SIRENAUDIO

Generative 2

User Manual (April 2016)

Version 2.0.5

Contents

System Requirements

Windows System Requirements

Windows XP, Vista, Windows 7, or Windows 8 machine and 4 GB RAM. An ASIO-compatible sound card is recommended for optimum audio performance. Windows users should thoroughly test the demo version on their computer. Windows users will need the latest version of Java installed, which can be downloaded here: https://java.com/en/download/

If you do not have an ASIO-compatible soundcard please try the free ASIO4All audio driver available here: http://www.asio4all.com/

Macintosh System Requirements

Mac PPC or Intel machine running OS X 10.4.11 or later, and 4 GB RAM.
Mac users will need to have Java SE 6 installed which can be downloaded here: http://support.apple.com/kb/dl1572

Support

If there are any issues with performance, send an email to: support@sirenaudio.co.uk outlining the nature of the problem and how you were using the application when the problem occurred.

Installation

SirenAudio software does not use an installer. Once the software is downloaded and has been authorised it is ready to use. By using the application you agree to the license agreement. The license agreement is included in the downloaded folder.

About the application

The Generative application was designed to create continually evolving soundscapes using audio from a sound file, or an external audio input. There are four granular devices whose parameters are altered continually by the application. Whilst the playback is granular, the input audio remains relatively unchanged. With the completion of version 2 of the application, many of the previously unchangeable parameters are available for the user to control. These include the pitches of each device, global tuning, segment selection, and granular settings.

Demo Version

The demo version of Generative has no internal record capabilities. If you create something interesting with the demo you can save it, however you cannot restore that session with the demo version.
The demo application will close after 20 minutes.

New in Version 2

- Restore sessions. Recall analysed audio with all user settings to completely restore a previous session.

- States section to alter parameters via MIDI notes and the computer keyboard.

- MIDI trigger section with amplitude envelope to set pitches and change state presets.

- Ability to change each devices pitch using a sliding scale or keyboard values.

- Graphic filter for each device, and a choice of state variable filter, or graphic filter for output audio.

- Improved user variation implementation for more precise variation control.

- Aux send to effects for each device.

- Effects channel with delay ramp, distortion, and delay effects.

- Random segments on copy function to shortcut analysis stage.

- Random Segments window with space and length settings.

- Options for CPU reduction: hide graphical playheads / set number of voices used by each device.

- Direct control of granular parameters by suspending the applications internal synthesis engine.

- User Playback Area for each device in order to give finer control of user playback position via MIDI.

- Global Pitch tuning and variation settings.

- Random pitch method by user scale or range.

- Option to alter pitches via MIDI by scale / range / keyboard interval.

- Ability to view, add, edit, and delete segments.

- Option to show segments of specific devices and/or user playback areas.

- Improved state variable filters (implementation by Tim Place of 74 Objects).

- Reverb (implementation by Tim Place of 74 Objects).

- Control Granular Parameters via MIDI

Left Column: Audio Input / Filter / Preset settings

Background Picture Toggle.
By clicking this button you can toggle the background picture
on or off. This setting is saved in the preference file (page 28).

1. Audio On / Off.
This control allows you to turn audio processing for the
application on or off. Its background turns green when the
audio is on.

2. Input Gain.
This control allows you to set the volume of the Input Source
(3), and shows the volume of the selected source.

3. Input Source.
This menu sets the input to be used for segment analysis
(Sample or External Input 1 + 2).

4. Preview On / Off.
When turned on this control's background turns green, allows you to
hear live audio from either the loaded sample or the external inputs.

5. Start/Stop External analysis.
This toggle is used to start and stop analysis of the External input. When
started audio will be analysed, and will be shown recording in the low
waveform display (page 16).

6. Input Filter Type.
Sets the type of filter (*bandpass, highpass, lowpass, notch*)
applied to the input audio.

7. Filter Frequency.
This control allows you to specify the cutoff filter frequency in Hertz.

8. Filter Q (resonance).
Sets the resonance of the filter. Higher values will produce a more
resonant affect around the specified filter frequency.

9. Preset Write Settings.
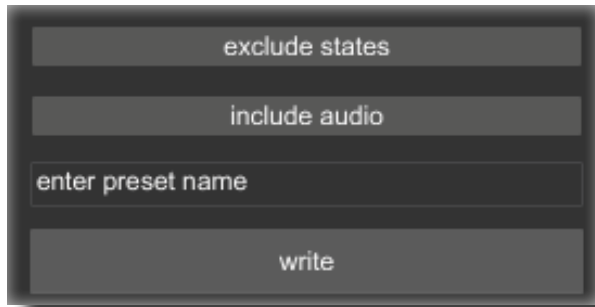This button opens the preset write settings window (12).

10. Preset Read.
When clicked this button opens a window allowing you to select a preset.
When selecting only select the .json file that does not include the '_
states' suffix. If a state preset has been saved using the settings window,
the states preset will be loaded automatically.

11. Update Preset.
The update button will overwrite the currently loaded preset.
This will include states and audio if they are included in the
write settings window (12).

9-11. **Read preset by drag and drop.**
In version 2.0.5 you can now drag and drop the main preset .json
file anywhere in to the preset area to load the preset.

Preset Write Settings

exclude states

include audio

enter preset name

write

12a. Include / Exclude States.
When set to include, the States section of the application (95) will be saved in a separate file with the text '_states' added to the preset name (12c).
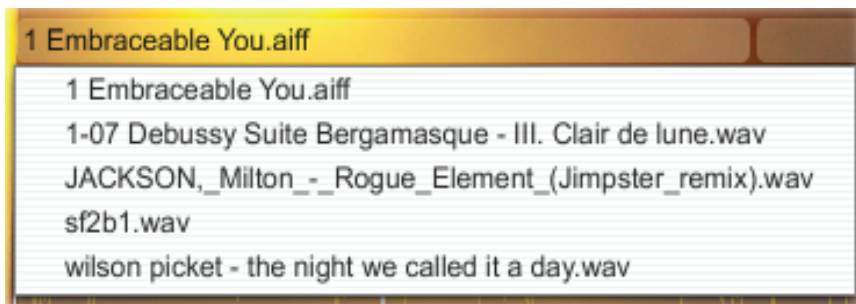
12b. Include / Exclude Audio.
When set to include, the audio used for granular playback which is shown in the low waveform display (67) will be saved in the same directory as the main preset file, allowing you to restore it. If audio is not included new audio will need to be recorded once the preset has been loaded.

12c. Preset Filename.
Text entered here is used to specify the name of the preset.

12d. Write.
When clicked this button allows you to specify the folder or directory where the preset will be saved.

Top Menu: File Selection / Loading / Copying

1 Embraceable You.aiff

1 Embraceable You.aiff

1-07 Debussy Suite Bergamasque - III. Clair de lune.wav

JACKSON,_Milton_-_Rogue_Element_(Jimpster_remix).wav

sf2b1.wav

wilson picket - the night we called it a day.wav

13. Audio Filename Display.
When a folder is loaded, this drop down menu allows you to select the sample to be used for analysis or copying.

file   folder   select all   copy selection

14. Load Audio File.
When clicked this button opens a window allowing you to import a sample to be analysed or copied.

15. Load Folder.
This control allows a folder of audio files to be imported. Loaded files can be selected using the Audio Filename Display (13).

16. Select All.
When clicked this button selects the loaded file from start to finish. The selection is used to define what part of the audio is used for analysis.

17. Copy Selection.
When clicked the selected audio is copied to the lower waveform to be used for each device's granular synthesis. If 'Random Segments on Copy' (97 i) is checked in the application Settings menu(97), random segments will be automatically created when copying. This is a useful tool to quickly generate sound if you do not wish to use the analysis tool to find segments.

Top Waveform Display / Waveform Controls

Read audio file by drag and drop. In version 2.0.5 you can now load an audio file by dragging and dropping it on to the top waveform display.
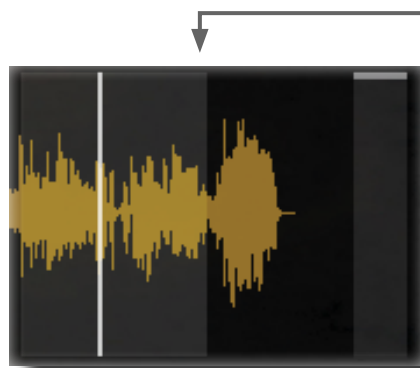
18. Selection highlight.
When a portion of the waveform is selected when in select mode (23), the selection will show a lighter colour than the default background.

