

# CAUSTIC 3

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## User's manual

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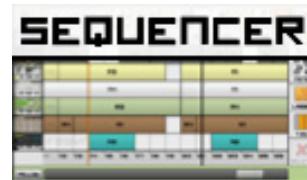
[Navigation](#)

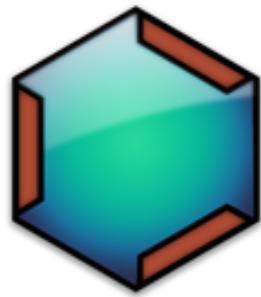
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### Machine Reference





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## App Overview

Caustic is a music creation tool that uses various synthesizers, samplers and effects to create songs. Limitless combinations of instruments and sounds means Caustic can be used to create music of various styles, even though the app's main focus is electronic music. Caustic is modelled after a rack-mount cabinet where devices are stacked and connected in order to produce sound.

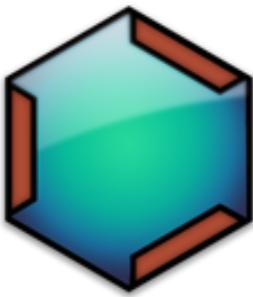
### Quick Glossary

Here's a quick list of words you'll see throughout this manual and their meaning in the context of this app:

**Machine:** A device which either produces or modifies sound. Caustic's rack consists of a maximum of 14 dynamic machines, plus 4 permanent machines: the [effects rack](#), the [mixer](#), the [master mixer](#) and the [sequencer](#).

**Long-press:** This action is done by pressing and holding the control for a second or two, until the extended action is performed.

**LFO:** Low Frequency Oscillator. A control signal generator that modifies a parameter via oscillation in the sub-sonic range (0-20Hz)



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## Navigation

There are three main components to Caustic's user interface (UI). The **rack scrollbar**, the **control panel** and the **machine view**.



To switch between machines in the machine view, touch then scroll up/down with the **rack scrollbar**. Alternatively, you can press the **Machine Button** on the left side of the **control panel** to bring up the [Machine Management screen](#). Touching any one of the machines in this screen will quickly jump to this machine.

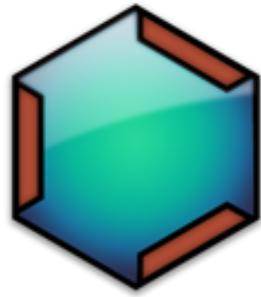
The app's [main menu](#) can be accessed by pressing the menu button in the control panel at any time. If your device has a menu button (Android only), this will also show the menu when pressed.

To control playback, use the **Play** and **Stop** buttons in the **control panel**. Pressing twice on the stop button rewinds the playback cursor to the beginning of the loop if loop cursors are set in the [Sequencer](#), or back to the start of the song if no loop cursors are set. Pressing a third time will bring the playback cursor to the beginning if a loop is set.

The record button can be used to arm the app for recording [automation](#) or to directly record notes into the pattern or song sequencers. Once armed for recording, the app flashes a red outline around its display area. Press stop or record again to disarm recording.

The **control panel** also shows information about the current song, playback time in beats, as well as status indicators for [Caustic Connect](#) and [MIDI connections](#).

Once a song is saved for the first time, any subsequent changes to the file will show the quicksave icon (blue disk) in the control panel. Press this to quickly save the file in its current state without having to use the main menu. Note that this overwrites the previous saved version of the file without warning.



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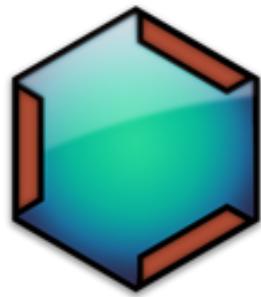
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## Creating a Song

These are the basic steps to creating a song in Caustic. Be sure to watch the [Caustic 3.0 Overview video](#) which also shows how to do this in a live demonstration.

### The steps

1. Start by creating a new song. Press the *Menu* button in the [Control Panel](#) and select "New" from the [Song](#) tab in the [app menu](#).
2. While in the [app menu](#), select the tempo for your song using the BPM controls.
3. Choose the machines you want to use by pressing the Machine Management button in the lower-left of the screen. This will bring up the [Machine Management screen](#) which lets you add/remove machines. Note that machines can be added/removed at any time, but any work done in these machines will be lost if they are removed.
4. Set the playback mode switch in the center of the [Control Panel](#) to **Pattern** (touch it to change from Song to Pattern). Press the **Play** button in the [Control Panel](#). Then, for each machine in your rack, create note or patterns for them using their respective [pattern editor](#).
5. If desired, add effects to your machine in the [Effects Rack](#).
6. Set the playback mode switch in the center of the [Control Panel](#) to **Song** (touch it to change from Pattern to Song). Go to the [Sequencer](#) and assemble your patterns. (See instructions in Sequencer page)
7. Once your patterns are placed to create your song, [record automation](#) for any controls you wish to have change dynamically throughout the length of the song.
8. When you are satisfied with the song, press the *Menu* button in the [Control Panel](#) to bring up the [app menu](#), select the "Song" tab then select "Export". This will show the [Song Export](#) screen.
9. Rinse, repeat, enjoy.



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## Automation

Automation is a term for the recording and playback of controls in Caustic. Once recorded, knob movements will playback automatically with song and on export. Watch the [automation tutorial](#) for visual examples of what can be achieved.

Song automation is automation which spans the entire length of the song. Pattern automation is automation that is tied to a particular pattern and will play back every time that pattern is placed in the [Sequencer](#). If a control is automated in both Pattern and Song mode, pattern automation will override song automation for as long as that pattern is triggered.

To record *pattern* automation, you must already have a pattern created in a [pattern editor](#) and the playback mode selection switch in the [Control Panel](#) must be set to Pattern.

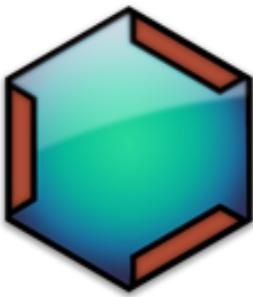
To record *song* automation, you must already have a [song created](#) in the [Sequencer](#) and the playback mode selection switch in the [Control Panel](#) must be set to Song.

Press the **Record** button to arm recording. A red outline will flash to confirm recording is armed. Next, record movements on a knob while the song or pattern is playing. A yellow box will appear around the control to indicate it has been automated in pattern mode. An orange box will appear around the control to indicate it has been automated in song mode. If there is no box around the control, then this control cannot be automated.

When done recording movements for this control, press **Stop** in the [Control Panel](#), this will disarm automation recording. Repeat the process for any other controls you wish to automate.

To remove automation from a control, make sure playback is stopped and you are in the correct playback mode for the automation you wish to clear, then press **Record**. With record armed, **double-tap the control** for which to clear automation. This will bring up a confirmation screen.

Once recorded, automation can be edited using the automation editors in either [pattern mode](#) or [song mode](#).



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## Song Export



This screen is used to export your song to your external storage.

The **filename** window shows the name of the file which will be written to storage. It defaults to the song's name but can be overridden by touching the display and choosing a different name.

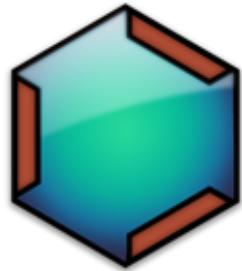
Next to the **filename** is a selector to choose the output file type. Choices are:

- **.WAV**: Uncompressed 44KHz 16bit stereo file, compatible with most audio software and players.
- **.OGG**: Ogg-Vorbis compressed 44KHz stereo file, compatible with most portable MP3 players.
- **.MID**: MIDI music file, contains basic note and timing information, along with machine names and structure. Compatible with most Digital Audio Workstation software (DAW).

If the file type is **.ogg** a **Quality** slider will be visible, offering to modify the compression quality (at the expense of file size).

Choose between exporting the full song or a portion determined by the loop cursors placed in the [sequencer](#). Note that if no loop cursors are set in the sequencer, the **Loop Region Only** option will not be available. If the selection is set to **Entire Song**, 2 seconds will be added after the last note has played to allow for note and effect decay.

To export your file, press the **Export** button. To cancel the export (once the export has started) press the **Cancel** button.



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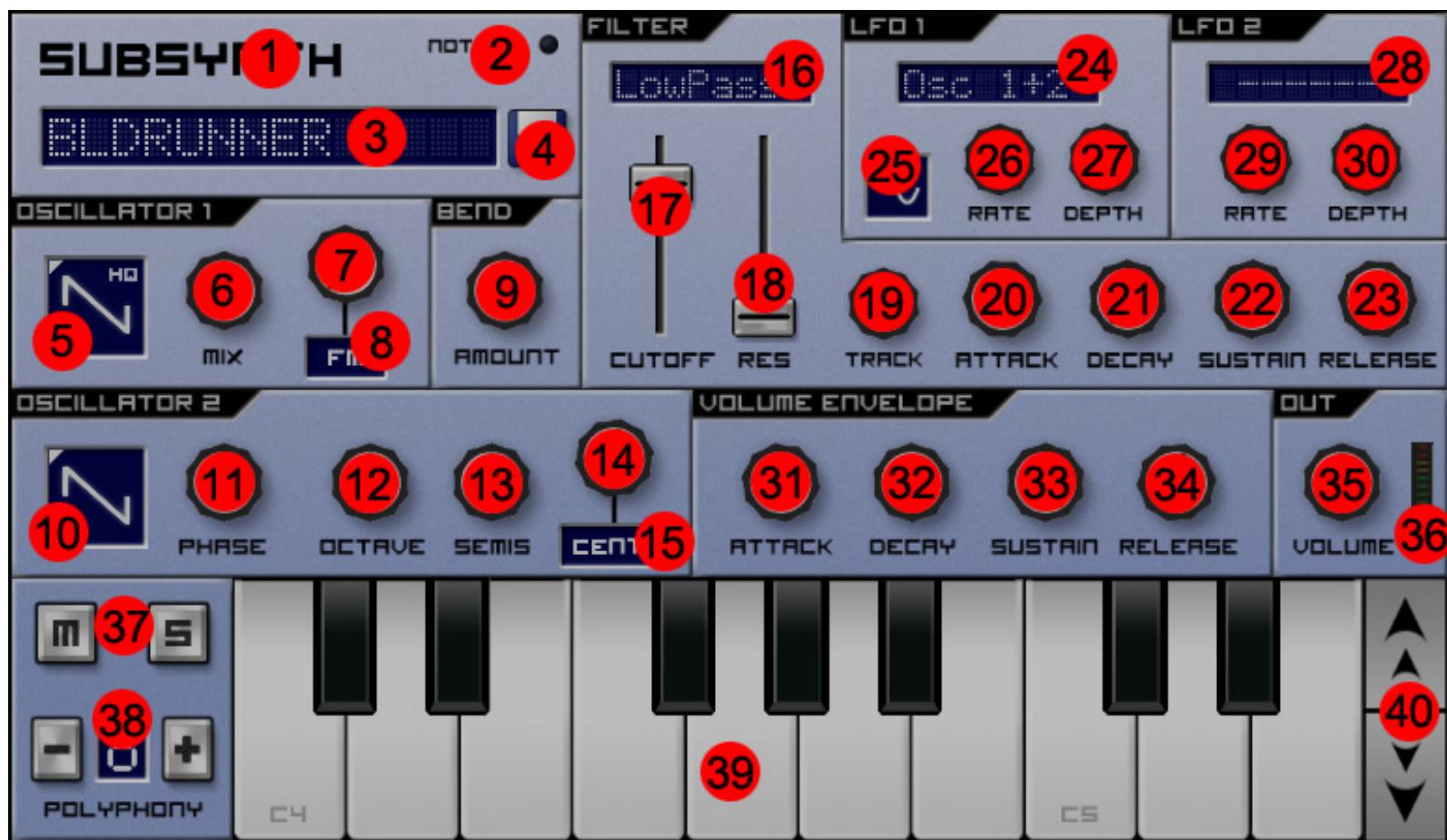
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## SubSynth

### Description

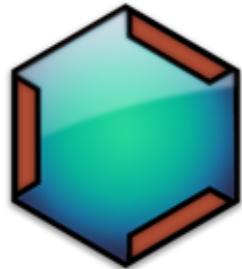
The Subsynth is a virtual analog synthesizer which produces sound by subtractive synthesis. It's called subtractive because you start with oscillators creating a sound that's rich in harmonics, and then you sculpt the sound with filters and LFOs to create the desired output sound. The [subsynth overview video](#) shows how this is done.

### UI Reference



1. **Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Note On LED:** This LED lights up whenever a note is triggered.
3. **Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains the positions of all knobs and controls. To load a preset, touch the preset LCD. This will bring up a [File Browser](#) with a list of saved presets to choose from. To scroll between presets in a directory, swipe left or right on the preset LCD.
4. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored in `/caustic/presets/subsynth`.
5. **Oscillator 1 Waveform selector:** Touch to change, 9 waveforms to choose from. Long-press to bring up the [custom waveform screen](#)
6. **Mix knob:** Controls the volume balance between Oscillator 1 and Oscillator 2.

7. **Modulation knob:** Controls how much modulation is applied to Oscillator 1 using Oscillator 2 as the modulator.
8. **Modulation mode selector:** Select between Frequency Modulation, Phase Modulation and Amplitude Modulation.
9. **Bend Amount knob:** The amount of portamento (bend) applied to each new note.
10. **Oscillator 2 Waveform selector:** Touch to change, 9 waveforms to choose from, plus silence to turn off.  
Long-press to bring up the [custom waveform screen](#).
11. **Phase knob:** The phase shift applied to the signal before it is mixed in with Oscillator 1.
12. **Octave knob:** Coarse frequency tuning for Oscillator 2, from -4 to +4 octaves.
13. **Semis knob:** Frequency tuning for Oscillator 2, in semitones (regular notes on a keyboard)
14. **Detune knob:** Fine frequency tuning for Oscillator 2, in cents.
15. **Detune mode selector:** Select between Cents and Unison. Cents affects only Osc2, unison detunes Osc1 inversely to Osc2 for a more pronounced yet more in-tune effect.
16. **Filter Type selector:** Touch to change. Choices are: Off - LowPass - HighPass - BandPass plus inverted versions of each one. The inverted version affects the envelope section. Instead of going from 0 to 1, invert makes them go from 1 to 0
17. **Filter Cutoff slider:** Sets the frequency at which the filter starts to cut.
18. **Filter Resonance slider:** Sets the amount of resonance produced by the filter. Resonance is defined by small peaks at harmonic frequencies to the cutoff frequency.
19. **Filter Keyboard tracking knob:** Controls the amount of filtering done based on the keyboard note played. Full keyboard tracking cuts off more the lower the note played.
20. **Filter Envelope Attack knob:** The amount of time before cutoff reaches the value defined by the cutoff slider, starting at 0
21. **Filter Envelope Decay knob:** The amount of time, after the attack period, for the cutoff to go from the slider value to the sustain level.
22. **Filter Envelope Sustain knob:** The value for cutoff at which to settle, once the attack and decay period have elapsed and the note is held, relative to the cutoff slider.
23. **Filter Envelope Release knob:** The amount of time for the cutoff to go from the sustain level down to 0.
24. **LFO 1 Target selector:** Sets which subsynth configuration value is modified by LFO 1.
25. **LFO 1 Waveform selector:** The waveform LFO 1 uses to modify its target value.
26. **LFO 1 Rate knob** The speed at which LFO 1 modifies its target value.
27. **LFO 1 Depth knob:** The amount of modification LFO 1 apply to its target value.
28. **LFO 2 Target selector:** Sets which subsynth configuration value is modified by LFO 2. (Cannot be the same as LFO1)
29. **LFO 2 Rate knob** The speed at which LFO 2 modifies its target value.
30. **LFO 2 Depth knob:** The amount of modification LFO 2 apply to its target value.
31. **Volume Envelope Attack knob:** The amount of time before volume reaches 100%, starting at 0
32. **Volume Envelope Decay knob:** The amount of time, after the attack period, for the volume to go from 100% to the sustain level.
33. **Volume Envelope Sustain knob:** The volume at which to settle, once the attack and decay period have elapsed and the note is held.
34. **Volume Envelope Release knob:** The amount of time for the volume to go from the sustain level down to 0.
35. **Output Volume knob:** The final output volume of the subsynth.
36. **Output VU meter:** Indicates the level at which the subsynth is outputting signal. If this reaches RED, then the subsynth will output distorted sound.
37. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
38. **Polyphony buttons and display:** Sets the number of notes which can be active at once. If the requested number of notes exceeds the polyphony count, a voice will be stolen from the oldest playing note.
39. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the subsynth.
40. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.



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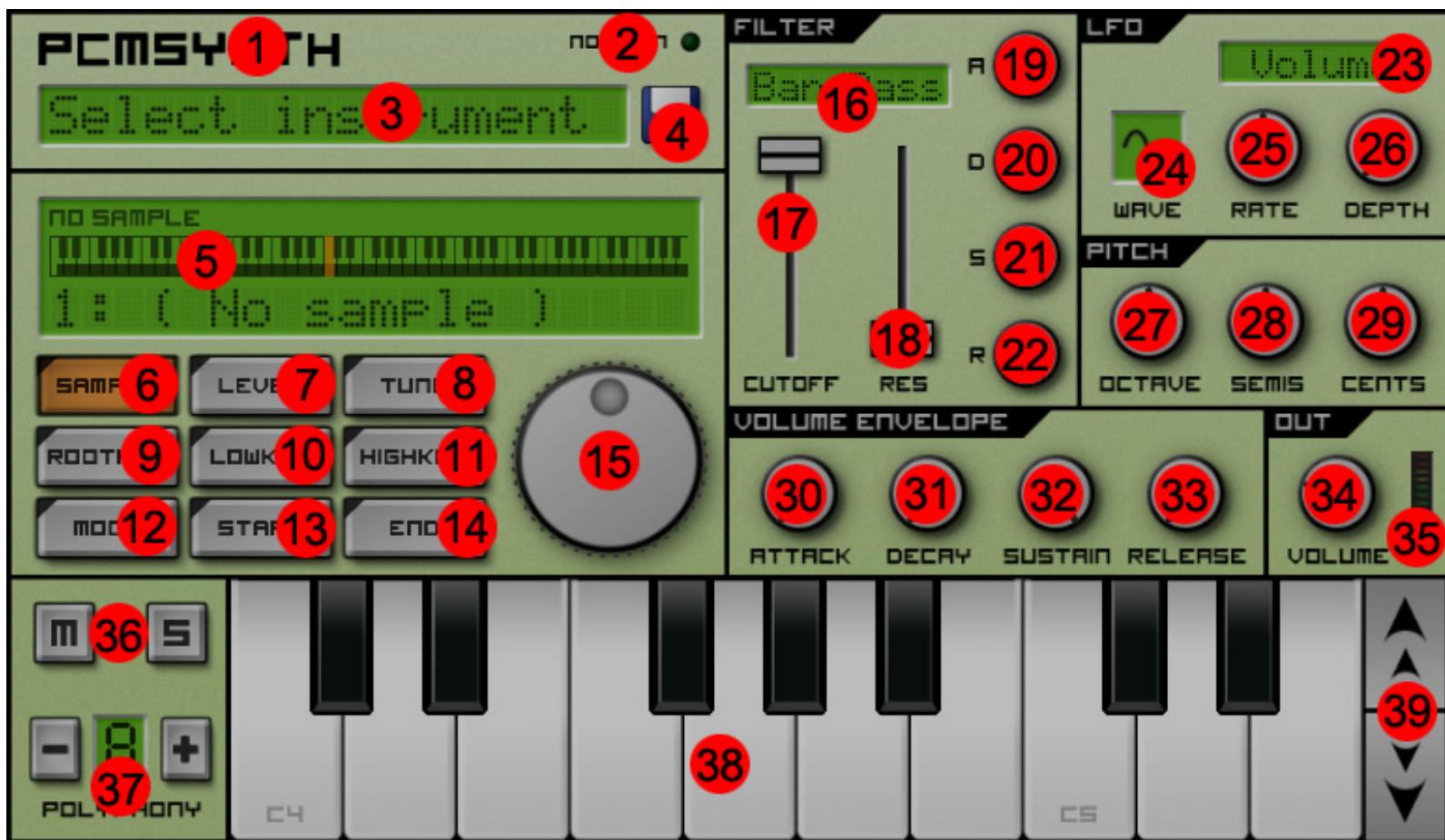
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## PCMSynth

### Description

The PCMSynth uses pulse code modulation samples (ex: WAVs) to produce sounds. The PCMSynth plays the sample at a different speed according to the note played. This instrument supports loading multiple waveforms which maps to different areas of the keyboards as well as loop points. The PCMSynth also has a classic synth section, offering similar filters, envelopes and LFOs as a virtual analog synth. These act to further modify the PCM samples played. The [PCMSynth tutorial video](#) shows how to use this machine.

