

Rave Generation



StarGate

Digital Reverb + Effects

User Manual

Overview

StarGate is a digital reverb and effects plugin recreating the Ursa Major StarGate 626 hardware unit. Based on the original EPROM data, it faithfully reproduces the complete digital circuit of the original hardware - every sample is calculated the same way as in the 1984 unit.

The plugin features 16 programs ranging from tight plates and intimate chambers to expansive cathedrals, deep canyons, and rhythmic echo effects. The original hardware used 16-position rotary switches for room selection, pre-delay, and decay time, each addressing different EPROM configurations that define unique tap structures and feedback networks.

StarGate extends the original hardware with fine-tune controls for delay and decay, allowing smooth adjustment between the 16 discrete hardware steps while preserving the authentic EPROM-driven sound. Additional features include a 15 kHz bandwidth with 3rd-order elliptic anti-aliasing filters, envelope-following modulation, adjustable LF and HF decay shaping, and independent direct/reverb mix controls.

Signal Flow

The input signal is summed to mono, scaled by the Input gain control, and passed through configurable high-pass and low-pass filters that shape the frequency content entering the reverb. The signal then enters a 3rd-order elliptic anti-aliasing filter that band-limits the audio to 15 kHz, matching the original hardware's bandwidth.

The filtered signal is written into a delay network alongside the feedback from the previous sample. The EPROM data tables define 15 feedback taps and 8 output taps (4 left, 4 right), each with unique delay times and gain coefficients that vary per program and per delay/decay step. An envelope follower on the input drives a modulation system that subtly varies the tap positions, adding the characteristic movement of the original hardware.

The feedback path includes its own high-pass and low-pass filters controlled by the LF Decay and HF Decay knobs. The output taps are summed into stereo and mixed with the direct signal according to the Direct and Reverb level controls.

Programs

The Room knob selects one of 16 programs. The first 8 are reverb programs based on the original StarGate 323 hardware. Programs 9 through F are additional rooms and echo effects unique to the 626. Each program has its own EPROM tap configuration, producing a distinctive spatial character.

Reverb Programs

Plate 1	Tight, bright plate reverb with short pre-delay. Ideal for percussion, snares, and adding presence to vocals.
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Plate 2	Slightly warmer and more diffuse plate. Works well on full mixes and instruments that need subtle ambience.
Chamber	Simulates a small reflective room. Dense early reflections with a controlled tail. Good for dialogue, vocals, and solo instruments.
Small Hall	Compact concert hall character. Balanced early reflections and a natural-sounding decay. Versatile across many sources.
Hall	Medium-sized hall with a smooth, even decay. Classic reverb for orchestral instruments, pads, and cinematic sound design.
Large Hall	Spacious hall with longer pre-delay and extended decay. Creates a sense of distance and grandeur.
Cathedral	Very large space with dense, enveloping reverb. Long decay times and complex reflections. Default program.
Canyon	The largest program - massive space with decay times up to 10 seconds. Deep, immersive reverb for atmospheric and ambient use.

Extended Programs (626)

Room 9	Additional room algorithm with distinct early reflection pattern.
Room A	Variation with different tap spacing and decay characteristics.
Echo B	Rhythmic echo with defined repeats. The Delay knob controls echo spacing; Decay controls the number of repeats.
Echo C	Variation with different echo timing and feedback structure.
Echo D	Longer echo spacing for spacious rhythmic effects.
Echo E	Extended echo with delay times reaching 200 ms and beyond at higher Delay settings.
Echo F	Dense echo pattern with complex multi-tap structure.
Small Room	Tight, intimate room with minimal pre-delay. Useful for adding subtle dimension without obvious reverb.

Controls

Main Controls

Input	Input gain level (0.0–10.0). Controls how hard the signal drives the reverb network. Higher settings produce a denser, more saturated reverb character. Default: 7.0.
LF Decay	Low-frequency decay shaping (0.0–10.0, min–max). Controls the high-pass filter in the feedback path. At minimum (0), bass frequencies are rolled off quickly, producing a thinner reverb tail. At maximum (10), bass decays fully, creating a warmer, fuller tail. Default: 7.0.
HF Decay	High-frequency decay shaping (0.0–10.0, min–max). Controls the low-pass filter in the feedback path. At minimum (0), the cutoff is at 3 kHz — the tail darkens quickly. At maximum (10), the cutoff reaches 15 kHz for a bright, open tail. Default: 7.0.
Direct	Dry signal level (0.0–10.0). Independent from the reverb level. Set to 0 for 100% wet reverb-only output (useful on aux sends). Default: 0.0.
Reverb	Wet reverb signal level (0.0–10.0). Controls the volume of the processed reverb output independently from the dry signal. Default: 10.0.

