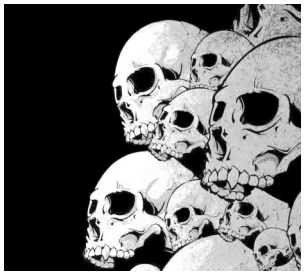
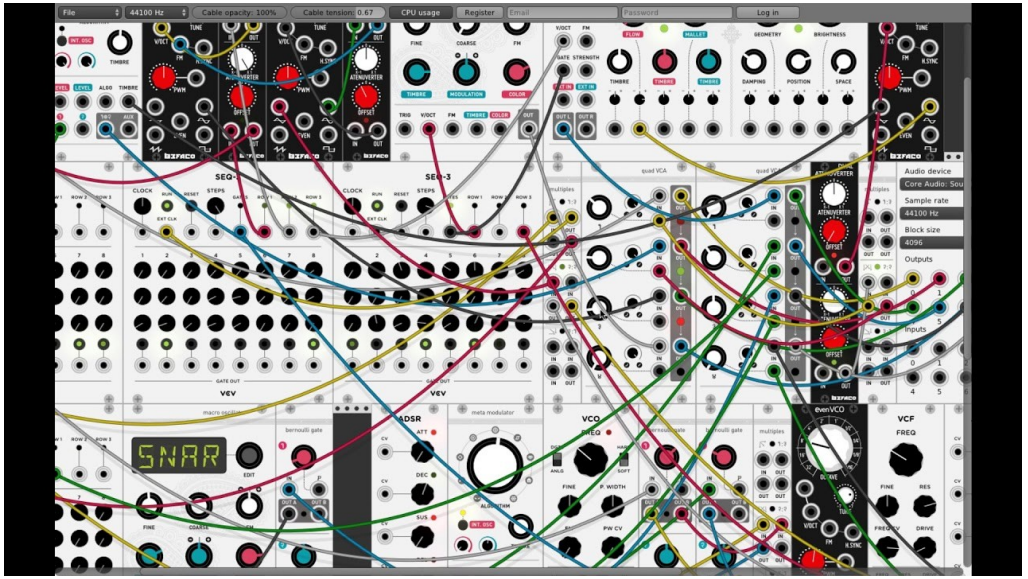


VCV Rack



Y. Collette (ycollette.nospam@free.fr)
https://audinux.github.io/

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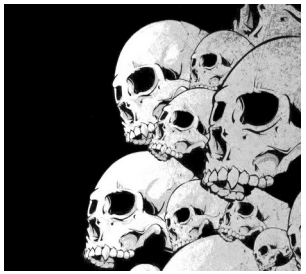
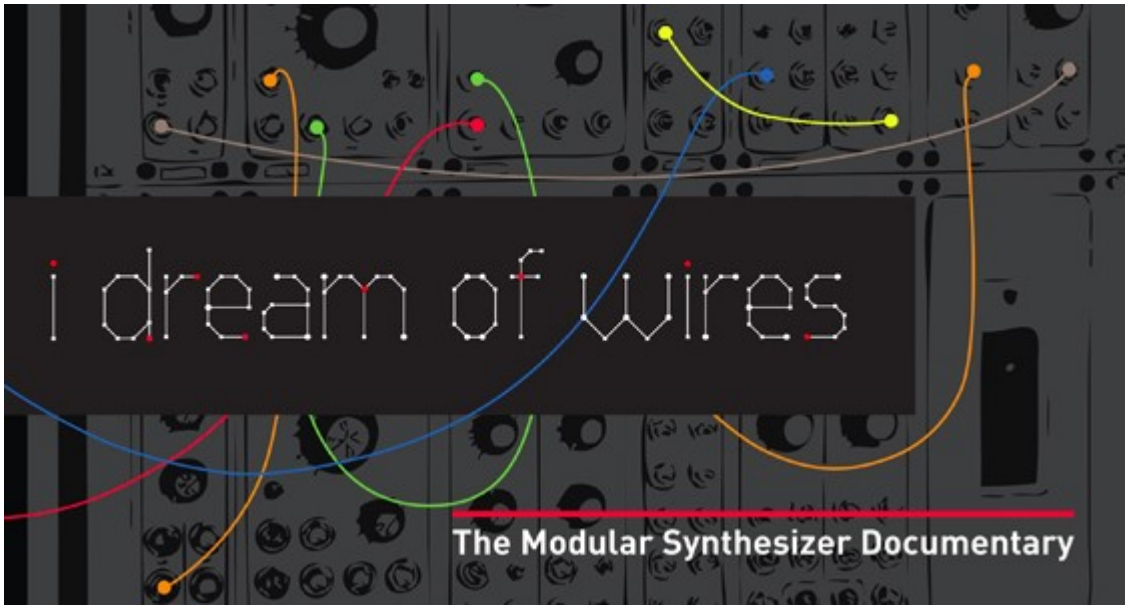


Modular Synthesis

http://www.idreamofwires.org/



A documentary on modular synthesis.

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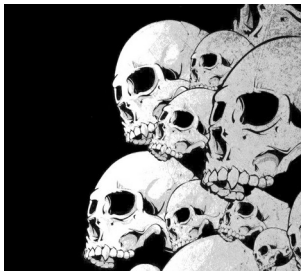

Modular Synthesis

https://sisterswithtransistors.com/

A documentary on the female pioneers of modular synthesis.

