

# **SPIRE**

## REASON RACK EXTENSION

### User Manual



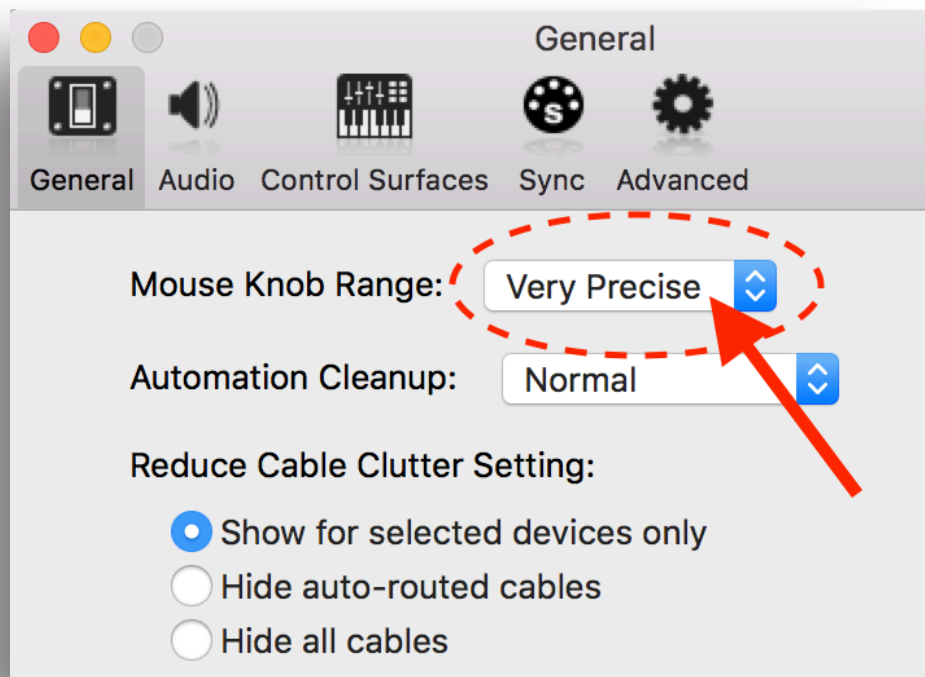
## Introduction

Founded in 2009 by musicians and programmers, Reveal Sound had the intention of creating first-class audio software. The purpose of our company is to prove that soft-synths can sound amazing. We are constantly improving our algorithms to achieve the perfect result. ReSpire is a Rack Extension polyphonic synthesizer that combines powerful sound engine and flexible modulation architecture. ReSpire embodies the best of both software and hardware synthesizers. This guide will show you how to use the ReSpire.

## Usage tips

Use shift + mouse left click on a knob or slider to fine adjust values.

We recommend that you set the Mouse Knob Range parameter to Very Precise in the Reason settings. **Reason Preferences / General / Mouse Knob Range: Very Precise.**



Use Cmd/Ctrl + mouse left click on a knob or slider to set default position.

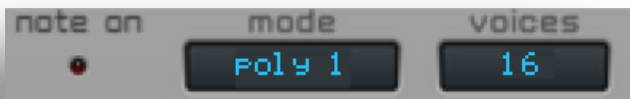
## Preset Manager



Pressing the up and down buttons cycles through the presets.

Clicking on the current preset name opens a drop down menu which displays all the presets in the current folder.

## Polyphonic modes



**Mono 1** – mono mode.

The pitch glides up to the selected note instead of starting immediately on the pressed note. (Portamento).

Envelopes are retriggered on each new note.

**Mono 2** – mono mode.

When two notes are held down at the same time the pitch glides to the last pressed note (Legato).

Envelopes are retriggered on each new note.

**Mono 3** – mono mode.

The pitch glides up to the selected note instead of starting immediately on the pressed note. (Portamento).

Envelopes are triggered when a note is first pressed and only retriggered when the note has been released and a new note is pressed.  
notes.

**Mono 4** – mono mode.

When two notes are held down at the same time the pitch glides to the last pressed note (Legato).

Envelopes are triggered when a note is first pressed and only retriggered when the note has been released and a new note is pressed.

**Poly 1** – polyphonic mode.

The pitch glides up to the selected note instead of starting immediately on the pressed note (Portamento).

