VOLTAVERB

Professional Convolution Reverb

User Manual

Version 1.0

- 4-IR XY Morphing System
- Tempo-Synced Rhythmic Gate
- Granular Processing Engine
- Vintage Effects Suite
- 8-Band Parametric EQ
- Dual LFO Modulation
- Spatial Pan-Following

Table of Contents

1. Introduction

Voltaverb is a professional convolution reverb plugin that combines high-quality impulse response processing with an extensive suite of creative DSP effects. It features intuitive room-shaping controls, 4-slot IR morphing, spatial pan-following, granular processing, freeze, vintage emulation, and more.

Available as VST3 on Windows and macOS, and Audio Unit on macOS.

Key Features

- **4-IR XY Morphing System** — Blend between four impulse responses in real-time using an intuitive XY pad. Create evolving, dynamic spaces that transform as your music plays.
- **Spatial Pan-Following** — The reverb tracks your input signal's panning position and adjusts the spatial position accordingly, creating a more realistic sense of space.
- **Tempo-Synced Rhythmic Gate** — Create pulsing, rhythmic reverb effects locked to your DAW's tempo. Perfect for electronic music, EDM, and modern productions.
- **Granular Processing** — Transform reverb into evolving, cloud-like textures with independent control over grain size, density, pitch, and stereo spread.
- **Vintage Effects** — Add analog character with authentic tape saturation, vinyl warmth, and tube harmonics. Each effect is carefully modeled for musical results.
- **Freeze Function** — Capture and sustain reverb indefinitely for infinite ambient textures, drones, and atmospheric pads.
- **8-Band Parametric EQ** — Surgical control over reverb tone with a fully parametric equalizer featuring multiple filter types.
- **Dual LFO Modulation** — Animate your reverb with two independent LFOs offering multiple waveforms for tremolo and filter sweep effects.
- **Resampling Room Size** — Resize virtual rooms from 50% to 300% with physically accurate pitch and character changes using high-quality resampling.

2. Installation

System Requirements

- **Windows:** Windows 10 or later (64-bit)
- **macOS:** 11.0 (Big Sur) or later (Intel & Apple Silicon native)
- **DAW:** VST3 or Audio Unit compatible
- **RAM:** 4 GB minimum (8 GB recommended)
- **Disk Space:** 200 MB (including factory IR library)

Installation Locations

macOS

Component	Path
VST3 Plugin	/Library/Audio/Plug-Ins/VST3/Voltaverb.vst3
Audio Unit	/Library/Audio/Plug-Ins/Components/Voltaverb.component
Factory IRs	/Library/Application Support/VoltaPlugins/Voltaverb/Factory IRs/
Factory Presets	/Library/Application Support/VoltaPlugins/Voltaverb/Presets/

Windows

Component	Path
VST3 Plugin	C:\Program Files\Common Files\VST3\Voltaverb.vst3
Factory IRs	C:\ProgramData\VoltaPlugins\Voltaverb\Factory IRs\
Factory Presets	C:\ProgramData\VoltaPlugins\Voltaverb\Presets\

Factory IR Library

The installer includes four categories of factory impulse responses:

- Spaces — Churches, halls, and real acoustic environments (Creator: Fokke van Saane)
- Hardware — EMT 244 Digital Reverb captures (Creator: A. Bernhard)
- Objects — Unusual resonant objects: buckets, pots, drums (Collection: Claustrofobia by Fokke van Saane)
- Speakers — Vintage speakers, radios, and telephones (Creator: Fokke van Saane)

See the Credits section at the end of this manual for complete attribution and licensing information.

3. Getting Started

Quick Start in 5 Steps

1. Open your DAW and insert Voltaverb on a track or bus

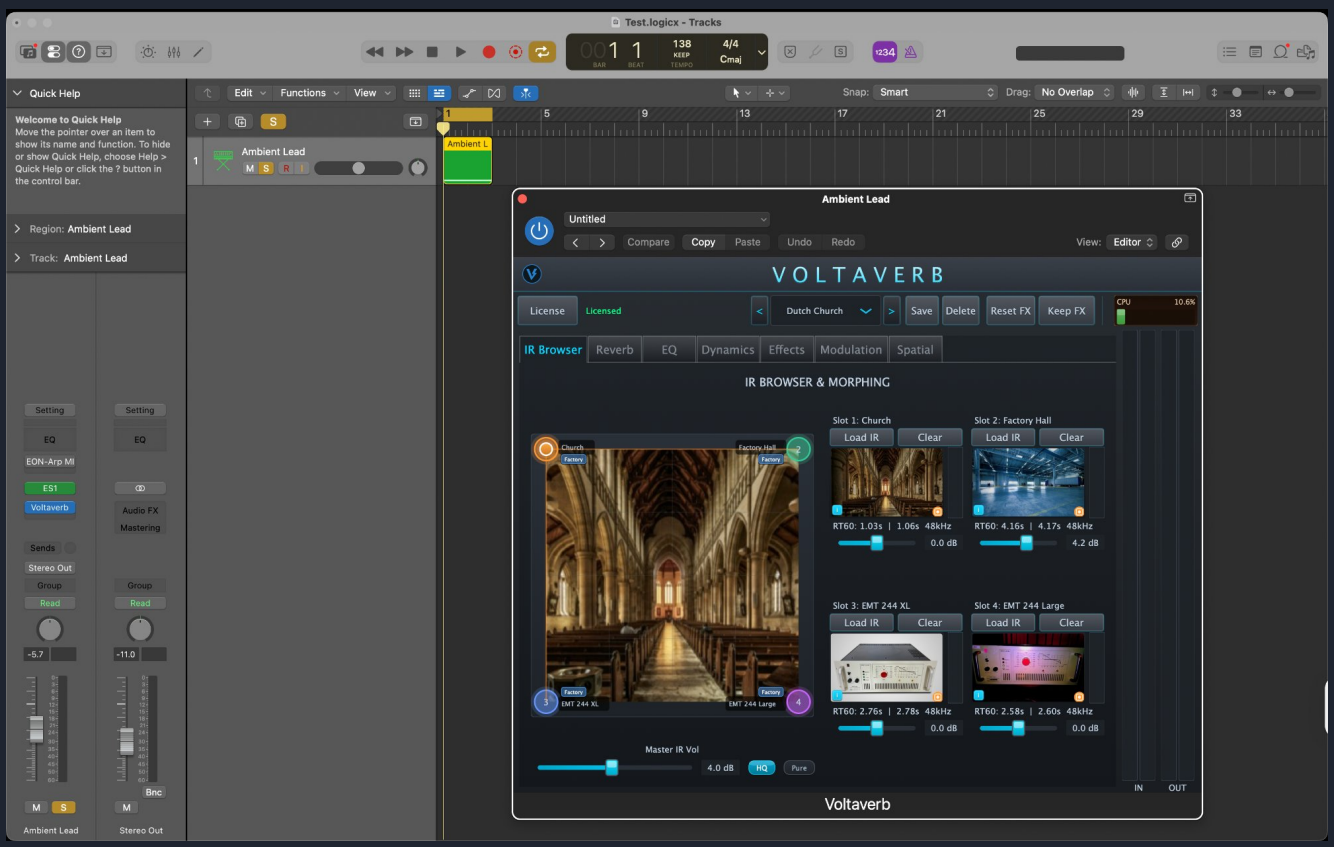
2. Load an impulse response from the IR Browser panel

3. Adjust the **Wet/Dry Mix** to blend reverb with your dry signal

4. Use the **Decay** and **Room Size** controls to shape the space

5. Explore the other panels for EQ, dynamics, modulation, and effects

> **Pro Tip:** *Start with a factory preset that matches your genre, then customize from there. This is the fastest way to achieve professional results while learning the plugin's capabilities.*



Voltaverb inserted on an Aux bus channel in Logic Pro

Buffer Size

Recommended: 512 samples or higher for full-range performance. All parameters work click-free at 512+.

At **256 samples**, the plugin works well for most settings, but extreme Room Size values (above ~230%) combined with complex IR processing can cause CPU spikes due to the FFT convolution workload. If you work at 256 samples, keep Room Size below ~230% or increase your buffer if you need the full 300% range.

1024+ samples gives the most headroom for CPU-heavy features like Shimmer (24 grain voices) and Granular processing.

> **Pro Tip:** *For the best balance of latency and performance, 512 samples is the sweet spot — it gives Voltaverb full access to every parameter without CPU concerns.*

4. Interface Overview

The Voltaverb interface is organized into a header section with global controls and a tabbed panel system for detailed editing.

Voltaverb Interface Overview

Voltaverb Interface Overview

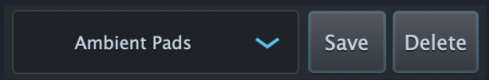
- **1. License Status** — Shows "Licensed", trial days remaining, or unlicensed state
- **2. Preset Browser** — Load and save factory or user presets
- **3. Save / Delete** — Manage user presets
- **4. Reset FX / Keep FX** — Control IR effect behavior when loading presets
- **5. Panel Tabs** — Switch between IR Browser, Reverb, EQ, Dynamics, Effects, Modulation, and Spatial
- **6. XY Morph Pad** — Blend between four impulse responses in real-time by dragging the cursor
- **7. IR Slot 1 (Top-Left)** — Load impulse response with waveform display and RT60 decay time
- **8. IR Slot 2 (Top-Right)** — Second impulse response slot with photo and controls
- **9. IR Slot 3 (Bottom-Left)** — Third impulse response slot
- **10. IR Slot 4 (Bottom-Right)** — Fourth impulse response slot

- **11. Master IR Volume** — Overall wet signal level control
- **12. Quality Controls** — HQ mode for full-length processing, Pure mode for convolution-only
- **13. CPU Meter** — Real-time processing load indicator
- **14. I/O Meters** — Monitor input (left) and output (right) signal levels

Header Controls

The header bar at the top of Voltaverb contains global controls that remain visible regardless of which panel tab is selected.

