Rove Generation

PRESENTS

SONIC SWEEP 2

USER MANUAL

Table of contents

1. Introduction

Sonic Sweep 2 is the next-generation console channel & bus processor inspired by the classic 8-bus console lineage. Three independent sweepable channels, a musical parallel/serial blend engine and deep analog modelling help you sculpt vibrant, mix-ready sound faster than ever.

Sonic Sweep 2 ships alongside **Sonic Sweep 2 CS** - a streamlined single-channel version of the same plugin, designed as a channel-strip insert for individual tracks. Both share the same license, the same sound and the same analog modelling.

2. Key features

- Tri-channel EQ strip with fully parametric Hi- & Lo-Mid bands (variable **Bandwidth 3 – 1/12 oct**), dedicated 12 kHz / 80 Hz shelves and a **75 Hz 18 dB/oct low-cut**.
- **Authentic analog behaviour**: input transformers, soft-clip fader amps, **console age** asymmetric distortion, and calibrated wide-band console hiss can be dialled in per taste.
- Parallel <> Serial engine: continuously morph between pure serial processing and true parallel summing with equal-power cross-fade.
- Variable EQ resolution: switchable **X2 Gain** (±15dB > ±30dB) and **X2 Freq** (3kHz > 6kHz).
- Clip indicators on each channel output.
- Selectable Quality mode (ECO/NORMAL/HIGH) with up to 4× oversampling for pristine anti-aliasing and silky-smooth saturation. CPU-optimised biquadratic filters.
- Shared Hi/Lo shelves applied post-blend maintain phase-coherence across all routing modes for cohesive tone.
- **Living console noise** with authentic drift, hum and random wandering for that "breathing" analog vibe.
- **Console-authentic signal flow**: Low-cuts before routing split prevent phase issues; post-fader mutes preserve noise floor.

- **Authentic NJM4560 op-amp modeling** with calibrated slew rate limiting across EQ, fader, summing and master stages for classic console character.
- **Neural LSTM saturation** trained on a real Mackie 8-bus channel strip captures every nonlinearity, harmonic and frequency-dependent character of the original hardware. Switchable CLASSIC/NEURAL saturation mode colours the signal before the channel GAIN IN stages.

3. What's new in Version 2

Area	Sonic Sweep 1	Sonic Sweep 2
Op-amp modeling	-	NJM4560 slew rate limiting (4.0 V/µs) across all stages
Shelf EQ	Modern 2nd order (12dB/oct+)	1st order console shelves (6dB/oct) with calibrated curves
EQ	3-band + HPF	5-band, dual-range, shared shelves
Lo-Mid Bandwidth	-	3 – 1/12 oct continuous
Routing	Serial only	Continuous Parallel<>Serial
Low-Cut	18 dB/oct Butterworth	18 dB/oct Chebyshev (75 Hz)
Modelling	Basic clip	Multi-stage soft clip + noise drift
Neural Saturation	-	Switchable saturation mode modelled from a real Mackie 8-bus console using a neural network
Console Noise	-	0-100 % variable & pink-filtered
Console Age	-	0-100% asymmetric distortion modeling
Oversampling	-	Quality selector: ECO (1×), NORMAL (2×), HIGH (4×) with FIR anti-alias filtering
Channel Strip variant	-	Bundled **Sonic Sweep 2 CS** - single-channel insert version

4. User interface

4.1 Global controls

Control	Range	Description
TRIM	-40/+40 dB	Pre-processor gain, slewed (20 ms) to avoid zipper noise.
CONSOLE NOISE	0-100 %	Calibrated pink hiss derived from a classic 8-bus console spectrum.

