

REAKTOR **ANIMATED CIRCUITS**

OPERATION MANUAL



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Users Guide written by Native Instruments

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1. What is REAKTOR ANIMATED CIRCUITS?

REAKTOR ANIMATED CIRCUITS features 200 exclusive brand new sounds based on these ensembles:

- ▶ Metaphysical Function
- ▶ Skrewell
- ▶ Newscool
- ▶ SpaceDrone
- ▶ Spiral

Spiral is an entirely new ensemble found only in this KORE SOUND PACK. Further information about Spiral is featured later in this manual.

REAKTOR is well-known for its advanced synthesizer sounds which are featured in this product: outstanding self-playing and evolving sounds that result in futuristic drones and organic sequences you can not create in that quality with any other tool available in the market today.

When loading a KORE SOUND from this collection, KORE 2 automatically loads its integrated REAKTOR engine, as well as the required Ensemble. Then, the specific sound is adjusted. This all happens automatically, with no additional adjustments necessary. After loading a sound, you can tweak it as our sound designers made the most important REAKTOR parameters available via KORE 2. They even assigned the Random-button of several ensembles to change the sound rather drastically.

The KORE 2 Control Pages and Sound Variations, preassigned for each KORE SOUND, enables you to morph from one sound world into another — something new to the already-innovative REAKTOR engine.

2. Content Description

The following paragraphs describe the content of REAKTOR ANIMATED CIRCUITS. However, listening to the KORE SOUNDS reveals more than these words describe. The following will give you a starting point but you will learn most about this KORE SOUND PACK by using it.

The description groups the KORE SOUNDS according to the Ensemble they use to generate sound. Each Ensemble provides a unique sound and gives a comprehensive overview of the KORE SOUNDS included in REAKTOR ANIMATED CIRCUITS.

To find all KORE SOUNDS based on a specific Ensemble, simply enter the Ensemble's name into the Quick Search Field. This will limit the search results accordingly and can also be combined with any other attribute.

All KORE SOUNDS of REAKTOR ANIMATED CIRCUITS can be operated musically with KORE's/KORE PLAYER's Control Pages. Each Ensemble provides at least one specific Control Page dedicated to the particular control capacities of the Ensemble. These Control Pages are explained within the Using KORE or KORE PLAYER section of each Ensemble's description.

If you also own REAKTOR you can access the Ensemble's control panel as well. For details about using the Ensembles are given within the "Using REAKTOR" sections below.

The KORE Sound Variations are mapped to REAKTOR Snapshots as follows: the REAKTOR Snapshot named after the KORE SOUND is identical to Sound Variation A. The Snapshots labelled with numbers from 1-7 contain the Sound Variations from B-H.



Note that some sounds feature a gradual attack due to the specific nature of their sound generation. It is therefore recommended not to increase volume if you load a KORE SOUND and don't hear anything immediately!

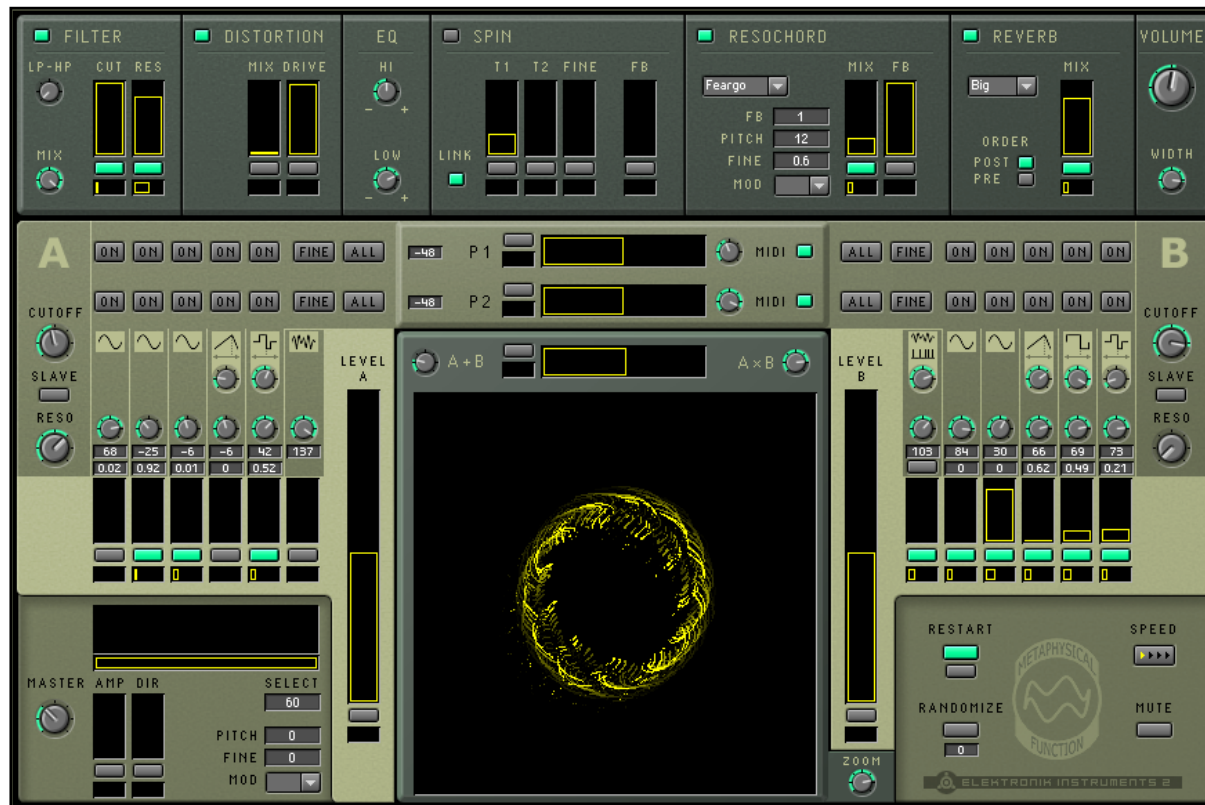



Please note that it always takes some time to load an Ensemble into the REAKTOR engine. This can be compared to the time required to load sound samples. This process has been highly optimized; nevertheless, it will be fastest if you don't switch the Ensemble with each sound. REAKTOR recognizes that the Ensemble has already been loaded and only changes its internal settings. So if you skip through the KORE SOUNDS of REAKTOR ANIMATED CIRCUITS, you will have faster loading times if you preselect only one Ensemble's sounds as described.



Details about Control Pages are given within the manuals of KORE and KORE PLAYER.

2.1 Metaphysical Function



 More about using REAKTOR's control capabilities can be found in the main REAKTOR manual.

More than 'just another' synthesizer, Metaphysical Function offers a truly engaging experience. By taking full advantage of REAKTOR's freedom to create completely new instruments, this unique sound design tool offers a vast and unparalleled sonic palette ranging from beautiful soothing tones to dark, disturbing soundscapes. Equipped with several effect units, its main concept is to constantly alter the level of parallel oscillators. We added new samples to this ensemble exclusively for this KORE SOUND PACK to create even crazier sounds.

2.1.1 Using Metaphysical Function in KORE or KORE PLAYER

Metaphysical Function is operated with two Control Pages: the Kreative Page and the Control Page.



- ▶ Restart: Restarts the internal parameter patterns, in order to restart the sound.
- ▶ Volume: Controls the master output volume.
- ▶ Random: Sets all static parameters in Metaphysical Function to random values. While all dynamically changing parameters keep their movements, this button allows creating a variant of the movements' environment. Note that this does not only affect the controls shown on the Control Pages, but also parameters only visible in REAKTOR. This therefore creates a sound impossible to create with the Control Pages. To return to the original sound, reload the KORE SOUND.
- ▶ Amount: Controls the amount of changes applied when pressing the Random button.
- ▶ Filter: Switches the internal filter section on or off. Note that this does not influence the Cut A and Cut B parameters.
- ▶ Cut A: Controls the cutoff frequency of a lowpass filter that is passed by half of the parallel oscillators. Higher values create brighter sound.
- ▶ Cut B: Controls the cutoff frequency of a lowpass filter that is passed by another half of the parallel oscillators. Higher values create brighter sound.
- ▶ Dist: Switches the overdrive distortion unit on or off.
- ▶ D Mix: Sets the amount of overdrive distortion mixed into the signal.
- ▶ Spin: Switches the left/right channel delay on or off. Together with the Time control, it can be used to create stereo effects.