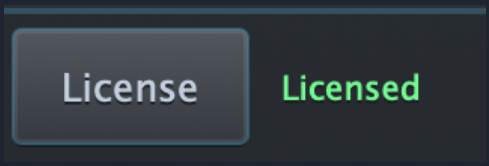
License Status



License Status indicator

Displays "Licensed" when activated, trial days remaining during evaluation, or "Unlicensed" if expired. Click to open the activation dialog.

Preset Browser



Preset Browser with Save and Delete buttons

Browse and load factory or user presets from the dropdown menu. Use Save to store your current settings and Delete to remove user presets.

Reset FX / Keep FX

Reset FX and Keep FX buttons

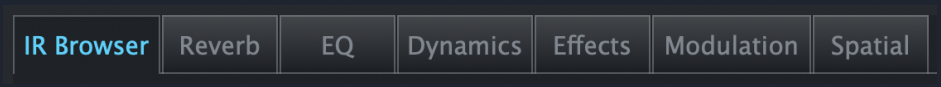
Reset FX returns IR effects to defaults. **Keep FX** preserves your current IR settings when loading presets.

Global Level Controls

These controls affect the overall signal flow and are accessible from the Reverb panel:

Control	Range	Default	Description
Input Gain	-20 to +20 dB	0 dB	Level into the reverb engine
Output Gain	-20 to +20 dB	0 dB	Final output level
Wet/Dry Mix	0-100%	50%	Blend between dry signal and reverb
Master IR Volume	-20 to +20 dB	0 dB	Overall wet signal level

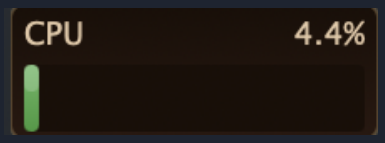
Tab Panels



Seven panel tabs organize Voltaverb's controls by function

- **IR Browser** — Load impulse responses and control morphing
- **Reverb** — Core reverb parameters (decay, size, damping, pre-delay)
- **Spatial** — Pan-following reverb and stereo positioning
- **Dynamics** — Rhythmic gate and compressor
- **EQ** — 4-band or 8-band parametric equalizer
- **Modulation** — LFOs, envelope follower, multiband processing
- **Effects** — Granular, freeze, and vintage effects

Level Meters & CPU



Real-time CPU usage display

The top-right corner displays input/output level meters and real-time CPU usage percentage.

5. IR Browser & Morphing

The IR Browser is where you load impulse responses and control the XY morphing system that blends between up to four IRs simultaneously.

Convolution Engine

Voltaverb features a **4-slot convolution engine** with real-time XY morphing between impulse responses. The engine uses parallel convolution with 10ms crossfade smoothing for artifact-free blending.

- **XY Pad** — Blend between four loaded IRs in real-time using bilinear interpolation
- **Background Processing** — IR loading and processing happens on a background thread with no audio glitches when loading new impulse responses
- **True Stereo Support** — Load mono, stereo, or true stereo (4-channel) impulse responses

The IR Browser with four impulse responses loaded and the XY morph pad

Loading Impulse Responses

Voltaverb has four IR slots arranged as corners of a 2D morphing space:

Slot	Position	Morph Coordinate
Slot 1	Top-Left	X=0, Y=0
Slot 2	Top-Right	X=1, Y=0
Slot 3	Bottom-Left	X=0, Y=1
Slot 4	Bottom-Right	X=1, Y=1

To load an IR:

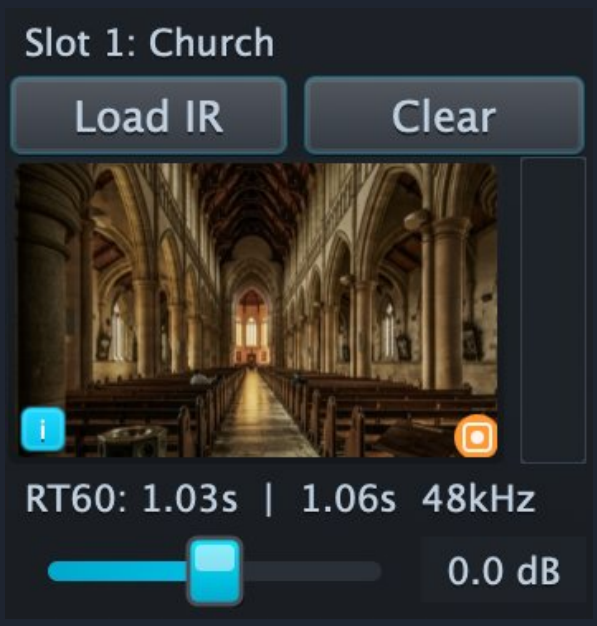
1. Click the **Load IR** button on any slot

2. Browse to a .wav, .aiff, or .vir file

3. The IR loads in the background (image appears when ready)

4. The slot displays the IR name, image, and calculated RT60 time

Supported formats: WAV, AIFF (any sample rate or bit depth), and encrypted .vir factory files.



Slot 1: Church with RT60 display, image preview, and gain control

Slot Metadata

Below each waveform/image, the slot displays three technical properties of the loaded IR: the **RT60** (reverberation time — how long the reverb tail takes to decay by 60dB), the **IR duration** (total length of the impulse response in seconds), and the **sample rate** of the original file. The RT60 is typically shorter than the IR duration since the tail may continue below -60dB.

Third-Party Impulse Responses

Voltaverb works with any standard WAV or AIFF impulse response file — simply drag and drop onto the plugin window to load. Beyond the included factory IRs, there are excellent free libraries available online:

- **OpenAIR** (openair.hosted.york.ac.uk) — An academic collection of churches, concert halls, and unique spaces under Creative Commons licensing.
- **EchoThief** (echothief.com) — Over 100 real-world impulse responses captured in locations ranging from parking garages to canyons.
- **Voxengo** (voxengo.com/impulses) — A curated selection of classic spaces.

Pro Tip: *Try loading different IRs across Voltaverb's four morph slots to blend characteristics between spaces — a cathedral crossed with a tiled bathroom can produce textures no single room could.*

Parameter Reset

All parameters across Voltaverb's seven panels support **double-click to reset to default** values. This applies to all ~108 sliders and knobs in the plugin. Simply double-click any control to instantly return it to its factory default setting.

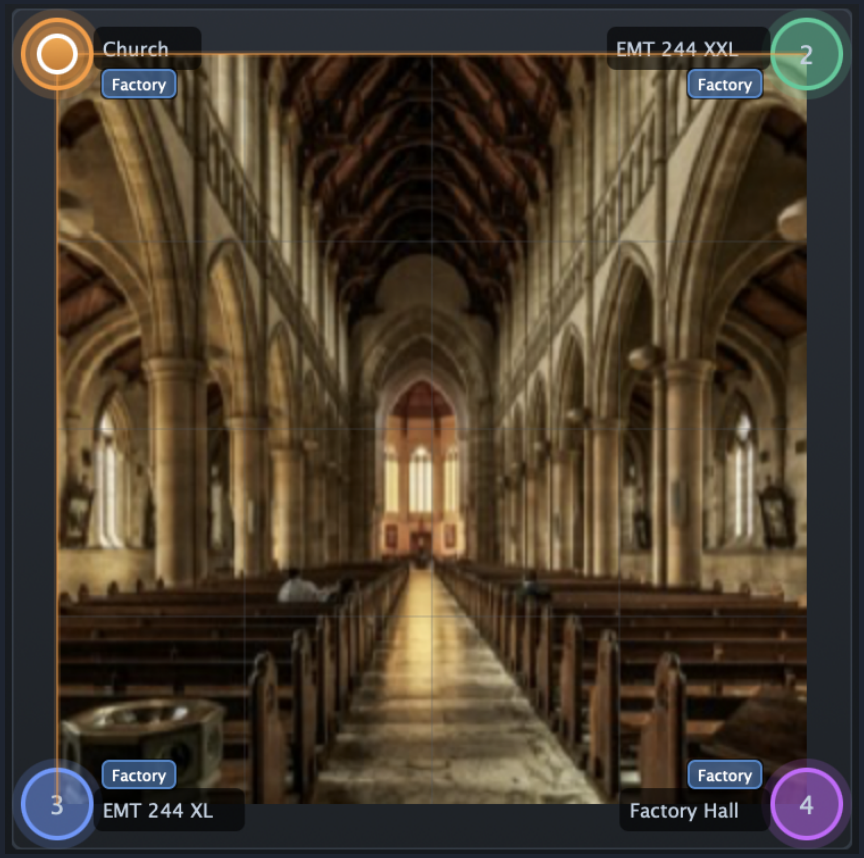
Drag & Drop Loading

You can also load impulse responses by dragging and dropping audio files directly from Finder onto the plugin window. Drag a .wav, .aiff, .flac, .ogg, or .vir file over any of the four IR slots and a cyan highlight will appear to show which slot will receive the file. If you are currently viewing a different tab, the plugin will automatically switch to the IR Browser tab as soon as the file enters the window.

