Manual

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Special thanks to the Beta Test Team, who were invaluable not just in tracking down bugs, but in making this a better product.

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1 Welcome to DEEP FREQ

Thank you very much for purchasing DEEP FREQ. DEEP FREQ is a KORE Instrument that…

This manual will help you get started with DEEP FREQ. If you want to start immediately, proceed to section ↑2, Installation and Activation. Please read that chapter carefully and fully, as it explains all the steps required to integrate DEEP FREQ into KORE 2 / KORE PLAYER. Following the Installation chapter is an explanation of the general usage of KORE Sounds within KORE 2 / KORE PLAYER in chapter ↑3, How to Use a KORE Instrument. If you are already familiar with KORE 2 / KORE PLAYER, this will be straightforward, but it might be worth a look nonetheless. Finally, chapters ↑4, Content Description, ↑5, The Ensembles and ↑6, Using DEEP FREQ of this manual add some more details regarding the specific content and usage of DEEP FREQ.

And now, let's get started…

2 Installation and Activation

The following section explains how to install and activate DEEP FREQ. Although this process is pretty much straightforward, please take a minute to read these instructions as it might prevent common problems.

2.1 Installing DEEP FREQ

After downloading a KORE Instrument, unzip the compressed archive you received from Native Instruments. It contains the installer application.

! Please install KORE 2 or KORE PLAYER before installing this KORE Instrument! Otherwise, Paranormal Spectrums will not work properly.

To install DEEP FREQ, double-click the installer application and follow the instructions on the screen. The installer application automatically places the new KORE Sound content files into the folders that KORE 2 / KORE PLAYER expects them to be in. In the course of the installation procedure, the installer application asks you to specify another folder for additional files.

2.2 Activating DEEP FREQ

When installation is finished, start the Service Center, which was installed with KORE 2 / KORE PLAYER. It will connect your computer to the Internet and activate your DEEP FREQ installation.

! Activation of KORE Instruments is optional. However, it will give you access to free updates.

! If your computer is not connected to the Internet, please consult the separate Setup Guide, which is included with your KORE 2 / KORE PLAYER package. It explains the offline activation procedure and contains detailed information about using the Service Center. It is also a reference if you experience problems with the activation process.

In order to activate your copy of DEEP FREQ, you have to perform the following steps within the Service Center:

1. **Log in**: Enter your Native Instruments user account name and password on the initial page. This is the same account information you used in the Native Instruments Online Shop when buying your KORE Instrument and for other Native Instruments product activations.
2. **Select products**: The Service Center detects all NI products on your computer that have not yet been activated and lists them. You can activate multiple products at once.
3. **Activate**: After proceeding to the next page, the Service Center connects to the Native Instruments server and activates your products.
4. **Download updates**: When the server has confirmed the activation, the Service Center automatically displays the Update Manager with a list of all available updates for your installed products. Please make sure that you always use the latest version of your Native Instruments products to ensure proper functioning.

Downloading updates is optional. After activation is complete, you can always quit the SERVICE CENTER. Now, you are ready to use DEEP FREQ. Please start KORE 2 / KORE PLAYER in stand-alone mode. This will trigger the database update process automatically and integrate new KORE Sounds into KORE 2's / KORE PLAYER's database.

3 How to Use a KORE Instrument

The following sections will give you a brief overview over some basic operations: you will learn how to search for sounds you have in mind and how to load and play KORE Sounds. For details on these topics, please read the KORE 2 / KORE PLAYER manual.

3.1 Finding a KORE Sound

All DEEP FREQ KORE Sounds are directly integrated into KORE 2's / KORE PLAYER's database. They will show up in the Browser's Search Results list alongside all the other sounds matching specific search criteria.

Searching for Sounds by Attribute

You can select a combination of Attributes in the Browser. The Sounds that match the Attributes' criteria will show up in the Search Results list. To do so:

- Click on the Attributes in the Browser. You can select multiple Attributes from an Attribute set by holding [Ctrl] (on Windows) or [Cmd] (on Mac) while clicking.

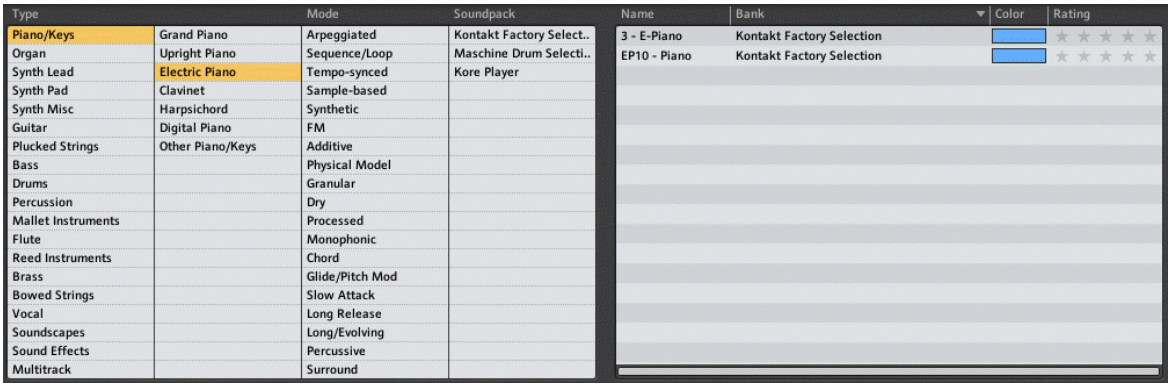

Fig. 3.1 KORE PLAYER's Browser (left) with a combination of Instrument Attributes selected, and the corresponding results in the Search Results list (right).

Searching for Sounds by Instrument

> **!** KORE 2 users: if the Soundpack column is not visible in the Attributes List, right-click on the Attributes List header and select the *Soundpack* entry in the upcoming context menu.

To restrict your search results to a specific Instrument's sounds:

- Select the desired Instrument in the Soundpack column of the Attributes List. The Search Results list shows the entire content of this particular pack.

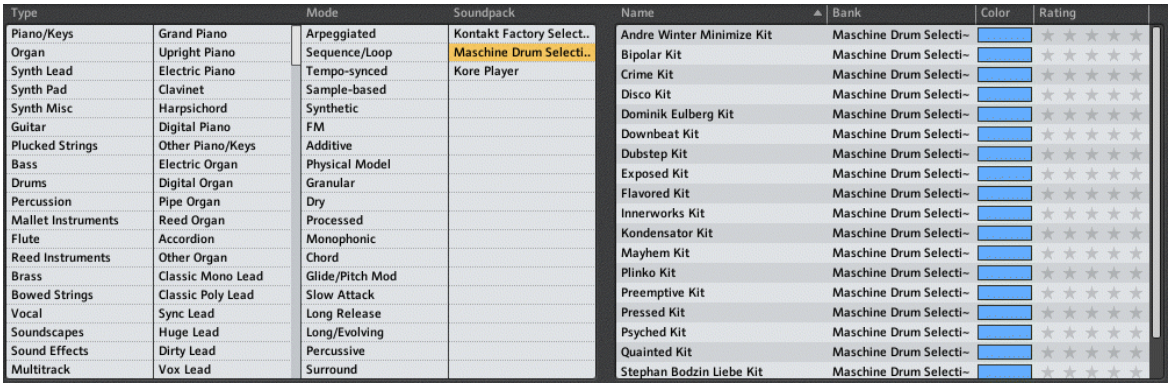

Fig. 3.2 KORE PLAYER Browser (left) and Search Results list (right) with MASCHINE Drum Selection highlighted.

Searching for Sounds via Full Text Search

There is another way to restrict your search results to your specific pack's sounds:

- Enter the KORE Instrument's name into the Quick Search field of the Browser, or even just a part of the name—for example, "paranormal." The corresponding KORE Sounds automatically appear in the Search Results List.

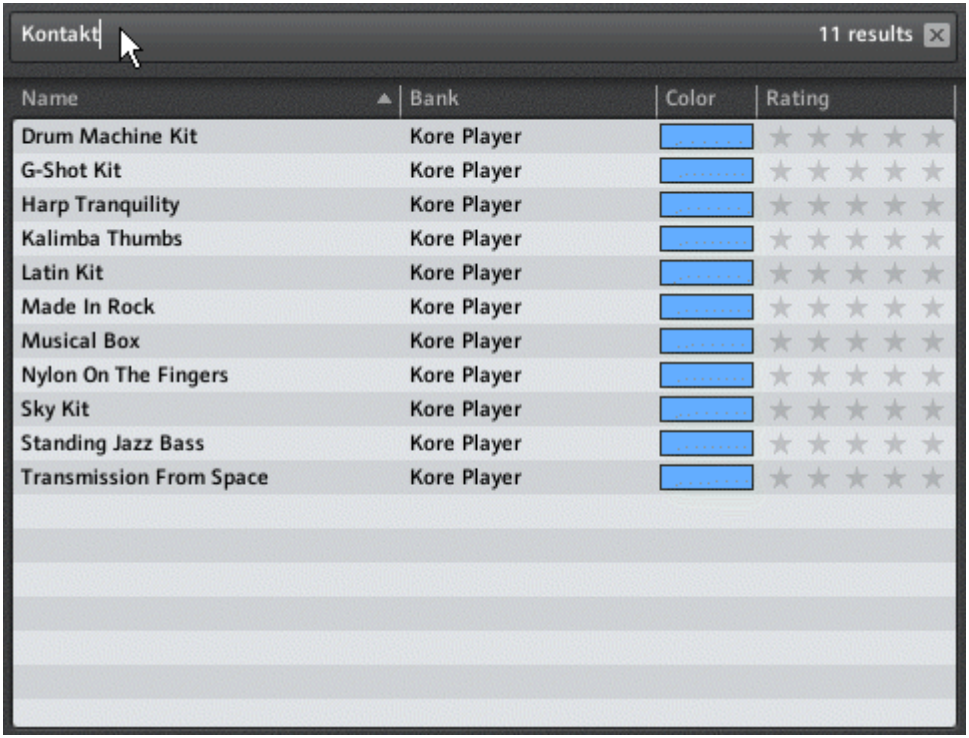

Fig. 3.3 The Quick Search field above the Search Results list.

