

025:250 COMPOSITION: ELECTRONIC MEDIA I

Fall 2012

General Options in AudioSuite Plug-ins

1. Normalizing is a very important function in audio mixing. Consider the issues below.

Ping-Pong Delay Adds a stereo, ping-pong delay to the audio signal by feeding back the original signal to its opposite channel.

Gain Adjusts gain (volume) change, in decibels or percentage before clip.

Invert Inverts phase (polarity).

Pitch Shift Changes an audio file's pitch with or without changing its duration.

Reverse Rewrites selected audio in reverse.

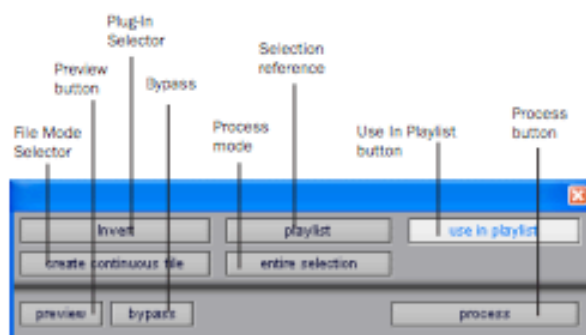
DC Offset Removal Recognizes and removes DC offset from audio files.

Signal Generator Generates audio tones for equipment calibration purposes.

Time Compression/Expansion Changes an audio file's duration with or without changing its pitch.

The AudioSuite Window

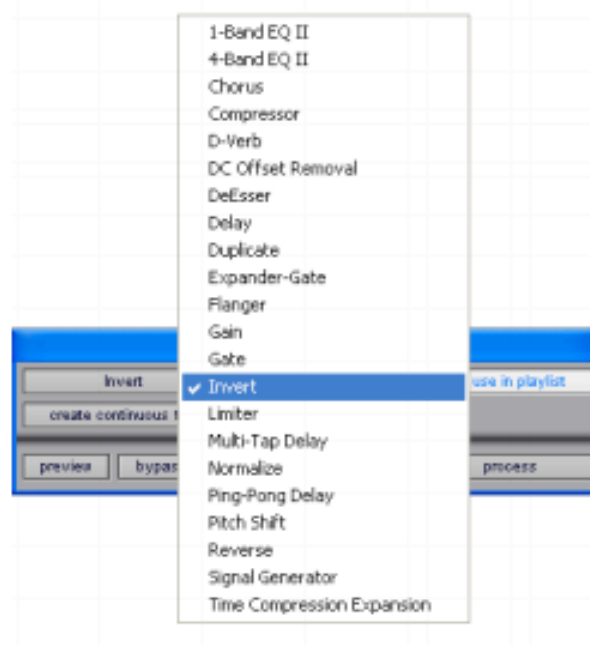
When you choose a plug-in from the AudioSuite menu, the AudioSuite window appears. From this floating window you can access and edit the controls for any non-real-time AudioSuite plug-in.



AudioSuite window

Plug-In Selector

From this menu you can select any AudioSuite plug-in installed in your Plug-Ins folder. (The Plug-In Selector follows the Pro Tools preference for Organize Plug-Ins Menu By.)



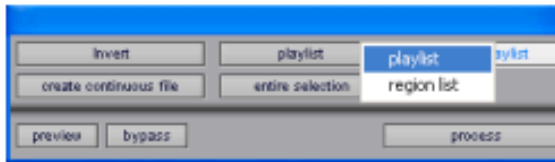
Plug-In Selector menu (flat list, non-category view)

Selection Reference

This menu aims the selected process at either regions selected in an audio track or playlist, or at regions selected in the Audio Regions List.

When you select a region on-screen (in either a track/playlist or the Region List) Pro Tools normally selects both occurrences of the region. Since you may not want to process both, this menu provides a convenient means of limiting the AudioSuite process to regions selected in one or the other.

Playlist Applies AudioSuite processing only to regions currently selected in tracks/playlists in the Edit window. Processing will not be applied to regions in the Audio Regions List.



Selection Reference pop-up menu (Invert plug-in shown)

Region List Applies AudioSuite processing only to regions currently selected in the Audio Regions List. Processing will not be applied to regions located in tracks and playlists in the Edit window.