Dragging an impulse response file onto Slot 3 — cyan highlight indicates the target slot

The XY Morph Pad

The central XY pad smoothly blends between your loaded impulse responses. Click and drag anywhere on the pad to mix between slots in real-time.



The XY Morph Pad with all four IR slots labeled — drag the cursor to blend between impulse responses

- **Top-left corner** = 100% Slot 1
- **Top-right corner** = 100% Slot 2
- **Bottom-left corner** = 100% Slot 3
- **Bottom-right corner** = 100% Slot 4
- **Centre** = Equal blend of all four

The morphing uses a single-convolution architecture: the four IRs are pre-blended into one morphed IR before convolution, ensuring stable CPU usage with no spikes.

Tips for XY Morphing

- **Automate** the X/Y position for evolving spaces
- **Corner positions** use less CPU (single IR) than center blends (all four IRs)
- Try loading **contrasting IRs** (e.g., tight room, cathedral, plate, spring) to access a wide range of characters

Slot Gain

Individual gain control (-20 to +20 dB) for balancing IR levels when morphing

Each slot has an individual gain control (-20 to +20 dB) to balance the relative levels of different IRs when morphing between them.

Quality Mode

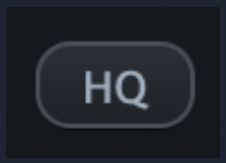
HQ Mode — Full-length IR processing with faster response:

- Full IR convolution (no tail truncation)
- 12ms parameter response for snappy dial adjustments
- Best for: Long reverbs, critical listening

Eco Mode — Reduced CPU usage for larger sessions:

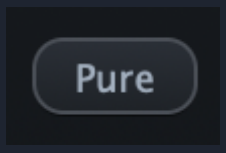
- Intelligently truncates long IR tails to 2 seconds
- Conservative parameter response to prevent CPU spikes
- Best for: General use, lower CPU

Mode	Description	Best For
Eco	Truncates IR tails to 2s, conservative response	General use, lower CPU
High Quality (HQ)	Full-length IR, 12ms parameter response	Long reverbs, critical listening



HQ toggle button

Pure Convolution Mode



Pure Convolution Button

Toggle this diagnostic mode to bypass all effects processing and hear only the raw convolution output. Useful for understanding what each effect contributes.

IR Images

Factory IRs include photographs of the spaces or equipment. Click the camera icon on any slot to toggle the image display.

Master IR Volume

Master IR Volume controls overall wet signal level

6. Reverb Controls

The Reverb panel contains controls for shaping the impulse response character.

The Reverb panel with core room-shaping controls

Core Space Controls

Core space-shaping controls — Decay and Room Size are the primary parameters

Control	Range	Default	Description
Dry/Wet Mix	0-100%	50%	Balance between dry signal and reverb
Decay	0.01x - 4.0x	1.0x	Multiplies the natural decay length
Room Size	50% - 300%	100%	Resamples the IR (changes pitch naturally)
Room Bright	0-100%	0%	Generates synthetic HF content to compensate for room size stretching
Room Tone	0-100%	0%	FFT-analysed adaptive bass boost with harmonic saturation above 50%

Decay controls the reverb tail length by applying an amplitude envelope to the impulse response. Uses **L2 norm matching** to maintain consistent loudness across all decay settings. Values below 1.0x shorten the tail (gated/tight reverb), while values above 1.0x extend it (lusher, longer tail). The first ~50ms of early reflections are always preserved so the control shapes the tail without reducing perceived volume.

Room Size resamples the early reflections using a **WindowedSinc interpolator** (HQ mode) or Lagrange interpolator (Eco mode), which changes both time and pitch — physically accurate behaviour. 200% makes the room sound twice as large; 50% makes it half as large.

Room Bright compensates for high-frequency loss caused by room size stretching. When Room Size is stretched beyond 110%, the resampling naturally shifts high frequencies downward (e.g. 15kHz drops to 5kHz at 300% size). Room Bright generates new synthetic high-frequency content from the existing IR using a harmonic exciter, ensuring stretched rooms retain realistic air and presence rather than sounding dull. The exciter blends in progressively — subtle at small stretches, more prominent at extreme sizes.

Room Tone adds low-frequency warmth and body to the reverb. It uses FFT analysis of the loaded impulse response to identify the room's natural bass character — its dominant low-frequency mode, energy distribution, and bandwidth — then applies a tailored dual-band bass boost that complements the space. IRs with naturally weak bass receive more enhancement, while bass-heavy IRs are boosted gently to avoid muddiness. The effect also scales with Room Size — larger rooms receive proportionally more bass, matching how real spaces behave. Above 50%, subtle harmonic saturation adds additional warmth. At 0%, no processing is applied.

Tone & Character

Tonal controls and pre-delay for positioning the reverb in the mix

Control	Range	Default	Description
Input Gain	±20 dB	0 dB	Level entering the reverb engine
Output Gain	±20 dB	0 dB	Final output level after processing
Pre-Delay	0-500 ms	0 ms	Time before reverb onset
Stereo Width	0-300%	100%	Stereo image expansion
Air	-12 to +12 dB	0 dB	Synthetic bright reverb layer + IR spectral reshaping
Attack	0-100 ms	0 ms	Fade-in time for early reflections

Air — "What's not there can't be turned up with EQ." When turned up (positive values), Air layers a **synthetic algorithmic reverb** on top of the convolution output, specifically designed to inject bright high-frequency content that may not exist in the original IR recording. The synthetic reverb automatically matches the loaded IR — its decay time, decay curve shape, and early reflection pattern are all analysed from the IR, so the added brightness blends naturally.

Additionally, the IR itself is reshaped: lows are reduced and highs are boosted to tilt the tonal balance toward brightness. For stretched room sizes (above 110%), a harmonic exciter generates new high-frequency content within the IR to replace the content that stretching shifted downward.

When turned down (negative values), Air acts as a simple high-frequency cut above 4kHz, darkening and warming the reverb. Useful for taming harsh or sibilant reflections. At 0dB, no processing is applied.

In summary: Air combines three layers — a real-time FDN synthetic reverb for brightness, IR spectral reshaping for tonal tilt, and a harmonic exciter for stretched rooms. Room Bright handles IR-level HF compensation for stretching separately.

Control	What It Does	Type
Room Bright	Compensates for HF loss due to room size stretching	IR reprocessing (exciter)
Room Tone	FFT-analysed adaptive bass boost scaled with room size	IR analysis + real-time filter
Air	High-shelf EQ + synthetic bright reverb layer on top of convolution	Real-time FDN + IR reshape

Stereo Width: 0% = Mono, 100% = Natural stereo, 200-300% = Widened/enhanced stereo.

Attack softens transients by fading in the reverb response. Useful for reducing harshness on percussive sources.

Enhancement

Add shimmer, movement, density, and diffusion to the reverb tail

Control	Range	Default	Description
Shimmer	0-100%	0%	Adds octave-up pitched content
Motion	0-100%	0%	Internal modulation for chorus-like movement
Thickness	0-100%	0%	Adds density and subtle saturation
Diffusion	0-100%	0%	Controls reverb tail density and smoothness

Shimmer creates ethereal, pitch-shifted tails using granular pitch shifting with crossfade windowing to minimize artifacts. Mixes octave-up harmonics into the reverb for otherworldly textures.

Diffusion adds additional smoothing to the reverb tail using a Schroeder allpass cascade topology with modulated delay times for a lush, natural sound.

Thickness uses a multi-voice chorus architecture with staggered LFO phases for widening and thickening the reverb.

Auto Gain

The Auto Gain section (visible as Tgt, Atk, Rel dials in the Reverb panel header) automatically compensates for level changes when adjusting Decay, Room Size, and other IR-modifying parameters.

Target (Tgt) — -36 to -12 dB, default -18 dB. The target RMS level the auto gain system aims for.

Attack (Atk) — 1-500 ms, default 50 ms. How quickly auto gain responds to level increases.

Release (Rel) — 10-2000 ms, default 200 ms. How quickly auto gain responds to level decreases.

> **Pro Tip:** *Enable Auto Gain to maintain consistent perceived loudness as you adjust room-shaping parameters, preventing unexpected volume jumps.*

Damping (3-Band)

Frequency-dependent decay control with material presets for realistic room simulation

Control	Range	Default	Description
Low Damp	0-100%	0%	Bass decay speed (below Low-Mid X)
Low-Mid X	100-2000 Hz	500 Hz	Crossover frequency between low and mid
Mid Damp	0-100%	0%	Mid decay speed
Mid-High X	500-10k Hz	3000 Hz	Crossover frequency between mid and high
High Damp	0-100%	0%	Treble decay speed (above Mid-High X)
Material	Presets	—	Quick damping curves (Acoustic Panels, Wood, etc.)
Dist	-100% to +100%	0%	Perceived distance via frequency-dependent air absorption

The 3-band damping uses **24dB/octave Linkwitz-Riley crossovers** for phase-coherent band splitting. **Material Presets** provide quick access to damping curves that simulate different room materials (wood, concrete, carpet, etc.). This is essential for creating natural-sounding spaces, as real rooms absorb high frequencies more quickly than lows.

Dist (Distance)

Controls the perceived distance of the reverb by simulating how sound changes as it travels through air. Uses an **FFT-based spectral processor** (STFT with 2048-sample frames) applied directly to the IR.

