FUTURE SOUND SYSTEMS

FIL2 SPECTRAL DEVASTATOR
User Guide

The filter...

The Spectral Devastator presents a new filter core designed by Finlay Shakespeare of Future Sound Systems. Based around a 12dB/octave Sallen-Key signal topology, the Spectral Devastator consists of separate high-pass and low-pass filters which, via a pair of **Normalling** switches, can by tied together without the need of extra patch cables.

The cutoff frequency of the high-pass filter can be normalled to control that of the low-pass filter. This is done by increasing the **CV2 Depth** of the low-pass filter whilst unpatched. By tweaking the high-pass filter's cutoff, the cutoff frequency of the low-pass filter will then also be controlled. As long as the **Normalling** switches are set **Post**-filter, a band-pass style filter can then be implemented with manual control over the cutoff frequency, and external voltage control over the filter spacing.

The Spectral Devastator earnt its name from its ability to heavily distort signals at the input of each filter. With the **Resonance** of each filter at minimum, the filters are typically slightly overdriven by most "standard" Eurorack audio signals. Sweeping the **Cutoff** frequency of each filter whilst in this state will result in typical high-pass and low-pass filtering. With a gradual increase in **Resonance**, the filters will become, not only more resonant, but also increasingly overdriven, until self-oscillation occurs. As well as typical filtering effects, an array of interesting features in each filter can be found. These include inter-modulation effects between the input audio and the filter's own oscillation, octaving of the input signal, and harmonic "scanning" of an input tone.

In use...

Whilst the core of the Spectral Devastator can wildly manipulate and distort input signals, the filters can also be used for more subtle effects. It is recommended that an attenuator module is used before the input stage of the FIL2. Doing so allows for the drive of each filter to be controlled, and will therefore extend the timbral range of the filters.

It is also suggested that the user experiments with different input waveforms into the Spectral Devastator. Whilst this seems like a simple task, a vast palette of timbres is available from the FIL2's outputs through varying the input waveform at different amplitudes. Employing continuous wave-morphing and wave-folding can yield an even greater range of results.

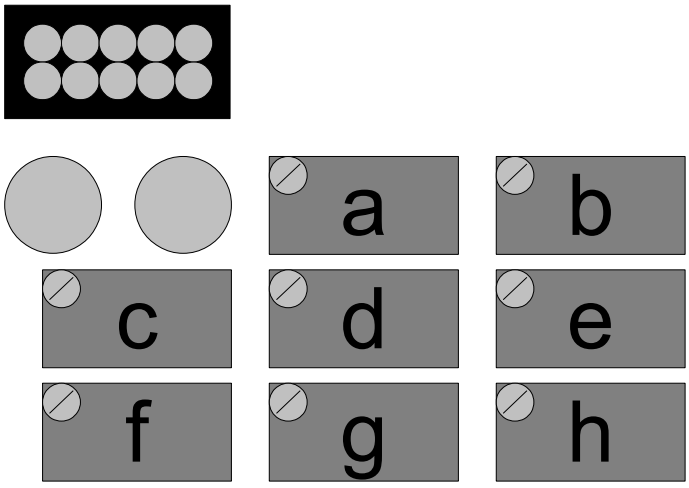
Whilst neither filters track to a standardised voltage/pitch scale, both filters can be used as oscillators when their **Resonance** controls are set to maximum. Through using "analogue style" sequencers, for example, the filters can be used melodically. Furthermore, one filter can be set to oscillate whilst the other filter manipulates the harmonic content of this oscillation via the **Normalling** switches.

Whilst audio cross-patching is readily available through the **Normalling** switches, frequency modulation of a filter's cutoff frequency can create further non-linear filtering. This is perhaps most useful when performed from the output of the other filter; for example, modulating the low-pass filter's cutoff frequency with the output of the high-pass filter, or vice-versa, when sharing a common, normalled input. Further havoc can be gained by employing feedback of the audio output back into the modulating filter's audio or control input.

Optional setup...

The trimpots on the rear of the module allow for setup of the **Cutoff** control potentiometers, as well as the depth of the **Resonance** settings. Please note that these trimpots are adjusted to taste after assembly, so a new FIL2 should be appropriately tuned. However, if the user feels that the control ranges need to be made either more or less extreme, the below trimmers can be adjusted. Also beware that a co-dependency exists between the **Cutoff** ranges and the **Resonance** depth, so these settings may need to be adjusted in a cyclical fashion in order for the desired changes to be made.