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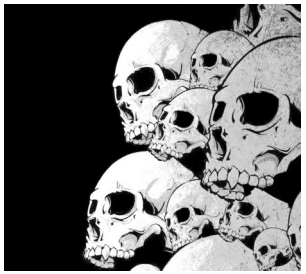
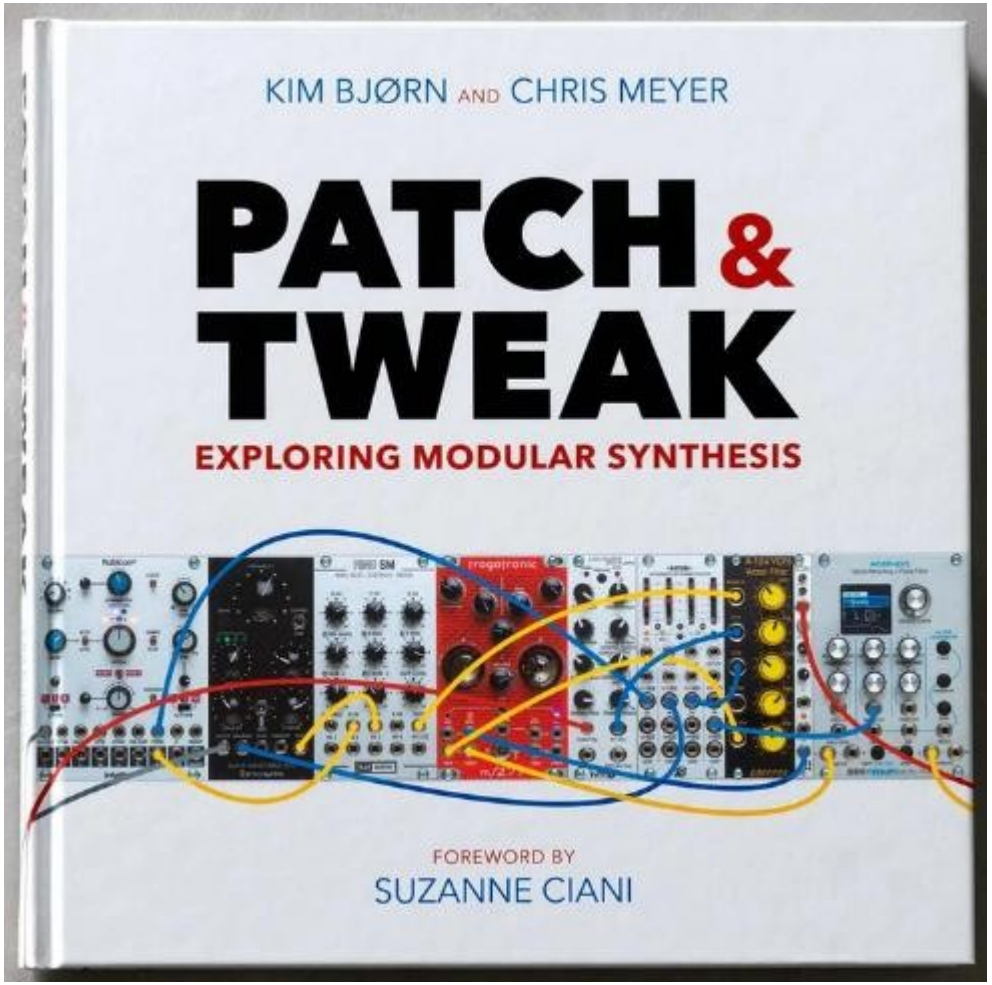


Book



A great book about modular synthesis :

PATCH & TWEAK

You can download associated resources via this link :

PATCH & TWEAK resources

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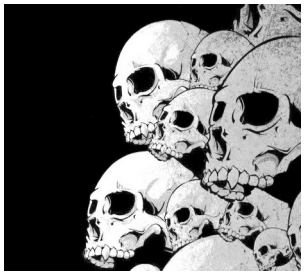
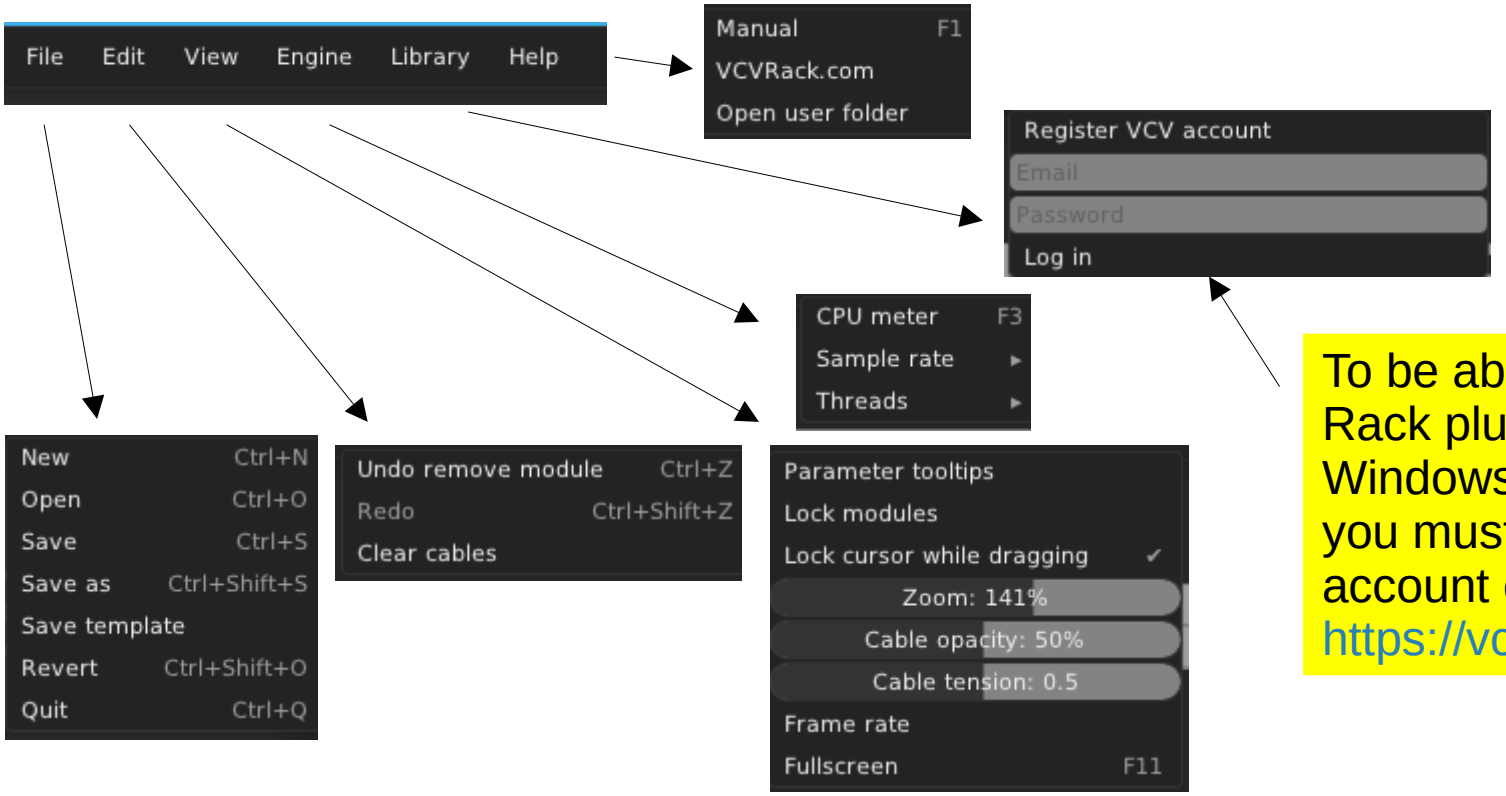