⚠ *If the Use In Playlist option is enabled in addition to Region List being selected in the Selection Reference pop-up menu, the processing will be applied to the selected region in both the playlist and the Regions List.*

Use In Playlist Button

This button determines whether the AudioSuite plug-in will replace *all instances* of the selected regions everywhere in the session, or *only* the occurrences of the regions that are currently selected.



Use in Playlist button

Use In Playlist Off When Use in Playlist is disabled, a new, processed version of the selected region will be added to the Regions List. No original regions will be replaced or overwritten anywhere in the session.

Use In Playlist On, Reference = Region List

When Use in Playlist is enabled and the Selection Reference pop-up menu is set to Regions List, all copies of the selected region will be replaced everywhere in the session.

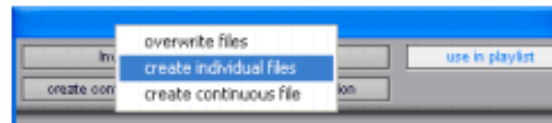
Use In Playlist On, Reference = Playlist

When Use in Playlist is enabled and the Selection Reference menu is set to Playlist, only regions selected in tracks in the Edit window will be replaced. If the session includes other copies of the region used in other playlists, those copies of the original, unprocessed region will not be replaced.

⚠ *If the Selection Reference pop-up menu is set to Region List, the Use in Playlist button will automatically be disabled to ensure that you do not accidentally replace every occurrence of the region in a session.*

File Mode Selector

This menu lets you select whether or not the AudioSuite plug-in will process the selected audio destructively or nondestructively, and how the original files will be modified.



File Mode pop-up menu (Invert plug-in shown)


There are three options:

Overwrite Files Processes the selected regions destructively, overwriting the original audio. Not all AudioSuite plug-ins can be used destructively.

Create Individual Files Processes the selected regions nondestructively, creating a new audio file for each region. The new audio files are added to the session, leaving the original source audio files in the Regions List unchanged.

(Whether the processed audio is added to the current playlist or only to the Regions List, is determined by the Selection Reference setting, as explained earlier.)

Create Continuous File Processes the selected regions nondestructively and creates a new audio file consisting of the selected regions consolidated into a single, unbroken region. This mode is particularly useful if you are assembling a composite track from multiple takes. This mode is not available when the Selection Reference is set to Region List.

 *The Create Continuous File option is not available with some time domain plug-ins. To achieve a similar result, use the Duplicate plug-in to consolidate regions processed with these plug-ins.*

Process Mode Selector

If you have made a selection that includes multiple regions, this pop-up menu lets you specify whether AudioSuite processing is performed on a region-by-region, or entire-selection basis.



Process Mode Selector (Invert plug-in shown)

Region by Region Analyzes each region in a selection individually, rather than over the entire multi-region selection as a whole.

Entire Selection Uses the entire selection for analysis. All regions will be analyzed and processed relative to the entire selection.

Chan/Track Process Mode Selector

If you have made a selection that includes regions from multiple tracks, the Normalize AudioSuite plug-in (as well as some third-party AudioSuite plug-ins) lets you choose whether you want to perform processing on a channel-by-channel/track-by-track, or an all-channel/all-tracks basis using the Chan/Track Process Mode Selector.



Chan/Track Process Mode Selector pop-up menu (Normalize plug-in shown)


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.

Preview

The Preview button lets you audition the effect of a plug-in before you process the audio. By adjusting the plug-in controls while you listen to this audio preview, you can fine-tune the effect. Not all AudioSuite plug-ins support this feature.

The Preview function routes audio to the specific outputs you have chosen with the Audition pop-up menu in the Outputs page of the I/O Setup dialog. Make sure you have configured this option correctly for your system or you may not be able to hear previewed audio.

 *For more information on using the I/O Setup dialog to configure your system's audio outputs, refer to the Pro Tools Reference Guide.*

Before you use Preview, be aware that:

- ◆ The performance of the Preview function depends on the speed of your CPU. Faster computers preview AudioSuite effects better than slower computers.
- ◆ Regardless of how many tracks and regions are currently selected, the Preview button will audition only the first selected stereo track or the first selected pair of mono tracks.
- ◆ If you are using Region-by-Region processing mode, the Preview function will preview only the first region within a multi-region selection. To hear all selected regions, temporarily select Create Continuous File from the File Mode menu before previewing.
- ◆ The Preview function is affected by the AudioSuite Buffer Size option (on the Processing page of the Pro Tools Preferences dialog). See “AudioSuite Processing Preferences” on page 36.