Control	Range	Description
CONSOLE AGE	0-100 %	Asymmetric distortion simulating analog component aging.
GAIN X2	Off/On	Doubles boost/cut range to ±30 dB for surgical tasks.
FREQ X2	Off/On	Doubles frequency-sweep ceiling (e.g. 3 kHz → 6 kHz).
LOW CUT FREQ	25-125 Hz	Sets the cutoff frequency used by ALL channel Low Cut buttons.
QUALITY	ECO / NORMAL / HIGH	Oversampling quality. ECO = 1× (zero latency), NORMAL = 2×, HIGH = 4×. Higher settings reduce aliasing in saturation and EQ stages at the cost of more CPU.
SATURATION	CLASSIC / NEURAL	Input saturation engine applied before channel GAIN IN stages. CLASSIC = hand-tuned algorithmic soft-clip (tanh curve). NEURAL = LSTM neural network trained on a real Mackie 8 channel strip, capturing authentic hardware nonlinearities. NEURAL automatically bypasses oversampling (forced to 1×).

4.2 Channel strip (Ch 1 – 3)

- **GAIN IN** (-∞ … +40 dB) – Transformer drive & soft-clip.
- **EQ FLIP** – Swaps EQ before/after clipper for alternate colours.
- **HI MID GAIN/FREQ/BW** – 500 Hz – 18 kHz fully parametric band with **3 - 1/12 oct BW.**
- **LO MID GAIN/FREQ/BW** – 45 Hz – 3 kHz fully parametric band with **3 - 1/12 oct BW.**
- **HI SHELF GAIN** – ±15 dB @ 12 kHz.
- **LO SHELF GAIN** – ±15 dB @ 80 Hz.
- **LOW-CUT** – **75 Hz 18 dB/oct Chebyshev** high-pass filter.
  Uses the frequency set by the global Low Cut Freq knob.
- **EQ IN** – Global bypass for the strip.
- **MUTE** – Hard mute pre-fader.
- **CHANNEL FADER** – Authentic ALPS-style D-taper (+10 dB to -∞).

4.3 Bus & Master section

Control	Range	Function
PARALLEL <> DAISY BLEND	0–100 %	Equal-power cross-fade between processing paths (0 % = parallel, 100 % = serial).
BUS FADER	+10 dB/-∞	Post-blend level trim with console taper.
MASTER MIX	0–100 %	Dry/Wet; squared law for finer low-blend resolution.

5. Signal flow & processing modes

In **Daisy mode** channels are cascaded; in **Parallel mode** they sum post-strip. Shared shelves ensure a single set of 12 k/80 Hz tone controls is applied after the blend, avoiding combing.

Low-cut filters are applied individually per channel BEFORE the parallel/serial split. Shared shelf filters (12kHz high, 80Hz low) are applied AFTER the blend to the combined signal, ensuring consistent tonal shaping regardless of routing mode.

When **Quality** is set to NORMAL or HIGH, the signal is upsampled (2× or 4×) before entering the channel strips and downsampled after the summing bus, just before the shared shelf filters. This ensures all non-linear processing (saturation, soft clipping, console age distortion, slew rate limiting) runs at the elevated internal rate for maximum fidelity. The shared shelf filters and dry/wet mix operate at the native DAW sample rate.

When the **Saturation** selector is set to NEURAL, a trained LSTM neural network colours the input signal before it reaches the channel GAIN IN stages, using a model trained on actual audio from a real Mackie 8-bus channel strip. This replaces the algorithmic soft-clip with learned analog behaviour applied once to the stereo signal before the three channel strips process it. Because the neural model already captures the full analog harmonic spectrum from the original hardware measurements, oversampling is automatically bypassed (forced to 1×) to save CPU. The Quality selector has no effect while NEURAL is active.

6. Analog modelling details

6.1 Soft-clip amplifiers

Each GAIN IN and CHANNEL FADER stage employs a 3-pole arctangent shaper tuned to a +26 dBu headroom profile for natural breakup.