Sorting Results by Instrument Bank Name

If you don't want to limit the results to a specific KORE Instrument, but do want to have the display grouped by Instruments, you can sort the list by Instrument bank names. To do so:

- Right-click the Search Results List's header row and activate the Bank entry in the upcoming context menu. This will show each KORE Sound's bank name in a new column of the Search Results List. Now click the Bank column's header to sort the list according to this specification.

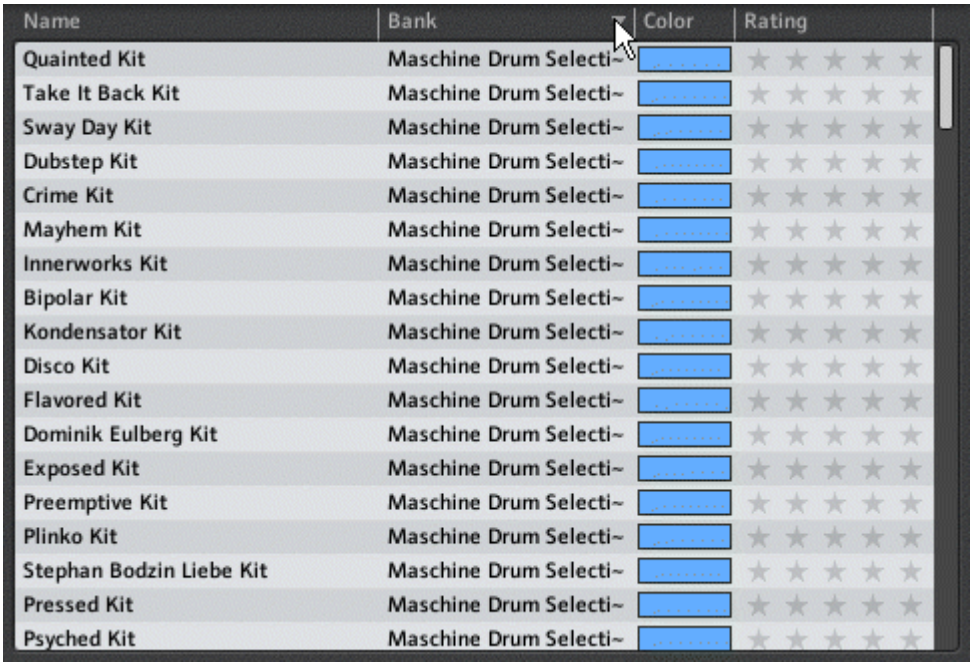

Fig. 3.4 The search results sorted by Instrument bank name.

3.2 Loading a KORE Sound

3.2.1 Loading a KORE Sound in KORE PLAYER

To load a KORE Sound in KORE PLAYER:

- Double-click its entry in the Search Results list. Alternatively, you can drag it onto KORE PLAYER's Global Controller. Both actions replace the currently loaded KORE Sound—if it is the first KORE Sound you load after start-up, it will replace an "empty" KORE Sound.

Fig. 3.5 Dragging a KORE Sound onto the Global Controller.

When a KORE Sound is loaded, its Control Page is mapped onto the Global Controller. This preassigned Control Page gives you access to the KORE Sound's most important parameters. The exact buttons and knobs assignments on the Control Page are specific to each KORE Sound, as well as the number of Control Pages. With the Global Controller, you also have immediate control over the KORE Sound's Variations. Please refer to the KORE PLAYER manual for details about Control Pages and Sound Variations.

If you use KORE PLAYER as a plug-in in a host environment, you can save the positions/states set on the eight knobs and eight buttons of the Control Page; saving the host's project saves all settings of all incorporated plug-ins and also all changes made to a KORE Sound loaded.

3.2.2 Loading a KORE Sound in KORE 2

To load a KORE Sound in KORE 2:

- Double-click its entry in the Search Results list. Alternatively, you can drag it onto KORE 2's Global Controller. Both actions replace the currently loaded KORE Sound—if it is the first KORE Sound you load after start-up, it will replace an "empty" KORE Sound.

Fig. 3.6 Dragging a KORE Sound onto the Global Controller.

If you want to place the KORE Sound into a specific Channel Insert within the Edit Area (instead of loading the KORE Sound into the focused one), you can also drag it directly onto the Sound Matrix.

When loaded, the KORE Sound will automatically be displayed, so that its Control Pages are directly mapped onto the Global Controller. If you are using the KORE 2 Controller, the mappings stored in the Control Pages are reflected in the Controller. Via the preassigned User Page, you have access to a KORE Sound's most important parameters: The exact button and knob assignments on the User Page are specific to each KORE Sound. With the

Global Controller, you also have immediate control over a KORE Sound's Variations (the different "shapes" of a KORE Sound, which can be selected via **A** to **H** in the Sound Variation grid).

If these terms are completely new to you, chapter 3.1 of the KORE 2 manual provides general information, and chapter 3.1.4 covers the Control Page system and Sound Variations.

4 Content Description

4.1 About DEEP FREQ

DEEP FREQ [dip frik] is the second KORE Instrument effects pack by Surround SFX, picking up where we left off with DEEP RECONSTRUCTIONS. Where DEEP RECONSTRUCTIONS focused on re-arranging a signal in time, DEEP FREQ is all about warping, bending, shifting, mangling and other mutilations of sound in terms of frequency. That's not to say there isn't any time-altering stuff going on, there's lots of that really, but the main object of DEEP FREQ is frequency. Like it's cousin, DEEP FREQ is designed to turn your signal into something completely different; no cuddly, friendly, care-bear-type processing included. It's also designed to do that with maximum speed and ease, much like you'd use certain popular outboard effects devices: you can get by, using presets because they already sound awesome, but if you want to roll your own, turning one of the knobs a little way can take you from completely mad to utterly insane processing within seconds, without leaving the realms of usable results. If you have to remix a tune and one track beats the other for uninspired boringness, if you're suffering from an acute case of "inspiration is out for lunch," or if you're simply looking for a particularly unique effect, DEEP FREQ was designed to sort you out. You'll surely get the idea by now so let us continue with some more technical info.

4.2 Feature Overview

DEEP FREQ contains 150 multi-effects patches, created using the GUITAR RIG 4, ABSYNTH 5 and KORE 2 engines, as well as four REAKTOR ensembles, custom-tailored for this release. Each of the patches features a unique and very complex signal flow structure, as well as eight sound variations for a total of 1200 effects.

4.3 Included Effect Types

As what kind of effect would you declare a four-voice resonator feeding into multiple parallel busses, each of which contains a different combination of delays, pitch-shifters, frequency shifters, reverbs, filters, ring-modulators, and each of which feeds back into the resonator in varying amounts? The answer is, it's hard to categorize. The above description is probably the most concise way of describing what's going on, and it would sound very differently for each of the patches.
But while it is difficult to categorize these effects, they have one thing in common: the focus is on frequency manipulation. So pitch-shifters, granular delays/shifters, frequency-shifters, filters, equalizers, tone-controls, ring-modulators, resonators, phasers, flangers, pseudo-resynthesizers, oscillating feedback loops, FM-effects, fuzz-boxes and the like make up for most of the modules in the signal processing chains. But don't worry, there also are many, many delays, reverbs, compressors, tape-echos, reversers, loopers, choruses, limiters, cross-faders, auto-panners, tremoloes and such to be found in DEEP FREQ. We'll describe some of the DEEP FREQ signal processing structures in the next section.

4.4 Example Signal Flow Structures

Describing the structures of all of the 150 KORE Sounds would be beyond the scope of this manual, but lets have a look at a few examples in the following sections.