The trimpots on the rear of the FIL2 take the following arrangement:



a = Highpass **Cutoff** frequency at 0
b = Highpass **Cutoff** frequency at 10
c = Highpass **Resonance** scale
d = Lowpass **Cutoff** frequency at 0
e = Lowpass **Cutoff** frequency at 10
f = Lowpass **Resonance** scale
g = Normalling CV bias at 0

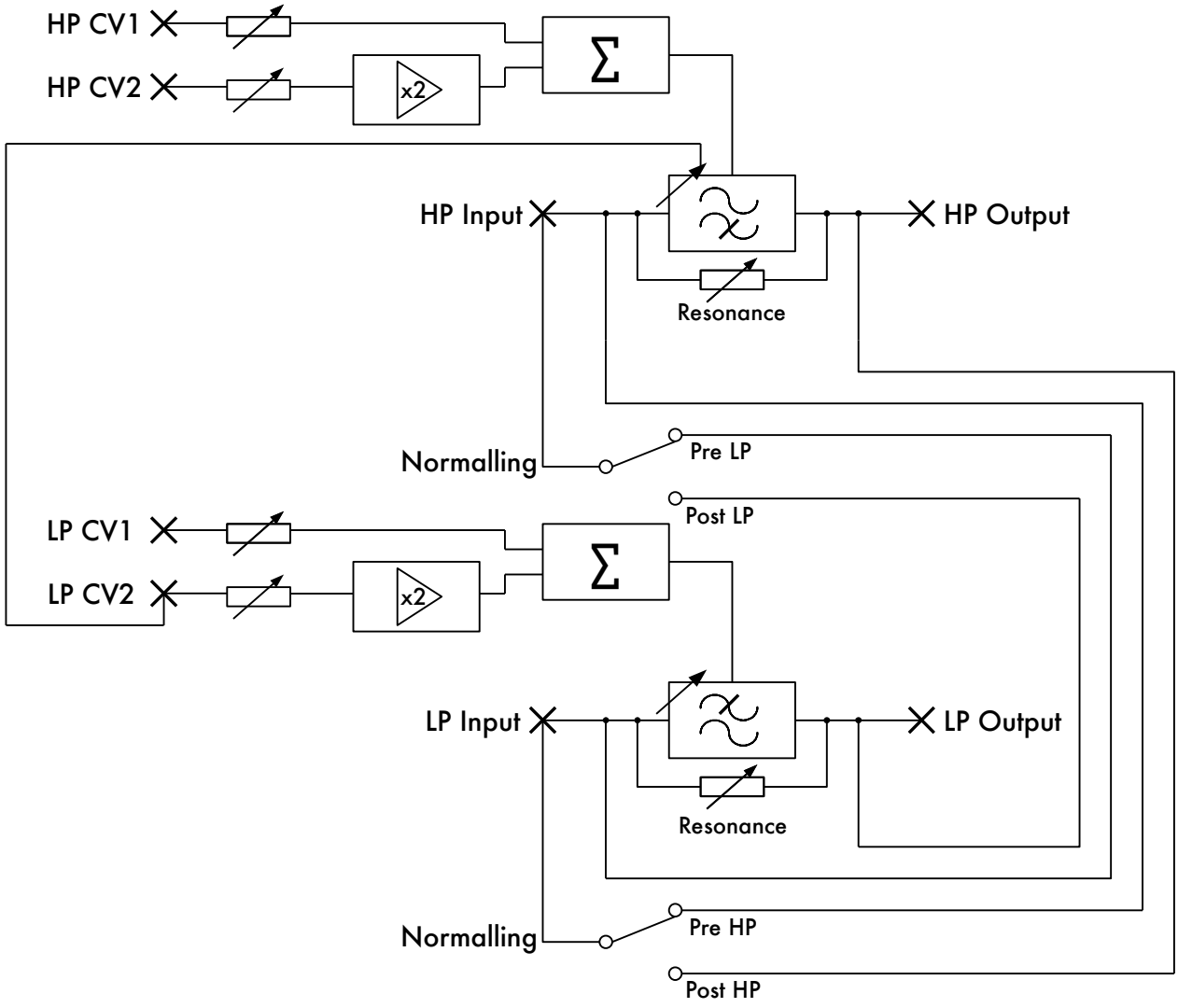
h = Normalling CV bias at 10

Trimpots **a, c, d, f** and **g** should be turned clockwise to increase control bias. Trimpots **b, e** and **h** should be turned anticlockwise to increase control bias.

Hardware specifications...

Module width = 12HP
Module depth = 29mm behind 2mm front panel
Current consumption = 40mA on +12V; 25mA on -12V
I/O = 4 CV ins, 2 audio ins, and 2 audio outs via 3.5mm unbalanced jack connectors

Signal flow diagram...



FUTURE SOUND SYSTEMS

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Unique designs and ideas in sound since 2005
Award winning engineering since 2014