Rave Generation

PRESENTS

RAVE DISTORTION 2

USER MANUAL

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1. Introduction

Rave Distortion 2 is a comprehensive audio processor that combines analog-modeled filters, authentic Pultec EQP-1A low-frequency equalization, character-based saturation, and dual distortion stages in a single powerful plugin. This major update introduces Wave Digital Filter modeling for the legendary Pultec low-frequency section, seven distinct saturation characters, advanced oversampling up to 16x, and a completely redesigned interface with 30 parameters for unprecedented sonic control.

Building on the foundation of the original Rave Distortion, version 2 adds professional features like the famous "Pultec Trick," symmetry control for asymmetric distortion, global dry/wet mixing, and tempo-synced LFO with multiple waveform shapes. Whether you're crafting aggressive electronic sounds, adding analog warmth to digital productions, or exploring new sonic territories, Rave Distortion 2 delivers the perfect blend of vintage character and modern precision.

2. Key Features

- **Authentic Pultec EQP-1A Low-Frequency Section**: Wave Digital Filter modeling of the legendary passive tube EQ with boost/attenuation at 30Hz, 60Hz, or 100Hz
- **Seven Saturation Characters**: Tube, Soft, Transistor, Diode, Digital, Vintage, and Modern - each with unique harmonic profiles
- **Advanced Oversampling**: Up to 16x oversampling with optimized FIR filtering for pristine quality at any setting
- **Dual Distortion Stages**: Two independent distortion processors with individual dry/wet mix and post-gain controls

- **4-Pole Moog-Style Ladder Filter**: Smooth 24dB/octave low-pass filter with resonance and LFO modulation
- **Tempo-Synced LFO**: Six waveform shapes (Sine, Triangle, Saw Up/Down, Square, Random) with adjustable rate and depth
- **Symmetry Control**: Shape the waveform asymmetry for unique harmonic content
- **DC Bias**: Add controlled DC offset before saturation for tube-like asymmetric distortion
- **Global Mix Control**: Blend the entire processed signal with the dry input
- **Professional Mid-Band EQs**: Low-mid and high-mid peak filters with adjustable frequency, width, and gain
- **Musical Feedback System**: Controllable feedback loop with tone shaping, taken post-Distortion 1 and injected pre-Saturation for complex harmonic interaction

3. Quick Start

1. **Insert Rave Distortion 2** on your desired track or bus
2. **Start with a preset** from the menu bar to explore different sonic possibilities
3. **Adjust the input filtering**: Use Pre-HP to remove unwanted low frequencies, then shape the highs with LP Freq and LP Reso
4. **Add character with saturation**: Select a Sat. Character type and adjust Drive to taste
5. **Apply the "Pultec Trick"**: Use LF Boost and LF Atten simultaneously for enhanced low-end clarity
6. **Shape the midrange**: Use the LM and HM filters for surgical frequency control
7. **Add distortion**: Engage one or both distortion stages with their Dry/Wet controls
8. **Fine-tune the output**: Adjust Global Mix for parallel processing and set Output level

4. User Interface

4.1 Pre Process Section

Input (-20dB to +20dB): Initial input gain control

- Adjusts the signal level entering the entire processing chain
- Use negative values to tame hot signals
- Positive values drive the filters and saturation harder

Pre-HP (0-100%): High-pass filter frequency (1Hz to 8kHz)

- Removes low-frequency content before processing
- Essential for controlling bass buildup in dense mixes

HP Reso. (0.0-1.0): High-pass filter resonance

- Adds emphasis at the cutoff frequency
- Can self-oscillate at high settings for creative effects

4.2 Feedback

Feedback (0-100%): Feedback amount control

- Routes signal from post-Distortion 1 back to pre-Saturation
- Creates complex harmonic interactions and sustained tones
- Features built-in decay (0.995) to prevent runaway feedback
- Start with low values (10-30%) for subtle enhancement

FB Tone (0-100%): Feedback tone shaping

- 0% = Dark (100Hz emphasis) for warm, muddy feedback
- 50% = Neutral (~630Hz) for balanced feedback character
- 100% = Bright (4kHz emphasis) for aggressive, cutting feedback
- Acts as a bandpass filter on the feedback path

4.3 LP Ladder Filter & LFO System

LP Freq (0-100%): Low-pass filter cutoff (40Hz to 20kHz)

- 4-pole Moog-style ladder filter design
- 24dB/octave slope for smooth, musical filtering