19. Zoom Control.
When a portion of the audio is selected the Zoom control can be used to zoom in to the current selection, or out to show the entire waveform of the loaded sample. When the control is at the top, the waveform is fully zoomed out. When the control is at the bottom the waveform is fully zoomed in to the selection.

20. Playback Position playhead.
When audio is being analysed or played, the playhead will be visible and will show the current playback position.

21. Play Audio.
When clicked this will play the currently selected audio. This button should only be used to preview the selected audio. No analysis is performed when the button is clicked.

22. Analyse Selection.
When clicked this button starts the amplitude analysis of the selected audio. This is a realtime process which uses the sensitivity and release time controls (25, 27) to look for peaks in the amplitude of the signal. It's possible to stop analysis by clicking this button again (you don't have to wait for it to finish).

| play | analyse selection | select | move |

23. Select mode.
When clicked this button is highlighted and indicates that select mode is enabled. Clicking and dragging on the waveform display will create a new selection.

24. Move mode.
When clicked this button is highlighted and indicates that by clicking on the selection and dragging, the selection will be moved around the waveform display.

Segment Detection / Segment Distribution

25. Sensitivity Control.
This control affects how the start and end points of a segment are defined. If the input analysis audio reaches a certain amplitude threshold a new segment's start point will be defined. If the amplitude drops below this value the segment's end point will be defined and a new segment can be created. Use higher values for quieter audio, and lower values for louder audio.

26. Default Segment Detection Settings.
This resets the Sensitivity and Release Time controls to their default settings.

27. Release Time Control.
Once a segment's end point has been defined, a new segment's start point can be defined only after the release time has elapsed.

28. Segments Found display.
This shows the number of segments detected at the analysis stage. This display also updates when random segments are generated, or segments are manually added or deleted by the user.

**29. Segment Distribution controls.**
Once a section of audio has been analysed, or random segments have been created, they will be distributed to each of the four granular devices based upon their length. This is an arbitrary assignment used as a simple way of distributing the segments to each device. By default the controls will divide the number of segments equally between devices. This setting can be altered by unchecking the 'Random Segments on Copy'(97 i) menu item from the Settings menu (page 26).

29 a. Segment Divider
This control divides the segments in to two groups. The length of these groups is shown in the number boxes either side of the control.

29 b/c. Default distribution buttons.
When clicked these buttons will distribute the segments in the 'Large' and 'Small' groups equally.
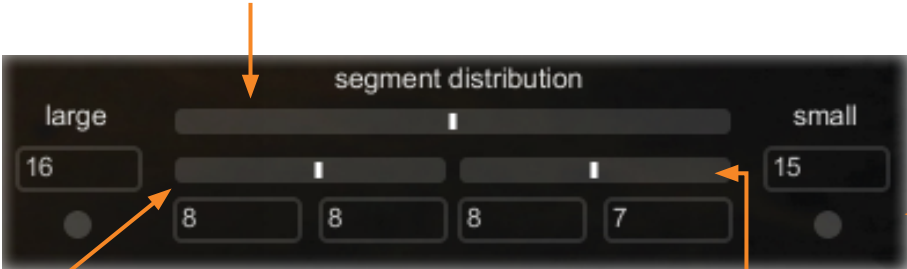
29b. Large Segment Divider.
This control divides the segments initially defined by the Segment Divider control in to two sub groups which are sent to devices 3 and 4. The number of segments sent to each device is shown in the number boxes below the control.

29c. Small Segment Divider.
This control divides the segments initially defined by the Segment Divider control in to two sub groups which are sent to devices 1 and 2 The number of segments sent to each device is shown in the number boxes below the control.

Device Gain / Pan / Interpolation / Mute / Solo

30. User Pan Control.
Note that the internal granular engine has its own method of continuous panning, however this control is used as a further panning stage.
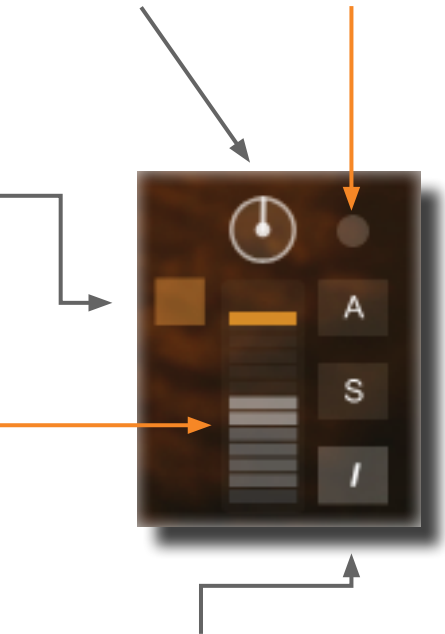
30a. Pan Reset Button.
When clicked this resets the panning dial to the center.
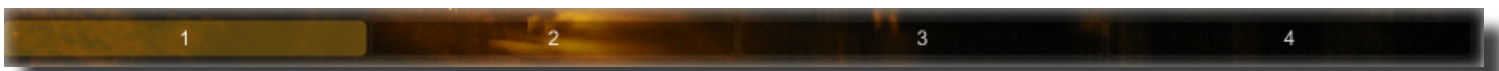
32. Automatic / User Playback Mode.
By default this control is set to automatic playback. This playback mode interpolates between segments relative to the device.

When User mode is enabled, direct control of the playhead associated with the device can be achieved via clicking on the waveform after selecting position(61) from the low waveform controls. Or by using MIDI. When using MIDI, the user playback area(70) can be defined which constrains MIDI values to the playback area allowing finer control of the playhead.

31. Mute toggle.
When the toggle shows a cross all granular processing for that device is turned off. This can be a useful control if you would like to save CPU by disabling all audio processing of the device

33. Gain Control. This controls the volume for each device. A volume meter is included within the control to give visual feedback of the device's volume

34. Interpolation toggle.
When turned on a the device's playhead will interpolate to different segments over a time specified by the internal probability engine. When turned off the playhead moves abruptly between different segments.

35. Solo toggle.
When clicked this solos the device. All audio processing is turned off for other devices when soloed.

Device Selection

36. Device selection control.
This control is primarily used to view the interface to alter the pitch and filter parameters of each device. Its secondary function comes in to use when a device's User playback mode is activated using the Automatic / User playback mode control(32). By selecting a device with the control, then selecting the position control(61) located on the low waveform controls, you can click to any point in the viewable waveform to change the playhead's location. In the picture device one is selected. Only one device can be selected at a time.

Display Area Selection

37. Device Filter view.
When clicked the filter corresponding to the device selected with the device selection control (36) will show the graphical filter in the display area. See 42

38. Pitch view.
When clicked the pitch window corresponding to the device selected with the device selection control (36) will show the pitch controls in the display area. See 46 - 50.

39. Aux view.
When clicked the Aux window(51) will be shown in the display area.

40. Effects view.
When clicked the two effects windows(52 - 55) will be shown in the display area.

41. Reverb view.
When clicked Reverb parameters will be shown in the display area. See 56.

Device / Output Graphical Filter

42. Graphical Filter Display.
By clicking on a rectangle which indicates a specific filter, you can drag the selected filter around a frequency range. You can also alter the gain of the filter by moving your mouse up and down while dragging. To alter the 'Q' or resonance of the filter, click the left or right edge of the filter and drag left or right to change the gradient. When altering a filter via MIDI (84 - 86), the filter must first be selected with the mouse so that its selection background is orange.
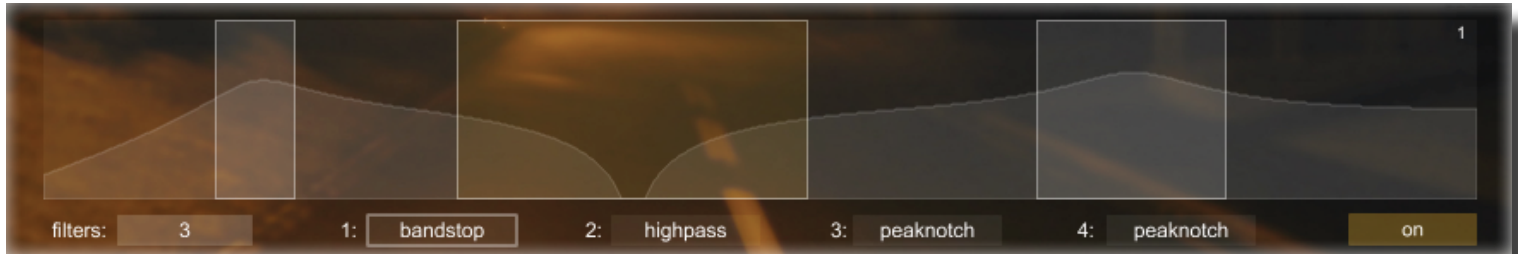
43. Filter Amount Menu.
Four filters are available for each device's graphical filter. Here three filters are selected.