Negative values (turning left): Simulates greater distance. High frequencies are progressively absorbed, with later reflections losing more brightness than early ones — just as in a real large space. At -100%, the reverb sounds distant and muffled, as if heard from far away. Applies both an immediate HF cut and a time-increasing HF decay.

Centre (0%): No distance processing. The IR plays back with its original tonal character.

Positive values (turning right): Adds presence and proximity. High frequencies are boosted, making the reverb sound closer and brighter. At +100%, the reverb takes on a forward, intimate quality. Applies a symmetric HF boost.

The effect is frequency-dependent — higher frequencies are affected more than lower ones, matching the physics of real air absorption where treble fades faster than bass over distance. The frequency curve uses a

pow(freq, 0.8) weighting so that the mid-high range (2-5kHz) is noticeably affected, not just the extreme top end.

Level Lock

The Level Lock button controls how damping affects the overall tail energy. When enabled (locked), damping maintains consistent loudness — frequency content is reshaped but the perceived volume stays the same. When disabled, damping reduces tail energy in the damped bands, resulting in a quieter tail in those frequency ranges.

Stage & Modulation

Control	Range	Default	Description
Direct Cut	0-100%	0%	Attenuates the first 80ms of early reflections in the IR
Early Level	0-100%	100%	Volume of early reflections (definition)
Late Level	0-100%	100%	Volume of reverb tail (wash)
Early Stretch	50-200%	100%	Time-stretch early reflections independently
Stereo Pan	L-C-R	Center	Positions the listener within the stereo field
Pan Depth	0-100%	0%	Stereo modulation width
Pan Speed	0.1-10 Hz	1 Hz	Rate of stereo modulation sweep

Adjust the balance between early reflections (definition) and the diffuse reverb tail (wash). More early reflections create a sense of proximity to the sound source, while more late reverb creates depth and spaciousness.

Tempo Sync

Control	Range	Default	Description
Pan Sync	Off/On	Off	Lock stereo modulation to tempo
Note	1/1 to 1/32	1/4	Note division for pan modulation when synced
Delay Sync	Off/On	Off	Lock pre-delay to tempo
Division	1/1 to 1/32	1/4	Note division for pre-delay when synced
Fine	±50 ms	0 ms	Fine adjustment added to synced pre-delay

Pan Sync locks the stereo modulation to your DAW's tempo. **Pre-Delay Sync** locks the pre-delay time to musical divisions of your DAW's tempo. This is invaluable for rhythmic productions where you want the reverb to "breathe" in time with the music.

> **Tip:** *Use Pre-Delay Sync on snares and percussion to keep reverb tails from cluttering the mix while maintaining rhythmic coherence.*

Reverse IR

The **Reverse IR** button flips the impulse response backward in time, creating dramatic reverse reverb effects. When enabled, the reverb builds up to transients rather than decaying away from them.

Creative Applications

- **Vocal swells** — Create haunting pre-echoes that lead into vocal phrases
- **Transition effects** — Build tension before drops or section changes
- **Sound design** — Generate otherworldly textures and evolving atmospheres
- **Snare lifts** — Add dramatic upward swells before snare hits

> **Tip:** *For best results with Reverse IR, use longer pre-delay values and automate the enable button to trigger reverse swells at specific moments.*

Reverse works best with longer IRs (halls, plates), where the decay tail creates a dramatic swell. Short, percussive IRs (objects, speakers) may show little audible difference when reversed.

> *When Reverse is enabled, Decay shapes the swell curve of the reversed tail — lower values create a steep, dramatic rise to the impact point, while higher values produce a gradual, even buildup.*

> *Some effects may sound slightly different in reverse mode.*

Control Dependencies

Certain controls are automatically disabled based on the state of other settings. This prevents conflicting or ineffective adjustments.

When Pan Follow is Enabled (Spatial Panel)

The following controls in Reverb Controls are disabled: Stage Position (Stereo Pan), Pan Depth, Pan Speed, Pan Sync, Pan Note. The following controls in Spatial Panel are disabled: Stage Pad (XY positioning), Link button, Reset button.

> *Pan Follow automatically controls reverb positioning based on the input signal's stereo position. Manual pan and stage controls would conflict with this automatic tracking.*

When Pan Sync is Enabled

Pan Speed is disabled — when tempo-synced, the Pan Note setting controls modulation rate instead of the free-running Pan Speed.

7. Spatial Panel

The Spatial panel provides pan-following reverb and stereo positioning controls using **mid-side processing** for precise stereo width control and **constant-power panning law** for smooth, natural pan movements.

The Spatial panel with pan-following and positioning controls

Pan Follow

Enables pan-following reverb mode where the reverb output tracks the stereo position of the input signal. When enabled, the reverb appears to emanate from where the source is panned rather than spreading across the full stereo field.

Core Tracking Controls

Control	Range	Description
Pan Follow	Off/On	Enables pan-following reverb mode
Reverb Focus	0-100%	0% = reverb tightly follows source; 100% = full stereo spread
Width	0-100%	0% = mono detection; 100% = full stereo width detection

Frequency-Based Tracking

Control	Range	Description
Low	0-100%	How much low frequencies contribute to pan detection
High	0-100%	How much high frequencies contribute to pan detection
Crossover	100-2000 Hz	Frequency split point between low and high tracking bands

Tracking Behavior

Control	Range	Description
Threshold	-60 to 0 dB	Minimum input level before tracking engages
Spread	0-100%	0% = mono reverb at position; 100% = full stereo around position
Range	0-100%	Maximum pan deflection; 0% = always centered, 100% = full L/R

Envelope Controls

Control	Range	Description
Hold	0-500 ms	Time reverb position is held before releasing
Attack	5-200 ms	How fast reverb follows movement to new position
Release	5-500 ms	How fast reverb returns toward center
Bias	0-100%	0% = follows source literally; 100% = strong center bias

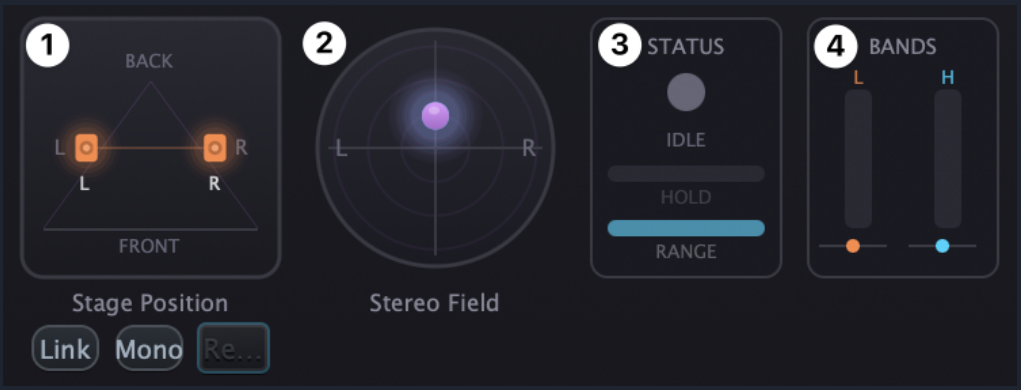
Detection & Character

Control	Options/Range	Description
Detect	RMS / Peak / Envelope	RMS = smooth average; Peak = transient; Envelope = shaped
Colour	0-100%	Applies IR tonal character to dry signal

Stage Position Controls

Control	Description
Link	When enabled, Stage Position pad controls both L/R channels together
Mono	Converts reverb output to mono; useful for mono compatibility checks
Reset	Resets both speaker positions on the Stage Pad to default

Meters & Visualizations



Spatial visualizations: 1) Stage Position, 2) Stereo Field scope, 3) Tracking Status, 4) Band levels

Stage Pad (1) — Interactive XY pad for positioning reverb in spatial field. X-axis = pan position, Y-axis = stage depth.

> *The Stage Pad, Link, and Reset controls are only interactive when Pan Follow is disabled. Disable Pan Follow to manually position the reverb using the Stage Pad.*

Stereo Scope (2) — An XY visualization showing stereo field relationship in real-time.

Tracking Status (3) — Visual feedback showing pan tracker state.