4.4.1 Buttbeard

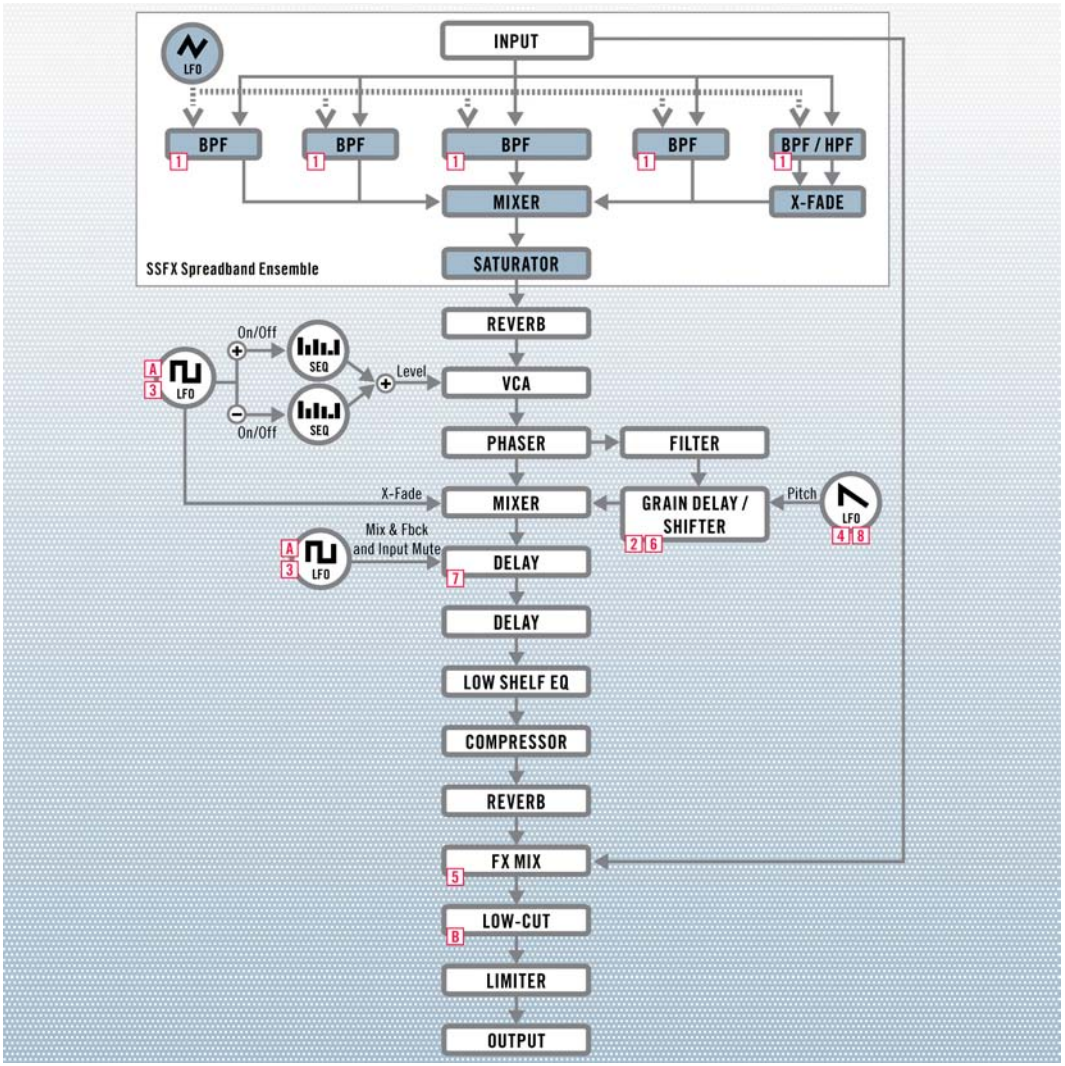

Fig. 4.1 Buttbeard signal flow.

Fig. 4.2 Buttbeard KORE Controller Page.

In the Buttbeard KORE Sound, the signal first passes through an instance of the SSFX Spreadbands ensemble, where a LFO modulates the spacing between five bandpass filters while the same LFO is inverted and used for modulating the center frequency of the filter array. The result of that is that while the center frequency of the array is lowered, the spacing between bands is increased, so the listener gets the idea that the cutoff frequency is lowered, while there still is high frequency content audible. To further support this effect, the top band output is crossfaded a little towards high-pass. The signal is then passed through a Reverb followed by an amplifier/attenuator, which is used to impose a rhythm onto the signal under step-sequencer control—think “trance gate” (but cool). The Reverb is used to make the effect more pronounced by making sure that there’s more of a continuous signal running into the amplifier. The sequencer controlling the amplifier is actually two step-sequencers, being alternatingly switched on and off by a square-wave LFO; this is done to generate a longer and more complex pattern than possible with just one sequencer. The output of the amplifier is fed into a phaser, after which the signal path is multed to two busses, one that carries just the phaser output and one that runs through a filter and an LFO-controlled granular pitch-shifter. The two busses are fed into a crossfade module, which is used to switch between the two sources under control of the same square-wave LFO that is used to switch sequencers. Next, we’re patching that into a delay used as freezer/looper by modulating feedback amount, input mute and dry/wet mix with a second square-wave LFO. After sending the result through another delay for a little bit of tempo-synced echo, a low-shelf EQ is applied to prevent intermodulation distortion in the following compressor. Another reverb is used to add a little shine to the signal before it hits the dry/wet mix stage where the original signal is mixed back in. Finally, a low-cut fil-

ter and a look-ahead limiter ensure that the results are kept in non-speaker-damaging territory. Now you know why we can't describe 150 KORE Sounds: it would take more than 150 pages to do so and anybody bold enough to read all of them would run the risk of a serious brain-meltdown.

4.4.2 Finite Wire

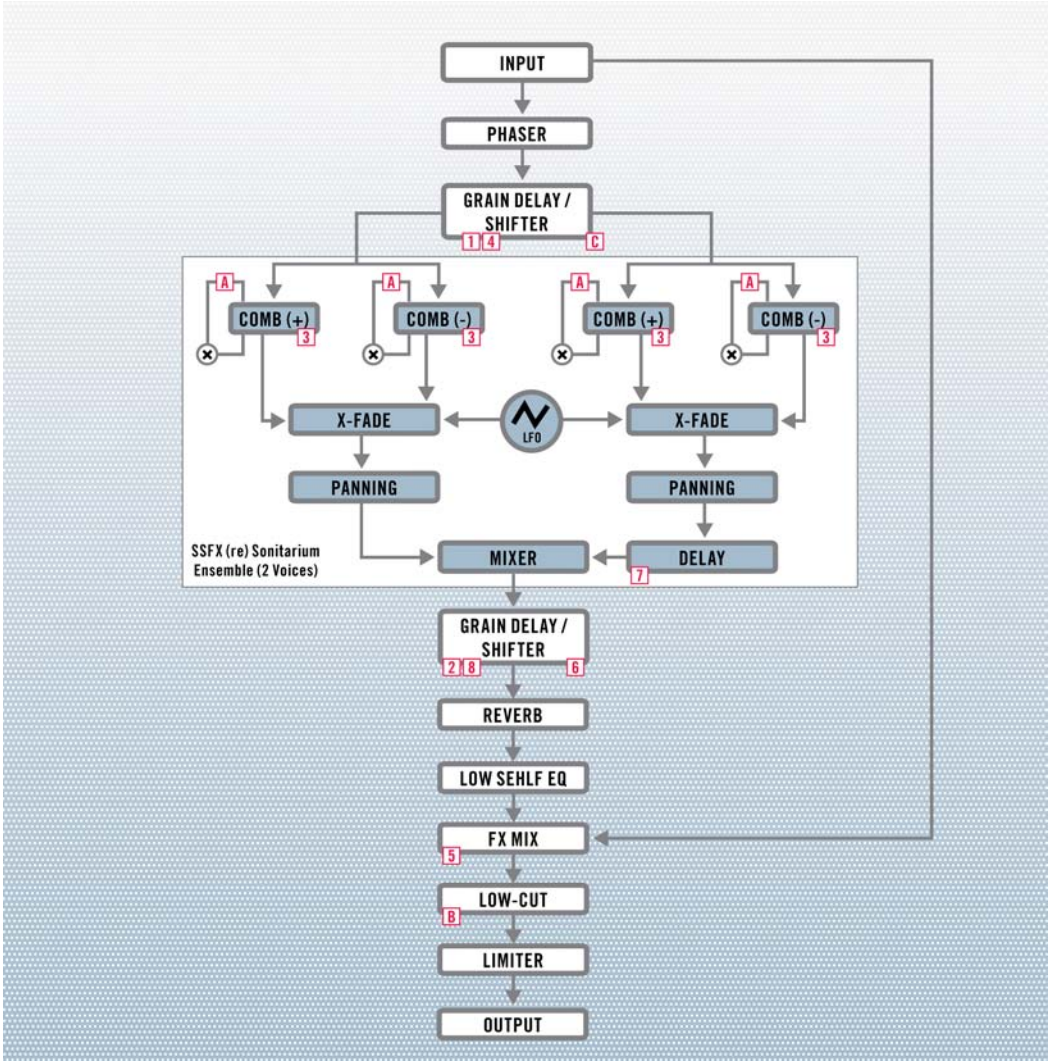

Fig. 4.3 Finite Wire signal flow.

Fig. 4.4 The Finite Wire KORE Controller Page.

In Finite Wire, the signal is first passed through a phaser and a granular pitch-shifter/delay, where the idea is that the resonances of the phaser are transposed in the pitch-shifter, before
being fed into an instance of the SSFX (re)Sonitarium ensemble. The SSFX (re)Sonitarium is set to be a two-voice resonator where an LFO is used to modulate the odd/even harmonics balance, and the two voices are panned hard left and hard right with the right voice being delayed by 3/16th notes. In this stage, harmonics are generated on top of the transposed & granulated phaser resonances. We're then feeding this into another granular pitch-shifter/delay that transposes the resonances added in the SSFX (re)Sonitarium along with the signal. Next, the signal is sent to a reverb for sweetening, and a low-shelf EQ for cleaning up any excessive low-frequency content generated by the pitch-shifters, before reaching the the dry/wet crossfade. A low-cut and a limiter make up the final output stage.