### UI Reference

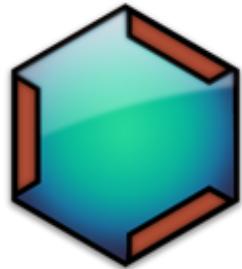


1. **Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Note On LED:** This LED lights up whenever a note is triggered.
3. **Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains the positions of all knobs as well as samples used. To load a preset, touch the preset LCD. This will bring up a list of saved presets to choose from.
4. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored on the external storage in /

caustic/presets/pcmsynth.

5. **Sampler Information Panel:** This displays context-aware information depending on which of the sampler panel buttons is currently selected, as well as a quick view of the current sample's settings. (See buttons below for more information)
6. **Sample Button:** When selected, this allows the user to scroll between loaded samples using the wheel(15) to change which sample is currently selected. To load a new sample, long-press this button to bring up a [file browser](#) and select a WAV sample. To delete a sample, see Level button below. Caustic supports mono or stereo, 16bit samples at any sampling rate but holds them as 16bit mono at the same sampling rate.
7. **Level Button:** When selected, this allows the user to set the volume level on the currently selected sample using the wheel(15). This control can also be used to remove a sample. If the level is set to 0% a prompt will pop up asking to confirm sample deletion. **Long-press this button to access the sample editor for the selected sample slot.**
8. **Tune/Pan Button:** When selected, this allows the user to fine-tune the sample's playback frequency using the wheel(15) to control the correction, from -50 cents to +50 cents. **Long-press this button to toggle to and from Pan mode instead. Once in pan mode, use the wheel (15) to pan an individual sample in the stereo field.**
9. **Root Key:** When selected, this allows the user to set which key represents the sample's base tuning. Use the wheel (15) to set the key or long-press the Root Key button then press the desired key on the preview keyboard (38). For example, if the WAV sample used was of a G5 note, then the rootkey should be set to G5 in order to ensure correctly tuned playback.
10. **Low Key:** When selected, this allows the user to set the lowest note which should use the currently selected sample for playback, using the wheel (15) or by long-pressing the Low Key button then pressing the desired key on the preview keyboard (38). This is mostly useful in multi-sample instruments where each sample maps correctly to a particular range of notes.
11. **High Key:** When selected, this allows the user to set the highest note which should use the currently selected sample for playback, using the wheel (15) or by long-pressing the Low Key button then pressing the desired key on the preview keyboard (38). This is mostly useful in multi-sample instruments where each sample maps correctly to a particular range of notes.
12. **Mode Button:** When selected, this allows the user to set the playback mode of the currently selected sample, using the wheel to toggle between modes.  
The different modes are:
  - o **Play Once:** (default) Plays the full sample each time a note is played
  - o **Note On/Off:** Plays the sample as long as the note is held
  - o **Loop Forward** Plays the sample starting at the Loop Start Point(13) until it reaches the Loop End Point (14), at which point it loops around to the Start Loop Point again, and does this until the note is released.
  - o **Loop Forward-Back** Plays the sample starting at the Loop Start Point(13) until it reaches the Loop End Point (14), at which point it starts playing in reverse until it reaches the Start Loop Point again, and does this until the note is released.
  - o **Intro + Loop Fwd** Same looping behavior as "Loop Forward" except playback always starts at the beginning of the sample when the note is first played.
  - o **Intro + Loop FwdBack** Same looping behavior as "Loop Forward-Back" except playback always starts at the beginning of the sample when the note is first played.
13. **Start Button:** When selected, this allows the user to set the point at which the currently selected sample will use as its start point for playback and looping, using the wheel (15) or by long-pressing this button to bring up the [Loop Point Editor](#)
14. **End Button:** When selected, this allows the user to set the point at which the currently selected sample will use as its end point for playback and looping, using the wheel (15) or by long-pressing this button to bring up the [Loop Point Editor](#)
15. **Wheel:** This is used to adjust the value of the parameter selected by the active button.
16. **Filter Type selector:** Touch to change. Choices are: Off - LowPass - HighPass - BandPass plus inverted versions of each one. The inverted version affects the envelope section. Instead of going from 0 to 1, invert makes them go from 1 to 0
17. **Filter Cutoff slider:** Sets the frequency at which the filter starts to cut.
18. **Filter Resonance slider:** Sets the amount of resonance produced by the filter. Resonance is defined by small peaks at harmonic frequencies to the cutoff frequency.
19. **Filter Envelope Attack knob:** The amount of time before cutoff reaches the value defined by the cutoff slider, starting at 0
20. **Filter Envelope Decay knob:** The amount of time, after the attack period, for the cutoff to go from the slider value to the sustain level.
21. **Filter Envelope Sustain knob:** The value for cutoff at which to settle, once the attack and decay period have elapsed and the note is held, relative to the cutoff slider.

22. **Filter Envelope Release knob:** The amount of time for the cutoff to go from the sustain level down to 0.
23. **LFO Target selector:** Sets which PCMSynth configuration value is modified by the LFO.
24. **LFO Waveform selector:** The waveform the LFO uses to modify its target value.
25. **LFO Rate knob** The speed at which the LFO modifies its target value.
26. **LFO Depth knob:** The amount of modification theLFO applies to its target value.
27. **Octave knob:** Coarse frequency tuning, from -3 to +3 octaves.
28. **Semis knob:** Frequency tuning, in semitones (regular notes on a keyboard)
29. **Cents knob:** Fine frequency tuning, in cents.
30. **Volume Envelope Attack knob:** The amount of time before volume reaches 100%, starting at 0
31. **Volume Envelope Decay knob:** The amount of time, after the attack period, for the volume to go from 100% to the sustain level.
32. **Volume Envelope Sustain knob:** The volume at which to settle, once the attack and decay period have elapsed and the note is held.
33. **Volume Envelope Release knob:** The amount of time for the volume to go from the sustain level down to 0.
34. **Output Volume knob:** The final output volume of the PCMSynth.
35. **Output VU meter:** Indicated the level at which the PCMSynth is outputing signal. If this reaches RED, then the PCMSynth will output distorted sound.
36. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
37. **Polyphony buttons and display:** Sets the number of notes which can be active at once. If the requested number of notes exceeds the polyphony count, a voice will be stolen from the oldest playing note.
38. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the PCMSynth.
39. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.



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## BassLine

### Description

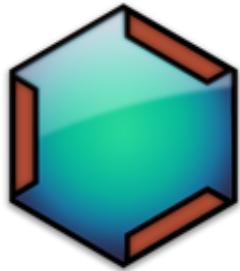
The Bassline is a monophonic lead synthesizer loosely modelled after the legendary Roland TB-303. It consists of a single oscillator(2 waveforms) running through an envelope-modulated resonant filter, with LFO and Distortion effect. The [bassline tutorial video](#) shows how it works.

### UI Reference



1. **Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains the positions of all knobs and controls. To load a preset, touch the preset LCD. This will bring up a [File Browser](#) with a list of saved presets to choose from.
3. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored on the external storage in / caustic/presets/bassline.
4. **Waveform selector:** Touch to change, 2 waveforms to choose from; Sawtooth and Square
5. **Pulse Width knob:** When the waveform selector(3) is on **square wave**, this knob will control the duty cycle of the square wave. From 1% to 50%. **Note: this control has no effect on the sawtooth waveform.**
6. **Tune knob:** Frequency tuning for the oscillator, in semitones. +1/-1 octave.
7. **Cutoff knob:** Sets the frequency at which the filter starts to cut.

8. **Resonance knob:** Sets the amount of resonance produced by the filter. Resonance is defined by small peaks at harmonic frequencies to the cutoff frequency.
9. **Envelope Modulation knob:** Controls the amount of filter change during each note's lifetime.
10. **Decay knob:** Controls the lifetime of each note.
11. **Accent knob:** Controls the volume added to notes with the **Accent(15)** modifier.
12. **Output Volume knob:** The final output volume of the bassline.
13. **Output VU meter:** Indicates the level at which the bassline is outputting signal. If this reaches RED, then the bassline will output distorted sound.
14. **Low Frequency Oscillator Target:** Sets which bassline configuration value is modified by the LFO (Pulse width, Filter Cutoff or Volume)
15. **LFO Rate knob** The speed at which the LFO modifies its target value.
16. **LFO Depth knob:** The amount of modification the LFO apply to its target value.
17. **LFO Phase knob:** Sets the timing for the sine wave used to modulate the LFO target. This is a offset sync value relative to the song's tempo.
18. **Distortion Program Knob:** Sets which distortion program is active (Off, OverDrive, Saturation, Foldback, Fuzz)
19. **Distortion Pre gain knob:** Pre-amplification used to send signal past the chosen program's threshold.
20. **Distortion Amount knob:** The amount of distortion applied to signal above the threshold.
21. **Distortion Post gain knob** Post-amplification used to compensate the distortion algorithm's output volume.
22. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
23. **Legacy glide button:** When pressed, this button controls the glide mode of the bassline synth. Legacy mode doesn't use overlapping notes to determine glide time and is mostly offered for legacy song support.
24. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the bassline.
25. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.
26. **Note On LED:** This LED lights up whenever a note is triggered.



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## BeatBox

### Description

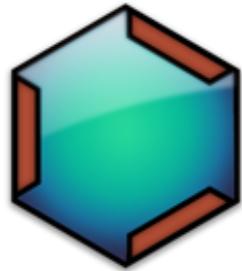
The BeatBox is a sample-based drum computer. It features 8 stereo output channels. [Here is a tutorial video](#) showing how to use it.

### UI Reference



1. **Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains a link to all samples used as well as the positions of every knob. To load a preset, touch the preset LCD. This will bring up a list of saved presets to choose from.
3. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored on the external storage in /caustic/presets/beatbox.
4. **Kit Options button:** This button brings up the [BeatBox Kit Options screen](#).

5. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
6. **Output Volume knob:** The final output volume of the BeatBox.
7. **Output VU meter:** Indicates the level at which the BeatBox is outputting signal. If this reaches RED, then the BeatBox will output distorted sound.
8. **Channel Mute/Solo buttons:** These buttons are used to cut out this channel from within the BeatBox's output mix or listen to **only** this channel.
9. **Sample Name LCD:** Displays the name of the loaded sample.
10. **Sample Load button:** Press this button to replace or load a sample into this channel. Pressing this will bring up a [File Browser](#) to choose your sample.
11. **Tuning knob:** Controls the pitch of the sample.
12. **Punch knob:** Controls how quickly the sample fades in. Can be used to remove the aggressive attack spike on most percussions.
13. **Decay knob:** Controls how quickly the sample fades out.
14. **Pan knob:** Controls the position of this channel in stereo space.
15. **Volume knob:** The mix volume for this channel.
16. **Preview Play button:** Press to hear the sample as it will sound when triggered through the pattern editor.



# CAUSTIC 3

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## PadSynth

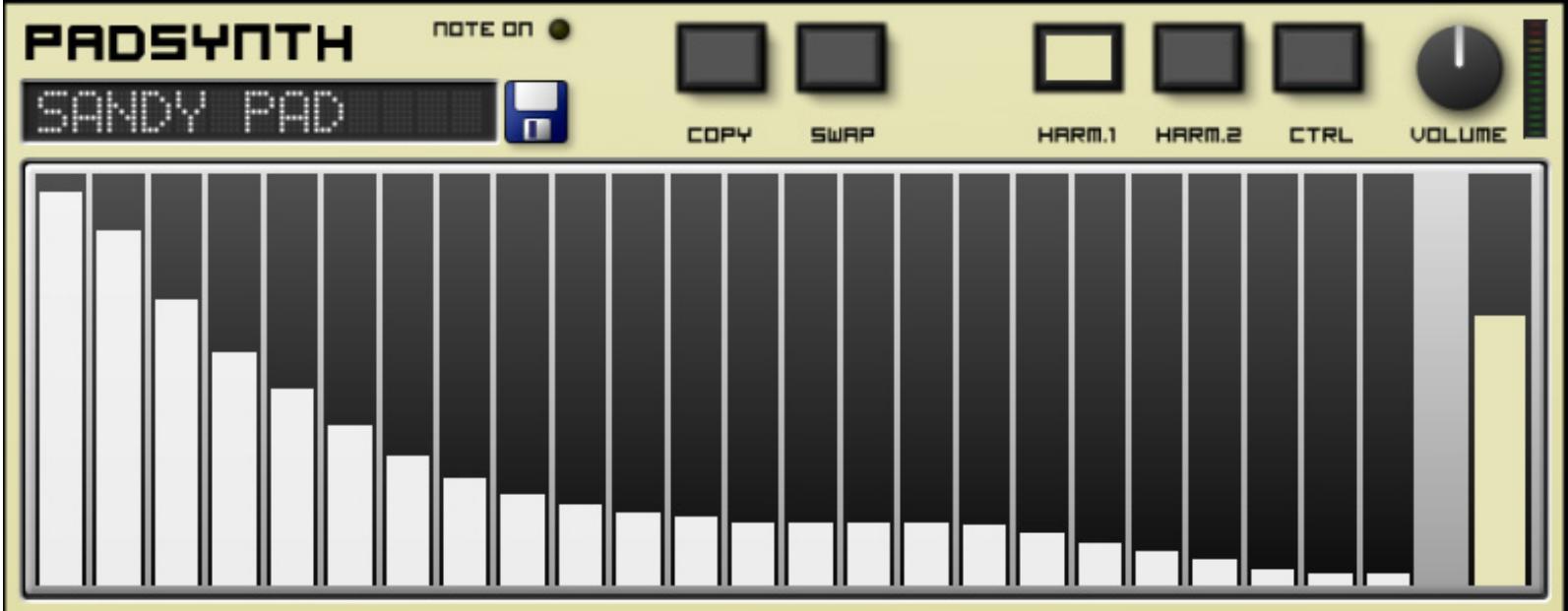
### Description

The PadSynth uses a special variant of additive synthesis to produce sound. The algorithm used was created by Paul Nasca and is described [here](#). It can create a variety of sounds but does well for new-age pads, bells and choirs washes. Harmonics are drawn in two tables which are then blended and played back to give the PadSynth its sound. The [PadSynth tutorial video](#) shows how to use this machine.

### UI Reference

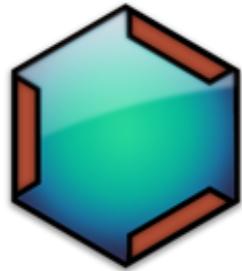


Note: By pressing one of the harmonics buttons (7, 8) you can access the harmonics editors, where you can set volumes for each harmonic by touching inside the bar area as well as the high frequency smearing or "width" parameter (rightmost, yellow bar)



1. **Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Note On LED:** This LED lights up whenever a note is triggered.
3. **Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains the positions of all knobs as well as samples used. To load a preset, touch the preset LCD. This will bring up a list of saved presets to choose from. To scroll between presets in a directory, swipe left or right on the preset LCD.
4. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored on the external storage in / caustic/presets/padsynth.
5. **Copy button:** Pressing this button while in Harmonic table view (7 or 8) will copy the content of the other harmonic table into the current one.
6. **Swap button:** Pressing this button will replace harmonic table 1's values with the values from table 2 and replace harmonic table 2's values with the values from table 1.
7. **Harmonic Table 1 button:** When pressed, the central view will switch to show Harmonic table 1's harmonic levels for editing. Each vertical bar represents a harmonic and the vertical value for each bar represents the volume of that harmonic in the output sound. The right-most (yellow) bar controls the amount of high-frequency smearing or "width" applied to the harmonics.
8. **Harmonic Table 2 button:** When pressed, the central view will switch to show Harmonic table 2's harmonic levels for editing. Each vertical bar represents a harmonic and the vertical value for each bar represents the volume of that harmonic in the output sound. The right-most (yellow) bar controls the amount of high-frequency smearing or "width" applied to the harmonics.
9. **Control button:** When pressed, the central view will switch to show the control knobs for shaping the PadSynth's sound (controls 12-31).
10. **Output Volume knob:** The final output volume of the PCMSynth.
11. **Output VU meter:** Indicated the level at which the PCMSynth is outputting signal. If this reaches RED, then the PCMSynth will output distorted sound.
12. **LFO1 Target selector:** Sets which PadSynth configuration value is modified by LFO1.
13. **LFO1 Rate knob:** The speed at which the LFO1 modifies its target value.
14. **LFO1 Depth knob:** The amount of modification LFO1 applies to its target value.
15. **LFO1 Phase knob:** LFO1 is time-sync'ed to the beat. The phase knob controls the relationship between the LFO sweep value and the beat time.
16. **LFO2 Target selector:** Sets which PadSynth configuration value is modified by LFO2.
17. **LFO2 Rate knob:** The speed at which the LFO2 modifies its target value.
18. **LFO2 Depth knob:** The amount of modification LFO2 applies to its target value.
19. **LFO2 Phase knob:** LFO2 is time-sync'ed to the beat. The phase knob controls the relationship between the LFO sweep value and the beat time.
20. **Morph Knob:** Controls the mix between the two harmonics tables. If the morph envelope is used, this knob defines the maximum value the envelope will reach.
21. **Morph Envelope button:** Used to toggle the use of the morph envelope.

