Faculty of Engineering & Technology Electrical & Computer Engineering Department

Communications Lab - ENEE4103

Pre-Lab #1

Experiment NO. 1: AM and DSB-SC Modulation and Demodulation

Prepared by:

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Instructor: Dr. Alhareth Zyoud

Teacher Assistant: Eng. Shadi Bannoura

Section: 4

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prelab 1			grade	out of
block diagram	modulation		0.5	1
	demodulation	coherent	0.75	1
		envelope	0.75	1
graphs/results	message m(t)	t and f	0.75	1
	carrier c(t)	t and f	0.75	1
	s(t)	μ=1 t and f	1	1
		μ>1 t and f	0.5	1
		μ<1 t and f	1	1
	m'(t)	coherent t and f	1	1
		envelope t and f	1	1
			8	10

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1. Double-side Band Modulation and Demodulation:

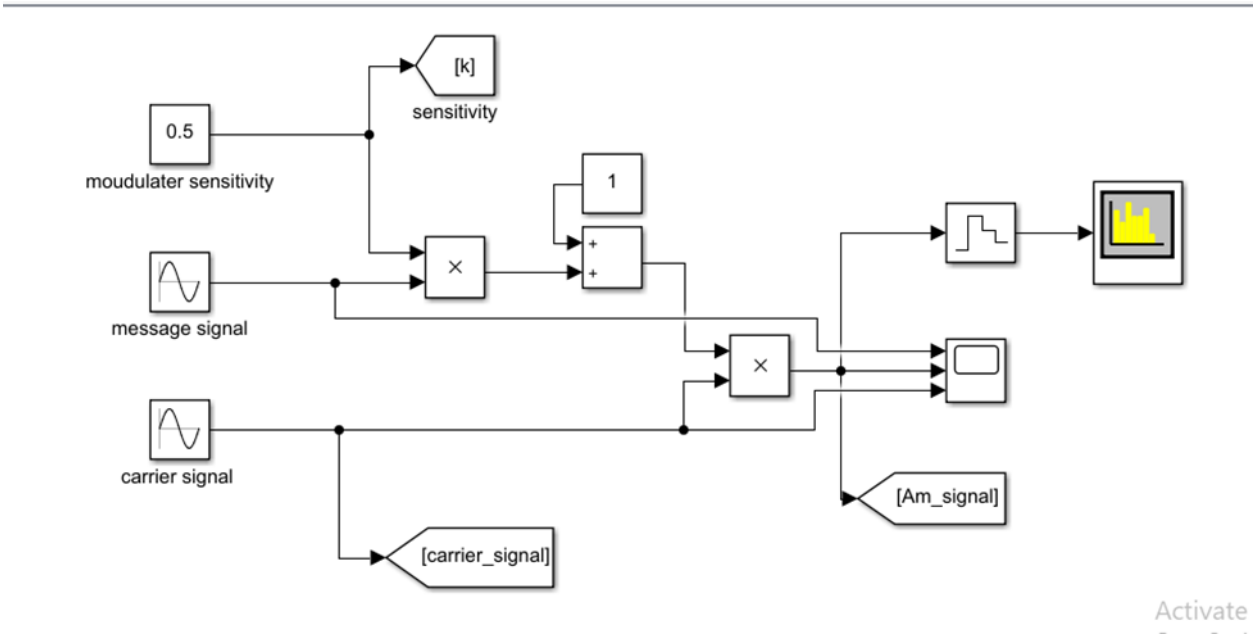


Figure 1.1: Modulator Block Diagram

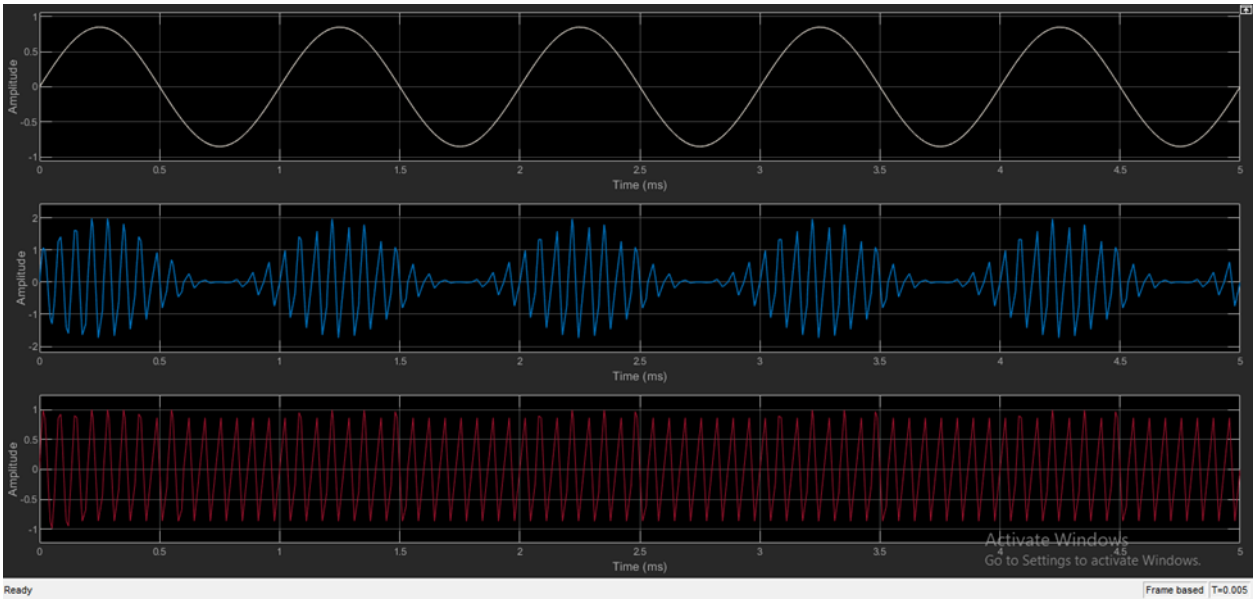


Figure 1.2: Modulator Output in the time domain

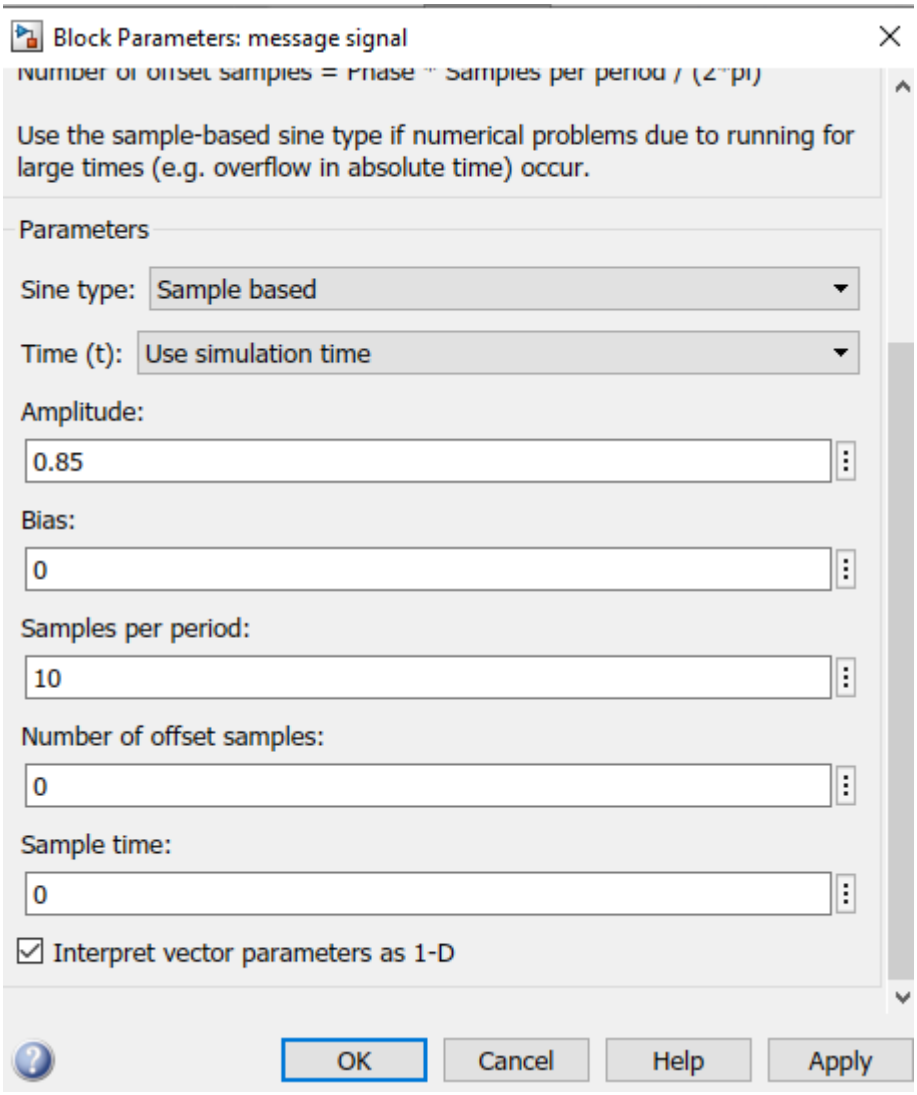


Figure 1.3: Message setting

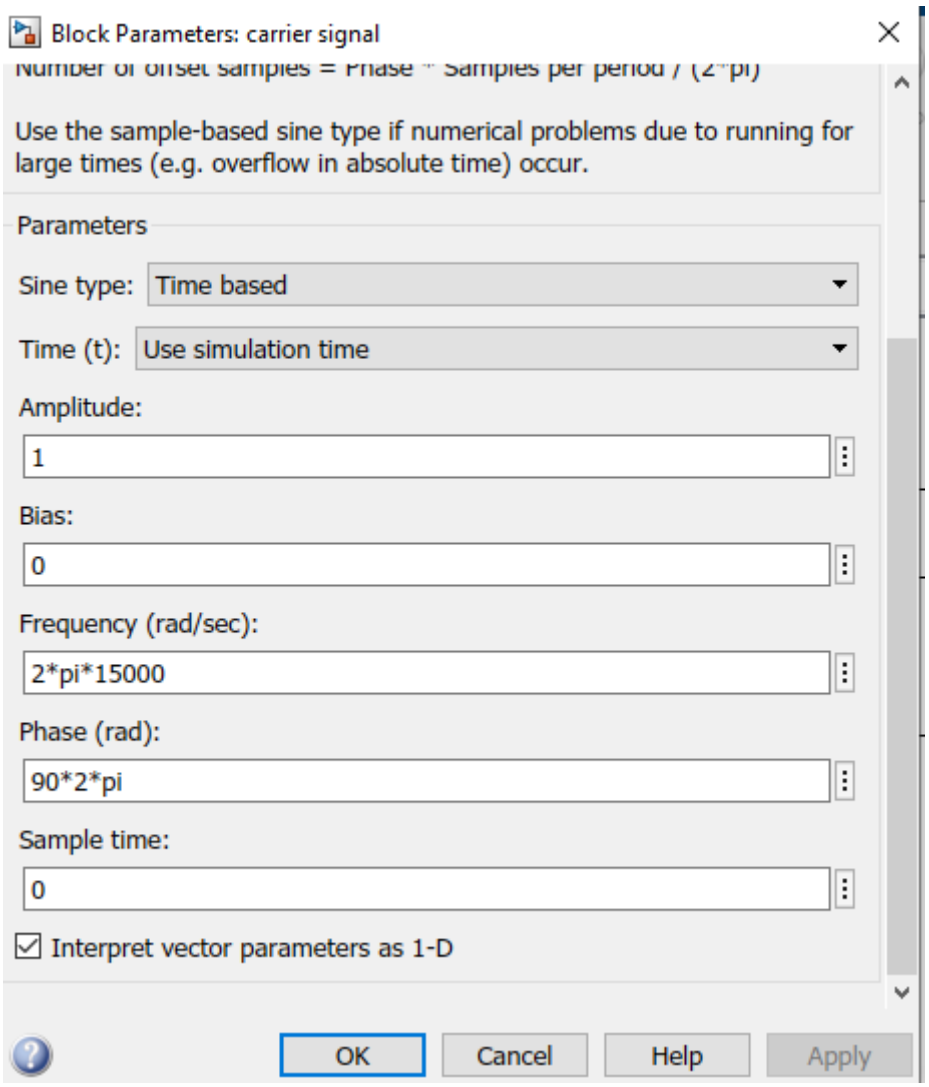
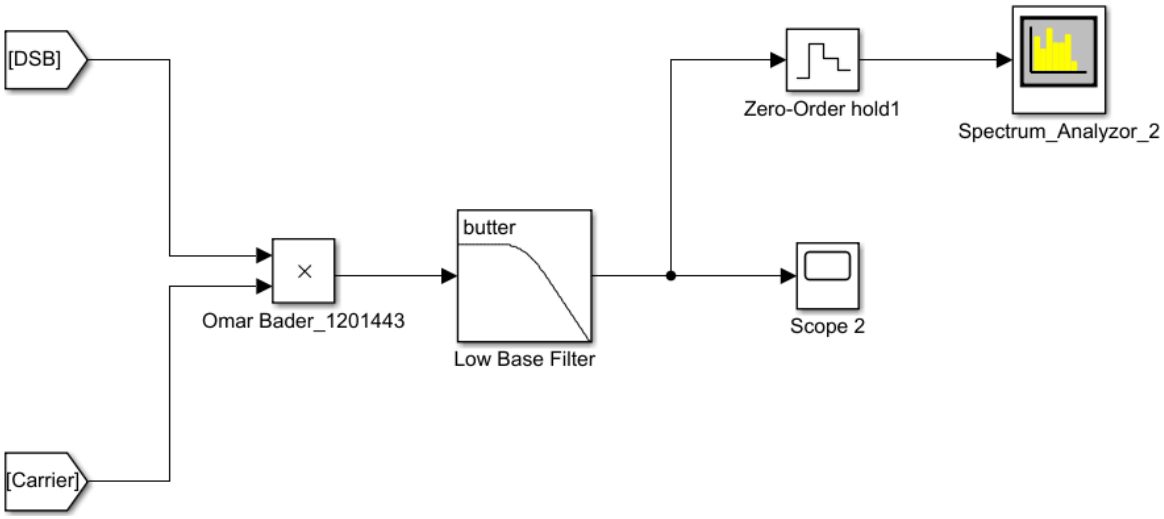


Figure 1.4: Carrier setting



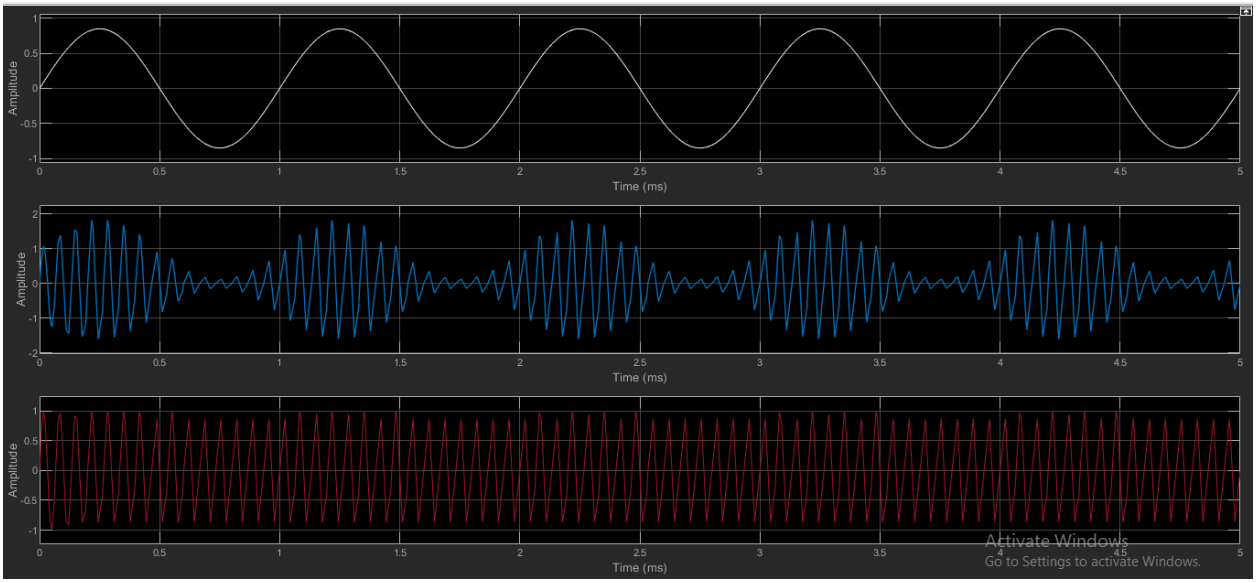


Figure 1.5: the modulation indexμ = 1(in Time domain)

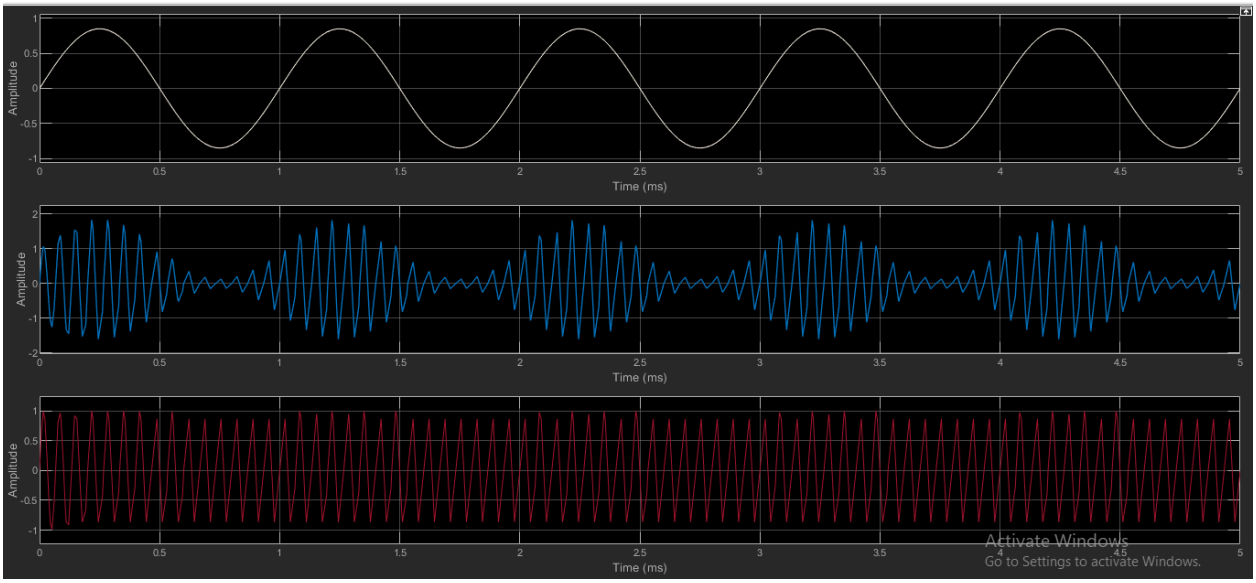


Figure 1.6: the modulation index μ>1(in the Time domain)

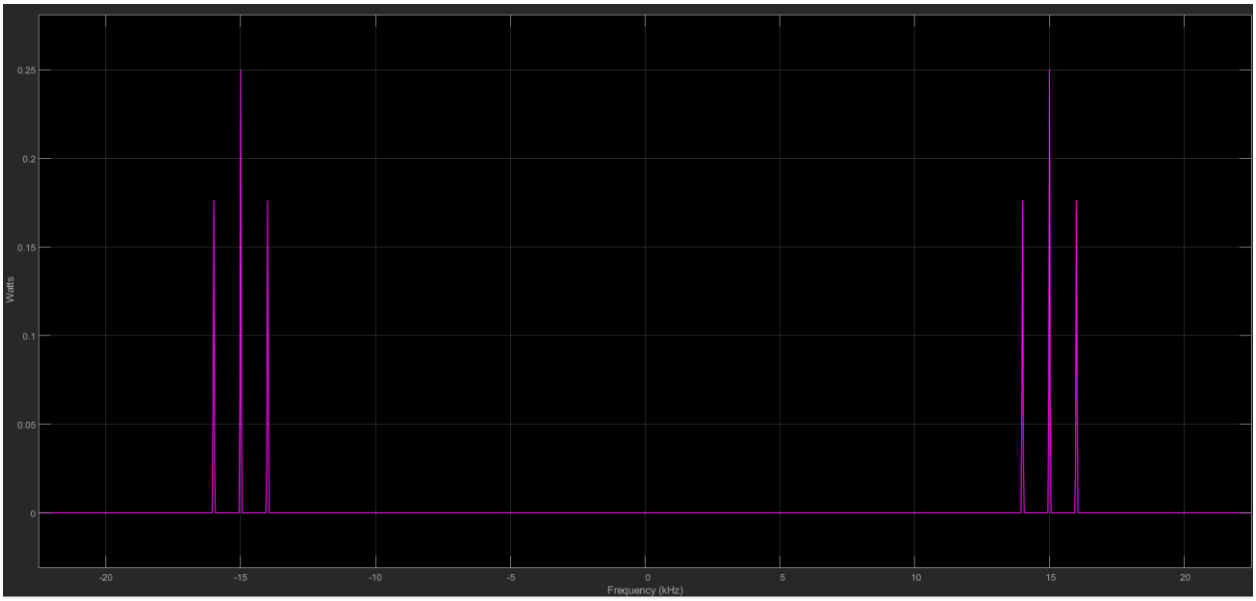


Figure 1.7: the modulation index μ >1(in the Frequency domain)

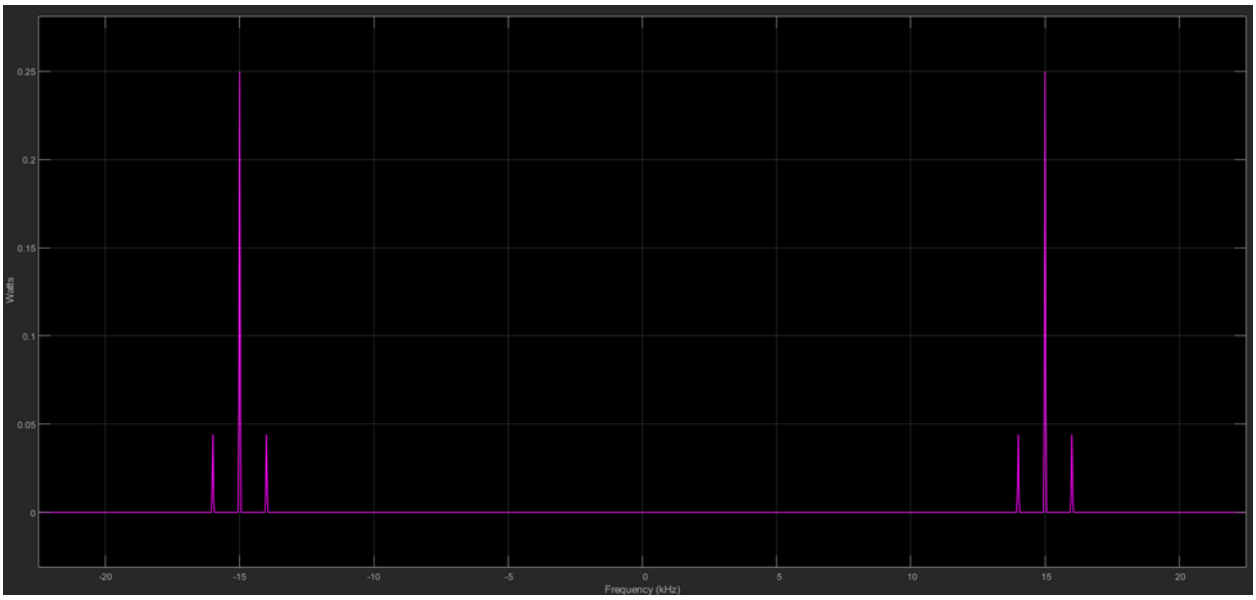


Figure 1.8: the modulation index μ< 1 (in Frequency domain):

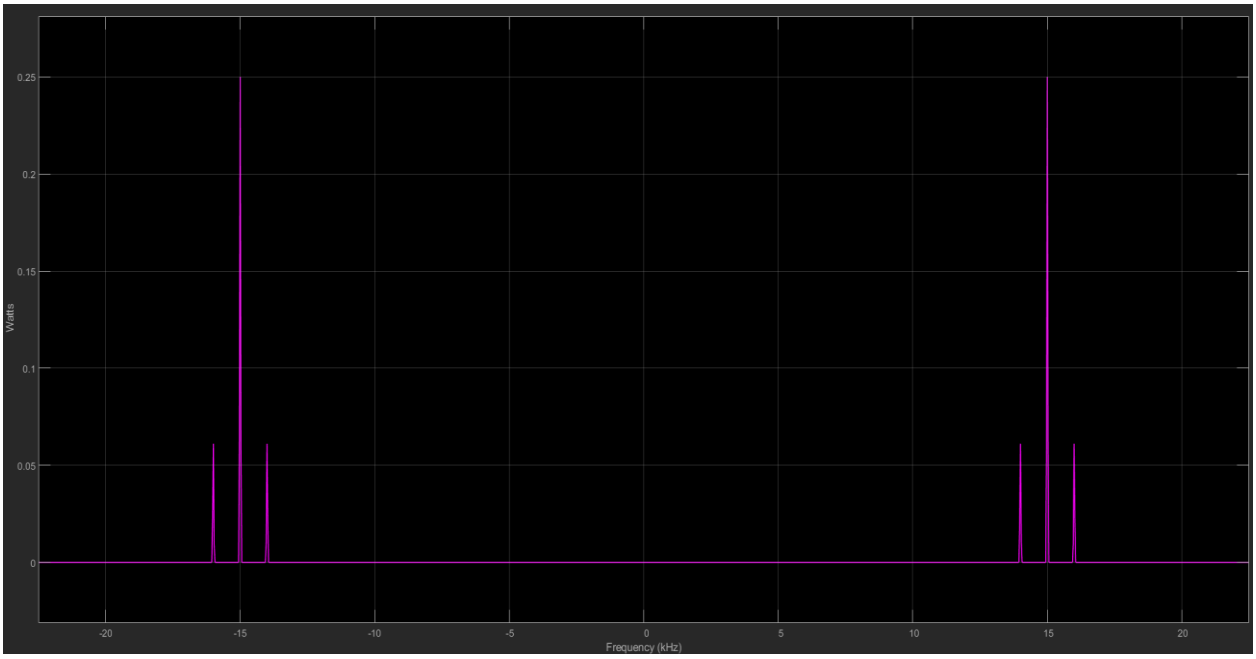


Figure 1.9: the modulation index μ= 1(in Frequency domain):

2. Part 2: Normal Amplitude Demodulation.

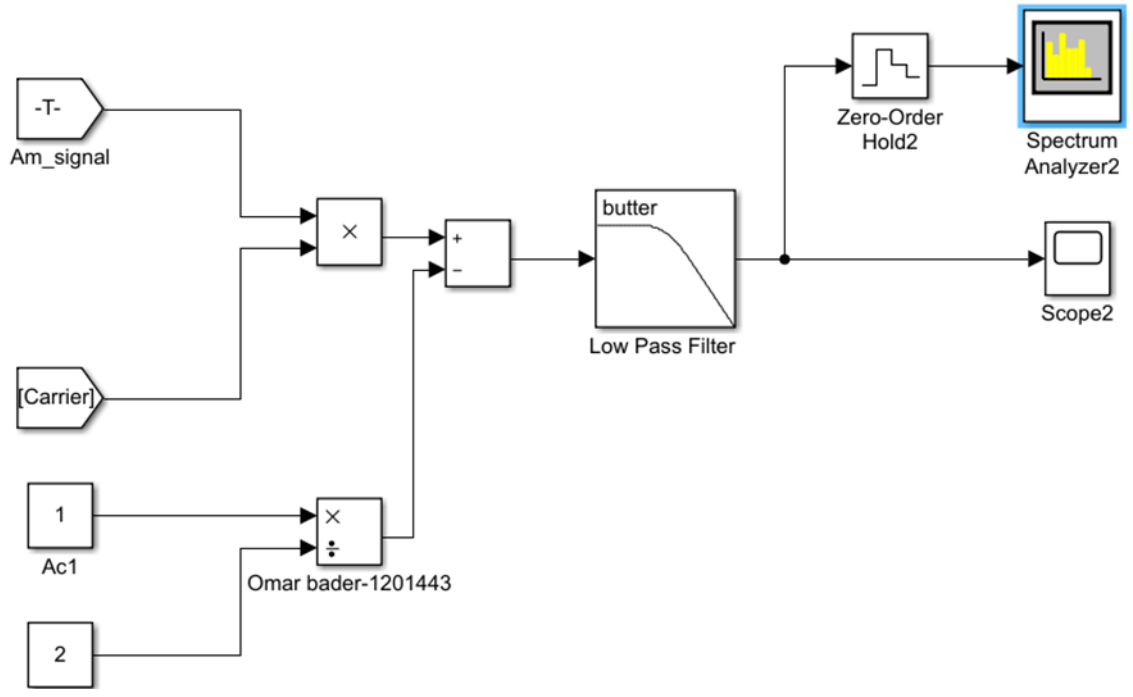


Figure 2.1: Coherent Demodulation

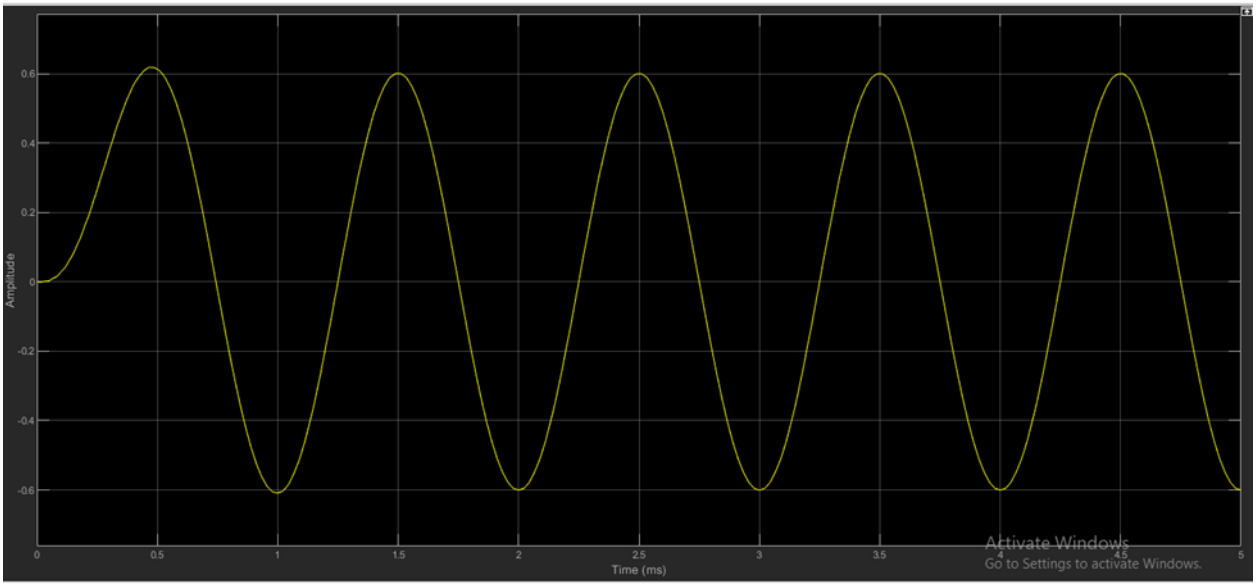


Figure 2.2: the modulation index μ> 1(in Time domain) Demodulation

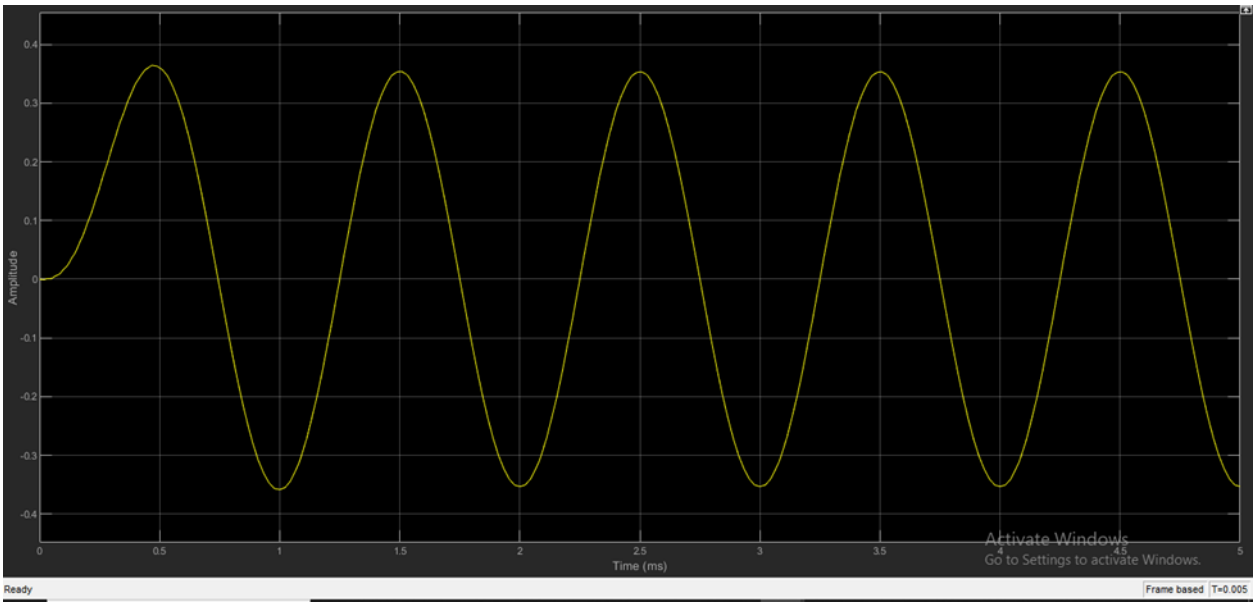


Figure 2.3: the modulation index μ<1(in the Time domain)

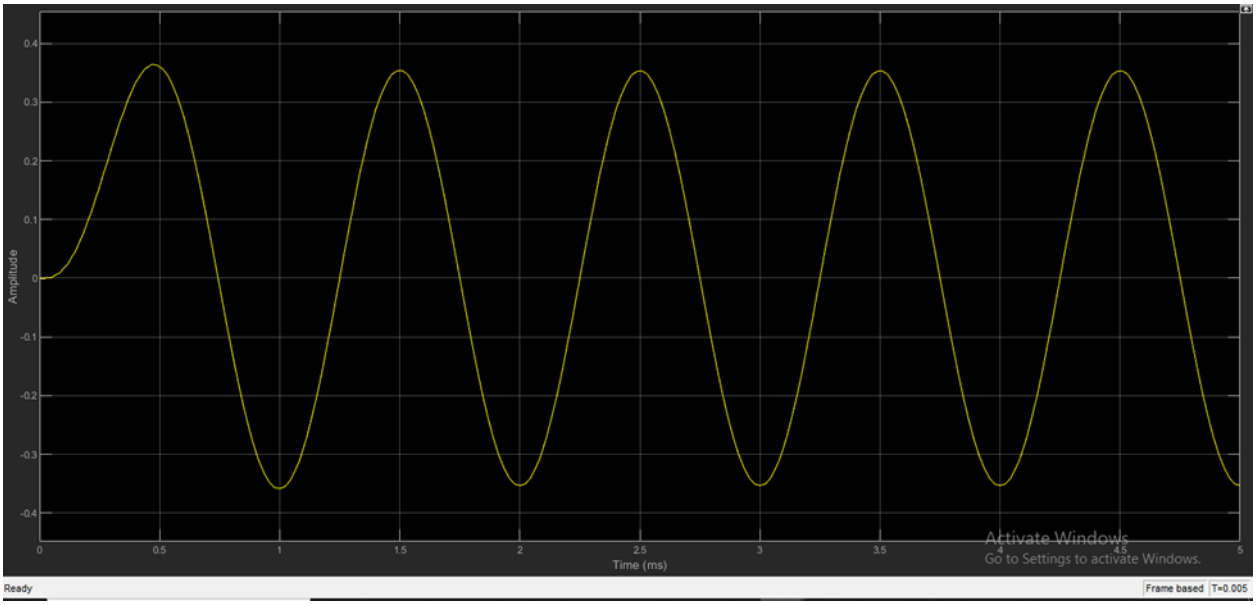


Figure 2.4: the modulation index μ=1(in the time domain)

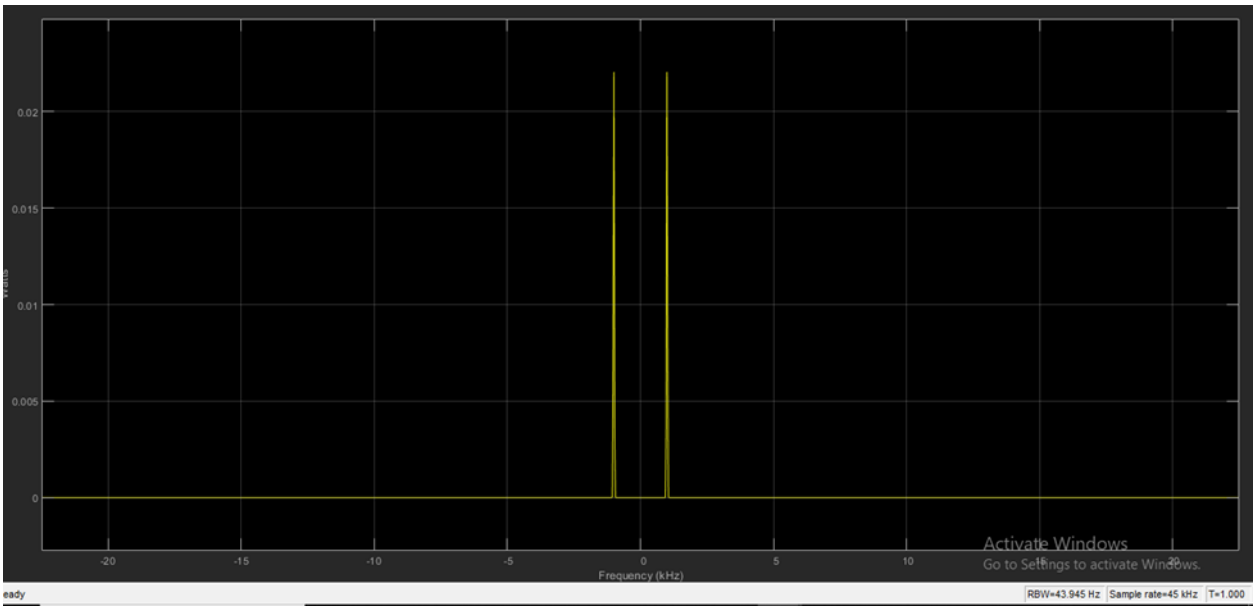


Figure 2.5: the modulation index μ > 1(in Frequency domain)

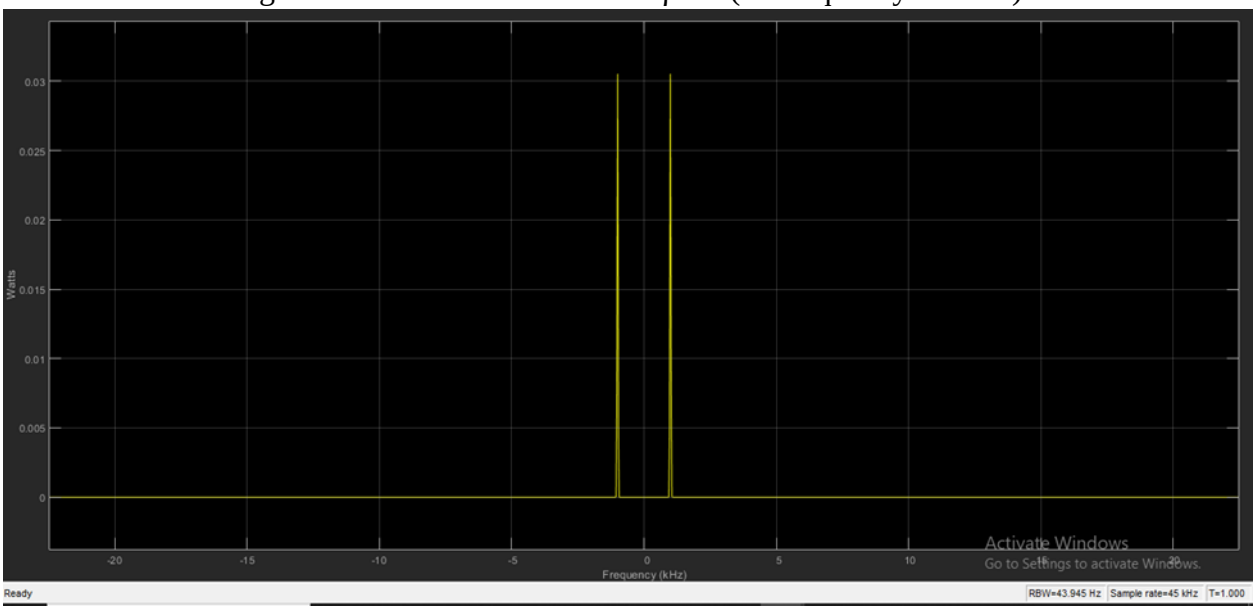


Figure 2.6: the modulation index μ< 1(in Frequency domain)

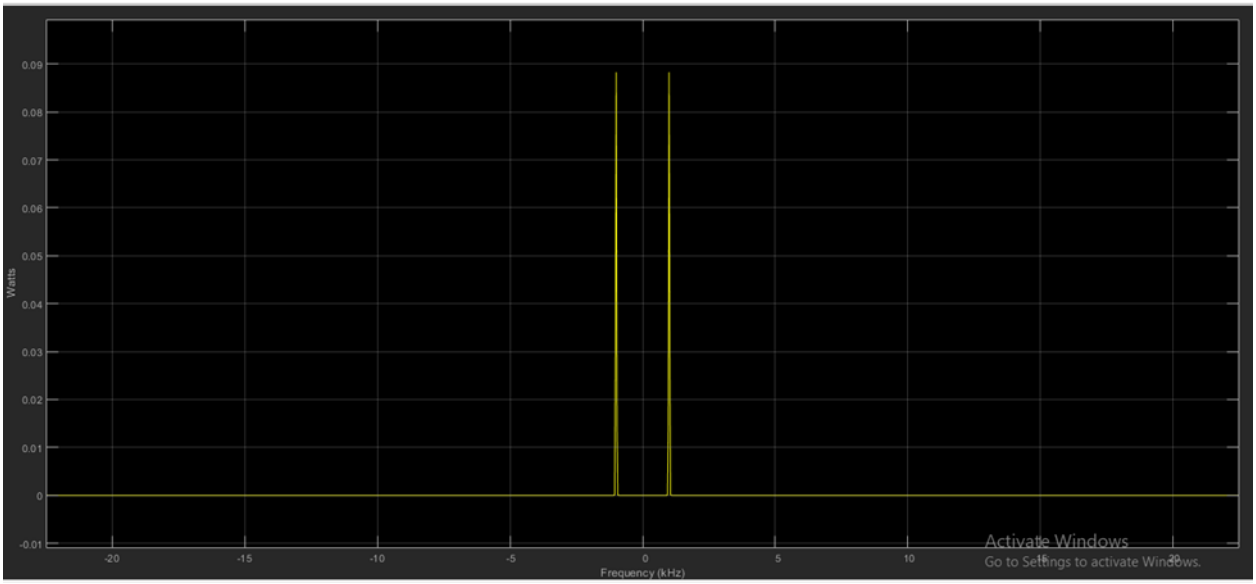


Figure 2.7: the modulation index μ= 1(in Frequency domain)

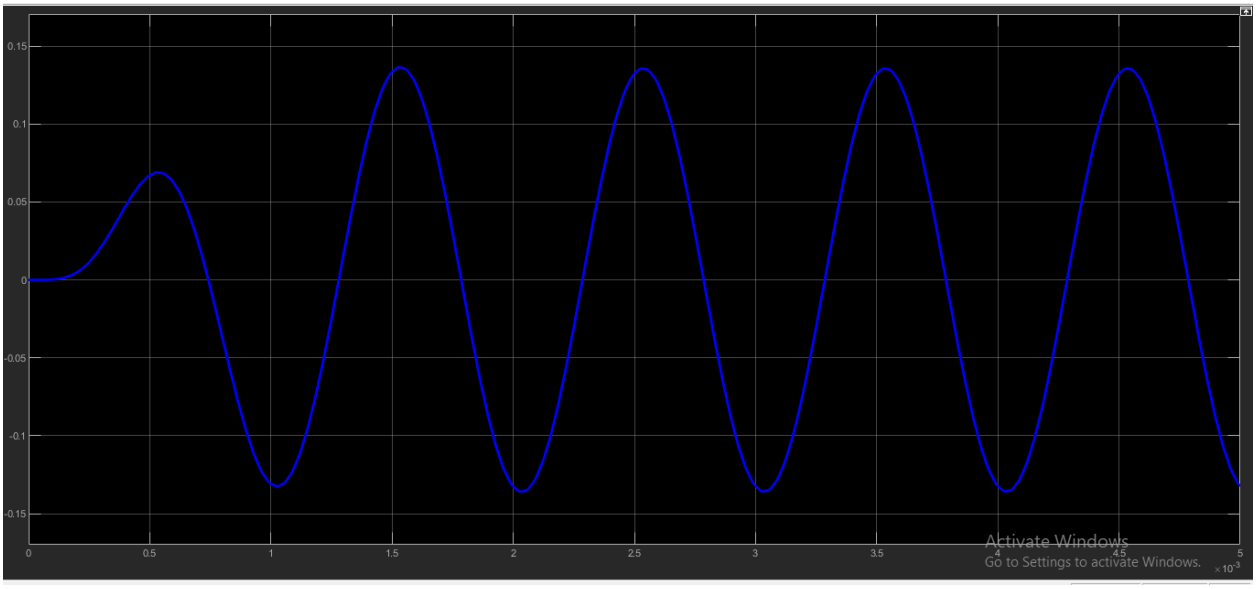


Figure 2.8: Demodulated Signal in Time Domain

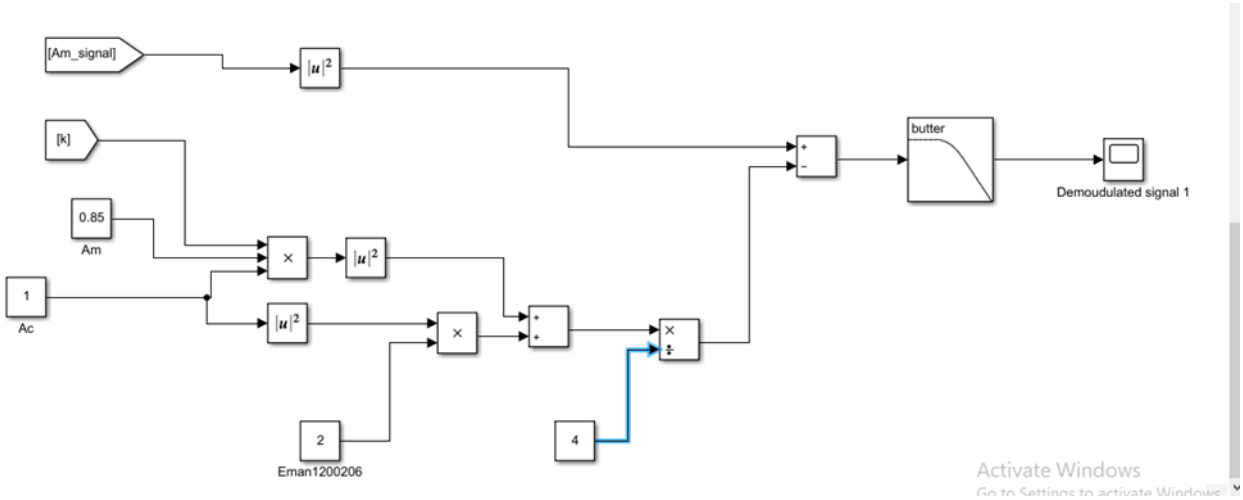


Figure 2.9: Envelop Detector Demodulation

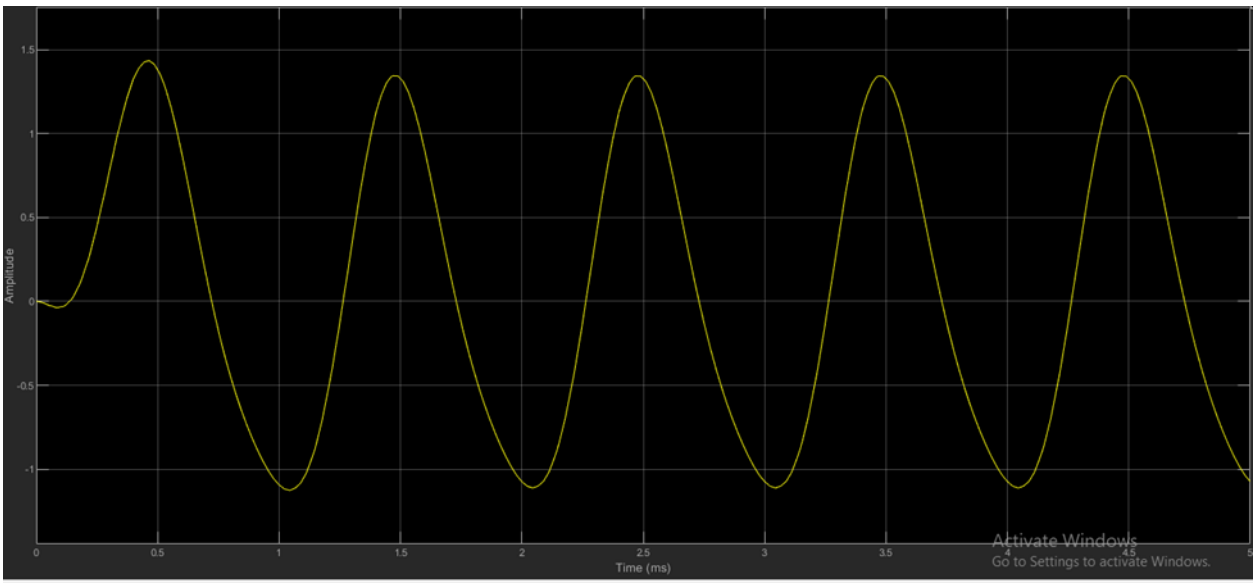


Figure 1.10: the modulation index is μ > 1(in Time domain)

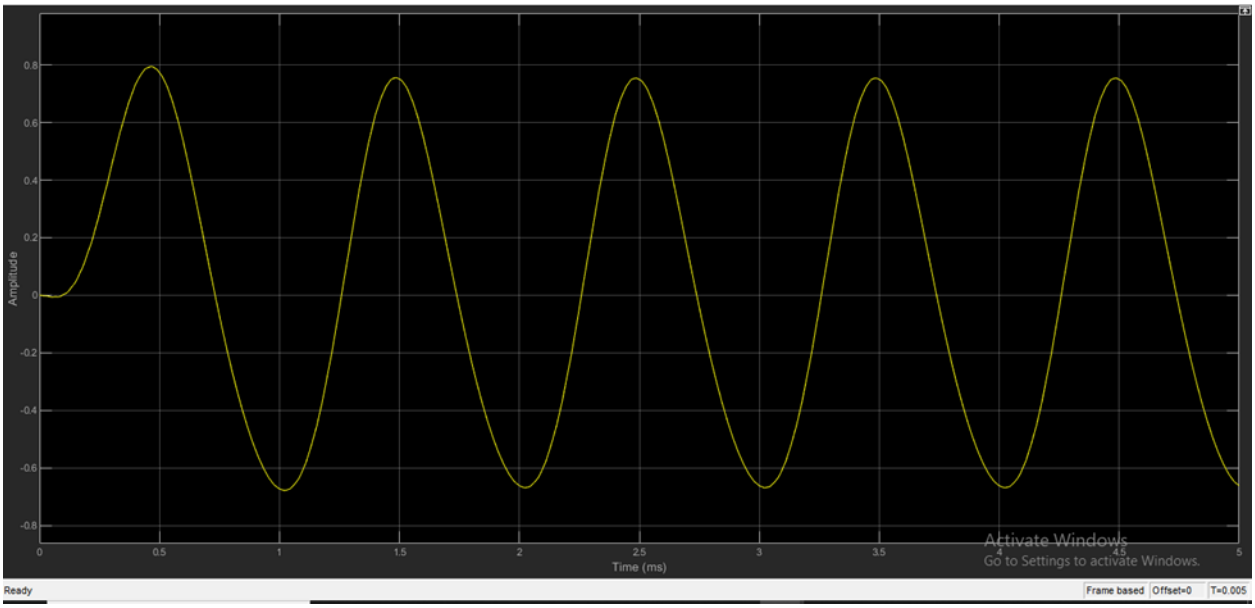


Figure 2.11: the modulation index is μ < 1(in Time domain)

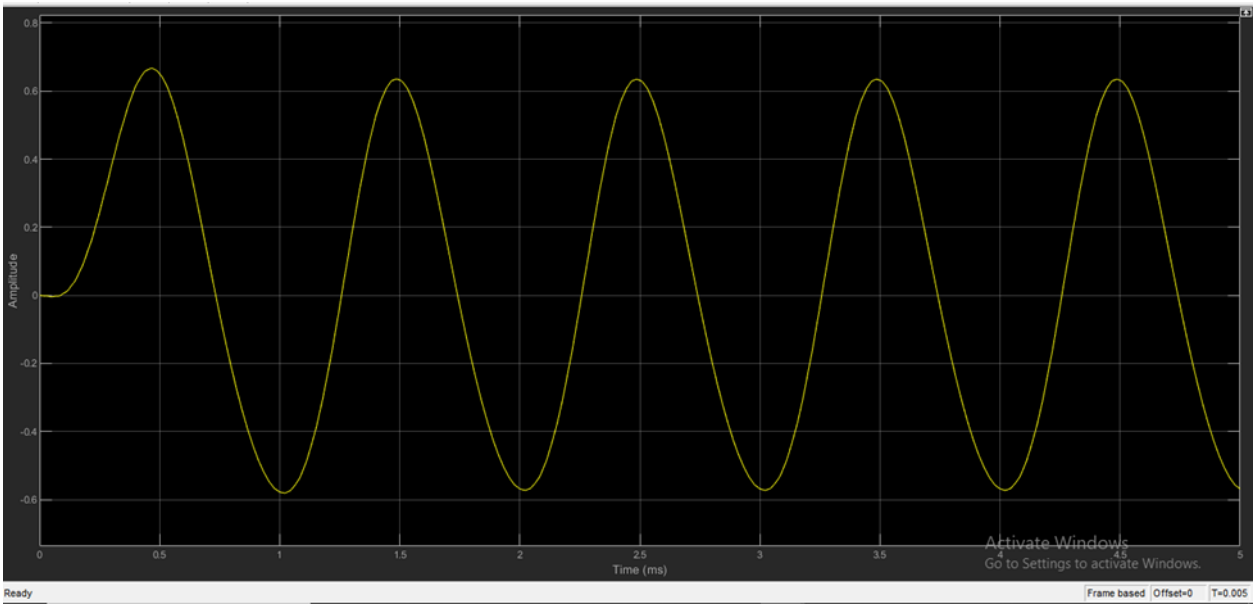


Figure 3.12: the modulation index μ = 1(in Time domain)

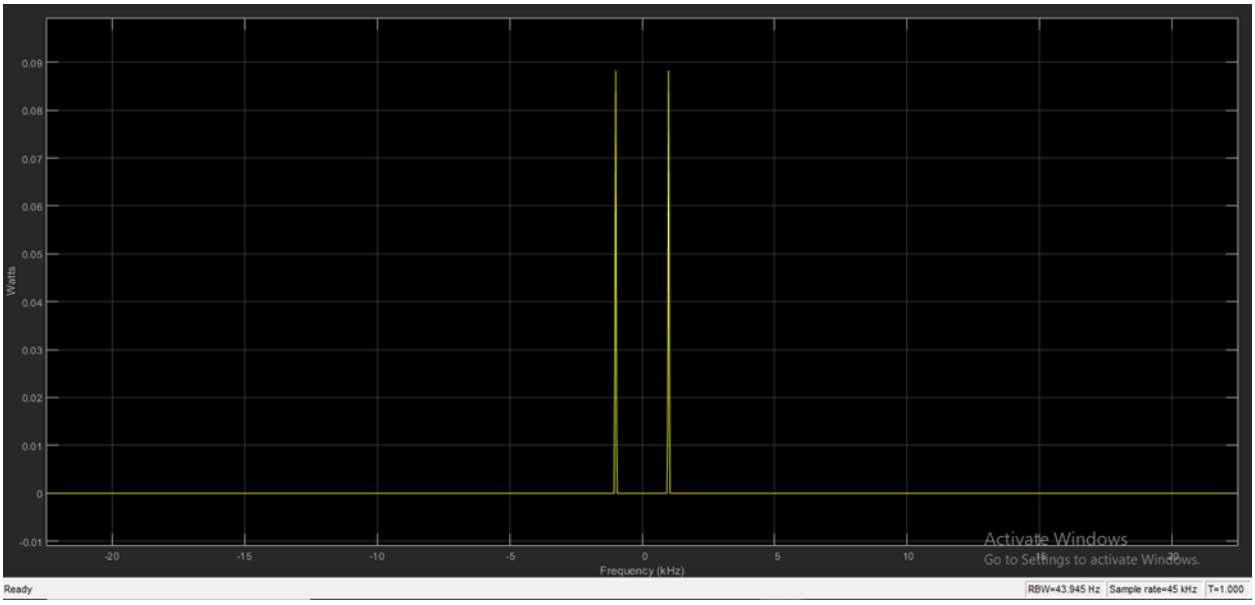


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Figure 4.13**:** demodulated signal when the modulation index μ > 1(in Frequency domain)

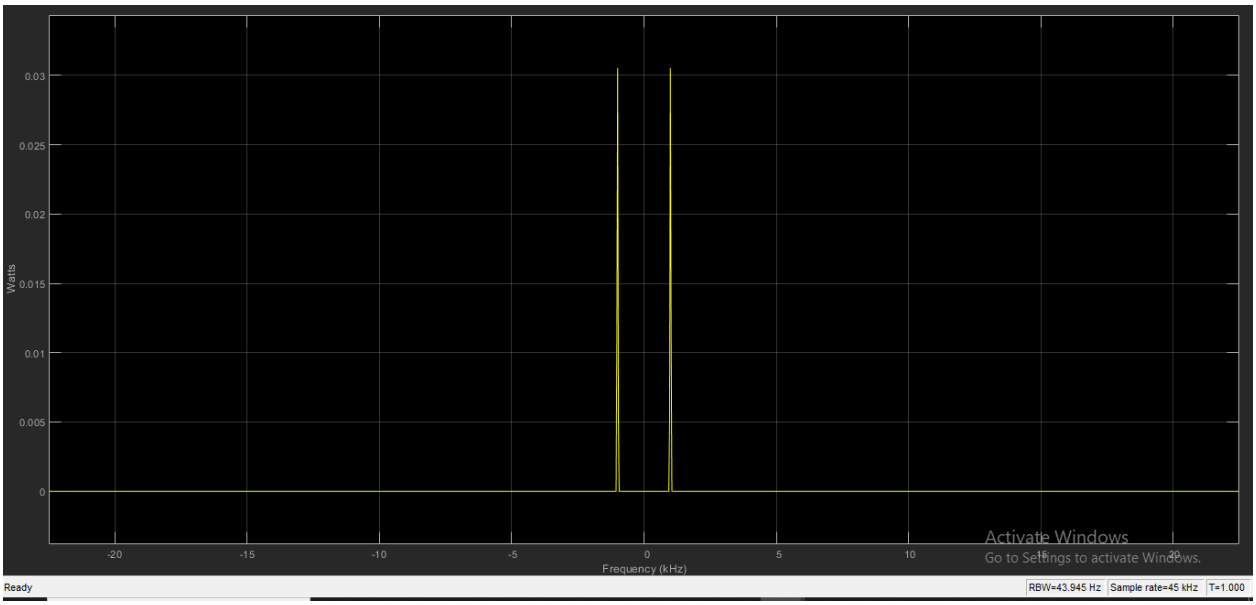

Figure 5.14**:** demodulated signal when the modulation index μ < 1(in Frequency domain)

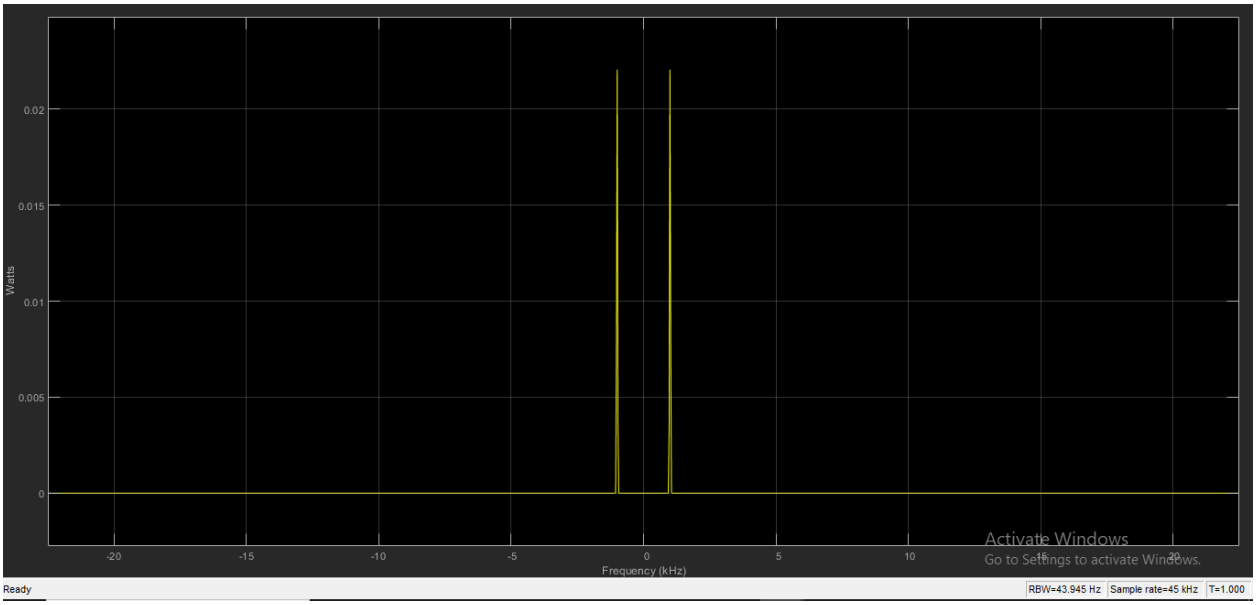

Figure 6.15**:** demodulated signal when the modulation index μ = 1(in Frequency domain)

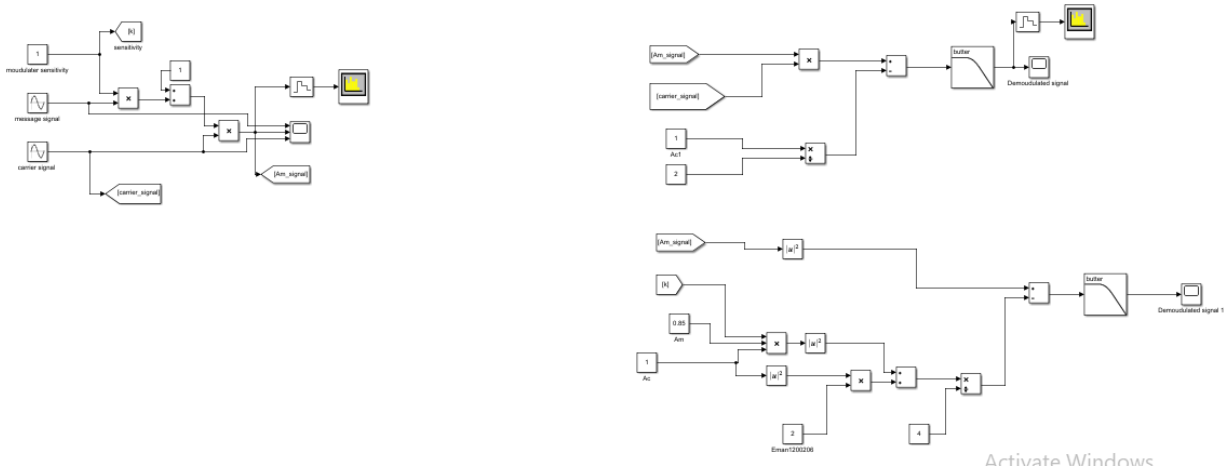

Figure 7.16**:** The complete block diagram

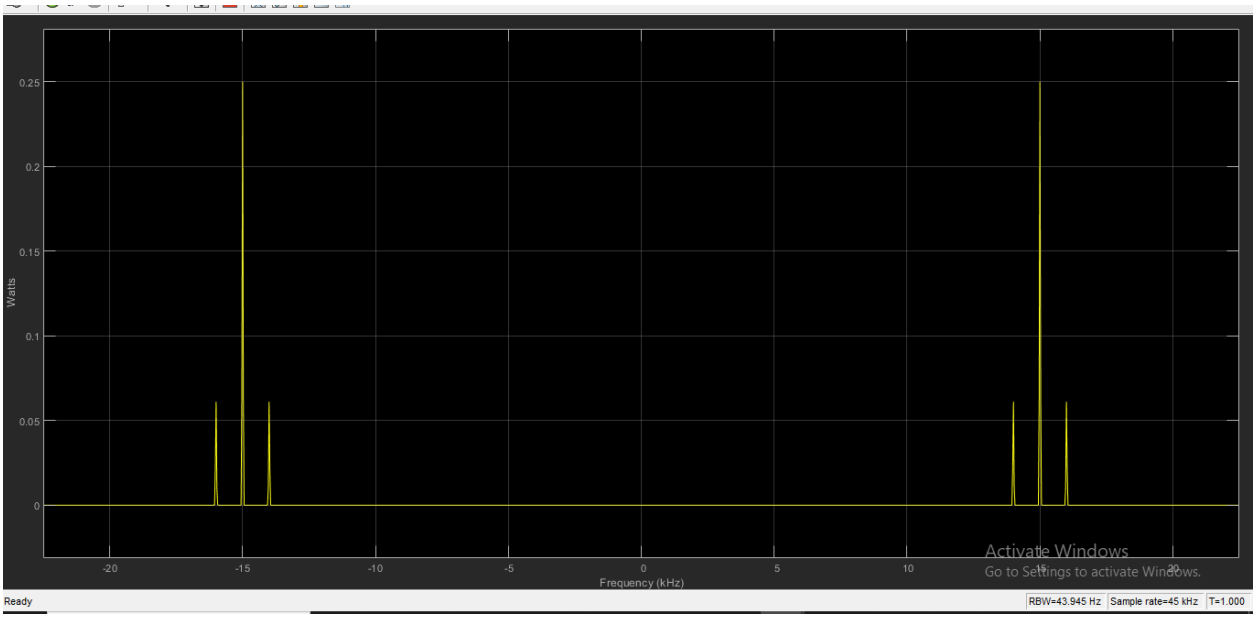

Figure 8.17**:** Modulated Signal when the modulation index μ < 1 (in Frequency domain)

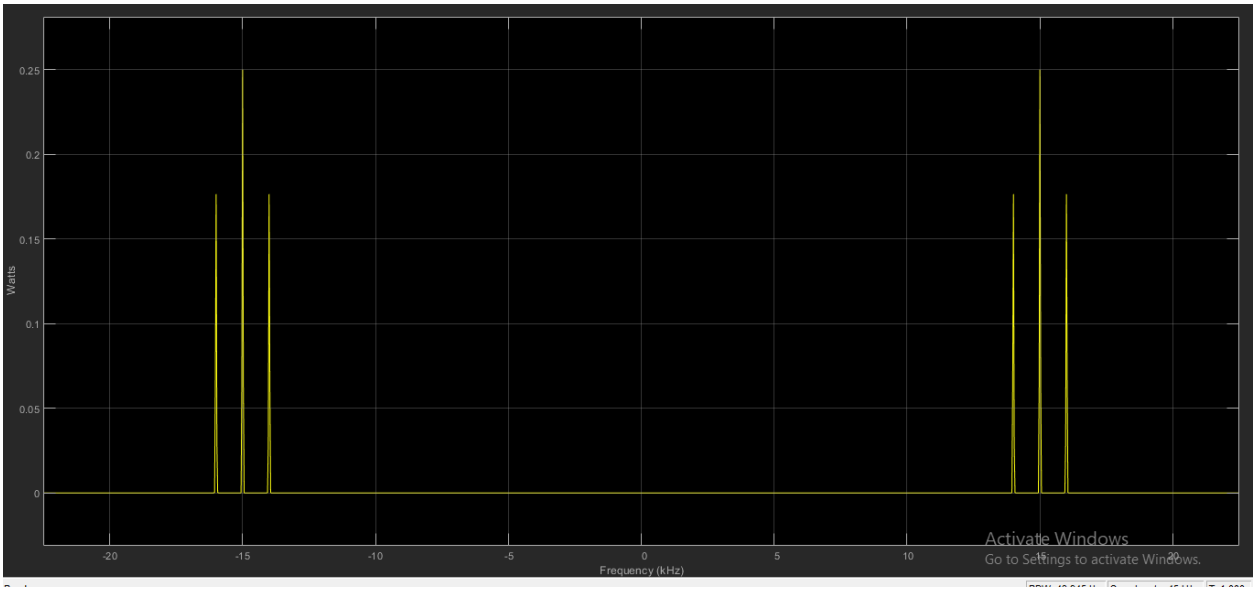

Figure 9.18**:** Modulated Signal when the modulation index μ > 1 (in Frequency domain)

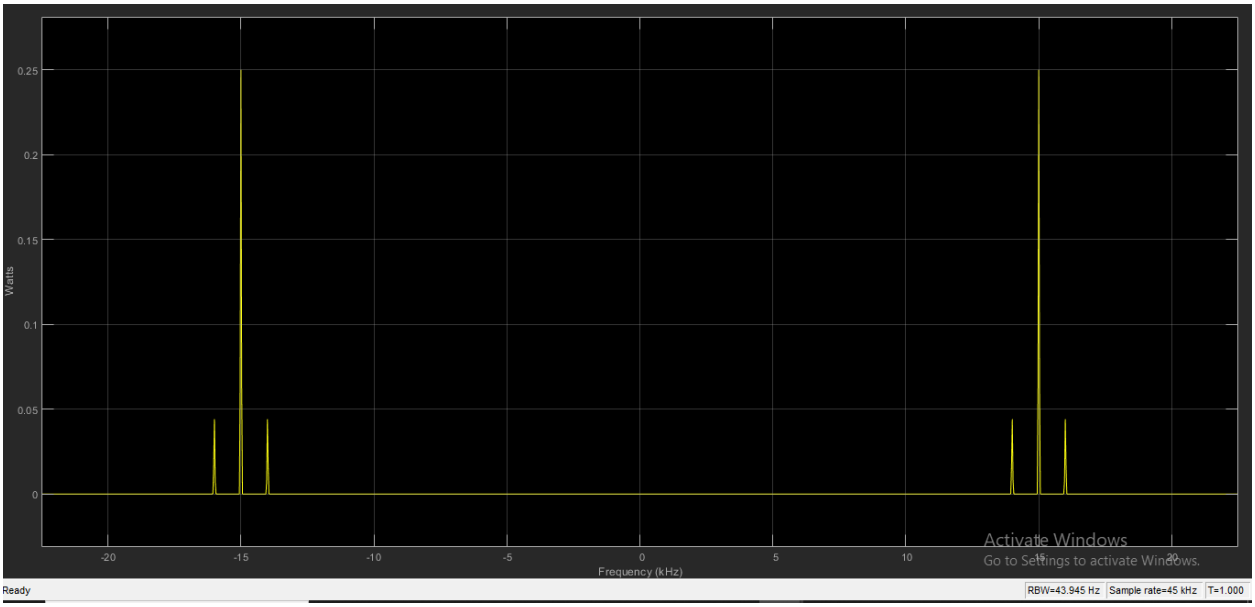

Figure 10.19**:** Modulated Signal when the modulation index μ = 1 (in Frequency domain)