LP Reso. (0.0-1.0): Low-pass filter resonance

- Controls feedback for emphasis at cutoff
- Self-oscillates at high settings

LFO Rate: Tempo-synced modulation rate

- Options: 1/64, 1/32, 1/24, 1/16, 1/8, 1/6, 1/4, 1/3, 1/2, 1
- Automatically syncs to host DAW tempo

LFO Depth (-100% to +100%): Modulation amount

- Controls how much the LFO affects LP Freq
- Negative values invert the modulation

LFO Shape: Modulation waveform

- Sine: Smooth, natural modulation
- Triangle: Linear sweeps up and down
- Saw Up/Down: Ramping effects
- Square: Rhythmic on/off modulation
- Random: Sample & hold for experimental textures

4.4 Saturation Section

Sat. Drive (-20dB to +20dB): Input gain into saturation

- Negative values reduce saturation
- Positive values increase harmonic content

Sat. Character: Seven distinct saturation types

- **Tube**: Warm, even harmonics like 12AX7 tubes
- **Soft**: Gentle compression with smooth limiting
- **Transistor**: Mix of soft and hard clipping
- **Diode**: Asymmetric response for odd harmonics
- **Digital**: Hybrid soft/hard clipping
- **Vintage**: Smooth analog-style saturation
- **Modern**: Clean, controlled clipping

Symmetry (0-100%): Waveform symmetry control

- Shapes the positive vs negative peaks differently
- Creates unique harmonic content

DC Bias (-10V to +10V): DC offset before saturation

- Shifts the waveform for asymmetric distortion
- Emulates tube and transformer behavior

Sat. Gain (-20dB to +20dB): Output level after saturation

4.5 Low-Mid Filter & Distortion 1

LM Freq (45Hz to 3kHz): Low-mid peak filter frequency **LM Width** (0.0-1.0): Bandwidth control (3 octaves to 1/12 octave) **LM Gain** (-18dB to +18dB): Peak filter gain

Distortion 1 (0dB to 60dB): First distortion stage intensity **Dry/Wet 1** (0-100%): Mix between clean and distorted **Post Gain 1** (-20dB to 0dB): Level compensation after distortion

4.6 High-Mid Filter & Distortion 2

HM Freq (300Hz to 18kHz): High-mid peak filter frequency **HM Width** (0.0-1.0): Bandwidth control **HM Gain** (-18dB to +18dB): Peak filter gain

Distortion 2 (0dB to 60dB): Second distortion stage intensity **Dry/Wet 2** (0-100%): Mix control **Post Gain 2** (-20dB to 0dB): Output level

4.7 Low Frequency Filter (Pultec EQP-1A)

LF Boost (0-10): Low-frequency boost amount

- Authentic Pultec curve with progressive response
- Musical enhancement of selected frequency

LF Atten (0-10): Low-frequency attenuation

- Enables the famous "Pultec Trick"
- Works at slightly different frequency than boost

LF Band: Frequency selection

- **30Hz**: Deep sub-bass enhancement
- **60Hz**: Classic low-end warmth
- **100Hz**: Upper bass without excessive sub

4.8 Utility Section

Global Mix (0-100%): Dry/wet mix for entire plugin

- Enables parallel processing
- Maintains transients while adding character

Output (-20dB to 0dB): Final output level

Oversample: Processing quality

- **Off**: No oversampling (lowest CPU)
- **2x Fast**: Linear interpolation
- **4x Good**: High-quality FIR filtering
- **8x Best**: Premium FIR filtering
- **16x CPU Fire**: Ultimate quality (high CPU usage)

5. Signal Flow & Processing

Input → **Input Gain** → High-Pass Filter → Low-Pass Filter (with LFO modulation) → Compensation Filter → **[+ Feedback Injection]** → Saturation (with Symmetry & DC Bias) → DC Blocking → Low-Mid Filter → Distortion 1 → **[Feedback Take Point]** → High-Mid Filter → Distortion 2 → Pultec Low Frequency → Output Gain → DC Blocking → Global Mix → Output

Processing Details

1. **Input Filtering**: Shapes the frequency content entering the processor
2. **Ladder Filter**: Provides classic synthesizer-style filtering with modulation
3. **Saturation Stage**: Adds harmonic richness with seven distinct characters
4. **Mid-Band EQs**: Surgical frequency control with variable bandwidth
5. **Dual Distortion**: Two stages for complex harmonic generation
6. **Pultec EQ**: Authentic low-frequency enhancement using Wave Digital Filters
7. **Output Stage**: Final level control with optional oversampling

