HEXINVERTER.NET

presents

vcNOIZ

voltage controlled noise oscillator

USER MANUAL v1.0

This general user manual applies to
ALL formats of vcNOIZ
(ie: eurorack, DIY, etc.)

Introduction

vcNOIZ is a voltage controlled noise oscillator for analogue synthesis. This module is capable of producing gritty, screechy and downright offensive sounding noise textures. Its sound signature is something like that of the noise generators in the Commodore 64 or Atari devices of yesteryear. It is also an excellent candidate for synthesizing percussive elements from scratch. It can create great sounding hihats!

vcNOIZ is not your typical noise module. It has voltage control of the noise frequency and a number of sub-octave noise outputs and other features. It might be better thought of as more of a VCO than a simple noise generator. However, it is still capable of providing pure white noise just like any other white noise module -- just turn the frequency of vcNOIZ to maximum and you will have pure white noise at the output!

Features

Expo. response CV input (-V to +V)
Linear response CV input (-V to +V)
Clock input (square wave, positive logic)
Clock output (warbly and unstable)

Pitch control (to tune base frequency, just like a VCO)
CV Attenuation

Base frequency noise output (a little smoother sounding than the divisions) [audio coupled]
Sub octave /4 output (gritty sounding) [audio coupled]
Sub octave /8 output (gritty sounding) [audio coupled]
Base frequency DC coupled gate output (for when wanting a random gate when using a slower clock/pitch rate)

Technical Specifications

Module Width: 6HP (eurorack)
Module Depth: 38mm (eurorack)
Current consumption: +35/-30mA @ 12V

Control/Panel Descriptions

Pitch Control -- This controls the base frequency of the noise VCO, just like any other VCO. Express yourself using this control while playing live for some awesome crunchy pitch sweeps! Turning the pitch all the way up will produce white noise at the AC NOISE output. Turning it all the way down will produce sub-audio clicks and pops which are suitable for use as random gates and to trigger events in your system.

EXP CV Control -- This controls how much the signal present at the EXP CV input

EXP CV input -- Input a control voltage to modulate the pitch of vcNOIZ exponentially (ie: musical response)

LIN CV input -- Input a control voltage to modulate the pitch linearly. In this way, you can use linear FM with the oscillator for interesting effects.

Clock input -- Input a positive logic clock anywhere around 3V in amplitude, and get a random noise signal generated from your clock signal through vcNOIZ. This is a great way to get a random gate signal at the DC noise output of vcNOIZ. NOTE: this replaces vcNOIZ's internal clock -- this means that vcNOIZ's CV inputs and pitch control no longer affects the noise present at the vcNOIZ outputs.

Clock output -- vcNOIZ's internal voltage controlled clock is present at this output. NOTE: the clock is actually rather unstable so is great for complex, evolving patches. No temperature compensation was used in the circuit, as I feel that the instability adds an element of randomness to the otherwise pseudo-random algorithm used in the module to create the noise.

AC Noise output -- This is the main, highest frequency noise output on vcNOIZ. When the pitch control is all the way up, white noise will be present at this output.

DC Noise output -- Running at the same frequency as the AC NOISE output, this DC-coupled noise output provides random gates and event triggers for use triggering events and driving clocks into other modules in your system. Try running this into a clock divider module and using the clock divisions to trigger percussive elements for some cool rhythmic patterns!

AC Noise /4 output -- This is a lower frequency (frequency / 4) version of the main AC NOISE output. This allows for simultaneous different frequencies of noise to be used and explored in your system at once. This output has a special disturbing sound character to it compared to the main AC NOISE output! This is a great output to use to generate different sounding percussive elements alongside the other outputs.

AC Noise /8 output -- This is a lower frequency (frequency / 8) version of the main AC NOISE output. This allows for simultaneous different frequencies of noise to be used and explored in your system at once. This output has a special disturbing sound character to it compared to the main AC NOISE output! This is a great output to use to generate different sounding percussive elements alongside the other outputs.

Some Patch Ideas

Not sure where to start with vcNOIZ? Here are some basic patch ideas that should hopefully spark some inspiration in you for other cool patches!

Patch Idea 1: Noise Pad

Use vcNOIZ like a regular VCO and patch it into a low-pass filter and VCA which you modulate with a volume envelope (ie: with a keyboard or sequencer). Make sure to use a filter with multiple signal inputs (or a mixer fed into the filter!). Now, 1 or 2 of vcNOIZ's AC Noise outputs through the filter. Sweep the cutoff and resonance up and down until you find something pleasing to your ear -- perhaps even add some cutoff modulation!

Now, before your VCA, mix the remaining raw output/s of vcNOIZ into your "pad" sound coming out of the VCF. Now you will have a mixture of filtered and raw sound from vcNOIZ with a variety of noise frequencies mixed together since you have used different outputs from vcNOIZ mixed together!

Use a volume envelope with a long Attack, Sustain and Release cycle to get a long, swelling pad type sound. Add some pitch modulation or sweep the pitch control until you get the sound you like! Mix in some other VCOs for a massive soundscape!

Patch Idea 2: HiHats/Percussive Elements

vcNOIZ can easily create multiple pitch-modulated drum textures at once, thanks to its multiple noise flavours available at one time.

To create a percussive sound, feed an AC output of vcNOIZ into a VCA which has a short Attack/Decay envelope applied to its volume. Trigger the envelope with a sequencer or whatever you use to trigger your drum sounds.

Do this once for each AC Noise output to create simultaneous but different sounding percussive elements! It is very easy to create an open and closed hihat at once in this manner.

Sweep the pitch of vcNOIZ until you find a satisfying frequency of noise to your ears. In this way, convincing hihats can be made without ever needing a high-pass filter!

Where things get really fun is to apply an LFO modulating the pitch of vcNOIZ. Try a relatively high frequency triangle waveform for "chorus" style effects on your hihats (with no external effects used!)

Patch Idea 3: Random Gates (or triggers)

vcNOIZ can be used as a random gate generator which could be utilised to trigger drums, envelopes or other events in your modular system. To use vcNOIZ as a random gate generator, the signal at the DC Noise output is used. The rate of noise is of course proportional to the frequency of vcNOIZ. A random signal of ON/OFF switches will appear at the DC Noise output of vcNOIZ. The gate will stay on for a random length of time, then turn off for a random length of time. If you want TRIGGER behaviour instead of gates (ie: randomly occuring pulses -- not a gate that turns on and off at random times), you can use the AC Noise outputs instead! These will provide a brief trigger-like pulse at random times instead of the gate signal at the DC Noise output.

Feeding the random gate into a clock divider and using the different clock divisions to trigger drums is an excellent way to arrive at some cool percussion sounds!

Also try feeding in an external clock into vcNOIZ which is also driving a more linear (non random) sequence of rhythmic events. You can then turn this “normal” clock into a random gate that is synced with your “normal” clock. Add some cool percussive elements that are driven by the random gate, and you will likely have interesting and evolving polyrhythms!