ETCH RED

OPERATION MANUAL

fxpansion

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1 Introduction

Etch Red is a dual-filter Rack Extension effect with distortion and compression. It features extensive modulation possibilities using its internal TransMod modulation system which allows complex, intricate modulation of the filters.

Etch Red Layout

Etch Red's interface is laid out in 3 sections, from top to bottom:

- Audio path: the Drive, Filter and Output modules
- Modulation source selection: this area lets you select a modulation source to edit its modulation depths for parameters
- Internal modulation sources: the Envelope, LFOs, Follower and Sample & Hold provide a variety of ways to modulate Etch Red's parameters

Etch Red also features a number of inputs and outputs on its rear panel, which allow you to inject external audio and modulation sources and also to route the output of the internal modulation sources to other destinations in your Reason session.

Standard controls/indicators

Bypass/On/Off

This control exists on all Reason devices for managing the state of the entire device.

Input meter

This meter represents the amplitude of the audio input signal.

Patches

Etch Red features programmable effect presets, called Patches. It includes a number of factory Patches which can be used as they are or provide you with a good starting point for further tweaking.

Patches use the '.repatch' file extension. Loading and saving Patches is done in the same way as for other instruments and effects in Reason, using the Patch browse and save controls at the top of the Etch Red panel.

Etch Red Audio path

The Drive, Filter and Output modules form the heart of Etch Red. By default, the Drive is placed before the filters in the signal path, although their order can be swapped using the Post button on the Drive module.

Each Filter module features 4 selectable filter types, each with a varied set of responses. There are dedicated key tracking and audio-rate FM functions, and the filters can be placed in parallel and panned left/right for true stereo filtering.

The Output module features final level controls for both filters, a simple but very effective 1-knob compressor and final output level and panning controls.

Etch Red Modulation

Using TransMod modulation in Etch

1. Select one of the 10 available modulation sources as the *currently viewed* source (LFO1 is selected by default)
2. Each parameter in Etch Red that can be modulated has an accompanying red *TransMod amount knob* which sets the modulation depth from the *currently viewed* TransMod modulation source.

   The red knob is bi-polar - it can introduce positive or negative modulation from the value set by the parameter's main knob.

Each TransMod source features its own set of modulation depths to each parameter: a parameter can be modulated by any number of the 10 available sources simultaneously. The TransMod system is discussed in detail in chapter 3.

TransMod Modulation sources

Etch Red features 5 built-in modulators: a triggered Envelope, 2 LFOs, an envelope Follower and a Sample & Hold (S&H). All are intended to be used with the TransMod system, although as mentioned, the LFOs feature a direct FM routing to each filter cutoff. The level of each modulator can be controlled by another modulation source, by modulating its Gain control. This is very useful for dynamic, evolving modulation shapes.

Although Etch Red features a number of built-in modulators, there are a number of other sources which are derived from the inputs on the rear panel.

Etch Red also features two additional modulation functions which operate outside the TransMod system:

Filter FM

The Filter FM function features a direct modulation routing from LFO1, LFO2 or the FM Override external inputs on the Etch Red rear panel. The depth is set by the FM knob on each filter, which can itself be modulated via the TransMod system. The filter FM function can operate at audio rates, unlike the TransMod system which is quantized to control rates.

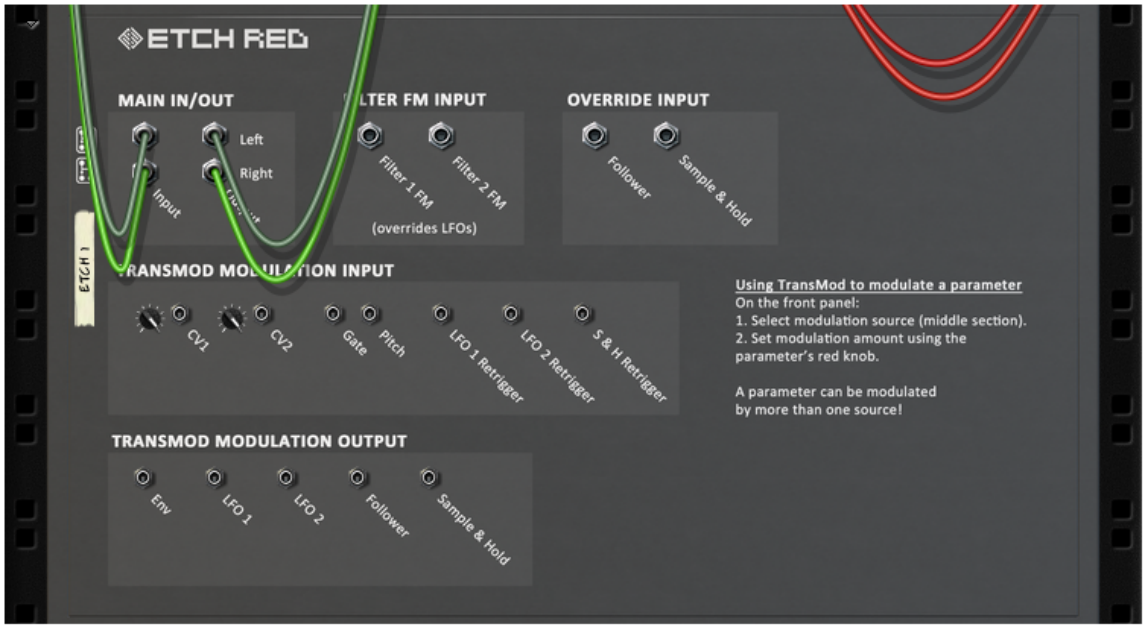
Filter Key Track

The Filter **Key Track** function allows you to 'play' Etch Red's filters using MIDI keyboard input via Reason's sequencer or from other modules such as the Matrix sequencer.

1.1 Using Etch Red in Reason

Etch Red is a Reason Rack Extension. In use, it is operated in a very similar way as any other device within Reason: the front panel houses Etch Red's controls and built-in modulation functions, while the rear panel features a number of audio and CV inputs and outputs.

Rear panel audio and CV/gate connections



Main audio in/out

Etch Red features stereo audio inputs and outputs in the Main In/Out section. If only one of the inputs is connected, this signal is duplicated to the other channel.

Filter FM audio inputs

The **Filter1 FM** and **Filter2 FM** inputs override the default routing of LFO1 or LFO2 to the audio-rate filter FM function on each filter.

These inputs are for audio signals only - CV sources should be connected to the CV1 or CV2 inputs and routed to the filter cutoffs via the TransMod system.

