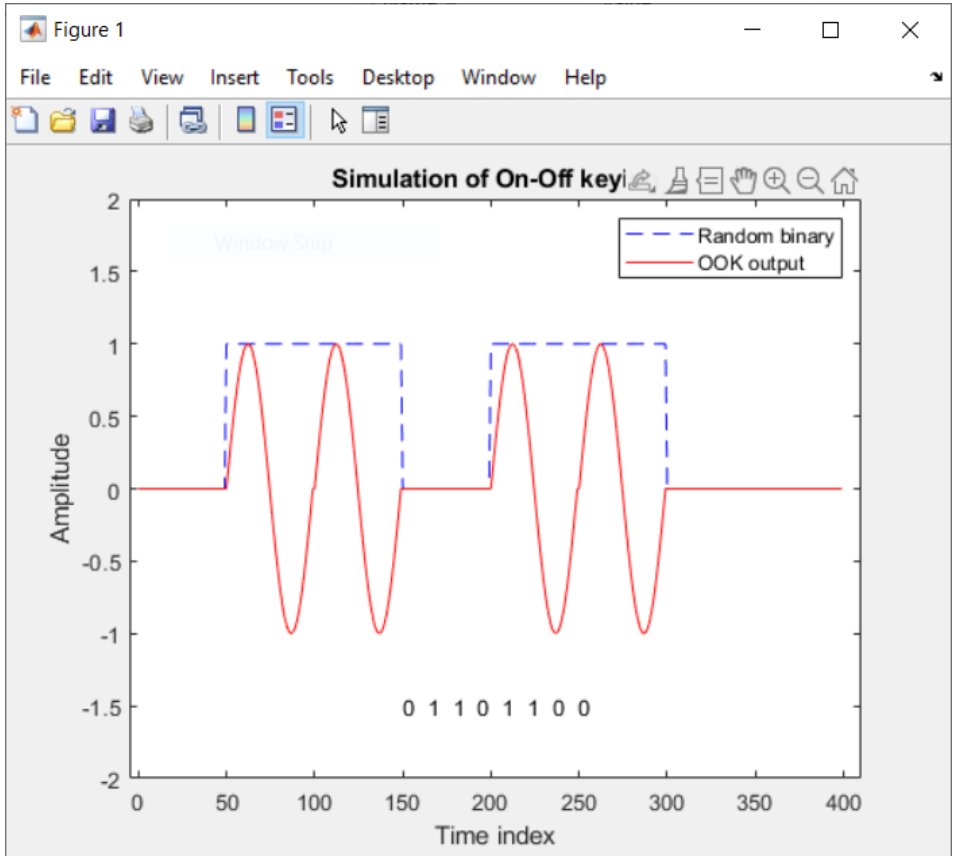
Figure 1
File Edit View Insert Tools Desktop Window Help
Simulation of On-Off key
Random binary
OOK output
Amplitude
Time index
0 1 1 0 1 1 0 0
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
50
100
150
200
250
300
350
400