- ▶ Time: Sets the time by which the left audio channel is delayed. Use this to create stereo effects (with a static setting) or to create pitch shift effects (by changing the value fast).
- ▶ Chord: Switches the Resochord unit on or off.
- ▶ C Mix: Controls how much of the signal passes the Resochord effect unit.
- ▶ Reverb: Switches the reverb effect on or off.
- ▶ R Mix: Sets the amount of reverb signal.



- ▶ Restart: Restarts the internal parameter patterns in order to restart the sound.
- ▶ Volume: Controls the master output volume.
- ▶ Random: Sets all static parameters to random values. While all dynamically changing parameters keep their movements, this button allows you to create a variant of the movements' environment.
- ▶ Amount: Controls the amount of changes applied when pressing the Random button.
- ▶ High: Sets the amount by which high frequencies are cut (low values) or boosted (high values).
- ▶ Low: Sets the amount by which low frequencies are cut (low values) or boosted (high values).
- ▶ A+B: Controls the volume of the signal that is created by mixing one half of the parallel oscillators (A) with the other half (B).
- ▶ Ring: Controls the volume of the signal that is created by ring-modulating one half of the parallel oscillators (A) with the other half (B).
- ▶ Width: Controls the stereo width of the signal.
- ▶ Pitch: Controls the playback pitch of a sample if the sound is setup to use one.

2.1.2 Using Metaphysical Function in REAKTOR

Metaphysical Function constantly generates sound from the moment the ensemble is opened, until it is closed. Pressing notes on your MIDI keyboard does not stop or start notes, or control pitch in the way you might expect.

Instead, the key to controlling Metaphysical Functions unique sound lies with the 32 automatable faders, which control a variety of parameters, including the amplitude and pitch of the oscillators, and the settings of the FX units.

Each fader has two modes of operation – static or automated. While static simply operates like a traditional fader, automated requires some explanation. To enable automation mode, press the button directly beneath the slider (highlighted in figure 1). The sliders will now begin playback of the last recorded automation sequence. In automation mode, the playback position is displayed underneath automation button. When it reaches the end of the sequence, it will loop back to the beginning.

The Playback Position display also functions as a recording arm button. Click it once to enter recording mode – the display will flash. Now place the mouse cursor over the fader, and while depressing the mouse button, move the mouse cursor. Notice that the position indicator will stop flashing and will instead display the recording position as a proportion of the available recording time. When you have finished recording, release the mouse button. The position indicator will return to recording arm state and resume flashing. Click it once to return to playback mode – the newly recorded sequence will now commence playback.

Two of the automated faders, labelled P1 and P2, are dedicated to pitch modulation. They can be assigned to any or all of the oscillators using the pitch modulation matrix, which is positioned above section A and B, either side of the P1 and P2 faders. Click the All button to route the fader to all oscillators, or assign them individually by clicking on the buttons above the oscillator icons.



Automation data is saved and recalled with snapshots as with other knob and fader settings.

Signal-flow Overview

Metaphysical Function features two independent signal generation sections named A and B. Section A features three sine waves, a triangular wave, a bipolar-pulse wave, and a lowpass-filtered noise generator. Section B is composed of two sine waves, a triangular wave, a pulse wave, a bipolar pulse wave and a two-mode noise generator.

The oscillators in each section are summed and then amplified, and then passed through a 12db filter. The output of the section A and B filters are then combined, both additively and by ring-modulation. The mix section is used to cross-fade between the summed signal and the ring-modulated signal.

Metaphysical Function also features a sampler module, the output of which is mixed with the combined output of sections A and B.

The signal is then passed through the Master Filter, the EQ unit, the Spin module, and then the Resochord and Reverb effects. The signal is then amplified according to the main volume control.

The main XY display visualizes the post-Spin output.

Sections A and B, and Sampler Module

OSCILLATOR LEVEL, PITCH SHAPE	<p>The amplitude of each oscillator can be controlled by the row of automatable faders in each bank.</p> <p>Above the amplitude faders are knobs to define the base pitch of each oscillator – the upper knob sets the pitch in semitones and the lower knob is for fine adjustment. For the noise oscillators, the knob determines lowpass-filter cutoff.</p> <p>Additionally, the shape of certain oscillators (triangle and pulse) can be defined.</p>
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FILTER	The oscillators are summed and passed through a 12db lowpass filter (controlled by the CUTOFF and RESO knobs). When the SLAVE button is depressed, the CUTOFF knob is overridden by the master filter cutoff. (The main filter is located in the FX section at the top left of the panel).
SECTION LEVEL	The overall Level of each section can be controlled and automated using the large faders either side of the waveform display.
SAMPLER MODULE	<p>Samples can be selected using the SELECT knob, and playback pitch can be defined by the PITCH and FINE knobs. Either P1 or P2 can be routed to the sample pitch via MOD.</p> <p>Loop range can be defined using the bar below the sampler graphic (when loading your own samples ensure that loop is enabled in the map editor).</p> <p>The amplitude and playback direction/speed can be automated via the AMP and DIR faders. The MASTER knob allows further adjustment of the amplitude.</p>

Pitch Routing Matrix

P1 AND P2	<p>These 2 faders can be used to control the pitch of the oscillators, the sampler and the Resochord effect.</p> <p>Movements can be recorded by mouse movements as with the other sliders, but also via MIDI input by enabling the MIDI button. Glide time can be set with the adjacent knobs.</p>
INDIVIDUAL AND ALL BUTTONS	To the left and right of the central P1 / P2 faders are controls for routing them to the oscillators in section A and B respectively. Click the ALL button to route to all oscillators in the section simultaneously, or click on the INDIVIDUAL buttons to assign oscillators one-by-one.

Mix Section

MIX CONTROLS	The central fader crossfades between the two mix types: left for A+B (summed) and right for AxB (ring-modulated). The A+B knob offsets the B section level relative to the A section in the summed mixing. The AxB knob controls the overall volume of the ring-modulated mix (ring-modulation tends to be quieter than summed mixing).
WAVEFORM DISPLAY	The phase offset of the X and Y axis can be adjusted by clicking on the screen and dragging the mouse – in effect rotating the image. ZOOM amplifies or attenuates the input signal.

