Noise Engineering
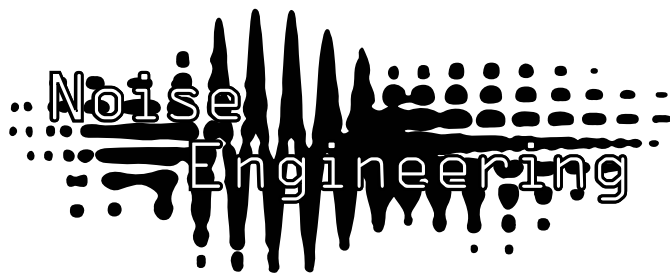# Pura Ruina

Three-stage CV-controlled full-wave rectifier.

Overview

Type	Three-stage rectifier/folder
Size	8HP Eurorack
Depth	.8 Inches
Power	2x5 Eurorack
+12 mA	75 mA
-12 mA	65 mA

Pura Ruina is a three-stage CV-controlled fully-hyphenated full-wave rectifier/distortion designed for audio. Simple waveforms can be manipulated into completely new and exciting tones, and already-complex sounds can be shredded into sonic oblivion. Add some CV and you'll never want to let PR out of your rack! Each stage has an individual level control with corresponding CV and individual out, as well as feeding to the universal Sum output. PR's rectification creates a unique flavor of distortion unlike standard wavefolding or clipping. The possibilities are virtually endless: add to a west-coast style complex oscillator setup for unique timbral shaping, annihilate a percussion mix through it, run its individual outs through other Ruina modules for further mayhem… You'll never run out of awesome things to try, we promise. You know you want one.

Etymology

Pura -- from Latin: "pure"
Ruina -- from Latin: "destruction"

"Pure destruction"

Input & output voltages

CV inputs are all 0-5v.

Special Thanks

Shawn Jimmerson, as always, has been a guiding light throughout the development of this module.

Power

To power your Noise Engineering module, turn off your case. Plug one end of your ribbon cable into your power board so that the red stripe on the ribbon cable is aligned to the side that says -12v and each pin on the power header is plugged into the connector on the ribbon. Make sure no pins are overhanging the connector.

Line up the red stripe on the ribbon cable so that it matches the white stripe and/or -12v indication on the board and plug in the connector.

Screw your module into your case BEFORE powering on the module. You risk bumping the module's PCB against something metallic and damaging it if it's not properly secured when powered on.

You should be good to go if you followed these instructions. Now go make some noise!

A final note. Some modules have other headers -- they may have a different number of pins or may say NOT POWER. In general, unless a manual tells you otherwise, DO NOT CONNECT THOSE TO POWER.
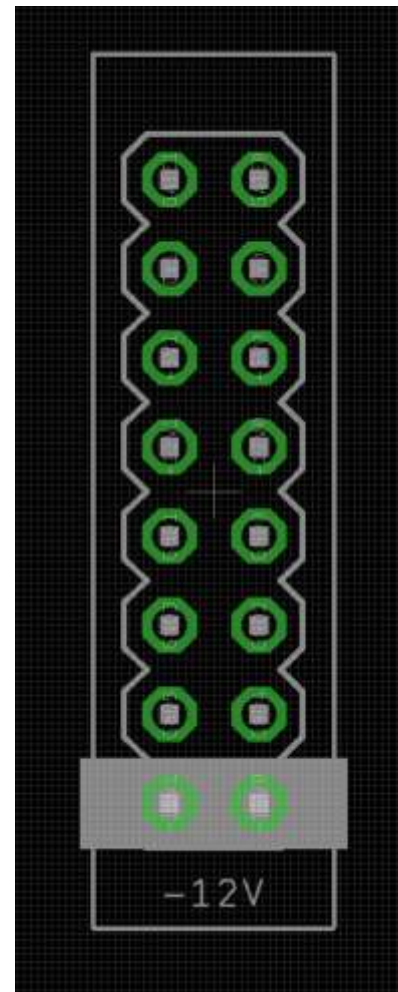
Warranty

Noise Engineering backs all our products with a product warranty: we guarantee our products to be free from manufacturing defects (materials or workmanship) for one year from the date of the original retail purchase (receipt or invoice required). The cost of shipping to Noise Engineering is paid by the user. Modules requiring warranty repair will either be repaired or replaced at Noise Engineering's discretion. If you believe you have a product that has a defect that is out of warranty, please contact us.