Override audio inputs

These audio inputs override the default signals used for the Follower (Envelope Follower) and Sample & Hold internal modulators in Etch Red.

Follower

With nothing patched to this input, the Follower module follows transients in the input audio signal (audio routed to the Main input). Patching an external audio signal into this input makes the Follower track transients in this signal instead.

Sample & Hold

With nothing patched into this input, the Sample & Hold module acts on a dedicated internal noise generator (the source that is sampled and held). If an external audio signal is patched into this input, it is used instead of the internal noise source.

TransMod modulation CV/gate inputs

CV1 and CV2

These inputs are used for the CV1 and CV2 TransMod modulation sources. Each of these inputs features an attenuator for fine-tuning the level of incoming CV signals.

Pitch, Gate

These inputs are related to various functionality within various TransMod sources and internal modulator devices in Etch Red.

The Pitch input is used for:

- the Pitch TransMod source, which lets you modulate parameters according to incoming note input
- the filter **Key Track** function, which allows precise note-to-frequency tracking for the filter cutoff

The Gate input receives velocity-sensitive gate CV signals and is used for the Envelope modulator and also the Velocity and Random TransMod sources.

Note: Etch Red receives MIDI note input from Reason's MIDI input and sequencer. This input, in addition to the rear panel Pitch/Gate inputs, is used for modulation functions which require a pitch or gate input.

LFO1 and LFO2 Retrigger

These inputs accept gate-type CV signals - when a suitable gate signal is received at each input, the relevant LFO is retriggered (it is restarted according to its current Phase setting).

S&H Retrigger

This input is intended to be patched to an external gate or square-wave LFO source to trigger the Sample & Hold modulator function in addition to its internal clock.

TransMod modulation CV outputs

These CV outputs provide the output from Etch Red's internal modulators so that they can be used to modulate parameters elsewhere within Reason. Simply patch the outputs to suitable CV inputs on another Reason device. The LFO1, LFO2 and S&H outputs transmit unipolar (0 to 1) or bipolar (-1 to 1) modulation depending upon the state of each modulator's **Unipolar** button, described in chapter 3.

2 Etch audio modules and signal path

Etch Red's audio modules are arranged from left to right in the default routing configuration.

Distortion routing

It is possible to change the position of the Distortion module before (default configuration) or after the filter stages using the **Post** button.

Filter routing

By default, Filter1 and Filter2 are arranged in series. It is possible to change this to a parallel routing using the **Parallel** button on the Filter2 module. Parallel routing is useful for stereo filtering.

Filter output levels

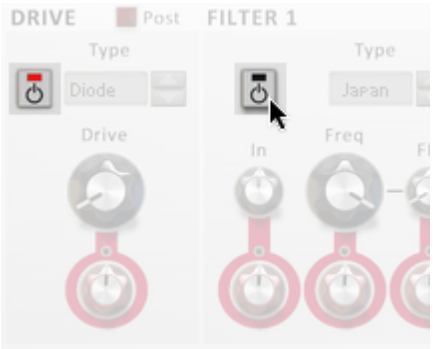
The Output module contains the final level controls for Filter1 and Filter2, labelled **F1 Out** and **F2 Out**.

Power buttons

The Drive, Filter1 and Filter2 modules feature a **Power** button - deactivate it to bypass the module.

In this example, the Drive module is active (powered on) while the Filter1 module has been deactivated (powered off).

To bypass Etch Red entirely, you should use the standard switch control at the top-left of the device.



2.1 Drive

The Drive module allows you to apply various flavours of overdrive and distortion to the signal, prior to or after Etch Red's filtering stages.

Power

The **Power** button activates or bypasses the Drive module.

Post

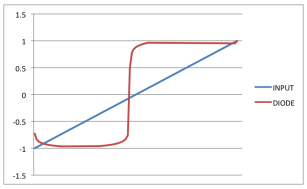
The **Post** button toggles the position of the Drive stage before or after the filtering stages. By default it is deactivated, meaning that the distortion occurs before the Filter stages. Enabling the button results in placing the Drive after the Filter stages.

Drive *[w/TransMod amount]*

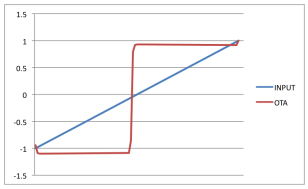
The **Drive** parameter sets the amount of drive applied to the signal.

Type

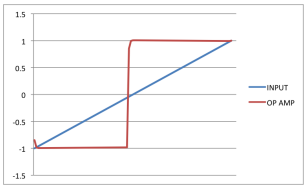
Each of the available **Type** settings changes the input to output amplitude in a non-linear way, with each setting offering different timbral effects. Click the up/down buttons to cycle through the available Types or click the display to select from a drop-down menu. The following response curves show the amplitude of the input signal vs. the output signal.



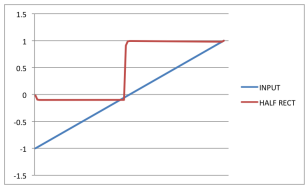
Diode



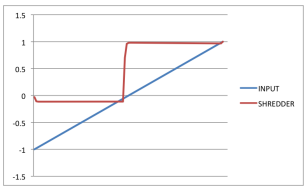
OTA



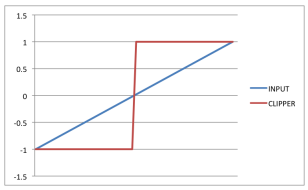
Op-amp



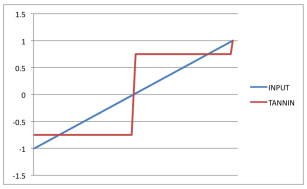
Half-rectifier



Shredder



Clipper



Tannin

2.2 Filter1 and Filter2

Etch Red's 2 filter modules are identical, although there are minor differences in terms of controls for linking and routing.

Power

The **Power** buttons for Filter1 and Filter2 allow you to activate or bypass each filter.

Key Track (Filter1 only)

The **Key Track** function lets you directly 'play' Etch Red's filters with notes from Reason's sequencer or its main CV/gate inputs. It is recommended to use this function rather than the Pitch TransMod source to modulate the **Freq** control because it results in perfectly accurate pitch tracking.

For key tracking both filters together, it is necessary to activate the **F1 Freq Link** button.

F1 Freq Link (Filter2 only)

With the **F1 Freq Link** button selected, adjusting or modulating the **Freq** control for Filter1 results in the same changes being applied to Filter2.