22. **Morph Envelope Attack knob:** The amount of time before morph reaches the value defined by the morph knob, starting at 0
23. **Morph Envelope Decay knob:** The amount of time, after the attack period, for the morph value to go from the main knob value to the sustain level.
24. **Morph Envelope Sustain knob:** The value for morph at which to settle, once the attack and decay period have elapsed and the note is held, relative to the morph knob.
25. **Morph Envelope Release knob:** The amount of time for the morph value to go from the sustain level down to 0.
26. **Table 1 Gain knob:** Sets the relative volume of harmonics table 1's output
27. **Table 2 Gain knob:** Sets the relative volume of harmonics table 2's output
28. **Volume Envelope Attack knob:** The amount of time before volume reaches 100%, starting at 0
29. **Volume Envelope Decay knob:** The amount of time, after the attack period, for the volume to go from 100% to the sustain level.
30. **Volume Envelope Sustain knob:** The volume at which to settle, once the attack and decay period have elapsed and the note is held.
31. **Volume Envelope Release knob:** The amount of time for the volume to go from the sustain level down to 0.
32. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
33. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the PCMSynth.
34. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.



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## 8BitSynth

### Description

The 8BitSynth doesn't rely on typical synthesis methods to generate sound. Rather it relies on a virtual 8bit processor evaluating an expression and outputting the result of the expression as audio. Any valid combination of numbers and mathematical operators can be used to craft the expression, and one variable is permitted: time (t). Because the calculations are done on 8 bits, numbers greater than 256 will wrap to 0, ensuring the signal is always within a certain range. While there are some tricks to getting certain results, this isn't a synth where you set out to produce a particular sound but rather a place to experiment and to be surprised by what you create. Because the output is 8 bit, this synth produces somewhat distorted sounds suitable for chiptunes, dubstep or experimental electronica. The [8BitSynth tutorial video](#) shows how to use this machine.

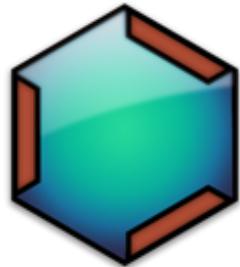
### UI Reference



- Machine Label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
- Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains the positions of all knobs as well as samples used. To load a preset, touch the preset LCD. This will bring up a list of saved presets to choose from. To scroll between presets in a directory, swipe left

or right on the preset LCD.

3. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored on the external storage in / caustic/presets/padsynth.
4. **Note On LED:** This LED lights up whenever a note is triggered.
5. **A-B Blend knob:** This knob controls the output mix between expression A and expression B
6. **Octave knob:** Coarse frequency tuning for the expression evaluator, from -4 to +4 octaves.
7. **Semis knob:** Frequency tuning for the expression evaluator, in semitones (regular notes on a keyboard)
8. **Cents knob:** Fine frequency tuning for the expression evaluator, in cents.
9. **Output Volume knob:** The final output volume of the PCMSynth.
10. **Output VU meter:** Indicated the level at which the PCMSynth is outputting signal. If this reaches RED, then the PCMSynth will output distorted sound.
11. **Expression window:** This is where your expression is displayed. Touching once inside the expression window places the cursor at the touched location. Long-pressing the expression window will offer to copy the content of the other expression into the one currently selected.
12. **Expression selection switch:** Selects which expression is displayed in the expression window and which expression is edited.
13. **Expression programming keyboard:** Contains various digit and operator keys as well as the time variable key (T), parentheses, and a backspace key (< ). Operators:
  - ^ Bitwise exclusive OR (XOR). For each bit, result is 0 if both sides are 1 or 0, and result is 1 otherwise.
  - & Bitwise AND. For each bit, set to 1 only if the numbers on both sides are 1
  - | Bitwise OR. For each bit, set to 1 if one the numbers on either sides is 1
  - << Shift left. Shifts all bits to the left by the amount specified (equivalent of multiplying by powers of 2)
  - >> Shift right. Shifts all bits to the right by the amount specified (equivalent of dividing by powers of 2)
  - + Standard arithmetic addition.
  - - Standard arithmetic subtraction.
  - \* Standard arithmetic multiplication.
  - / Standard arithmetic division.
  - % Modulo (aka remainder) part of a division
  - ( and ) Parentheses, used to force the order of evaluation.
14. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
15. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the PCMSynth.
16. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.



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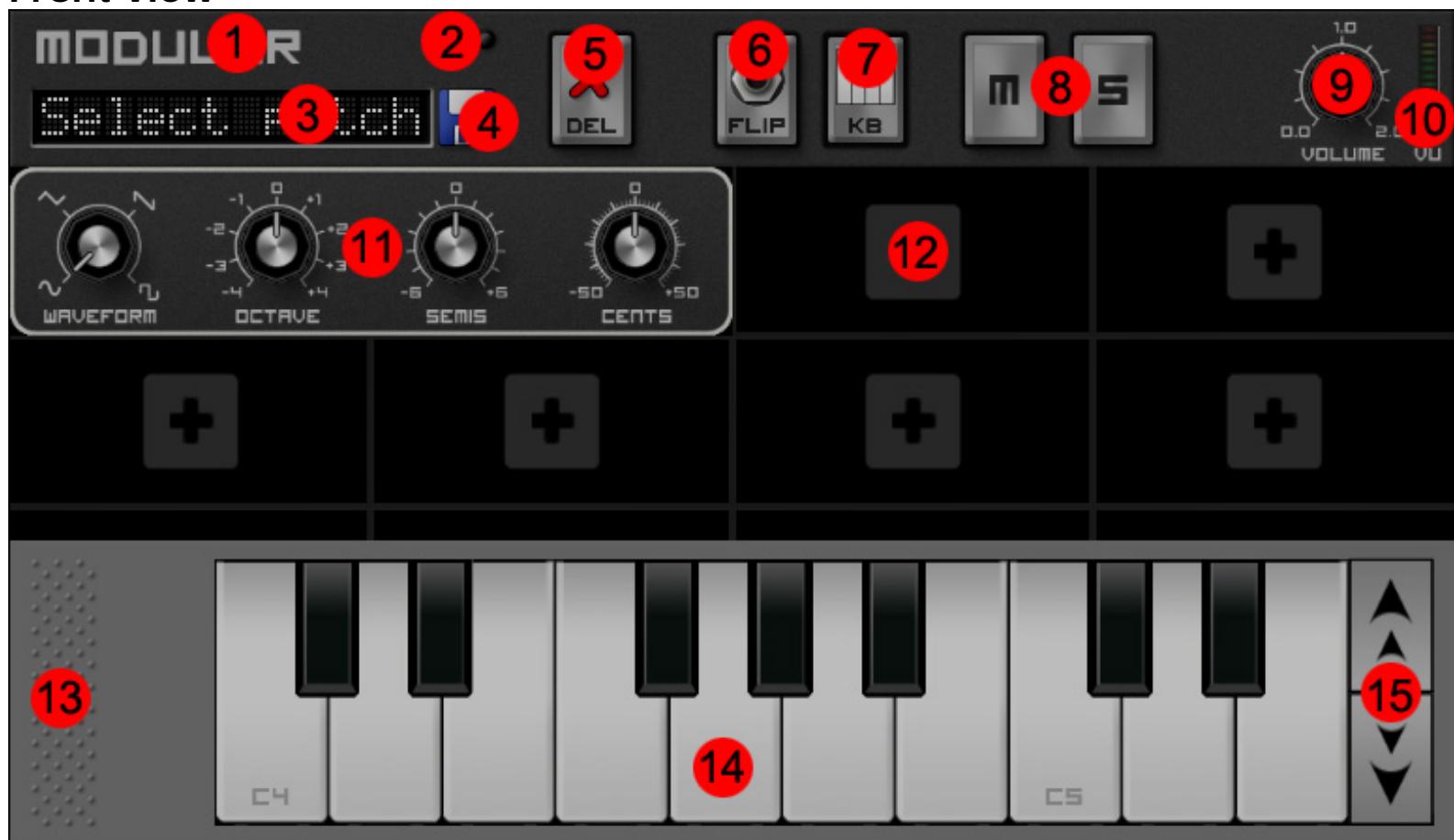
## Modular

### Description

The Modular Synth is a synthesizer where you can assemble your own synth from components. Components are selected from a catalog, placed and routed. A newly placed modular is empty and contains no components. Touch inside one of the component slots to bring up the component catalog. Output can be either mono or stereo, depending on output routing. The [Modular tutorial video](#) shows how to use this machine. A lot can be learned by studying the various built-in presets.

### UI Reference

#### Front view

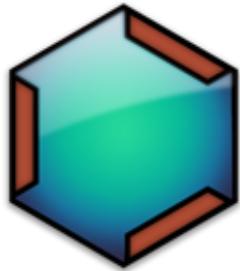


#### Rear View



- Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
- Note On LED:** This LED lights up whenever a note is triggered.
- Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains a link to all samples used as well as the positions of every knob. To load a preset, touch the preset LCD. This will bring up a list of saved presets to choose from.
- Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored in /caustic/presets/modular.
- Delete component button:** Press this button to select a component to remove. Removing a component clears all wire routing to and from it.
- Flip button:** This button toggles between front and rear view of the modular synth. The front view contains the major knobs and controls while the rear view is where gain adjustments and wire routings are made.
- Preview keyboard button:** This button toggles visibility of the preview keyboard for the modular synth. In order to maximize component area, the preview keyboard is not present by default.
- Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
- Output Volume knob:** The final output volume of the Modular synth.
- Output VU meter:** Indicates the level at which the Modular is outputting signal. If this reaches RED, then the Modular will output distorted sound.
- Modular component:** There are many different types of modular components, each having a particular role in how it treats the signal going through it.
- Component bay:** To place components, touch inside one of the component bays and the component catalog will be displayed. Once placed, some components span 1 bay some span 2 bays. If the catalog is brought up on a bay where there is only room for 1, the component catalog will disallow selection on large components.
- Preview keyboard gripper:** Once, visible (7), the preview keyboard can be moved vertically by dragging this gripper area.
- Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the Modular. Toggle its visibility using the keyboard button(7)
- Octave buttons:** Raises or lowers the octave of the Preview Keyboard.
- Note CV signal jack:** The note control voltage (CV) is a signal representing the note played. Route this signal to "note" inputs on sound generator components for example.
- Note Velocity signal jack:** The note velocity is a signal representing the velocity associated with the note played. Normally velocity gets reflected as a change in output volume and if that's all you want, route this signal to the "Volume Mod" input (22). However, because this is a regular control signal it can be routed to filter controls or more creative uses too.
- Mod wheel signal jack:** This control signal represents the value of the Modulation wheel on a connected MIDI controller. This signal has no effect without a MIDI controller connected.
- Left/Mono output jack:** This is the Modular's main audio output (routing to the effects and mixer after volume adjustments).
- Output gain adjustment knob:** Used to control the output volume for the modular patch, and leaves the main Volume knob(9) free for general use and automation.
- Right output jack:** If a signal is routed to the right output jack, it will be assumed that the synth should output Left and Right signals as part of a stereo output for the synth.
- Volume modulation jack:** Route a control signal to this input jack to affect the overall volume of the Modular patch's output volume.
- Component connection jack:** Left-most connection jacks on modular components are generally *inputs* and thus receive one control signal. Right-most connection jacks are usually *outputs* and can be routed to one or many inputs by dragging from the output jack to the desired input jack(s).
- Routing wire:** Wires are automatically placed when a connection is made between an output jack and an input jack(23)





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## Organ

### Description

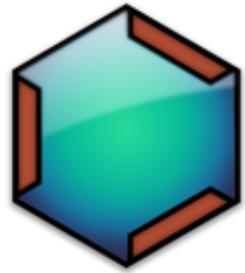
The Organ models a drawbar organ similar to the Hammond B3 and Leslie speaker combo. Sound is created by pulling on 9 drawbars, each representing a different harmonic. The sound is then passed through a rotary speaker simulator (Leslie) and overdrive unit. The [organ tutorial video](#) shows how to use this machine.

### UI Reference



1. **Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains the positions of all knobs and controls. To load a preset, touch the preset LCD. This will bring up a [File Browser](#) with a list of saved presets to choose from.
3. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored on the external storage in /caustic/presets/organ.
4. **Output VU meter:** Indicates the level at which the organ is outputting signal. If this reaches RED, then the organ will output distorted sound.

5. **Drawbars:** Pull down on the drawbars to determine the amplitude of each harmonic. A drawbar pulled all the way down outputs at full volume.
6. **Percussion Tone knob:** Controls the harmonic balance for the percussion sound. Fully left corresponds to the 4" harmonic, fully right corresponds to the 2 2/3" harmonic
7. **Percussion Decay knob:** Controls how quickly the percussion sound decays to silence. When turned to the minimum time (fully left), the percussion effect is turned off.
8. **Leslie Speed knob:** Controls the rotation speed of the simulated rotary speakers in the Leslie unit.
9. **Leslie Depth knob:** Controls the amount of rotation effect mixed into the final output.
10. **Drive knob:** Controls the amount of distortion applied to the output signal. (This is a very mild overdrive)
11. **Output Volume knob:** The final output volume of the organ.
12. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
13. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the organ.
14. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.



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## Vocoder

### Description

The Vocoder is a special machine because it acts more like an effect than a stand-alone synth. Two signals are needed to make the vocoder work so it is important to understand the basics of vocoding. **If your vocoder doesn't seem to play in pattern mode, read on or watch the tutorial video...**

The basic principle of the vocoder is it takes modulator signal, analyzes it for frequency content along each of the 8 bands, then uses the frequencies gain values to filter out the output or carrier signal. Typical modulation sources include vocals or natural instruments

**Because the vocoder allows for 6 possible modulator sources, it's important not only to place notes for the carrier synth but also to select a modulation source in the pattern editor by entering note data in the bottom octave (C1). This triggered "note" tells the app when to start the modulator signal and can be used to restart a modulator or switch modulators mid-way through a pattern.**

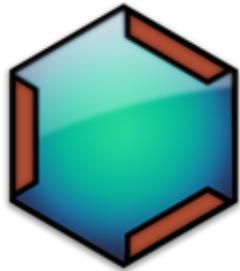
The [vocoder tutorial video](#) shows how to use this machine.

### UI Reference



1. **Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Note On LED:** This LED lights up whenever a note is triggered.
3. **Modulator information:** This display shows the name of the currently selected modulator as well as the power going into each frequency band when playing.
4. **Load modulator button:** Pressing this button will bring up a [File Browser](#) to let you load a WAV file as your modulation source for the selected modulator slot.
5. **Clear modulator button:** Pressing this button will clear all modulator information for the selected modulator.
6. **Sample editor button:** Pressing this button will launch the [Sample Editor](#) where you can record a new modulation waveform or manipulate an existing one.
7. **Machine selector button:** Pressing this button will cycle through the machines in your rack and use the selected one as the modulation source for the selected modulator slot.
8. **Modulation slot selector:** Select between 6 different modulation sources. The selected modulator will be the one to play when notes on the preview keyboard are played.
9. **Character control EQ sliders:** Control the balance of frequencies in the resulting vocoded carrier sound.
10. **Carrier selector:** Select between the internal oscillator or any other machine in your rack as the carrier signal to be vocoded.
11. **Send notes to carrier button:** When pressed, notes from the vocoder's pattern editor will be sent to the external carrier (if selected in 10)
12. **Waveform selector:** Select between sawtooth or squarewave as the waveform for the internal carrier synth's oscillators.
13. **Unison knob:** Controls the +/- detuning between the twin oscillators in the internal carrier synth.
14. **Sub knob:** Controls the mix volume of the sub-oscillator (1 octave below note) in the internal carrier synth.
15. **Noise knob:** Controls the mix volume of the white noise generator in the internal carrier synth.
16. **Slew knob:** Controls the maximum rate of change for the frequency response (articulation) between modulator and carrier.
17. **High Frequency Bypass knob:** Controls the volume of high frequency content in the modulator that gets mixed into the final vocoded result.
18. **Dry knob:** Controls the volume of modulator that gets mixed into the final vocoded result.
19. **Output Volume knob:** The final output volume of the vocoder.
20. **Output VU meter:** Indicates the level at which the vocoder is outputting signal. If this reaches RED, then the vocoder will output distorted sound.
21. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.

22. **Polyphony buttons and display:** Sets the number of notes which can be active at once. If the requested number of notes exceeds the polyphony count, a voice will be stolen from the oldest playing note.
23. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the subsynth.
24. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.



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## FM Synth

### Description

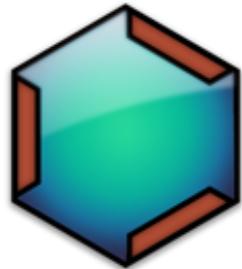
The FMSynth is a 3-operator modeling synth which uses Frequency Modulation (through a phase modulation algorithm) to produce sound. Each operator is controlled by a separate envelope and there are 5 different ways to combine the operators. The [FMSynth tutorial video](#) shows how to use this machine.

### UI Reference



1. **Machine Label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Note On LED:** This LED lights up whenever a note is triggered.
3. **Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains the positions of all knobs and controls. To load a preset, touch the preset LCD. This will bring up a [File Browser](#) with a list of saved presets to choose from.
4. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored on the external storage in / caustic/presets/fmsynth.