44. Filter Type Menu.
This allows you to choose from various common filter types. When clicking and dragging on one of the filters, the corresponding filter menu will turn white. This allows you to set the selected filter's filter type.

45. Graphical Filter on / off.
This menu turns the currently selected filter on or off.

Device Pitch Controls

46. Pitch keyboard control. By clicking on the keyboard, the pitch of the selected device can be changed. Since the granular synthesis is based upon an audio sample, a ratio is used instead of a frequency when altering the pitch of the device. A transposition of -12 semitones will result in a ratio of 0.5, +12 a ratio of 2. This ratio is shown in the ratio display number box, and is relevant for both device, and global tuning.
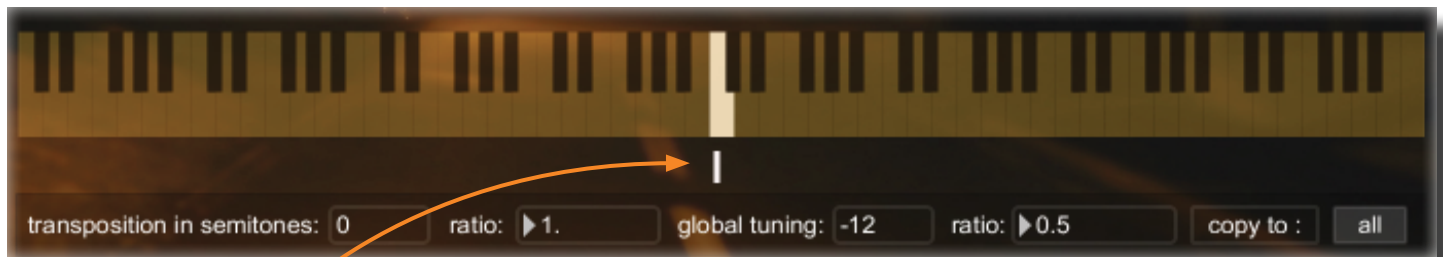
47. Pitch slider.
This slider allows for finer control of the pitch ratio. Allowing ratios that are in between notes. Hold down shift while clicking and dragging for finer control.

48. Global Tuning.
On each device's pitch controls there is a global tuning control. This alters the global tuning of all of the devices, whilst retaining their individual pitch intervals. This control can be altered using both the global tuning and ratio number boxes.
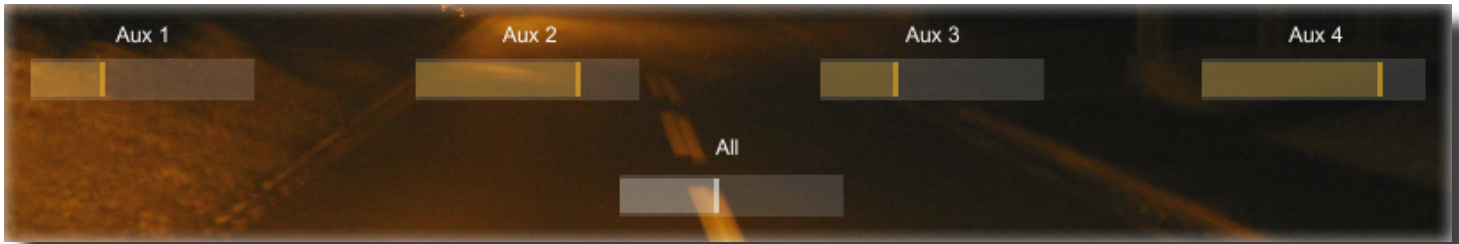
49. Ratio number.
The ratio control can be manually set by clicking and dragging on the number box, or by clicking on the box and entering numbers via the computer keyboard.

50. Copy pitch.
These controls can be used to copy the currently selected device's pitch to another device, or to all devices.
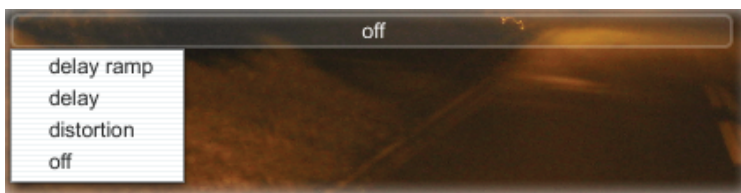
Aux Sends

51. Aux send.
These controls define the volume of each device sent to the effects chain. The 'all' control changes all settings to the same value. After the effect stage the audio is added together with the audio before the effects stage and then sent to the output.

Effects

52. Effects Selection.
This menu allows you to select from three effects that are used in the effects chain. These effects are a delay ramp, delay, and distortion.

53. Delay Ramp. This effect changes a delay time without changing the pitch of the delay.

53c. Clear/Default/Trigger controls.
The clear button clears the audio in the delay line. The default button draws a default slope in to the effects ramp display. Finally the trigger control is used to start the delay ramp.

53a. Delay Ramp Length.
This number box sets the length of the delay in seconds.

53b. Feedback Amount.
This sets the feedback amount of the delay.
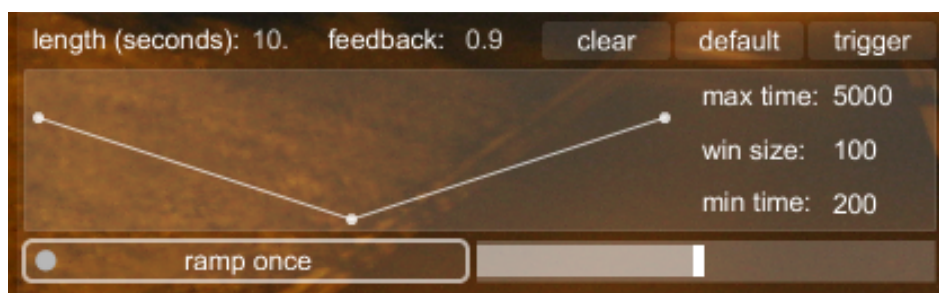
53d. Delay Ramp display.
Clicking on a point will allow you to move that point around the display. Clicking on the line creates a new point.

The ramp begins on the left and ends on the right and it's length is defined by the Delay Ramp length number box (53a). The minimum delay time is the lowest point on the Y axis, and the maximum time is the highest point.

53f. Delay Ramp Loop menu.
This control allows you to set the delay ramp to complete one cycle when it is triggered. Or it can be set to 'repeat' so that the ramp continually loops once it has finished a cycle. The grey circle to the left of the menu will blink to indicate a new cycle has been started.

53e. Window Size.
This control effects how abrupt the changes in the delay time will be. Smaller values will produce more abrupt changes.

53g. Delay Ramp Mix control.
This control sets the dry / wet mix of the effect.

Effects (cont.)

54. Delay. This effect consists of three delays with time, feedback, and mix controls.
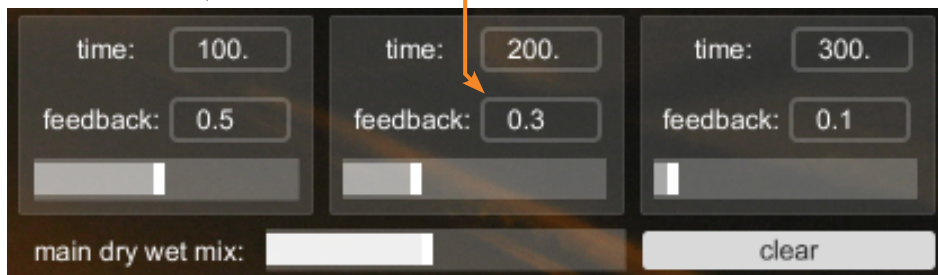
54a. Delay Time controls. These controls change the time of the delay.

54b. Feedback Amount These number boxes range from 0 - 0.99. With 0.99 providing the most feedback.

54c. Delay Dry / Wet Mix. These controls alter the mix between dry and wet (delayed) signals for each delay.