The value of the Filter2 Freq control is added to that of Filter1, so its value acts as an offset to the Filter1 Freq value. Therefore, if you want both filters' **Freq** parameters to be the same, you should set Filter2's **Freq** control to 0 when using the **F1 Freq Link** function.

Any offset between the **Freq** setting of Filter1 and Filter2 is preserved whenever possible. Any offset can be temporarily lost by moving the filter frequency to the extreme minimum/maximum positions, although it returns when moving the filter back into the main range.

Parallel (Filter2 only)

The **Parallel** button allows you to toggle the routing of Filter1 and Filter2. By default it is deactivated, meaning that the routing of the filters is serial: Filter1 is placed before Filter2 in the signal path. With the button activated, the 2 filters operate on the same input signal in parallel, with the output being subsequently mixed after the filtering stages.

Type

Etch Red features 4 different filter models, selectable with the **Type** control. Each Type provides a varied set of **Mode** settings and possesses different circuit-modelled characteristics. Click the up/down buttons to cycle through the available Types or click the display to select from a drop-down menu. See chapter 5 for filter response curves of all Types and Modes in Etch Red.

Japan

This filter type is a classic Japanese monosynth filter based on cascaded OTA components. The Japan filter offers a large variety of filter **Mode** settings: As well as conventional 2-pole and 4-pole low-pass, band-pass, high-pass and notch filters, it also features a 2-pole peak filter response and a number of additional combinations of low-pass, high-pass, notch and peak filter outputs which provide a huge range of possible sonic effects.

SVF

This filter is a typical state-variable filter (SVF) design, offering 2-pole and 4-pole low-pass, band-pass, high-pass, notch and peak filter responses using the **Mode** control.

Fatty

The Fatty filter is an OTA-based Sallen-Key filter design, offering low-pass, band-pass, high-pass and notch **Mode** settings.

Comb

The Comb filter is great for all sorts of uses, especially lush detune and chorus textures, resonant special FX and sounds reminiscent of flanging and phasing.

When the Comb is selected, 2 **Mode** settings are available: negative and positive.

Mode

Each filter **Type** offers a number of different **Mode** settings. The number and nature of the modes available depend on the current filter Type setting.

In *[w/TransMod amount]*

The **In** control sets the level of the audio entering the filter. Audio at higher levels drive the filter harder internally, leading to more saturation and a grittier timbre. Dial this control back in order to achieve warmer sounds.

Freq *[w/TransMod amount]*

The **Freq** control sets the cutoff frequency of the filter. While this parameter features its own TransMod amount knob, it is also possible to use direct modulation from LFO1, LFO2 or the FM Override CV inputs using the **FM** parameter.

Rez (Resonance) *[w/TransMod amount]*

This control sets the amount of resonance, or emphasis around the cutoff frequency. Higher **Rez** settings lead to filter self-oscillation effects.

FM *[w/TransMod amount]*

The **FM** control sets the amount of direct filter cutoff frequency modulation applied from the active FM source.

By default, LFO1 is used for the FM function. This can be changed to LFO2 using the **FM LFO** switch. You can also use the Filter1 FM and Filter2 FM inputs on Etch Red's rear panel to use any audio signal from elsewhere in your Reason session.

FM LFO switch

Each filter's **FM LFO** switch selects between LFO1 and LFO2 as the **FM** source, unless the Filter FM inputs on the rear panel are used.

Pan *[w/TransMod amount]*

Each filter can be panned anywhere within the stereo field using the **Pan** control. This parameter can be modulated for auto-panning effects.

Filter connections

Filter FM inputs

The FM inputs override the LFO1 or LFO2 routing to the filter **FM** function. These inputs are optimized for audio-rate modulation and accept audio signals only. To modulate the filters with external CV sources, use the CV1 and CV2 TransMod source and its associated rear panel inputs.

2.3 Output

F1 Out, F2 Out

The **F1 Out** and **F2 Out** parameters set the level of the audio leaving each of the 2 filters, useful for attenuating or boosting each signal after filtering.

Comp (Compress)

The Output section features a simple single-control compressor, switchable between a soft and hard knee response.

The **Compress** parameter sets the amount of compression applied to the signal. At the minimum setting, no compression is applied and the signal passes through to the Output module without being processed.

Hard (Hard-knee)

By default, Etch Red's compressor features soft-knee behaviour. With the **Hard** button activated, the compressor behaves with hard-knee characteristics.

Level *[w/TransMod amount]*

The **Level** control sets the final level of the audio leaving Etch Red, useful for any final attenuation or boosting of the signal.

Mix *[w/TransMod amount]*

The **Mix** control sets the balance between the original input signal (towards the left of the control) and the processed signal (towards the right of the control).

3 Using TransMod modulation in Etch Red

Guide to using the TransMod system

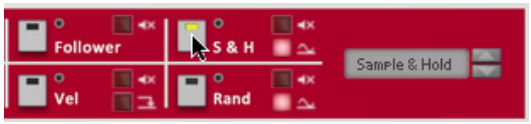
1. Select a TransMod modulation source

In the middle of the Etch Red panel are a number of buttons which represent the various TransMod modulation sources that are available.

One of the sources must be the *currently selected source* - only one source 'view' is visible at one time, but modulation can exist from any number of the available sources simultaneously. The yellow LED on a source's selector button is lit when it is currently selected.

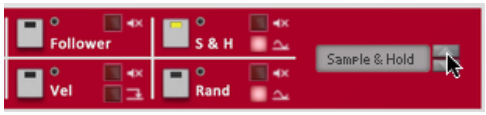
There are 3 ways of selecting a TransMod modulation source:

1.



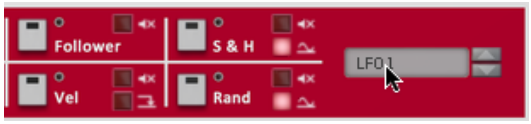
Click the selector button for any modulation source to select it.

2.

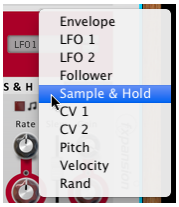


Click the up/down buttons to cycle through all the modulation sources sequentially.

3.



Click the display to select the desired source from a drop-down menu.



2. Set the modulation depth for a parameter using its associated TransMod amount knob

Each parameter that can be modulated features an associated red knob, used for specifying the amount of TransMod modulation from the currently selected modulation source.

TransMod amount knobs are *bi-polar*:

- When centred, their value is 0
- Turning them to the right causes positive modulation from the original value of the parameter
- Turning them to the left causes negative modulation

Note that the LED above the TransMod amount knob has turned *yellow* - this indicates that the knob features a modulation depth for the *current source*.