Menu bar



To be able to install VCV Rack plugins on Windows and MacOS, you must create an account on https://vcvrack.com/

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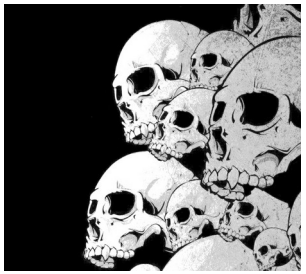

Before we start

We will use the following modules from VCV Rack :
- Fundamental - https://vcvrack.com/Fundamental
- SV modular - https://vcvrack.com/DrumKit
- AS - https://library.vcvrack.com/AS
- Impromptu - https://library.vcvrack.com/ImpromptuModular
- Audible Instruments - https://library.vcvrack.com/AudibleInstruments
- Squinky labs - https://library.vcvrack.com/squinkylabs-plug1
- aridacity - https://library.vcvrack.com/aridacity
- Befaco - https://vcvrack.com/Befaco
- Eseries - https://vcvrack.com/ESeries
- Aaron Static - https://library.vcvrack.com/AaronStatic
- BogAudio - https://library.vcvrack.com/Bogaudio
- Valley - https://library.vcvrack.com/Valley
- Bark - https://library.vcvrack.com/Bark

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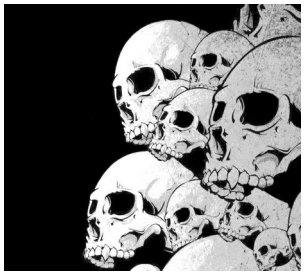

Before we start

To install these modules :
- on MacOS / Windows : create an account (it’s free) and then click on each of the links and register to this module. An installation will be perfomed and once this is done, you will have to restart VCV Rack.

On Linux / Fedora, install the LinuxMAO COPR repository and then the VCV Rack plugins :

```
$ dnf copr enable ycollet/linuxmao
$ dnf install rack-v1-DrumKit \
              rack-v1-AS \
              rack-v1-ImpromptuModular \
              rack-v1-AudibleInstruments \
              rack-v1-squinkylabs-plug1 \
              rack-v1-aridacity \
              rack-v1-Befaco \
              rack-v1-ESeries \
              rack-v1-AaronStatic \
              rack-v1-Bogaudio \
              rack-v1-Valley \
              rack-v1-Bark
```

And then start Rack &.

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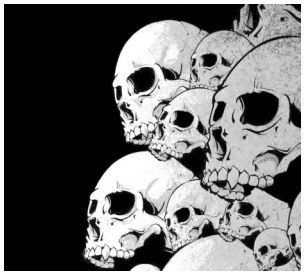


VCV Rack

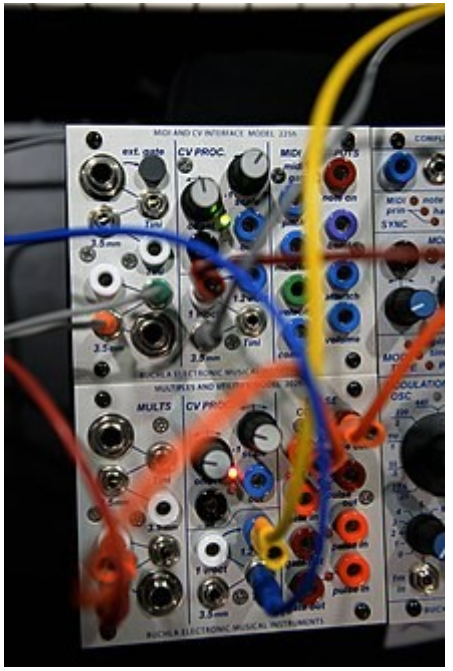
Control Voltage / Gate /Trigger

Two methods exist to control via a voltage (CV) :

The **CV** (in octave per volt), which Robert Moog invented, is used by the majority of modular synth manufacturer, and also by the EuroRack norm.
To go to the next octave, you just have to add one volt (this will multiply by 2 the frequency), and substract one volt to go to the lowest octave (this will divide the frequency by 2).

The **GATE** signal is used to notify the switching on / off of an action.

The **TRIGGER** signal is a pulse notifying the switching on / off of an action.



https://fr.wikipedia.org/wiki/CV/gate

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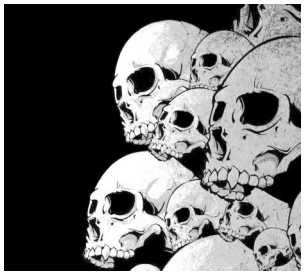