54d. Main Dry / Wet Mix. This control alters the overall dry / wet mix. This is between all delay signals combined and the audio before the delay effect.

54e. Delay Clear. This control will clear all delays so that no audio remains in the delay lines.

55. Distortion. This effect allows you to combine three different distortion effects.

55a. Tanh~ distortion. This distortion provides a smooth rounding of the signal with lower values, and gradually becomes more distorted with higher values.

55b. Overdrive~ distortion. This distortion produces more high frequencies that the Tanh~ distortion and has an aggressive sound.

55c. Downsamp~ distortion. This distortion is a downsampling or bitcrushing effect.
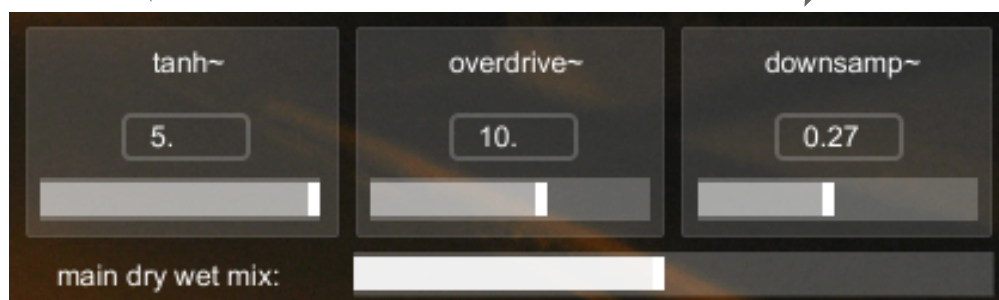
55d. Dry / Wet. These controls alter the dry / wet balance of each distortion effect.

55e. Main Dry / Wet Mix control. This control alters the overall dry / wet mix. This is the mix of all distortion signals combined and the audio before the distortion effect.

Reverb

56a. Default Settings
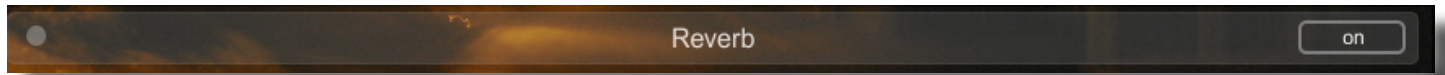When clicked this button sets all of the reverb parameters to default values.

56. Reverb.
This is the final process after the filters and effects. The reverb implementation is from Timothy Place's TapTool set of Max/MSP objects.
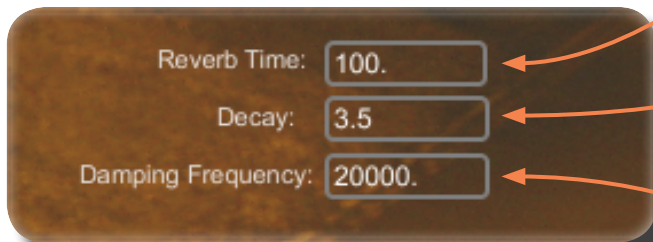
56b. Reverb on / off.
This turns the reverb effect on or off.

Reverb   on

Reverb Time: 100.
Decay: 3.5
Damping Frequency: 20000.

56c. Reverb Time.
Delay time in milliseconds. Relates to room size / how quickly echo density builds up in the reverberator.

56d. Decay time
How long (in seconds) for the reverberant sound to decay 60 dB.

56e. Damping filter cutoff in Hz.
Emulates the effect air and walls have on sound as it travels and reflects.
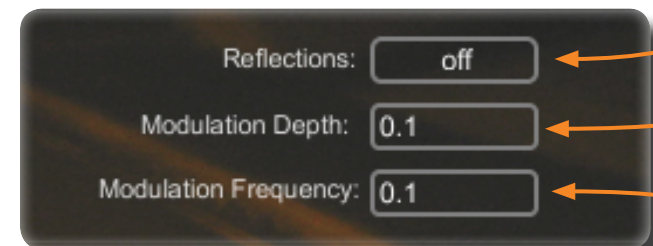
Mix

Lowpass filter frequency: 15000.

56f.Dry/Wet Mix.
Controls the main dry / wet mix of the reverb effect.

56g. Cutoff frequency.
Sets the frequency of the final lowpass filter stage to control the brightness of the reverb.

Reflections: off
Modulation Depth: 0.1
Modulation Frequency: 0.1

56h. Reflections on/off .
Toggles on/off early-reflections.

56i. Modulation Depth.
Modulation depth for the modulation frequency.

56j. Modulation Frequency.
Modulation frequency in hertz - applied to the reverb's delay times internally.

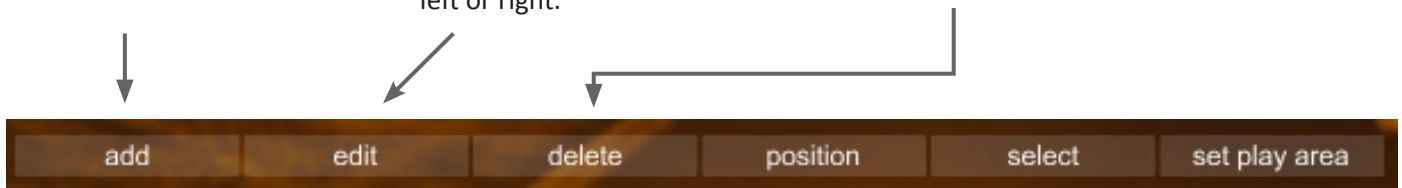# Low Waveform Controls

57. Add Segment.
Allows you to manually add segments to the low waveform. Segments cannot overlap.

58 Edit Segment button.
Allows you to edit existing segments by clicking inside the segment and dragging left or right.

59. Delete Segment button.
When selected this control allows segments to be deleted by clicking on them.


60. Position.
When a device is in user playback mode and the position control is selected and the device is selected with the device selection control the user can click on any part of the visible waveform to move the playhead there.

61. Select.
When clicked this button allows the user to select a portion of the low waveform in order to zoom in and out using the low waveform zoom control (69).

62. Set Playback Area.
When clicked this control allows you to set the selected device's user playback area for use with MIDI input. The playback area's colour corresponds with that device's user playback colour. Playback areas can overlap.
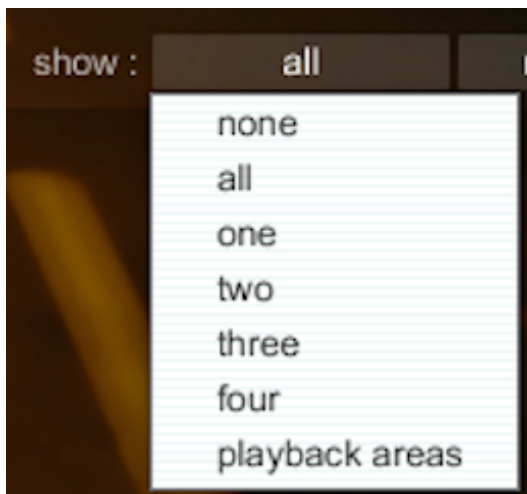
63. Show menu.
This menu allows you to display various information that is relative to the low waveform.

None clears all graphics from the waveform.

All shows all segments for all devices. This menu item is selected automatically when the Add / Edit / Delete buttons are selected to give you a full overview of the segments.

One / Two / Three / Four, show the corresponding device's segments.

The *Playback Areas* item will show the user playback areas for each device if they have been defined.

64. Normalise.
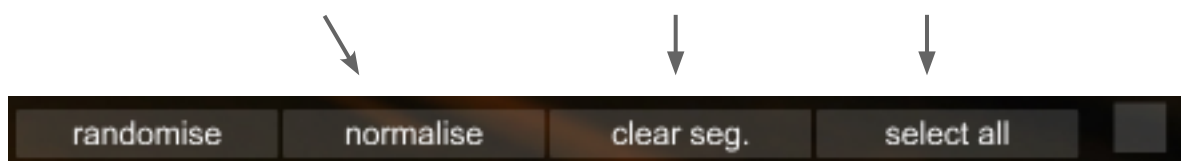When clicked this button will normalise the analysed or copied audio.

65. Clear Segments.
When clicked this control will clear all current segments.

66. Select All.
This button will selects the entire low waveform and zooms out.

67. Randomise Segments.
This button allows you to create new random segments (more info on page 23)

97 g. Show Playhead mirror.
This toggle sets and mirrors the show playhead menu item in the settings menu. By default it is crossed (on) which will show device playheads over the waveform. On some systems this may be computationally expensive, so this control allows you to hide this visualisation.