6. Tips & Tricks

The Pultec Trick

- Set LF Band to 60Hz or 100Hz
- Add 3-5 on LF Boost for weight
- Add 2-4 on LF Atten for clarity
- Perfect for kick drums and bass

Character Saturation Guide

- **Tube**: Vocals, bass, full mixes
- **Transistor**: Drums, percussion
- **Digital**: Electronic sources
- **Vintage**: Acoustic instruments
- **Modern**: Clean distortion for any source

LFO Applications

- **Sine at 1/4**: Classic filter sweep
- **Square at 1/16**: Trance gate effects
- **Random**: Experimental textures
- **Triangle at 1/8**: Smooth rhythmic filtering

Oversampling Recommendations

- **Mixing**: 4x Good for quality/CPU balance
- **Mastering**: 8x Best or 16x for maximum quality
- **Live Performance**: Off or 2x Fast for low latency
- **Heavy Distortion**: Higher rates prevent aliasing

Creative Techniques

- Use Symmetry with DC Bias for tube-like asymmetry
- Combine both distortion stages at low settings for complex harmonics
- Use Global Mix at 30-50% for parallel processing
- Try negative LFO Depth for inverted modulation

Feedback System Applications

- **Subtle Enhancement (5-15%)**: Adds harmonic richness without obvious feedback
- **Sustained Tones (20-40%)**: Creates singing sustain on lead sounds
- **Self-Oscillation (50%+)**: Use with caution - creates wild, unpredictable textures
- **Tone Control**: Dark settings work well with bright sources, bright settings cut through dense mixes

Feedback + Saturation Interaction

- The feedback is injected before saturation, allowing the Sat. Character to shape the feedback tone
- Different saturation characters respond uniquely to feedback:
  - **Tube**: Smooth, controlled feedback buildup
  - **Transistor**: More aggressive feedback with earlier breakup
  - **Digital**: Harsh, immediate feedback response
- Use Symmetry and DC Bias to further shape how feedback interacts with saturation

7. Installation & Troubleshooting

System Requirements

- **OS**: Windows 10+ or macOS 10.13+
- **CPU**: Intel Core i5 or equivalent (i7 recommended for high oversampling)
- **RAM**: 4GB minimum (8GB recommended)
- **Formats**: VST3, AU (macOS)

Installation

1. Run the installer for your operating system
2. Follow on-screen instructions
3. Locate "Rave Distortion 2" under "Rave Generation" in your DAW

Troubleshooting

- **High CPU usage**: Reduce oversampling rate or disable when not needed
- **Crackling/dropouts**: Increase buffer size in DAW settings
- **Plugin not appearing**: Rescan plugins in your DAW
- **Presets not loading**: Ensure preset folder exists at the correct location

Preset Locations

- **Windows**: C:\Users\[username]\Documents\Rave Generation\Rave Distortion 2\Presets
- **macOS**: /Users/[username]/Documents/Rave Generation/Rave Distortion 2/Presets

8. Technical Specifications

Parameter	Range	Description
Input Gain	-20dB to +20dB	Initial gain stage before all processing
Pre-HP	1Hz - 8kHz	2-pole resonant high-pass filter
LP Filter	40Hz - 20kHz	4-pole Moog ladder filter

Parameter	Range	Description
LFO Rate	1/64 - 1	Tempo-synced modulation
Saturation	7 types	Character-based harmonic generation
Feedback	0-100%	Post-Distortion 1 to pre-Saturation feedback loop
FB Tone	100Hz - 4kHz	Bandpass filter for feedback character
Feedback Decay	0.995 (fixed)	Natural damping to prevent runaway
LM/HM Filters	Variable	2nd-order peak filters
Distortion	0-60dB	Dual hard-clipping stages
Pultec LF	30/60/100Hz	WDF-modeled passive EQ
Oversampling	Up to 16x	FIR anti-aliasing filters
Latency	0-20 samples	Depends on oversampling setting

Rave Distortion 2 by Rave Generation combines cutting-edge digital processing with authentic analog modeling to deliver a versatile distortion and filtering powerhouse. From subtle warmth to extreme sonic destruction, this plugin provides the tools to shape your sound with precision and character.

For updates, additional presets, and support, visit **ravegeneration.io**