RAVE DISTORTION

1.0.0

USER MANUAL

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1.1 INTRODUCTION

Welcome to the Rave Distortion plugin! This plugin is an audio effect inspired by various hardware devices, including distortion and overdrive pedals, synthesizer filters, EQs, mixing consoles, and filter banks. Designed to inject character and intensity into your tracks, this plugin is ideal for producers and sound designers eager to explore new sonic territories. Whether you're crafting hard-hitting electronic beats or adding grit to your cinematic scores, Rave Distortion brings you the essence of analog warmth and digital precision. With features such as a 4-pole low-pass filter modeled after a transistor ladder design and resonant high-pass filtering, it provides unparalleled flexibility and sound quality.

1.2 KEY FEATURES

• Multiple Filter Types: Includes high-pass, low-pass, mid, and low-frequency filters each with resonance and modulation capabilities. Features a 2-pole resonant high-pass filter (12dB/octave) and a 4-pole low-pass filter (24dB/octave) modeled after a transistor ladder filter for smooth and warm effects.

• Dual Distortion Stages: Two separate distortion stages each with their own dry/wet mix and post-gain controls.

• Dynamic LFO Integration: LFO rate can be synced with project tempo, affecting the low-pass filter frequency for rhythmic modulation effects.

• Advanced Saturator with adjustable drive: Fine-tune saturation to achieve everything from subtle warmth to aggressive distortion.

• DC Block Filters: Prevent DC offset, ensuring clean and high-quality audio output.

• Comprehensive Parameter Control: Extensive control over each aspect of the audio processing to tweak the sound to perfection, including controls for low-mid and high-mid filters with adjustable bandwidth (1/12 octave to 3 octaves).

2.1 USER INTERFACE - MAIN CONTROLS

1. <u>PRE-HP</u> (Pre-High-Pass): Controls the frequency cutoff of the resonant high-pass filter which removes low-frequency content from the input signal before processing. This is a 2-pole (second-order) resonant high-pass filter, providing a slope of 12dB/octave.

2. <u>HP RESO.:</u> Adjusts the resonance of the high-pass filter. Capable of generating feedback.

3. <u>LP FREQ</u> (Low-Pass Frequency): Adjusts the cutoff frequency of the low-pass filter. This 4-pole (fourth-order) filter, with a slope of 24dB/octave, is modeled after a well-known transistor ladder filter by cascading four one-pole filters in series. This design achieves a smooth and warm filtering effect, renowned for its distinctive sound and resonance in classic synthesis. The unique sound, especially when driven hard, results from its non-linear behavior, managed through polynomial approximations.

4. <u>LP RESO.</u> (Low-Pass Resonance): The resonance parameter controls the feedback mechanism, shaping the filter's self-oscillation characteristics and enhancing its analog warmth.

5. <u>LFO RATE</u> (Low-Pass LFO Rate): Sets the rate at which the low-pass filter frequency is modulated by the low-frequency oscillator, allowing rhythmic variations that sync to the tempo of the host DAW.

6. <u>LFO DEPTH</u> (Low-Pass LFO Depth): Controls the depth of the modulation effect applied to the low-pass filter frequency by the LFO, affecting how dramatically the filter frequency changes.

7. <u>SAT. DRIVE</u> (Saturation Drive): Adjusts the drive level for the saturation effect, controlling the intensity of harmonic distortion.

8. <u>DC BIAS:</u> Introduces a continuous direct current (DC) offset into the signal path before saturation, altering the waveform symmetry and affecting the harmonic distortion for unique tonal shaping and dynamic effects.

9. <u>SAT. OUTPUT</u> (Saturation Output): Sets the output level of the saturation effect.

10. <u>LM FREQ</u> (Low-Mid Frequency): Controls the center frequency of the low-mid peak filter. This is a second-order peaking filter with a 12dB/octave slope on each side of the peak.

11. <u>LM WIDTH</u>: Adjusts the bandwidth of the low-mid peak filter. Modeled after well-known American and German 8-bus mixing consoles. When the control is fully to the left (0.0), the bandwidth is 3 octaves (wide). When the control is fully to the right (1.0), the bandwidth is 1/12 octave (narrow). When the control is in the middle (0.5), the bandwidth is approximately 1.5417 octaves. A fixed bandwidth of approximately 1.5 octaves is common for many mixing consoles, providing a balance between narrow and wide bandwidth. This setting avoids making the filter too peaky or too broad, ensuring it affects the frequency spectrum appropriately.

12. <u>LM GAIN</u>: Sets the gain of the low-mid peak filter.

13. <u>DISTORTION 1</u>: Controls the intensity of the first distortion stage.

14. <u>DRY/WET 1</u>: Adjusts the balance between the dry (unprocessed) and wet (processed) signals for the first distortion stage.

15. <u>POST GAIN 1</u>: Sets the output volume of the first distortion stage, useful for leveling after processing.

16. <u>HM FREQ</u> (High-Mid Frequency): Controls the center frequency of the high-mid peak filter.

17. <u>HM WIDTH</u>: Adjusts the bandwidth of the high-mid peak filter. Modeled after well-known American and German 8-bus mixing consoles. When the control is fully to the left (0.0), the bandwidth is 3 octaves (wide). When the control is fully to the right (1.0), the bandwidth is 1/12 octave (narrow). When the control is in the middle (0.5), the bandwidth is approximately 1.5417 octaves.

18. <u>HM GAIN</u>: Sets the gain of the high-mid peak filter.

19. <u>DISTORTION 2</u>: Controls the intensity of the second distortion stage.

20. <u>DRY/WET 2:</u> Adjusts the balance between the dry (unprocessed) and wet (processed) signals for the second distortion stage.