FX section

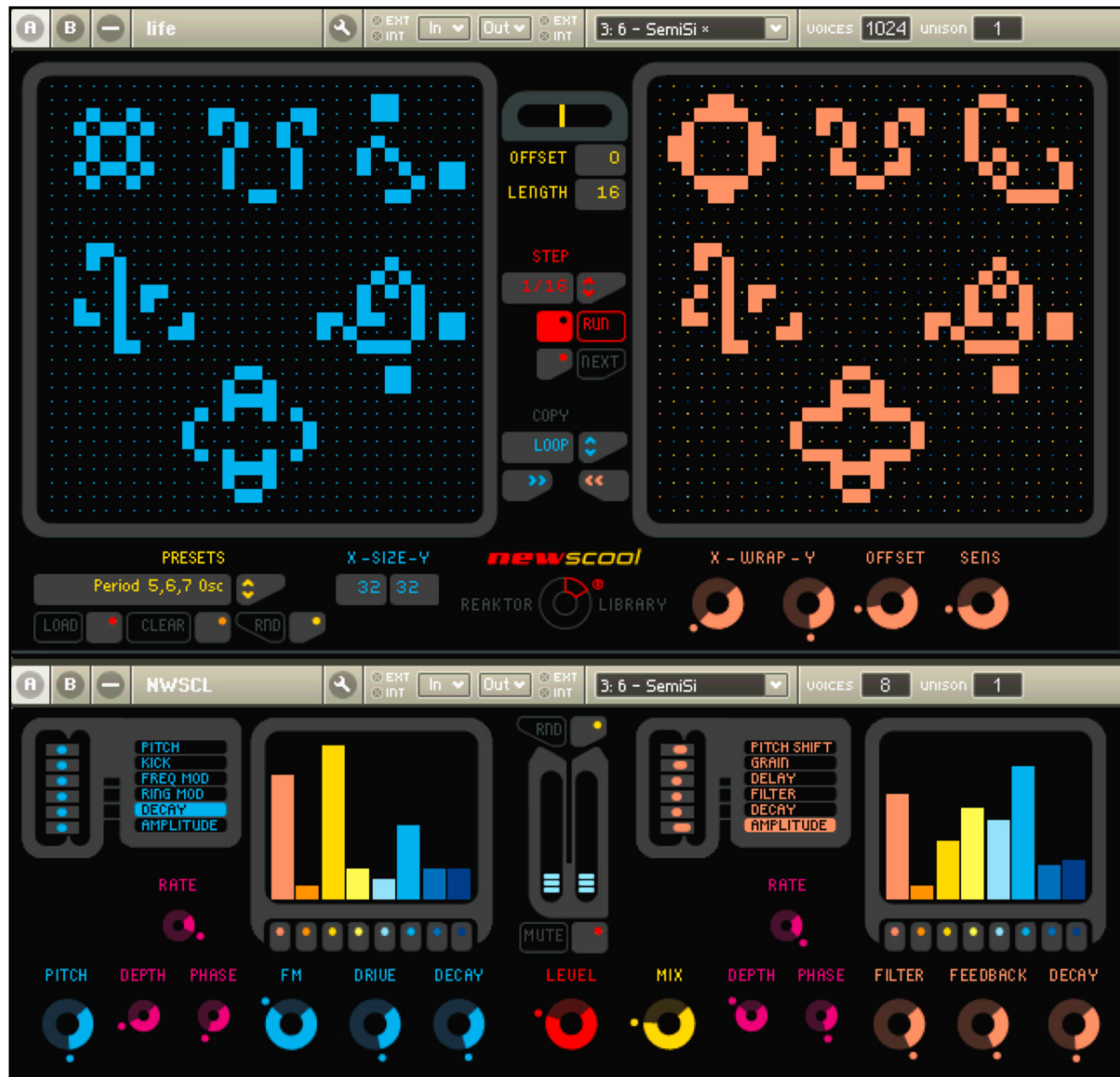
FILTER	<p>The filter cutoff and resonance can both be controlled and automated by the CUT and RES faders.</p> <p>LP-HP crossfades between the lowpass filter [at the left] and the highpass filter [at the right].</p> <p>Mix crossfades between the unprocessed signal [at the left] and the filter output [at the right].</p>
DISTORTION	Mix crossfades between the unprocessed signal [at the bottom] and the distorted signal [at the top]. DRIVE determines the extent of the distortion.
EQ	Hi determines high frequency shelving cut/boost. Set to the centre for no change. Similarly, Low determines low frequency shelving cut/boost.
SPIN	A delay effect, containing controls for left (T1) and right channel (T2) delay time and feedback (FB). The effect can be used for traditional delay sounds, for spreading the sound within the stereo panorama field, and for delay-modulation sounds (similar to pitch shifting).

RESOCHORD	<p>The Resochord uses 6 parallel delay lines, each at differing delay times representing the notes of a chord. This in effect imposes an additional harmonic structure onto the input signal.</p> <p>The preset list selects from 20 chord types. Delay feedback is the sum result of the FB KNOB and FB FADER. The overall delay time is offset in semitones via PITCH, FINE and either P1 or P2 via MOD.</p> <p>MIX crossfades between the dry signal [at the bottom] and the Resochord output [at the top].</p>
REVERB	<p>The preset list selects from 6 room types. Order determines the serial routing order of signal through the Resochord and Reverb units, (after the Spin module). Select <i>Pre</i> to route the post-spin signal through the Reverb first, then Resochord. Select <i>Post</i> to route through the Resochord first, then Reverb.</p> <p>MIX crossfades between the dry signal [at the bottom] and the Reverb output [at the top].</p>
VOLUME	<p>VOLUME determines the overall level, and WIDTH determines the amount of stereo spread.</p>

Additional Controls

RESTART	<p>When this button is activated, starting or ending any automation recording will restart all sliders. Pressing the button below will restart all sliders immediately (which simulates recalling a snapshot).</p>
SPEED	<p>The overall automation speed can be set to one of four levels by clicking on this button.</p>
RANDOMIZE	<p>Randomizes all controls.</p>
MUTE	<p>Mutes the output.</p>

2.2 Newscool



Newscool is a REAKTOR classic completely rebuilt for REAKTOR 5, with an innovative sequencer (at the top) and the characteristic sound engine (at the bottom). The engine consists of a tone generator on the left and a multi-effect unit on the right. The signal is produced by eight parallel oscillator units whose parameters are modulated extensively. The effect unit parameters provide pitch shift, delay and filter effects, and are similarly modulated.

The sequencer is based on the “Game of Life” model developed by John Conway in the 1970s. A two-dimensional pattern is processed in steps: An element of the pattern becomes alive (dark in this implementation) in the following step if three of its eight neighbours are alive it remains alive in the subsequent step. If then two or three neighbours are still alive, it dies (and becomes a light square again). Several patterns emerge over time by this set of rules: Gliders move over the grid, cross oscillating in several phases, some objects remain stable and don’t change from step to step while others remain unstable forever. These patterns trigger the sound engine which generates “lively” sequences.

2.2.1 Using Newscool in KORE or KORE PLAYER

All KORE SOUNDS based on Newscool provide two Control Pages. The Newscool Synth Page (see illustration below) provides control over the sound generation, while the Newscool Track Control Page (second illustration below) is used to handle the sequencing part of Newscool.



! Note that these controls duplicate parameters available within the REAKTOR interface, explained within the Using REAKTOR section below. Therefore check those paragraphs for technical background information.

- ▶ Run: Starts the Newscool sequencer.
- ▶ Reset: Resets the Newscool sequencer’s pattern to its initial state, in order to restart the sequence.
- ▶ Rnd Synth: Randomizes all parameters of the Newscool synthesis engine. Note that this does not only affect the controls shown on the Control Pages, but also parameters only visible in REAKTOR. As a result, this creates a sound impossible to create with the Control Pages. To return to the original sound, reload the KORE SOUND.
- ▶ Rnd Pat: Randomizes all parameters of the Newscool sequencer pattern. Note that this does not only affect the controls shown on the Control Pages, but also parameters

only visible in REAKTOR. As a result, this creates a sound impossible to create with the Control Pages. To return to the original sound, reload the KORE SOUND.

- ▶ Pitch: Controls the main pitch of the sound signal.
- ▶ FM: Sets the absolute amount of frequency modulation during sound synthesis. Higher values create harsher sounds.
- ▶ Drive: Sets the amount of saturation drive applied to the tone generator's signal. High values create a louder, rather distorted signal.
- ▶ Decay: Sets the absolute decay time. This changes between percussive sounds at low values and texture sounds at high values.
- ▶ FX Mix: Determines the balance between the unprocessed signal and the effect signal. The effect signal is influenced by the Filter, Feedback and FX Decay controls.
- ▶ Filter: Controls the main filter frequency. Higher values create harsher sounds.
- ▶ Feedback: Adjusts the main feedback amount of the effect unit. High values can create resonance effects. The parameter should be handled together with Filter and FX Decay.
- ▶ FX Decay: Controls the time after which the effect signal is faded out. This changes between percussive sounds at low values and texture sounds at high values.