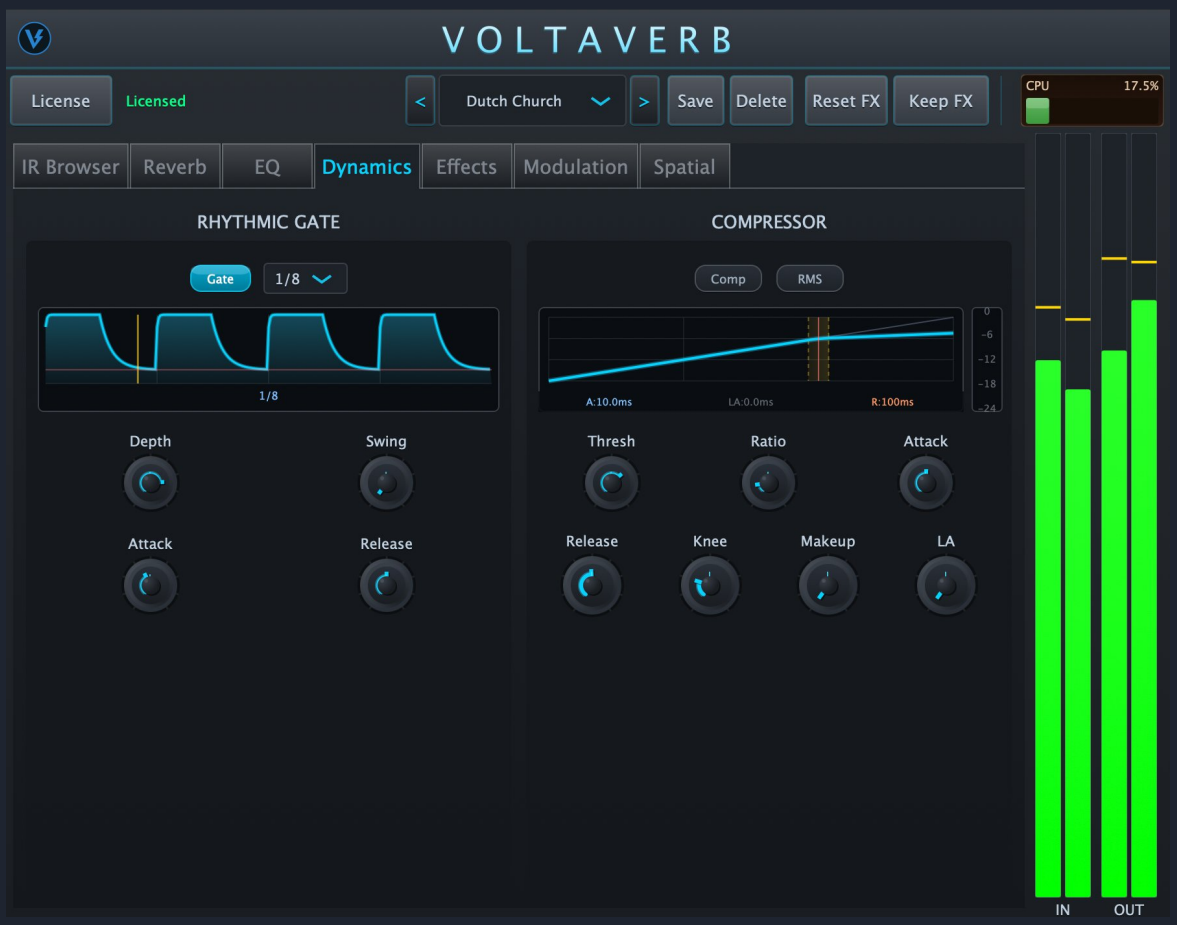
Band Visualization (4) — Displays detected levels and pan positions of low and high frequency bands.

Source Pan Meter — A horizontal meter with cyan dot (source) and purple dot (reverb output).

Stereo Correlation Meter — Displays phase relationship: +1 = mono-compatible, 0 = uncorrelated, -1 = out-of-phase.

8. Dynamics Panel

The Dynamics panel provides two powerful processors: a tempo-synced Rhythmic Gate and a full-featured Compressor.



The Dynamics panel with gate and compressor controls

Rhythmic Gate

The Rhythmic Gate chops the reverb into tempo-synced pulses, creating the classic "gated reverb" effect popularized in the 1980s. Modern applications include trance gates, sidechained reverb effects, and rhythmic textures.

Control	Range	Default	Description
Enable	Off/On	Off	Activate rhythmic gate
Rate	1/1 - 1/32	1/8	Gate rhythm in note divisions
Depth	0-100%	80%	How much the gate attenuates (100% = full silence)
Swing	0-100%	0%	Groove offset for humanization
Attack	0.1-100 ms	5 ms	How quickly the gate opens
Release	1-500 ms	50 ms	How quickly the gate closes

Tip: *For classic trance gate effects, use 1/8 or 1/16 rate with 80-100% depth. Add 20-30% swing for a more organic feel.*

Compressor

The compressor controls the dynamic range of the reverb tail. Use it to bring up quiet details, tame loud peaks, or create pumping effects when used aggressively.

Control	Range	Default	Description
Enable	Off/On	Off	Activate compressor
Threshold	-60 to 0 dB	-20 dB	Level at which compression begins
Ratio	1:1 - 20:1	4:1	Amount of gain reduction above threshold
Attack	0.1-100 ms	10 ms	How quickly compression engages
Release	10-1000 ms	100 ms	How quickly compression releases
Knee	0-12 dB	3 dB	Transition smoothness around threshold
Makeup	0-24 dB	0 dB	Output gain compensation

Tip: *For subtle pumping, use the compressor with slow attack (30-50ms) and fast release (50-100ms).*

Lookahead (LA) — 0-20 ms, default 0 ms. Introduces a small delay allowing the compressor to anticipate peaks and respond more transparently.

Detection Mode (RMS/Peak) — Toggle between RMS (smooth average, better for sustained material) and Peak (transient-responsive, better for percussive sources) detection.

9. EQ Panel

Surgical control over reverb tone with a fully parametric equalizer. The EQ processes only the wet signal, allowing you to shape the reverb's frequency content without affecting your dry signal.

Filter Technology

The EQ uses **TPT State Variable Filters** — the same topology used in professional EQs like FabFilter Pro-Q. This provides:

- **Zipper-free automation** — 5ms exponential smoothing on all parameters
- **Numerical stability** — Denormal protection and bounded parameters prevent CPU spikes
- **Cascaded slopes** — 12/24/48 dB/octave options for LP/HP filters

The EQ panel with interactive frequency curve and band controls

Interface Elements

4-Band Mode — Simplified EQ with four bands for quick adjustments

8-Band Mode — Full parametric EQ with eight bands for detailed sculpting

EQ Enable — Bypass the entire EQ section to compare processed/unprocessed

Frequency Curve — Interactive display with real-time spectrum analyzer. Click and drag nodes to adjust.

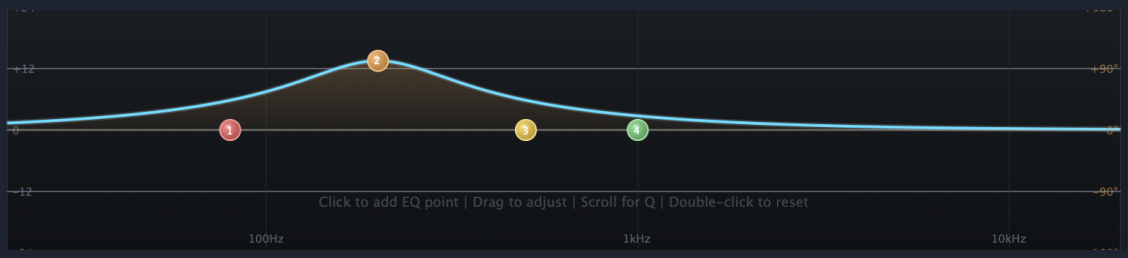
Per-Band Parameters

Parameter	Range	Description
Frequency	20-20k Hz	Center frequency for the band
Gain	±24 dB	Boost or cut amount at the center frequency
Q	0.1-30.0	Bandwidth (higher values = narrower bandwidth)

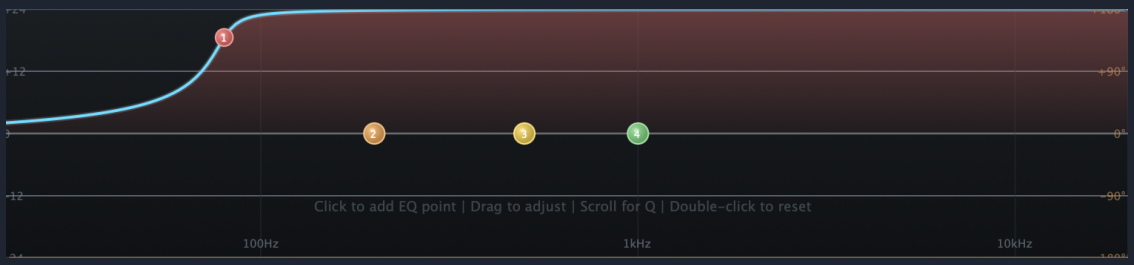
Available Filter Types: Bell (parametric peak/notch with adjustable Q), Low Shelf, High Shelf, Baxandall Low Shelf, Baxandall High Shelf (vintage-style phase-coherent shelving), Low Pass, High Pass (with resonance and selectable slopes), Notch, Band Pass

Filter Type Examples

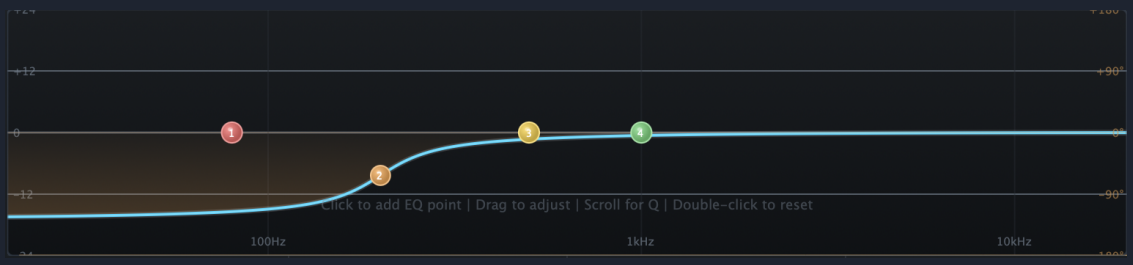
Each filter type shapes the frequency response differently:



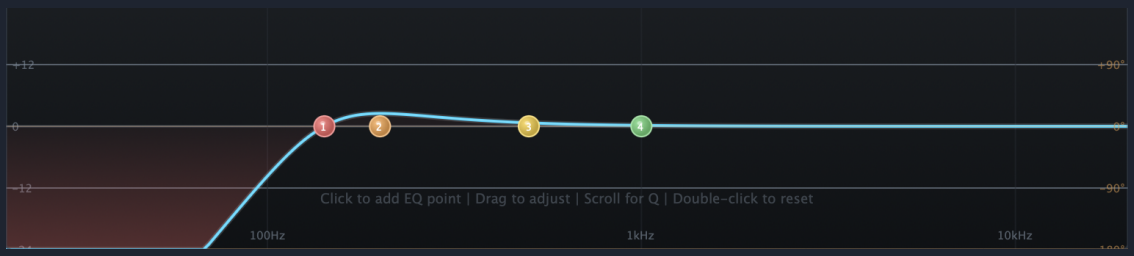
Bell (Peak) — Boost or cut a specific frequency range with adjustable width (Q)



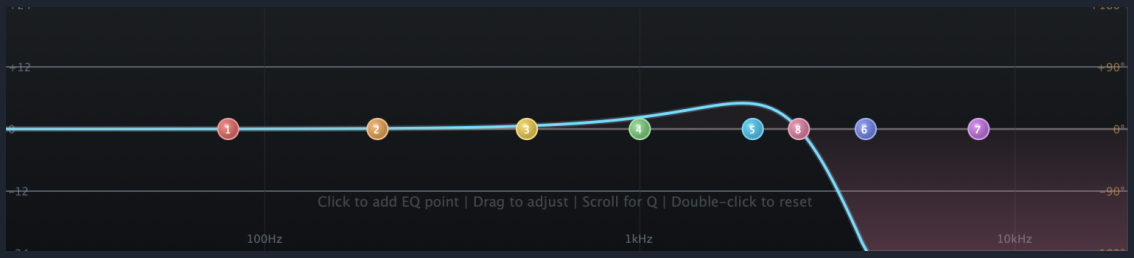
Low Shelf — Boost or cut all frequencies below the corner frequency



High Shelf — Boost or cut all frequencies above the corner frequency



Low Cut (High Pass) — Remove frequencies below the cutoff point



High Cut (Low Pass) — Remove frequencies above the cutoff point

Spectrum Analyzer

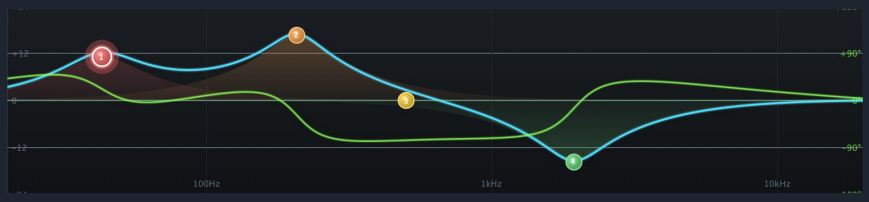
The EQ panel features a real-time spectrum analyzer that displays the frequency content of the reverb signal.

- **Real-time display** — Shows the frequency spectrum of the wet signal as it plays
- **EQ curve overlay** — Your EQ adjustments are displayed as a colored curve over the spectrum
- **Draggable nodes** — Click and drag the numbered band nodes directly on the graph
- **Frequency scale** — Logarithmic scale from 20 Hz to 20 kHz

Real-time spectrum analyzer with EQ curve overlay and draggable band nodes

Phase Response Curve

The lime green line in the EQ display shows the phase response curve — how much the EQ shifts the phase of the audio signal at each frequency. Toggle on/off with the Phase button.



The EQ graph showing magnitude response (cyan) and phase response (lime green)

EQ Tips for Reverb

- **Cut below 200 Hz** to prevent muddy, boomy reverb tails
- **Gentle high shelf cut** at 6-8 kHz helps reverb sit behind the mix
- **Notch out** problem frequencies that resonate in the IR
- **Boost around 2-4 kHz** for more presence and clarity in the reverb

> **Tip:** *Use the spectrum analyzer to identify resonant frequencies in your IR, then apply narrow notch cuts to tame them without affecting the overall character.*

10. Modulation Panel

The Modulation panel provides two systems for animating your reverb: a 4-band multiband processor for frequency-specific control, and a dual LFO system with envelope follower for dynamic modulation.

The Modulation panel with Multiband, LFOs, and Envelope Follower

Multiband Processing

Split the reverb into four frequency bands with independent control over each band's XY morph position, gain, and mix level. This allows for sophisticated frequency-dependent spatial processing, such as sending lows to one IR and highs to another.

Crossover Controls: Sub/Low, Low/Mid, and Mid/High set the crossover frequencies between the four bands.

Per-Band Controls: Band Enable (toggle each band on/off), Gain (level control for the band), Mix (wet/dry blend for the band).

LFO 1 (Tremolo)

Modulates the output level for tremolo/amplitude modulation effects.

LFO 2 (Filter Sweep)

Modulates the brightness parameter for filter sweep effects.

Control	Range	Default	Description
Rate	0.01-20 Hz	1 Hz	Modulation speed (or note division if synced)
Depth	0-100%	0%	Modulation intensity
Wave	Various	Sine	Waveform: Sine, Triangle, Square, Saw Up/Down, Random
Sync	Off/On	Off	Lock to DAW tempo

Envelope Follower

The envelope follower tracks the input signal level and uses it to modulate reverb parameters. This creates dynamic, responsive effects that react to your playing.

Control	Range	Default	Description
Env Attack	0.1-1000 ms	10 ms	How quickly the follower responds to increases
Env Release	1-5000 ms	100 ms	How quickly the follower responds to decreases
Sensitivity	0.1-10x	1x	Input level scaling for the follower
Target	Various	Mix	Parameter to modulate (Mix, Decay, etc.)

Tip: *Use the envelope follower to auto-duck reverb when input is loud, maintaining clarity. Set fast attack and medium release for sidechain-style pumping effects.*

11. Effects Panel

The Effects panel houses Voltaverb's creative sound design tools: three vintage effects processors for analog character, a granular processing engine for textural transformations, and a freeze function for infinite sustain.

The Effects panel with Vintage, Granular, and Freeze processors

Vintage Effects

Add analog warmth and character with three carefully modeled vintage processors.

1. Tape

Control	Range	Description
Drive	0-100%	Amount of tape saturation and harmonic content
Warmth	0-100%	Low-frequency enhancement and smoothing
Wow	0-100%	Slow pitch variation (speed fluctuation)
Flutter	0-100%	Fast pitch variation (motor irregularities)

2. Vinyl

Control	Range	Description
Crackle	0-100%	Amount of vinyl surface noise
Wear	0-100%	High-frequency degradation and filtering
Rumble	0-100%	Low-frequency turntable rumble

3. Tube

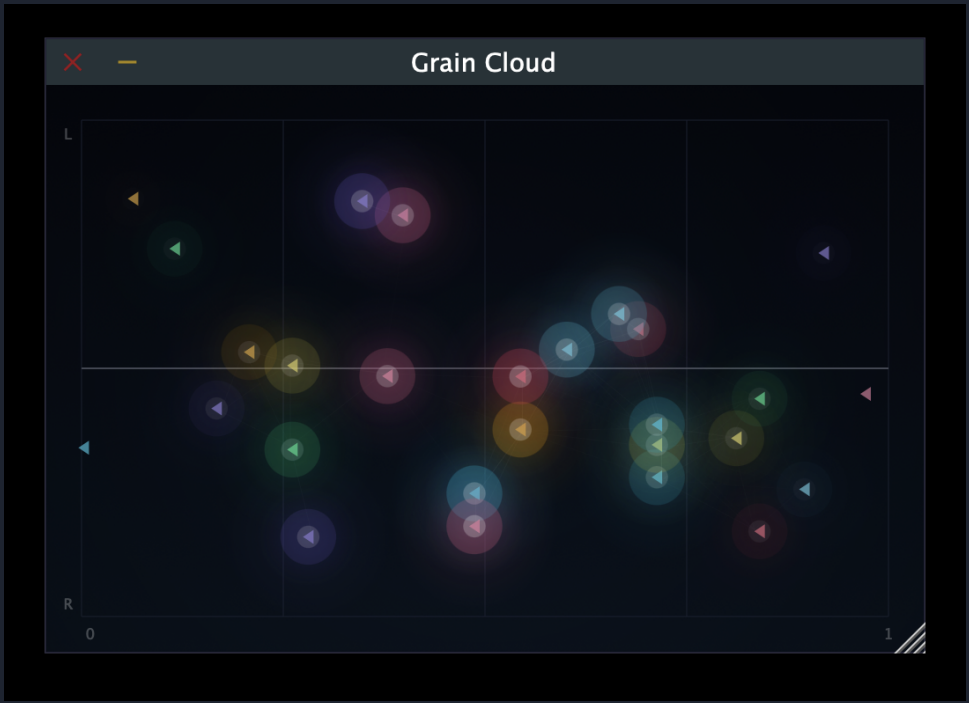
Control	Range	Description
Gain	0-100%	Input drive into the tube stage
Bias	0-100%	Tube bias point (affects harmonic character)
Output	0-100%	Output level after tube processing

Vintage Mix — Master wet/dry blend for all three vintage effects combined.

Granular Processing

The granular engine transforms reverb into evolving, cloud-like textures by slicing the audio into tiny grains and recombining them. Uses crossfade windowing to minimize artifacts between grains.