Bypass

When Bypass is enabled, the selected audio is auditioned without AudioSuite processing. The Bypass button applies only to previewing. It does not affect actual AudioSuite processing.


Process

Clicking this button begins AudioSuite processing of the selected audio. Processing can occur during playback (though it may take slightly longer). Processed files are auto-named with the region or audio file's name plus an acronym for the chosen AudioSuite process.

New files are written to the hard disk specified for that track in the Disk Allocation dialog, or to the same drive as the original file if the region is not currently on a track. See “Auto-File Naming of AudioSuite-Processed Audio” on page 36.


Multichannel Processing

Most DigiRack AudioSuite plug-ins can process up to 48 channels of audio simultaneously.

 *When processing multiple regions of different formats (mono and multichannel surround, for example), all channels will be processed according to the channel format of the AudioSuite plug-in. Mono AudioSuite plug-ins can process stereo regions and stereo AudioSuite plug-ins can process mono regions.*

Undoing AudioSuite Processing

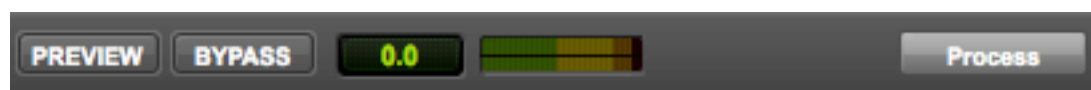
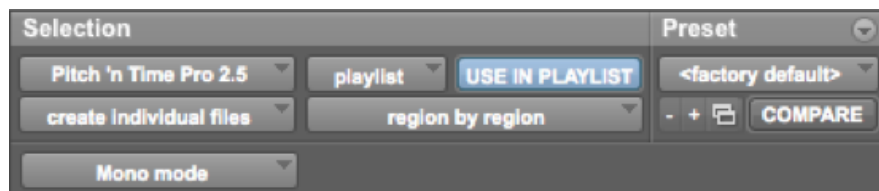
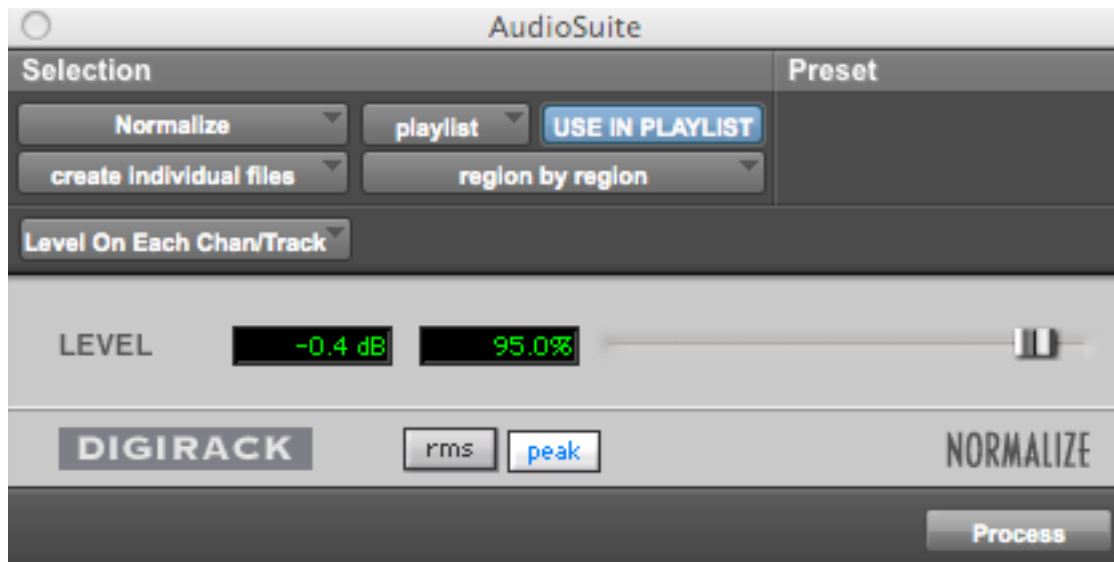
If you have processed an audio selection nondestructively, the Undo and Redo commands let you undo the selected AudioSuite process. You can undo or redo an AudioSuite process during audio playback.