Also note that the LED to the top-right of the S&H source's selector button has turned *red*, to indicate that modulation exists to one or more parameters from that source.

TransMod depths

The defined modulation depth represents the maximum amount of modulation possible from the initial value of the parameter (defined by its main black-coloured knob) with the current TransMod source. The changing intensity of the TransMod source, as well as the combined effect of any other TransMod sources which have been routed to the parameter, dictate the actual modulation that occurs at any one time.

Using multiple modulation sources

1.

Select another modulation source, such as the Follower source.

Note that the Pan parameter's TransMod amount knob has snapped back to zero, due to the fact that no modulation yet exists from the Follower source to the Pan parameter.

Also note that the LED above the Pan's TransMod amount knob has turned *red*. This indicates that the parameter features modulation depths from a modulation source *other than the current source*.

2.

Create a modulation depth for a parameter.

Note that the LED above the Rez parameter's TransMod amount knob has turned *yellow*, which indicates that it features a modulation depth from the *current source*.

Also note that the LED to the top-right of the Follower source's selector button has turned *red*, to indicate that modulation exists to one or more parameters from that source.

Polarity: Unipolar / Bipolar operation

The LFO, S&H and Random sources can all be set to operate with unipolar or bipolar behaviour.

1.

By default, the modulation from the S&H module acts in 1 direction only as it outputs positive values from 0 to 1.

2.

Deactivate the source's **Unipolar** button so that it outputs negative and positive values between -1 and 1.

This means that the Pan control is now modulated in both directions about the centre.

Source Mute buttons

Each source also features a **Mute** button. While this button is activated, the modulation from the source is disabled and the source therefore has no effect. This function is useful for quickly establishing which source may be causing a certain audible effect.

Controls that can be modulated

All of the following Etch Red parameters can be modulated:

- Drive
- Filter 1 & Filter 2 In
- Filter 1 & Filter 2 Freq
- Filter 1 & Filter 2 FM
- Filter 1 & Filter 2 Rez
- Filter 1 & Filter 2 Pan
- Output Level
- Output Mix
- Env Gain
- LFO1 & LFO2 Rate
- LFO1 & LFO2 Gain
- Follower Gain
- S&H Rate
- S&H Gain

TransMod resolution

TransMod modulation occurs at control rates, in 64-sample blocks. Etch Red's dedicated filter FM function operates independently of the TransMod system and can act at audio rates, either using the internal LFOs or an external audio source patched to the Filter1 FM and Filter2 FM inputs.

3.1 TransMod modulation sources

Envelope

The Envelope source provides the output from the Envelope module.

LFO1 and LFO2

These sources provide the output from LFO1 and LFO2.

Both these sources can be set to bipolar operation instead of the default unipolar behaviour by deactivating the source's **Unipolar** button.

Follower

The Follower source provides the output from the Envelope Follower module.

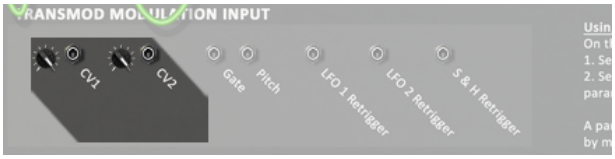
S&H (Sample & Hold)

The S&H source provides the output from the S&H module.

This source can be set to bipolar operation instead of the default unipolar behaviour by deactivating the source's **Unipolar** button.

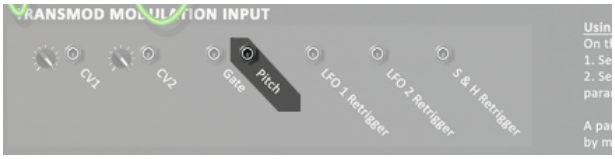
CV 1 and CV 2

These sources provide the CV signals that are inserted into the CV 1 and CV 2 inputs located on the rear panel.



Pitch

The Pitch source is derived from notes received at the Pitch CV input on the rear panel from other devices' CV outputs and from Reason's MIDI input and sequencer.



For precise filter cutoff tracking, it is recommended to use the dedicated filter **Key Track** function instead of modulating the Freq controls with the Pitch source via the TransMod system.

Vel (Velocity)

The Velocity source provides the velocity value of each gate signal received at the Gate input on the rear panel and each note received from Reason's MIDI input or sequencer.

The Velocity source features an additional button in the modulation source selector area. If the **Note-off Reset** button is enabled, the value of the Velocity source returns to zero after the input gate signal has returned to zero (or if the sequencer/MIDI input note is released).

If the button is deactivated, the source stays constant at the last value until a new value is generated.

The **Note-off Reset** button is deactivated by default.

Rand (Random)

The Random source outputs a random value each time that the Gate input on the rear panel is fed with a suitable gate signal and when notes are received from Reason's MIDI input or sequencer.

This source can be set to bipolar operation instead of the default unipolar behaviour by deactivating the source's **Unipolar** button.

4 Etch internal modulators

Almost all modulation in Etch Red relies on the TransMod modulation system. The exceptions are the **FM** and **Key Track** functions in Filter1 and Filter2.

Output indicator meters

Note the black-windowed meter-style indicators to the right of each internal modulator's name. This is a real-time representation of the amplitude of each modulator's output.

Sync buttons

The internal clocks in the LFOs and S&H modules are synchronized to the Reason tempo by default, with the Rate control determining the speed in BPM-based values.

When **Sync** is enabled, automating the **Rate** control results in the phase being resynced, meaning that an abrupt transition may occur. This is necessary to remain synchronized and retain consistency upon repeated playback.

Deactivate the **Sync** button for any module - such as LFO2 in the example above - so that its Rate control can be set in Hz. While in this mode, automating the Rate control does not change the phase.

4.1 Envelope

The Envelope module is triggered via Etch Red's Gate CV input and via notes from Reason's MIDI input or sequencer to generate AHD envelopes for modulating Etch Red's parameters via the TransMod modulation system.

The Envelope can be used to modulate the Output **Level** so that audio only passes through while the envelope is active, useful for triggered envelope filtering effects. Alternatively, try modulating the filters' **Freq** control, especially with the **Velocity** button enabled.

Velocity button

By default, the Envelope output is not dependent on incoming gate or note velocity. With the **Velocity** button activated, incoming velocity dictates the level of the envelope output.

Atk (Attack)

The **Attack** is the time taken for the envelope to rise from 0 to a value of 1.

Hld (Hold)

The envelope is held at a value of 1 for the duration of the **Hold** time.

Dcy (Decay)

The **Decay** is the time taken for the envelope to return to 0.

