



User Manual



Introduction

Spire is a software polyphonic synthesizer that combines powerful sound engine modulation, flexible architecture and a graphical interface that provides unparalleled usability. Spire embodies the best of both software and hardware synthesizers. This guide will show you how to use the Spire.

Activation

To activate the licensed copy of the Spire, press **MENU**, **Register**, and then specify the path to the activation file **spire.lic**, that was sent to you by e-mail.

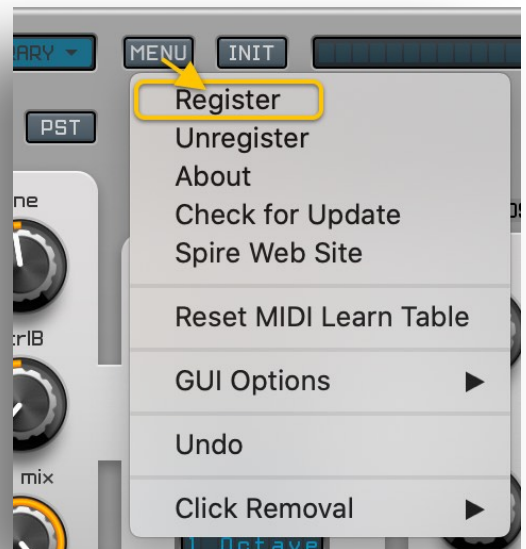
Deactivation

To deactivate, press **MENU**, **Unregister**.
The license file will be moved to the Trash.

Alternatively, you can manually delete the license file **comm_spire.lic**. File is located in the folder:

For Mac OS:
/Users/<username>/Library/Application Support/RevealSound/

For Windows:
\Users\<username>\AppData\Roaming\RevealSound

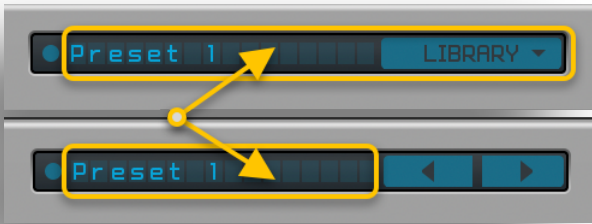


Usage tips

Use shift + mouse left click on a knob or slider to fine adjust values.
Use mouse double click or command/ctrl + mouse left click on a knob or slider to set default position.

Preset Manager

Click on the area with the name of the preset on the top panel to open/close the preset manager.



General view



The panel on the left displays folders with presets, sorted by authors, tags or favorite presets.

The panel on the right displays the presets.

The **History** button opens/closes the window with previously used presets.

Presets can be switched by cursor keys or by mouse click.

It is also possible to switch presets using an external MIDI controller. To assign, use the **MIDI Learn** function -> click on the button to switch presets on the top panel -> rotate the controller on an external MIDI device.

Top left panel



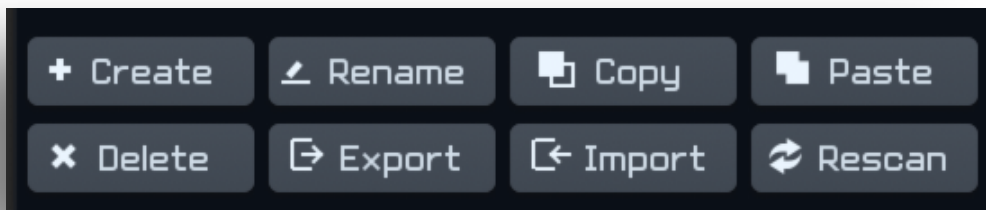
Folder - display folders with presets.

Author - sort by author.

Tag - sort by tags.

Favorite - display your favorite presets.

Bottom left panel



Create - create a folder.

Rename - rename the folder.

Copy - copy the folder to the clipboard.

Paste - paste the folder from the clipboard.

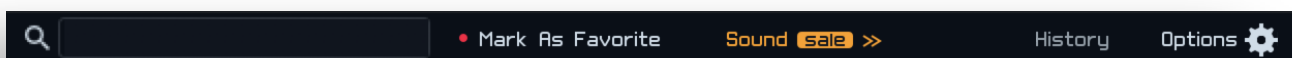
Delete - delete the folder.

Export - export a folder with subfolders to a single file.

Import - import a single file containing folders with presets. You can also import a single preset (*.spf) or sound bank (*.Sbf) of the old format.