 *Undo is not available when a plug-in is configured for destructive editing since the process has already overwritten the source audio file.*

1. Plug-ins can be used in Pro Tools in 3 ways, as discussed below.
 - a. Regions can be selected by highlighting, and a plug-in can operate on those. The result will be an audio file

with an abbreviation at the end of the filename to identify the plug-in that transformed it. This is most commonly used in electronic music composition and in sound effects for film.

- b. A track can have one or more plug-ins as inserts. The plug-ins affect everything in the track, but they do not process the regions into new audio files. This is most commonly used in multi-instrument recordings, where each instrument has its own track. The values can be changed during the mixing process.
- c. RTAS, or RealTime AudioSuite plug-ins are used in a similar way as inserts, except that each parameter of the plug-in can be automated. This has potential applications in electronic music composition.
- d. Approaches b and c, above, can also be used with a live input into the track, although this is not very common.



Changing Settings with the Next (+) and Previous (-) Settings Buttons

(Pro Tools 6.7 and Higher Only)

The Next (+) and Previous (-) Settings buttons let you select the next or previous setting of the Librarian menu.

COMPARE

- Small Hall
- Vocal Plate
- Vocals Slow Ballad
- Vocals Uptempo

- ✓ <factory default>

- Save Settings
- Save Settings As...
- Copy Settings
- Paste Settings
- Import Settings...
- Delete Current Settings File...
- Lock Settings File
- Set As User Default

- Settings Preferences ▶
 - Set plug-in Default To ▶
 - Save plug-in Settings To ▶
 - Set Root Settings Folder...

USE IN PLAYLIST

- Save Settings
- Save Settings As...
- Copy Settings
- Paste Settings
- Import Settings...
- Delete Current Settings File...
- Lock Settings File
- Set As User Default

- Settings Preferences ▶

- ✓ playlist
- region list

- mono mode
- ✓ stereo mode

- overwrite files
- ✓ create individual files
- create continuous file

region by region
✓ entire selection

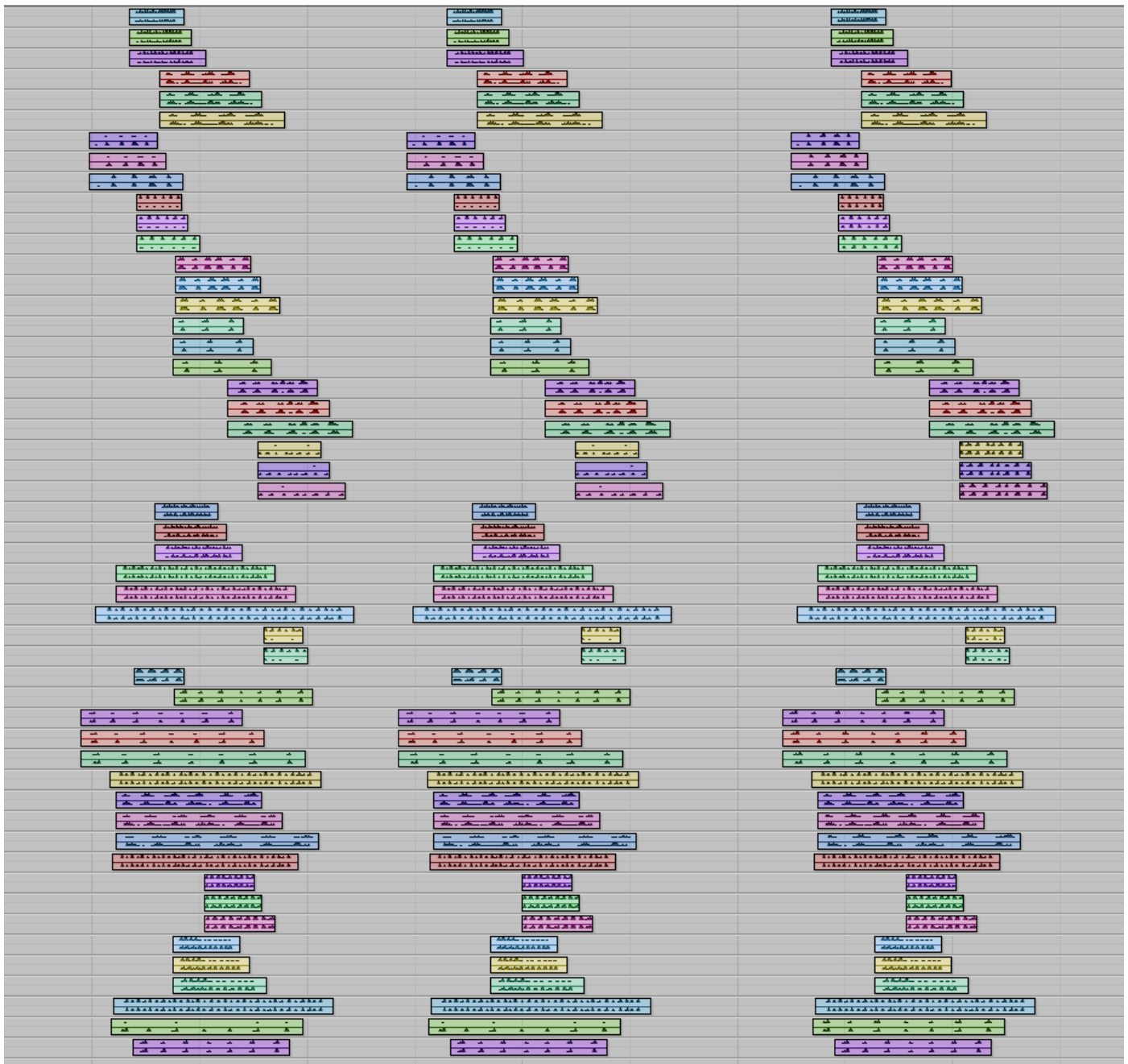
EQ	▶	AudioTrack Mono
Dynamics	▶	AudioTrack Stereo
Pitch Shift	▶	BIAS Repli-Q Mono
Reverb	▶	BIAS Repli-Q Stereo
Delay	▶	BIAS SuperFreq-10 Mono
Modulation	▶	BIAS SuperFreq-10 Stereo
Harmonic	▶	BIAS SuperFreq-4 Mono
Noise Reduction	▶	BIAS SuperFreq-4 Stereo
Dither	▶	BIAS SuperFreq-6 Mono
Sound Field	▶	BIAS SuperFreq-6 Stereo
Other	▶	BIAS SuperFreq-8 Mono