Low Waveform Display

68. Segment Display.
The orange bars indicate a segment's start and end point.
Segments can be altered using the Add / Edit / Delete controls (58-60).
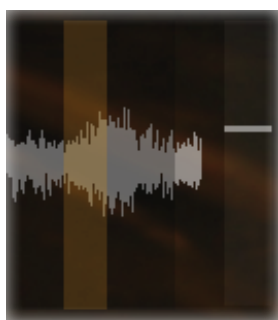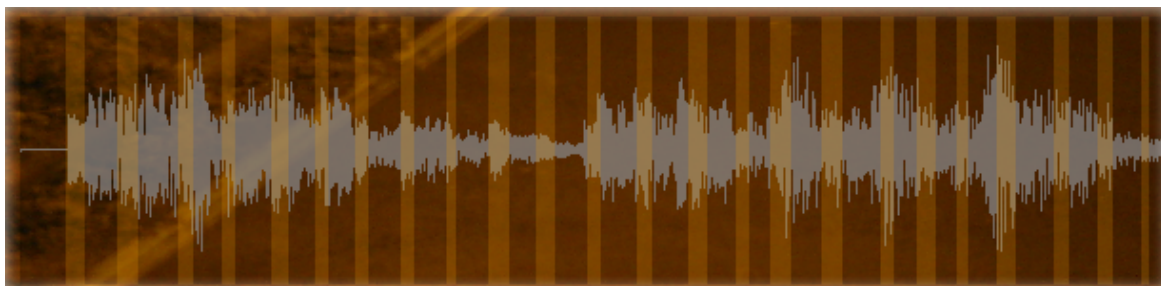
69. Low Waveform Zoom.
When a portion of the audio is selected the Zoom control is used to zoom in to the current selection, or out to show the entire waveform of the loaded sample. When the control is at the top the waveform is fully zoomed out. When the control is at the bottom the waveform is fully zoomed in to the selection.
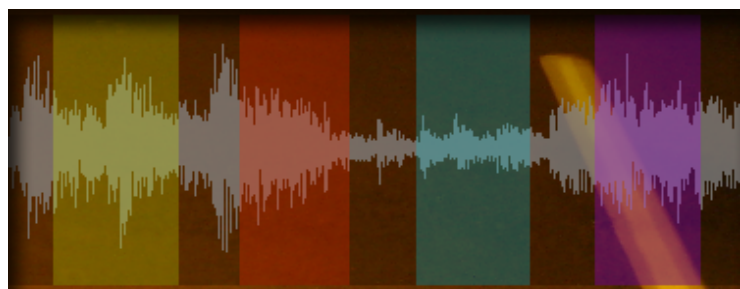
70. Playback Area Display.
When the Set Playback Area control is active and the Playback Areas item is selected from the Show menu you will be able to see and edit the user playback areas for each device. Green corresponds to the first device, red to the second, teal to the third, and purple to the fourth device.
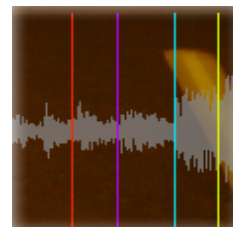
71 a. Playhead (automatic mode).
When the Playback mode is set to automatic the playheads, or current playback positions will be shown as vertical white lines over the low waveform display.
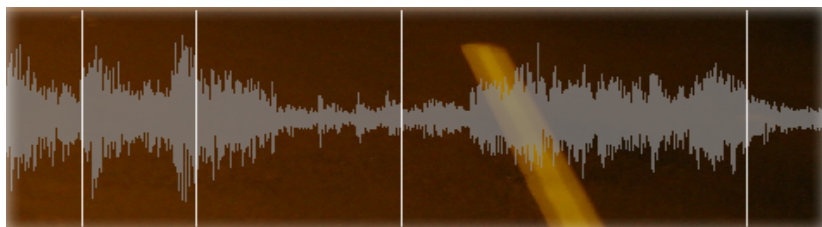
71 b. Playhead (user playback mode).
When in user playback mode the playheads will change colour to correspond with the device they are representing.

Right Column : Output Gain / Record / Filter

72. Output Gain.
Sets the output volume of all combined sounds.

73. Record Settings.
When clicked this opens the Record Settings window(78) which allows you to specify which audio streams to record, as well as different bit depths of the resulting files

74. Start / Stop Record control.
When clicked this begins recording. An output directory must be set in the Record Settings window before clicking the button to start the recording.

75. Record Time Display.
This display shows how long in minutes and seconds has elapsed after the recording has been started.

76a. Output Filter Type.
This control allows you to set the output filter to SVF (State Variable Filter) or Parametric. See 75e for Parametric.
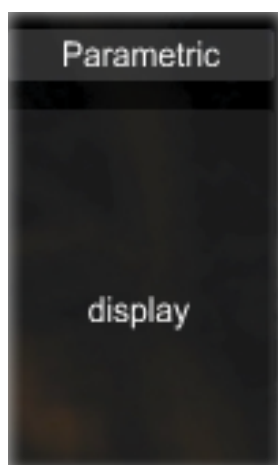
76b. SVF Filter Type.
Sets the filter on or off, and defines the filter type.

76c. Cutoff Frequency.
Cutoff frequency in Hz.

76d. Q or Resonance.
Controls the resonance of the filter. Higher values accentuate the effect of the filter around the cutoff frequency.

76e. Parametric Filter Type.
The Output Filter Type menu allows you to set the output filter to a graphical filter, like each device's filter. When the show filter button is clicked the filter will be shown in the display area. For information about this type of filter see 42-45.
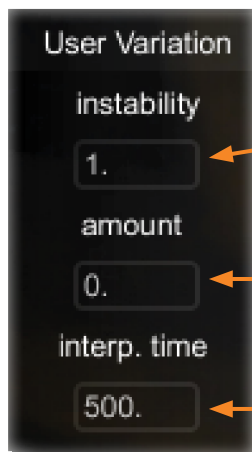
77. User Variation Settings.
These settings affect the playhead position when a device's playback mode is set to 'U' or user.

77 a. Instability.
The playhead position is altered by low pass filtered noise. The instability control sets the cutoff frequency in Hz. The higher the value the more erratic the changes will be

77 b. Amount.
This defines the size of the variation. Higher values will make a greater impact on the playhead position.

77 c. Interpolation.
This sets the speed at which the playhead moves from one point to another. This control interpolates from position to position regardless of if a device's interpolation toggle(34) is off.

78. Record Settings Window.
When the Record Settings button(73) is clicked, the window below is opened revealing record settings.
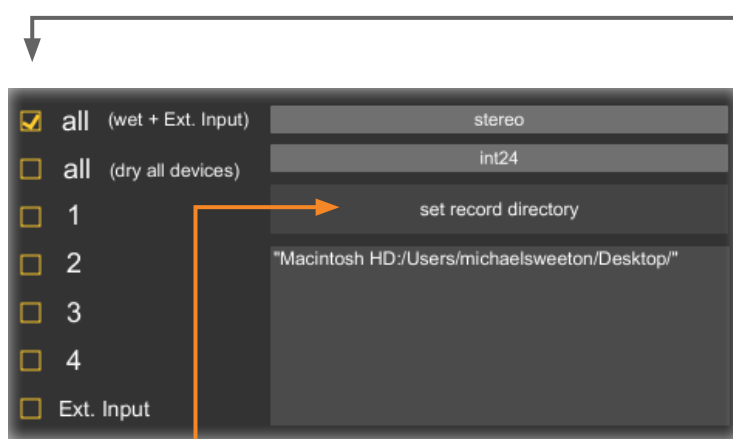
78 a. Channel Record Selection.
This checkbox control allows you to select which parts of the internal audio to record.

All (wet) combines all four devices and is essentially the audio that you can hear excluding the External Input.

All (dry) combines all devices after the panning and filter stages. It excludes the External Input, Reverb, and Effects.

1-4. These checkboxes allow you to record each device individually. Reverb and Effects are not included.

External Input. When ticked this checkbox allows you to record the External Input. To record the External Input the Input Source (3) must be set to either External Input 1 or 2, depending on which channel you wish to record.

78 b. Mono / Stereo.
This menu allows you to selected whether the recorded files will be mono or stereo. When recording the external input the resulting file will always be mono.

