Rave Generation

PRESENTS

SONIC DYNAMICS

USER MANUAL

Table of contents

---

1. Introduction

Sonic Dynamics is a powerful stereo compressor/limiter plug-in by Rave Generation, inspired by a classic analog dynamics processor design. It delivers authentic vintage character and modern flexibility through detailed analog modeling.

Two emulation modes are provided: Modern/Rev D for clean, precise dynamics (using THAT2180 VCA, low noise and fast envelope response) and Vintage/Rev C for colored, "musical" compression (with DBX2150-style VCA, more distortion, ripple-induced saturation and slower, pumping envelopes).

Sonic Dynamics faithfully captures soft-knee curves, separate peak/RMS detection, sidechain gating, and stereo linking behaviors of its hardware predecessor, while adding modern conveniences (mix control, high-pass sidechain filter, etc.). The result is an analog-flavored compressor/limiter with gate and sidechain capabilities that is equally at home on sources from vocals to drum bus and mix bus.

2. Signal flow and features

Stereo/Dual-Mono Processing
By default, Sonic Dynamics is a true stereo processor. With Stereo Link on, one envelope (from the louder channel) drives both channels' VCAs. With Link off, it operates in dual-mono: each channel's compressor and gate respond independently.

Sidechain Routing
The main inputs feed both the audio output and the internal sidechain detector. If an external sidechain is available and Ext SC is enabled, the plug-in uses the auxiliary inputs as the detection source for both compressor and gate. This allows ducking or keycontrolled effects. The Lo Freq Relax HPF is always applied to whichever source is used for detection.

Compressor/Limiter
Feed-forward VCA compressor with controls for threshold, ratio, attack, release, knee, and make-up gain. In Limit mode, it uses a high ratio and fixed attack/release for fast, transparent limiting. Soft knee gives a smooth transition, while hard knee is abrupt; detection can be Peak or RMS.

Gate/Expander

The gate and compressor share a single VCA, just like the original hardware. The gate's control voltage is summed with the compressor's control voltage before driving the VCA, with diode isolation ensuring the gate can only add gain reduction (never reduce it).

Gate Threshold and Gate Rate control when the gate closes and how quickly it decays. An anti-chatter network (R89/C45 = 100 ms smoothing) prevents rapid toggling near the threshold. When Stereo Link is on, the gate also links both channels. At minimum threshold the gate is fully bypassed. The gate detector follows the selected sidechain source.

Low-Frequency Relax (De-Rumbler)

The Lo Freq Relax HPF cleans up sub-bass before detection. It is a cascaded 24 dB/oct high-pass filter whose cutoff is controlled by the knob. Use this to prevent deep bass hits (like kick or low-end rumble) from over-triggering compression. For example, setting it to 80 Hz can avoid excessive pumping on bass-heavy tracks. At 0 Hz this feature is disabled.

Auto and Mode-Dependent Control Behavior

Sonic Dynamics automatically disables or ignores certain controls when specific modes are active, authentically mirroring the behavior of the analog hardware:

Limit Mode: When Limit mode is engaged, the Ratio control is overridden to an extremely high value for true peak limiting. Attack and Release controls remain active, allowing you to shape the limiter's response.

RMS Mode: When RMS detection is selected, the detector uses heavy averaging that makes the envelope program-dependent. Attack and Release controls remain active but the perceived dynamics behavior changes due to the averaged detection.

LED Meters: The gain reduction (GR) and output meters remain active in all modes, giving you instant visual feedback on compression, gating, and output levels with no added latency.

---

3. Revision C vs Rev D emulation modes

The Revision switch selects between two modes: Rev D (Modern) and Rev C (Vintage).

Rev D (Modern/Clean)

Models a later hardware revision built for precision. It uses low-noise THAT2180 VCAs and large power-supply capacitors (1000 μF), resulting in very low distortion and a virtually silent noise floor. The factory pre-trimmed THAT2180 VCA provides wider bandwidth (20 MHz) for tight, well-behaved envelope response. The result is clean limiting/compression with minimal coloration. In this mode no extra noise or hum is added.

Rev C (Vintage/Character)

Emulates the earlier revision with a grittier sound. It uses DBX2150 VCAs (which, especially without perfect trim, introduce more distortion and second harmonics when driven). The VCA's narrower bandwidth (6 MHz) adds subtle high-frequency rolloff, and the lack of factory symmetry trimming means heavier compression reveals more character. Heavy compression causes a slight "sag" and adds low-level hum and 120 In Rev C mode, the compression breathes and

pumps more. Subtle PSU noise plus 60/120 Hz components are inserted into the signal path to mimic the authentic vintage noise floor.

Overall, Rev C sounds warmer and more colored – ideal for drums or mix busses – while Rev D is more transparent and clinical, better for mastering or clean peak limiting.

Users switch revisions with the Revision knob. A quick way to audition the difference is to flip between modes on the same material: Rev C will typically add grit and give a looser "hold" feel, whereas Rev D stays tight and silent under load. Both modes use the same control layout; only the internal modeling changes.