4.4.3 De-Facto Chimp

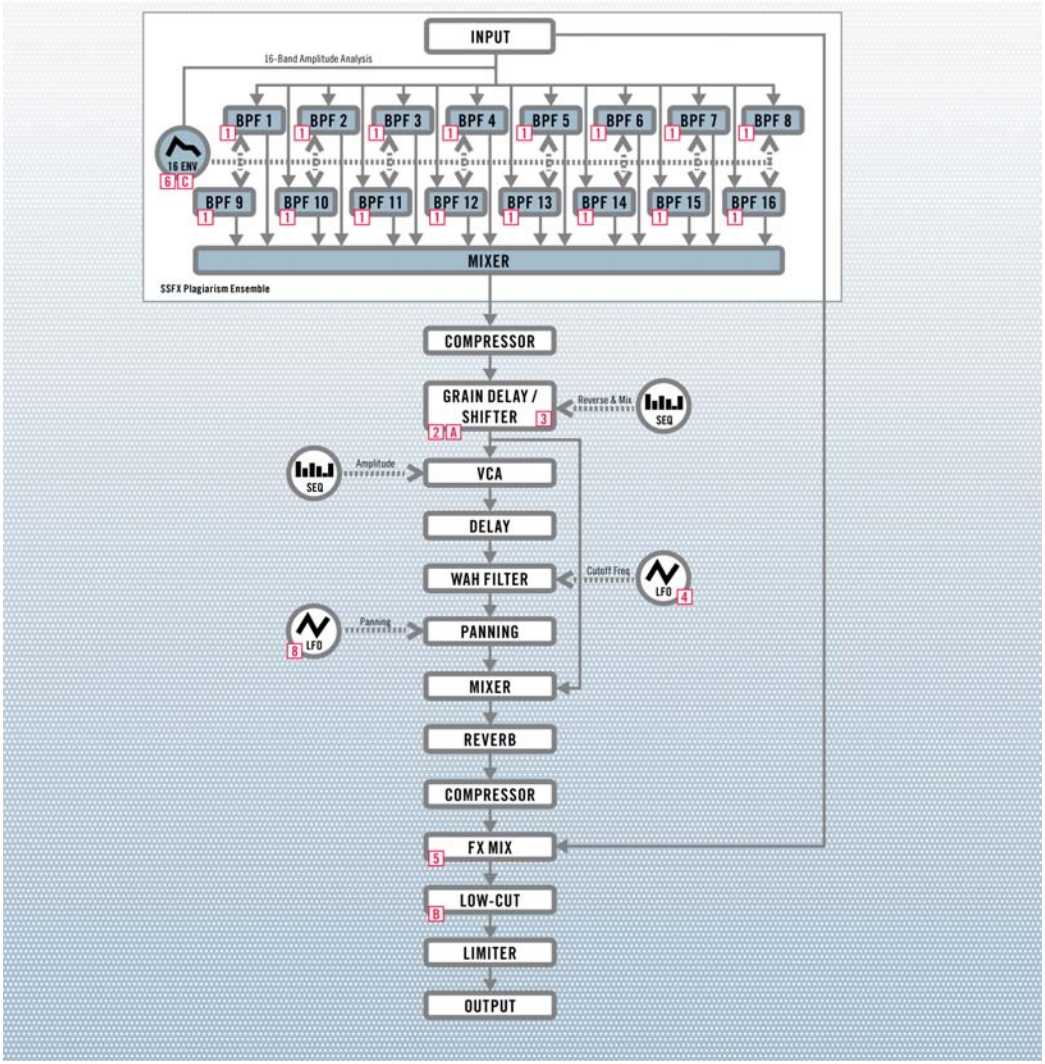

Fig. 4.5 De-Facto Chimp signal flow.

Fig. 4.6 The De-Facto Chimp KORE Controller Page.

This patch starts out with the input signal passing through an instance of the SSFX Plagiarism ensemble running in 16 BPF mode. We are then applying a compressor to the filtered signal to get it back into a predictable level range and feed it into a granular pitch-shifter delay under step-sequencer control—the sequencer is switching the reverse mode of the granular delay on and off, while also switching it in and out of the signal path. In the next processing stage, the signal is sent to a parallel path consisting of a sequencer controlled gate, which is triggered for the duration of a quarter note on the beginning of each bar, a feedback delay, an LFO-controlled Wah-Filter and an auto-panner where panning is modulated by another LFO, kind of like you'd occasionally open the send to a tape delay when producing dub music, but automated. This parallel path is then mixed in and the result is sweetened with a little spring reverb before hitting another compressor, the dry/wet mixing stage, a low-cut filter and a limiter.

5 The Ensembles

5.1 Overview

The four REAKTOR ensembles included with DEEP FREQ are:

1. **(re)Sonitarium**, a four-voice resonator that allows crossfading between even and odd harmonics per voice. There are two LFOs, an envelope follower, a delay and a filter per voice as well as macro controls for fast editing as well.
2. **Plagiarism** synthesizes a completely new signal out of 16 Oscillators or Bandpass Filters whose amplitudes are derived from the amplitude envelope of the input signal, and whose frequencies are controlled by a look-up table containing various frequency maps, including the harmonic series, odd/even harmonics, reverse-ordered harmonic series, stacked fifths etc.
3. **Spreadbands** consists of five parallel filters in Bandpass mode. Their frequencies are defined via the center frequency of the middle band and the "Spread" parameter, which sets the distance between adjacent bands in semitones. The lowest and highest bands can be crossfaded between Bandpass and Lowpass and Highpass modes, respectively. An oversampled Saturator can be used for thickening.
4. **Modul8** contains three separate, crazy modulation effects that are hybrids between chorus, granular and pitch-shifting circuits. You can think of them as “circuit bent pitch-shifters” or something like that.

In order to make these Ensembles accessible to users who do not own a REAKTOR license, four KORE Sounds are wrappers for them, giving access to all their parameters. They can easily be identified by their prefix “SSFX.”

5.2 (re)Sonitarium

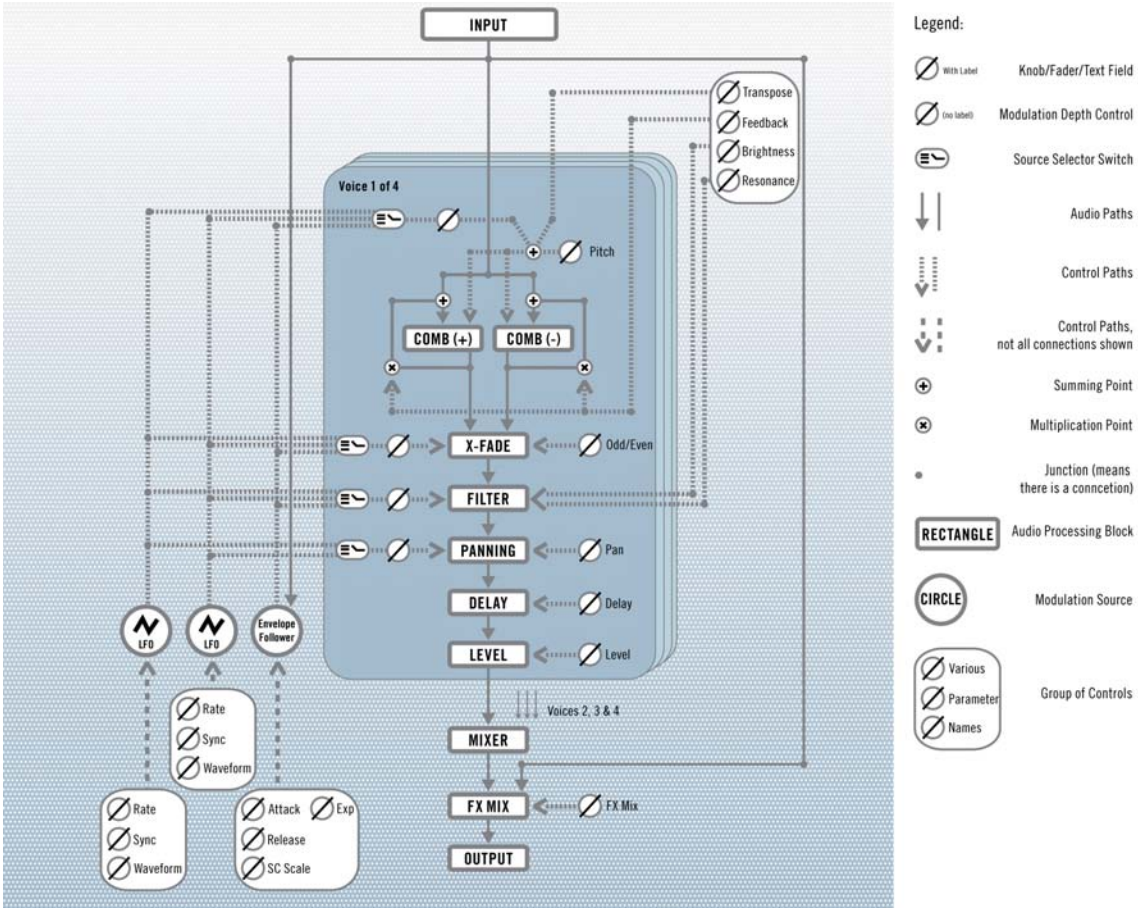

Fig. 5.1 Signal flow of (re)Sonitarium.