**Poly 2** – polyphonic mode.

When two notes are held down at the same time the pitch glides to the last pressed note (Legato).

**Voices** – set the number of voices for the polyphonic modes.

## Oscillators

ReSpire features 4 completely identical oscillators.



## Mixer

Use the knobs labelled **OSC1**, **OSC2**, **OSC3**, **OSC4** to adjust the volume of each oscillator. When the knob is set all the way to the left the oscillator is completely shut off and the LED light immediately to the left is unlit. Knob position within a 1-30 (yellow LED)

Knob values between 1 - 30 (as indicated by a yellow LED light) add the oscillator into the rendering but pass no sound. This is useful when you are only want to use an oscillator as a modulator.

## Oscillator



**OSC1, OSC2, OSC3, OSC4** – Switches between individual oscillators.

**Note, Octave, Fine** knobs set the pitch of the oscillator.

**CtrlA, CtrlB** – multifunctional knobs, their tasks change depending on the oscillator mode. Each oscillator has four available modes: Classic, Noise, FM, AMSync and SawPWM.

**Phase** – controls the position of the phase. Selecting a value between 0 – 29 means the oscillator will be “free-running” or “random”, in whichever “**ANA**” mode activated or not, respectively.



Selecting a value between 30 – 1000 will make the oscillator restart its phase at the position shown on the display.

**Wave + WT Mix** – select any of the 49 available waveforms and mixes it with the signal at a level set by the ‘WT Mix’.

## "Classic" Mode

In this mode, you can crossfade between a saw and a square waveform (the square can have its pulse width adjusted) and mix this with the wavetable waveforms.

**CtrlA** – crossfades the signal between Saw and Square (Pulse).

**CtrlB** – controls the width of the Pulse. In addition, this knob allows you to change the Waveform’s starting point (not the same as the Phase knob), expanding the palette of the sounds that can be created.

## "Noise" Mode

Noise generation that can be shaped by filters.

**CtrlA** – controls the filter cutoff frequency. Values between 0 – 500 engage the Low-Pass filter while values between 501 – 1000 engage the High-Pass filter.

**CtrlB** – controls the filter Resonance.

Enabling **KEY** follow mode means the cutoff frequency corresponds to the note’s frequency.



## "FM" Mode

Frequency modulation mode.

This uses the same phase modulation mode that was in the DX7 synthesizer.

You can modulate any waveform from the Wave list. The modulator signal is a Sine wave.

**CtrlA** – modulation intensity.

**CtrlB** – modulation frequency.

The WT MIX knob allows you to mix in a copy of the selected wave with its pitch corresponding to the frequency modulator’s pitch.

## "AMSync" Mode

This combines oscillator sync with amplitude modulation.

**CtrlA** – crossfades the signal between Saw and Square (Pulse).

**CtrlB** – modulation frequency.

## "SawPWM" Mode

Sawtooth Pulse Width Modulation

**CtrlA** – switches SawPW waveform between 4 different types.

**CtrlB** – controls the width of the Pulse. In addition, this knob allows you to change the Waveform’s starting point (not the same as the Phase knob), expanding the palette of the sounds that can be created.

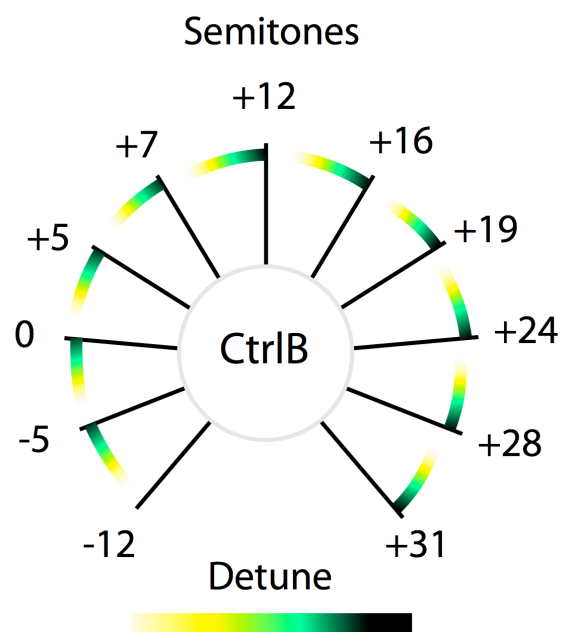
## "HardFM" Mode

It is a phase modulation mode. **HardFM** mode uses integrated solutions to create more expressive sound, which becomes saturated with a lot of harmonics and wide range of timbres. You can modulate any wave from "**Wave**" list. Selected wave acts as the source and the modulator at the same time.

