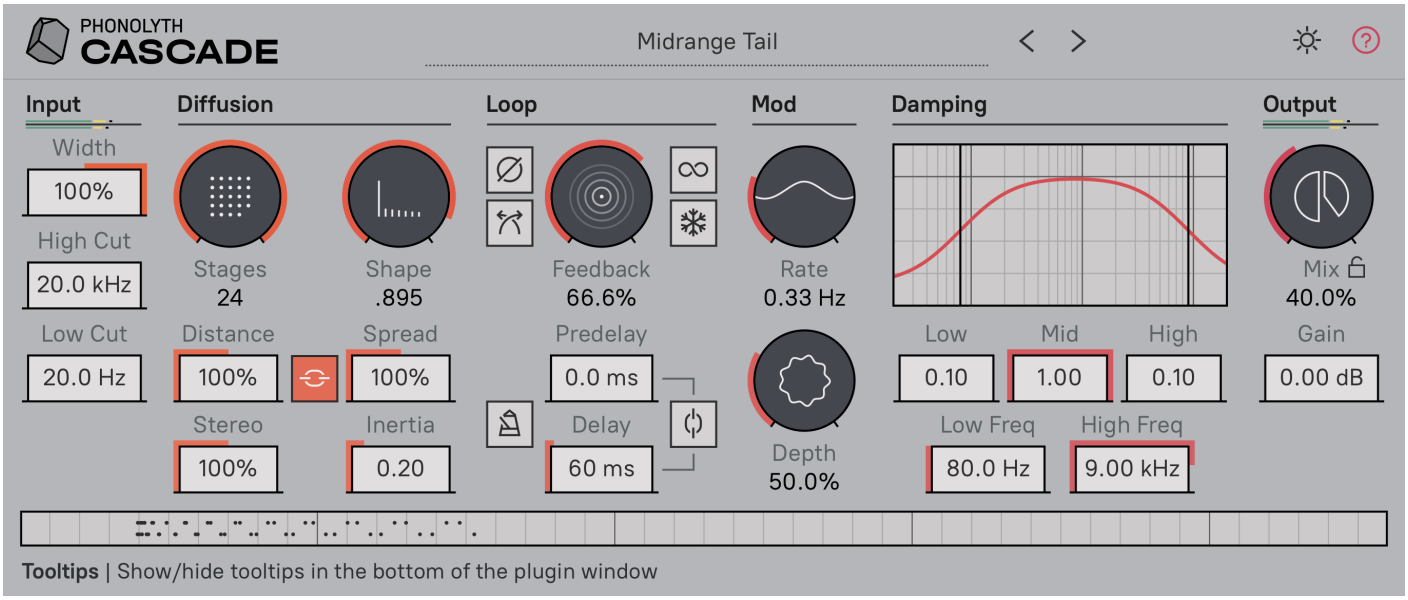
PHONOLYTH
CASCADE

User Manual
1.0



Cascade is a reverb and diffusion processor with an experimental edge. Designed first and foremost with expansive modulated supernatural spaces in mind, it features an extensive set of controls to explore other sonic territories such as stereo widening, transient smearing, hybrid delay/reverb and chorus/flanger/resonator-like effects.

How It Works

> If this sounds too technical, feel free to skip ahead — you don't need to know or understand this to use Cascade.

At its core, Cascade uses a chain, or cascade, of 24 *allpass delay* (a.k.a. *allpass diffuser*) stages for each of the left and right channels. Each of these stages smears and diffuses the incoming signal a bit, and chaining enough of these together results in a lengthy and diffuse reverberation effect. A notable feature of the allpass delay is its ability to produce various kinds of non-exponential responses, which works great for out-of-this-world effects like blooming and super long reverberation.

Now, this structure can sound somewhat static if allpass delay times are constant, so Cascade employs a randomized modulation scheme where each of the delay times is modulated by a dedicated LFO that is purposefully out of sync with others, thus adding a sense of motion to the sound.

Last but not least, Cascade incorporates a feedback loop around the entire chain, making infinite reverb and delay-infused diffusion textures possible. The feedback loop is complemented by damping filters to modify the frequency response over time.

User Interface

Cascade user interface window is freely resizeable. To resize the window, simply drag on its bottom right corner.

> Note that in *Logic Pro*, you have to drag the corner of the plugin UI itself, not the window around it.

Preset Bar

Located at the top of the Cascade user interface, the Preset Bar lets you load and save presets, as well as access several other features.

	Click to open the About page, where you can check plugin version information and access support resources.
Midrange Tail	Shows the name of the current preset. Click to show or hide preset browser (see Presets).
< >	Click to switch to the previous or next preset in the list.
☼ / ☾	Switches between dark and light UI color schemes.
ⓘ	Toggles the visibility of UI element tooltips located at the bottom of the plugin window.

Parameter Controls

Input

This section controls the processing of the input signal before it gets sent to the diffusion and feedback stages.