5. **Operator3 Feedback knob:** Controls the amount of signal from operator 3 that is fed into itself for modulation
6. **Operator3 Feedback velocity button:** When pressed, note velocity affects how much feedback is applied to operator3.
7. **Volume velocity button:** When pressed, note velocity affects the output volume of the FMSynth.
8. **Output Volume knob:** The final output volume of the FMSynth.
9. **Output VU meter:** Indicates the level at which the fmsynth is outputting signal. If this reaches RED, then the fmsynth will output distorted sound.
10. **Algorithm selector:** Touch to change, 5 algorithms to choose from. The different algorithms change which operator modulates which other operator(s) and which operators are fed to the output.
11. **LFO target selectors:** Press one or multiple buttons to have the LFO affect these parameters. A1 = amplitude of operator 1, A2 = amplitude of operator 2, A3 = amplitude of operator 3, AO = amplitude of the output. F1 = frequency of operator 1, F2 = frequency of operator 2, F3 = frequency of operator 3.
12. **LFO Rate knob:** The speed at which the LFO modifies its target value(s).
13. **LFO Depth knob:** The amount of modification the LFO applies to its target value(s).
14. **Level knob:** The output volume of the operator. In case the selected algorithm has this operator modulating another, this determines the modulation amount. In case the selected algorithm has this operator outputting to final mix, this determines the output volume level in the mix.
15. **Level velocity button:** When pressed, note velocity affects the level of the operator.
16. **Octave knob:** Coarse frequency tuning for the operator, from -4 to +4 octaves.
17. **Fixed tone button:** When pressed, the tone emitted from this operator will be fixed and determined by the octave and semis knob. It **will not** follow the note played on the keyboard.
18. **Semis knob:** Frequency tuning for the operator, in semitones (regular notes on a keyboard)
19. (ommitted)
20. **Volume Envelope Attack knob:** The amount of time before the operator reaches the level defined by the level knob, starting at 0.
21. **Volume Envelope Attack Exp button:** When selected the attack curve will be exponential instead of linear.
22. **Volume Envelope Decay knob:** The amount of time, after the attack period, for the level to go from the level knob value to the sustain level.
23. **Volume Envelope Decay Exp button:** When selected the decay curve will be exponential instead of linear.
24. **Volume Envelope Sustain knob:** The value for operator level at which to settle, once the attack and decay period have elapsed and the note is held, relative to the level knob.
25. **Volume Envelope Link button:** When selected, the values of decay and release will be linked. Any changes to one will reflect in the other.
26. **Volume Envelope Release knob:** The amount of time for the level to go from the sustain level down to 0.
27. **Volume Envelope Release Exp button:** When selected the release curve will be exponential instead of linear.
28. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
29. **Polyphony buttons and display:** Sets the number of notes which can be active at once. If the requested number of notes exceeds the polyphony count, a voice will be stolen from the oldest playing note.
30. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the fmsynth.
31. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.



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## KSSynth

### Description

The KSSynth is a string modeling synth, based on the [Karplus-Strong algorithm](#). The KSSynth offers two string modeling units which can be combined to create different variations of plucked and hammered sounds. Because of how the algorithm works, notes can only be triggered, not held (note length will be ignored). The other important consideration is that because the algorithm is based on tapped delay lines, notes cannot be bent. The [KSSynth tutorial video](#) shows how to use this machine.

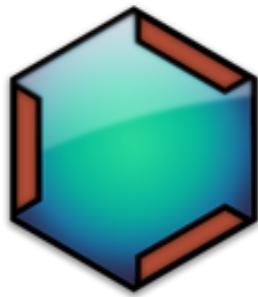
### UI Reference



1. **Machine label:** This is used to identify this machine in various places throughout the app. Its value can be changed via a long-press action (label changes color to indicate a successful touch). Upon successful long-press, a keyboard offering you to rename the machine will appear. Use this to identify a machine in a rack configuration where there might be more than one instance of the same machine.
2. **Note On LED:** This LED lights up whenever a note is triggered.
3. **Preset LCD:** This display shows the name of the last loaded preset and is used to load presets. A preset is a saved file that contains the positions of all knobs and controls. To load a preset, touch the preset LCD. This will bring up a [File Browser](#) with a list of saved presets to choose from.
4. **Save Preset button:** This button allows you to save your own presets to disk for use later. Pressing this button will bring up a keyboard allowing you to name your preset. Presets are stored on the external storage in /

caustic/presets/kssynth

5. **Pre Filter knob:** Determines the tone of the initial "pluck". No filtering results in a very harsh attack. More filtering will result in a smoother sound right from the start.
6. **Pre Filter Track knob:** Controls how the pre-filtering tracks the key being played. When tracking is fully enabled, low notes will get more filtering applied to them than high notes.
7. **Pre Filter Velocity knob:** Controls how the pre-filtering tracks the velocity (strength) of the note being played. When this knob is set to full, softly played notes will get more filtering applied to them than loud notes.
8. **Decay knob:** Controls the time taken for the note to fade to silence after being triggered.
9. **Volume knob:** The final output volume of the KSSynth.
10. **Output VU meter:** Indicates the level at which the KSSynth is outputting signal. If this reaches RED, then the KSSynth will output distorted sound.
  
11. **Keyboard Follow button:** When pressed, the KS unit will produce tones following the note that was triggered, otherwise it will produce a constant note determined by the pitch controls.
12. **Octave knob:** Coarse frequency tuning for the KS unit, from -2 to +2 octaves.
13. **Semis knob:** Frequency tuning for the KS unit, in semitones (regular notes on a keyboard)
14. **Cents knob:** Fine frequency tuning for the KS unit, in cents.
15. **Damping knob:** Controls the amount of attenuation of high frequencies over the life of the note. Low dampening will result in a brighter tone.
16. **Damping Track knob:** Controls how the damping tracks the key being played. When tracking is fully enabled, low notes will get more damping applied to them than high notes.
17. **Damping Velocity knob:** Controls how the damping tracks the velocity (strength) of the note being played. When this knob is set to full, softly played notes will get more damping applied to them than loud notes.
18. **Invert switch:** Changes the tone of the KS unit from a harsh impulse to a softer, warm pluck.
19. **Mix knob:** Controls the balance of volume between the two KS units.
20. **Invert Mix switch:** Inverts how the two units combine to correct phase cancelation issues or to create soft attacks.
21. **Mute/Solo buttons:** These buttons link to the ones in the [mixer](#) and are used to cut out this machine from the final mix or listen to **only** this machine.
  
22. **Preview Keyboard:** This keyboard is used to play notes to help when designing sounds with the KSSynth.
23. **Octave buttons:** Raises or lowers the octave of the Preview Keyboard.

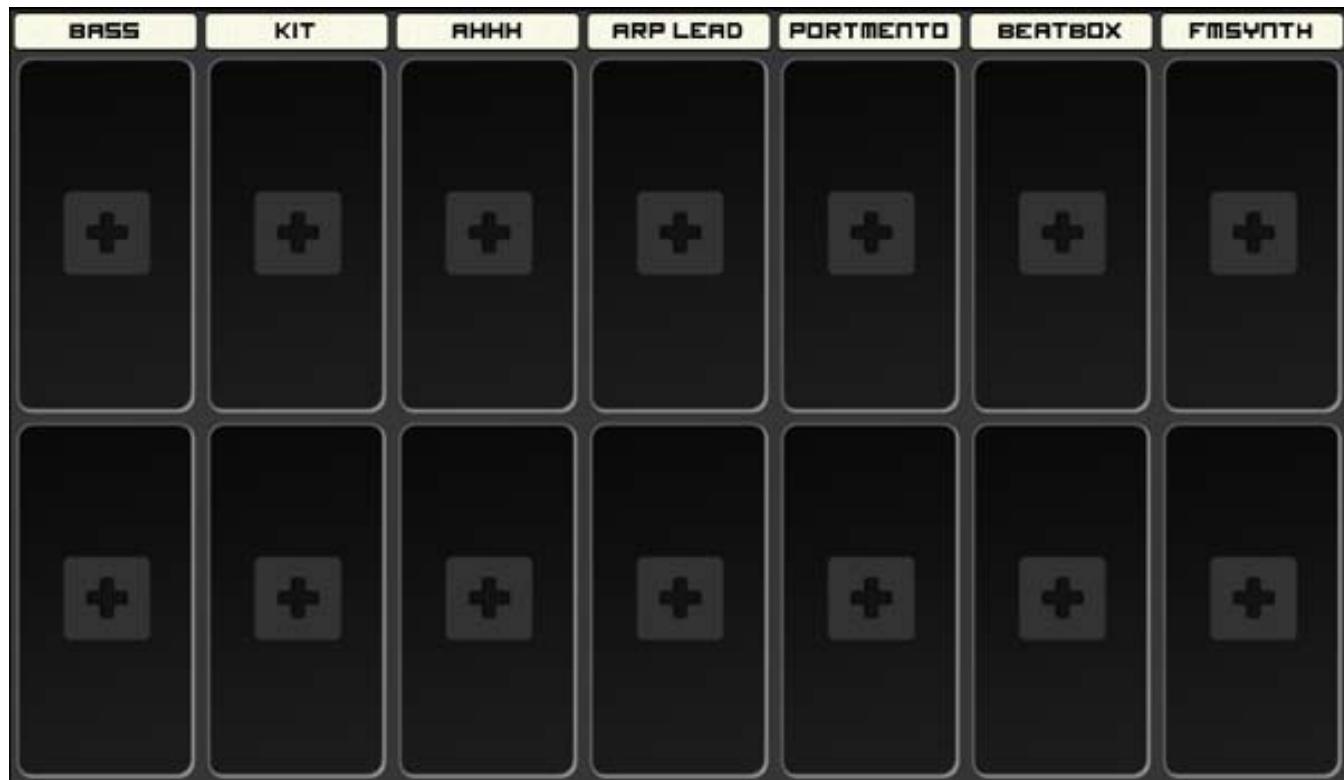


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## Effects Rack

The effects rack is where you can place various insert effects to further shape the sound of each machine. You can place up to 2 insert effects per machine. The signal direction is top to bottom, meaning the machine's audio comes into the topmost effect (if present) then gets sent into the bottom-most insert effect (if present) and then into the [mixer's](#) input strip for that machine.



To place a new effect, touch inside an empty slot and effect selection popup will ask you which effect you want to place. To remove an effect, touch the "X" in the lower right-hand corner of the effect. All effects can be bypassed (signal goes thru untouched by the effect) by pressing the top of the effect where its name is. The top-right LED indicates whether the effect is active or not.

### Video tutorials

[Distortion & BitCrusher](#)

[Compressor](#)

[Flanger & Chorus](#)

[Phaser & AutoWah](#)

[Parametric EQ & Limiter](#)

[Vinyl Simulator](#)

[Comb Filter & Cabinet Simulator](#)

[Static Flanger & Delay](#)

[Reverb & Multi-Filter](#)

There are currently 16 insert effects which can be placed:

## Distortion



**Program:** The algorithm used to distort the sound. Choices are Overdrive (tube amp), Saturation (Soft-knee limiter), Fuzz (Hard-knee limiter), Foldback (folds the signal onto itself)

**Pre:** Pre-amplification used to send signal past the chosen program's threshold.

**Amount:** The amount of distortion applied to signal above the threshold.

**Post:** Post-amplification used to compensate the distortion algorithm's output volume.

## BitCrusher



**Depth:** The bit depth, from 0 to 16 bits

**Rate:** The sampling rate, from 1Hz to 44KHz

**Jitter:** The amount of randomness on the Rate control

**Wet:** The ratio of modified signal to original signal, from 0% to 100%

## Compressor



**Threshold:** The volume at which the compressor will start modifying the signal.

**Ratio:** The amount of reduction applied to signal over the threshold

**Attack:** The time it takes to reach full compression once signal over threshold has been detected.

**Release:** The time it takes to shut down compression after the signal has gone below the threshold.

**SideChain:** The signal used as a trigger to the compressor. Default is the current machine channel but it can be changed to any input line in the mixer (1-6)

A compression amount VU next to the sidechain indicates how much of the signal is being removed through compression.

## Flanger



**Depth:** The sweep width in frequency range.

**Rate:** The speed at which the effect sweeps the frequency range.

**Feedback:** The amount of output signal that is fed back into the input for processing.

**Wet:** The ratio of modified signal to original signal, from 0% to 100%

**Waveform:** Controls how the flanger oscillates. Signals can be mono or stereo, linked or inverted, sinewave or trianglewave and oscillate only above or below 0

## Chorus



**Depth:** The detune width in frequency range.

**Rate:** The speed at which the effect sweeps the detune amount.

**Delay:** The delay time that is added to the signal before it enters the chorus.

**Wet:** The ratio of modified signal to original signal, from 0% to 100%

**Waveform:** Controls how the chorus oscillates. Signals can be mono or stereo, linked or inverted, sinewave or trianglewave and oscillate only above or below 0

## Phaser



**Low:** The lowest frequency the phaser will sweep to.  
**High:** The highest frequency the phaser will sweep to.  
**Depth:** The sweep width in frequency range.  
**Rate:** The speed at which the comb filter sweeps the frequency range.  
**Feedback:** The amount of output signal that is fed back into the input for processing.

## Auto-Wah



**Speed:** The reaction time for the filter to go from OFF to ON.  
**Depth:** The maximum amount of cutoff applied to the incoming signal.  
**Cutoff:** The cutoff frequency for the internal band-pass filter.  
**Resonance:** The resonance amount for the internal band-pass filter.  
**Wet:** The ratio of modified signal to original signal, from 0% to 100%

## Parametric EQ



**Freq:** The frequency at which to apply the equalization.  
**Gain:** The volume gain to apply around the selected frequency (boost or cut).  
**Bandwidth:** The size of the surrounding frequencies that will be affected by the equalization.

## Limiter



**Pre:** The amplification of the signal going into the limiter  
**Post:** The amplification of the signal after it has been compressed (make-up gain).

**Attack:** The time it takes to start clamping once signal over 100% has been detected.

**Release:** The time it takes to stop clamping after the signal has gone below 100%.

## Vinyl Simulator



**Dust:** The amount of dust sounds generated.

**Scratch:** The amount of scratch sounds generated.

**Noise:** The amount of low-frequency noise generated.

**Age:** The amount of band-pass filtering applied to the incoming signal.

**Wet:** The amount of generated signals (dust+scratch +noise) that will go into the original signal

## Comb Filter



**Freq:** The target frequency that the comb filter is letting through.

**Reso:** The amount of resonance (feedback) on the filter

**Wet:** The ratio of modified signal to original signal, from 0% to 100%

# Cabinet Simulator



**Width:** The simulated cabinet's physical width.  
**Height:** The simulated cabinet's physical height.  
**Damp:** The amount of volume dampening that occurs on each reflection inside the simulated cabinet  
**Tone:** The frequency attenuation that occurs on each reflection inside the cabinet  
**Wet:** The ratio of modified signal to original signal, from 0% to 100%

## Static Flanger



**Delay:** The sweep width in frequency range.  
**Feedback:** The amount of output signal that is fed back into the input for processing.  
**Wet:** The ratio of modified signal to original signal, from 0% to 100%  
**Waveform:** Controls how the flanger oscillates. Signals can be mono or stereo, linked or inverted, sinewave or trianglewave and oscillate only above or below 0

## Delay



**Time:** The time between each echo tap of the delay.  
**Feedback:** The amount of output signal that is fed back into the input for processing.  
**Wet:** The amount of modified signal mixed into the original signal, from 0% to 100%  
**(Pattern selector):** The type of delay, mono or stereo ping-pong LR or RL, joint or inverted

## Reverb



**Room:** The size of the simulated reverberation chamber.  
**Damp:** The amount of volume dampening that occurs on each reverb reflection.

**Delay:** The delay time that is added to the generated echoes before they mix into the output.

**Width:** The stereo separation of the generated echoes.

**Wet:** The amount of modified signal mixed into the original signal, from 0% to 100%

## MultiFilter

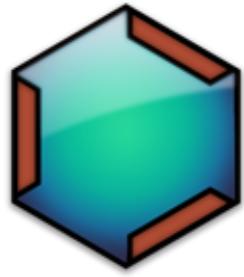


**Type selector window:** Tap to change filter type and to see how the filter will affect incoming signal

**Freq:** The frequency at which the filter will act.

**Reso:** The resonance of each filter type (or bandwidth in the case of "Band Isolate")

**Gain:** The volume gain to apply around the selected frequency (boost or cut)



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## Mixer

### Description

The mixer is where the signal from each machine gets added (or "mixed") into the final audio result you hear. There are 7 "strips" in each mixer, and 2 possible mixers in your rack. The first mixer corresponds to machines 1-7 and the second mixer corresponds to machines 8-14 (if present)

### UI Reference

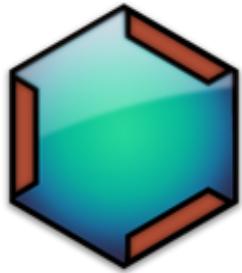


Each strip has the following controls which affect the sound signal coming from the machine (once it has passed through the insert effects):

1. **EQ Knobs (Bass, Mid, High):** These are equalizer controls that affect the tone of the audio signal, each component can either be amplified or cut.
2. **Global Effects Send Knobs:** These control how much of the machine's audio signal is sent into each global effect for processing.
3. **Stereo Knobs:** The Pan knob controls the placement of the machine's audio signal in the output stereo panorama. The Width knob controls a small delay between left and right ear, this gives the impression that the sound is captured from a stereo source. The greater the Width value, the more stereo separation in the sound. When the control is centered there is no delay. When the knob is turned left the delay is in the left ear and when the knob is turned right then delay is in the right ear.
4. **Mute/Solo Buttons:** Mute stops this machine's audio from going into the output mix. Solo mutes out every machine except the Solo'ed one.
5. **Volume Knob:** Controls this machine's final volume that will be mixed into the output. This also affects the

amount of signal sent to the Global Effects.

6. **VU meter:** Indicates the level at which this machine is outputting signal. If this reaches RED, then this machine will output distorted sound into the final mix.
7. **Strip Identifier Label:** Shows the name of the machine connected to this strip. *Tip: Double-tap the label to quickly jump to the machine.*



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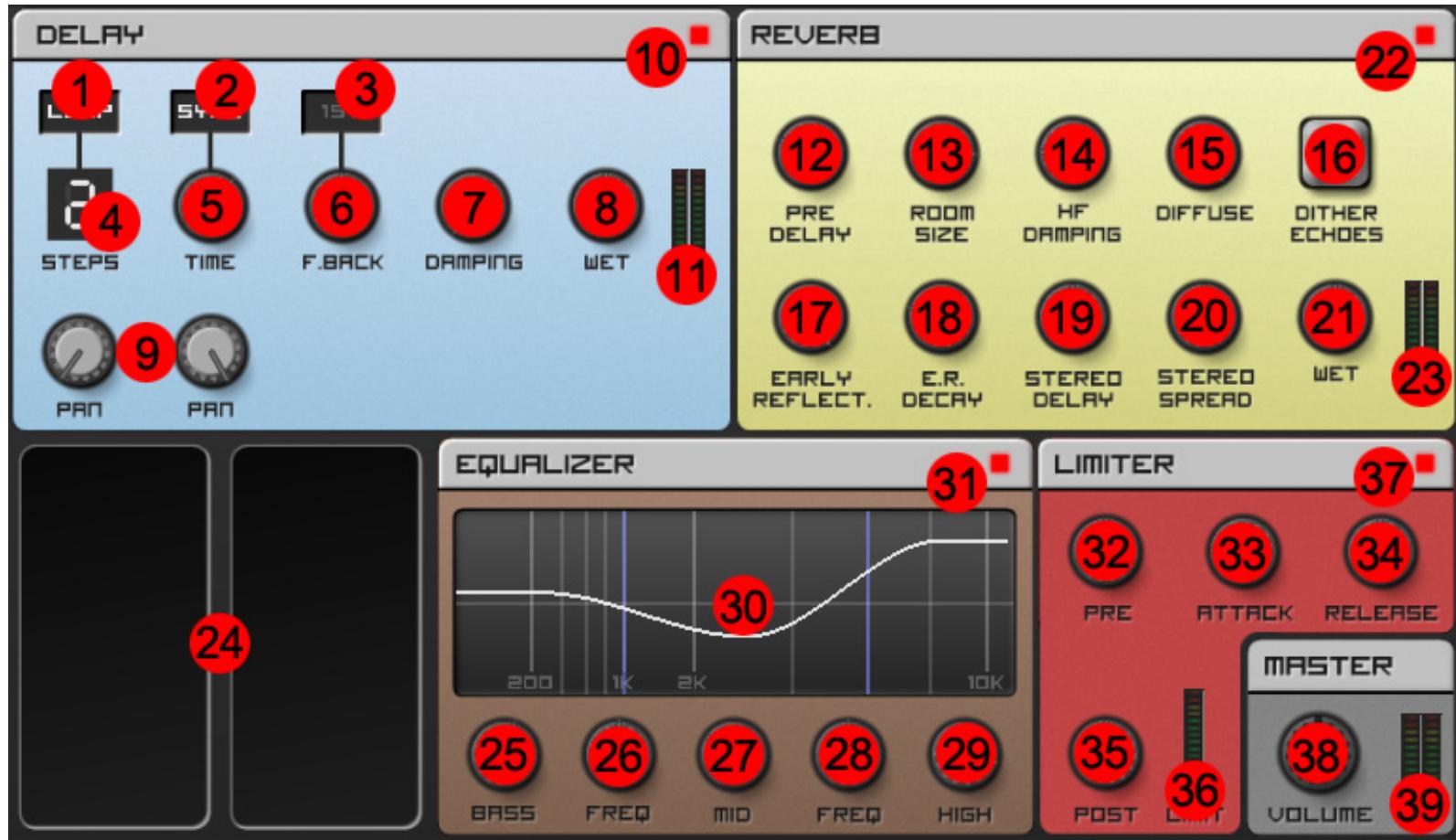
## Master

### Description

The Master section is where the global effects are configured and where you can manipulate the combined sound of all the instruments in your rack before it heads out to the sound card. There are two insert effect slots, a semi-parametric EQ, a limiter effect as well as a final volume control.