Crv (Decay Curve)

The **Curve** setting controls the shape of the **Decay** stage. At low settings it has a linear decay behaviour, while at high settings, the curve is exponential.

Gain *[w/TransMod amount]*

The **Gain** control offers a final attenuation control for the output of the module before it enters the TransMod modulation system. At 100%, no attenuation is applied to the output modulation signal.

This control is intended to be modulated by other TransMod sources for dynamic, evolving modulation effects.

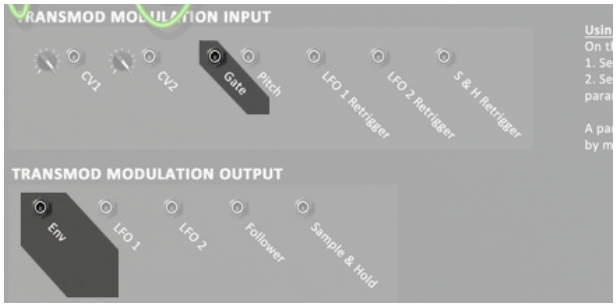
Envelope connections

Gate input

The Envelope requires a standard Reason gate signal with velocity to be connected to the Gate input on the rear panel. It also responds to notes from Reason's MIDI input or sequencer.

Env output

The Env output provides the output from the Envelope modulator so that it can be used to modulate parameters in other Reason devices.



4.2 LFO1 and LFO2

Etch Red's LFOs can operate at audio rates, reaching speeds of 1024 Hz. These speeds are intended to be used with the dedicated **FM** function on each filter module.

The TransMod modulation from the LFOs is always quantized to control rates.

Sync button

With the **Sync** button enabled, the **Rate** control is set in BPM values derived from the Reason tempo.

With the **Sync** button disabled, the **Rate** control is set in Hz.

The Sync function must be deactivated to achieve audible LFO rates to use with the filter **FM** function.

The behaviour of the Sync function is explained in more detail here.

Rate *[w/TransMod amount]*

The **Rate** control dictates the speed of the LFO's oscillation.

Shape

The **Shape** selector allows you to choose one of several waveform shapes. Click the up/down buttons to cycle through the available shapes or click the display to select from a drop-down menu.

Sawtooth, Square, Sine, Triangle and Arc-Sine (A-Sine) shapes are available.

Mph (Morph)

The **Morph** control shifts the centre point of the waveform without altering the wavelength. It is similar to a pulse width control in that it varies the duty cycle of the waveform.

Phs (Phase)

The **Phase** control allows you to adjust the phase of the LFO within 360 degrees.

Gain *[w/TransMod amount]*

The **Gain** control offers a final attenuation control for the output of the module before it enters the TransMod modulation system. At 100%, no attenuation is applied to the output modulation signal.

This control is intended to be modulated by other TransMod sources for dynamic, evolving modulation effects.

LFO connections

LFO1 & LFO2 Retrigger inputs

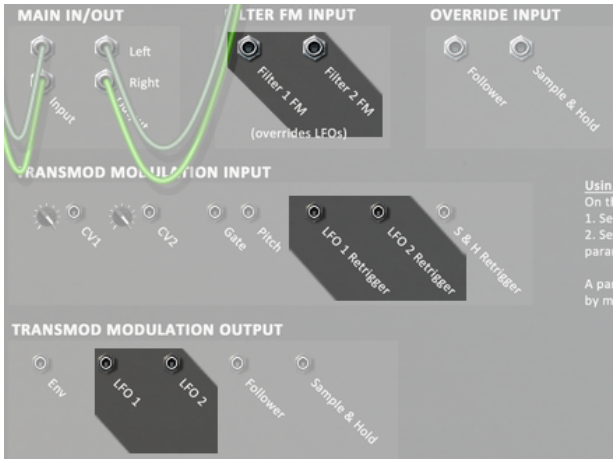
Each LFO can be retriggered using the dedicated CV inputs on the rear of the Etch Red panel. Try retriggering the LFOs with gate signals or LFOs from elsewhere in your Reason project.

LFO outputs

The LFO outputs provide the output from each LFO so that they can be used to modulate parameters in other Reason devices.

Filter FM inputs

These do not affect the LFO directly but please note that connecting these inputs overrides the default routing of LFO1 or LFO2 to the dedicated FM function on Filter1 and Filter2.



4.3 Follower

The Follower (envelope follower) produces a modulation signal by reacting to the amplitude of the audio input signal with specified attack and decay envelope characteristics.

HPF

Activating the **HPF** button enables a high-pass filter on the input signal prior to the Follower's peak detection. The filter is applied whether using the main input or the Follower Override input. The HPF function is enabled by default.

Atk (Attack)

This control sets the **Attack** time of the envelope generated in response to a new detected transient.

Dcy (Decay)

This control sets the **Decay** time of the generated envelope.

Lvl (Level)

The **Level** control allows you to attenuate the level of the signal entering the envelope follower transient detection circuit. At 100%, no attenuation is applied on the signal.

Gain *[w/TransMod amount]*

The **Gain** control offers a final attenuation control for the output of the module before it enters the TransMod modulation system. At 100%, no attenuation is applied to the output modulation signal.

This control is intended to be modulated by other TransMod sources for dynamic, evolving modulation effects.

Follower connections

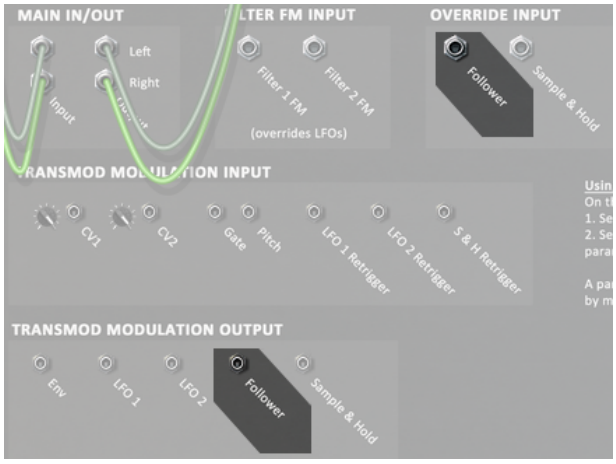
Follower Override input

By default, the Follower reacts to the main audio input signal.

By connecting the Follower Override input on Etch Red's rear panel, you can make the Follower react to a signal from a suitable audio source elsewhere within Reason instead.

Follower output

The Follower output provides the output from the Follower modulator so that it can be used to modulate parameters in other Reason devices.