Width — Stereo width of the input signal.
0% — sum to mono, **100%** — preserve full width, **-100%** — swap left and right channels.
If the input signal is panned to the side, this control can be used for stereo effects such as the wet signal appearing on the opposite side of the input, or, in conjunction with **Cross-Feedback**, starting on one side and gradually spreading across the whole stereo spectrum.

High Cut, Low Cut — Cutoff frequency of the high-cut and low-cut filters respectively, applied before diffusion and feedback stages.

Diffusion

This section controls the parameters of the diffusion stage, which can affect length, density, envelope and overall character of the effect.

Stages — Determines the number of allpass diffuser stages to use. Generally, using more stages results in higher diffusion density and longer decay. Depending on **Shape**, this may also result in a slower reverb onset.

Shape — Controls the feeback/feedforward gain of the active allpass diffusers, which simultaneously affects the amount of diffusion and envelope of the effect. The knob graphic schematically shows the impulse response of a single diffuser.

.0	a single delay repeat
.0—.618	progressively more diffusion with a reverse-like envelope
.618—.99	even more diffusion with 'normal' envelope and, at the same time, progressively more dry signal
1	dry signal only

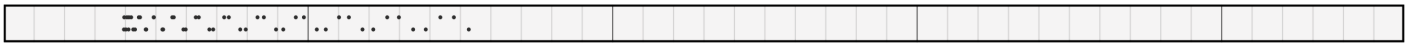
Try **.85—.99** to find a sweet spot for long decays, or around **.5-.618** for reverse reverb effects.

Distance — Delay time of the first diffusion stage. Higher values result in longer decay and a more neutral response, while lower ones can sound more 'metallic' or 'boxy'. Try setting high **Distance** and low **Spread** values for a pulsating or fluttering effect.

Spread — Spacing between succesive diffusion stages relative to the first. Higher values make the reflections more spread out in time.

Distance/Spread Link	Links **Spread** to **Distance**. The resulting coupled parameter can be thought of as a regular reverb size parameter, while using different values for **Spread** and **Distance** can further tweak the reverb character or make for unusual sounding effects.
Stereo	Controls the stereo-opposed time offsets for the left and right allpass diffuser stages.
Inertia	Controls the amount of time it takes for new **Distance**, **Spread** and/or **Stereo** values to settle. This parameter doesn't have an effect unless any of the mentioned parameters are being changed.

Stage Delays Visualizer



Located at the bottom of the plugin interface, this element visualizes the delay times of diffusion stages, reacting to changes in the parameters **Stages**, **Distance**, **Spread** and **Stereo**. It can give a general idea of the response length; however, that also strongly depends on **Shape** and **Feedback**.

Thicker dots represent currently active stages and grid lines are spaced 10 ms apart.

Loop

This section controls the parameters of the feedback loop around the diffusion stage, as well as predelay and loop delay times.

Feedback Polarity	When enabled, the signal polarity is flipped with each pass through the feedback loop. Depending on other parameters, this can have little effect on the sound or a very pronounced effect, e.g., with low **Delay** and non-zero **Feedback**, or when **Shape** is close to 1.
Cross-Feedback	Swaps the left and right channels of the feedback signal. With feedback engaged and depending on other parameters, this may alter the stereo quality of the resulting effect and/or increase modulation complexity.
Feedback	The amount of feedback around the diffusion stage. Generally speaking, more feedback results in longer decay. Keep in mind that with low **Delay**, this can also impact the frequency response and volume of the effect due to comb-filtering.
Infinite	Sets feedback to 100% for infinite decay while still letting new signal in.
Freeze	Sets feedback to 100%, stops accepting incoming signal, pauses modulation and progressive damping of the recirculating signal, thus effectively freezing the current content of the diffusion stage.

Predelay Delay time applied before sending the input signal through the diffusion stage. This can be used to perceptually separate the dry and wet signals, or make the reverb signal appear farther.

Delay Delay time applied to the diffused signal being fed back to the diffusion stage input. Besides affecting the decay length, this can have a big impact on the frequency response and volume of the effect, i.e. different frequencies being boosted and cut due to comb-filtering. Delay has no effect if **Feedback** is 0%.

Delay Sync — Allows setting **Predelay** and **Delay** as rhythmic subdivisions of the host tempo.

Delay Link — Links **Delay** parameter to **Predelay**.

Mod

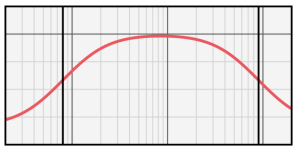
This sections controls the parameters of modulation applied to allpass delay times. The modulation employs multiple LFOs that operate asynchronously, resulting in intricate modulation patterns. This can help reduce ringing in the reverb tail and add a sense of motion to the sound.

Rate Sets the average rate of random modulation of diffusion stages' delay times.

Depth Contols the amount of pitch change induced by the modulation.

Damping

This section controls the damping filters parameters. These filters are positioned after the diffusion stage and before the feedback loop send, meaning that the signal passes through them at least once (with zero feedback) and with each pass through the feedback loop. You can adjust the filter parameters in the response plot itself for a more hands-on approach, or use the controls below for better accuracy.