- ▶ Mute 1 to Mute 8: Mutes individual parts of the multi-track signal. Use these mute controls to decrease the audible density of the pattern's sound.
- ▶ X-Wrap, Y-Wrap and Offset 1: Control the relation between the sequencer's repeating pattern and the individual parts of the multi-track signal. Use these controls to change the sound of a pattern while the rhythmical pattern itself remains unchanged.

- ▶ **Length:** Controls the length of the sequencer's repeating pattern
- ▶ **Offset 2:** Shifts the sequencer's repeating pattern so that it aligns with rhythms synchronized to the same MIDI clock, for example other sounds within KORE or any other host.
- ▶ **LFO Rate and LFO Depth:** Control a low frequency oscillator that slowly modifies the sound parameters of the synthesis engine, without relation to the sequencer's pattern.

2.2.2 Using Newscool in REAKTOR

Life Sequencer

As explained above the sequencer proceeds from one step to the next one by a set of Life rules that translate the current pattern into the following one. The two-dimensional Life pattern is mapped onto the eight channels of the tone generator by the grid of the **PERFORMER DISPLAY**: By using the **WRAP X/Y** controllers this mapping can be modified smoothly. The **SENSITIVITY** knob also interacts with the trigger signals.

Within the **BOARD DISPLAY** Life patterns can be loaded from a bank of factory presets. These patterns can be altered, or you can build completely new ones. The **BOARD DISPLAY**'s content can be copied to the **PERFORMER DISPLAY** manually, at the beginning of the Life evolution or at the beginning of each loop.

LOOP DISPLAY	Shows the process of the loop steps. (See also RUN and LENGTH .)
OFFSET	Sets an offset in steps to the sequencer read-out.
LENGTH	Adjusts the length of the loop in steps. Since the pattern of the BOARD DISPLAY can be copied automatically to the PERFORMER DISPLAY at the beginning of each loop cycle, the loop length controls how often the performer resets to the initial pattern.

STEP	Selects the step length of the life sequencer in MIDI units, e.g. selecting a sixteenth calculates a new pattern life phase each sixteenth of the MIDI clock.
RUN	Switches the life process on or off. When on, each MIDI clock step (see STEP) generates a new phase of the pattern according to the life rules (see the instrument description); the result is displayed in the PERFORMER DISPLAY. The MIDI clock has to be running, or else this button shows no effect.
NEXT	Calculates the next life sequencer phase independently of the MIDI clock.
COPY	Selects at which point the pattern of the BOARD DISPLAY is copied to the PERFORMER DISPLAY: manually (by pressing the To PERFORMER button), at the start of the sequencer when the RUN button is pressed, or at the beginning of each loop cycle (see LENGTH).
TO PERFORMER	Copies the pattern of the BOARD DISPLAY to the PERFORMER DISPLAY.
TO BOARD	Copies the pattern of the PERFORMER DISPLAY to the BOARD DISPLAY.
BOARD DISPLAY	This is a buffer where life patterns can be loaded from the preset list (see PRESETS), edited, or randomly generated. You can draw patterns directly into the display with the mouse.
PRESETS	Selects a pattern from a list of factory presets, which can then be loaded into the BOARD DISPLAY by pushing the LOAD button.
LOAD	Copies a pattern from the list of factory presets into the BOARD DISPLAY.
CLEAR	Deletes the current pattern of the BOARD DISPLAY.
RANDOM	Randomly generates a pattern within the BOARD DISPLAY.

SIZE X/Y	Sets the size of the BOARD DISPLAY. When the pattern is copied to the PERFORMER DISPLAY, the size parameters are also adapted to the performer.
PERFORMER DISPLAY	Shows the current life phase; its pattern is also used to calculate the next phase. It cannot be edited, patterns can only be copied to it from the BOARD DISPLAY (see also COPY and LENGTH). The grid behind the pattern is used to map the two-dimensional pattern onto a one-dimensional rhythmic sequence (see WRAP X/Y).
WRAP X/Y	Controls the projection of the pattern onto the audible sequence; the ratio between horizontal and vertical wrap parameters is visible as a grid within the PERFORMER DISPLAY.
OFFSET	Adds an offset to the WRAP X/Y parameters, thus altering the sequence by shifting it in time.
SENSIBILITY	Determines how many trigger signals are generated from the pattern of the PERFORMER BOARD. Turn to the right for dense trigger sequences, turn to the left for the opposite effect.

Newscool

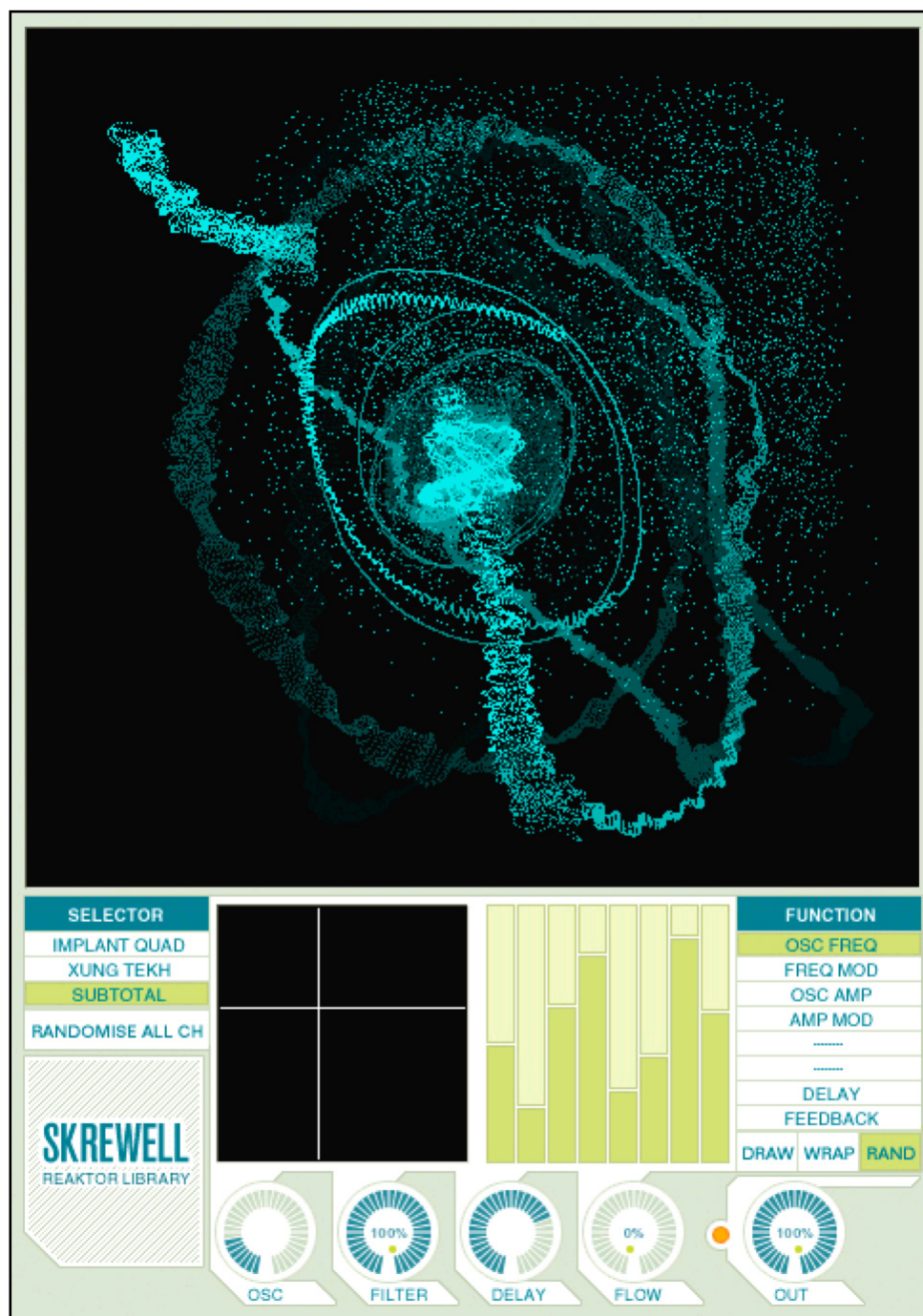
The sound engine consists of a tone generator (in the parameter list below referred to as TG) and a multi- effect unit. Both achieve their characteristic sounds via vast modulation of their parameters by two simple LFOs. Those parameters control eight independent synthesizer tracks that are triggered by the LIFE SEQUENCER; each of the tracks can be muted. The RANDOM button sets all those parameters to random values; within the TG / EFFECT Poly Control areas they can be controlled manually. The parameter shown within these displays is selected using TG / EFFECT PARAMETER SELECT controls.