The [Master Effects tutorial video](#) shows how to use this machine

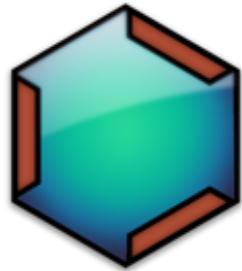
### UI Reference



1. **Delay Loop toggle:** When enabled, this tells the global delay unit to send to output of the final delay tap back into the first delay tap for continued processing.
2. **Delay Time Sync toggle:** When enabled, the global delay's time knob snaps to BPM-sync intervals. Otherwise, the time knob is free to have any value, regardless of BPM sync.
3. **Delay First Tap Feedback toggle:** When enabled, this tell the global delay unit to attenuate the input signal according to the Feedback knob *before* going into the first delay tap.
4. **Delay Step Count selector:** Touching this selector controls the number of delay taps present inside the global delay unit.
5. **Delay Time knob:** Controls the time before the signal is moved between each delay tap.(and output)
6. **Delay Feedback knob:** Controls the amount of signal that is fed back into the next delay tap each time the

signal moves between taps. This is effectively a volume damping control.

7. **Delay Damping knob:** Controls the amount of high-frequency damping between taps in the global delay unit.
8. **Delay Wet knob:** Controls the amount of signal coming out of the global delay unit that gets mixed into the final output signal path.
9. **Delay Pan knobs:** Control the stereo panning for each delay tap output.
10. **Delay Bypass Toggle:** When enabled (RED), the delay unit is active and producing signal. When disabled, the delay unit is bypassed and not outputting any signal.
11. **Delay Output VU meter:** Indicates the level at which the global delay unit is outputting signal. If this reaches RED, then the global delay unit will output distorted sound.
12. **Reverb Pre Delay knob:** Controls the small delay before the input signal reaches the reverberation chamber in the global reverb unit.
13. **Reverb Room Size knob:** Controls the simulated room size for the global reverb unit (volume attenuation over time)
14. **Reverb High Frequency Damping:** Controls the amount of high-frequency damping between echoes in the global reverb unit.
15. **Reverb Diffuse knob:** Controls the amount of pre-smearing applied to the input signal before it hits the reverb chamber. This can help eliminate micro-echoes on sharp hits like drums.
16. **Reverb Dither Echoes button:** When pressed, the time between each echo in the reverb chamber is slightly modified to simulate imperfection in surface (helps remove metallic sound)
17. **Reverb Early Reflections knob:** Controls the volume of echoes occurring during the Pre delay(12) time.
18. **Reverb Early Reflections Decay knob:** Controls how quickly the early reflections decay during the pre -delay (12) time.
19. **Reverb Stereo Delay knob:** Controls the amount of delay time between the Left-Right stereo reverb outputs.
20. **Reverb Stereo Spread knob:** Controls the mix of Stereo-Mono reverb output.
21. **Reverb Wet knob:** Controls the amount of signal coming out of the global reverb unit that gets mixed into the final output signal path.
22. **Reverb Bypass toggle:** When enabled (RED), the reverb unit is active and producing signal. When disabled, the reverb unit is bypassed and not outputting any signal.
23. **Reverb Output VU meter:** Indicates the level at which the global reverb unit is outputting signal. If this reaches RED, then the global reverb unit will output distorted sound.
24. **Master insert effect slots(x2):** Touch inside one of these boxes to place an [insert effect](#) in the master signal path (after Delay and Reverb are added)
25. **EQ Bass Level knob:** Controls the amount of low-frequency signal in the master audio output (boost or cut)
26. **EQ Bass-Mid Frequency knob:** Controls the crossover frequency between the Bass and Mid level controls.
27. **EQ Mid Level knob:** Controls the amount of mid-frequency signal in the master audio output (boost or cut)
28. **EQ Mid-High Frequency knob:** Controls the crossover frequency between the Mid and High level controls.
29. **EQ High Level knob:** Controls the amount of high-frequency signal in the master audio output (boost or cut)
30. **EQ Frequency Response curve:** Displays an approximation of the 3 EQ frequency bands, their crossover frequencies and their effect on the incoming signal.
31. **EQ Bypass toggle:** When enabled (RED), the EQ unit is active and modifying the incoming signal. When disabled, the EQ unit is bypassed and not modifying the signal.
32. **Limiter Pre knob:** Controls the amplification of the signal going into the limiter
33. **Limiter Attack knob:** Controls the time it takes to start clamping once signal over 100% has been detected.
34. **Limiter Release knob:** Controls the time it takes to stop clamping after the signal has gone below 100%.
35. **Limiter Post knob :** Controls the amplification of the signal after it has been compressed (make-up gain).
36. **Limiter amount VU meter:** Indicates the amount of limiting currently taking place (level of the signal being removed)
37. **Limiter Bypass toggle:** When enabled (RED), the limiter unit is active and modifying the incoming signal. When disabled, the limiter unit is bypassed and not modifying the signal.
38. **Master Volume knob:** Controls the final volume of the audio signal before it goes to the device's output.
39. **Master Stereo VU meter:** Indicates the level at which the app is outputting signal. If this reaches RED, then the app will output distorted sound.

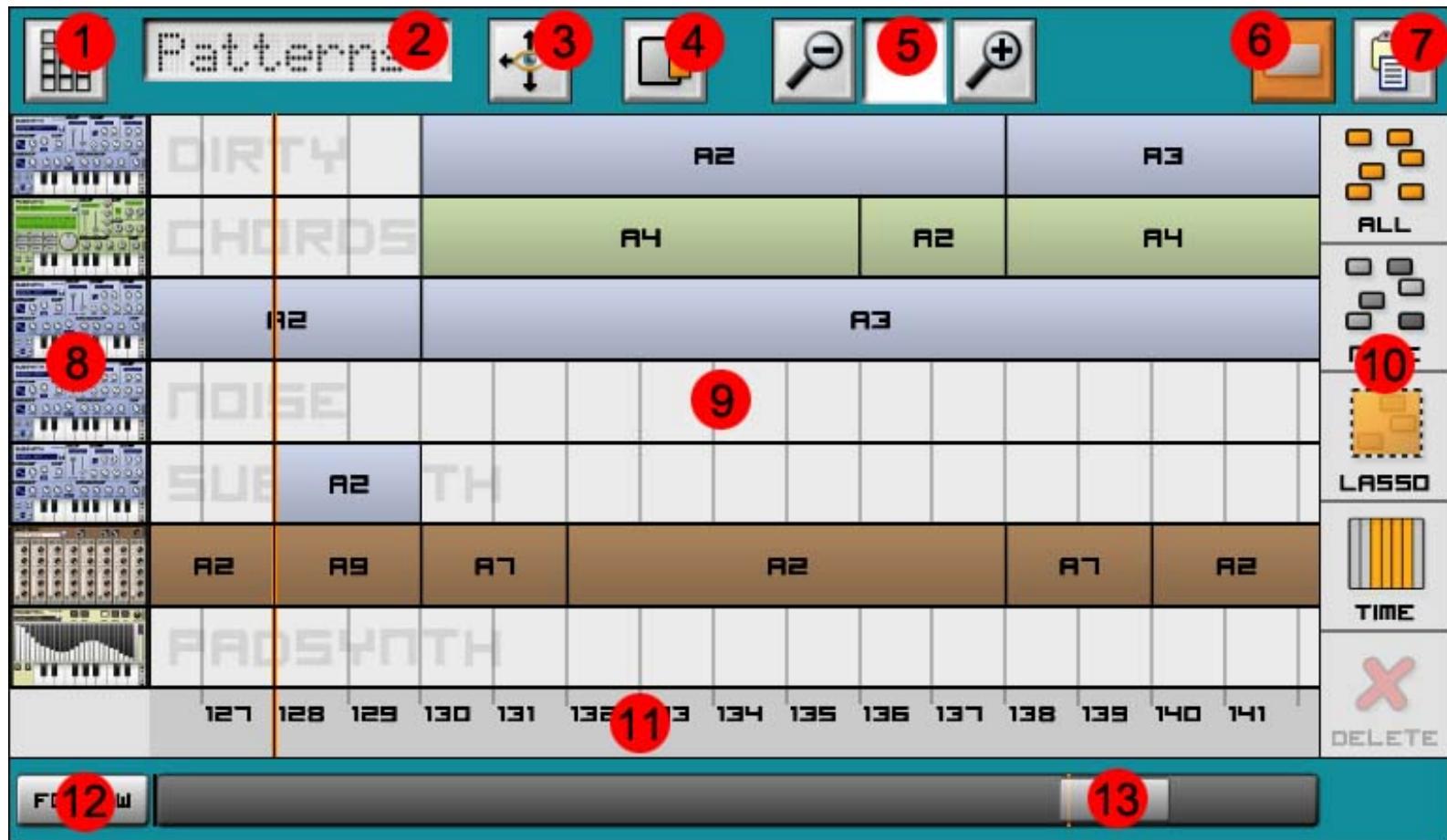


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## Sequencer

The sequencer is where patterns and notes are put together to create a song. Make sure the toggle in the [Control Panel](#) is in **Song** mode to use the sequencer.



The sequencer has 2 views which work at the same time to trigger notes, a pattern view and a piano roll view. Use the **View(1)** button in the upper-left corner to change views. There is also an automation editor view, which is described below.

To place notes or patterns, touch inside the main sequencer window(9) where you wish to place the note or pattern. In the case of patterns, press in the horizontal line corresponding to the machine you want to trigger and a pattern selection popup will display asking you to select a pattern to trigger. To stretch a note or pattern, press the stretch icon(4) and use it same as in the [pattern editor](#). To pan inside the main sequencer window(9), press the pan icon(3) and drag the view or use the horizontal scrollbar (13) at any time.

At the bottom of the sequencer is the timeline(11). This shows a measure count as well as any loop points that are set. To create a loop, touch and drag towards the left **inside** the timeline. To clear a loop, drag right inside the timeline so that the loop cursors end up in the same position, and release.

To set the playback start position, touch once inside the timeline at the desired start location.

To insert patterns in between existing patterns blocks, first place the playback cursor at the desired insert time. Then long-press inside the timeline at this time until a popup is shown. Select the number of measures to insert and press ok.

To trim patterns and delete the empty space left by the deleted patterns, first create a loop cursor selection in

the timeline around the patterns to delete, then long-press inside the loop area in the timeline. A confirmation popup will be displayed. When the sequencer is playing, a black line will show the current play position.

To have the sequencer automatically scroll to follow a playing song, press the **Follow (12)** button.

## Pattern View

Use the zoom magnifiers(5) or grid selection button to scale the view, zooming in pattern view only affects what you see.

Inside the main sequencer window(9) there are horizontal rows corresponding to each machine slot in your rack. Touch the machine icons on the left and drag up or down to scroll between machines.

To trigger a pattern to play, touch a grid square for the desired machine at the desired measure. A pattern selection popup will be shown. Select the desired pattern and press OK. To move a placed pattern block, touch and drag the block to the new time location. To move multiple blocks at a time, press the selection sidebar mode button (6) then press the **multi** icon in the right sidebar(11). From there, select each block by touching it once. Selected blocks will be highlighted in orange. Then touch-drag any of the selected blocks to move all blocks to the desired time. Multi-select applies for most basic operations in pattern view where you want to work on more than one pattern block. You can also use Lasso select or Time select as described in the [pattern editor](#).

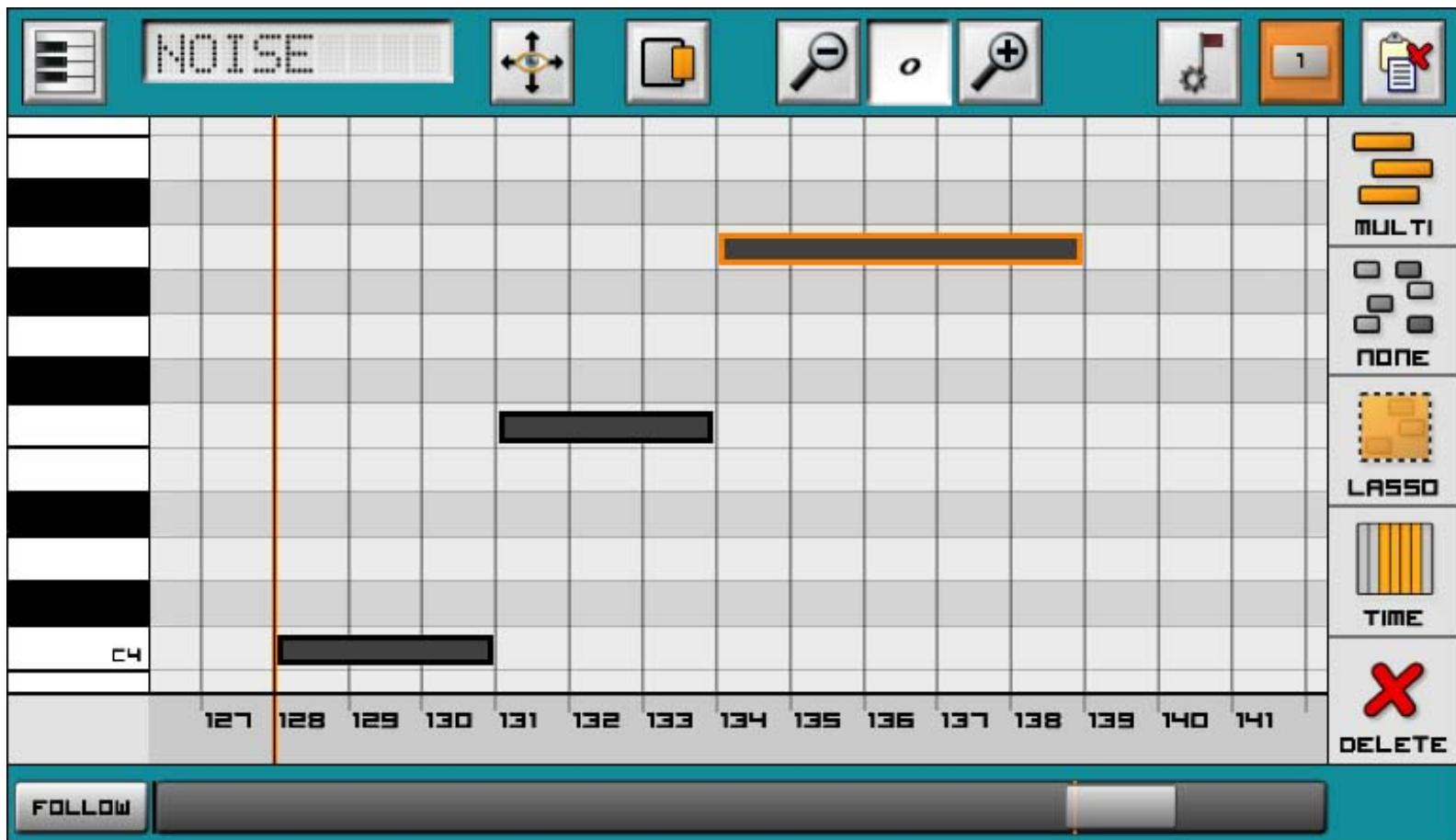
To have a pattern repeat over multiple measures, press the Stretch icon(4). Select the desired block by touching it, then drag the stretch handle on the right side of the block to the correct end measure. Alternately, simply touch and drag the size button left or right and this will quickly stretch the pattern without going into stretch mode.

To copy a pattern block or group of blocks, press the Edit sidebar mode button (7) then select the desired block(s) then press the Copy button in the right sidebar (10). To determine where the block(s) will get pasted, touch once inside the timeline at the desired measure to place the orange vertical line, then press the Paste button. To remove a block (or blocks) select the block(s) and press the delete (X) button in the lower-right corner.

If two pattern blocks overlap, a red Error button will appear in the lower-left corner of the sequencer and the offending patterns will be highlighted in red. Pressing the error button will jump to show the first error. To clear the error, move or delete the offending block(s).

*Tip: Double-tapping any of the machine icons on the left-hand side(8) will jump to that machine.*

## Piano roll View



The piano roll view can be used to add notes that are longer than 8 measures or create non-repeating note sequences.

It is very similar to the [Pattern editor](#) except that it spans over the entire song instead of just a few measures. Touch the display in the upper left to select which piano roll machine to work with.

Use the zoom magnifiers(5 above) or grid size button to scale the view. Zooming in piano roll view sets the default new note length.

To scroll the keyboard up and down in octaves, touch and drag up/down in the side keyboard (8 above). Hold a note in the side keyboard to hear a preview of it in the linked machine.