Fundamental Modules

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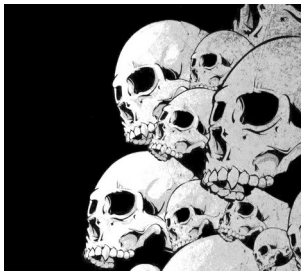
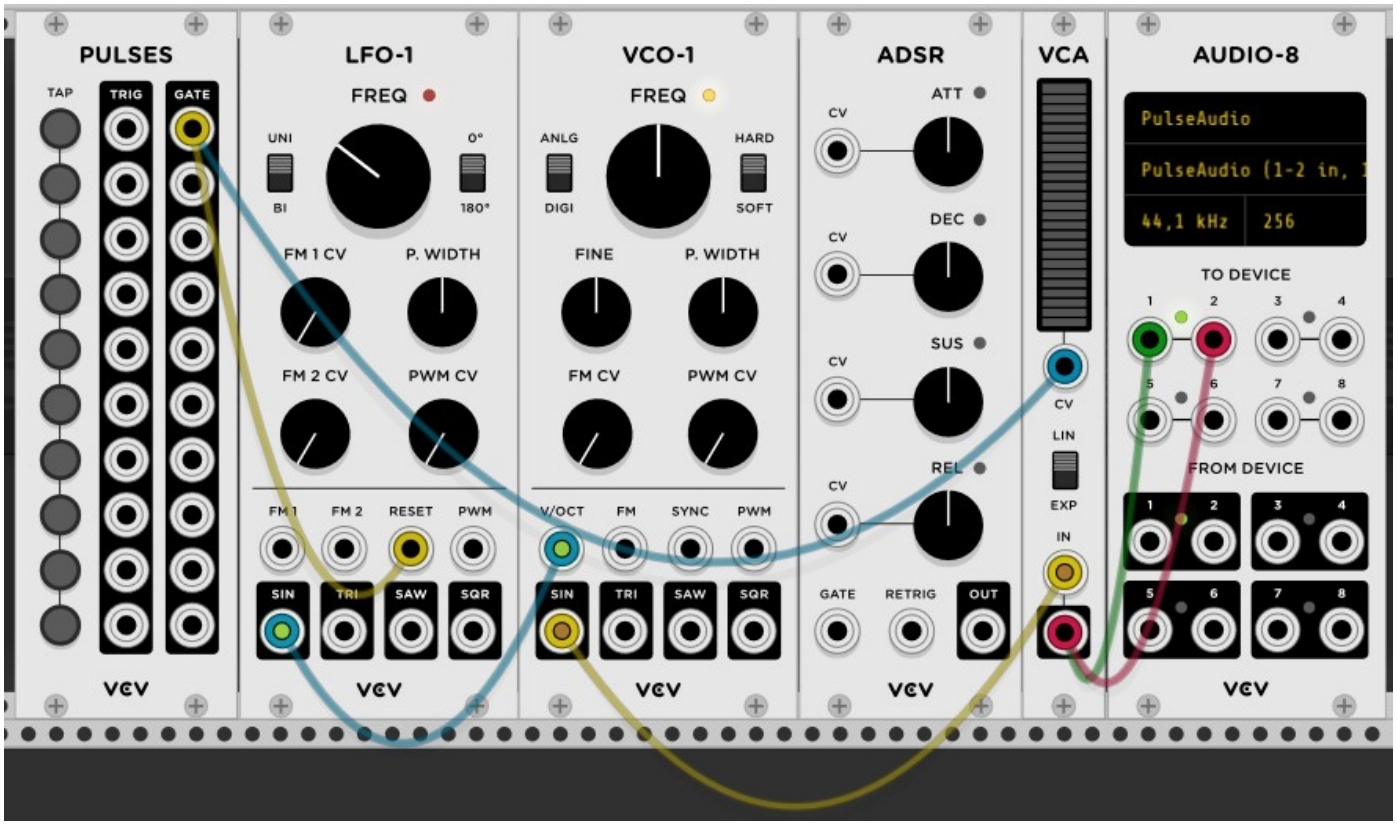


Fundamental Modules

The fundamental modules gives you access to all the basic modules we can find in modular synthesis. Really useful to learn modular synth.

We will present all these modules some slides after ...



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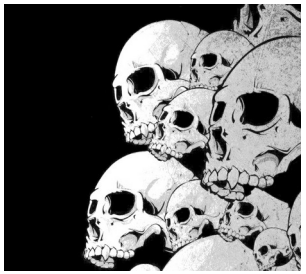
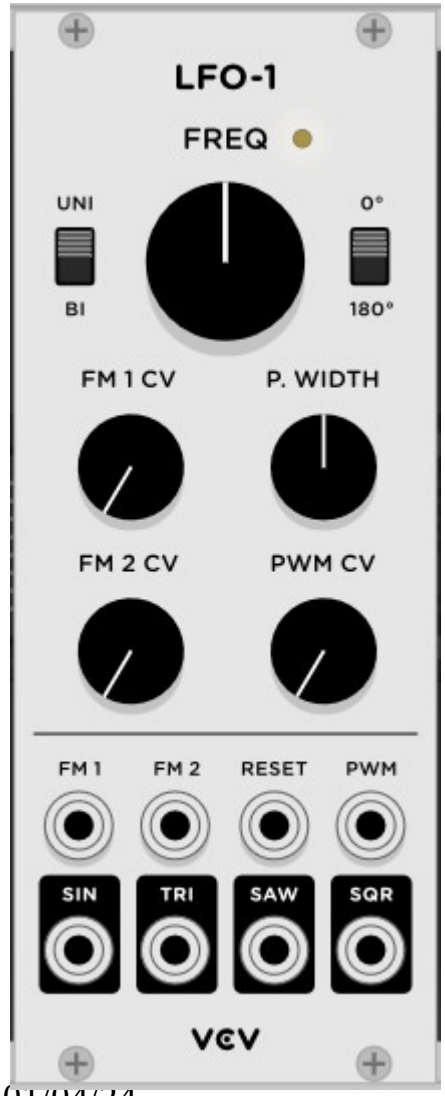


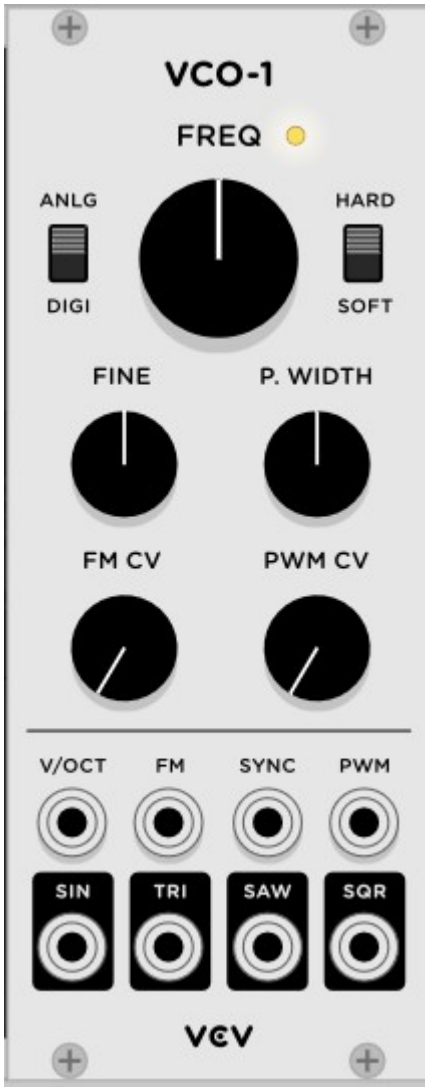
VCO / LFO



Some basic building blocks :

VCO : Voltage Control Oscillator
Black connectors : outputs
Grey connectors : CV inputs
This oscillator produces audible frequencies

LFO : Low Frequencies Oscillator
The oscillator produces low frequencies. It will be used to control other devices.