**CtrlA** - Intensity of the modulation.

**CtrlB** - Frequency of modulator's note. It acts in a stepwise manner, as shown in the diagram. Steps have their area of detuning.

**WT Mix** - Slowly morphs (transforms) the current wave into the next wave from "**Wave**" list, which has a frequency of the note lower by the one octave (a kind of sub-oscillator).



## "Vowel" Mode

Vowel sounds simulation mode.

**CtrlA** - Morphing of the vowel phoneme: "A" - "E" - "I" - "O" - "U"

**CtrlB** - The frequency of the formant, the character of the voice differs from the super-low to the super-high.

## Unison



ReSpire has a very powerful unison with several advanced settings.

Each oscillator can have its own unison. Choose the number of voices (up to 9), its spread and one of the following modes:

**1, 2, 3 Octaves; Major 3rd; Minor 3rd; Major 7th; Dominant 7th; Minor-Major 7th; Minor 7th; Minor 9th; Major 9th; Dominant 9th; Half-Diminished 7th; Diminished 7th; Suspended 2; Suspended 4; Perfect 5th; Perfect 4th.**

**Detune** – detunes the voices.

**Density** – this is a unique parameter. This allows you to detune the voices in an irregular way. experiment with it to achieve unique unison sounds.

- You can simulate a "Supersaw" - turn the Density knob to the far right and set the unison to 7 voices (using 9 voices makes the sound more dense and delicious!).
- Simulate a "Hypersaw" by turning the Density knob to the center (double mouse click). **ANA** button must be turned **off** (oscillator starts with a random phase position).



All other Density positions result in a unique grouping of voices.

Also, by changing the number of voices, their spread and their pitch distribution you can achieve quite unusual results. The results are interesting, try experimenting with it!

## Signal control and settings



**ANA** – switches between phase behavior:

- Enabled - the oscillator is “free-running” (as in analog synthesizers).
- Disabled - the oscillator starts with a random phase position.

**Wide** – distributes unison voices throughout the stereo field.

**Pan** – controls the panning position of the sound.

**Filter input** – determines the amount of sound that’s sent into each filter, the middle position passes an equal amount of sound through both filters.

**INV** – inverts the oscillator’s output.

**KEY** (key tracking) – if enabled the oscillator tracks its pitch depending on the note pressed. If not enabled the pitch does not follow the notes pressed.

## Filters



There are two filters. Both can be set to different modes independently. Each mode has different filter types. The filters can be routed in parallel or serial.

**Cut 1,2** – cutoff frequency.

**Res 1,2** – resonance amount.

These are the filter modes and their respective types:

- **Perfecto** a unique algorithm that combines the best characteristics of analog and digital filter types. Great for a broad spectrum of sounds. Modes: **LP4, BP4, HP4, Peak**
- **Acido** type does not repeat at 100%, but good for simulating TB-303 sounds and not only. Modes: **LP1, LP2, LP3, LP4**
- **Infecto** type does not repeat at 100%, but simulates the filter sound of a Virus TI synthesizer. Modes: **LP2, BP2, HP2, Notch**
- **Scorpio** another unique algorithm by our team that combines the best characteristics of analog and digital filter types. Great for a broad spectrum of sounds. Modes: **RedLP2, RedLP4, BlackLP2, BlackLP4, BlackHP, BlackBP**
- **Combo** filter consists of a series of regularly spaced spikes, giving the appearance of a comb. Modes: **Mono +, Mono -, Stereo +, Stereo -**.
- **Shaper** - Filter + distortion/overload. Available modes: **Saturator, Foldback**.  
**Cut 1, Cut 2** - Cutoff frequency of the filter. Values between 0 and 500 act as a **Low-Pass** filter, values between 501-1000 act as a **High-Pass** filter.  
**Res 1, Res 2** - The intensity of distortion (similar to **Drive**)

**Keytrack** – when enabled the filter cutoff frequency follows the midi note, both in positive or negative values.

**Filter Balance** – this controls the filters balance. If the knob at zero you hear the first filter, when the knob in the middle, you can hear both, and when the knob in the right position, you will hear only the second filter.