6.2 Console Age modeling

Console Age simulates the asymmetric distortion that develops in analog consoles over time due to component aging:

- 0-30%: Subtle vintage character emerges

- 30-75%: Progressive aging characteristics build
- 75%: Full vintage console asymmetry
- 75-100%: Extreme aging for creative effects

The asymmetry affects positive and negative signal peaks differently, creating the sought-after "vintage console mojo" where:

- Positive peaks get slightly enhanced
- Negative peaks get compressed
- Overall character becomes more musical and alive

6.3 Console-style noise

Noise is generated as white → 1-pole six-stage pink filter → 4.7 kHz LPF. The noise floor "breathes" through multiple modulation sources:

- 0.17 Hz drift simulates console temperature fluctuations
- 50 Hz power ripple adds authentic studio hum
- 100 Hz harmonic provides subtle resonance
- Random walk creates unpredictable organic movement

Console noise intelligently scales with input gain and routing mode, more hiss with higher gain, 3x compensation in parallel mode to maintain consistent analog character when summing.

6.4 EQ curves

All filters are 64-bit double-precision biquads. Hi/Lo shelves use 1st order (6dB/octave) filters at 12kHz and 80Hz respectively, matching the authentic console topology. Low-cut is a 3rd-order Chebyshev (18 dB/oct) matching the console spec.

6.5 Authentic op-amp character

Sonic Sweep 2 models the slew rate characteristics of the NJM4560 operational amplifiers found in classic mixing consoles. This authentic 4.0 V/µs slew rate limiting is applied at four critical stages. Recreates natural transient softening and harmonic character that makes classic consoles sound musical rather than clinical. Most noticeable on drums and percussion, this modeling adds the subtle "analog rounding" that helps tracks sit together in a mix.

6.6 Routing Intelligence

Equal-power blending uses trigonometric curves for the Parallel<>Serial mix, maintaining full energy at 50% blend, perfect for that "bigger than both" drum bus sound.
FREQ X2 switches affect only the parametric bands, keeping shelves at musical ±15dB.
EQ Flip mode reduces console noise for cleaner surgical work.

6.7 Oversampling Engine

Sonic Sweep 2 features a selectable oversampling engine that runs the entire saturation and EQ processing chain at a higher internal sample rate. This dramatically reduces aliasing artifacts — the harsh, inharmonic distortion products that appear when non-linear processes (soft clipping, transformer drive, asymmetric aging) fold frequencies back below Nyquist.

Three quality modes are available via the **QUALITY** selector:

• **ECO (1×)** - No oversampling. Zero added latency, lowest CPU load. Ideal for tracking, large session counts, or when running at high base sample rates (96 kHz+).
• **NORMAL (2×)** - 2× oversampling with a 32-tap Kaiser-windowed FIR anti-alias filter. Noticeably cleaner saturation character, especially when pushing GAIN IN hard. Moderate CPU increase.
• **HIGH (4×)** - 4× oversampling with a 64-tap FIR filter. The highest fidelity mode, delivering pristine, alias-free saturation and the smoothest analog character. Best for mix bus duties, mastering, or final renders.

All EQ filter coefficients, slew rate limiters and saturation stages automatically recalculate for the effective internal sample rate when the quality mode changes. NORMAL and HIGH modes introduce a small amount of processing latency which is automatically reported to your DAW for perfect delay compensation.

6.8 Neural LSTM Saturation

Sonic Sweep 2 includes an alternative saturation engine based on a Long Short-Term Memory (LSTM) recurrent neural network — the same technology popularised by the Proteus/NAM (Neural Amp Modeling) scene. Instead of designing a saturation curve by hand, the LSTM was trained on simultaneous input/output recordings captured from a real Mackie 8-bus channel strip. The network learned the exact transfer function of the analog hardware, including every nonlinearity, harmonic colouring, frequency-dependent saturation and subtle dynamic behaviour that the original circuit produces. In Sonic Sweep 2 this model is applied to the input signal before it enters the three channel GAIN IN stages, adding authentic analog colour at the very start of the processing chain.