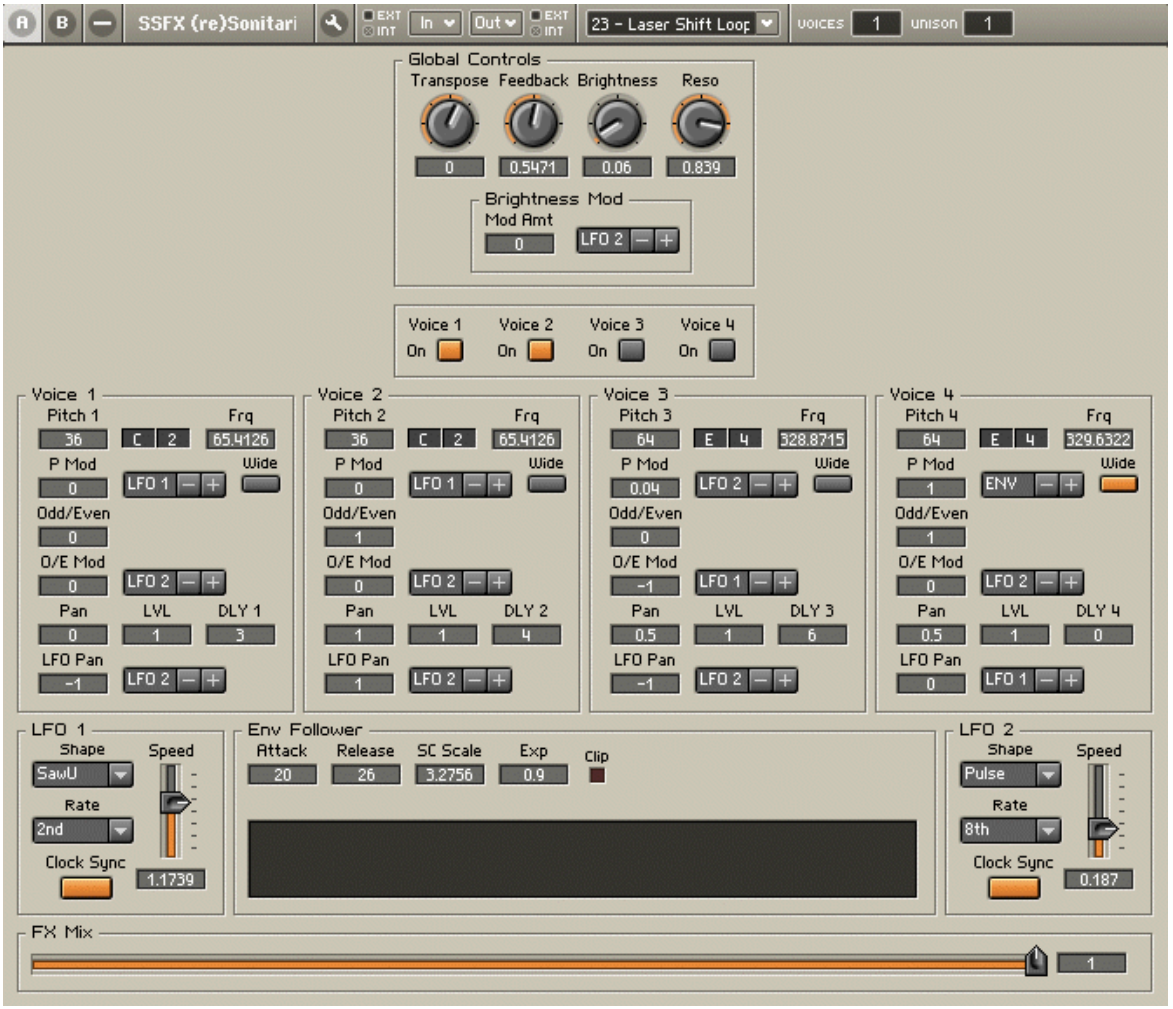

Fig. 5.2 (re)Sonitarium control page.

The SSFX (re)Sonitarium ensemble consists of four separate resonator voices with a twist: it is possible to crossfade between odd and even numbered harmonics, which gives very interesting and unique results. Additionally, the voices feature a lowpass filter after the resonator, which is linked to the pitch of the resonator to create “damping” type effects.

The filter cutoff frequency can be offset to allow more harmonics to pass, can resonate and can be modulated. Each voice features modulation options for pitch, odd/even balance and panning, as well as a tempo-synced delay to shift the voices against each other in time. Modulations sources provided are two tempo-syncable LFOs and an envelope follower. To allow for easy editing, we've implemented a set of global controls for transposing all resonators while keeping their relative pitch intervals intact, for adjusting lowpass filter offset, for adjusting global resonator feedback and filter resonance. Voices can be individually bypassed to conserve CPU.

5.2.1 Global Controls

- **Transpose** transposes all four Resonator voices. This value is added to the individual voice's pitch value.
- **Feedback:** Global Resonator feedback amount. Applies to all four Voices.
- **Brightness:** Each Resonator is followed by a 4-pole LPF whose cutoff frequency is linked to the Resonator frequency. The Brightness parameter adds an offset to the LPF cutoff to allow more harmonics to pass.
- **Reso** adjusts the resonance of the LPF.
- (**Brightness**) **Mod Amt** controls Brightness (LPF) Modulations Depth. Negative values invert the modulation.
- (**Brightness**) **Mod Source** selects LFO 1, LFO 2, ENV (unipolar Envelope Follower output) or ENVb (bipolar ENV) as source for Brightness modulation.
- **Voice 1 On** to **Voice 4 On:** These buttons activate or deactivate the voices. Inactive voices do not use CPU.

5.2.2 Voice 1-4 Controls

- **Pitch** controls the Pitch of the respective Voice, the value is in MIDI Note Number. The Global Transpose value is added to this value. The musical name of the pitch and the frequency in Hertz are displayed.
- **P Mod:** Pitch Modulation Depth. The range is +-1 Semitone when "Wide" is off and +-12 Semitones when "Wide" is on. Negative values invert the modulation.
- **P Mod Source** selects LFO 1, LFO 2, ENV (unipolar Envelope Follower output) or ENVb (bipolar ENV) as source for Pitch modulation.

- **Wide** switches pitch modulation depth between a +- 1 semitone and a +-12 semitone range.
- **Odd/Even** controls the level balance of odd and even harmonics.
- **O/E Mod:** Odd/Even balance modulation depth. Negative values invert modulation.
- **O/E Mod Source** selects LFO 1, LFO 2 or ENV (unipolar Envelope Follower output) as source for Odd/Even balance modulation.
- **Pan:** Voice panning. 0 = Left; 0.5 = Centre; 1 = Right
- **LVL** adjusts the level of the Voice. Negative values invert phase.
- **DLY:** Delay time for the Voice in 16th notes.
- **LFO:** Pan LFO panning modulation depth.
- **Pan LFO Select** selects either LFO 1 or LFO 2 as source for panning modulation.

5.2.3 LFO 1 & LFO 2 Controls

- **Shape** selects the LFO waveform.
- **Rate** sets LFO speed in note values if Clock Sync Mode is on.
- **Clock Sync** activates Clock Sync mode, syncing LFO speed to song tempo & timeline.
- **Speed** sets LFO speed in Hz if Clock Sync Mode is off.

5.2.4 Envelope Follower Controls

- **Attack:** Envelope Follower Attack Time.
- **Release:** Envelope Follower Release Time.
- **SC Scale** scales the output of the envelope. Use this to adapt the Envelope Follower sensitivity to input level.
- **Exp:** Envelope Follower output is raised to this power. Higher values tend to expand or exaggerate the waveform, lower values tend to compress it.

5.2.5 Output Controls

- **FX Mix** adjusts the Dry/Wet balance for the entire effect.

5.3 Plagiarism

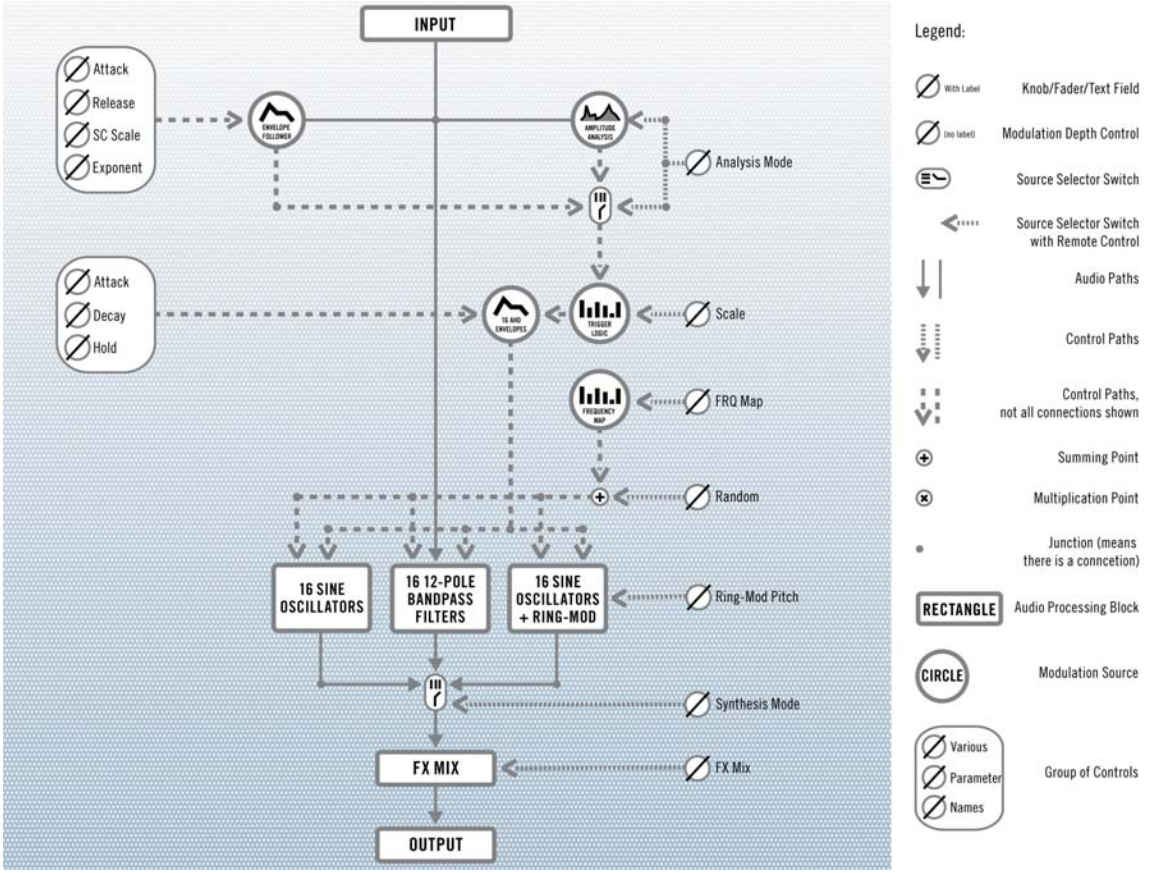

Fig. 5.3 SSFX Plagiarism signal flow.