**LINK** – when enabled both filter's cutoffs are linked. If enabled, set the second filter's cutoff to the middle position and it will follow the first filter cutoff. When the second filter is set to positions other than center the cutoff frequency will be offset to a higher or lower value than the first filter cutoff.

**PAR** – switches between parallel or serial filter modes. When the button active the filter is in parallel mode, when the button is inactive the filter is in serial mode.

## Setting filters in serial mode:

1. Make sure that both filters are used.
2. PAR button should be disable.
3. Filter Input set to the far left position (this passes the signal through the first filter only).
4. Set the Balance to the far right position (only the second filter is audible).

## Setting filters in parallel mode:

1. Make sure that both filters are in use.
2. PAR button should be enable.
3. Filter Input set to the center position (passes the signal to both filters).
4. Set the Balance to the center position (both filters are audible).

# Modulators

The modulation section consists of

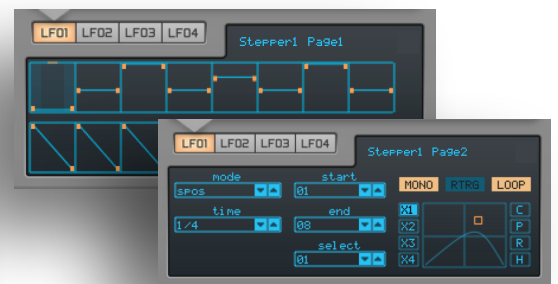
4x Envelopes



4x LFOs



2x Steppers



Macro Control

Matrix



PitchWheel ModWheel



# Envelope



**ENV1, ENV2, ENV3, ENV4** – switches between envelopes.

**ATT** (Attack) – time it takes the envelope to rise from 0 to 1000.

**DEC** (Decay) – time it takes the envelope to fall from the attack level to sustain level.

**SUS** (Sustain) – the level the sound sustains at after the decay envelope has ended.

**SLT** (Slope Time) – time it takes the envelope to fall from the sustain level to the slope level.

**SLL** (Slope Level) – the level the sound sustains at after the sustain envelope has ended.

**REL** (Release) – time it takes the envelope to drop to 0 after the note has been released.

You can choose the curve type for each envelope stage by clicking on the graphic display:

**ATT** – Lin, Exp, Pow.

**DEC** – Exp1, Exp2, Pow.

**SLT** – Lin, Exp, Pow.

**REL** – Exp1, Exp2, Pow.

To the right of the sliders are controls for linking the envelopes to sound sources and adjusting their velocity sensitivity:

**AMT 1+2** (Amount) – the intensity of the envelope on its respective sound source.

**VEL 1+2** (Velocity) – the intensity of velocity sensitivity which determines the strength of the envelope.

**! Note: Envelope 1 controls the output amplitude of the all 4 Oscillators.**

*In order to assign, for example, the second envelope to the amplitude of the second oscillator, set the volume of OSC2 to 30 (the minimum audible value). Then in envelope 2 assign one of the modulation sources to Osc2 Amp (OscMixer) and adjust the amount.*

# LFO



**Rate** – LFO rate.

**SYNC** – LFO rate is synchronized with the host's tempo.

**Time** – sets the time synchronization when SYNC is activated.

**Sym** (Symmetry) – shifts the LFO signal upwards or downwards.

**Phase** – controls the position of the phase. Selecting a value between 0 – 29 means the phase will be “free-running”. Selecting a value between 30 – 1000 will make the phase restart at the position shown on the display.

**Form** (dropdown menu) – select a waveform for the LFO.

**Form** (slider) – transforms the shape of the waveform.

**Amp** (Amplitude) – amplitude level of the LFO.

**MONO** – switches monaural LFO mode off / on.

**Fade in** – gradually fades in the LFO amplitude level. To adjust the fade in, hold the mouse down on the LFO display and drag up or down.

**Amt 1+2** (Amount) – the intensity of the LFO on its respective sound source.

**Vel 1+2** (Velocity) – the intensity of velocity sensitivity which determines the strength of the LFO.

# Stepper



Stepper is an advanced step sequencer with a flexible waveform editor. For each step, you can assign a unique waveform. The individual waveforms combine to form sequences that range from simple to intricate patterns.