This warranty does not cover damage due to improper handling, storage, use, or abuse, modifications, or improper power or other voltage application.

Interface

See Design Notes (below) for information on full-wave rectification.

1:
Dry signal volume.
2:
Single full-wave rectification stage volume.
4:
Double full-wave rectification volume.
8:
Triple full-wave rectification volume.
CV ins 1/2/4/8:
CV control of volume for each stage. Knobs act as offsets for the CV inputs.
All CV:
Simultaneous control of all four CV inputs.
In:
Audio input.
Outs 1/2/4/8:
Individual outputs for each section.
Sum Out:
Output for all four stages summed together.

Patch Tutorial

First Patch:
Patch a simple waveform (like a sine wave) to the In jack. Patch the Sum Out jack to your mixer. Adjust the knobs to see what kind of sounds PR can create.
**Second Patch:**
Using the patch from the previous example, take a quad CV source like Mimetic Digitalis and modulate the 1, 2, 4, and 8 CV inputs to create tonally evolving sequences.
Third Patch:
Patch a different type of sound (for instance, a percussive loop) and run it through PR. New sounds are waiting to be discovered!
Fourth Patch:
PR can act as a complex VCA. Run an oscillator to the In jack and the Out jack to your mixer. Run an envelope to the All CV input. PR now controls the volume of your voice as well as adding harmonic complexity! For even more control, run the envelope through a mult and attenuators (like Sinc Defero) and modulate each section's volume individually for more harmonic possibilities.
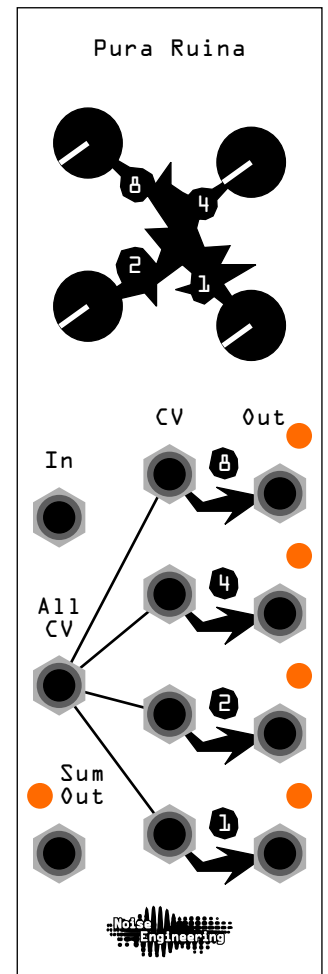
Design notes

Full-wave rectification (FWR) transforms a bipolar AC signal so that the negative amplitude portions of the signal become positive. It does cool and interesting things to harmonics. For example, a FWR sine waveform loses its fundamental and has a new fundamental at twice the frequency. This forms the basis for the module: 1 is the dry signal. 2 FWRs the incoming signal. 4 FWRs the signal resulting from 2, and so on.

Most modules in the NE lineup start as one of our conceptions and we champion it. This one was one of Stephen's. He has been interested in full-wave rectification distortions for a long time: he built his first one in high school! It was only a matter of time before he convinced the rest of team NE that we needed to make one in Eurorack.

Pura Ruina started as a simple full-wave rectification module long before we dreamed up the Distortion-of-the-Month series. We initially conceived of it as more of a simple 4hp "anti-filter" that would do really cool things. Then we prototyped it and it did not do really cool things. It did not even do vaguely cool things. We tweaked and tweaked and at least Stephen remained convinced that there was a kernal of...something there. The rest of us were skeptical but believe it might have merit. We sat on it for a few months.

And then there was the fateful day when we decided to do a series of distortions. Although the concept for the series was based on other circuits and modules, Pura Ruina quickly slotted in. We revised it to fit that line.

The first version remained 4hp. It full-wave rectified, but didn't stage split, and wasn't CV-able. It was better than the previous incarnation, but Stephen pretty quickly spotted the potential this time around and slapped the circuit together.

The first go with this revision blew us away. A simple sine wave in with a bit of modulation sounded almost like polyphony. He was vindicated! The idea had been good after all!

The sonic possibilities PR opens up are way beyond what we hoped for with this one. Where our other distortions can do pretty EQ, crazy drive, hella resonance...this one is a beast entirely of its own.