4.4 Sample and Hold (S&H)

The Sample and Hold (S&H) function is designed to output a stream of varied modulation values and act as a 'random LFO'.

By default, a dedicated internal noise signal is sampled and held periodically (with the period dictated by the **Rate** control). When a clock pulse occurs, the dedicated internal noise signal is 'sampled' - its current value is 'snapshotted' - and held constant at the sampled value until the next clock pulse, when the process repeats.

Sync button

With the **Sync** button enabled, the **Rate** control is set in BPM values derived from the Reason tempo.

With the **Sync** button disabled, the **Rate** control is set in Hz.

The behaviour of the Sync function is explained in more detail here.

Rate *[w/TransMod amount]*

The **Rate** control dictates the speed of the sample and hold process.

Slew

The **Slew** control introduces lag between each sampled and held value, resulting in a smoother transition between values instead of abrupt changes with the control at the minimum setting.

Gain *[w/TransMod amount]*

The **Gain** control offers a final attenuation control for the output of the module before it enters the TransMod modulation system. At 100%, no attenuation is applied to the output modulation signal.

This control is intended to be modulated by other TransMod sources for dynamic, evolving modulation effects.

Sample & Hold connections

S&H Override input

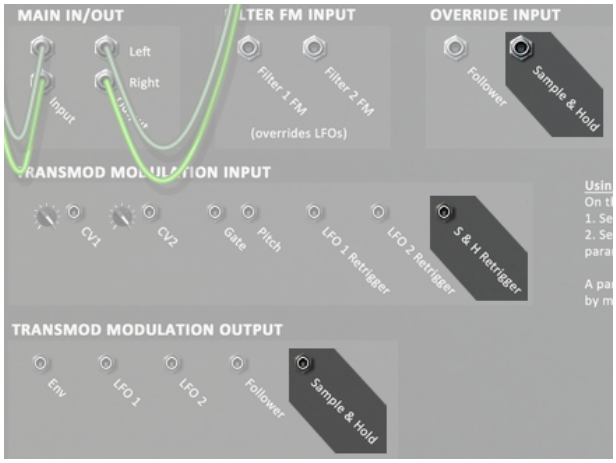
The S&H Override input can be connected to an external audio source to use with the S&H in place of its internal noise source.

With the input connected, the S&H module operates on the connected signal. When it is disconnected, the internal noise source is used.

S&H Retrigger input

The S&H Retrigger input can be connected to a suitable source of trigger signals, such as gates, LFOs etc, to trigger the S&H function.

This function is applied in addition to the internal clock. To trigger S&H events only with an external gate or clock, set the **Rate** parameter to a frequency lower than the external gate/clock.



Sample & Hold output

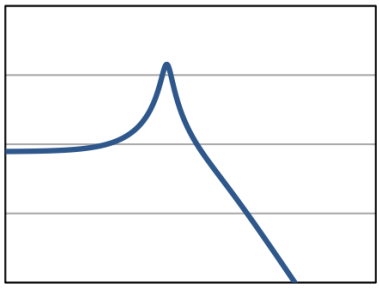
The Sample & Hold output provides the output from the S&H modulator so that it can be used to modulate parameters in other Reason devices.

5 Filter response curves

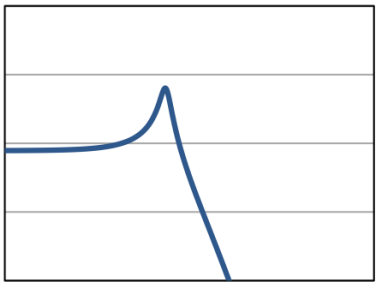
The filter response curves in this section represent output amplitude (vertical axis) against frequency (horizontal axis).

5.1 Japan filter type

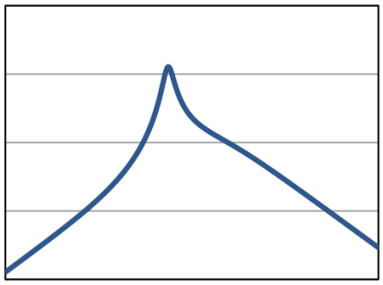
Japan 2L



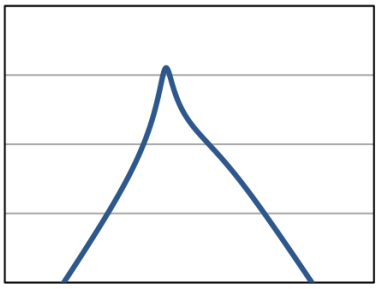
Japan 4L



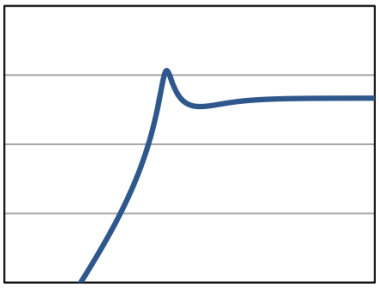
Japan 2B



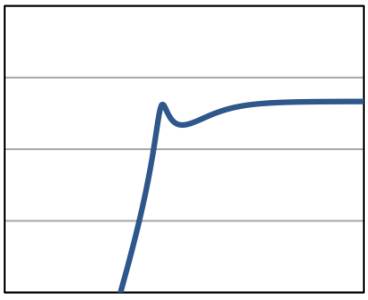
Japan 4B



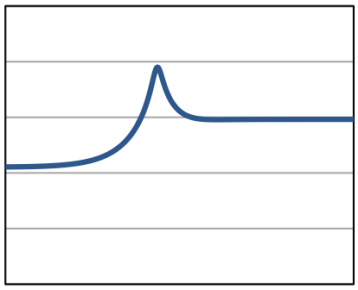
Japan 2H



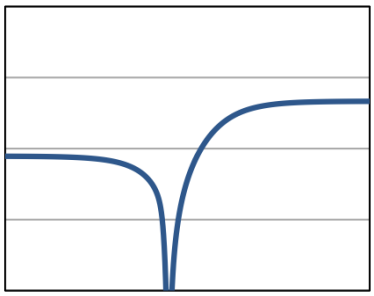
Japan 4H



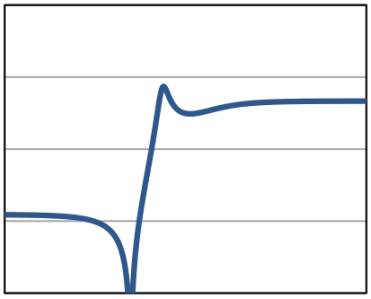
Japan 2P



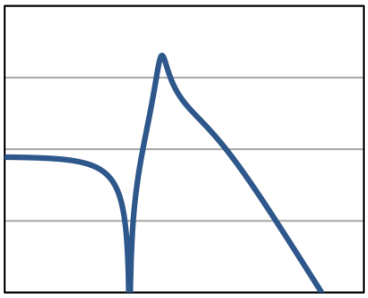
Japan 1N + 2P



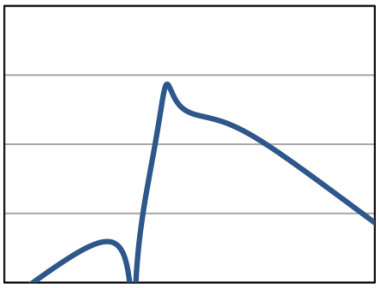
Japan 2N + 2P (8ve) (N2P2T)