78 c. Bit Depth.
This control allows you to set various bit depths to record at.

78 d. Set Record Directory control.
When clicked this button opens a window so that you can set the directory in which the files are stored. This directory is then displayed in the space below. Make sure you have enough space on your hard drive to record. A 30 minute stereo recording at a sampling rate of 44.1kHz and a bit depth of 24 will result in a file of around 455Mb.
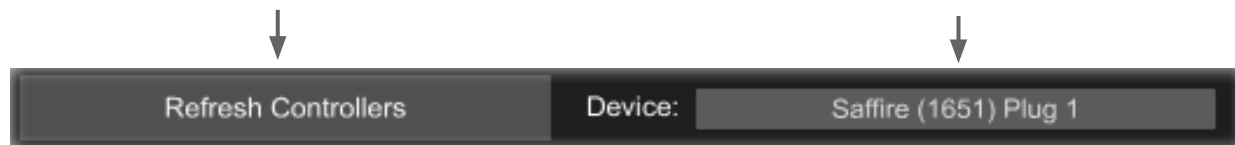
MIDI

79. Refresh controllers
When clicked this button refreshes the list of controllers shown in the device menu.

80. MIDI Device.
This menu allows you to set which device will send MIDI information to set a MIDI parameter when in learn mode.

Refresh Controllers	Device:	Saffire (1651) Plug 1

81. Input Controller Value display.
This shows the MIDI value of the current controller number.

82. Input Controller Value display.
This shows the MIDI value of the current MIDI input.

83. Unlearn MIDI in Window.
When clicked all assignments in the main MIDI window will be unlearned.

controller number: 26 | value: 47 | Unlearn All MIDI in Window

84. Learn MIDI.
When clicked this will allow a MIDI assignment to be made. Input some MIDI controller data to your computer and you will see the controller number and value boxes change.

85. Controller Number.
This display shows which controller number has been assigned to the control.

86. Controller Value.
This shows the MIDI value of the assigned controller number.

87. Pitch MIDI Mode.

Each granular device has a MIDI pitch control.

The *Free* mode covers the entire frequency range of the keyboard. To smooth these values change the pitch slide control in the MIDI trigger window.

The *Keyboard* mode constricts the MIDI values to the ratios of the keyboard shown in the display area.

The *State* mode refers to the States window. The random pitch method in this window defines whether the range or scale will be used. If the range is selected from the Random Pitch Method menu (97 a) the MIDI values will be constrained to this frequency range. If Scale is selected, the 0-127 MIDI range will be split equally over the scale. If 4 notes are in the scale, the MIDI range will be split in to blocks of around 31, allowing you to assign different notes of the scale by altering the MIDI value.

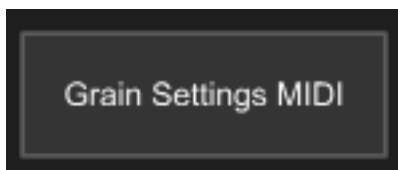To alter the interpolation time from one pitch to another see 90g.

Effects MIDI + Grain MIDI
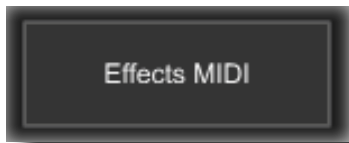
88 a. Effects MIDI window.
 In the bottom right hand corner of the MIDI window is the Effects MIDI button which opens a window to allow you to assign MIDI controllers to any effects that have been loaded

Below is the Effects MIDI window, with the Delay Ramp effect loaded in effect 1 slot, and the Distortion effect loaded in the effect 2 slot. The Unlearn All MIDI in Window button unlearns MIDI only in the Effects MIDI window.

88 b. Grain MIDI window.
 In the bottom right hand corner of the MIDI window is the Grain MIDI button which opens a window to allow you to assign MIDI controllers to the granular parameters accesible via the Grain Settings window.
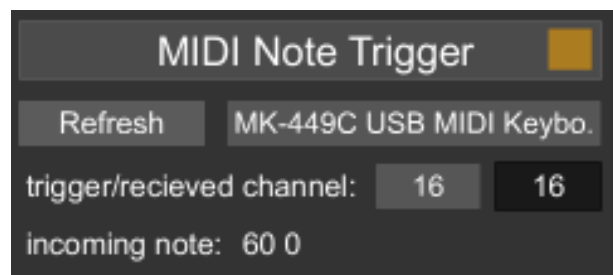
MIDI Trigger
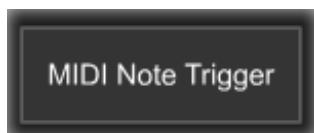
89. MIDI Trigger window.
In the bottom right hand corner of the MIDI window is a button to open the MIDI Trigger window.

90. MIDI Note Trigger section.
This section allows you to use MIDI notes to trigger actions in the States Window, as well as set pitches and play each device as a monophonic synthesiser.

90 a. MIDI Note Trigger On / Off
This must be set to on for the trigger to work.

90 b. MIDI Input Device and Refresh.
Similar to control 79, this menu allows you to select a MIDI device from which to receive note information. The last entry in the menu allows you to use the computer keyboard to play notes in the style of Ableton Live's computer keyboard toggle. Keys A-L play the white notes, keys W-O play the black notes, Z lowers the octave, while X raises it. The 'Refresh' button updates the menu with any controllers connected after the application has been launched.

90 c. Trigger Channel / Received Channel and Note.
The trigger channel allows you to set the channel which the application will recieve MIDI on. The received channel shows the incoming MIDI channel - these must be the same for the MIDI trigger to work. The incoming note shows the pitch and velocity of an incoming MIDI note.

90 d. Action 1.
This menu defines the first of two actions that can be assigned to an incoming MIDI note.

Off means that no action will be triggered on an incoming MIDI note.

Alter States Preset allows you to use incoming MIDI notes to switch between presets in the States window. The first preset in the States window is triggered by note 60 (middle C), and the final preset by note number 75.

Alter Global Tuning allows you to use any MIDI note to change the pitch ratio of the global tuning, If the Envelope (90 g) is on and the action is set to alter global tuning all of the device's audio is combined and their amplitude will be enveloped on receiving a note on message.

Set Pitch 1 - 4. These selections will change the selected device's pitch. If the Envelope is on, the selected device's amplitude will be enveloped.

90 e. Action 2.

This menu defines the second of two actions that can be assigned to an incoming MIDI note.

Off means that no action will be triggered on an incoming MIDI note.

Cycle Segments will increment the index of the segment selection in the States window each time a MIDI note on message is received.

Random Segments will select a segment at Random from the segment selection in the States Window when a MIDI note on message is received.

Play Device Pitches. This selection emulates a 4 voices synthesiser with each device responding to pitch and note on / off data. Once all four voices have been used a new note cannot be specified without first sending note off data to free a device's voice. This action also works with the Amplitude Envelope, with each device having it's own separate envelope.

Set Pitch 1 - 4. These selections will change the selected device's pitch. If the Envelope is on, the selected device's amplitude will be enveloped.

90 f. State Preset Key Trigger.
When this toggle is on the computer keyboard can be used to change the States preset number. The characters : Q W E R T Y U I Correspond to the first 8 preset slots. And the Characters : A S D F G H J K, Correspond to the last 8 slots (8-16). This control works independently from the Action 1's Alter States Preset selection.

90 g. Envelope controls. These controls relate to the amplitude envelopes which are applied to the device and main audio outputs as specified by the Action 1 and 2 menu selections.
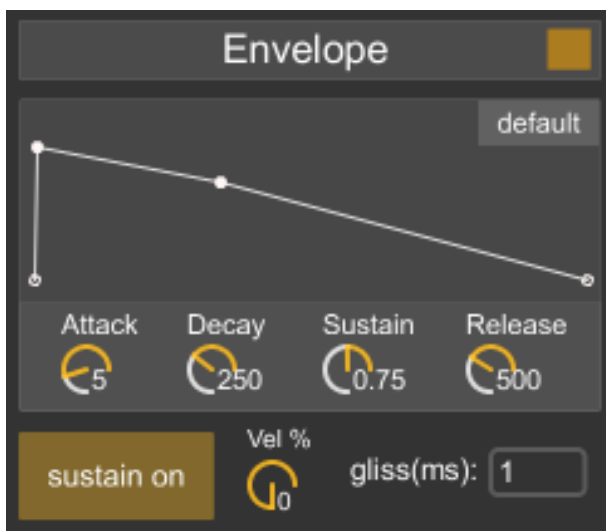
Envelope On / Off toggle. Turns the envelope on or off. Note that the MIDI settings are saved in a preferences file - so if you cannot hear any audio output, it may be caused by the envelope being on.

