

Computer Music Techniques
Lab Frequency Modulation Techniques

OBJECTIVES:

DEMONSTRATE AN UNDERSTANDING OF THE FUNDAMENTALS OF FREQUENCY MODULATION THROUGH A SERIES OF AUDIO EXPERIMENTS.

1. Start the FM synthesizer example which runs in Max/MSP. Check to be sure you have an audible output. Activate fm module 1 (carrier) and fm module 2 (modulator).
2. Set the harmonicity ratio for the modulator to .02 (a sub-audio frequency). Set amplitudinal envelope for the modulator so that it has a gradually increasing slope for the attack and decay. Pull the start and end points in toward the center of the envelope window. Pull the peak down so that it is fairly close to the lowest point.
3. Play a note and write down your observations about the impact the modulator has on the carrier frequency. What happens as you increase the peak on the modulator's envelope?
4. Gradually increase the modulator frequency. How does this change the sound?
5. Set the modulator to a harmonicity ratio of 0.5, 0.2, 1, and 2. For each ratio, play a note and describe the change in the fundamental frequency and the side bands. What happens to the fundamental? Plot the frequency of the carrier and the sidebands on a frequency/amplitude graph. Increase the peak of the modulator and describe what happens to the sound.
6. Set the amplitudinal envelope of the carrier to resemble a sharply ascending and descending slope. How does this change the sound? What acoustic instrument does this sound like?

END OF LAB 4.1