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 -".



On the left are non-normalized regions.

In the middle are normalized regions that use a single peak as the reference.

On the right are normalized regions that use the peak in each track as the reference.

Teaching Policies & Resources — Syllabus Insert

Administrative Home

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at <http://clas.uiowa.edu/students/handbook>.

Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their University of

Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences (Operations Manual, III.15.2, k.11).

Accommodations for Disabilities

A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

Academic Honesty

All CLAS students have, in essence, agreed to the College's Code of Academic Honesty: "I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled (CLAS Academic Policies Handbook).

CLAS Final Examination Policies

The final examination schedule for each class is announced around the fifth week of the semester by the Registrar. Final exams are offered only during the official final examination period. No exams of any kind are allowed during the last week of classes. All students should plan on being at the UI through the final examination period. Once the Registrar has announced the dates and times of each final exam, the complete schedule will be published on the Registrar's web site.

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS Academic Policies Handbook).

Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

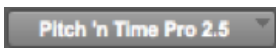
Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Department of Public Safety website.

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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.

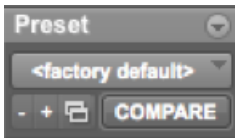


b. The menus below act on a selected region in the edit window (which is called the *playlist*) in Pro Tools.



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.



- a. 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.
- b. 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.
- c. 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

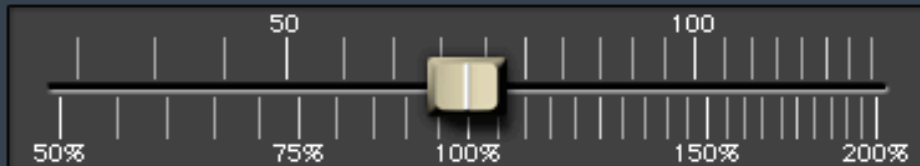
source rate

1.000

target rate

1.000

Rate change



bpm

68.0001

percent

100.000000

Output

Length

Units

Hours:Mins:Secs

start

11:15:35.214

end

11:15:35.260

length

0.045

Source

Target

11:15:35.214

11:15:35.260

0.045

Capture

Pitch

MODE

Tone

Hz

440.000

note

A4

cents

0

Bypass

original key

C

transposed key

C

octave

Key shift



semitones

0.00

percent

100.000000

Output

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



Preview gain

Output gain



clip

Preview

Bypass

0.0



UpdateWavfrm

Process