Envelope display / Default / ADSR. This allows you to change the points displayed in the envelope by clicking and dragging them. New points cannot be added and the first and last points cannot be changed. When clicked the default button sets the envelope to it's default position. The ADSR dials allow you to change the Attack, Decay, Sustain, and Release values of the envelope.

Gliss (milliseconds).
This parameter controls the length of time it takes to fade to a new pitch ratio, and applies to all voices.

Sustain toggle. Turns the envelope's sustain on/off. When on holding a MIDI note down will keep the volume at the sustain level until released.

Vel %. The larger the percentage the more effect an incoming note's velocity will have on the volume of the envelope.

Grain Settings / Pitch Var. / Voices / Random Segments

Grain Settings. Here you can suspended the applications internal synthesis engine and provide values of your own.
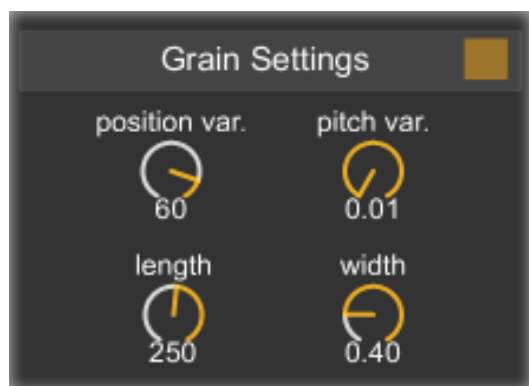
91 a. On / Off.
When crossed this control suspends the synthesis engine and forward the values shown.

91 b. Position Variation
Sets the amount of variation of all device's playheads within the current segment's range.

91 c. Pitch Variation.
This number box changes the pitch variation of each device. Larger values produce more erratic changes in pitch.

91 d. Length.
This control sets the length of each grain.

91 e. Width.
This control sets the stereo width of the granular synthesis.

92. Global Pitch Variation.
This window, also accessed via the Settings menu, allows you to control variation of the global pitch. The amount and instability controls work in the same way as the user variation controls (77), as the method of obtaining values uses the same low pass filtered noise technique, but instead of being applied to the user playback position, it is applied to the global pitch.

93. Voices.
These settings relate to how many voices each device uses during the synthesis stage. This control's primary use is to offer variations in the trade off between performance and CPU. Reducing the number of voices can have a significant effect on the amount of CPU consumed and you should experiment with different voice amounts if you find that running Generative on its own, or in conjunction with other programs results in audio degradation. 5 Voices for each device reduces the amount of voices by 16, and due to the nature of the application's granular synthesis, still sounds relatively similar to 9 voices. Each device ranges from 2 - 9 voices.
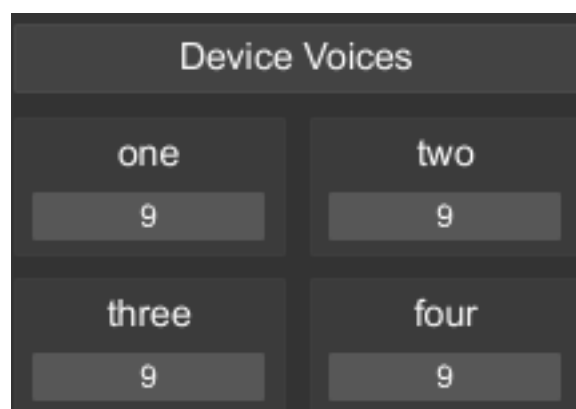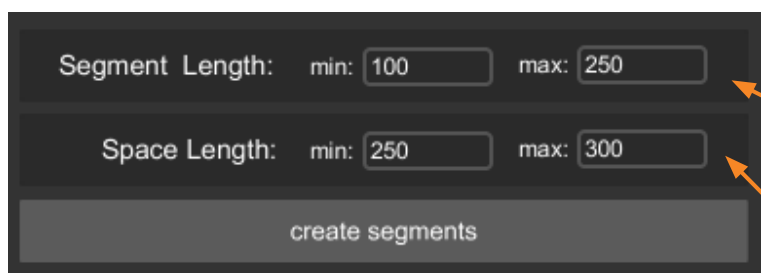

94. Random Segments window.
This window can be accessed from the Settings menu and allows you to create random segments which are scaled to the length of the copied or analysed audio.

94 a. Segment Length settings.
These settings define the minimum and maximum length of a random segment.

94 b. Space Length.
This allows you to define the minimum and maximum length of the space between segments.

94 c. Create Segments.
When clicked this button will erase all current segments, create new random segments based on the above settings, and if Autosplit segments(97 d) is checked in the settings menu, these new random segments will be split equally between the four devices.

States

The States window allows you to control various parameters of the application by storing 'states' of the application within presets that can be changed via MIDI, the computer keyboard, or the mouse. The window is accessed via the Settings menu.
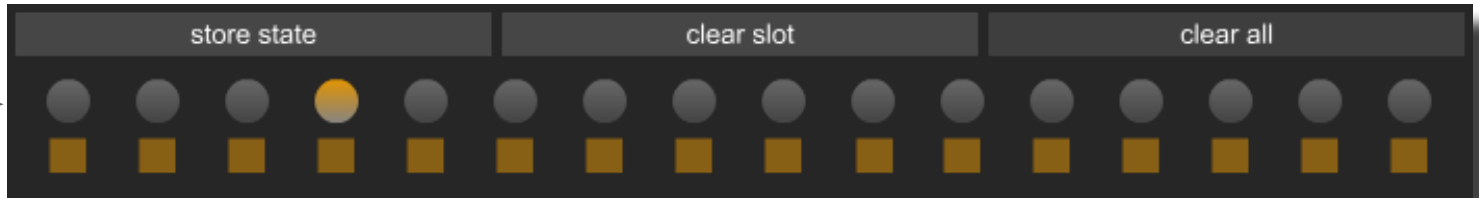
95 a. Store State button.
When clicked this stores the parameters shown in the state window in the currently selected slot

95 b. Clear Slot button.
This button clears the selected slot of any preset data.

95 c. Clear All button.
When clicked this button clears all preset slots. This will be indicated by the preset slots occupied cross not being visible.

95 d. Slot Selection tool.
When clicked this tool changes the to the saved state associated with the selected preset. By hovering with the mouse the number of the preset is displayed. This display changes to reflect the current state when the state is altered via MIDI or via the computer keyboard (90 e, 90 f). The selected preset colour is orange.

95 e. Preset occupied display.
When a cross appears in the space below a preset's circle it indicates that there is data stored in the preset.
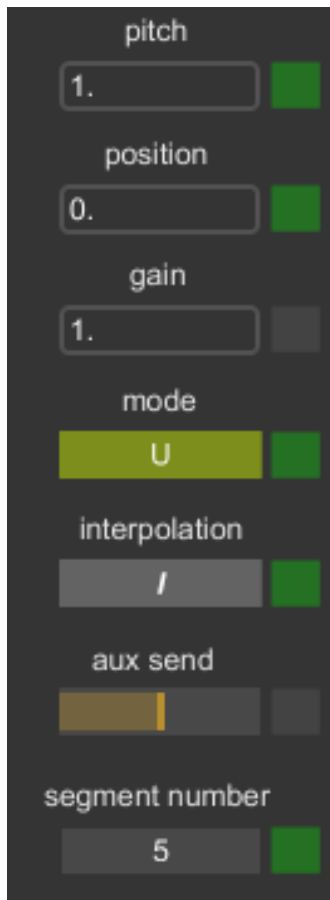
95a. Device Pitch Ratio.

95b. Device Position.
This display relates to a user specified position. This can be specified while in User Playback mode using either a MIDI input or using the Position control on the low waveform and clicking with the mouse.

95 c. The device's volume.

95 d. Device playback mode.
(User / Automatic). This can be altered by clicking.

95 e. Interpolation on / off.
Whether the device's interpolation is on or off.

95 f. Aux Send Amount. The amount of the device's signal sent to the effects stage.

95 g. Current Segment Number.
Different combinations of segments can be achieved by using the Pause Segment Interpolation control(97 a) and clicking on the number, which will reveal a drop down menu.