Each step is divided into three zones: the “Start” **(1)**, the “Center” **(2)** and the “End” **(3)** with its own editor **(4)**. Editing is done by holding the mouse on the display and moving it.

**Free Time** – sets modulation rate.

**Time** – sets the synchronization rate.

**Mode** – synchronization mode:

- **Free** – the position and speed of the step sequencer are “free-running”.
- **Sync** – the step sequencer’s speed is synchronized.
- **Spos** – the step sequencer’s speed and position are synchronized.

**Start** – loop start position.

**End** – loop end position.

**Select** – Selecting an edit step (only 16 steps are available)

**MONO** – switches monaural LFO mode off / on.

**RTRG** – retriggers the step sequencer when a new midi note is triggered.

**LOOP** – on / off of the loop mode.

For example, if the loop mode is set to retrigger, the loop mode is engaged, 'start' is set to **4** and 'end' is set to **6** the stepper will start from step **1** and then enter the loop once its reached step **4**.

**1-2-3 “4-5-6” “4-5-6” “4-5-6”...**

If you choose the same settings but Retrigger is turned off, the stepper will play directly from the start of the loop. **“4-5-6” “4-5-6” “4-5-6”...** It will NOT begin at step **1**.

**X1, X2, X3, X4** – amount of time divisions in each step.

**C** – copy settings from the selected step.

**P** – paste settings from the clipboard to the selected step.

**R** – reverses the selected step.

**H** – switches the editing mode between curve or rectangular.

## Matrix



The matrix consists of 15 slots, each of which have 2 sources and 4 targets. Potential sources include: oscillators, LFO, envelopes, steppers, MIDI signals and MIDI controllers. Almost every parameter can be modulated in ReSpire! This allows for virtually unlimited signal routing possibilities!

**Sources 1,2** – modulation sources.

**Trg 1,2,3,4** – modulation targets.

**Select Slot** – selects the slot for editing.

## Macro Control

The Macro control consists of 4 modulation knobs, each of which can be modulated, also be a source of modulation.



## Drift, Portamento, Pitch Bender, Global Transpose



**DRIFT** – Toggles the drift function on / off. When enabled this randomly changes the pitch within a range of +/-3 cent. The LFOs' frequencies also drift.

**Glide** – adjusts the time it takes for the pitch to glide to its destination.

**LOG** – switches between linear and logarithmic sliding curves.

**Bender Up / Down** – defines pitch bend range for the pitch wheel.

**Transpose** - Set the global pitch of the synth.



# Effects

## Shaper

Available modes:

**Soft, Warm, Hard, Clip, Tube1, Tube2, Tube3, FBsin, FBtri, Flt+dcm** (filter +decimator), **dcm** (only decimator).

**Band** – if enabled, only the distorted signal within the low cut and high cut value will be audible.

**HQ** - enable the 8x oversampling mode.

**Drive** – distortion strength.

**Bit** – bit depth reduction knob.

**S.Rate** – sample rate reduction knob.

**Low Cut** – determines the frequency of the low cut (high pass) filter.

**Hi Cut** – determines the frequency of the hi cut (low pass) filter.

**Dry/Wet** – crossfades between the dry and wet signal.



## Phaser and Vowel

**Stages** – mode selection: **1-6 Stages, Vowel Low-Mid-Hi**.

**Pre** – if it is enabled, the effect will be before the shaper in the signal chain.

**Freq** – base frequency.

**F.Back** – feedback.

**Spread** – stereo widening.

**Rate** – modulation rate.

**Depth** – modulation depth.

**Dry/Wet** – crossfades between the dry and wet signal.



## Chorus and Flanger

**Mode** – **01** - Flanger effect. **02-06** - Chorus effects with different density.

**J8** - the sound is similar to the sound of chorus in JP8000 hardware synthesizer.

**Delay** – delay.

**F.Back** – feedback.

**Rate** – modulation rate.

**Depth** – modulation depth.

**Wide** – stereo widening.

**Low Cut** – determines the frequency of the low cut (high pass) filter.

**Hi Cut** – determines the frequency of the hi cut (low pass) filter.

**Dry/Wet** – crossfades between the dry and wet signal.



## Delay

**Ping-Pong** – switches on the ping pong feedback mode.

**SYNC** – synchronizes the delay time to host's tempo.

**Delay L** – delay length of the Left (First) channel.

**Delay R** – delay length of the Right (Second) channel.

**Rate** – modulation rate.

**Modulate** – modulation intensity.

**F.Back** – feedback.

**Wide** – stereo widening:

- When the knob is set right of center (501 - 1000) the normal delay mode is engaged.
- When the knob is set left of center (0 - 500) the left and right delay channels are swapped.
- When the knob is set to its center position (500) – the delay output is in mono.
- When the **Ping-Pong** button enabled:
- When the knob is set left of center (0 – 500) the cross feedback mode is engaged.
- When the knob is set right of center (501 - 1000) the pingpong mode is engaged.

