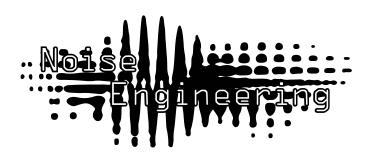# Noise Engineering
Sinc Bucina

Resonant low-pass gate with variable filter
slope, RC envelope generator, and slew

Overview

Type	VCFA, envelope generator, slew
Size	4HP Eurorack
Depth	.8 Inches
Power	2x5 Eurorack
+12	45 mA
-12	40 mA

Sinc Bucina is the sequel to one of our first modules, Sinclastic Empulatrix, replacing the clamping VCA with a resonant low-pass VCF and VCA combo. The velocity-dependent Ping input offers classic release-only LPG behavior, while the Gate in offers much more complex slewing, useful for simple ASR envelopes to dynamic modulation. The Envelope Out allows the internal envelope to be routed out into a patch for even more versatility and modulation fun.

Etymology

Sinc -- shortened from Sinclastic from Old English sinc 'treasure', from greek clastic 'easily removable'
Bucina -- from Latin: "War Trumpet"

"Easily Removable War Trumpet"

Input & output voltages

Ping will trigger starting at 2v and will fully open the VCFA at 5v.
Gate in will respond to voltages up to 10v.
The envelope output is 0-6v, depending on Ping/Gate input.

Patch Tutorial

Patch 1: Send a simple oscillator signal to the Audio In. Patch the Audio Out to your mixer. Send a trigger to the Ping input and play with the Release time to create plucky, percussive sounds. Also try sending a more complex oscillator (like the Loquelic Iteritas or Ataraxic Iteritas) for classic "west coast" tones (and beyond)!

Patch 2: Send an audio signal to the Audio In and patch the Audio Out to your mixer. Send a stepped voltage sequence to the Gate In and adjust the Attack and Release times to increase or decrease slewing between steps and create a dynamic, harmonically rich sequence.

Patch 3: Run a trigger into an attenuator (like Sinc Defero) or a VCA and then into the Ping input of SB. Patch an oscillator to the Audio In and the Audio Out to your mixer. Adjust the attenuator or open and close the VCA to hear the different dynamics SB can impart onto a waveform. A static attenuated trigger can be useful to shape the character of SB.

Interface

Hit: Momentary button that sends a gate to the Gate In for as long as the button is pressed.
Attack: Sets the rise time for the slew. The Attack stage is bypassed if a trigger is sent to the Ping input.
Release: Sets the fall time for the slew.
6/0/12: Sets the LPG's behavior: resonant 6dB-slope low-pass filter, no filter (just VCA), or 12 dB-slope low-pass filter.
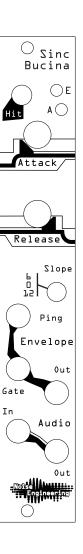**Ping:** Amplitude-dependent trigger input. Sending a trigger to this input bypasses the Attack stage. Release time is set by the Release knob. Ping input is voltage dependent: a lower voltage trigger will open the VCA and VCF less than a higher voltage trigger, which allows for expressive and dynamic sequencing. 0-5v; +5v opens the VCA/VCF completely.
Gate: Slew input. Also voltage dependent: a lower voltage will open the VCA and VCF less than a higher voltage. Send a gate to this input for ASR envelope behavior, or send more complex signals in to be slewed, with rise rate set by Attack and fall rate set by Release. 0-5v.
Out: Envelope out.
Audio In: Audio into the VCF/VCA.
Audio Out: Audio out from the VCF/VCA.

Design Notes

The first design of Sinc Bucina was created soon after Don Buchla's death. Though electronically SB is a distant cousin of the original low-pass gates, it very much draws inspiration from Buchla's pioneering early synthesizer work. This is technically our first analog filter. Sinc Bucina is a simple two pole low-pass filter with a following VCA. All sections are implemented with the SSI2164 VCA. We chose not to use vactrols for practical and environmental reasons, but the envelope generator is a very simple DRC network with a little complexity to give a touch of the vactrol temporal-nonlineary behavior.

Special Thanks

Don Buchla