TG POLY CONTROL	Sets the parameters for the tone generator. There are eight bars, one for each track; the value can directly be drawn into the display. The parameter displayed is selectable by TG PARAMETER SELECT.
TG MUTE TRACK	Switches the tracks' tone generators individually on or off.

TG PARAMETER SELECT	Selects which parameter of the tone generator is displayed and edited within TG POLY CONTROL. There are six parameters available: Pitch, Kick Amount, Frequency Modulation Amount, Ring Modulation Amount, Decay Time and Amplitude.
TG PARAMETER MODULATION	Displays the modulation value for each parameter; by clicking into the display the modulation of the respective parameter can be switched on or off. For modulation, a sine LFO is used (see TG MODULATION RATE/DEPTH/PHASE).
TG MODULATION RATE	Sets the speed of modulation in sequencer steps.
TG MODULATION DEPTH	Sets the amount of modulation.
TG MODULATION PHASE	Sets the phase of the sine LFO.
PITCH	Sets the absolute range of the pitch modulation. This is a bipolar control: turn the knob to the left for inverse modulation and to the right for normal modulation. There are individual (relative) values for each track adjustable in the TG POLY CONTROL.
FM	Sets the absolute amount of frequency modulation. There are individual (relative) values for each track adjustable in the TG POLY CONTROL.
DECAY	Sets the absolute decay time. There are individual (relative) values for each track adjustable in the TG POLY CONTROL.
DRIVE	Sets the amount of saturation drive applied to the tone generator's signal.
EFFECT POLY CONTROL	Sets the parameters for the tone generator. There are eight bars, one for each track; the value can directly be drawn into the display. The parameter displayed is selectable by EFFECT PARAMETER SELECT.
EFFECT MUTE TRACK	Switches the tracks' effect units individually on or off.

EFFECT PARAMETER SELECT	Selects which parameter of the effect unit is displayed and edited within EFFECT POLY CONTROL. There are six parameters available: pitch shift amount, pitch shift grain size, pitch shift delay time, filter frequency, decay time, and amplitude.
EFFECT PARAMETER MODULATION	Displays the modulation value for each parameter; by clicking on the display the modulation of the respective parameter can be switched on or off. A sine LFO is used for modulation (see EFFECT MODULATION RATE/DEPTH/PHASE).
EFFECT MODULATION RATE	Sets the speed of modulation in sequencer steps.
EFFECT MODULATION DEPTH	Sets the amount of modulation.
EFFECT MODULATION PHASE	Sets the phase of the sine LFO.
FILTER	Sets an absolute offset to the effect's filter frequency, shifting the individual values of each track that can be edited in the EFFECT POLY DISPLAY.
FEEDBACK	Sets the level of the signal that is routed from the effect's output back to its input.
DECAY	Sets an absolute offset to the effect's decay time, shifting the individual values of each track that can be edited in the EFFECT POLY DISPLAY.
MIX	Controls the ratio between the unprocessed, dry sound (at the left) and the effect's wet signal (at the right).
LEVEL	Sets the instrument's master level.
MUTE	Mutes the complete instrument.
RANDOM	Randomly sets all parameters of each track within TG PARAMETER DISPLAY and EFFECT PARAMETER DISPLAY.

2.3 Skrewell



Skrewell is an intuitive sound design workstation whose soundscapes can range from meditative atmospheres to crackling harshness. Its sound engine uses eight parallel oscillator sections (channels) that blend into one complex signal.

2.3.1 Using Skrewell in KORE or KORE PLAYER

All Skrewell sounds come with a single Control Page that provides immediate access to the relevant parameters. We added internal KORE effects to the Skrewell sounds to extend the sound mood possibilities.



- ▶ **Random:** Sets all parameters to random values. Note that this does not only affect the controls shown on the Control Page, but also parameters only visible in REAKTOR. As a result, this creates a sound impossible to create with the Control Page. To return to the original sound, reload the KORE SOUND.
- ▶ **Stereo:** Switches additional stereo manipulation on or off.
- ▶ **Volume:** Controls the master output volume.
- ▶ **Pitch:** Controls the sound's master pitch. This can be used to transpose the whole sound.
- ▶ **Cutoff:** Controls the sound's master filter frequency. Higher values create harsher sounds.
- ▶ **Flow:** Controls the inertia of the Skrewell machine. Higher values result in faster, more chaotic changes within the sound.
- ▶ **FX Mix:** Controls the balance between the signal of Skrewell and the additional KORE effect signal, created by different effect processors per sound.
- ▶ **Freq:** Controls the additional frequency shifter's amount of sound manipulation in this example. This knob can also be named differently when controlling other FX parameters.

- ▶ **EQ:** Controls the additional reverb's frequency response in order to create brighter or duller reverb signals. This knob can also be named different when controlling other FX parameters.
- ▶ **Delay:** Controls the sound's main delay amount. Note that the delay is part of the main Skrewell engine so changing this parameter often has huge impact on the overall sound.

2.3.2 Using Skrewell in REAKTOR

Operation Modes

There are three operation modes, each one based on a unique tone generator system. In Implant Quad mode, each channel consists of a pulse oscillator with subsequent feedback delay; within the delay line a normalizer and a filter alter the signal. Xung Tekh is similar, except the filter is placed before the feedback delay. Subtotal uses a parabolic waveform instead of the pulse waveform and omits the filter completely. The parameters of the tone generators are adjusted in the Sound Engine section.

OPERATION MODE	Selects the main way of operation.
RANDOMIZE ALL CH.	Sets all parameters of all channels to random values. Before using this function, lower the OUTPUT VOLUME to prevent unexpected bursts of noise!

Sound Engine

This section adjusts the parameters of the tone generators. Depending on the OPERATION MODE setting, a list of the currently available parameters is in the PARAMETER SELECT display. The selected parameter can then be edited within the EDIT AREA, where each bar represents one of the eight parallel oscillator units that form the tone generators.

FUNCTION	Switches between the various parameters that control the channels. Depending on the OPERATION MODE, there are different sets of available parameters. The values of the selected parameter are displayed for each oscillator section in the EDIT AREA.
EDIT MODE	Selects in which way the instrument interprets mouse movements within the EDIT AREA. DRAW allows direct adjustment of each bar. WRAP lowers / raises all bars simultaneously, keeping their ratio constant. If a value exceeds the value range it is mirrored. RAND performs random changes on all eight bars.
EDIT AREA	Displays the selected parameter, with one bar representing the parameter's value for each of the eight channels. Mouse movements within this area alter those values, controlled by the EDIT MODE.
DISPLAY CONTROL	Scales the Lissajous display.

