

The Prelab

For this lab you will need to create an AM modulator. Use $f_s = 48$ kHz. For your message, have the program generate a sinusoidal signal. You should be able to vary the message frequency dynamically as your code is running.

Amplitude Modulation

1. Why do we modulate?
2. How would you go about generating your message signal. Write all the equations that you will need.
3. Write a MATLAB code to generate your AM signal.
4. Sketch the magnitude of the frequency response.

Amplitude Demodulation

1. On a magnitude spectrum plot identify: (a) where is the passband, (b) where is the stopband, (c) where is the transition band. Also, explain what is meant by passband ripple and stopband ripple.
2. Use MATLAB to create an elliptic filter with the following specifications: $R_p = 0.1$ dB and $R_s = 50$ dB. What is the order of the filter?
3. Use MATLAB to express the filter as a cascade of second-order systems. You can use *fdatool*.