**Low Cut** – determines the frequency of the low cut (high pass) filter.

**Hi Cut** – determines the frequency of the hi cut (low pass) filter.

**Dry/Wet** – crossfades between the dry and wet signal.



## Reverb

**Mode** – reverb modes: **Plate1**, **Plate2**.

**SYNC** – syncs the predelay time with the host's tempo.

**Predelay** – time delay before reverb triggering.

**Damp** – determines how much high frequencies are dampened.

**Wide** – stereo widening.

**Decay** – reverb decay time.

**Color** – low pass and high pass filter.

**Dry/Wet** – crossfades between the dry and wet signal.



## Out

**X-Comp** – multiband upward/downward compressor.

It's disabled when the knob is in it's leftmost position.

**Velocity** – determines the amount of velocity sensitivity.

**Volume** – overall level.

**Warm** - normal or warm character.

**Soft** - clear or soft character.

**Boost** - boost the overall level.



## Equalizer

**LOW, MID, HI**– band selection buttons.

**Freq** – determines the frequency of the eq band.

**Q** – resonance of the selected band.

**Level** – attenuation or gain of the selected band.



# Arpeggiator



The arpeggiator functions as an automatic arpeggio or sequence performance depending on the selected mode.

## Modes:

- **Up** – ascending notes order, starting with the lowest note.
- **Down** – descending notes order, starting with the highest note.
- **Up/Down** – ascending then descending note order. Lower and upper notes are **not** restarted when a change of direction occurs.
- **Up/Down2** – ascending then descending notes order. Lower and upper notes are restarted when a change of direction occurs.
- **Down/Up** – descending then ascending notes order. Lower and upper notes are **not** restarted when a change of direction occurs.
- **Down/Up2** – descending then ascending notes order. Lower and upper notes are restarted when a change of direction occurs.
- **Random** – random notes order.
- **Ordered** – order in which the notes were pressed.
- **Step** – plays a sequence of note defined in the step sequencer.
- **Chord** – plays all held notes using the step sequencer.

**Gate** – length adjustment for the note.

**Time** – sets the synchronization rate.

**Swing** – affects the time position of each odd note (step). The swing factor can be either positive or negative. Thus, the Swing affects the Steppers' modules as long as the synchronization time of the Stepper and Arp are identical.

**Octave** – each arpeggio cycle can be transposed up to 4 octaves. Transposition does not occur when one octave is selected.

**End** – the sequence can be looped by setting an 'end' value. By default it is set to "No" and does not loop.

To use the sequence, switch the arpeggiator mode to Step or Chord.

Transpose determines the pitch of each note in sequence determined by the MIDI notes triggered.

**Velocity** – determines velocity value of each note in sequence. If the velocity is set to zero, the note is silent. The length of each note can be extended by using the Hold button (right arrow symbol). This is useful for making slide effects.