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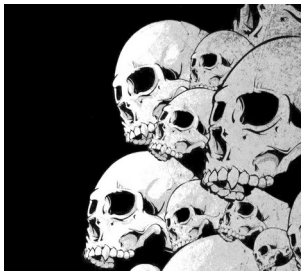
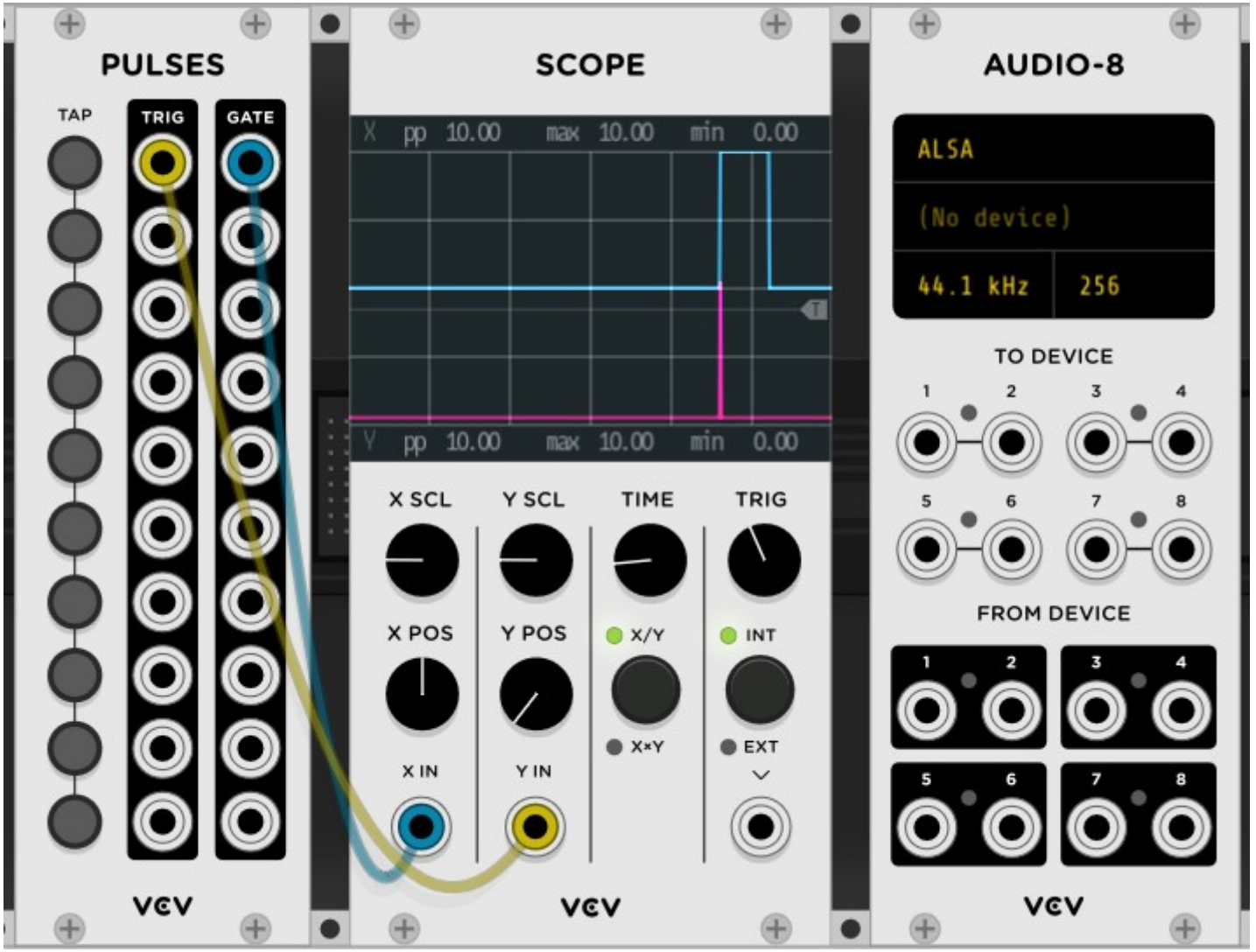


Gate / Trigger



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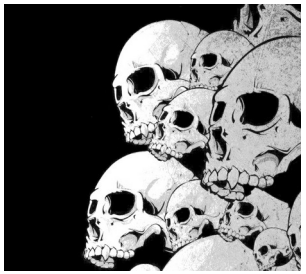
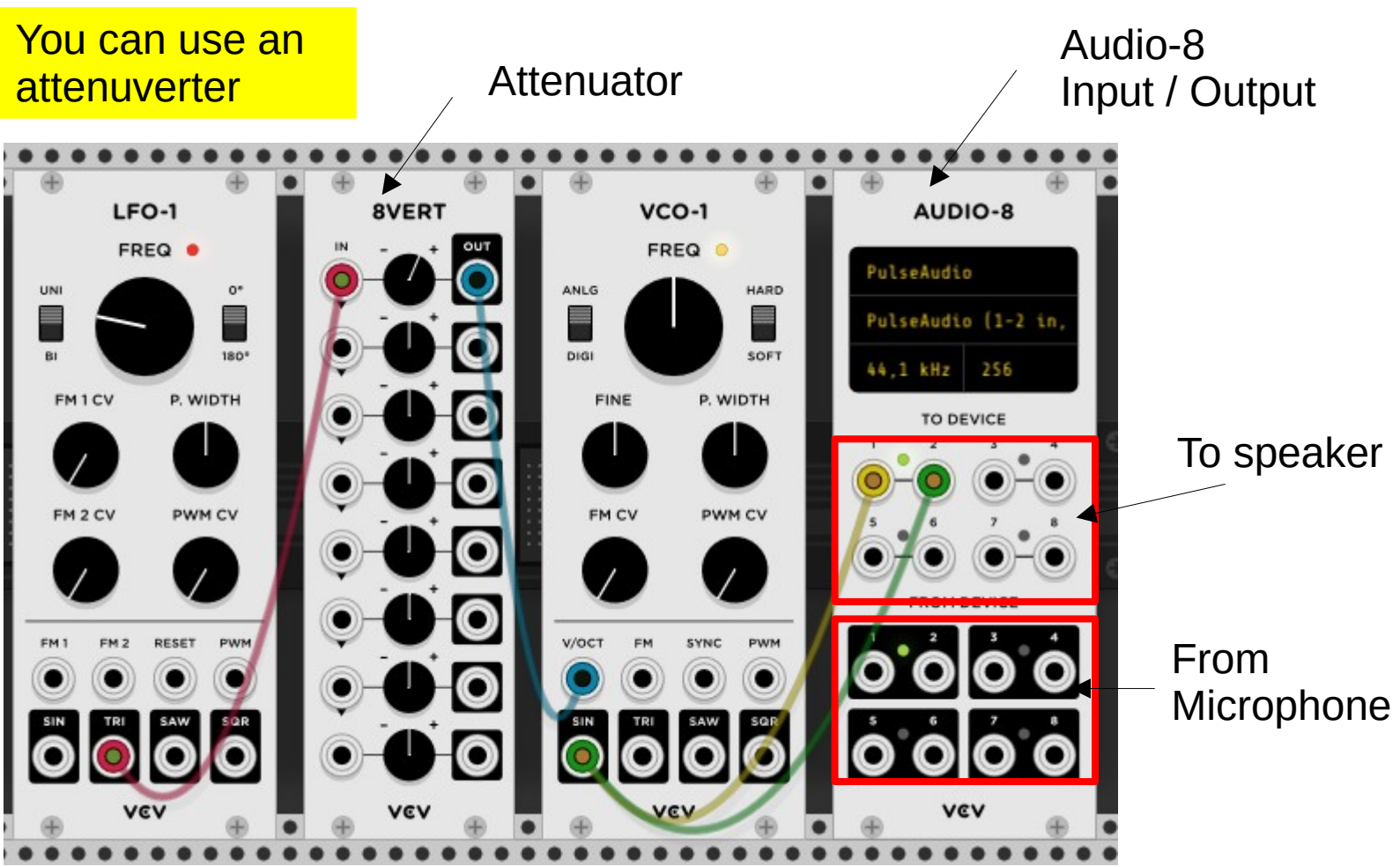