Control	Range	Default	Description
Grain Size	10-500 ms	100 ms	Duration of each grain
Density	0-100%	50%	How many grains play simultaneously
Spread	0-100%	0%	Stereo distribution of grains
Pitch	-24 to +24 st	0	Grain pitch shift
Pitch Random	0-100%	0%	Per-grain pitch variation
Reverse Prob	0-100%	0%	Probability of playing grains backward
Position	0-100%	50%	Playback position within the buffer
Pos Random	0-100%	50%	Random position variation
Filter	200 Hz-18 kHz	18 kHz	Per-grain lowpass filter
Resonance	0-100%	0%	Filter Q factor
Feedback	0-100%	0%	Recirculation amount
Jitter	0-100%	0%	Timing randomization
Width	0-200%	100%	Grain stereo width
Flt Rnd	0-100%	0%	Randomises per-grain filter cutoff frequency
Mix	0-100%	0%	Granular wet/dry blend



The Grain Cloud visualizer showing active grains with position and playback direction

Freeze Engine

Captures and sustains the reverb tail infinitely using **spectral freezing** with crossfade looping for seamless sustain. When enabled, the reverb buffer loops seamlessly, allowing you to build evolving drones and atmospheric pads.

Control	Range	Default	Description
Freeze Enable	On/Off	Off	Engage infinite sustain
Smoothing	1-1000 ms	50 ms	Crossfade time when engaging/disengaging freeze
Filter Cutoff	1-20 kHz	8 kHz	Low-pass filter on frozen signal
Mix	0-100%	100%	Freeze blend level
Mod Rate	0.1-5 Hz	0.7 Hz	Internal pitch modulation speed for movement
Mod Depth	0-100%	50%	Internal pitch modulation intensity

Tip: *Automate Freeze enable for dramatic transitions. Use Mod Depth for subtle pitch movement in frozen textures to prevent them from sounding static.*

12. Presets

Loading Presets

Use the preset dropdown at the top of the interface to browse and load factory or user presets.

Factory Preset Categories

- **Rooms** — Small to large acoustic spaces: studios, bedrooms, living rooms, warehouses
- **Halls** — Concert halls, theaters, and large venue simulations
- **Plates** — Classic plate reverb emulations from vintage to modern
- **Ambient** — Atmospheric and textural presets for soundscapes
- **Creative** — Sound design presets featuring granular, gated, and experimental effects

Saving Presets

1. Dial in your desired settings

2. Click the Save button

3. Enter a name for your preset

4. The preset is saved to your user library

User Preset Storage Locations:

- macOS: ~/Library/Application Support/VoltaPlugins/Voltaverb/Presets/
- Windows: %APPDATA%\VoltaPlugins\Voltaverb\Presets\

Preset Management

Action	Description
Save	Store current settings as a user preset
Delete	Remove user presets (factory presets are protected)
Compare	A/B between your edits and the saved state
Copy/Paste	Transfer settings between plugin instances

Lock IR Effects

When enabled, loading a preset will preserve your current IR-related settings (room size, decay, damping, brightness, etc.) so you can audition presets while keeping your room shape.

Reset IR Effects

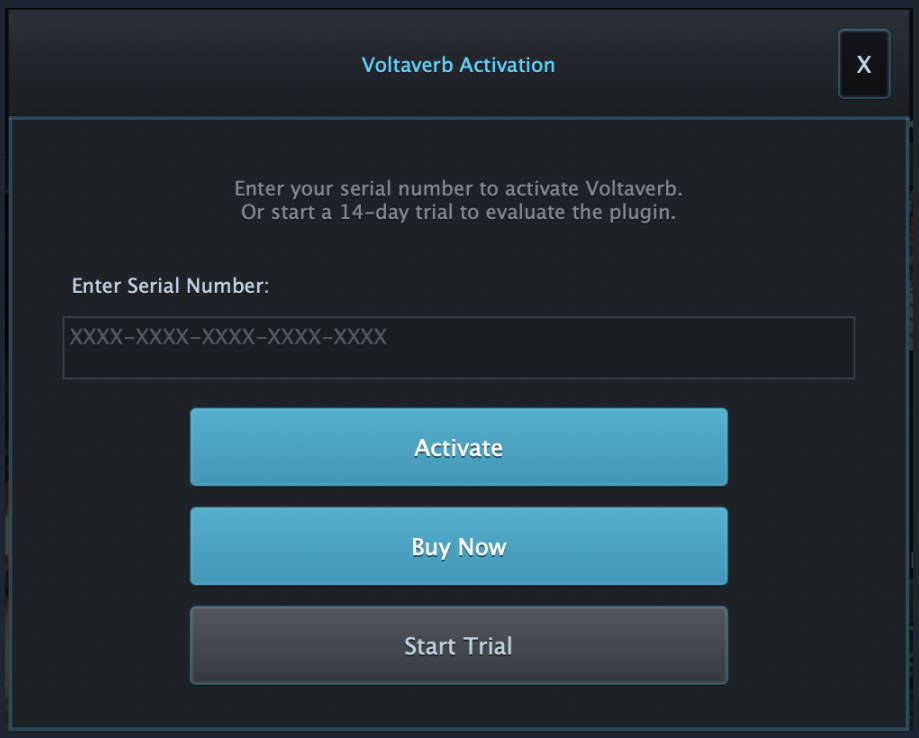
Returns all IR-related parameters to their default values without affecting your loaded impulse responses.

> **Tip:** *Use Compare to A/B your tweaks against the original preset. Copy/Paste is invaluable for transferring settings between different plugin instances in your session.*

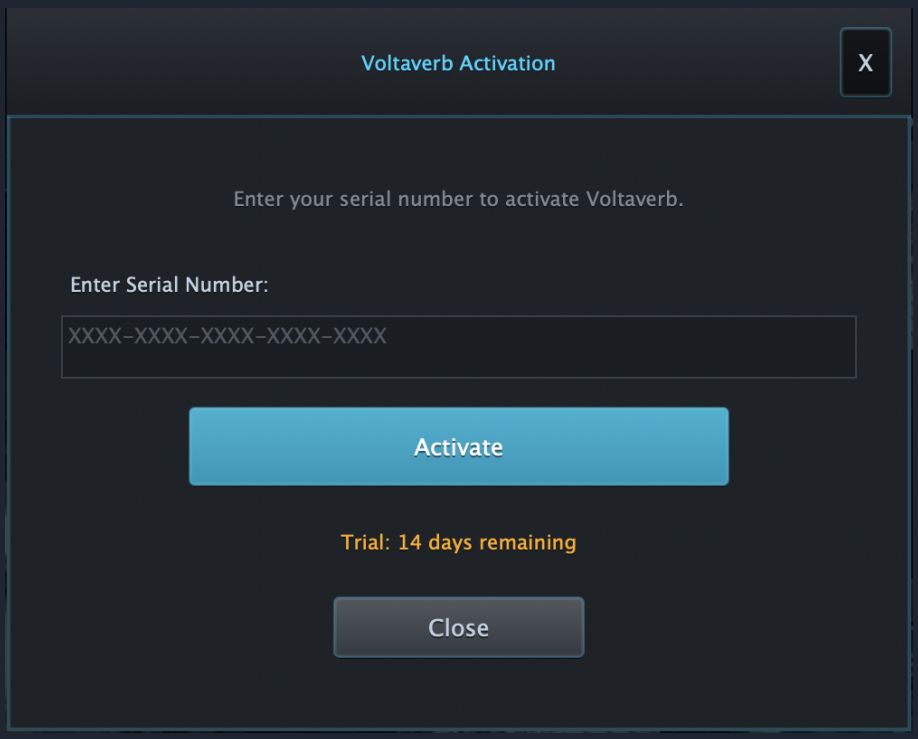
13. Licensing & Activation

Trial Mode

Voltaverb offers a 14-day free trial with full feature access. The remaining trial days are displayed in the plugin interface.



Initial activation dialog with options to Activate, Buy Now, or Start Trial



Trial mode showing 14 days remaining

Activation

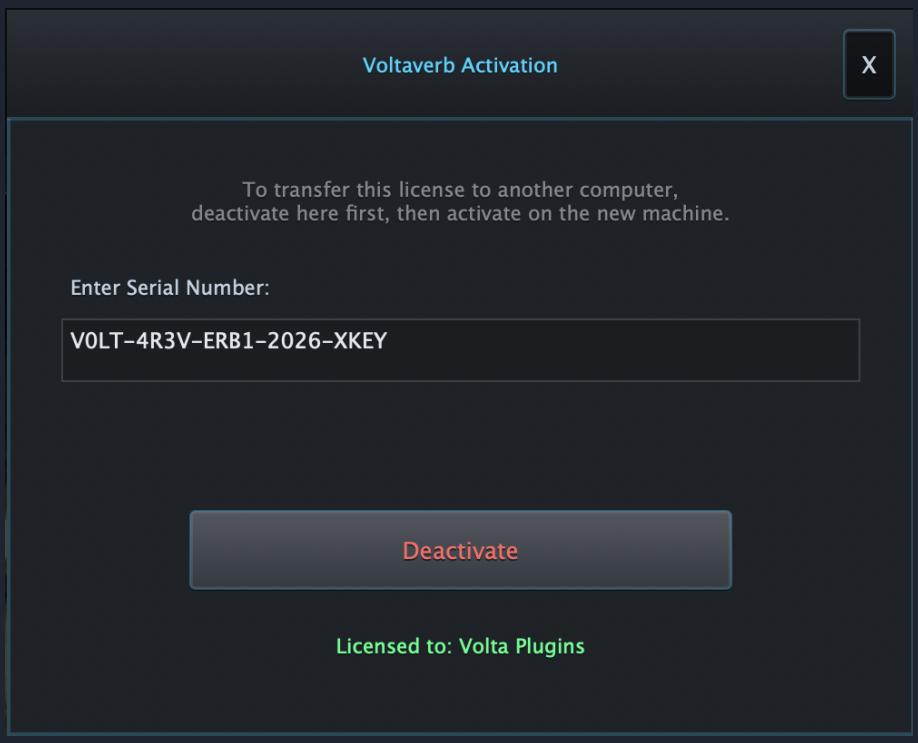
1. Purchase a license to receive your serial number via email