### Velocity Modes:

**Key** – each note in the arpeggio uses its own velocity value, determined by the current MIDI note.

**Hold** – all notes have the same velocity value as the first played MIDI note (until released).

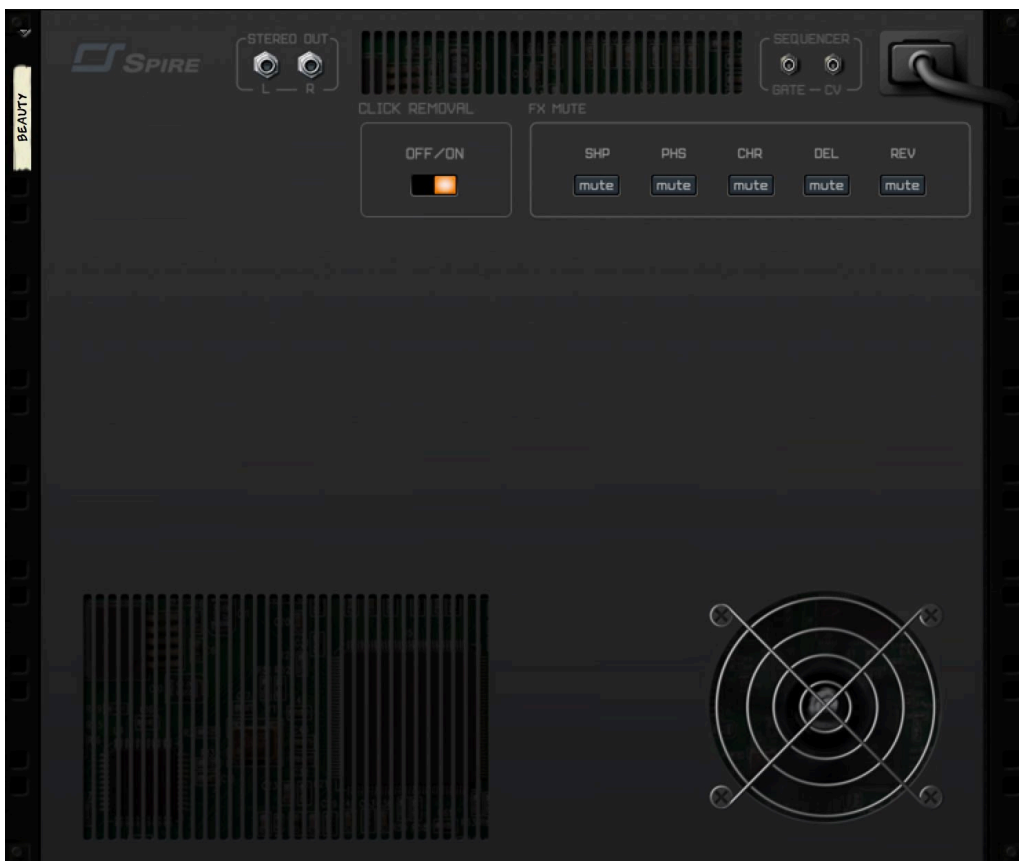
**Step** – takes the velocity value from the step sequencer.

**Step+Key** – takes into account both the step sequencer and MIDI note's velocities.

**Step+Hold** – takes into account both the step sequencer and the first played MIDI note's (until released) velocities.

## Device back panel

- **Click Removal** - Eliminates digital clicks that occur with small number of polyphony voices.
- **FX Mute** - Disabling effects.



## ReSpire MIDI CC

MIDI Contr. #	Parameter name
1	Mod Wheel
2	Breath
4	Pitch Shift
5	Glide
7	Volume
10	Pitch Fine
11	Expression
12	X-Comp
13	Arp On/Off
14	Macro Mod 1
15	Macro Mod 2
16	Macro Mod 3
17	Macro Mod 4
18	Filter 1 Cutoff
19	Filter 1 Resonance
20	Filter 1 Type/Mode
21	Filter 2 Cutoff
22	Filter 2 Resonance
23	Filter 2 Type/Mode
24	Filter Keytrack
25	Filter Balance
26	Filter Routing
27	Filter Link
28	Reverb Mode
29	Reverb PreDelay
30	Reverb PreDelay Sync
31	Reverb Sync Button
33	Osc1 - ctrlA
34	Osc1 - ctrlB
35	Osc1 - WTMix
36	Osc1 - Phase

MIDI Contr. #	Parameter name
37	Osc1 - Detune
39	Osc1 - Density
40	Osc2 - ctrlA
41	Osc2 - ctrlB
42	Osc2 - WTMix
43	Osc2 - Phase
44	Osc2 - Detune
45	Osc1 - Density
46	Osc3 - ctrlA
47	Osc3 - ctrlB
48	Osc3 - WTMix
49	Osc3 - Phase
50	Osc3 - Detune
51	Osc3 - Density
52	Osc4 - ctrlA
53	Osc4 - ctrlB
54	Osc4 - WTMix
55	Osc4 - Phase
56	Osc4 - Detune
57	Osc4 - Density
58	Env1 - Att
59	Env1 - Dec
60	Env1 - Sus
61	Env1 - Slt
62	Env1 - Sll
63	Env1 - Rel
65	Env2 - Att
66	Env2 - Dec
67	Env2 - Sus
68	Env2 - Slt
69	Env2 - Sll
70	Env2 - Rel