VCO / LFO
Example

You can use an attenuverter



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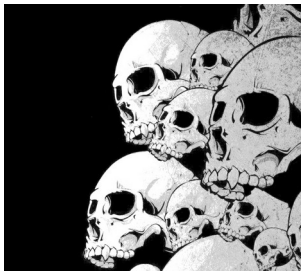


A Simple Example

Fundamental LFO1

Fundamental VCO1

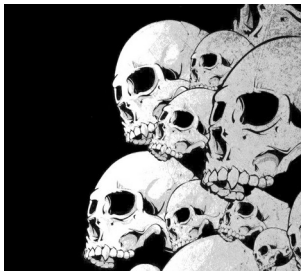
Core Audio

Fundamental LFO1

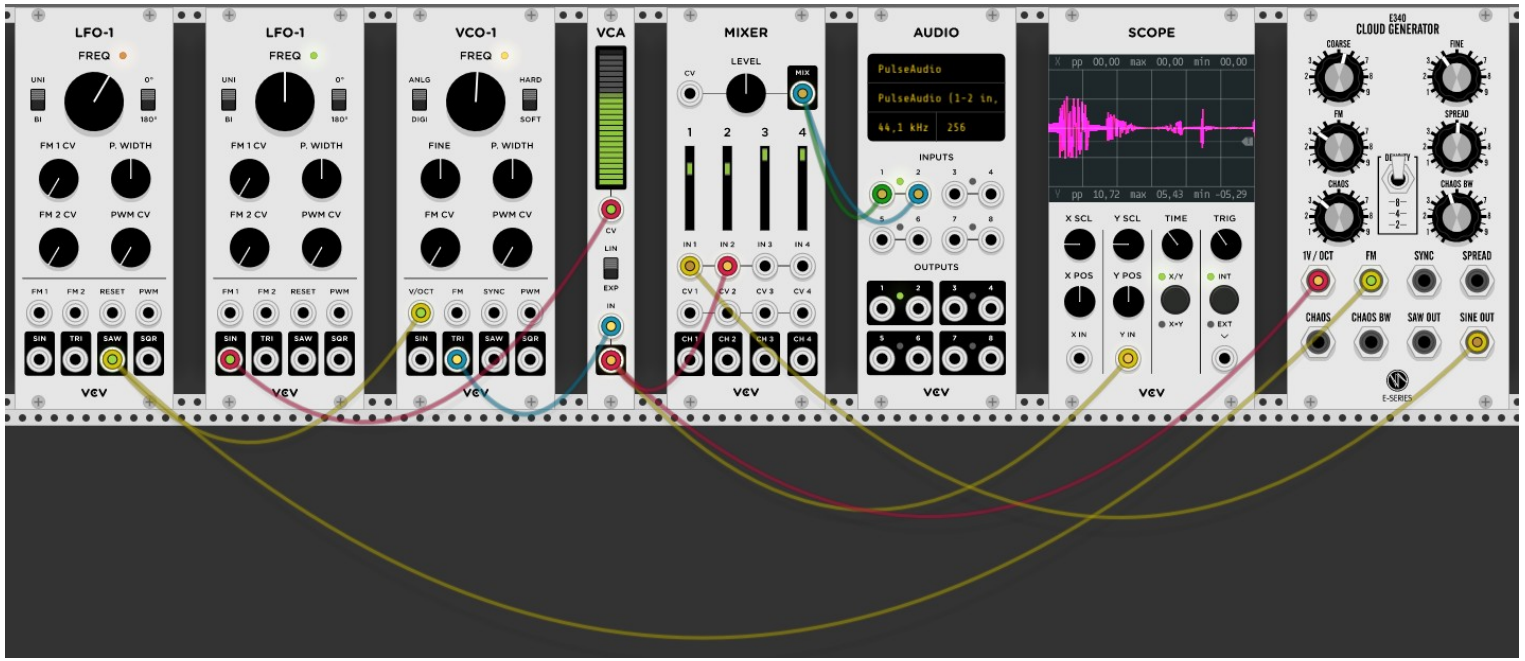
Fundamental VCA1

Fundamental Scope

CC BY



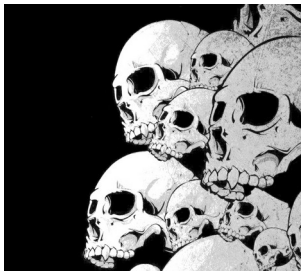
An Example with the Cloud Generator



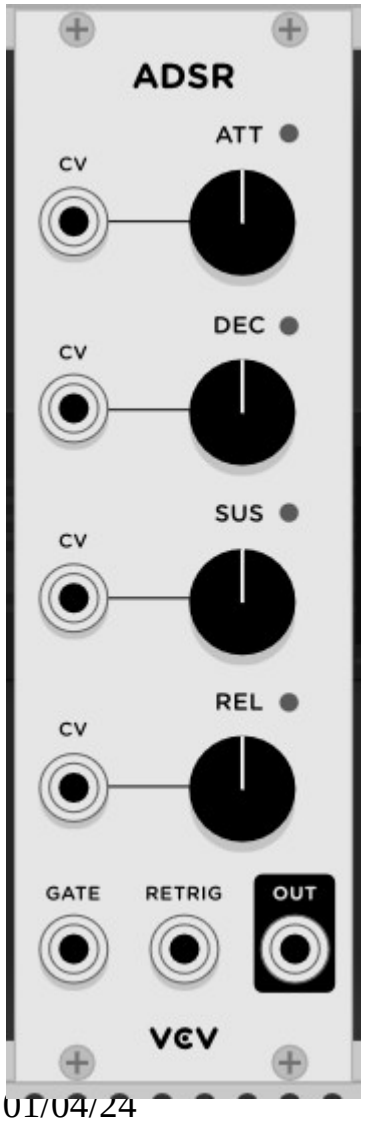
Fundamental LFO1	Fundamental VCO1	Fundamental Mixer	Fundamental Scope