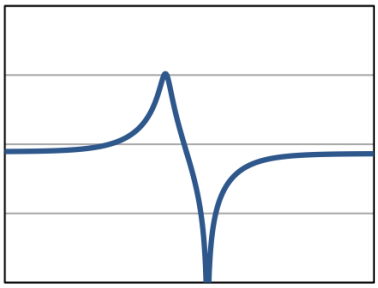
Japan 2N + 2L (8ve) (N2L2T)



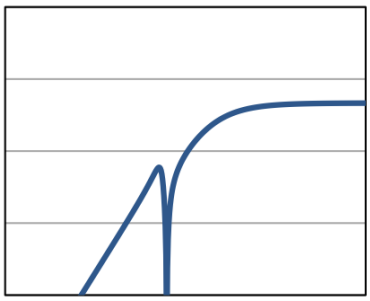
Japan 2N+1H+1L (8ve)



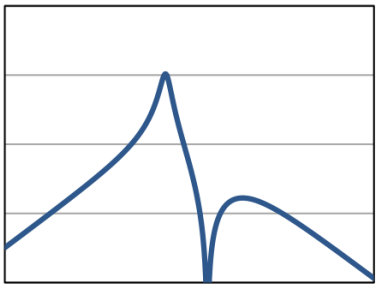
Japan 2P + 2N (8ve)



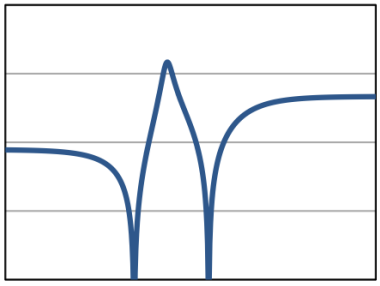
Japan 2H + 2N (8ve)



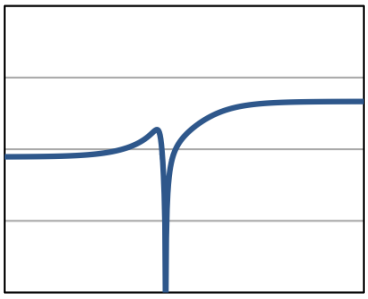
Japan 1H + 1L + 2N (8ve)



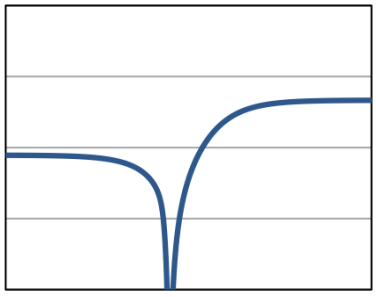
Japan 2N + 2P + 2N (8ve)



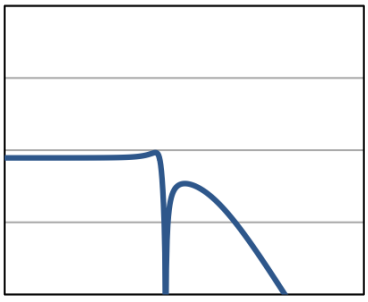
Japan 2N



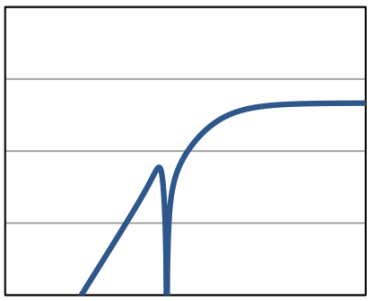
Japan 4N



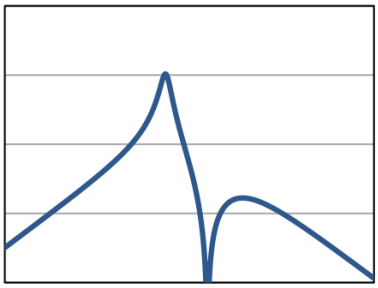
Japan 2N + 2L



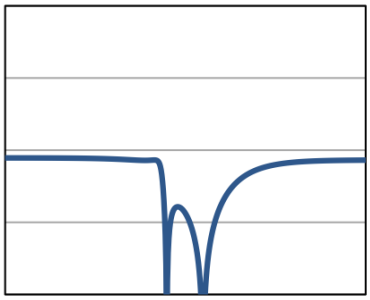
Japan 2H + 2N



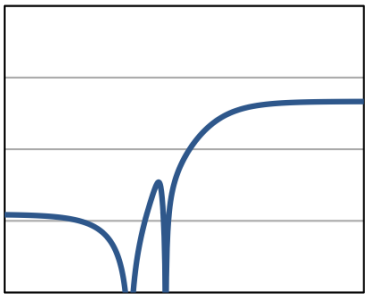
Japan 1H + 2N + 1L (8ve)



Japan 2N + 2N (+8ve) (A)

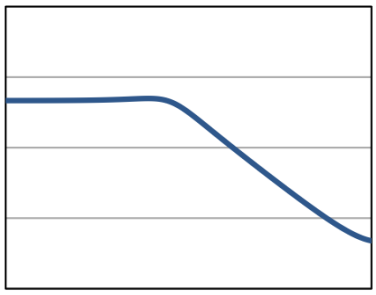


Japan 2N + 2N (-8ve) (B)