Rescan - rebuild the database, in case of not relevant display of folders with presets.

Top right panel

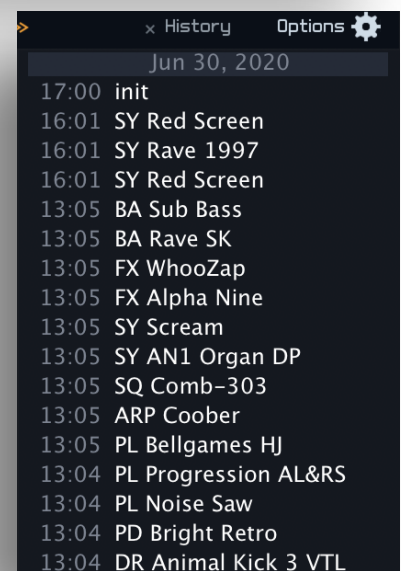


Mark As Favorite - mark a preset as a favorite.

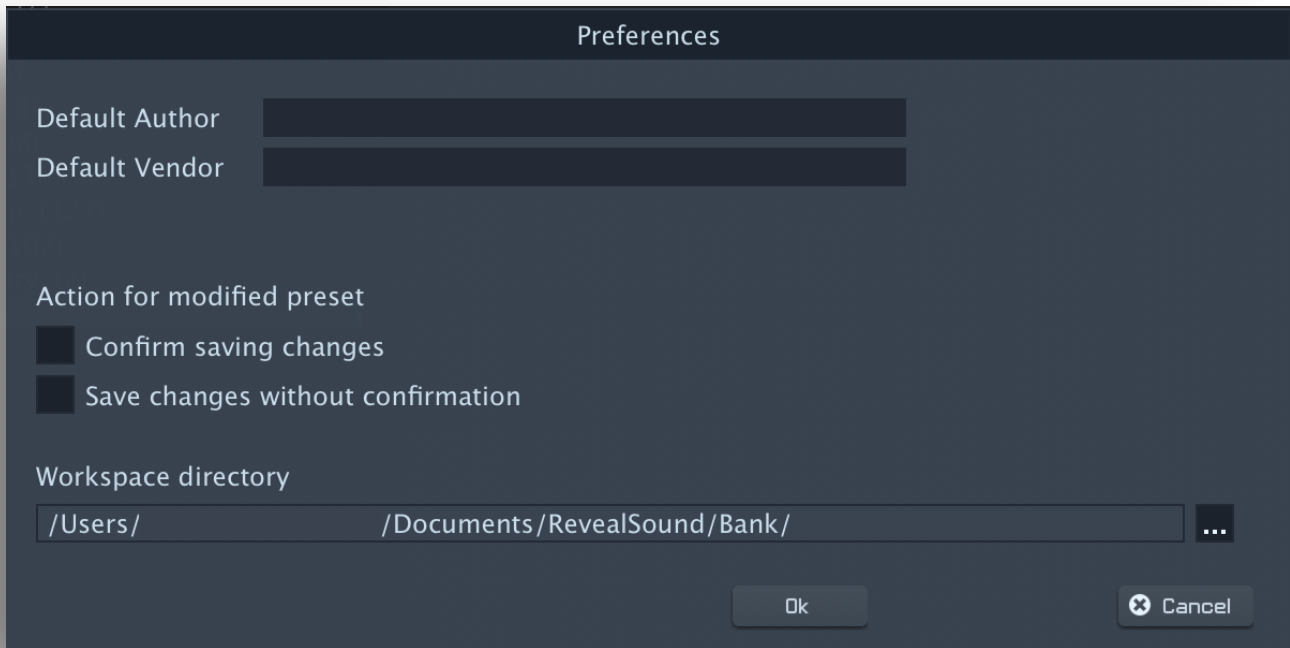
Sound Store (Sale) - the button leads to the sound store page.

<https://reveal-sound.com/store/>

History - open / close the panel with presets used earlier. The "Cross" button clears the entire story.



Options - open the panel with advanced settings (Preferences).



Default Author - set the default author name.

Default Vendor - set the default seller / label / company name. Optional.

Actions for Modified Presets.

By default, a modified preset does not save changes when switching to the next preset.

Confirm saving changes - add an offer to save the modified preset when switching.

Save changes without confirmation - allow to save modified preset without warning.

Workspace directory - set a folder for user presets - **User Library**.