Fundamental LFO1	Fundamental VCA1	Core Audio	Befaco Cloud Generator

CC BY

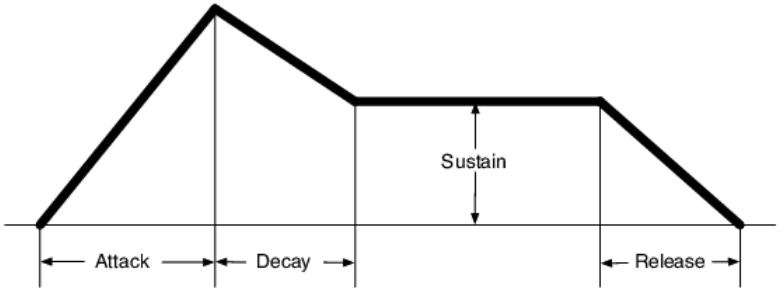


ADSR / VCA



ADSR :

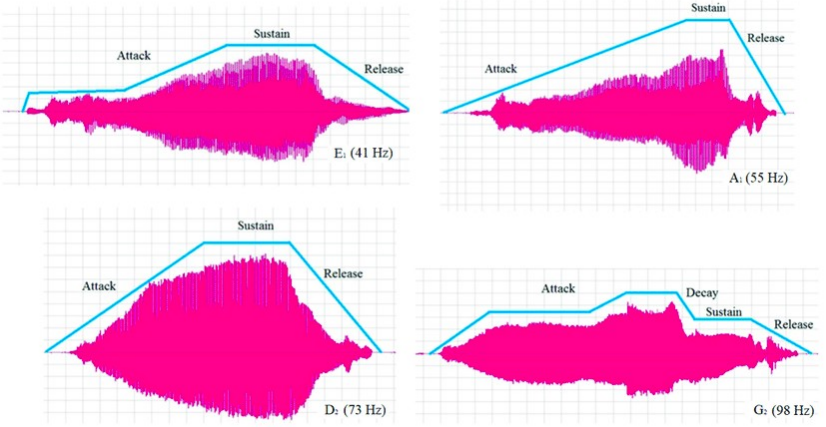
Attack
Decay
Sustain
Release

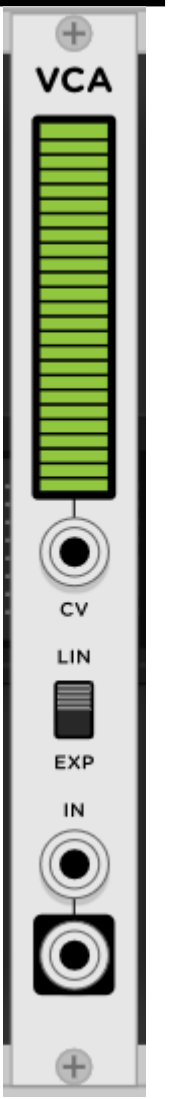


Produces a signal which will be used to control the amplitude of a sound

VCA : **V**oltage **C**ontrol **A**mplifier

Most of the time, an ADSR enveloppe is used with a VCA





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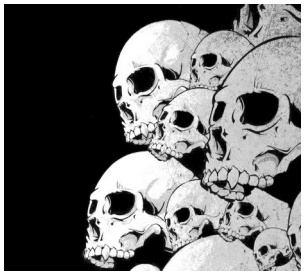
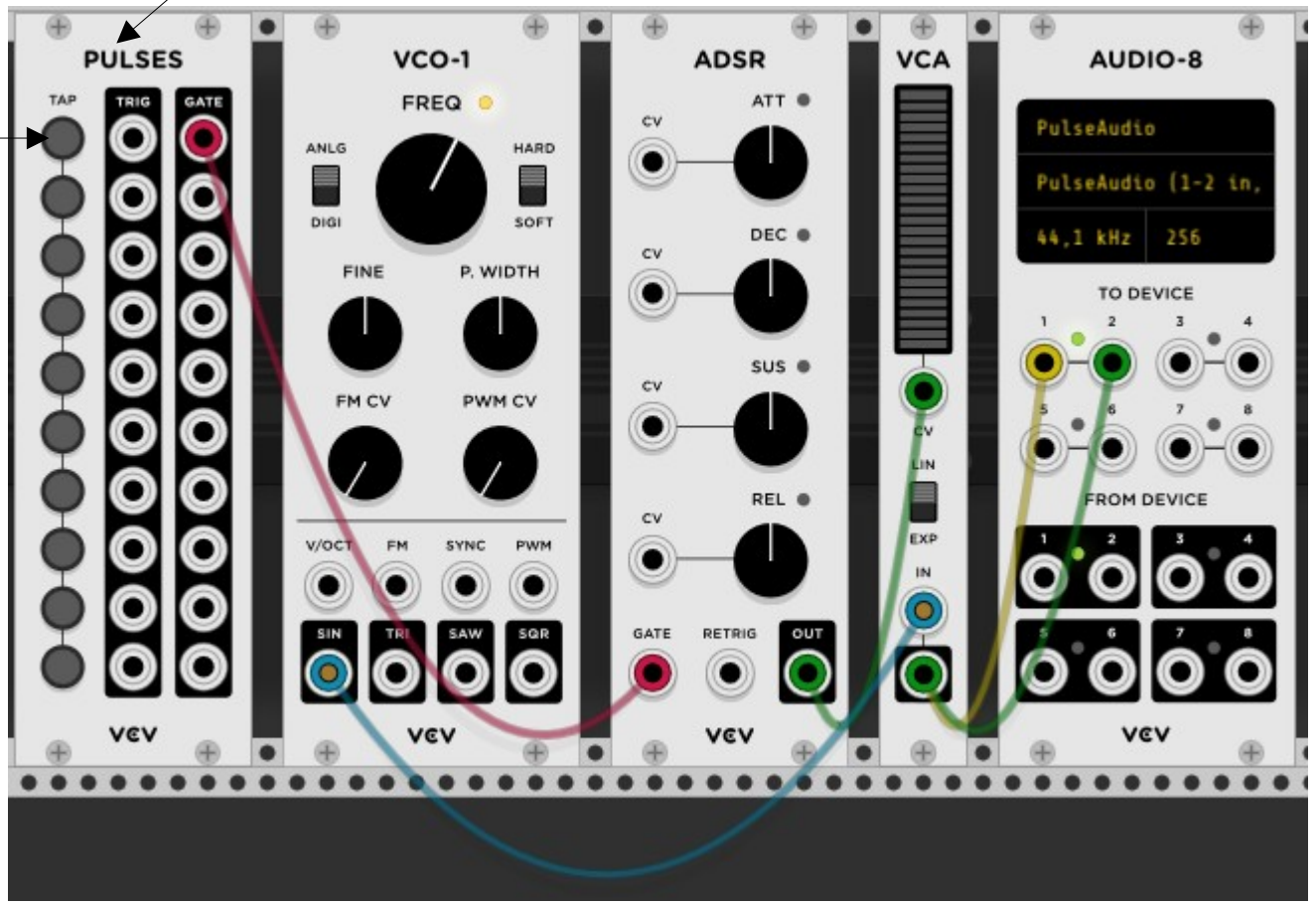


