

Experiment–2

Aim:	
To study the working of DBSC modulator and demodulator	
Description:	
MATLAB software with essential configurations.	
Theory:	
DBSC modulation involves modulating a carrier signal with both upper and lower sidebands containing the message signal, followed by the suppression of one sideband and the carrier itself. At the receiver, the carrier is recovered, and the appropriate sideband is selected for demodulation. This technique optimizes bandwidth usage and spectral efficiency in communication systems, reducing interference and improving signal quality. Overall, DBSC modulation and demodulation offer a streamlined approach to transmitting information effectively while conserving valuable frequency spectrum resources.	
Code:	
1	<i>%program for dsbsc modulation and demodulation</i>
2	close all;
3	clear all;
4	clc;
5	
6	t = 0:0.000001:0.001;
7	Vm = 1;
8	Vc = 1;
9	fm = 2000;
10	fc = 50000;
11	
12	m_t = Vm * sin(2 * pi * fm * t);
13	subplot(4,1,1);
14	plot(t, m_t);
15	title('Message Signal m_t');
16	xlabel('Time (s)');
17	ylabel('Amplitude');
18	
19	c_t = Vc * sin(2 * pi * fc * t);
20	subplot(4,1,2);
21	plot(t, c_t);
22	title('Carrier Signal c_t');
23	xlabel('Time (s)');
24	ylabel('Amplitude');
25	
26	subplot(4,1,3);
27	s_t = m_t .* c_t;
28	hold on;

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29 plot(t, s_t);
30 plot(t,m_t, 'r:');
31 plot(t,-m_t, 'r:');
32 hold off;
33 title('DSB-SC Signal s_t');
34 xlabel('Time (s)');
35 ylabel('Amplitude');
36
37 r_t = s_t .* c_t;
38
39 [b, a] = butter(1, 0.01);
40 mr = filter(b, a, r_t);
41 subplot(4,1,4);
42 plot(t, mr);
43 title('Recovered Message Signal');
44 xlabel('Time (s)');
45 ylabel('Amplitude');
46 sgtitle('Sujal Singh (04119051723)')

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Output:

