

Final Project

EC 303P Principles of Communication Systems

Goal of the final project to show the impact of jamming on AM and FM radios.

Part I: FM Radio and Study of MOS Score (Due November 4th)

Design a FM broadcast system with at least 2 independent broadcast station each with bandwidth of 10 kHz. Each must transmit an audio signal frequency modulated using carrier frequencies of 15kHz and 25 kHz. Let the modulating frequency be 2 kHz and the modulation index = 1.

1. Design a receiver that can tune to one of these stations. Comment on quality of the received signal.
2. Introduce an AWGN channel between the transmitter and receiver. Analyze the effect of SNR varying from 5 dB to 15 dB (with step size of 5) on the demodulated signal. Write your observation based on the quality of the resultant demodulated signal (both music and voice signal).
3. Plot the power spectrum of the FM modulated signal at each carrier frequency, combined transmitted signal and received signal (with and without noise). Also plot the power spectrum of signal obtained before and after tuning to the stations.

Note: Consider audio signal (.Wav file) for duration of 5 seconds.

MOS score: Write a small note on MOS and estimate the MOS of the received FM signal as SNR changes from 5 to 15 dB.