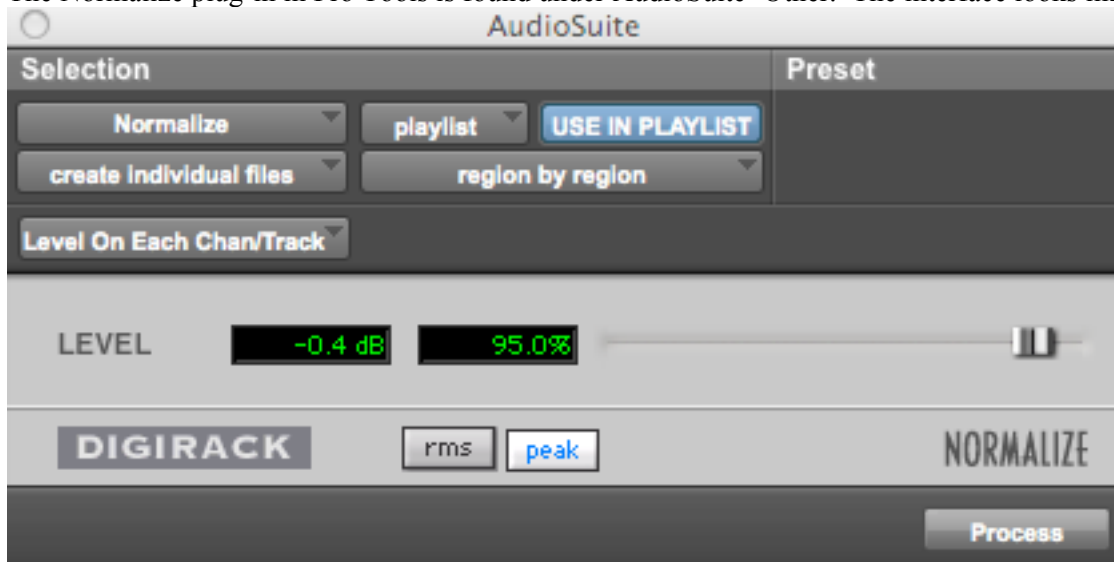


025:250 COMPOSITION: ELECTRONIC MEDIA I

Fall 2012

Normalizing in Pro Tools

1. Normalizing is a very important function in audio mixing. Consider the issues below.
 - a. Frequently, an audio file or region will have its peak lower than 0 db.
 - b. If you process and mix files or regions that have relatively low amplitudes, if these are ever boosted in volume, graininess, coarseness, or roughness may be heard. This is because processing and mixing have acted on a low-resolution sound, and because of this, the result may be even more grainy.
 - c. To prevent this from happening, you should first normalize the audio files. This provides a processing or mixing process with the greatest possible amount of data, and thus resolution.
 - d. Frequently, a soft audio file may sound noisy when normalized. This is because the noisy part of the sound has been raised in amplitude, along with non-noisy parts. It is important to note that when normalizing a noisy file, noise is not actually introduced by normalization. It is merely played loud enough so that noise becomes audible. To counteract that effect, the automated volume in Pro Tools should be lowered. This reduces the overall loudness as well as the noisy parts. The benefit of doing this, as mentioned above, is to provide processing with the greatest amount of data for the best resolution.
 - e. This is the aural equivalent of using graphic plug-ins on low resolution images. The result of the plug-in is generally better with high-resolution images than will low-res ones.
2. Normalization can also be applied to a stereo file with one channel louder than the other. Normalizing will make the softer channel as loud as the louder channel.
2. Normalizing is different than gain change, compression, or limiting, as will be discussed in class.
3. The Normalize plug-in in Pro Tools is found under AudioSuite>Other. The interface looks like the image below.



1. Principles of Pitch-Shifting
 - a. Definition of pitch-based sound: harmonic
 - b. Non-pitch: inharmonic
 - c. Instrument-like
 - d. Other-like
 - e. Sounds that are 1-2 semitones apart have voice-leading motion.
 - f. Sounds that are 3-5 semitones apart have gap-fill potential and suggestion for listener.
 - g. Sounds that are 6- and higher semitones apart have strong potential to be disjoint and unrelated.
 - h. Glisses have comical effect when rate is short.