---

4. Applications

Sonic Dynamics adapts seamlessly to a broad spectrum of studio and production tasks, such as:

Vocal Leveling
Even out vocal performances by setting a low threshold and moderate ratio. Soft knee and medium attack/release preserve natural dynamics while taming peaks. The analog character of the compressor adds warmth to vocals.

Sidechain Ducking
Route a rhythmic element (kick or another track) into the external sidechain. When that track plays, the main signal (e.g. bass or pad) is automatically turned down ("ducked") by the compressor. This creates pumping effects or ensures the kick punches through. The LoFreq Relax filter can be used to ignore unwanted frequencies on the sidechain.

De-Essing
Use the External Sidechain with a high-pass EQ (or a dedicated de-esser EQ) into the sidechain input. The compressor will then detect only high-frequency sibilance and reduce it. Adjust Gate Threshold (as a de-ess threshold) and fast attack to clamp down harsh "esses" only.

Drum Bus/Punch
Insert on a drum bus with Rev C (Vintage) mode for a classic analog "glue" sound. Fast attack and release settings can make the drums pump. The gating can tighten noise gates on toms or overheads if needed.

Mastering Limiter
In Rev D mode with Limit on, use it as a final limiter. Fast attack, short release, and Clip 0 dB engaged will cleanly catch peaks with minimal coloration. Watch the GR meter to make sure you're not over-compressing.

Noise Gating
Use the gate by raising Gate Threshold to cut hiss between notes or to gate reverb tails. With Stereo Link on, gating is identical on both channels to avoid imbalances.

5. User interface overview

Authentic controls | First row

Threshold (dB) – Sets the compression threshold. Turning it clockwise raises the threshold, resulting in less compression. Below this level the signal is passed through; above it, gain reduction is applied.

Ratio (:1) – Sets the compression ratio. Lower ratios (e.g. 2:1–4:1) provide gentle leveling, while higher ratios (e.g. 10:1 and above) clamp peaks more aggressively. In Limit mode (when Limit is On), the ratio is overridden to an extremely high value for true limiting.

Attack (ms) – Controls how fast the compressor reacts to signal above threshold. It ranges from 0.1 ms (instant attack) to 200 ms (slower attack) by default. Short attack times clamp transients tightly; longer times let initial peaks through for punch.

Release (ms) – Sets the release time (50–3000 ms by default) for how quickly gain reduction returns to zero after the signal falls below threshold. Longer release smooths gain changes; shorter release is more "snappy." In RMS mode, the detection averaging is program-dependent, so the perceived envelope behavior changes even though the Attack/Release knobs remain active.

Output (Make-Up Gain) (dB) – Adjusts the output level (0 to +20 dB). This compensates for gain reduction or introduces analog-style saturation when pushed. Typical analog practice is to add a few dB of make-up gain after compression, sometimes driving into subtle soft clipping for warmth.

Peak/RMS – Selects detector mode. Peak responds to signal transients for fast, punchy compression. RMS uses an averaged detector for smoother, program-level control. In RMS mode the detection averaging is program-dependent, giving a different feel even though Attack/Release knobs remain active. Use Peak for percussive material, RMS for transparent leveling.

Knee (Hard/Soft) – Switch between hard-knee (abrupt onset of compression) and soft-knee (smooth transition around the threshold). Use Hard knee for precise limiting or effect compression; Soft knee for more transparent or musical leveling.

Bypass/Comp – Engage or bypass compression. In Comp mode, the compressor processes the signal normally. In Bypass mode, the input is passed through untouched (use this to compare processed vs. dry). In hardware this was a hard switch; here it toggles DSP processing on/off.

Gate Threshold (dB) – Sets the gate (expander) threshold from –60 dB to +10 dB. When the input (or sidechain) level falls below this threshold, the gate closes (attenuates signal). Clockwise increases the threshold (making gating more aggressive). The gate uses an envelope that immediately opens when the level exceeds this threshold.

Gate Rate (ms) – Sets the gate release (decay) time from 20 ms up to 2000 ms (2 s). When the signal drops below the threshold, the gate stays open for the set time, then smoothly fades closed.

Stereo Link (Off/On) – Toggles linking of the two channels. When On (linked), both the compressor and gate compute a single envelope from the louder (max) channel and apply that gain reduction to both

channels. This prevents stereo imbalance (gain changes in one channel are "tracked" by the other). When Off (dual-mono), each channel is processed independently.

Additional controls | Second row

Revision (Rev C/Vintage ; Rev D/Modern) – Selects the hardware revision emulation. Rev D (Modern) is the default: it models a pristine version of the hardware (low noise, tight response). Rev C (Vintage) models an earlier revision with more noise, hum, and distortion (plus slower envelope). See the Rev C vs Rev D Emulation section for details.