The SSFX Plagiarism circuit synthesizes a signal out of 16 Oscillators or Bandpass Filters, whose amplitudes are derived from the amplitude envelope of the input signal, and whose frequencies are controlled by a look-up table containing various frequency maps, including the harmonic series, odd/even harmonics, reverse-ordered harmonic series, stacked fifths etc.

We'll call the Oscillators/Filters "OSC" from here on.
The input signal is fed into a circuit that analyses its amplitude contour and generates amplitude envelopes for the 16 OSC based on that. It can operate in three different modes.

- In mode 1, the rectified input signal amplitude is compared against 16 equidistantly spaced amplitude values in parallel. Each comparison result triggers one AHR envelope when the result becomes "true." This means that the first of the 16 OSC will sound at the very lowest input levels, while higher numbered OSC will needs progressively more input level to be triggered. It also means that all OSC can be triggered simultaneously by a full-scale input.
- In mode 2, the input signal is first fed into an Envelope Follower, whose output signal directly selects one of the 16 envelopes and triggers it on selection. This also means that higher input level equals higher OSC number, but the difference to mode 1 is that only one envelope is triggered at a time (though they may sound at the same time due to their decay phase).
- Mode 3 is similar to mode 2 in terms of how the envelopes are selected and triggered, and thus in only one envelope being triggered at any one time, but it does not use the Envelope Follower. Instead, it uses the rectified input signal like mode 1 does, and feeds that into a sample and hold circuit.

The 16 envelopes are then used to control the levels of the 16 OSC running in one of three modes: Sine, Ring-Mod or 36db/Oct Bandpass filters (fed with the input signal).

Fig. 5.4 SSFX Plagiarism control page.

5.3.1 Synthesis Controls

- **Mode** selects the Synthesis Mode Sine, Ring-Mod or BPF.
- **Pitch** sets the base frequency for the 16 Oscillators/Filters. Unit is MIDI note number.

- **RM Pitch** sets the pitch of the modulator for Ring-Modulator mode.
- **FRQ Map** selects the frequency map used, and thus defines the pitches/frequencies of the 16 Oscillators/Filters. You can think of this as a "Spectrum selector". See below for details on the frequency maps.
- **RND** adjusts the Amount of pitch/frequency randomisation applied.

5.3.2 Analysis (and Amplitude) Controls

- **Mode** selects Analysis Mode 1, 2 or 3.
- **Scale** scales the control signal used for selecting envelopes. This allows bringing the control signal into the range needed to play back all 16 Oscillators/Filters. Larger Scale value = higher number Oscillator/Filter gets triggered (well, sort of....).
- **Attack** sets the attack time of the envelopes.
- **Decay** sets the decay/release time of the envelopes.
- **Hold** sets the hold time of the envelopes. For Mode 1 this also translates into lower trigger rates at higher hold values.

5.3.3 Envelope Follower Controls

- **Attack:** Envelope Follower Attack Time.
- **Release:** Envelope Follower Release Time.
- **SC Scale:** Scales the output of the envelope. Use this to adapt the Envelope Follower sensitivity to input level.
- **Exp Envelope:** Follower output is raised to this power. Higher values tend to expand or exaggerate the waveform, lower values tend to compress it.

5.3.4 Output Controls

FX Mix adjusts the Dry/Wet balance for the entire effect.

5.3.5 Frequency Maps

- Map 0: Harmonic Series, normal order, factors 1...16

- Map 1: Harmonic Series, reversed order, factors 16...1
- Map 2: Odd harmonics 1...15, then even harmonics 2...16
- Map 3: Stacked fifths, first on basis of the fifth, then on the octave of the fifth, factors 1 1.5 2.25 3.375 5.0625 7.5938 11.3906 17.086 25.6289 3 4.5 6.75 10.125 15.1876 22.7812 34.172
- Map 4: Harmonics 1...16 interlaced ascending with offset of 8, factors 1 9 2 10 3 11 4 12 5 13 6 14 7 15 8 16
- Map 5: Minor scale, factors 1 1.1225 1.1892 1.3348 1.4983 1.6818 1.7818 2 2.245 2.3784 2.6696 2.9966 3.3636 3.5756 4 4.49
- Map 6: Major scale, factors 1 1.1225 1.2599 1.3348 1.4983 1.6818 1.8877 2 2.245 2.5198 2.6697 2.9966 3.3636 3.7755 4 4.4898
- Map 7: Pentatonic minor, factors 1 1.1892 1.3348 1.4983 1.7818 2 2.3784 2.6697 2.9966 3.5636 4 4.7568 5.3394 5.9932 7.1272 8
- Map 8: Pentatonic major, factors 1 1.1225 1.2599 1.4983 1.6818 2 2.2449 2.5198 2.9966 3.3636 4 4.4898 5.0397 5.9932 6.7272 8
- Map 9: 4 Octaves * 3 detuned, factors 1 2 4 8 1.005 2.005 4.005 8.005 0.995 1.995 3.995 7.995 1.008 1.992 4.008 7.992
- Map 10: 6 Octaves * 2.5 detuned, factors 1 2 4 8 16 32 1.005 2.005 4.005 8.005 16.005 32.005 1.008 1.992 4.008 7.992
- Map 11: 8 Octaves * 2 detuned, factors 1 2 4 8 16 32 64 128 1.005 2.005 4.005 8.005 16.008 32.008 64.008 127.992
- Map 12: Whole tones, factors 1 1.1225 1.2599 1.4142 1.5874 1.7818 2 2.2449 2.5198 2.8284 3.1748 3.5636 4 4.4898 5.0396 5.6569
- Map 13: Stacked 4ths, factors 1 1.3348 1.7818 2.3784 3.1748 4.2379 5.6569 7.551 10.0793 13.4543 17.9593 23.9729 32 42.7149 57.0175 76.1092

5.4 Spreadbands

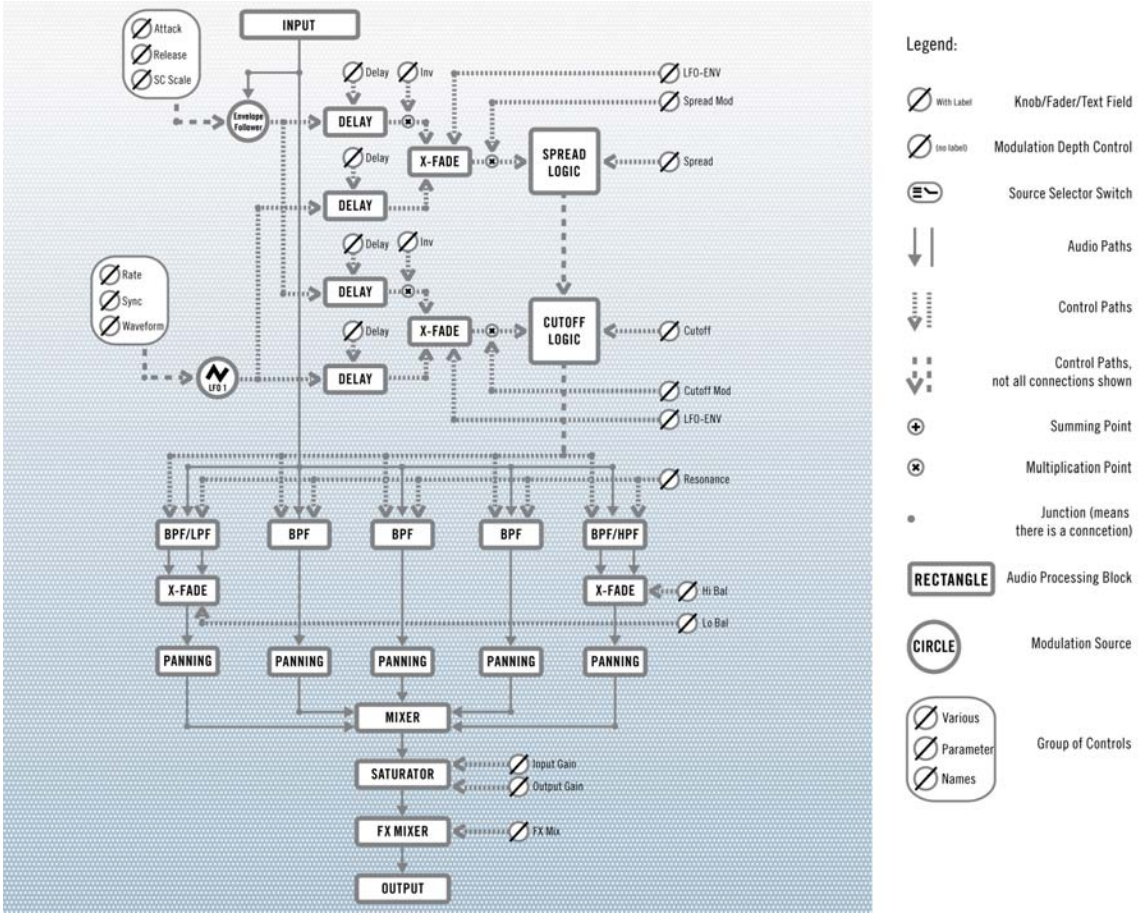

Fig. 5.5 Spreadbands signal flow.

Fig. 5.6 Spreadbands control page.

The SSFX Spreadbands circuit consists of five parallel filters in Bandpass mode. Their frequencies are defined via the center frequency of the middle band and the "Spread" parameter, which sets the distance between adjacent bands in semitones. Thus a Spread of "12" will result in the filters being spaced one octave apart. The lowest and highest bands can be crossfaded from Bandpass to Lowpass and Highpass, respectively. An Envelope Follower and an LFO can be used to modulate Center Frequency and Spread independently. The output of the filters is fed into an oversampled Saturation circuit before being blended with the input signal in the "FX Mix" stage.

5.4.1 Spreadbands (Filter) Controls

- **Cutoff** sets the center frequency of the filter array in MIDI note number (69= 440hz).