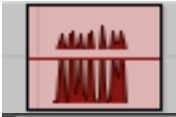
- i. Glisses have foreboding effect when rate is long.
 - j. Multiple glisses should have independent rates for rich, non-mechanical textures.
 - k. Multiple glisses with the same rate have potential to seem mechanical or synthesized.
 - l. Short sounds in a cloud or mass can create a virtual gliss when each successive note is a microtone higher.
 - m. Discussion of the relation between pitch and frequency.
2. Principles of Time-Expansion and Compression
- a. Smearing
 - b. Metallic artifact
 - c. Shortened sounds have more punch
 - d. Lengthened sounds have ethereal quality that dominate the emotional structure of the context.
 - e. Long sounds in general, should not be very loud. They will have a strong presence even when played softly.
2. Pitch-shifting in Pro Tools.
- a. There are two basic ways an audio file can be pitch-shifted.
 - b. One method is called *varispeed*. This term originally was used with tape recorders when the playback speed was varied. When the speed increased, the pitch was raised. When the speed decreased, the pitch was lower.
 - c. The major shortcoming of varispeed transformations is that pitch and time are linked. Higher sounds are played back faster, and lower sounds are played back slower.
 - d. The biggest advantage of varispeed transformations is that the audio quality is very clean, and unadulterated by calculation artifacts.
 - e. Another method of pitch-shifting an audio file is to use a signal-processing algorithm to change pitch and timing independently. There are many pitch-shifting algorithms. One of the best is employed in the plug-in, Pitch 'n Time Pro, by Serato.
3. Serato Pitch 'n Time.
- a. This plug-in has been used by people in the audio field for over 10 years. There are currently two versions: Pitch 'n Time LE, and Pitch 'n Time Pro.
 - b. Pitch 'n Time LE sells for around \$250, while the Pro version sells for around \$700.
 - c. In the Electronic Music Studios, the desktop computers in Studios 1 and 2 have the Pro version installed.
 - d. The studio's laptop computers running Pro Tools has the LE version installed.
 - e. The LE and Pro versions used the same basic algorithms, and thus produce the same quality of sonic output.
 - f. The Pro version has additional features than the LE, as will be discussed below.
- a. Mono. This can be place anywhere in the stereo field.
 - b. Stereo-ized centered mono. This file began has a mono file that was converted to stereo so that each side presented the exact same sound. This is indistinguishable from mono, to the ear.
 - c. Stereo-ized panned mono. The file began as a mono file that was converted to stereo and panned off-center in the process. This means that the left channel sound is identical to the right channel sound, except that one channel is louder than the other.
 - d. Discrete stereo. This is when the left channel sound is completely different than the right channel sound.
 - e. Mixed stereo. This is when the left channel contains some sounds that are louder and some that are softer than the sounds in the right channel
3. Special consideration. The key commands for changing the automation view to waveform view does not work when Pitch 'n Time is open. This key command is "control opt -".



Level on each channel/track
Region by region

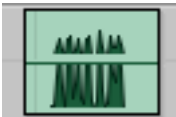


Level on each channel/track
Entire selection



create continuous file entire selection

Level On All Chans/Tracks



create individual files entire selection

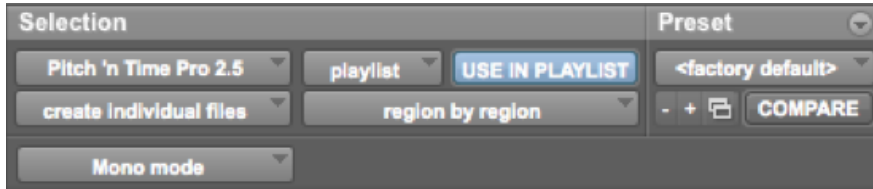
Level On All Chans/Tracks

Level on All Chans/Tracks and entire selection
Level on Each ChanTrack and entire selection
Level on Each ChanTrack and region by region

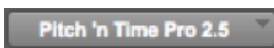
Peak On Each Chan/Track Analyzes and processes each selected track individually. If you apply the Normalize plug-in to multiple tracks or a multichannel track in Peak On Each Chan/Track mode, each channel or track will be normalized independently, without regard to the other selected tracks.