Limit (Off/On) – Engages Limiter mode. With Limit on, the ratio is overridden to an extremely high value for true peak limiting. Attack and Release controls remain active, letting you shape the limiter's transient response. This provides "brick-wall" style limiting while keeping envelope controls available for fine-tuning.

Lo Freq Relax (Hz) – Applies a sidechain high-pass filter (0–250 Hz) in cascade (24 dB/octave). Turning up this knob reduces the compressor's sensitivity to low frequencies (preventing "pumping" from deep bass). At 0 Hz the filter is bypassed (full bandwidth). Typical use: set 40–100 Hz to let sub-bass fluctuate without triggering gain reduction.

Ext SC (Off/On) – External Sidechain enable. When Off, the compressor and gate detect on the main input signal. When On, they use the external sidechain inputs (if your DAW route provides a sidechain input) as the detection source . This allows, for example, ducking the signal with another track, or de-essing by feeding a de-esser EQ into the sidechain.

Mix (%) – Dry/Wet mix control (0–100%). At 100%, only the compressed (wet) signal is heard. At 0%, the signal is fully dry (bypassed). Intermediate settings blend the two equally (true parallel compression). Use this for parallel processing (e.g. heavy compression on the wet blend while retaining dynamics on the dry mix).

Main Out (dB) – Final output level trim (–20 to +20 dB). This adjusts the overall output volume of both channels. It can be used for additional make-up gain or to attenuate the output after clipping.

Clip 0dB (Off/On) – Optional 0 dB hard clip. When On, the output waveform is clipped at 0 dBFS. A small amount of soft saturation is applied just before clipping for a smooth transition (mimicking analog saturation near its rails). Use this as a safety limiter to prevent digital overs, or as a creative "brick-wall" effect on peaks.

Meters – Below the controls are four meters: GR L/R (Gain Reduction) and Level L/R (Output Level). The GR meters show the instantaneous gain reduction in dB for each channel. The Level meters show output level in dBFS for each channel (smoothed peak). Watch the GR meters to see compression amount and the Level meters to monitor output peaks, especially when Clip 0dB is on.

6. Tips & tricks

Parallel Compression
Back off the Mix knob to blend dry and compressed signals. This "New York" style compression lets you add punch (wet) without losing the original transients (dry).

Lo-Freq Relax
Tweak the Lo Freq Relax to smooth out pumping. For example, set around 50-80 Hz on mixed material to make sure bass instruments don't trigger the compressor too hard.

Attack/Release Sweet Spots
For vocals and bass, try medium attack (10–30 ms) and medium release (100–300 ms) to preserve warmth. For drums, shorter attack (1–5 ms) can catch transients, with moderate release. Listen and adjust by ear.

Rev C for Character
To fatten drums or add drive, use Rev C with a high ratio and slap a bit of output gain. The added harmonics and subtle distortion can make the sound "pop". Conversely, use Rev D when you want pure transparent control (e.g. classical sources or full mixes).

Gate as Expander
Even if no complete silence is desired, you can set Gate Threshold so only lowlevel noise is cut, letting the main audio pass uninterrupted. This lowers the noise floor on quiet passages.

Experiment with Limiter Mode
Flip Limit on/off while listening. Some material benefits from the slower, more musical limiting that Limiter mode provides; for others, leaving it as a normal compressor may sound smoother.

7. Installation & specifications

System requirements
• Operating System: macOS 10.13+ or Windows 10+
• Processor: Intel Core i5 or equivalent
• RAM: 4 GB minimum (8 GB recommended)
• Plugin Formats: VST3, AU (macOS)
• DAW: Any compatible host (Logic Pro, Ableton Live, Studio One, FL Studio, etc.)

Installation process
1. Download the installer from the official website
2. Run the installer and follow on-screen instructions
3. Launch your DAW and rescan plugins if necessary
4. Locate "Sonic Dynamics" in your plugin list

Troubleshooting
• Plugin not appearing: Ensure plugin path is correct in your DAW settings
• High CPU usage: Reduce oversampling if available, or increase buffer size
• Activation issues: Check internet connection and license key accuracy

Specifications
• Sample Rates: Supports all standard sample rates (44.1–192 kHz and beyond) without issue. The sidechain filters and envelopes auto-adjust to the sample rate.
• Internal Resolution: 64-bit floating-point processing ensures low noise and precise math. (No audible truncation or dithering artifacts.)
• Latency: Zero-lookahead design means effectively 0 samples of additional latency. The compressor is feed-forward with no look-ahead buffer. Meter smoothing and filter calculations introduce negligible delay.
• Formats: Available as VST3 on Windows and macOS, and AU on macOS.
• Threading: Processes stereo inputs with a single processing thread. (Stereo linking does not use additional CPU compared to dual-mono mode.)
• CPU Usage: Optimized for low overhead, suitable for multiple instances in a session. The plugin uses native C++ code not requiring additional frameworks.

For more resources, updates, and preset packs, visit ravegeneration.io.