Folder **Factory Sounds** doesn't change.

Right bottom panel



Keyboard & Notes - add a note about the preset. It is also possible to listen to the preset by clicking on the drawn panel with piano keys.



- set the current preset as the default preset.

Create - create a preset with current settings.

Save - save changes.

Rename - rename the preset.

Copy - copy the settings to the clipboard.

Paste - paste from the clipboard.

Delete - delete the preset.

Edit - open the panel for advanced preset editing.

Dialog box titled "Edit preset 'init' details".

Fields:

- Bank
- Author
- Vendor
- Tag 1
- Tag 2
- Tag 3
- Tag 4
- Tag 5

Icon placeholder: PNG 200x200px

Buttons: Load Icon, Clear Icon

Notes

Buttons: Ok, Cancel

Bank - set the name of the sound bank.

Author - set the name of the author.

Vendor - vendor / label / company name.

Load Icon - assign an icon to a preset. Icon format 200x200 pixels.

Clear Icon - delete the icon.

Tag - set the tags to the preset. Factory tags are available in columns 1,2,3, custom tags are in columns 4 and 5.

Notes - add additional information about the preset.

Polyphonic modes and Midi Learn



Mono 1 – mono mode.

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

Envelopes are retrigged 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 retrigged 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 retrigged 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 retrigged 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.

MIDI – MIDI learn – allows you to assign parameters of Spire to an external MIDI controller.

- **Midi learn** - click the MIDI 'learn' button, click on the synth parameter that's going to be linked then press control on your external MIDI controller..
- **Midi unlearn** - click the MIDI 'learn' button then click the control on your external MIDI controller that you want to be unlinked.

Oscillator

Spire 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.

Module



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

CPY/PST – copy / paste oscillator settings.

Octave, Note, 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.

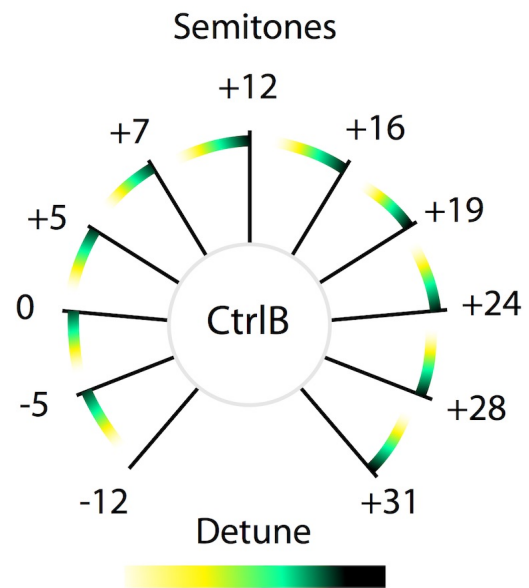
"HardFM" Mode

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



Spire 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 – 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

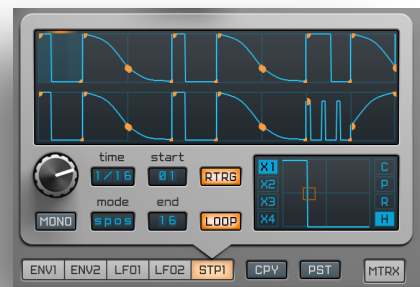
4x Envelopes



4x LFOs



2x Steppers



Macro Control



Matrix



PitchWheel ModWheel



Envelope



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

CPY/PST – copy / paste the settings of the envelope.

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.

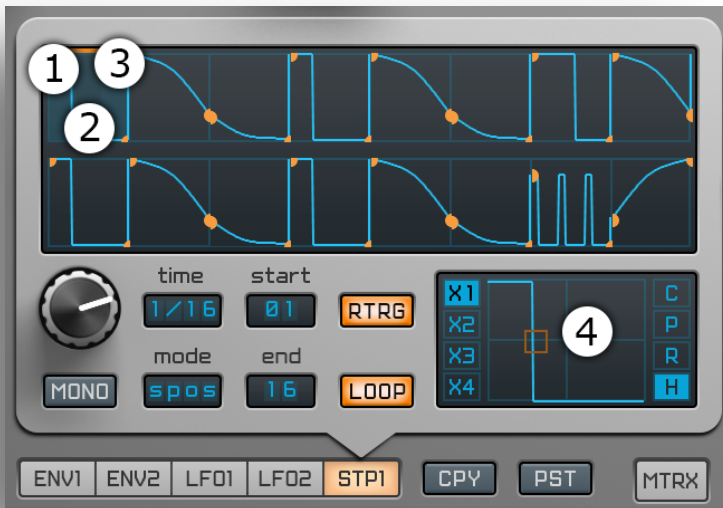
MONO – switches monaural LFO mode off / on.