21. <u>POST GAIN 2</u>: Sets the output level of the second distortion stage.

22. <u>LF FREQ</u> (Low Frequency): Adjust the low-frequency filter settings for shaping the bass content.

23. <u>LF GAIN</u>: Sets the gain of the filter.

24. <u>OUTPUT</u>: Sets the overall output level of the plugin.

2.2 USER INTERFACE - ADDITIONAL CONTROLS

PRECISE MOVEMENTS:
Holding down the 'Shift' key while adjusting a knob will enable you to make precise movements. This feature is especially critical when adjusting frequency values in Hz. Allowing for finer control over the audio processing parameters.

RESET KNOB
Right clicking a knob will reset its value. This action will restore the knob or fader to its default or initial position. Alt + click also works (MacOS: 'option' + click).

ADJUST VALUE:
Double-clicking a knob allows you to adjust its value directly. This action provides a quick and intuitive way to fine-tune parameters with precision.

UNDO/REDO
Access Undo and Redo from the menu bar to easily correct or reapply changes. Undo reverses the last adjustment, preventing errors, while Redo restores it, essential for efficient workflow and precise edits.

GUI OPACITY
From the menu bar, users can adjust the GUI Opacity from 0% to 100%. This control allows for varying the transparency of the plugin interface, offering better visibility of underlying work areas or personal preference adjustments.

RESIZE
The interface can be resized from 70% to 200% of its original size via the menu bar. This feature accommodates different screen sizes and resolutions, ensuring Rave Distortion is accessible and comfortably usable on a wide range of devices and display settings.

PRESET MENU
Accessible from the menu bar, the Preset Menu provides a comprehensive interface for browsing, loading, and selecting factory presets, enhancing the ease of finding the right settings for any session. Additionally, users can Load/Save, and Copy/Paste presets.

Presets can be downloaded from https://ravegeneration.io and are regularly updated.
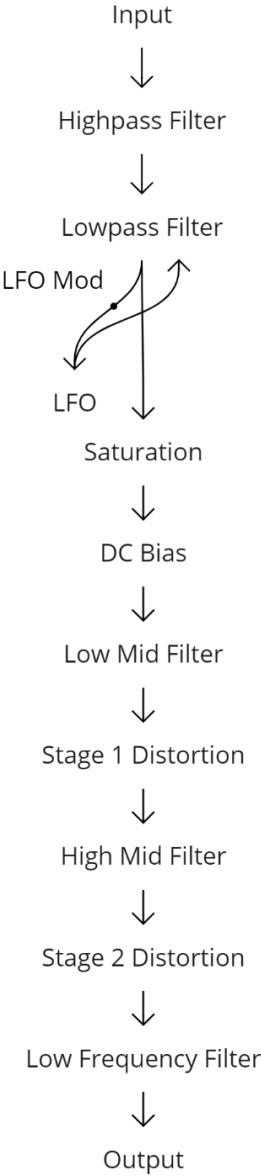
The 'Presets' folder will be auto-generated after launching the plugin for the first time, the folder is stored at:
Windows: C:\Users\[username]\Documents\Rave Generation\Rave Distortion\Presets
MacOS: /Users/[username]/Documents/Rave Generation/Rave Distortion/Presets

3.1 SIGNAL FLOW

The signal flow in the plugin follows the layout of the user interface, progressing from left to right in a grid of 6 knobs across 4 rows. Each row represents a stage in the signal processing chain. The precise signal flow through the plugin is as follows:

Input
↓
Highpass Filter
↓
Lowpass Filter

LFO Mod

LFO

Saturation
↓
DC Bias
↓
Low Mid Filter
↓
Stage 1 Distortion
↓
High Mid Filter
↓
Stage 2 Distortion
↓
Low Frequency Filter
↓
Output

3.2 TECHNICAL SPECIFICATIONS

FEATURE	SPECIFICATION	DESCRIPTION
Pre-HP	0 to 100% (1 Hz to 8 kHz)	High Pass Filter Cutoff to manage bass levels
HP Reso.	0.0 to 1.0	High Pass Filter Resonance to enhance specific frequencies
LP Freq	0 to 100% (40 Hz to 20 kHz)	Low Pass Filter Cutoff to smooth out high frequencies
LP Reso.	0.0 to 1.0	Low Pass Filter Resonance to emphasize frequencies at the cutoff
LP LFO Rate	1/64 to 1 (Syncs to DAW)	Controls the modulation applied to LP Freq. The Frequency range of the LFO is 20 Hz to 20 kHz
LP LFO Depth	0% to 100%	Controls the depth of the LFO effect on the low-pass filter
Sat. Drive	-20 dB to 20 dB	Controls the level of saturation drive
DC Bias	-10V to 10V	Adjusts the symmetry of the saturation process
Sat. Output	-20 dB to 20 dB	Sets the output level after saturation
LM Freq	45 Hz to 3000 Hz	Low-Mid Peak Frequency control
LM Width	0.0 to 1.0	Low-Mid Bandwidth control
LM Gain	-18 dB to 18 dB	Gain control for Low-Mid Filter
Distortion 1	0 dB to 60 dB	Intensity of the first distortion stage
HM Freq	300 Hz to 18 kHz	High-Mid Peak Frequency control
HM Width	0.0 to 1.0	Bandwidth control for High-Mid Filter
HM Gain	-18 dB to 18 dB	Gain control for High-Mid Filter
Distortion 2	0 dB to 60 dB	Intensity of the second distortion stage
LF Freq	20 Hz to 300 Hz	Controls the frequency of the low-frequency filter
LF Gain	-12 dB to 12 dB	Gain control for Low Frequency Peak
Output	-20 dB to 0 dB	Overall output level of the plugin