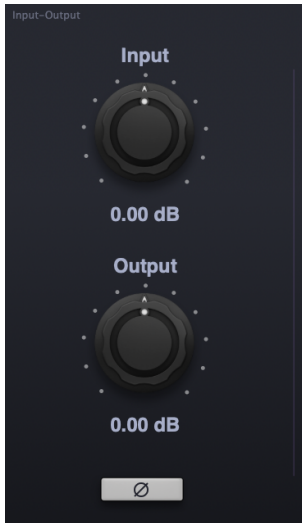# Marauder 2.0 User Manual

Marauder 2.0 is a complete re-design of my original Marauder plugin which was originally just a bit crusher. Marauder 2.0 is a multiband sound-destroyer that combines bit crushing, resampling, plucked string/vibration emulation, distortion, filtering, and multiband control. Let's take the tour!

Input/Output section

The IO section is pretty straightforward.
`Input` controls a gain multiplier on the signal coming into the plugin while the `Output` controls a gain multiplier on the signal coming out of the plugin. The `Phase` toggle button inverts the polarity of the signal. There is a hard clipper right before the `Output`, so pushing the `Input` up hard will give you hard clipping distortion above 0 dB. The amount of distortion isn't affected by `Output`, so pulling `Output` down will lower the volume of the distortion, not lower the amount of distortion.
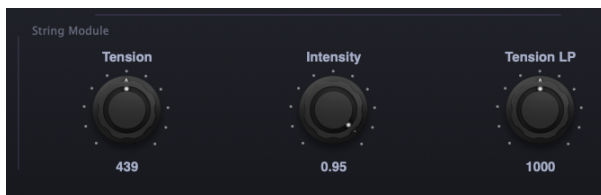
Multiband Bit-Crusher

The four `Band` dials control the mix of each band coming out of the bit-crusher. A mix of 100%

means all of that band passes through the bit-crusher while a mix of 50% means 50% of that band passes through the bit-crusher and is then mixed with 50% of the dry band after the bit-crusher. You can also `mute` or `solo` bands with the toggle buttons under the dials.

The bit-crusher includes the `Bit Crush`, `Resample`, `Drive`, and `Mix`. `Bit Crush` is a bit reduction from 1 to 16 bits, 16 bits being the default setting with no change. The `Resample` dial resamples your audio with a range of 5 to 50. This range maps to a frequency range of 800 to 20000 Hz, which has a natural scaling in the 5 to 50 range. `Drive` controls a lofi distortion algorithm which sounds really heavy and packs a lot of destruction. Lastly, `Mix` is a mix control for the whole bit-crushing section, so it extends the band mixes by acting as a master mix that affects all bands equally.

String

The `String` module turns the audio coming into the plugin into a plucked string using the `Karplus-Strong` algorithm. The `Tension` dial sets the tension of the string, which translates to the frequency of the vibration. Small tension values give you a PCV pipe kind of effect, medium value give you a resonant, plucked string effect and large tension values approach delay effects. The `Intensity` dial is a combination of feedback amount and mix. High intensity means more effect with more repeats and a low intensity means less of an effect. Lastly, the `Tension LP` is a lowpass filter on the feedback loop, which controls the brightness of the string sound.
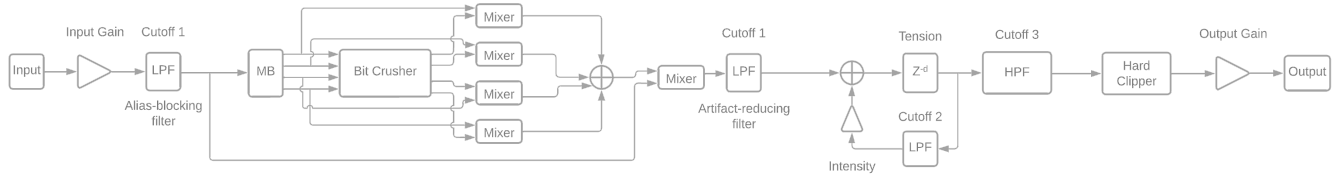
Filter

The filter module is mostly straightforward. It's a lowpass and highpass filter, but with some extra routing. The `LPF` dial controls two separate lowpass filters, one just before the `Bit Crusher` as an alias-blocking filter and one right after the `Bit Crusher` as an artifact removing

filter. So, moving the `LPF` sets the cutoff for both of these lowpass filters. The `HPF` controls the cutoff of a highpass filter right after the `String` module and before the hard clipper.
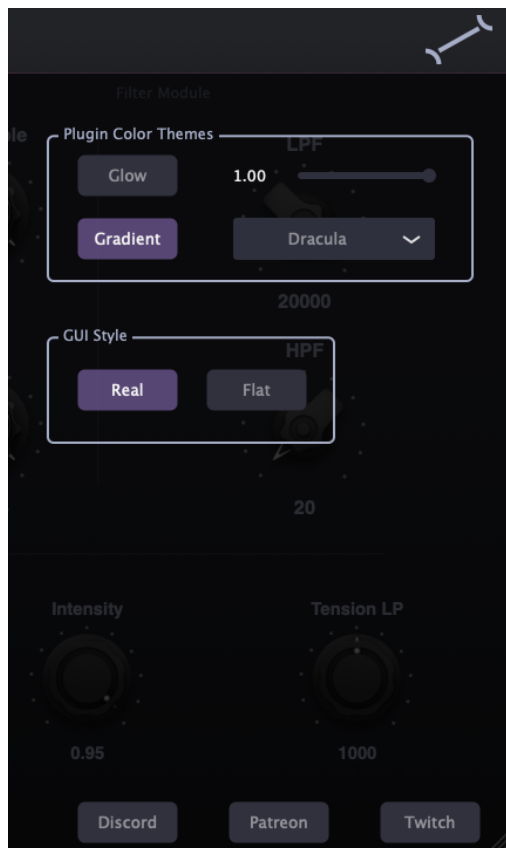
Signal Flow Diagram

Here is a block diagram describing the design of Marauder

At its core, it can be boiled down to:
input > LPF > multiband split > Bit Crusher > LPF > String model > HPF > hard clipper > output

Settings

The settings page has a bunch of cool GUI customizations that I'm always working to improve. Let's start with the `GUI Style` section.

GUI Style

This changes the style of the plugin to either a realistic skeuomorphic design or a flat design. When on the `Flat` mode, the `Glow` button toggles on a glow effect with the slider next to it controlling the brightness of the glow.

Gradient

The `Gradient` toggles a color gradient on the background

Color Theme

The `Color Theme` dropdown menu allows you to choose from a collection of color themes that are applied to the plugin background, text color, flat control colors, and various line and graphics colors.

Social Buttons

Lastly, at the bottom of the settings page are three buttons that take you to my various social platforms that are hopefully actually useful to you. `Discord` to join my community and chat with me and like-minded folks, `Patreon` to download my other free plugins (and donate if you want), and `Twitch` where I livestream audio plugin development.