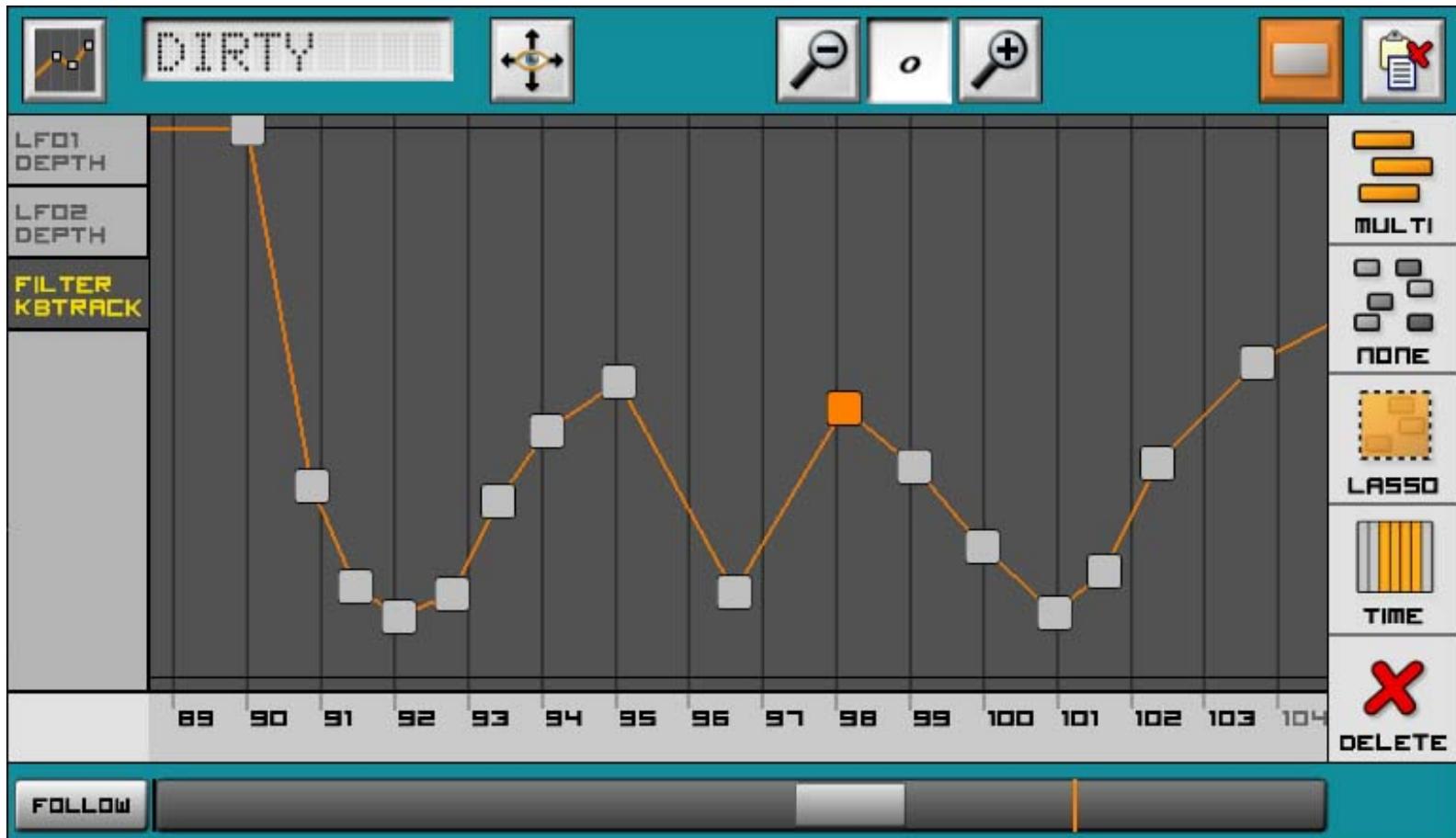
To add a note trigger, touch a grid square for the desired note at the desired time. (The initial length of the new note will be determined by the zoom level.) To move a placed note trigger, touch and drag the trigger to the new time or note. To move multiple triggers at a time, press the selection sidebar mode button (6) then press the **multi** icon in the right sidebar(11). From there, select each trigger by touching it once. Selected triggers will be highlighted in orange. Then touch-drag any of the selected triggers to move all trigger to the desired time or note offset. Multi-select applies for most basic operations in piano roll view where you want to work on more than one note trigger. You can also use Lasso select or Time select as described in the [pattern editor](#).

To change the length of a note trigger after it is placed, press the Stretch icon(4 above). Select the desired trigger by touching it, then drag the stretch handle on the right side of the trigger to the desired time. Position will snap to the grid size determined by the zoom level. Alternately, simply touch and drag the size button left or right and this will quickly stretch the note without going into stretch mode.

To copy a note trigger or group of note triggers, press the Edit sidebar mode button (7) then select the desired note trigger(s) then press the Copy button in the right sidebar (10 above). To determine where the note trigger(s) will get pasted, touch once inside the timeline at the desired measure to place the orange vertical line, then press the Paste button. To remove a note trigger (or note triggers) select the note trigger(s) and press the delete (X) button in the lower-right corner.

If two note triggers overlap, a red Error button will appear in the lower-left corner of the sequencer and the offending note triggers will be highlighted in red. Pressing the error button will jump to show the first error. To clear the error, move or delete the offending note trigger(s).

## Automation Editor View

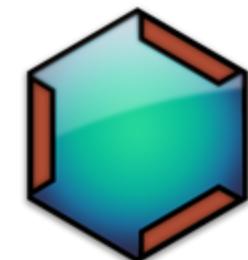


The automation view can be used to modify or create automation data for controls. First, automate the control for song mode as described in the [automation section](#). Select the machine containing the automated control using the machine selector in the upper left. Then select the desired automated control from the list on the left. Once selected, the control automation data will appear as a curve in the main sequencer window. Automation is comprised of one or many keyframes, denoted as little squares in this view, and which represent the value for the automated control at the specified time in the timeline. **Note that the automation playback follows the curve between keyframes and not the actual points so the number of keyframes doesn't affect the smoothness of the automation.** To see the automation curve without keyframes, toggle the pan(3 above) button. A semi-transparent curve represents time for which there are no automation keyframes but where the value of the control still depends on a keyframe before or after this time.

To modify an existing keyframe, touch and drag it to a new position. Multiple keyframes can be selected using the different selection modes. If a keyframe moves beyond the previous or next keyframe, the keyframes will automatically get re-ordered as to not break time continuity.

To add a keyframe, touch anywhere at the time where you wish to set the keyframe and place the key at the current value.

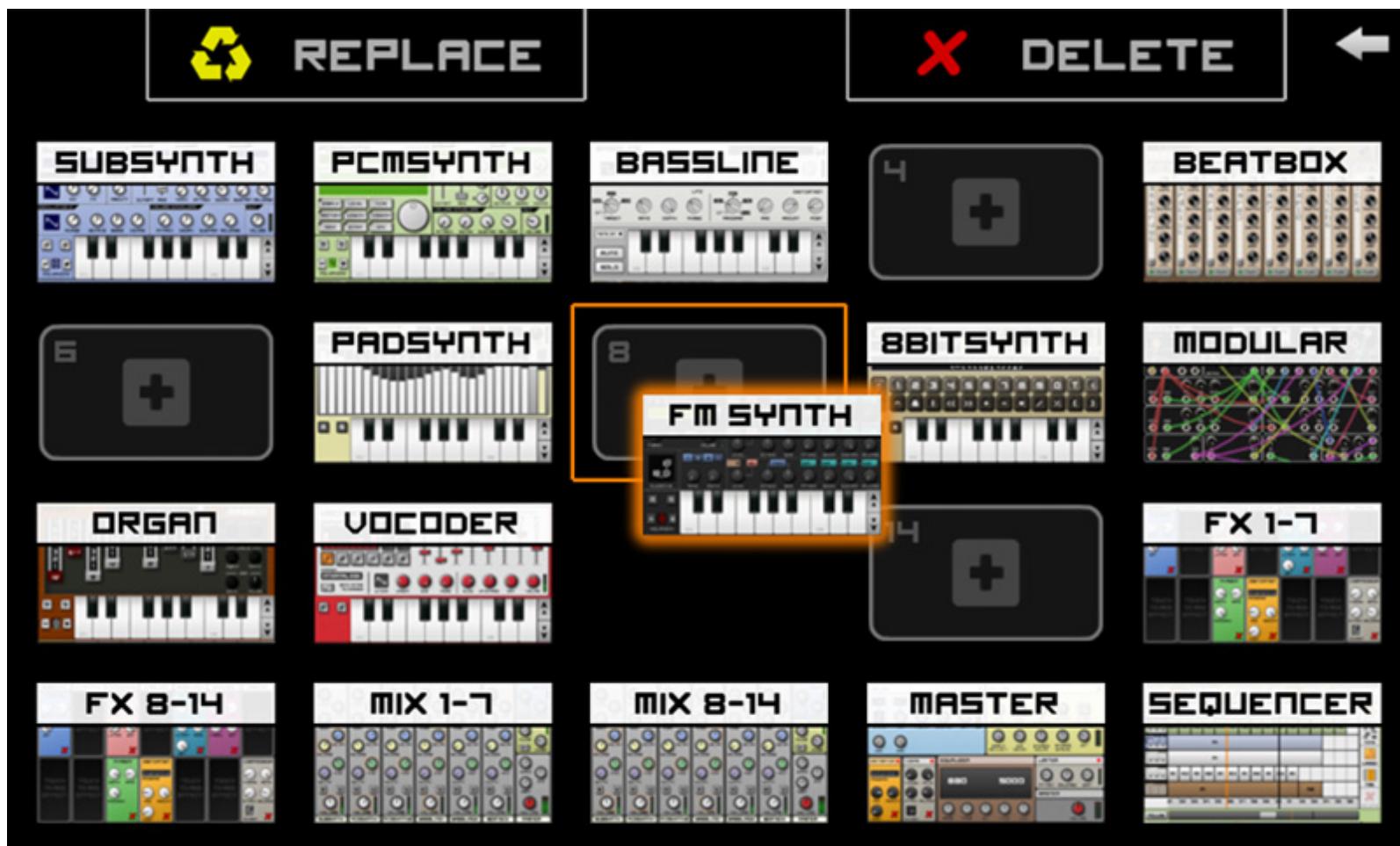
Keyframes can be pasted between controls and will retain relative values between them.



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## Machine Management



Use this screen to:

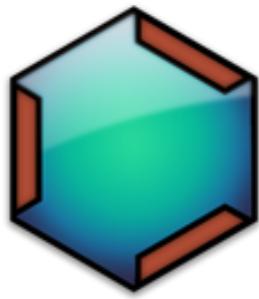
**Jump between machines:** Tap once on a machine to quickly scroll to that machine in your rack.

**Add a machine:** Tap on an empty machine slot to bring up a machine selection popup.

**Move a machine:** Drag a machine to an empty slot or between two existing machines to re-order them.

**Remove a machine:** Drag a machine towards the top of the screen and a "Delete" region will appear on the right. Releasing the machine inside the delete region will remove it from the rack.

**Replace a machine:** Drag a machine towards the top of the screen and a "Replace" region will appear on the left. Releasing the machine inside the replace region will offer to change this machine for another type. Replacing a machine keeps all pattern and song data intact across machines but automation is lost (controls don't map across machines)



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## App Menu

The app menu is broken up into 5 sections which can be accessed by selecting one the the tabs at the top: Song Operations, App Options, MIDI configuration, Caustic Connect, and Help.

### Song



**New** - This will clear the rack and reset all pattern and song data. If there are unsaved changes, a prompt will offer to save changes first.

**Load...** - This will bring up a [File Browser](#) to choose a song to load. If there are unsaved changes to the current song, a prompt will offer to save changes first.

**Save...** - This will bring up a keyboard screen to choose a name for your song. (Full version only)

**Export...** - This will launch the [Export](#) screen. (Full version only)

**Import...** - This will launch the [MIDI import](#) screen.

**Tempo** - This is where you set the tempo (in BPM) for your song. Use the + and - buttons to raise or lower the tempo. Alternatively, tap a few times on the BPM indicator at the desired rate to set BPM (tap tempo).

**Shuffle Mode Buttons** - This will set the global shuffle mode for all patterns in the song. Select either 8th notes

(March) or 16th notes (Swing).

**Shuffle Knob** - This will dial in the amount of global shuffle for your song, based on which shuffle mode is selected.

**Song Length** - This measures the length of the current song using the information in the sequencer and the BPM settings.

## Options



**Screen Wake Lock** - When selected, this option will prevent your device from "sleeping" after a period of inactivity. This is useful when you are listening to your song and haven't touched the screen in a while but don't want the device to sleep and cut off the audio.

**Sound New Notes** - When selected, this option will make each new note placed in pattern editors and sequencer trigger a sound, based on the note that's placed or moved.

**Audio API (Android only)** - Select between AudioTrack and OpenSL ES. AudioTrack is provided for legacy support but OpenSL ES gets better performance and latency on newer devices. OpenSL ES is available on devices running Android 2.3 (gingerbread) or greater but the major latency improvements are only present in Android 4.2.2 (JellyBean) and greater.

**Internal Latency** - This sets the size of the internal processing buffer. Lowering this value makes key touch events get processed quicker and can help VU meters update faster, at the expense of higher CPU load.

**Song End Mode** - This sets the playback behavior for the sequencer when the song is done playing.

**Allow Screen Rotation** - When selected, this option allows the app to display multiple machines when the device is held vertically (portrait mode).

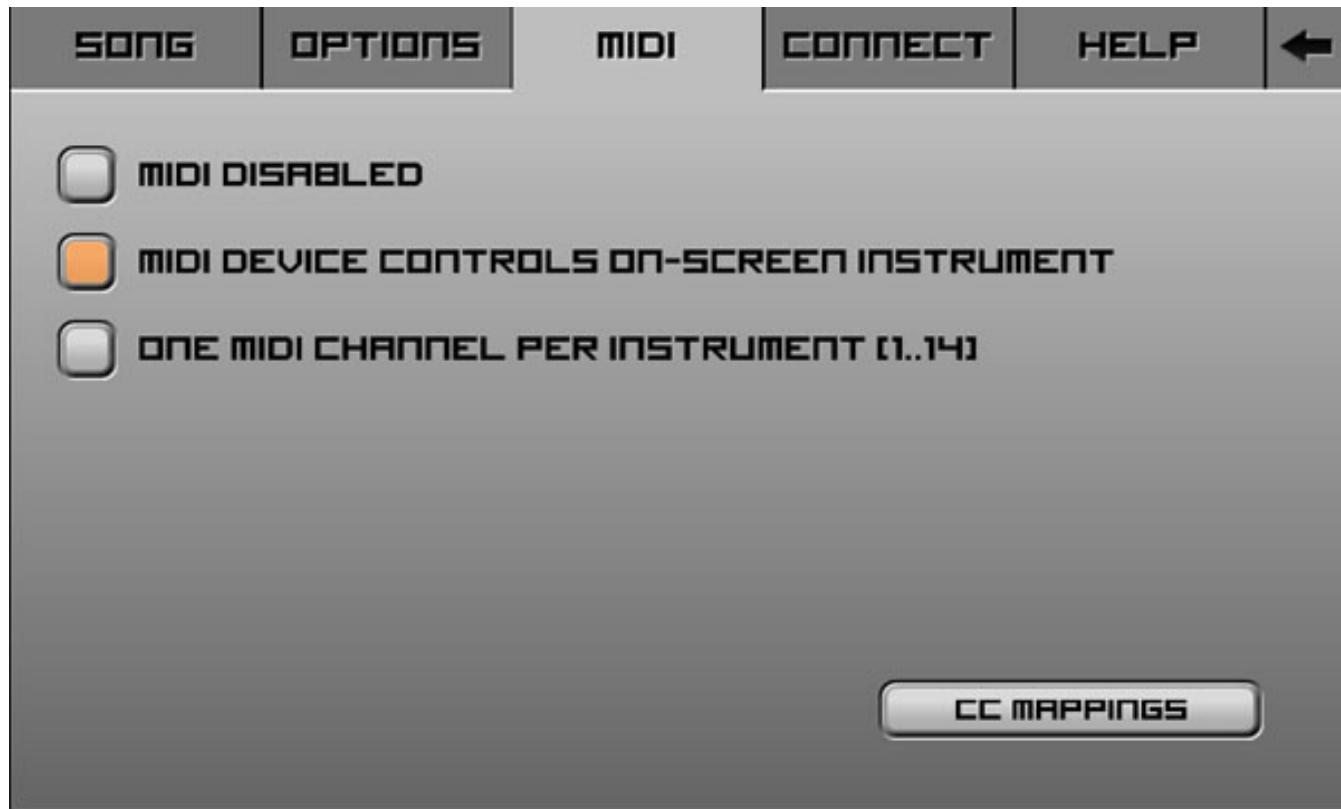
**Keyboard Key Size** - This sets the size of the keys in the preview keyboard displayed on each machine.

**Piano Roll Key Size** - This sets the size of the keys in the pattern editor and sequencer piano rolls.

**Control Panel Position** - This sets the placement of the control panel, either at the top or bottom of the screen.

**Advanced...** - This brings up a screen with options for advanced users.

## MIDI



**Disabled** - MIDI input device ignored.

**On-screen instrument** - MIDI input device will control the machine that's visible on screen (or at the top in portrait mode).

**One channel per instrument** - MIDI input device's channel (Ch.) assignment will determine which machine it controls. E.g.: Channel 1 = machine in slot 1, Channel 2 = machine in slot 2, etc.

**CC Mappings** - Brings up a screen where you can assign MIDI controls to controls in Caustic. This is also where you can set the pitch bend range. See the [what's new in 3.1 video](#) to see how this works.  
Using a MIDI controller in Caustic (Android Only)

(See demo video)

In order to use a MIDI device for input, you must be running Android OS v3.2 (Honeycomb MR2) or later **and have a device which supports USB host mode**. You will also need a USB MIDI controller that supports driver-less use on PC and a USB on-the-go cable to connect it.

When MIDI support is enabled (See below), start Caustic then connect the controller to your device. An Android popup should appear requesting permission for Caustic to access the USB device. Select "Allow" in order to use the controller with Caustic.

## Connect

[SONG](#)[OPTIONS](#)[MIDI](#)[CONNECT](#)[HELP](#)

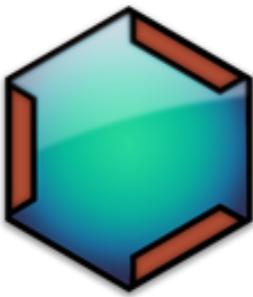
## FTP SERVER STARTED

**SERVER IP:****192.168.2.8****SERVER PORT:****3131****USERNAME:****CAUSTIC****PASSWORD:****CONNECT****STOP**

Caustic Connect allows you to remotely access your device's caustic documents (songs, presets and samples) via an external wireless connection on another device (eg. a computer or another mobile device). When started, Caustic Connect serves files using the FTP protocol and requires an FTP client to connect. A good, free FTP client for PC and Mac is [FileZilla](#) but any compatible FTP will work. For **read-only** access to your content from a web browser, enter the following URL in your browser's address bar:

**ftp://<ip\_address>:3131**. (Replace <ip\_address> with the address listed in the "server IP" field on your device and remember to separate the IP from the port number using a colon character : so in this example we would type:

**ftp://192.168.2.8:3131** and press enter. The browser should then ask to enter username and password and then present a page with the content of your device for downloading.