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.

Cmd / Ctrl + click on the “Start” make the amplitude equal to the amplitude of the “End” of the previous step.

Cmd / Ctrl + click on the “End” make the amplitude equal to the amplitude start of the next step.

Knob Rate – sets modulation rate.

Time – sets the synchronization rate.

MONO – switches monaural LFO mode off / on.

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.

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

Start – loop start position.

End – loop end position.

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 Retrig 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.

CPY/PST – copy / paste the stepper settings. You can also copy and paste settings from one preset to another.

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 spire! This allows for virtually unlimited signal routing possibilities!



PG1,2,3,4,5 – switches between matrix pages.

Src 1,2 – modulation sources.

Trg 1,2,3,4 – modulation targets.

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.

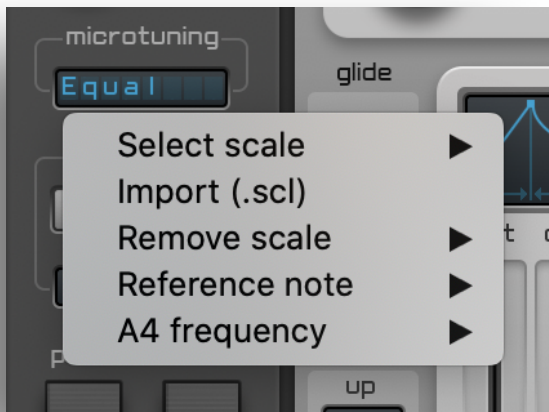
LOG – switches between linear and logarithmic sliding curves.

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

Transpose - Set the global pitch of the synth.



Microtuning



An interesting feature of Spire is that it can be tuned using different temperaments using Scala tuning files. By default, Spire is set to **Equal Tempered** scale. Also Spire can be tuned an **A4=432 Hz**, known as **Verdi's 'A' / Pythagorean Tuning**.

Select scale - click to select imported tuning file.

Import (.scl) - click to import Scala tuning file.

Remove scale - click to remove imported tuning file.

Reference note - click to set reference note. By default, reference note is A4.

A4 frequency - click to set frequency A4 note . By default, frequency is 440 Hz.

Available frequencies from 432 Hz to 446 Hz in steps of 2 Hz.

FX section

Shaper



Available modes:

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

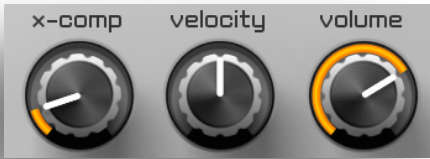
Wide – stereo widening.

Decay – reverb decay time.

Color – low pass and high pass filter.

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

Master Out



X-Comp – multiband upward/downward compressor. It's disabled when the knob is in its leftmost position.
Velocity – determines the amount of velocity sensitivity.
Volume – overall level.

Three-band EQ



Warm - normal or warm character.
Soft - clear or soft character.
Boost - boost the overall level.

EQ – on/off button of the equalizer.
LowShelf, Peak, HiShelf – band selection buttons.
Frq – 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.

On/Off – engages or disengages the arpeggiator.

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 in the sequence take the "Velocity" value of the last played MIDI note.

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 last played MIDI note's velocities.

Themes

1. Press **MENU / GUI Options**
2. Select **Original, Dark, Legacy, Light Gray, Navy Gray Theme**



Appendix A. Third-party materials and licenses

Spire incorporates materials from several Open Source software projects. Therefore the use of these materials by Spire is governed by different Open Source licenses. This document reproduces these licenses and provides a list of the materials used and their respective licensing conditions. Section 1 contains a list of the materials used. Section 2 reproduces the applicable Open Source licenses. For each material, a reference to its license is provided.

Materials

- Spire contains code of Symbiosis which is governed by New Simplified BSD License and Copyright (c) 2009-2013, NuEdge Development / Magnus Lidström. All rights reserved.

- Spire contains cJSON library which is governed by license and Copyright (c) 2009 Dave Gamble.

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```
printf("%s",png_get_copyright(NULL));
```

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