- **Reson** sets the filter resonance for all bands.
- **Spread:** Frequency spacing between bands in semitones.
- **Ultra** adds a second filter stage with high resonance, resulting in a steeper slope and a more "liquid" sound.
- **Stereo Band:** stereo weighting; a value of "1" will leave all bands of both channels at unity gain, settings <1 will lower the level of odd numbered bands in the left channel and of even numbered bands in the right channel, settings >1 will do the opposite. Band #1 will always remain at unity gain to keep the stereo image somewhat stable.
- **Lbal** crossfades Band 1 output between BPF and LPF (0 = BPF, 1 = LPF)
- **Hbal** crossfades Band 5 output between BPF and HPF (0 = BPF, 1 = HPF)

5.4.2 Satur8 Controls

- **In Gain:** Input gain into the Saturation circuit. Higher values give more saturation. Unit is dB.
- **Out Gain:** Output gain of the Saturation circuit.

5.4.3 Frequency Modulation Controls

- **Frq Mod** controls the filter array center frequency modulation amount; unit is semitones.
- **LFO-ENV** blends the modulation source from pure LFO modulation (=0) via 50/50 mix (= 0.5) to pure Envelope Follower modulation (= 1).
- **LFODly** delays the LFO signal used to modulate the filter array center frequency; unit is 16th notes.
- **LFO Wide:** During "On" state, the LFO signal is inverted for the right channel, resulting in the modulation going in opposite directions for the left and right channels.
- **ENV Inv:** During "On" state, the Envelope Follower signal is inverted and normalised; this means that instead of going from 0...1, the envelope will go from 1...0.
- **EnvDly d**elays the Envelope Follower signal used to modulate the filter array center frequencies; unit is 16th notes.

5.4.4 Spread Modulation Controls

- **Sprd Mod** controls the Frequency Spread modulation amount; unit is semitones.

- **LFO-ENV** blends the modulation source from pure LFO modulation (=0) via 50/50 mix (= 0.5) to pure Envelope Follower modulation (= 1).
- **LFODly** delays the LFO signal used to modulate the Frequency Spread; unit is 16th notes
- **LFO Wide:** When "On," the LFO signal is inverted for the right channel, resulting in the modulation going in opposite directions for the left and right channels.
- **ENV Inv:** When "On," the Envelope Follower signal is inverted and normalised; this means that instead of going from 0...1, the envelope will go from 1...0.
- **EnvDly** delays the Envelope Follower signal used to modulate Frequency Spread; unit is 16th notes.

5.4.5 Envelope Follower Controls

- **Attack.** Envelope Follower Attack Time.
- **Release.** Envelope Follower Release Time.
- **SC Scale** scales the output of the envelope. Use this to adapt the Envelope Follower sensitivity to input level.

5.4.6 LFO Controls

- **Shape** selects the LFO waveform.
- **Rate** sets LFO speed in note values if Clock Sync Mode is on.
- **Clock Sync** activates Clock Sync mode, syncing LFO speed to song tempo & timeline.
- **Speed** sets LFO speed in Hz if Clock Sync Mode is off.

5.4.7 Output Controls

FX Mix adjusts the Dry/Wet balance for the entire effect.

5.5 Modul8

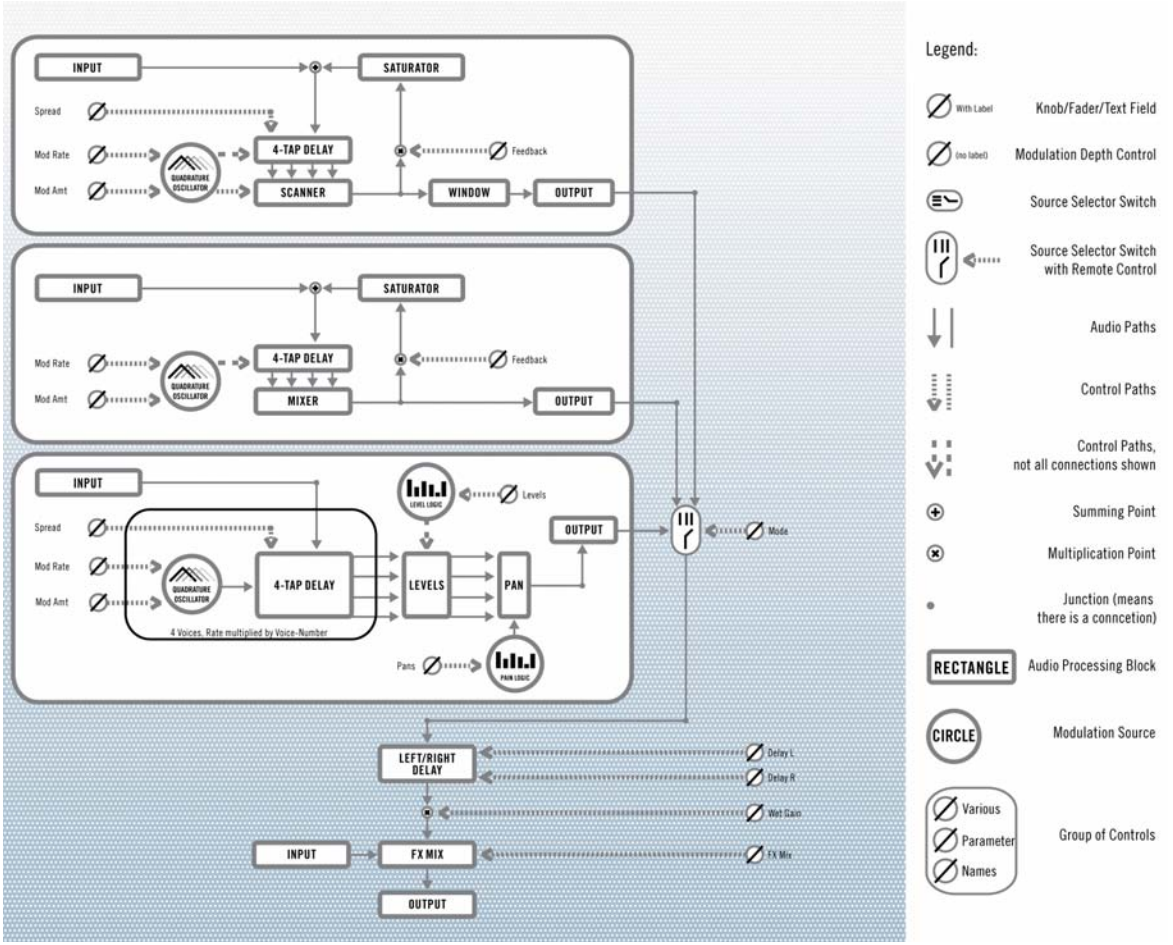

Fig. 5.7 Modul8 signal flow.

The SSFX Modul8 ensemble contains three seperate modulation FX circuits which are switched between using the Mode selector switch.

- The **Witch mode** is based on a four-tap delay, whose delay times are set by the spread control and modulated by a quadrature oscillator. The four taps are then sequentially crossfaded between by a synced sawtooth oscillator, windowed and sent to the feedback and output circuits. In a way this Mode resembles a faulty pitch-shifter design. Yumm.
- **Zombie mode** is also built on a four-tap delay, but the delay times are not spread out and the taps are not faded between.
- **Demon mode** is a little more complex. Here we have a quad synced quadrature oscillator that modulates delay times of four four-tap delays. For example, the four delay times of the first four-tap delay might be modulated by four 10 Hz sine waves at 90 degrees phase shift relative to eachother while the delay times of the other three delays would be modulated at 20 Hz, 40 Hz and 80 Hz, respectively. Additionally, the outputs of the four delays are level-scaled and panned using look-up tables. Sounds cool, huh. Yeah, it does, actually.

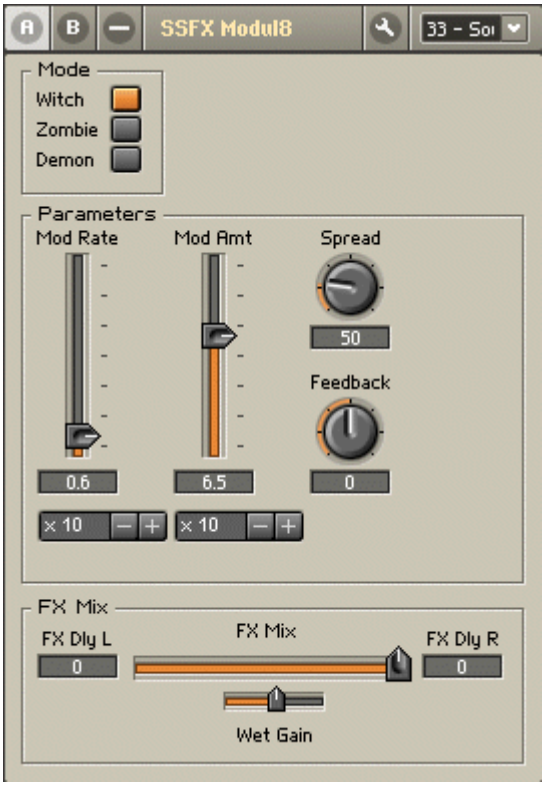

Fig. 5.8 Modul8 control page.

5.5.1 Global Controls

Mode selects Witch, Zombie or Demon mode.

5.5.2 Parameter Controls

Parameter Controls Common To All Modes

- **Mod Rate** controls the rate of the modulating (quadrature) Oscillator. The value of this fader is scaled with the value of the switch below. The Unit of the result is Hertz.
- **Mod Rate:** Range Selector Modulation rate range selector switch.