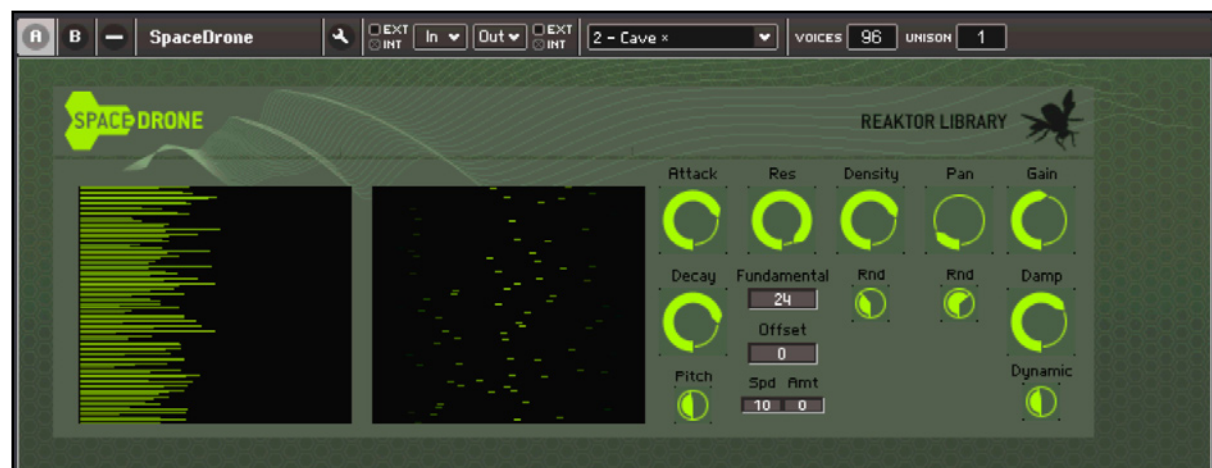
Master Controls

These master controls either scale the settings of the SOUND ENGINE section (e. g. DELAY TIME) or adjust additional tone generator parameters (e. g. FLOW AMOUNT). As they affect all eight channels of the tone generators simultaneously they can be used to alter the overall sound.

OSCILLATOR PITCH	Modifies the pitch of all channels. Technically, it controls a mapping function that modulates the values adjusted within the EDIT AREA for each channel. Only very high individual settings will result in high pitches if turned to the left, while less high values will be mapped onto low pitches; move to the right for the opposite effect.
FILTER CUTOFF	Modifies the filter cutoff frequency of all channels; see OSCILLATOR PITCH for technical details.
DELAY TIME	Modifies the delay time of all channels; see OSCILLATOR PITCH for technical details. By turning the knob to the left the delay times can be dramatically shortened, resulting in comb filter-like effects.

FLOW AMOUNT	Adjusts various amounts of modulation, depending on the selected OPERATION MODE, e.g. frequency modulation amount, amplitude modulation amount etc. Like the OSCILLATOR PITCH, this knob maps the individual channel's value. Turn to the left for less modulation and more inertia, turn to the right for the opposite effect.
OUTPUT VOLUME	Sets the master output volume. As slight variations of Skrewell's parameters might result in extreme volume changes, this control should be handled carefully. There is an additional MUTE button at the knob's left.

2.4 SpaceDrone



SpaceDrone generates atmospheric sound scapes which range from light rain or howling wind noises to deep and uncanny space sounds. Technically the instrument is based on 96 parallel voices spread across the frequency spectrum. Each voice consists of a noise generator; the signal's amplitude is shaped by an envelope, its frequency content gets modified by a bandpass filter, and finally it gets positioned in the stereo field.

2.4.1 Using SpaceDrone in KORE or KORE PLAYER

KORE SOUNDS based on SpaceDrone are equipped with two Control Pages: an Easy Page for fast and simple editing, and an Expert Page for more detailed sound tweaking.



- ▶ **Pitch:** Adjusts the direction and amount of pitch modulation. Low values create a down-up pitch change, high values result in an up-down movement. The movement's speed is controlled with Attack (the time required for the first movement, up or down) and Decay (the time required for the second part, down or up). High values of the Reso control make this effect more audible.
- ▶ **FFreq:** Controls the fundamental frequency. Use this to transpose the whole sound.
- ▶ **Damp:** Creates a duller sound at high values.
- ▶ **Reso:** Adjusts the resonance of the engine's parallel bandpass filters. Higher values increase the presence of sine-like sounds in the output signal, low values emphasize the noise part of the output.
- ▶ **FX Mix:** Controls the balance between the unprocessed signal and the effect signal of an additional reverb unit.
- ▶ **FX Rel:** Sets the release time of the reverb unit. Higher values create longer reverb tails.
- ▶ **Attack:** Controls the main attack time of the engine. This value specifies the amount of time one signal takes to fade in the mix of 96 parallel signals.
- ▶ **Decay:** Controls the main decay time of the engine. This value specifies the amount of time one signal takes to fade out the mix of 96 parallel signals.



- ▶ Gain: Sets the amount of amplification applied to each voice independently. Increase the value for a generally louder sound.
- ▶ Offset: Sets the offset of the filter harmonics: All 96 parallel signals are harmonics of the fundamental frequency (controlled by FFreq); all harmonics below the one adjusted here are skipped. Higher values transpose the final sound upwards, but also increase its harmonic tension.
- ▶ Dens: Sets the global density of the signal. Higher values result in a higher number of parallel signals at any one time.
- ▶ Dyna: Sets the dynamic range of the individual signals. At a maximum value all signals have the same loudness, at lower values the dynamics change randomly.
- ▶ FX Mix: Controls the balance between the unprocessed signal and the effect signal of an additional reverb unit.
- ▶ Diff: Sets the amount of diffusion of the reverb signal. Turn it to the right for a less echoic sound.
- ▶ Hi Cut: Sets the cutoff frequency of the lowpass filter that is damping the high frequencies within the reverb signal. Increase the value for a less sharp sound.
- ▶ Rel: Sets the release time of the reverb unit. Higher values create longer reverb tails.

2.4.2 Using SpaceDrone in REAKTOR

Sound Engine

The parameters of the sound engine are in the A panel of the instrument. They control the noise generators, their subsequent bandpass filters, the amplitude shaping envelope and corresponding triggering algorithm, and the pan, gain and damping of the signals.

ATTACK	Sets the time that passes until the amplitude envelope reaches its peak after triggering. The DENSITY knob controls speed at which the envelope is re-triggered.
DECAY	Sets the time that passes until the amplitude envelope completely fades out after it has reached its peak. The DENSITY knob controls speed at which the envelope is re-triggered.
PITCH	Sets the amount by which the amplitude envelope modulates the voice's pitch, i. e. the bandpass filter's center frequency. Turn to the left for inverse modulation – the higher the envelope signal, the lower the pitch. Turn to the right for the opposite effect.
RESONANCE	Sets the bandpass filter's resonance.
FUNDAMENTAL	Adjusts the fundamental frequency, i. e. the pitch of the lowest voice.
OFFSET	Sets the offset of the filter harmonics: All voices are harmonics of the fundamental frequency (see FUNDAMENTAL); all harmonics below the one adjusted here are skipped.
SPEED	Controls the rate at which a LFO modulates each voice's frequency randomly.
AMOUNT	Sets the amount by which the voice's frequency is changed by the random LFO.
DENSITY	Sets the speed at which each voice's amplitude envelope is re-triggered.

RANDOM	Sets the randomness of the re-triggering events. Turn to the left for completely regular re-triggering; turn to the right to give each voice a slightly varied re-triggering speed.
DYNAMIC	Sets the dynamic range of the amplitude envelope. Turn to the left to bind every voice to a constant maximum level; turn to the right to allow some (randomly picked) voices to be quieter.
PAN	Sets the rate at which each voice is rotated within the stereo field.
RANDOM	Sets the randomness of the panning speed. At high values each voice has a slightly different pan rate.
DAMP	Sets the amount of damping applied to high frequencies.
GAIN	Sets the amount of amplification applied to each voice independently.

