025:250 COMPOSITION: ELECTRONIC MEDIA I
Fall 2010
Sound Object Variation

1. In non-electronic music, varying material by pitch and rhythm has a long tradition. In electronic music, variation in pitch and time has been under-utilized as a structural resource in works that have a very rich timbral pallette. In this class, however, the timbres in each student's project have been limited to the sound-mining of one or two recordings. Before exploring ways to timbrally vary a sound-class, sound-object, or gesture, students are encouraged to build a large set of variations created in the pitch and time domains. This will aid in the composition of linear, contrapuntal, and collage materials.

2. Variations in the pitch domain can be done on any or all parts of a sound-class, sound-object, and gesture.
Varispeed
Transposition implies that rhythm is preserved. Pitch n' Time.

3. Pro Tools session considerations.
   a. The sample rate, bit depth, and file type should be determined.
   b. The soundfiles should be either mono and stereo, or stereo only, as discussed in Item 3c, below.
   c. If the session uses both mono and stereo soundfiles, then both mono and stereo tracks should be used.
   d. Alternatively, if the session uses both mono and stereo soundfiles, all mono tracks can be used. This is because dragging a stereo soundfile into the edit window can be done with one stereo track, or it can be split into two mono regions as it is dragged onto two mono tracks.
   e. If the session uses only stereo soundfiles, then all tracks should be stereo.
   f. Discussion of these options.
   g. The number of channels should be determined. If this project uses more than two speakers in stereo, then the output of each track needs to be set.

4.

In the pitch domain by transposing individual sounds of a complex sound object.
   In the time doman by compressing, stretching, expanding, and shortening, slowing down, and speeding up.
   a. Compressing is time-compression with software or plug-ins
   b. Stretching is time-stretching with software or plug-ins,
   c. Slowing down is varispeed pitch-shift down, not preserving time duration.
   d. Speed up is varispeed pitch-shift up, not preserving time duration.
   e. Shortening is cutting and pasting parts of a sound onto itself using crossfades.
   f. Expanding is copying and pasting parts of a sound onto itself using crossfades.

2. The noise or indeterminate parts of a sound should not be processed. The pitched or determinate parts of a sound can be processed.

Problems with long tones in electronic music:
   a. The emotional atmosphere can be dominated by a long sound and oppressed by it.
   b. They can hold back or prevent musical change.
   c. A sound can seem non-intentional after a period of time, as if the composer turned it on and walked away.
   d. They can lose their sense of rhythm, purpose, and direction.
   e. Acoustically, certain frequencies that are sustained at even moderate volume levels can be painful to the audience.
   f. Acoustically, can mask or smear the attacks of other sounds.

3. How long tones are created in electronic music:
   a. Synthesis.
   b. Varispeed pitch-shift down.
   c. Time-stretching.

d. Cross-fading copies of a region in Pro Tools.

4. Shortcomings of the techniques in Item 3a, above:
   a. Prolonged synthesized tones can seem very mechanical and dull.
   b. Varispeed pitch-shifts down creates low tones, making high tones difficult to produce with this method.
   c. Time-stretching is a very popular technique that sounds better with some algorithms, plug-ins, and software than others. Artifacts are usually created, and attacks are elongated and smeared.
   d. Cross-fading in Pro Tools works best with sounds that are relatively short. Care must be taken not to let the copies sound like mechanical reproductions.

5. Recommendations when using long tones:
   a. The consequences of a long tone should be considered by the composer.
   b. A long tone should generally be as short and as quiet as possible.
   c. In addition to having a long tone be as soft as possible, consider the use of *non-intentional* automated volume changes. This helps keet the sound alive in the listener's mind.
   d. More *intentional* techniques for keeping a sound alive include cross-fading the long tone to another sound of the same pitch, panning the sound, and re-acquiring the sound after a moment of silence.
   e. Treat the long tone as a unique pitch not doubled by other tones sounding at the same time.
   f. Use long sounds at the end of a phrase, rather than the beginning.
   g. Use long sounds for a purpose, such as inharmonic timbres, clusters, and glisses.
   h. Use little or no reverb.