MIDI Contr. #	Parameter name
71	Env3 - Att
72	Env3 - Dec
73	Env3 - Sus
74	Env3 - Slt
75	Env3 - Sll
76	Env3 - Rel
77	Env4 - Att
78	Env4 - Dec
79	Env4 - Sus
80	Env4 - Slt
81	Env4 - Sll
82	Env4 - Rel
83	LFO1 - Rate
84	LFO1 - Sym
85	LFO1 - Morph
86	LFO1 - Amp
87	LFO1 - Phase
88	Reverb Decay
89	Reverb Damp
90	Reverb Color
91	Shaper Mix
92	Phaser Mix
93	Chorus Mix
94	Delay Mix
95	Reverb Mix
102	LFO2 - Rate
103	LFO2 - Sym
104	LFO2 - Morph
105	LFO2 - Amp
106	LFO2 - Phase
107	LFO3 - Rate
108	LFO3 - Sym

MIDI Contr. #	Parameter name
109	LFO3 - Morph
110	LFO3 - Amp
111	LFO3 - Phase
112	LFO4 - Rate
113	LFO4 - Sym
114	LFO4 - Morph
115	LFO4 - Amp
116	LFO4 - Phase
117	Reverb Color
118	Reverb Wide
128	Osc1 - Type
129	Osc1 - Note
130	Osc1 - Fine
131	Osc1 - Wave
132	Osc1 - Unison Voices
133	Osc1 - Unison Mode
134	Osc1 - Wide
135	Osc1 - Pan
136	Osc1 - Filter Input
137	Osc2 - Type
138	Osc2 - Note
139	Osc2 - Fine
140	Osc2 - Wave
141	Osc2 - Unison Voices
142	Osc2 - Unison Mode
143	Osc2 - Wide
144	Osc2 - Pan
145	Osc2 - Filter Input
146	Osc3 - Type
147	Osc3 - Note
148	Osc3 - Fine
149	Osc3 - Wave

MIDI Contr. #	Parameter name
150	Osc3 - Unison Voices
151	Osc3 - Unison Mode
152	Osc3 - Wide
153	Osc3 - Pan
154	Osc3 - Filter Input
155	Osc4 - Type
156	Osc4 - Note
157	Osc4 - Fine
158	Osc4 - Wave
159	Osc4 - Unison Voices
160	Osc4 - Unison Mode
161	Osc4 - Wide
162	Osc4 - Pan
163	Osc4 - Filter Input
164	Mix Osc1 - Level
165	Mix Osc1 - Mute
166	Mix Osc2 - Level
167	Mix Osc2 - Mute
168	Mix Osc3 - Level
169	Mix Osc3 - Mute
170	Mix Osc4 - Level
171	Mix Osc4 - Mute
186	LFO1 - Form
187	LFO1 - Sync
188	LFO1 - Time
191	LFO2 - Form
192	LFO2 - Sync
193	LFO2 - Time
196	LFO3 - Form
197	LFO3 - Sync
198	LFO3 - Time
201	LFO4 - Form

MIDI Contr. #	Parameter name
202	LFO4 - Sync
203	LFO4 - Time
204	Shaper Mute
205	Phaser Mute
206	Chorus Mute
207	Delay Mute
208	Reverb Mute
209	Shaper Mode
210	Shaper Drive
211	Shaper Bit
212	Shaper S.Rate
213	Shaper Low Cut
214	Shaper Hi Cut
215	Phaser Mode
216	Phaser Freq
217	Phaser F.Back
218	Phaser Spread
219	Phaser Rate
220	Phaser Depth
221	Chorus Mode
222	Chorus Delay
223	Chorus F.Back
224	Chorus Rate
225	Chorus Depth
226	Chorus Wide
227	Chorus Low Cut
228	Chorus Hi Cut
229	Delay Ping-Pong ON/OFF
230	Delay Sync
231	Delay L
232	Delay R
233	Delay L Sync

MIDI Contr. #	Parameter name
234	Delay R Sync
235	Delay F.back
236	Delay Color
237	Delay Wide
238	Delay Modulate
239	Delay Rate