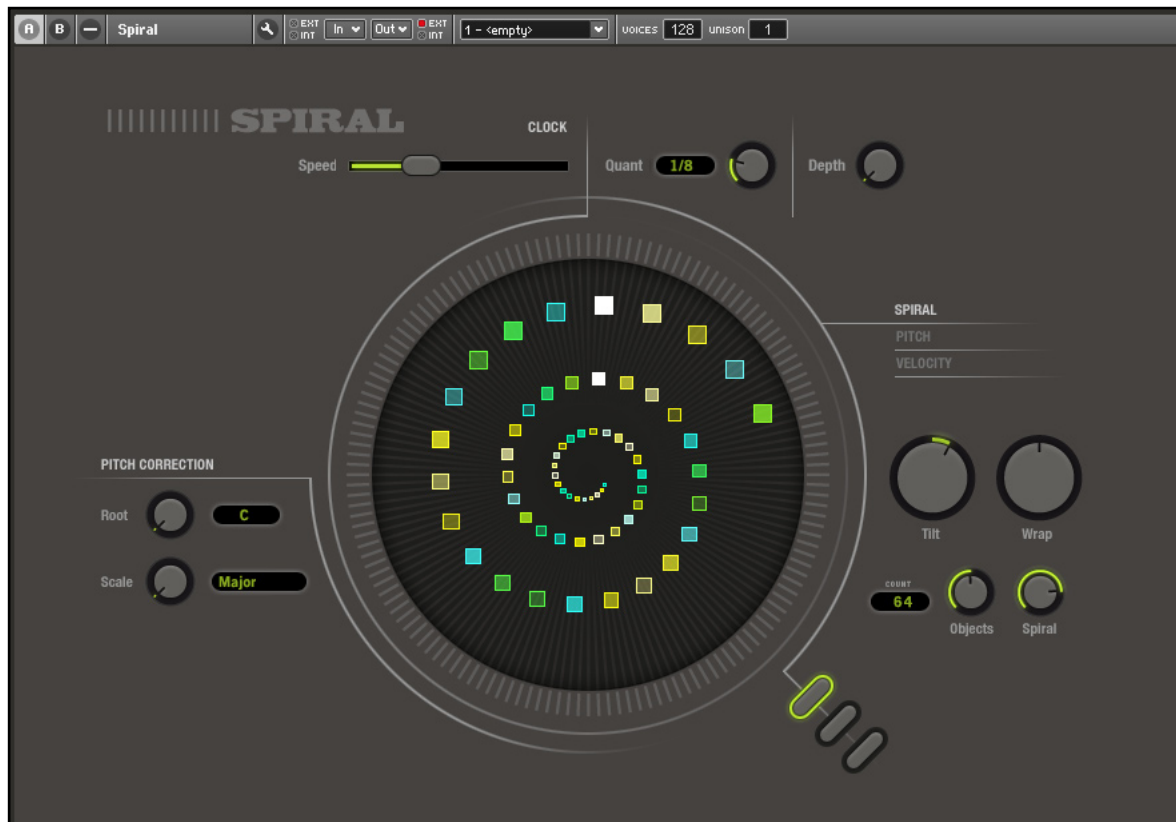
Reverb

The reverb unit is contained within the panel's B view. It can further enhance the spatial character of the atmospheric pads. When not in use it should be turned off by the **POWER** control to save CPU power. Although it is built completely within the new and efficient REAKTOR core layer, it is designed to produce high-quality reverberation sounds.

SIZE	Sets the size of the virtual reverberation room.
SYMMETRY	Places the signal in the virtual reverberation room. Turn to the left or right to move the signal away from the center.
DIFFUSION	Sets the amount of diffusion of the reverb signal. Turn to the right for a less echoic sound.

RELEASE	Adjusts the time that passes before the reverberation sound has decayed.
SPIN	Sets the amount of modulation applied to the reverb. Technically, the modulation affects the delay time of the delay modules on which the reverb is build.
FREQUENCY	Sets the rate of the LFO used as modulation source (see SPIN).
HIGH CUTOFF	Sets the cutoff frequency of the lowpass filter that is damping the high frequencies.
HIGH DAMP	Sets the amount of damping applied to the frequencies above the HIGH CUTOFF frequency.
LOW CUTOFF	Sets the cutoff frequency of the highpass filter that is damping the low frequencies.
LOW DAMP	Sets the amount of damping applied to the frequencies below the LOW CUTOFF frequency.
MIX	Crossfades between the unprocessed, dry signal (at the left) and the reverberated, wet sound (at the right).
POWER	Switches the reverb unit on or off. Turn off to save CPU power if the reverb is not used.


2.5 Spiral



Spiral has been newly developed for REAKTOR ANIMATED CIRCUITS. Purely a MIDI instrument, it does not create any sound by itself: it is used as drone-like sequencer for other instruments, and its generative algorithms create fractal melodies that merge mathematics with music.


The Spiral Ensemble comes in two versions: One contains the main Spiral instrument alone. It can be used in combination with any other instrument, such as REAKTOR or any other plug-in. We added Massive and FM8 sounds as sound generators in this instance for you to use. The other one combines Spiral with REAKTOR's Steampipe 2 instrument whose sounds complement Spiral's melodies. The following explanations focus on Spiral itself.

To understand the way Spiral works have a look at the picture above. It shows the Ensemble's panel within REAKTOR, focused on a central circular display. Several objects are located around the display's center, each with a specific distance. Each object has a specific speed that determines how fast it rotates around the center.

 Detailed information about Steampipe 2 can be found within REAKTOR 5's Instrument Guide.

The rotating objects turn into music by triggering MIDI notes. Each time an object passes a virtual pick-up line at the top of the display it creates a note according to the object's specific pitch, and velocity settings. (This note is visualized by a short blinking of the object.) By attaching any sound generator that listens to MIDI events to Spiral, you can create any type of sound with this experimental sequencer.

Nearly all other controls you see within the panel are used to control how pitch, velocity and rotation speed are assigned to the various objects. There is a pitch correction mechanism (for use if you prefer a minor scales for example) Also there is a more general section that determines the rotation's main speed as well as quantization to a MIDI clock (so that the melody remains synchronized to other MIDI events within REAKTOR, KORE or KORE PLAYER).

 You can find more information about setting up MIDI connections within REAKTOR in REAKTOR's main manual.

2.5.1 Using Spiral in KORE or KORE PLAYER

All KORE SOUNDS that incorporate Spiral have three Control Pages. The Spiral Realtime Page (see below) contains controls for realtime changes of the sequence, while the Spiral Settings Page (second illustration below) holds more static settings. The third page controls the sound generators being used for the KORE SOUNDS.



- Pitch: Controls the central pitch of the melody. The pitch values of all objects are grouped around this center. Increase or decrease this value to transpose the whole melody.
- Step P: Controls the difference in pitch between two adjacent objects. Higher values result in more complex melodies.

- ▶ Shift P: Controls the initial object's pitch (from which all other pitch values are derived dependent on the Step control) in relation to the central pitch. It can be used to create a variation of an existing melody.
- ▶ Spread: Controls the pitch range of the melody. High values result in a very widespread melody, while low values concentrate all objects' pitch values around the central pitch.
- ▶ Vel: Controls the central velocity of the melody. The velocity values of all objects are grouped around this center. Increase or decrease this value to change the whole melody's loudness or other parameters assigned to velocity.
- ▶ Step V: Controls the difference in velocity between two adjacent objects. Higher values result in more complex melodies.
- ▶ Shift V: Controls the initial object's velocity (from which all other velocity values are derived dependent on the Step control) in relation to the central velocity. It can be used to create a variation of an existing melody.
- ▶ Range: Controls the velocity range of the melody. High values result in a very wide-spread velocity range, while low values concentrate all objects' velocity values around the central velocity value.