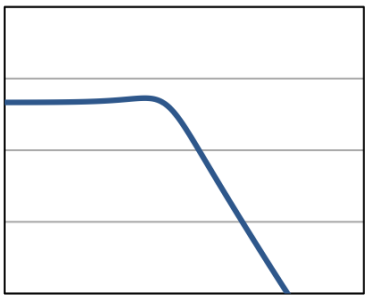


5.2 SVF filter type

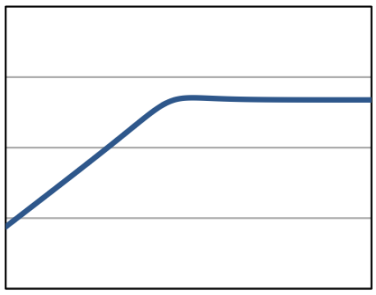
SVF 2L



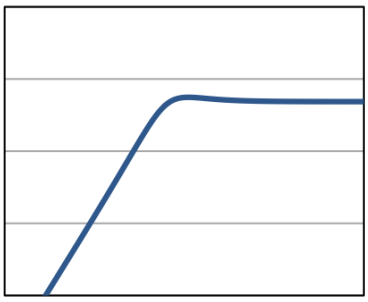
SVF 4L



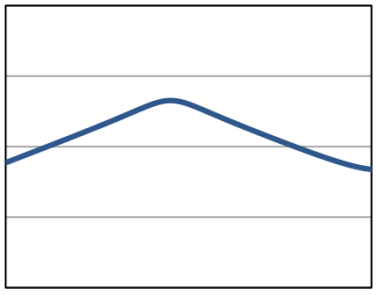
SVF H2



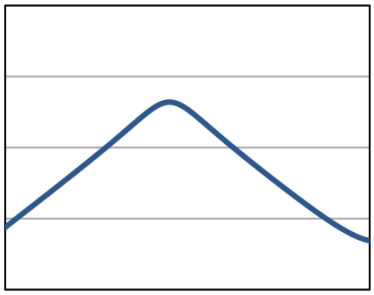
SVF H4



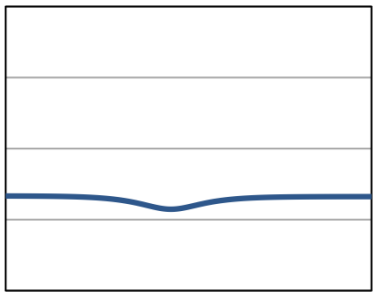
SVF 2B



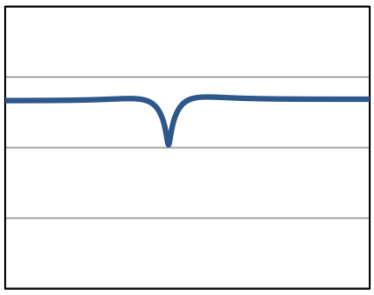
SVF 4B



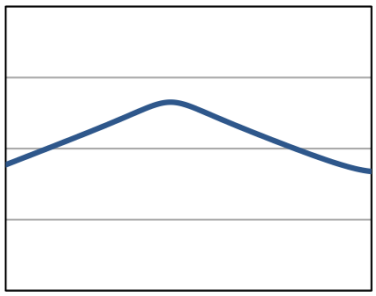
SVF 2N



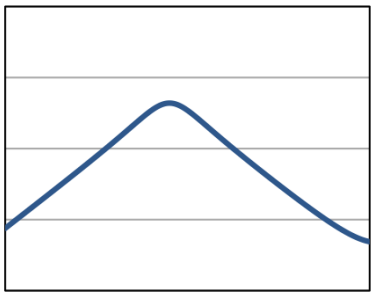
SVF 4N



SVF 2P



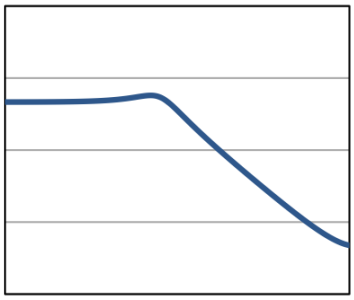
SVF 4P



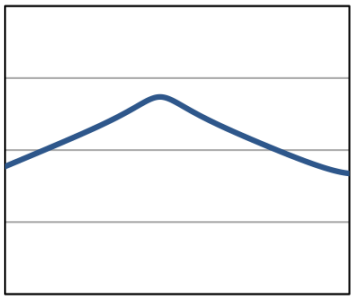
5.3 Fatty and Comb filter types

Fatty

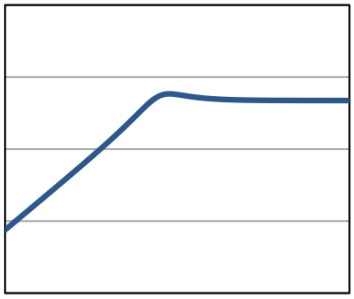
Fatty Lowpass



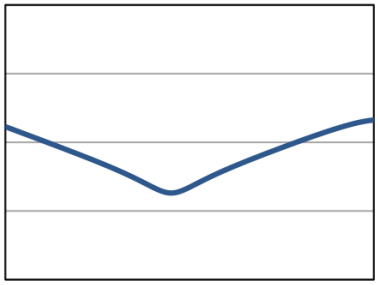
Fatty Bandpass



Fatty Highpass

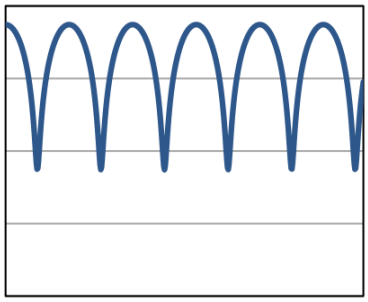


Fatty Notch

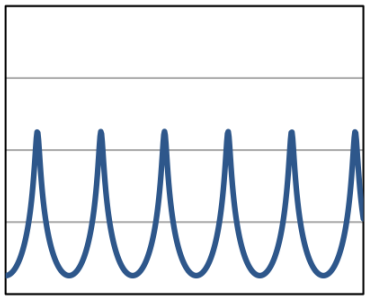


Comb

Comb Positive



Comb Negative



6 Credits

Programming: Jamaine Obeng, Steve Baker, Paul Chana
GUI design: Steve Baker
QA: Drew Vernon, Tom Meaney, Mike Bugh, Sam Gillies
Video: Rory Dow
Sound design: Drew Vernon, Tom Meaney, Mike Bugh, Jamaine Obeng, Sam Gillies
Documentation: Mayur Maha
Image design: Rus Brockman
Web development: Andreas Schnetzler, Sam Sharp, Rob Philp
Project management: Steve Baker
Artist Relations: Clare O'Brien
Support: Alex Volmer, Ryan Sellers
Additional contributions: Angus Hewlett, Rhiannon Bankston-Thomas, SKoT McDonald
FXpansion USA: Terry Hardin, Leslie Crook

Special thanks to Propellerhead Software and the Propellerhead test pilots.