To: Prof. Ross Snider

From: Jeff Meirhofer

Regarding: Lab #4 – AM and FM Sinusoidal Signals

Date: February 12, 2009

**Summary:**

The purpose of this lab is to provide an introduction to frequency modulation (FM) and amplitude modulation (AM) of sinusoidal signals.

**FM and AM**

**3.1)** We start by synthesizing a chirp signal. The instantaneous frequency varies from 15,000 Hz to 300 Hz for this signal. If we listen to it and plot the spectrogram, we can see that the signal chirps up, down, and up again. This is due to the effects of folding.

**3.2 b)**

**3.2 c)**

**5)** Now we will use some advanced techniques to replicate the sound of a clarinet. First, we will use a tool for generating woodwind envelopes called “woodwenv”. We must determine the values to scale the envelope by to get the proper envelopes for our clarinet sound. There are two envelopes that make up the total envelope, an amplitude envelope (A(t)) and a modulation envelope (I(t)). Both are used in the FM synthesis equation . You can see from a plot that the carrier frequency is the frequency of the note.