The result is a model that reproduces the character of the real console channel strip with a fidelity that hand-tuned algorithms cannot easily match. Where CLASSIC mode uses a mathematically designed tanh-based soft-clip curve to approximate saturation, NEURAL mode plays back learned behaviour from actual audio measurements.

The trained model weights are frozen and run in real-time as a stereo pair on the input stage, before the three channel strips (approximately 13,000 multiply-adds per sample — very lightweight). A built-in DC blocker removes any residual bias drift from the LSTM hidden state. Because the neural model already encodes the full analog harmonic spectrum from the original hardware, oversampling is automatically bypassed when NEURAL is active to avoid unnecessary CPU load.

Switch between CLASSIC and NEURAL at any time using the **SATURATION** selector. A smooth crossfade is applied during the switch to prevent clicks or glitches.

7. Parameter reference

Below is the complete list of automatable parameters exposed by Sonic Sweep 2.
Channel parameters repeat for Ch 1, 2 & 3.

7.1 Global parameters

Control	Range	Default	Notes
Trim	-40/+40 dB	0 dB	20 ms slew-smoothed
Console Noise	0/100 %	0 %	Pink-filtered hiss level
Console Age	0/100 %	0 %	Asymmetric aging distortion
Gain X2	Off/On	Off	Doubles boost/cut span
Freq X2	Off/On	Off	Doubles sweep ceiling
Low Cut Freq	25/125 Hz	75 Hz	Shared low-cut frequency
Quality	ECO/NORMAL/HIGH	ECO	Oversampling: 1×/2×/4×
Saturation	CLASSIC/NEURAL	CLASSIC	Input saturation: algorithmic (Classic) or neural network (Neural)

7.2 Per-channel parameters

Control	Range	Default	Notes
Gain In	-∞/+40 dB	0 dB	Transformer & clipper drive
EQ Flip	Off/On	Off	Places EQ pre/post clip
Hi-Mid Gain	-15/+15 dB (±30 dB via ×2)	0 dB	
Hi-Mid Freq	500 Hz-18 kHz (and ×2)	3 kHz	
Hi-Mid BW/OCT	3-½oct	2.0	
Lo-Mid Gain	-15/+15 dB (±30 dB via ×2)	0 dB	
Lo-Mid Freq	45 Hz-3 kHz (and ×2)	250 Hz	
Lo-Mid BW/OCT	3-½oct	2 oct	Continuous control
Hi Shelf Gain	-15/+15 dB	0 dB	Fixed 12 kHz turnover
Lo Shelf Gain	-15/+15 d	0 dB	

8. Tips & tricks

- Drive **GAIN IN** to +20 dB, back off **CHANNEL FADER** for punchy transformer growl.
- Use **EQ GAIN ×2** for precise notch cutting (-30 dB) when de-ringing snare tails.
- Dial **Lo-Mid Bandwidth** narrow (<0.5 oct) to surgically remove mud or wide (>2 oct) for musical body boosts.
- **High-Shelf Overdrive Trick** – Crank **HI SHELF** to +15 dB then push **GAIN IN**; the clipper folds back the boosted edge, creating a sharp notch right below 12 kHz that tames harsh cymbal fizz without extra EQ cuts.
- Blend at 40–60 % Parallel to fatten a drum bus while retaining transient focus.
- **Console Age Sweet Spots**: Try 25% for subtle vintage warmth, 40% for noticeable character, or 60% for heavily-aged console vibe.
- **Vintage Bus Processing**: Combine Console Age (30-40%) with Console Noise (15-25%) and slight GAIN IN drive for authentic classic console summing.
- **Oversampling Workflow**: Use ECO while tracking and arranging for zero latency, switch to NORMAL or HIGH for the final mix or bounce. The difference is most audible when pushing GAIN IN hard with Console Age engaged.
- **HIGH Quality on the Mix Bus**: For mastering or mix-bus duties, set Quality to HIGH. The 4× oversampling makes the soft-clip saturation and Console Age distortion noticeably smoother and more refined, especially on complex full-mix material.
- **Neural Mode on the Drum Bus**: Switch Saturation to NEURAL for authentic Mackie summing bus character. The LSTM was trained on real hardware, so it reproduces the exact harmonic colouring and dynamic feel of the original console — especially effective on drums and full-mix bus duties where that analog “glue” matters most.
- **Classic vs Neural A/B Test**: Toggle between CLASSIC and NEURAL while playing back your mix to hear the difference. CLASSIC gives a cleaner, more predictable soft-clip; NEURAL adds the subtle asymmetries and frequency-dependent behaviour of the real analog circuit. Note that NEURAL automatically bypasses oversampling, so no need to adjust the Quality selector when switching.