- ▶ Speed: Controls how fast the objects are rotating around the center, correlated to the MIDI clock. It can therefore be used to increase or decrease the general density of notes.
- ▶ Quantize: Determines to which rhythmical grid all notes are quantized, e.g. a sixteenth note. Whether quantization is active or not depends on the Depth control.

- ▶ **Depth:** Specifies to which extent trigger events are delayed in order to match the rhythmical quantization grid. At a minimum value, a note is triggered immediately when an object passes the virtual pick-up line. At a maximum value, the trigger signal is delayed until the MIDI clock reaches the next full quantization value, e.g. the next full sixteenth note. This control can become very effective when using values just below the maximum: The rhythmical grid will become audible, but it will be interpreted with slight inaccuracies due to human interpretation and perception.
- ▶ **Root:** Specifies the root pitch of the scale. Use it to change the harmonic “color” of the melody.
- ▶ **Objects:** Control the number of objects rotating around the display’s center. The higher the number, the higher the density of notes triggered by the Spiral sequencer.
- ▶ **Step S:** Controls the difference in speed between two adjacent objects. Higher values result in more complex melodies.
- ▶ **Shift S:** Controls the initial object’s speed from which all other speed values are derived dependent on the Step control. It can be used to create a variation of an existing melody.
- ▶ **Spiral:** Controls how much the individual objects differ in speed. The higher the value, the faster fast objects will rotate while slow objects will remain slow. This can be used to increase the “chaos” aspect of a melody. However as it strongly interacts with the Step control, it needs to be used experimentally together with the other parameters.

2.5.2 Using Spiral in REAKTOR

As to be seen in the panel illustration above, there are four main areas within the panel: Pitch Correction on the left side, Spiral, Pitch and Velocity on the right, with the central display and Clock positioned in the center.

Clock

The controls of the clock section determine in which way Spiral reacts to an incoming MIDI clock signal. This signal is created by REAKTOR (if Spiral is used in REAKTOR stand-alone), KORE (if Spiral is used as part of a KORE SOUND) or in any other host (if KORE

is used as a plug-in). As the same clock signal is sent to all instruments, it automatically synchronizes their rhythmical activities.

SPEED	Controls how fast the objects rotate around the center, correlating to the MIDI Clock. It influences the rotation speed of all objects simultaneously and can therefore be used to increase or decrease the general density of notes: The faster an object rotates, the earlier it triggers a new note by passing the virtual pick-up line.
QUANT	Determines to which rhythmical grid all notes are quantized, e.g. a sixteenth note. Whether quantization is active or not depends on the Depth control.
DEPTH	Specifies to which extent trigger events are delayed in order to match the rhythmical quantization grid. At a minimum value, a note is triggered immediately when an object passes the virtual pick-up line. At a maximum value, the trigger signal is delayed until the MIDI clock reaches the next full quantization value, e.g. the next full sixteenth note. This control can become very effective when using values just below the maximum: The rhythmical grid will become audible, but it will be interpreted with slight inaccuracies due to human interpretation and perception.

Pitch Correction

With the controls of this section, the generated notes can be re-organized so that they fit a musical scale. As explained above, each rotating object has a specific pitch value which is used when triggering a note. These pitch values can be adjusted within the Pitch tab (explained below), yet these values come from the chromatic scale: They contain all twelve pitch classes (c, c#, d, d# and so on). Often, Spiral's melodies become more musically usable when restricting the pitch classes to a traditional scale like the major scale, where only seven distinct classes are used (c, d, e, f and so on).

SCALE	Determines the scale to which all pitch values are mapped. Major and Minor are commonly known, but all others can also be used when the actual scale is undefined. They can be treated as colors that are blended onto the melodies.
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ROOT	Specifies the root pitch of the scale. For example if Scale is set to major, a value of “C” will result in a C major scale (C, D, E, F and so on). Consequently, C# will use a C# major scale (C#, D#, E#, F# and so on).
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Spiral, Pitch and Velocity

These three tabs control the values for rotation speed (Spiral tab), pitch and velocity are assigned to each object. Within the Spiral tab the number of rotating objects can be controlled as well.

These values are the main controls to manipulate the fractal melodies of the Spiral ensemble. Note that their usage is simpler than their detailed explanation. If the following descriptions don't help, just try experimenting!

SPIRAL OBJECTS	Controls the number of objects rotating around the display's center. The higher the number the higher the density of notes triggered by the Spiral sequencer.
SPIRAL SPIRAL	Controls how much the individual objects differ in speed. The higher the value, the faster fast objects will rotate while slow objects will remain slow. This can be used to increase the “chaos” of a melody. However as it strongly interacts with the Step control it needs to be used experimentally, together with the other parameters.
SPIRAL STEP	Controls the difference in speed between two adjacent objects. Higher values result in more complex melodies. Technically speaking, all objects are aligned along a line. The Step parameter defines how much faster the next object within this line is, in relation to its predecessor. However, at a maximum level (which is defined by the Spiral parameter) the Step value is inverted, so that the next object is slower than its predecessor. At the minimum speed level, the Step value is inverted again, so that objects become faster again - and so on, until all objects have a specific speed. High Step levels increase the frequency of those inversion points, and thus the melody's variation.

SPIRAL SHIFT	Controls the initial object's speed from which all other speed values are derived, dependent on the Step control. It can be used to create a variation of an existing melody.
PITCH PITCH	Controls the pitch range of the melody. High values result in a very widespread melody, while low values concentrate all objects' pitch values around the central pitch.
PITCH SPREAD	Controls the pitch range of the melody. High values result in a very widespread melody, while low values concentrate all objects' pitch values around the central pitch.
PITCH STEP	Controls the difference in pitch between two adjacent objects. Higher values result in more complex melodies. All objects are aligned along a line and The Step parameter defines by how many semitones the next object's pitch is above its predecessor's. At a maximum level (which is defined by the Spread parameter) the Step value is inverted so that the next object has a lower pitch than its predecessor. At the minimum pitch level (also defined by the Spread parameter), the Step value is inverted again, so that objects become higher. This process continues until all objects have a specific pitch. High Step levels increase the frequency of those inversion points and therefore the melody's variation also
PITCH SHIFT	Controls the initial object's pitch (from which all other pitch values are derived dependent on the Step control) in relation to the central pitch. It can be used to create a variation of an existing melody
VELOCITY VELOCITY	Controls the central velocity of the melody. The velocity values of all objects are grouped around this center. Increase or decrease this value to change the whole melody's volume..
VELOCITY SPREAD	Controls the velocity range of the melody. High values result in a very widespread velocity range, while low values concentrate all objects' velocity values around the central velocity value.

VELOCITY STEP	Controls the difference in velocity between two adjacent objects. Higher values result in more complex melodies. All objects are aligned along a line and The Step parameter defines how much louder the next object is in relation to its predecessor. At a maximum level (which is defined by the Spread parameter) the Step value is inverted, therefore the next object is quieter than its predecessor. At the minimum velocity level (again defined by the Spread parameter), the Step value is inverted again so that objects become louder. This process continues until all objects have a specific velocity. High Step levels increase the frequency of those inversion points and therefore the melody's variation also
VELOCITY SHIFT	Controls the initial object's velocity (from which all other velocity values are derived dependent of the Step control) in relation to the central velocity. It can be used to create a variation of an existing melody.

3. Credits

Original Ensembles by Mike Daliot, Martijn Zwartjes, Lazyfish

Additional Ensemble modifications by Dietrich Pank

Sound Design Concept & Specification: Tobias Menguser

Additional Sound Treatment: Alex Hofmann

Sound Design: Antonio Blanca, Dietrich Pank, Jeremiah Savage, Matthias Fuchs, Thomas Binek (tasmodia), Thomas Koot

Graphic Design for Spiral: Gregory Pinot

Documentation: Cornelius Lejeune, Tobias Menguser, Ema Jolly