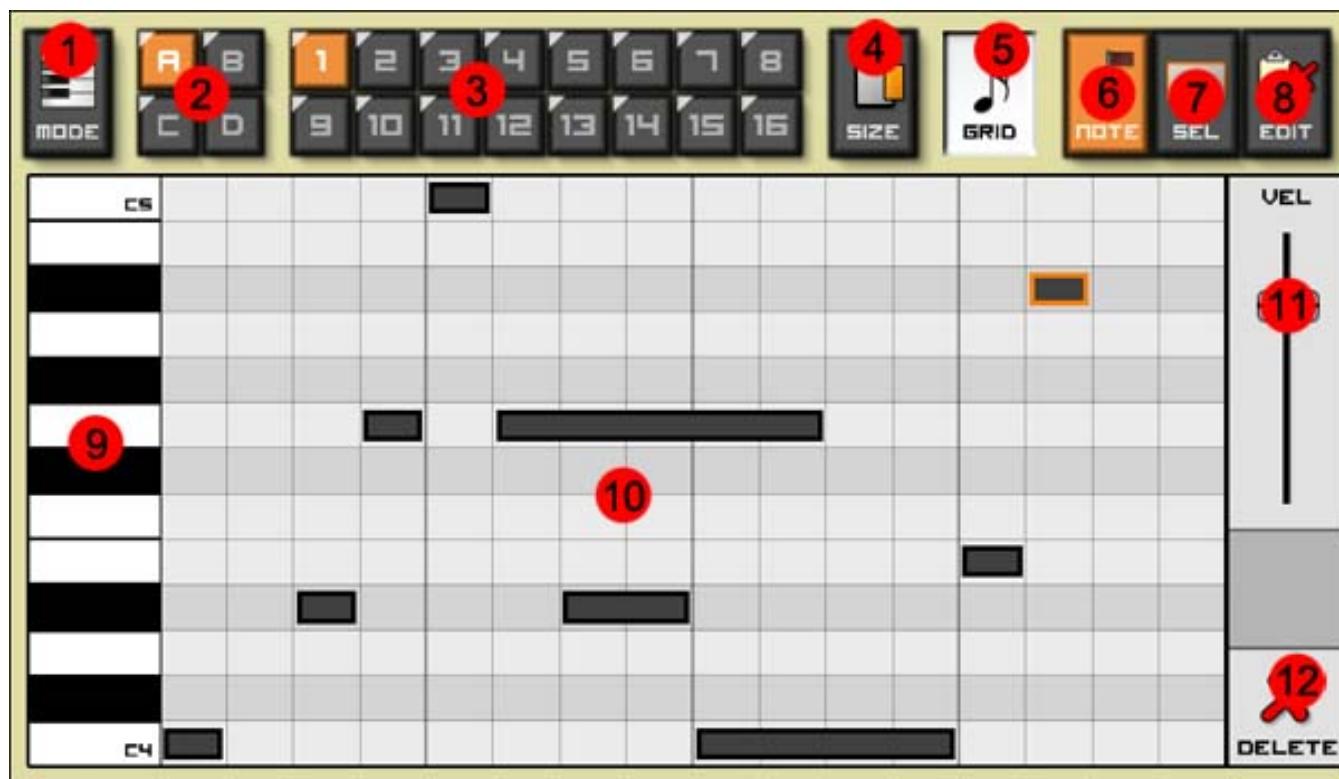


# CAUSTIC 3

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## Pattern Editor

This editor is used in all machines to create note patterns. The pattern is the basic building block for creating tracks in Caustic. Each pattern can span 1, 2, 4 or 8 measures and can contain notes from C1 to C8.



### Creating a pattern

Make sure the pattern editor is in piano roll mode using the **mode(1)** button. There should be a vertical piano on the left as shown above.

Select an empty pattern slot using **bank(2)** and **pattern(3)** buttons. By default, each pattern is 1 measure long. To grow a pattern, press the **grid(5)** button and select either 2, 4 or 8. To shrink it, press the **grid(5)** button and long press the new size (1, 2 or 4). When grid is pressed, a "Quantize" toggle will appear on the right. Turn Quantize off to record, move and stretch notes without snapping to the grid. To align notes to the selected grid size, select them then turn on Quantize.

To create a note trigger, touch inside the main **piano roll window(10)** at the desired note and time. The initial size of the note will depend on the grid size. Use the **grid(5)** button to toggle grid sizes. The default grid size is 16th notes but this can be extended up to 64th by selecting a smaller grid size.

Once placed, a note's length can be modified by selecting the **Size(4)** button and dragging the small handle which appears next to the selected note. New notes cannot be placed when the **Size** button is active. **Tip: to save time and avoid going in and out of selection mode when placing new notes, simply touch the size(4) button and hold it while dragging left or right to resize the note.**

To adjust the position of a note trigger, touch and drag it to the desired position. (Size button must **not** be active)

To scroll the piano roll up and down in octaves, touch and drag up/down in the **side keyboard(9)**. Hold a note in the side keyboard(9) to hear a preview of it in the linked machine.

If the pattern spans more than one measure or the grid is zoomed in past 16th notes, a horizontal scroll bar will appear to allow for quick navigation in the time axis.

To select a note trigger, simply touch it. Double-tap a note to quickly delete it. See below for selecting multiples notes.

The right-hand side panel will change depending on what mode is selected.

To edit the selected note's properties, press the **Note mode button (6)**. To change selected note velocity (volume), use the **velocity slider(11)** to adjust velocity from 5% to 100%. When the velocity slider is active, an indicator above the slider will show the current velocity value. The note trigger in the piano roll window will also reflect velocity by changing its opacity.

Some machines offer additional note options like accent and glide. Accent gives note triggers an extra volume boost and glide will bend between note values without re-triggering the volume envelope.

**Tip - Advanced Glide:** Only monophonic machines can glide (ex: bassline and modular) but setting the polyphony down to 1 on any synth which allows you to do so will enable glide notes. To control the length of a note glide, overlap the first note with the second note. The second note will still trigger at the correct time, but the synth will use the overlap portion of time as a duration for the glide between notes. See the [Advanced Glide tutorial](#) for examples.

To select multiple notes, press the **Select mode button (7)**. If a note is selected, pressing **Multi** will allow you to add and remove random notes by touching them. **All** selects all notes in the pattern, and **None** clears the selection. The number of selected notes will appear in the select button's selection icon.

To use lasso select, press the **Lasso** button then touch/drag to form a selection around the notes you wish to select. Lasso selection is reset after each selection so press it each time you wish to create a new selection. In case the pattern spans more than one measure, drag the selection to the edge of the screen and the pattern will automatically scroll.

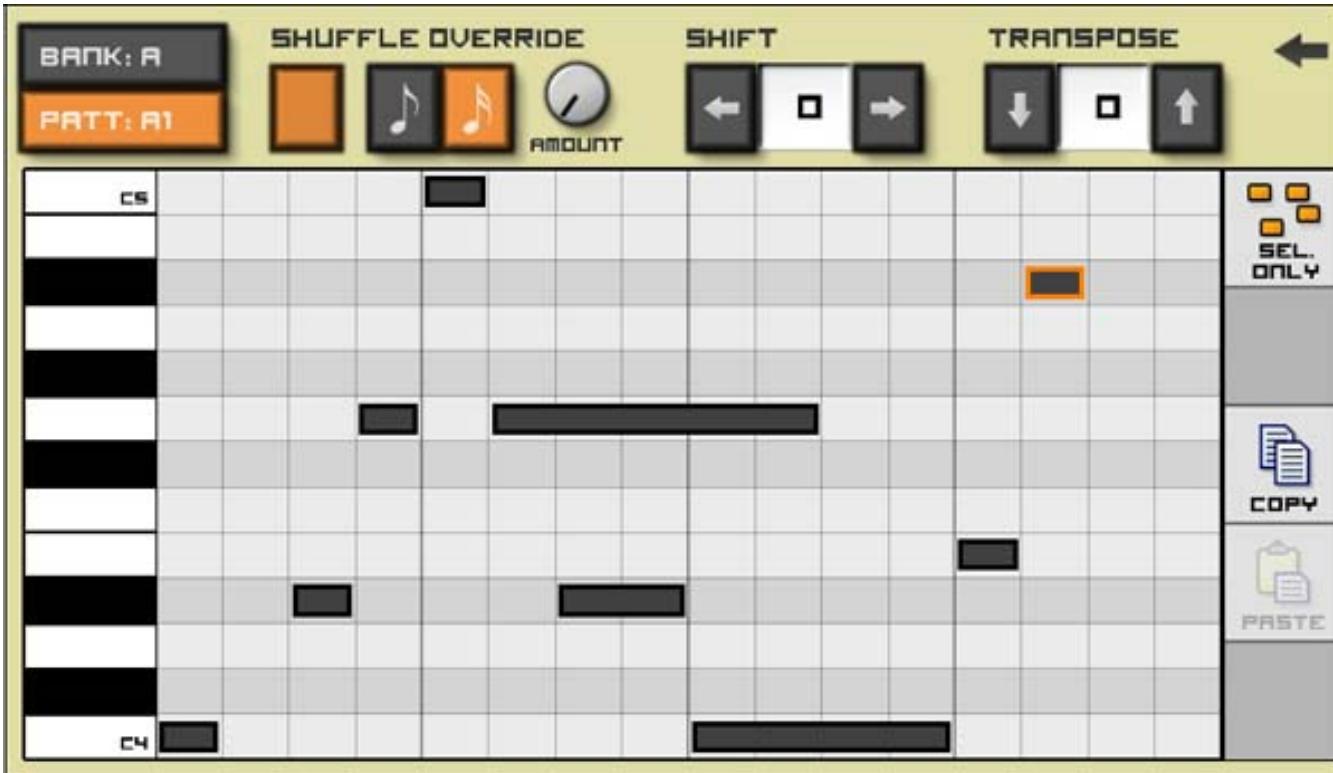
To use time select, press the **Time** button then drag to form a selection on the time grid for the notes you wish to select. Time selection is reset after each selection so press it each time you wish to create a new selection. In case the pattern spans more than one measure, drag the selection to the edge of the screen and the pattern will automatically scroll.

To copy or paste selected notes, press the **Edit mode button (8)**. The **Copy** button will place the selected notes into the app's clipboard. Notes can then be pasted into the same pattern, another pattern, or another machine's pattern (if the notes are within that machine's range) using the **Paste** button. When copying into the same pattern, a paste destination cursor will appear at a value rounded up by one beat. The paste destination cursor can be moved by dragging the lower arrow handle or removed by pressing the upper "X" button. Newly pasted notes can be dragged to move them to a new position. In case the pattern spans more than one measure, dragging the selected notes to the edge of the screen will cause the pattern to scroll automatically.

To remove selected note triggers, select them using one of the selection tools, then press the **Delete (X) button (12)** in the lower-right corner. To quickly remove a single note trigger, double-tap it.

To undo or redo past actions, use the Undo and Redo buttons.

## Pattern Options



Long-pressing a pattern selection button(3 above) will bring up advanced pattern options for that pattern. From here, it is possible to override the global song shuffle, shift notes in time as well as transposing notes. By default, all notes are moved when shift or transpose operations are performed. To only affect selected notes, use the "Sel. Only" toggle on the right.

To copy an entire pattern (Notes + automation curves), press the Copy button in the advanced pattern options menu. The pattern content can then by pasted into another pattern (or another machine's pattern) by bring up advanced pattern options in the destination pattern and pressing **Paste**.

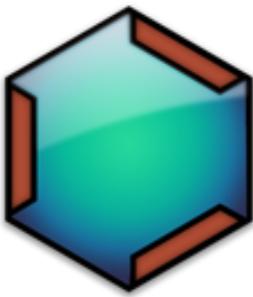
## Automation Editor View



The automation view can be used to modify or create automation data for controls which are tied to the selected pattern. First, automate the control for pattern mode as described in the [automation section](#). Select the desired automated control from the list on the left. Once selected, the control automation data will appear as a set of bars. There is one bar for each 32nd note time division. To set a bar's value touch inside the curve view at the desired time. The Size button can be used to gain finer control over touch areas. Multiple bars can be selected using the different selection modes.

Bar values can be pasted inside the pattern as well as shared between controls and will retain relative values between them.

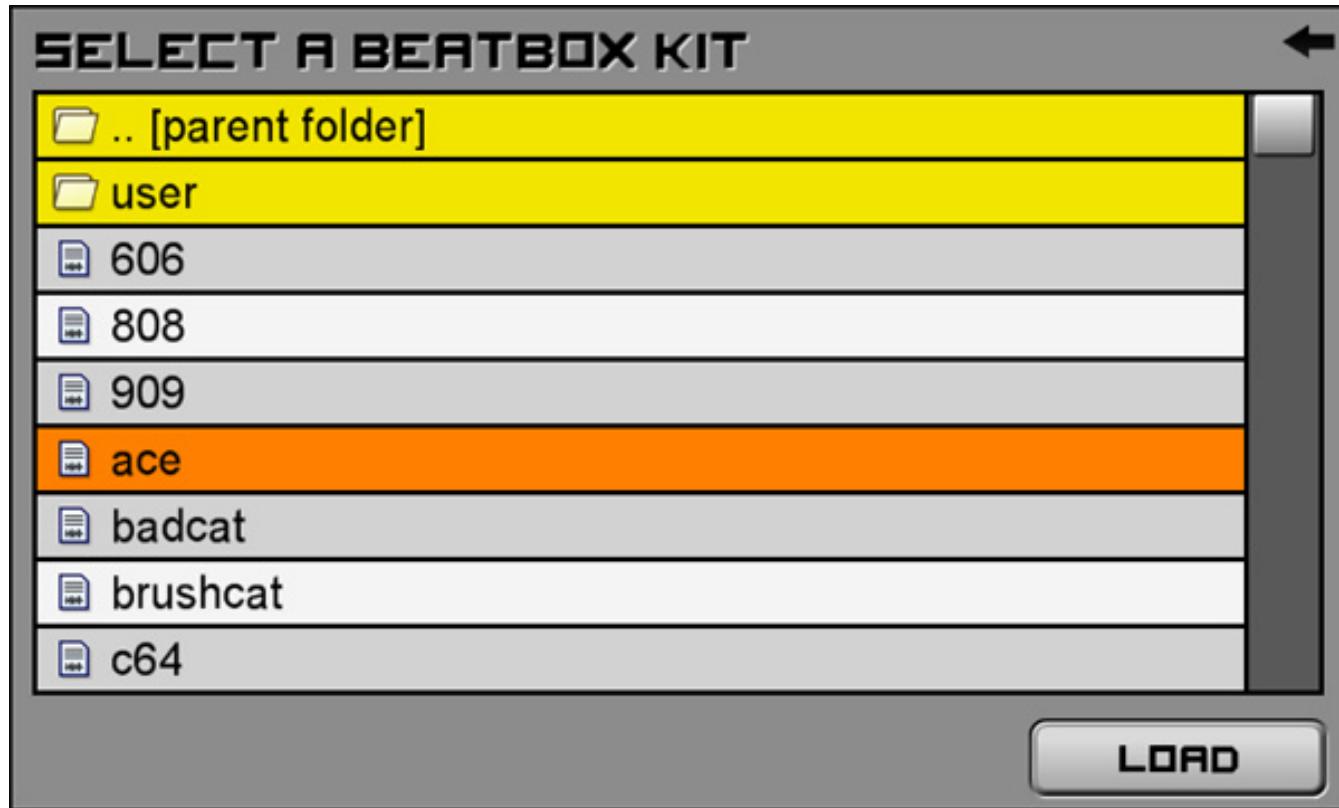
On playback, pattern automation will move the automated control following the bar values. A Smoothing knob at the top controls the rate at which the control is allowed to change. For rapid changes like trance gates, set the smoothing to 0. To avoid rapid changes on filter cutoff for example, set smoothing to higher. Use the visual feedback from the knob as well as the auditory result to determine the correct smoothing amount for the desired effect.



# CAUSTIC 3

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## File Browser



This screen is used to select a file from a list of files available on your storage. The type of files listed is set by the machine that launched it to ensure all files shown can be loaded.

The large middle windows shows a list of files and folders. Folders are marked as yellow. Selecting a folder will drill into that folder and list the files present there. The special ".." folder represents the parent folder to the current one. Pressing this will go up to the parent folder and list the files present there.

To navigate the list, touch/drag inside the list to scroll, or drag the scroll cursor on the right-hand side for quicker movement.

Some file types can be previewed and will offer a **Preview** button to do so. Press the button to hear the file played.  
*Tip: Long-press the preview button to have the file automatically preview as you select it in the list.*

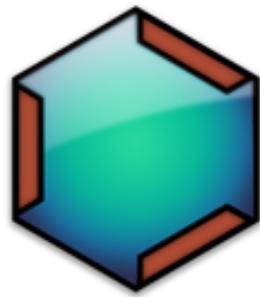
The **Get More...** button (Android Only) in the bottom left-hand corner will launch a market search for content packs compatible with Caustic. New 3rd-party content is added regularly so it's good to check often. Note that anyone can offer content for Caustic and the responsibility is left up to the user when downloading content packs. SingleCellSoftware does not directly endorse or support any 3rd-party content.

When you have selected the file you want to load, double-tap it or press the **Load** button.

For basic file management, long-press any file and a popup will appear offering a few different file operations.



Files can be cut, copied, renamed and deleted here. Confirmation is required for deletion and only single files and empty folders can be deleted. New folders can be created by long-pressing on any file inside the destination folder. Same for pasting, the copied file will be placed inside the same directory as the file selected via long-press. Approximate file size is also displayed at the top.



# CAUSTIC 3

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## Custom Waveform Editor



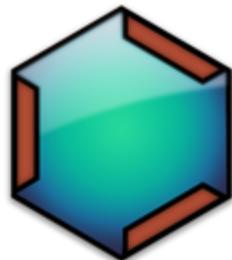
This editor lets you draw your own waveform for use in an oscillator. To draw a waveform, touch and draw inside the main window, the display will update in real-time. You can preview the sound of your waveform (combined with any other oscillators and filters in your subsynth) by pressing the preview keyboard at the bottom.