9. Installation & troubleshooting

9.1 System requirements

Before installing Rave Generation: Sonic Sweep 2, please ensure that your system meets the following requirements:

- Operating system:
  - macOS 10.13 or later
  - Windows 10 or later
- Software: Digital Audio Workstation (DAW) that supports VST3, or AU plugins (e.g., Ableton Live, Logic Pro, Studio One, FL Studio, etc.).
- Processor: Intel Core i5 (or equivalent) or higher for optimal performance.
- RAM: 4 GB minimum (8 GB or more recommended for larger projects).
- Disk Space: 200 MB of free disk space for installation.

9.2 Installation process

1. Download the installation file from the official website or the platform where you purchased the plugin.
2. Run the installer and follow the on-screen instructions.
3. Launch your DAW and locate Rave Generation: Sonic Sweep 2 in your plugin list.
4. If prompted, activate the plugin using the license key provided upon purchase.

9.3 Troubleshooting

If you encounter any issues during installation or operation, try the following solutions:

- Plugin not showing in DAW: Ensure that the plugin folder path is correctly set within your DAW's plugin manager.
- Activation issues: Double-check your internet connection and ensure you are entering the correct license key.

10. Sonic Sweep 2 CS - Channel Strip Edition

Sonic Sweep 2 CS is the single-channel sibling of Sonic Sweep 2, included free with your Sonic Sweep 2 license. It's the same DSP - same EQ curves, same analog modelling, same neural saturation, same console noise - running on one channel instead of three.

10.1 When to use which

- **Sonic Sweep 2** (3-channel): bus processing, drum bus summing, parallel/daisy routing, mix-bus glue.
- **Sonic Sweep 2 CS** (1-channel): per-track inserts, channel-strip workflow, lower CPU when you want the sound on individual tracks.

10.2 What's different in CS

- Single channel (no Channel 2 or 3).
- Single OUTPUT fader (Channel 1's authentic ALPS-style D-taper).
- No Parallel<>Daisy blend — nothing to be parallel with.
- Roughly 2–3× lower CPU per instance, making it practical to insert on many tracks.

10.3 What's identical

- All EQ behaviour, ranges and filter curves (HI MID, LO MID, shelves, low-cut).
- Console Noise, Console Age, EQ Gain X2, EQ Freq X2, Low Cut Freq.
- Quality selector (ECO/NORMAL/HIGH).
- Saturation selector (CLASSIC/NEURAL).
- TRIM, MIX (dry/wet).
- The neural LSTM model and all analog modelling.

10.4 Signal flow (CS)

Input → Global Trim → Low Cut → Neural Saturation (if active) → Channel Strip (Gain, EQ, Bypass, Fader) → Master Saturation → Shared Shelves → Dry/Wet Mix → Output

Same chain as Channel 1 of the full version, just without the summing bus.

10.5 License

Your Sonic Sweep 2 license key activates Sonic Sweep 2 CS as well. Enter the key once in either plugin; both will activate.

For more resources, updates, and preset packs, visit ravegeneration.io. Dive deeper into the world of audio manipulation and discover new ways to bring your tracks to life.