Frequency response of the damping filter.
Drag vertical lines to adjust crossover frequencies.
Drag up and down to adjust shelving gains.

Low, Mid, High Control the shelving gain of the low-, mid-, and high-frequency bands respectively.

Low Freq, High Freq Control the crossover frequencies of the frequency bands.

Output

Mix Controls the blend between the dry and wet signals.
0% — dry only, **50%** — equal amounts of both, **100%** — wet only.

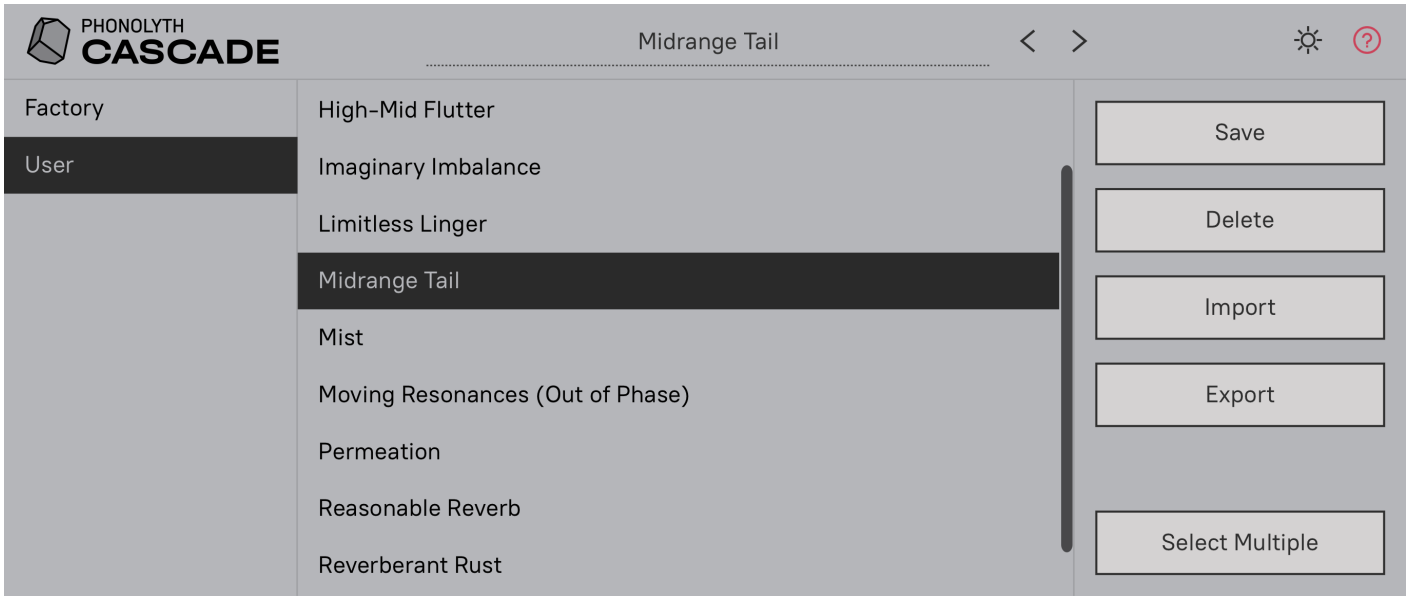
Mix Lock — If enabled, the Mix setting will not change when switching presets.

Gain Controls the output level of the sum of dry and wet signals. Generally, this should be set to 0 dB for reverb effects, but it can be useful to lower the output level when using Cascade as a chorus/flanger/resonator effect.

> Parameter Automation
> All parameters are available for host control and automation. For more details on how to use this feature, check the documentation for your host.

Presets

The preset button (located in the top center of Cascade window) shows the name of the current preset. Click this button to open the preset browser, which allows you to load, save and manage presets. (To close the browser, click the button again.)



Cascade comes with a number of presets available in the *Factory* bank on the left. These presets cannot be deleted. The presets you save will be located in the *User* bank.

To *load* a preset, click the preset name in the list.

To *save* a preset, click **Save** and enter the preset name. If a preset with this name already exists, you will be asked if you want to replace it.

To *delete* a preset, select it in the list, click **Delete** and confirm deletion in the popup dialog. Alternatively, click **Select**, put checkmarks against the presets that you want to delete and click **Delete**.

Import/Export (iOS)

To *export* a preset, select it in the list (or tap **Select** and check multiple presets), then tap **Export** and choose the desired sharing option in the system dialog.

To *import* presets, tap **Import**, select the presets you want to import in the presented system file browser and tap **Open**.

Import/Export (macOS/Windows)

As the desktop operating systems provide free access to the file system, you can import and export presets by copying preset files to and from the designated user preset folders:

- **macOS:** *~/Music/Phonolyth/Cascade/Presets*
- **Windows:** *Documents\Phonolyth\Cascade\Presets*