95 h. State Value Enable toggle.
When crossed this toggle allows values to be sent to the relevant parameters.
If the toggle is empty no values will be sent when a State is recalled.

States (cont.) 2

96. State Operations.

96 a. Current Pitches to All. This button sends the currently displayed pitches (96 h) to all State preset slots.

96 b. Randomise Pitches. Sends random pitches to all states based upon the random pitch method specified.

96 c. Randomise Segments. When clicked this button will fill all preset slots in the State window with a random segment.


96 d. Randomise Positions. When clicked this button will fill all preset slots in the State window with a random playback positions that can be moved to when a device is in user playback mode.

96 e. Pause / Resume Segment Interpolation. This control allows you to suspend the inbuilt progression of segments so that you can select custom segments (96 g) to be saved with a State preset.

96 f. Random Pitch Method. This menu controls whether the Key or Range methods are used for randomising pitches.

96 g. Randomise Main Pitches. Randomises only each device's current pitch based upon the method used.
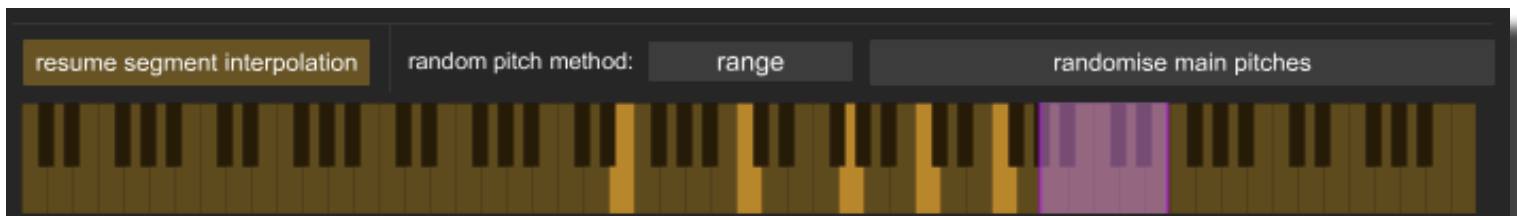

96 h. Key Method. When the Key method is chosen as the Random Pitch Method you can click on the keyboard display to specify a scale which will be used to derive random values when a Randomise State / Randomise Main pitches buttons are pressed.

96 i. Range Method. This allows you to specify a range which will include all values in between the ratios specified using the keyboard. The random pitches will be assigned anywhere within this range.

Settings Menu

97. Settings.
This menu contains many links to settings and windows that are not found in Generative's main application window.
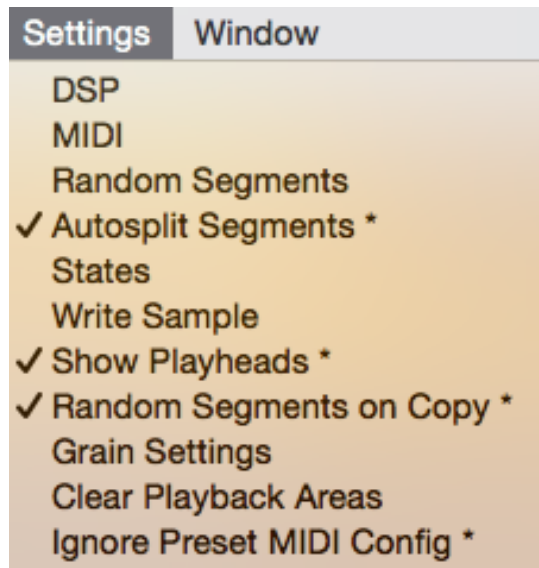
97 a. DSP.
This menu item opens the DSP window allowing you to specify your audio settings. It is important to select the correct audio driver and device from the DSP window, when you first use the application.

97 b. MIDI.
Opens the main MIDI settings window from which items 78 - 89 can be accessed.

97 c. Random Segments.
Opens the Random Segments window (94).

97 d. Autosplit Segments.
This item does not open a window, but toggles whether segments will be split equally between all devices after analysis or copying of the audio sample.

97 e. States.
This item opens the States window (95 - 96).

97 f. Write Sample
This menu item writes the analysed or copied waveform shown in the low waveform display to a file.

97 g. Show Playheads.
This item will toggle whether playheads are visible (71). Displaying playheads can be CPU heavy on some machines, so turning this item off may reduce CPU by a significant amount.

97 h. Random Segments on Copy
Toggles whether random segments are created when a selection of the loaded audio file is copied. Random segments will be generated based upon settings within the Random Segments window(94).

97 i. Grain Settings.
Opens the Grain Settings window which also contains the Global Pitch Variation and Device Voices settings.

97 j. Clear Playback Areas.
Clears the playback areas (70), specified by the Set Playback Area control (63).

97 k. Ignore Preset MIDI Config.
By default the MIDI learn configuration is saved in the preferences file (page 28), and restored on load. When a preset is saved the applications MIDI settings are saved with it. This may mean that loading a preset will load a new MIDI configuration which you do not want.

There may be cases where you want to save different MIDI configurations with presets - in which case you can uncheck this preference.

DSP Settings

The DSP Settings window allows you to set which drivers and devices to be used for the audio input and output. It is important to set these parameters when first using the application so that you can choose the correct device and drive when using the Feedback application.

Audio on/off toggle. This control shows, and allows you to set whether audio the audio is turned on or off. It reflects the value of the on/off toggle in the main application window (1).

Driver Settings. This menu allows you to select which audio driver the Feedback application will use.

Input Device / Input Source / Output Destination / Playthrough Input. These settings allow you to chose the devices used for audio input and output. The Playthrough Input allows you to hear the input audio mixed with audio from the Feedback application.

Vector Sizes. These settings allow you to change the Vector or Buffer sizes that the application will use. By default Feedback uses a vector sizes of 512 samples. Generally speaking, smaller vector sizes will produce more CPU, whereas larger sizes will lessen it.

Sampling Rate. Here you can set the sampling rate that your audio driver will use. Feedback has been primarily tested at 44.1kHz (or 44100 as shown). Higher sample rates may degrade the audio quality and cause the application to become unstable.

Audio CPU. This display show how much CPU is being used for the audio processing in Feedback. To get a clearer picture of the CPU being used by the Feedback application, open Activity Monitor on Mac, or Task Manager on Windows.

CPU Limit. This parameter allows you to set a limit on the percentage of CPU the Feedback application will use. By default this is set to 0, which does not apply any limit to CPU usage.

The Overload button will flash when the application runs out of CPU.

Vector Optimization / Scheduler in Overdrive / in Audio Interrupt. With the exception of 'in Audio Interrupt' these settings make the application more responsive when handling MIDI input.

Channel Input / Output settings. In this section you can set the default inputs and outputs that are available from your audio interface. For example if you want to send audio out of your interface's third and fourth outputs, you can select them from the right hand drop down menus.

Audio Driver Setup, when clicked this will open your systems audio driver settings.

I/O Mappings. This button opens the I/O Mappings dialog which allows you to assign more than one channel to a single audio output.

Preferences File

When you first load the application, Generative will save a preference file (generative_prefs.txt) to one of the following locations...

Macintosh : "Macintosh HD:/Users/Shared/generative_prefs.txt"

Windows : "C:/Users/Public/generative_prefs.txt"

If the hard drive that Generative is being run from is different from 'Macintosh HD' or 'C', Generative will replace the default name with the name of the drive it is run from.

Now when you open the application, Generative will recall the following settings...

- Record directory / bit depth / sample rate / mono or stereo.

- Autosplit Segments on/off.

- Random Segments on Copy on/off.

- Voices (number of voices for each granular player).

- Background picture on/off.

- Show Playheads on/off.

- Zoom Factor (for small screens).

- MIDI Learn Configuration.

Acknowledgments

Many thanks to all who have helped me over the years, either through education, creative projects, or support and enthusiasm for the software. I would not have been able to create these applications without the generous help of users on the Cycling74 forums. And of course Cycling 74 themselves, who continue to improve on a great software application in Max/MSP.

Thanks to the beta testers over both versions of the applications (apologies if I've forgotten anyone...). Charlie Grant, Clement Battung, Don Haugen, Ed Ten Eyck, Mario Isaac Borrell, Porya Hatami, Michael O'Bannon, Scott Simons, Ed Ten Eyck, Grant Gard, Fernando Carvalho, Yorgos Stasinoulias, John Denosky, Robert Hyman, Felix Petrescu, Dom Slessor, and John Alexander.