- **Mod Amt** controls the depth of the delay time modulation. The value of this fader is scaled with the value of the switch below. The unit of the result is milliseconds.
- **Mod Amt:** Range Selector Modulation depth range selector switch.

Parameter Controls Specific To Witch Mode

- **Spread** adjusts the delay times of the four delay taps in an incremental way; at a Spread value of 50, this translates into 0, 50, 100 and 150 ms.
- **Feedback** controls Feedback amount.

Parameter Controls Specific To Zombie Mode

Feedback controls Feedback amount.

Parameter Controls Specific To Demon Mode

- **Spread** adjusts the delay times of the four delay taps in an incremental way; at a Spread value of 50, this translates into 0, 50, 100 and 150 ms.
- **Levels** selects a set of values for the output levels of the 4 delay circuits from a look-up table, think of this as a "level pattern". See below for details on the “patterns”.
- **Pans** selects a set of values for the output pan positions of the 4 delay circuits from a look-up table, think of this as a "panning pattern". See below for details on the “patterns.”

5.5.3 Output Controls

- **FX Mix** adjusts the Dry/Wet balance for the entire effect.
- **FX Dly L** delays the left channel wet signal. Value is in 16th notes.
- **FX Dly R** delays the right channel wet signal. Value is in 16th notes.
- **Wet Gain** adjusts the level of the wet signal.

5.5.4 Level Patterns

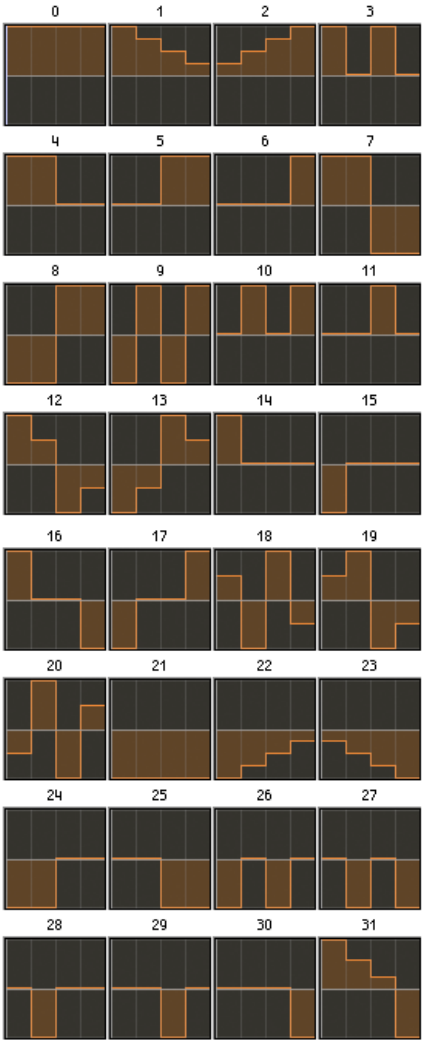

Fig. 5.9 Demon mode level patterns. Gain is 1 at the top, 0 in the middle and -1 (inverted phase) at minimum.

5.5.5 Pan Patterns

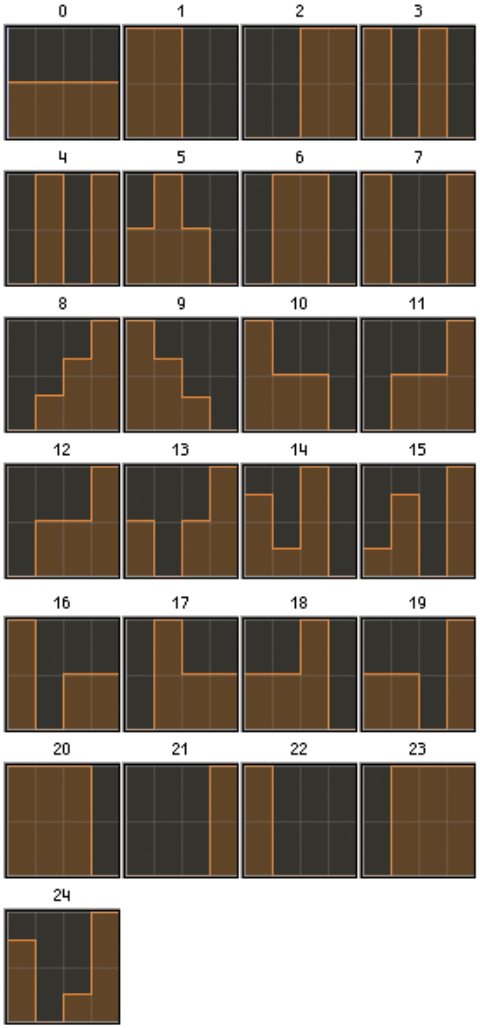

Fig. 5.10 Demon mode pan patterns. Pan is left at maximum, centre at the middle and right at minimum.

6 Using DEEP FREQ

The following sections will give you a brief overview of how to use DEEP FREQ, including how to set it up with your host and how the controls are mapped.

6.1 Basics

DEEP FREQ is a pack of effects, not instruments, so:

- make sure you search for effects in the KORE / KORE PLAYER browser, not for instruments. Refer to the application's manual for details on how to do this.
- you need to insert the KORE / KORE PLAYER instance as an effect insert, not as an instrument.
- nearly all of the DEEP FREQ KORE Sounds use tempo-synced modulators, so there needs to be a MIDI clock signal running (the host needs to be playing).

The DEEP FREQ effects were primarily designed as insert effects; they turn your signal into something completely different, so quite often there isn't much of a point in mixing the processed and unprocessed signal, or in applying the same effect to multiple mix elements as you would do with, say, a reverb. You can, of course, use them as send effects if you want.

6.2 About Levels

The DEEP FREQ effects, by their very nature, generate a lot of resonances and use feedbacks, so the output level varies very much with the specific input signal used. We've done our best to get consistent output levels, but as this is obviously only possible to a certain degree, be advised that

- to get the levels into a predictable range, there is always a limiter as last part of the signal chain, which is positioned after the dry/wet control for various reasons. As DEEP FREQ is designed primarily as insert effect that completely replaces the input signal this should usually not be an issue. Should there be too much limiting going on, reduce the input level to KORE / KORE PLAYER

- always be careful with monitoring levels, certain input signal / parameter combinations can be very loud if there is a resonance at a frequency already very pronounced in the input signal
- many effects use envelope followers or other level-dependent modulation schemes, so if your input signal has some dynamic range left, you may get better results

6.3 Controls Mapping

The DEEP FREQ KORE Sounds all feature one page of assigned controls. To help you find your way around DEEP FREQ, we've tried to map parameters to similar controls across all KORE Sounds. As the internal structure of the effects varies greatly, so do the parameters that need to be mapped; hence it wasn't always possible to stick to the exact same mapping. We've also tried to place controls that interact with each other and controls that affect parameters on the same part of the effect, next to each other, if that seemed appropriate. So take the following parameter type mapping scheme as a guideline, not as a fixed scheme.

Fig. 6.1 Controls mapping on KORE / KORE PLAYERs Controller Page.

- The leftmost knob of row 2 is ALWAYS assigned to FX Mix (aka "Dry/Wet")
- The leftmost button of row 2 is ALWAYS assigned to activate a low-cut filter (well, actually a low-shelf with a very high cut amount) in the output section, post FX Mix, pre limiter. It is set to a very low frequency as to not make the output sound thin, but can work wonders when there are resonances/feedbacks at very low frequencies that would normally cause distortion in the output limiter.

- The buttons typically "belong to" the knob they are above/under, switching some parameter in the same effects section that the knob controls; for example you could find a button that switches between bandpass and lowpass filter modes above a knob that adjusts the cutoff frequency of that filter.
- The leftmost two knobs of the top row are typically assigned to filter cutoff frequency and pitch type parameters, respectively. If there are more than two of this type of parameter to be assigned, additional knobs are used, usually row 1/knob 3 and row 2 / knob 2.
- The rightmost knob of row 1 and the rightmost knob of row 2 are typically assigned to LFO rate/waveform or other modulation parameters; if there are more modulation parameters to be mapped, we first "grab" row 2, knob 3, then row 1, knob 3.
- The second knob from the left of row 2 is usually mapped to some parameter that mixes parts of the effects chain; it might crossfade between two parallel signal paths, or control reverb mix amount etc.
- The third knobs from the left of both row 1 and 2 are mapped according to the requirements of the effect, but you'll often find granular or "color" parameters mapped to the top one and delay or feedback/intensity type parameters mapped to the bottom one.

Ensemble Wrapper Controls Mapping

The four ensemble wrapper sounds, identified by their prefix "SSFX," are a little different: they utilize two or more pages of controls, to map all parameters of the ensembles to the KORE/KORE PLAYER controls.

6.4 Sound Variations

Each of the 150 KORE Sounds contains eight Sound Variations accessed via the morphing pad. As the underlying effects structure is typically very complex, and the KORE / KORE PLAYER controls typically have a very large parameter control range, the Sound Variations will often sound **very** different to each other. So in many cases, they're effectively not really "variations" on one effect, but rather, they are effects in their own right. Make sure you check all eight variations of a KSD so you don't miss anything!

When dragging the “Morph Square,” the morphing applies to knobs only. Buttons only get switched when loading a Sound Variation directly by clicking on it. Because of this, results may vary depending on which Sound Variation you start off with when morphing.

As there are many modulation rate parameters assigned to the knobs that control tempo-synced modulators, morphing may not always be smooth.

7 Credits

Production: All Reaktor Ensembles, KORE Sounds and Sound Variations by Denis Gökdag of Surround SFX.
Manual: by Denis Gökdag.
Special thanks to: Tobias Menguser, Alexander Stamm, Gerald Zollner, Christoph Laue and Patryk Korman at NI for their support in making DEEP FREQ happen!