Peak On All Chans/Tracks Uses all currently selected channels and tracks for analysis. If you apply the Normalize plug-in to a multichannel track or multiple tracks in Peak On All Chans/Tracks mode, the tracks will be analyzed as a single entity and regions will be normalized relative to the averaged peak level within all selected channels and tracks.

1. The example below shows how to apply Pitch 'n Time to a region.



a. The menu below navigates through all of the plug-ins in the Audiosuite.

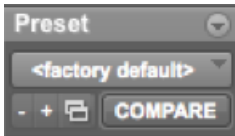


b. The menus below act on a selected region in the edit window (which is called the *playlist*) in Pro Tools.



The relation between *playlist* and *region list* will be reviewed in class.

c. The menus below allow presets to be created, saved, and compared.



For the purposes of this class, presets are probably not worth the effort to create. Studio recordings of performances, as well as research projects that require consistency and rigor, might find presets useful.

d. The menus below allow the creation of individual files, which is generally desired.



The menus are interactive, as will be demonstrated in class. For the purposes of this class, the menu items shown above are probably the most useful.

2. The panel below allows one to set several general functions.



- The scale options are Lin, for linear, and Log, for logarithmic. In the grid window, discussed below, lines that appear straight when Lin is selected will appear curved when Log is selected. The sliders in the lower panels will also appear scaled differently. In music, we hear in a linear fashion what is electrically a logarithmic function. In general, I recommend viewing such functions linearly, as this corresponds visually to what we hear.
- When the grid window is selected, the Show button displays lines in the background. When both Show and Snap are selected, edit handles will snap to the gridlines, as discussed below.
- The Range options are 2x, 4x, and 8x. When 2x is selected, time can be expanded up to twice as long and pitch can be shifted up or down an octave. When 4x is selected, time can be expanded up to 4 times as long and pitch can be shifted up or down 2 octaves. When 8x is selected, time can be expanded up to 8 times as long and pitch can be shifted up or down 4 octaves. The

AudioSuite

Selection

Pitch 'n Time Pro 2.5

playlist

USE IN PLAYLIST

create individual files

region by region

Preset

<factory default>

COMPARE

Mono mode

serato

scale

Lin

Log

grid

Show

Snap



Pitch 'n Time

range

2x

4x

8x

algorithm

A

B

V

Tempo

MODE

source bpm

68.0001

bars:beats

0:0.051

meter

4/4

Bypass

Rate change

source rate

1.000

target rate

1.000



Output

bpm

68.0001

percent

100.000000

Length

Units

Hours:Mins:Secs

	start	end	length	
Source	11:15:35.214	11:15:35.260	0.045	Capture
Target	11:15:35.214	11:15:35.260	0.045	

Pitch

MODE

Tone

Hz

440.000

note

A4

cents

0

Bypass

Key shift

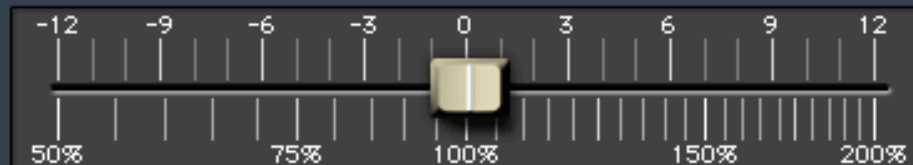
original key

C

transposed key

C

octave



Output

semitones

0.00

percent

100.000000

Pitch 'n Time Pro 2.5.1, ©1999-2010 Serato Audio Research



Output gain

clip



Preview

Bypass

0.0



UpdateWavfrm

Process