Program & Timing Controls

Room	Selects one of 16 programs (Plate 1 through Small Room). Each program loads a completely different EPROM tap configuration with unique delay structure, feedback network, and spatial character. Default: Cathedral.
Delay	Pre-delay and tap structure selection (0–15, 16 steps). Each step addresses a different EPROM configuration that changes the entire delay tap layout for the selected program. For reverb programs this controls pre-delay timing. For echo programs this sets the echo spacing. Default: 4.
Delay Fine	Fine-tune adjustment for the delay (–10.0 to +10.0). At 0.0 the delay is unmodified. Positive values extend the delay modulation; negative values shorten it. Allows smooth tweaking between the 16 hardware steps. Default: 0.0.
Decay	Decay time and feedback gain selection (0–15, 16 steps). Each step addresses a different EPROM gain configuration for the

	feedback taps. Step 0 produces minimal decay; step 15 produces maximum decay time for the selected program. Default: 12.
Decay Fine	Fine-tune adjustment for the decay (–10.0 to +10.0). At 0.0 the feedback gain is unmodified. Positive values increase feedback for a longer tail; negative values decrease it for a shorter tail. Provides ±20% gain scaling. Default: 0.0.

Override Switches

Input Mute	Stops new audio from entering the reverb network. The existing reverb tail continues to decay naturally. The dry signal through the Direct control is also muted. Useful for creating reverb tails that fade out independently of the source.
Dry Only	Passes only the dry signal, cutting the reverb output to zero. The reverb network continues processing internally, so switching back restores the full reverb tail immediately.
Reverb Clear	Forces the decay step to 0, rapidly clearing the reverb tail. Useful for cutting reverb between sections or creating gated reverb effects. The reverb network resets when activated.
Power	Master bypass. When off, the plugin outputs silence. When on, normal processing resumes.

Quick Start

Classic plate reverb: Select Plate 1 or Plate 2. Set Delay to 2–4, Decay to 8–10. Keep LF Decay around 5 to prevent muddy bass buildup. Works great on vocals, snares, and percussion.

Lush hall reverb: Select Hall or Large Hall. Set Delay to 4–8 for noticeable pre-delay separation, Decay to 10–14 for a long, smooth tail. Push HF Decay to 8–10 for brightness, or pull it back to 4–5 for a darker, more natural sound.

Ambient wash: Select Cathedral or Canyon. Set Decay to 13–15 for maximum sustain. Use Decay Fine to dial in the exact tail length. Set Direct to 0 and use on an aux send for a pure reverb return.

Rhythmic echo: Select any Echo program (B through F). The Delay knob now controls echo spacing rather than pre-delay. Start with Delay at 6–8, Decay at 5–8 for clear repeats. Use Decay Fine to control how many repeats you hear.

Gated reverb: Select a large room (Hall, Cathedral). Set Decay high for dense reflections, then use Reverb Clear to cut the tail sharply. Automate the Reverb Clear switch for rhythmic gating effects.

Freeze effect: Set Decay to 15 with Decay Fine at +10 for maximum feedback. Engage Input Mute to freeze the current reverb tail as a sustained pad. The tail will ring indefinitely.

Subtle room ambience: Select Small Room or Chamber. Set Delay to 0–2, Decay to 4–6. Blend with Direct at 7–8 and Reverb at 3–4 for a natural sense of space without obvious reverb.

Fine-tuning: The Delay Fine and Decay Fine knobs allow you to dial in settings between the 16 hardware steps. This is especially useful for echo programs where precise timing matters, or for decay where you want the tail just slightly longer or shorter than a given step provides.

Technical Specifications

Programs	16 (8 reverb + 8 extended rooms/echoes)
Bandwidth	15 kHz (3rd-order elliptic anti-aliasing)
Delay Steps	16 per program (EPROM-addressed)
Decay Steps	16 per program (EPROM-addressed)
Feedback Taps	15 per program
Output Taps	8 (4 left, 4 right) per program
Modulation	Envelope-following, input-driven
Formats	VST3, AU, AAX
Platforms	macOS 10.13+, Windows 10+

Support

For technical support, updates, and additional information:

Website: ravegeneration.io

Email: support@ravegeneration.io

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