To start from one of the basic waveforms, touch the icon for the desired waveform at the top of the window. The display will reset to this waveform and can be edited from there. To start from the other waveform (Osc1's custom waveform in the case of Osc2 and Osc2's custom waveform in the case of Osc1), press the pencil icon with a number above it. A single-cycle WAV file can also be loaded by pressing the small file icon, this will bring up a file browser to select a WAV file. Note that this is intended for small, **single cycle** waveforms so large WAV files will not load.

You can apply noise to the waveform by pressing the **Apply** button inside the **Noise** group box. Use the **Density** and **Amount** knobs to respectively control the distribution and amplitude of the noise. Pressing the **Apply** button multiple times (or holding it) will continue to add noise.

You can smooth out your waveform by pressing the **Apply** button inside the **Smoothing** group box. Use the **Amount** knob to control the amount of smoothing applied on each pass. Pressing the **Apply** button multiple times (or holding it) will continue to smooth out the waveform..

When you are satisfied with the waveform, press the back arrow to return to the machine that launched the editor.



# CRUSTIC 3

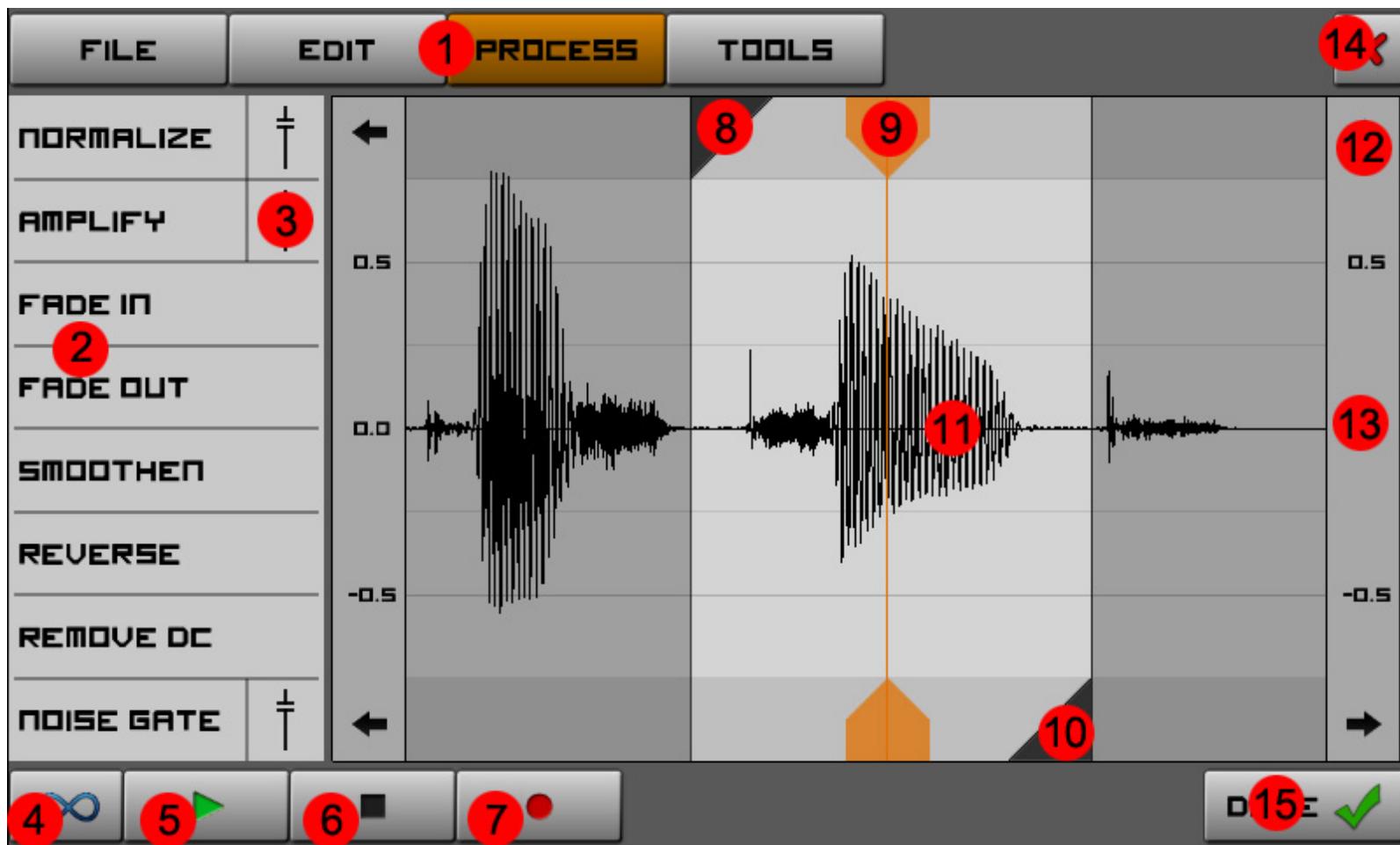
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## Sample (WAV) editor

### Description

The sample editor is a tool which can be used to record sounds or edit existing sounds. It is launched as part of a machine which uses samples internally ([PCMSynth](#), [BeatBox](#) or [Vocoder](#)).

### UI Reference



1. **Main menu:** Determines the operations offered in the sub-menu(2). Press the selected main menu item again to hide the sub-menu(2)
2. **Sub-Menu:** Shows various operations which can be performed depending on which main menu(1) item is selected. To apply an operation in the sub-menu, tap once on its entry. (see below for explanations of each entry)
3. **Extended Parameter button:** Certain operations have an configuration parameter which determines its effect. Pressing this button will display a slider which can be used to adjust the parameter. Press the red "X" button to cancel and hide the slider, press the green checkmark to confirm the operation.
4. **Loop Toggle button:** When enabled, playback will resume automatically once the play cursor reaches the end of the selection.
5. **Play button:** Starts audio playback on the selected sample portion.
6. **Stop button:** Stop audio playback.
7. **Record button:** Shows a microphone popup where audio recording can be triggered. Note that recorded sample data replaces the entire content of the sample with the recorded content and the operation cannot be undone.
8. **Selection start cursor:** This determines the start point of the selection for future sample operations. To place this cursor touch anywhere inside the upper light gray area (8) above the waveform view (11) and drag.
9. **Edit cursor:** This determines where sample data will get pasted as part of the Edit, Paste and Paste Mix operations. To place this cursor drag either the upper or lower orange gripper box (9) to the desired location.

10. **Selection end cursor:** This determines the start point of the selection for future sample operations. To place this cursor touch anywhere inside the lower light gray area (9) below the waveform view (11) and drag.
11. **Waveform view:** Displays the sample data for the loaded waveform. Touch and drag inside this area to pan the sample, pinch to zoom in or out and double-tap to reset zoom and cursors to their defaults. Once zoomed in far enough, orange boxes will appear, allowing the user to directly manipulate individual sample points.
12. **Snap buttons:** In each corner of the Waveform view (11), there are arrows.
  - Touching the **top-left** arrow will move the Start cursor to the **previous** zero-crossing in the signal.
  - Touching the top-right arrow will move the Start cursor to the **next** zero-crossing in the signal.
  - Touching the **top-left** arrow will move the End cursor to the **previous** zero-crossing in the signal.
  - Touching the top-right arrow will move the End cursor to the **next** zero-crossing in the signal.
13. **Amplitude ruler:** Shows how signal amplitude relates vertically.
14. **Cancel button:** Exits the sample editor *without* using any of the modifications made within the sample editor session.
15. **Done (confirm) button:** Exits the sample editor and tell the launching machine to update its sample data to the result of the edited sample.

## Menus

## File

---

**Load:** Brings up a [file browser](#) which you can use to select a WAV file to load into your sample editor.

**Rename:** This lets you change the name or label associated with this sample in the machine that launched it.

**Save As:** Lets you save out this sample as a new WAV file or overwrite an existing WAV file.

**Save Sel.:** Lets you save only the selected portion of the sample out to a WAV file.

**Info:** Displays information about the sample. (file name, duration, bit depth and sampling rate)

## Edit

---

**Undo (redo):** Reverts (or re-does) the last action performed in the sample editor.

**Remove:** Deletes the selection portion of the sample and joins up the remaining sample on both sides.

**Cut:** Same as remove (above) but places the deleted portion into the clipboard for pasting later.

**Copy:** Place the selected portion of sample into the clipboard without affecting the existing sample.

**Paste:** Inserts the content of the editor clipboard at the point marked by the edit (orange) cursor. This moves any sample content following the edit cursor to *after* the inserted sample data.

**Paste Mix:** Mixes the content of the editor clipboard with the waveform at the point marked by the edit (orange) cursor. This doesn't move the existing sample content but rather combines it with the clipboard content.

**Crop:** Trims the sample to *only* include the portion which is selected (deletes everything before and after the selection).

**Mute:** Replaces the selected sample portion with silence.

## Process

---

**Normalize:** This operation analyzes the select sample portion, finds the maximum value, then rescales (amplifies up or down) the selected portion so that the maximum value lines up with the normalization threshold. To set the threshold value, press the extended parameter button (3) and adjust the slider. An orange horizontal line will show you the threshold and how it relates to the sample loaded. Press the green checkmark to confirm the threshold and apply the normalization. To quickly normalize without changing the threshold, simple press Normalize without extending the parameter slider.

**Amplify:** This operation rescales the selected portion of the sample based on the amplification level set using the extended parameter slider (3). While adjusting the amplitude slider, an orange overlay will show an approximation of the signal level at the current amp level. Note that all signal is shown in orange but only the selected portion will have amplification applied upon confirmation (green checkmark)

**Fade In:** Modifies the selected portion of signal by starting from silence and ramping linearly to the original volume over the duration of the selection. Repeating the fade over the same selection will produce more exponential results.

**Fade Out:** Modifies the selected portion of signal by starting from the original volume and ramping linearly to silence over the duration of the selection. Repeating the fade over the same selection will produce more exponential results.

**Smoothen:** Interpolates linearly between the two outer-most sample points of the current selection. This can be used to fill in an error in the audio clip and should only be used over a few points.

**Reverse:** Flips the selected portion of the sample so that it plays backwards. Reversing again brings it back to normal playback direction.

**Remove DC:** This operation analyzes the selected portion of the sample, establishes average value (Direct Current component), then subtracts this average value from the selection. Can be used to remove a vertical shift over the length of a sample so that subsequent amplification operations don't further push it towards one end. If there is no DC in the signal, this operation will not affect the signal.

**Noise Gate:** This operation analyzes the selected sample portion and silences out any portion of audio that falls below the noise threshold. To set the noise threshold, press the extended parameter button (3) next to the noise gate and adjust the slider. An orange horizontal line will show you the threshold and how it relates to the sample loaded. Press the green checkmark to confirm the threshold and apply the noise gate. To quickly apply a noise gate without changing the threshold, simple press Noise Gate without extending the parameter slider.

## Tools

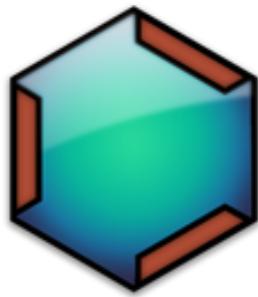
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**Spectrum:** Display a spectral (frequency) plot of the selected sample portion. Press any upper menu button to return to normal time/selection view.

**Find Root (PCMSynth only):** This tool analyzes the selected sample portion and tries to correlate its dominant frequency with a note on the keyboard. Once the operation is successful and the sample confirmed by pressing Done(15), the PCMSynth will automatically load the root note into the selected sample slot's "root note" value

**Load Loop (PCMSynth only):** This operation sets the start / end selection points based on the loop points established in the PCMSynth's [Loop Point Editor](#) for that sample slot. This can be useful for trimming unused portions of a sample to save memory.

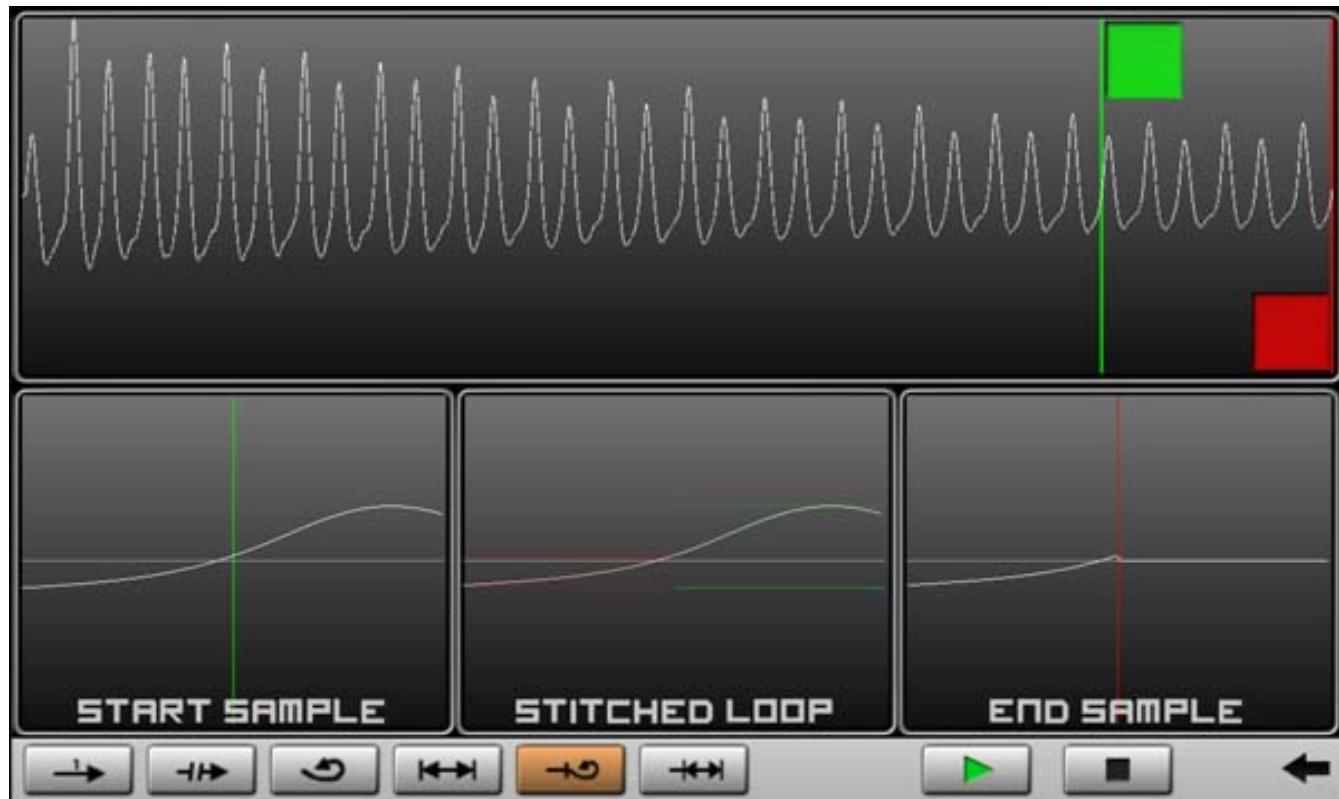
**Vocality (Android only):** This launches the [Vocality app](#) and gathers the output result into the sample area. While Vocality was developed by a Caustic user, it is not a SingleCellSoftware product so any support issues or queries should be directed to [PolynomialC](#) instead.



# CAUSTIC 3

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## Loop Point Editor



This editor lets you fine-tune the loop points in a sample for use in the [PCMSynth](#).

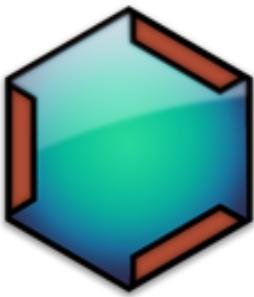
The large topmost window shows a full view of the waveform while the bottom corner windows show zoomed views at the start and end points respectively. The bottom-middle view is a stitched preview to help line up your waveform for looping. It also contains min/max level indicators which help choose a loop point that wont "pop".

Use the **Play** and **Stop** buttons at the bottom to start/stop the sample's playback. The playback mode can be changed using the lower left set of buttons.

Drag the green cursor in the top window to coarse-tune the position of the loop's start point. Drag the red cursor in the top window to coarse-tune the position of the loop's end point.

To fine-tune the loop points, touch and drag in each of the bottom corner windows to find a suitable loop point, using the bottom-middle preview as a guide. For a loop with no pops, choose a set of loop points where the preview window shows no discontinuities between the two sides of the waveform and has very little differences in level indicators (as shown in the example above).

When you are satisfied with the loop points, press the back arrow in the lower-right corner to return to the machine that launched the editor.



# CAUSTIC 3

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## BeatBox Kit Settings

This screen is used to create mute groups and to allow editing of each of the beatbox's samples.

### KIT SETTINGS



#### MUTE GROUPS

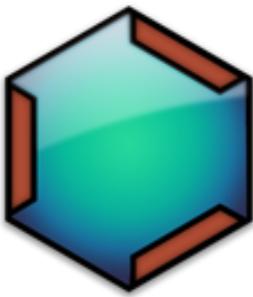
CHANNEL	1	2	3	4
BD BRUSH 2				
SN BRUSH6		■		
SN BRUSH3		■		
SWEEPSNARE				
HHP PEDAL				
TOM BRUSH MEDIO 2				
TOM BRUSH BASSO 3				
RIDE BRUSH 1				

### Edit samples

To edit a sample, touch the waveform icon next to its name. This will launch the [sample editor](#).

### Mute groups

Mute groups are used to cut out one channel when another channels starts playing. This is classically used on HiHats where it is impossible for an open hat to sound at the same time as a closed hat. There are 4 independent mute groups, which can contain any number of channels. Every time a channel starts playing it will mute out all channels which share the same mute group.



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## MIDI Import

Track name	Notes	Mapped machine	
melody - tenor sax	266	PCM SAX	Aa
electric piano	851	not mapped	
lead guitar	859	not mapped	
rhythm guitar	837	not mapped	
rock organ	1836	not mapped	
drawbar organ	380	not mapped	
bass guitar	1292	not mapped	
BassDrum(C1)	9289	not mapped	

**IMPORT**

MIDI (.mid) files can be imported into Caustic's song sequencer. After selecting a MIDI file, you need to map each MIDI instrument to a machine in your rack. Touching inside the area marked "not mapped" or any of the already mapped machines will bring you to the Machine Management screen where you can add a new machine or select one of your existing machines for mapping. Once selected, the machine can be quickly renamed in the MIDI import screen by pressing the "Aa" button next to the selected instrument track.

Multiple MIDI tracks can be assigned to the same machine and there is no requirement to map all MIDI tracks. Imported note events will be placed in the sequencer pianoroll for each instrument. (MIDI import does not create patterns). The import operation is additive so you should start from a blank song if that is your intention. Multiple passes using the same MIDI file are also possible because of this. For drums, it recommended to use a PCMSynth as the imported notes will likely lie outside the limited range of the BeatBox machine. A special GM drumset PCMSynth preset is available which has standard MIDI mappings for basic drums.