2. Open Voltaverb and click the activation area

3. Enter your 25-character serial number (format: XXXX-XXXX-XXXX-XXXX-XXXX)

4. Click Activate (requires internet connection)

5. Your license is now active on this machine



License window when activated, showing option to Deactivate for license transfer

License Details

- Each license allows activation on **up to 3 machines**
- The plugin verifies online periodically (**30-day offline grace period**)
- Your license is tied to your machine's hardware fingerprint
- To transfer a license to a new machine, deactivate on the old machine first
- Contact support at support@voltaplugins.com if you need assistance

14. Tips & Recipes

Transparent, Natural Reverb

- Load a real space IR (Factory Hall, Church, PA Horn Hall)
- Wet/Dry: 25-40%
- Motion: 0%, Thickness: 0%
- Damping: Use material presets for realism
- Enable Pure Convolution to verify

Lush Vocal Reverb

- Load an EMT 244 Medium or Long IR
- Wet/Dry: 40-60%, Decay: 1.3-1.8x
- Pre-Delay: 30-80 ms, Shimmer: 10-25%
- Air: +3 to +6 dB, Stereo Width: 150-200%

Ambient Pad Textures

- Load any IR, set Room Size: 200-300%
- Shimmer: 50-100%, Freeze: Enable with 70-100% mix
- Granular: Enable, Density 60%, Pitch +12 or -12
- Motion: 40-80%, Thickness: 30-50%

Rhythmic Gated Reverb

- Load a large hall IR, Decay: 1.5-2.0x
- Gate: Enable, Rate 1/8, Depth 80-100%
- Gate Attack: 1-5 ms, Release: 30-80 ms
- Swing: 20-40% for groove, Wet/Dry: 60-80%

Lo-Fi Vintage Reverb

- Load a speaker or telephone IR
- Vintage Tape: Enable, Drive 40%, Warmth 60%
- Vintage Vinyl: Enable, Crackle 20%, Wear 30%
- Air: -6 to -9 dB, Motion: 30-50%

Creative Sound Design

- Load 4 different IRs across all slots

- Move XY pad to blend between spaces
- Granular: High density, random pitch, high spread
- Freeze: Engage momentarily for captured textures
- Modulation: Both LFOs active at different rates
- Reverse: Toggle for dramatic builds

Creating Realistic Spaces

- Start with Room Size at 100% for natural IR proportions
- Use High Damp below 1.0x to simulate natural air absorption
- Adjust Early/Late balance: more early reflections = closer source
- Keep Motion and Shimmer low for transparency

Electronic Music Production

- Enable Rhythmic Gate at 1/8 or 1/16 for pulsing, synced reverb
- Use the envelope follower for automatic sidechain-style ducking
- Add Shimmer for ethereal, pitch-shifted tails
- Experiment with Freeze for evolving ambient pads

CPU Optimization

- Corner morph positions use less CPU (single IR)
- Center position uses most CPU (all four IRs blended)
- Disable unused effects to save processing power
- Use smaller Room Size values for lighter processing
- Switch to Eco quality mode for general use

15. Troubleshooting

High CPU Usage

- Switch to Eco quality mode (disable HQ)
- Move the XY morph pad toward a corner (away from center)
- Lower Room Size (larger values = more processing)
- Disable Shimmer, Granular, or Freeze when not needed
- Reduce Stereo Width below 200%

Audio Clicks or Pops

- Increase Freeze Smoothing time when engaging/disengaging
- Soften Gate Attack (increase to 5-10 ms)
- Ensure buffer size in your DAW is at least 256 samples
- Reduce the number of active effects

Reverb Too Quiet

- Increase Master IR Volume
- Check Wet/Dry Mix level
- Verify an IR is actually loaded (check waveform display)
- Check that Decay isn't set very low
- Ensure Early Level and Late Level aren't reduced

Missing Factory IRs

- Reinstall using the installer package
- macOS: Check /Library/Application Support/VoltaPlugins/Voltaverb/Factory IRs/
- Windows: Check C:\ProgramData\VoltaPlugins\Voltaverb\Factory IRs\
- Verify the subfolders: Spaces, Hardware, Objects, Speakers

License Issues

- Ensure internet connection for initial activation
- Verify serial number is entered correctly (25 characters, format XXXX-XXXX-XXXX-XXXX-XXXX)
- Check you haven't exceeded 3 machine activations
- Use the Deactivate button on old machines before activating on new ones
- Contact support at support@voltaplugins.com

16. Technical Specifications

Specification	Value
Convolution Engine	4-slot parallel with XY morphing
Plugin Formats	VST3, Audio Unit
Platform	Windows 10+ (64-bit), macOS 10.13+ (Intel & Apple Silicon native)
I/O Configuration	Stereo In / Stereo Out (True Stereo IR support)
Internal Processing	64-bit floating point
Supported Sample Rates	44.1, 48, 88.2, 96, 176.4, 192 kHz
Maximum IR Length	10 seconds at 48kHz
IR Slots	4 (with XY morphing)
EQ Topology	TPT State Variable Filter
EQ Bands	Up to 8 (fully parametric)
Phase Vocoder	STFT with transient detection
Crossovers	24dB/oct Linkwitz-Riley
Latency	Zero-latency (partitioned convolution)
IR Formats	WAV, AIFF, VIR (encrypted factory)
Parameters	All fully automatable
MIDI Learn	Supported for all parameters

Automation

All parameters in Voltaverb are fully automatable from your DAW. However, different parameters have different response characteristics depending on their underlying processing.

Fully Real-Time — Automate Freely

These parameters respond instantly with no latency or catch-up:

- **Mix / Gain / Input Gain / Output Gain**
- **Pre-Delay** (including synced modes)
- **Stage** — Position, Depth, Spread, Width
- **EQ** — all 8 bands (frequency, gain, Q, type)
- **Dynamics** — Gate and Compressor (all parameters)
- **Modulation** — LFO 1 & 2, Envelope
- **Granular** — all parameters (size, density, pitch, position, etc.)
- **Freeze** — all parameters
- **Vintage** — Tape, Vinyl, Tube (all parameters)
- **Morph X/Y** — instant real-time IR blending
- **IR Slot Gains**
- **Character / Thickness / Diffusion / Shimmer** — all real-time DSP
- **Spatial Tracking** — all parameters

Smooth Automation with Brief Catch-Up (~20-30ms)

These parameters have a real-time bridge that gives instant perceptual response, then the IR catches up in the background:

- **Room Size** — real-time spectral tilt EQ bridges the gap
- **Reverb Time (Decay)** — real-time envelope correction bridges
- **Room Brightness** — real-time EQ bridges
- **Damping (Low/Mid/High)** — real-time 4-band EQ bridges
- **Air Absorption** — real-time HF filtering bridges
- **Attack / Early Level / Late Level / Early Stretch** — small debounce lag

Use Sparingly in Automation

- **Reverse IR** — works but has a ~50ms fade-out/fade-in during the flip
- **Room Tone** — may briefly lag if background IR processing is busy

Pro Tip: *For the smoothest automation experience, keep your buffer at 512 samples or higher. The real-time bridges ensure that even IR-reprocessing parameters feel responsive during automation.*

17. Credits

Factory IR Library

Spaces Collection

Creator: Fokke van Saane

Content: Churches, halls, and real acoustic environments

License: Commercial use licensed to Volta Plugins Ltd

Hardware Collection

Creator: A. Bernhard

Content: EMT 244 Digital Reverb captures

Objects Collection (Claustrofobia)

Creator: Fokke van Saane

Content: Unusual resonant objects including buckets, pots, drums

License: Commercial use licensed to Volta Plugins Ltd

Speakers Collection

Creator: Fokke van Saane

Content: Vintage speakers, radios, telephones

License: Commercial use licensed to Volta Plugins Ltd

Development

Built with: JUCE Framework (juce.com)

Developed by: Volta Plugins Ltd

Developer: Ben Anderson

General Usage Notes

All impulse responses included with Voltaverb are provided for use within the Voltaverb convolution reverb plugin only.

Users may:

- Use Voltaverb with any included IRs in commercial music production
- Render audio using Voltaverb's impulse responses for commercial release
- Use Voltaverb in film, TV, game, and other media production

Users may NOT:

- Extract impulse response files from Voltaverb for use in other software
- Redistribute impulse response files separately from Voltaverb
- Sell or license the impulse response files independently
- Claim ownership of any third-party impulse responses

Special Thanks

Special thanks to Fokke van Saane for his generous support of independent plugin developers and for creating the exceptional impulse response recordings that form the core of Voltaverb's factory library.

Support & Contact

Email: support@voltaplugins.com

Website: www.voltaplugins.com

Documentation: www.voltaplugins.com/docs

VOLTAVERB User Manual — Version 1.0