ADSR / VCA
Example

Pulses generator

This button will trigger the sound modulated by the enveloppe



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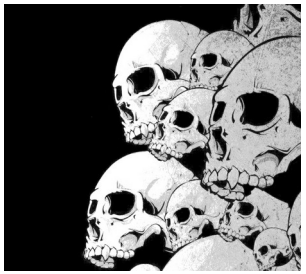
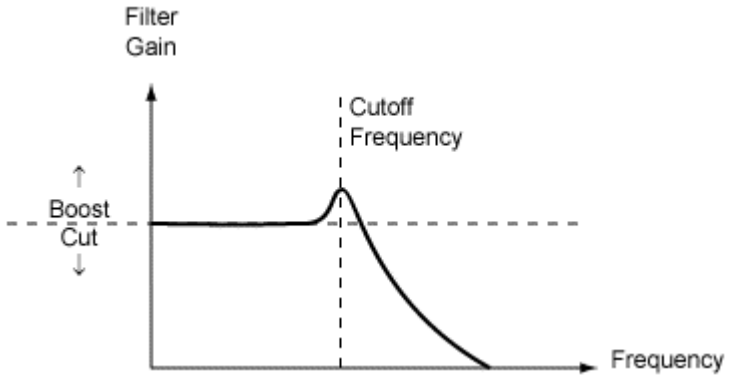


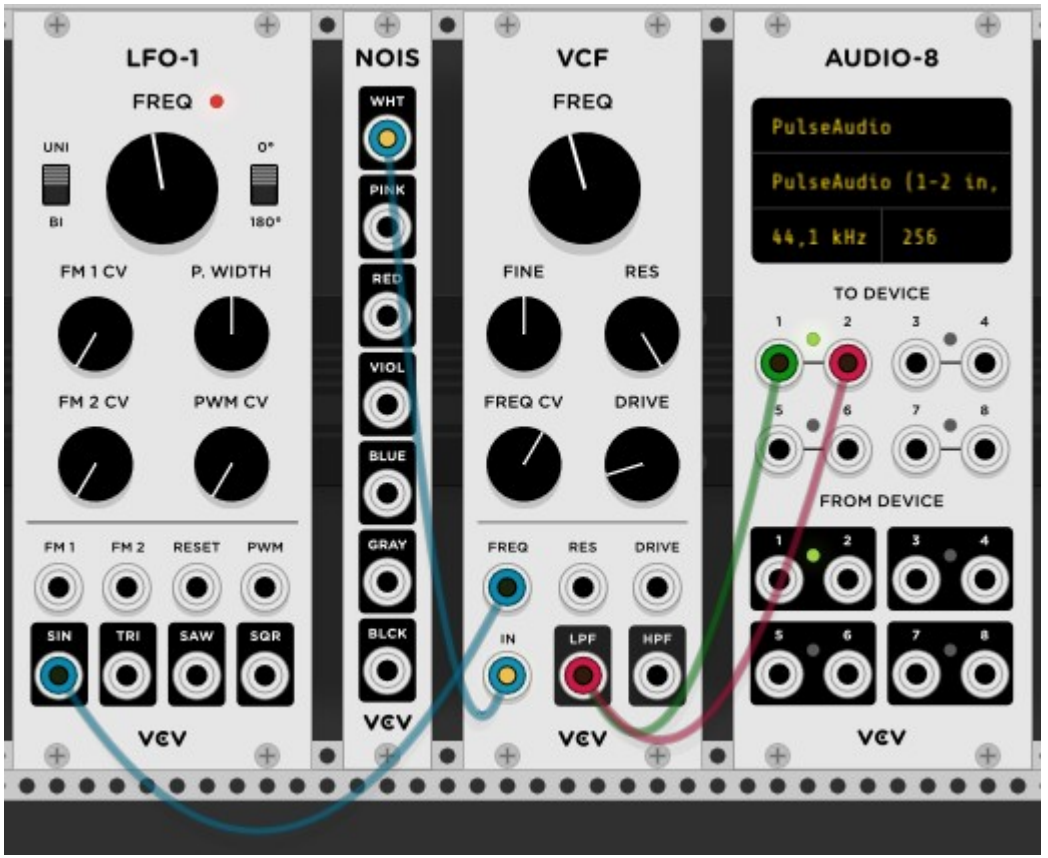
VCF
Example

VCF : **V**oltage **C**ontrol **F**requency

A filter (low pass or high pass) controled by a CV signal.

FREQ/CV : the sensivity to the of the cutoff frequency wrt the CV signal amplitude.
RES : The resonance of the filter





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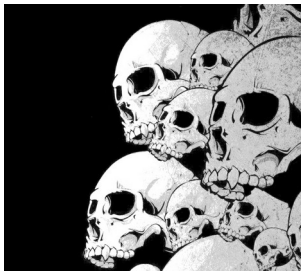

Sequencer
Example

Clock module
To adjust the speed of the sequencer

8 notes sequencer

Quantizer
To transform the continuous signal into discrete levels

You can disable some levels by clicking on them

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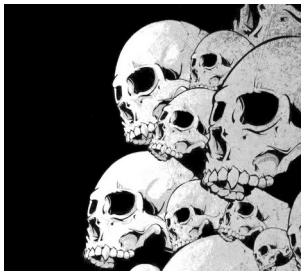

Drum Sequencer

Bass drum, snare, hit hat from SV modular
Drum sequencer from SV modular

Mixer and Reverb from AS

Clock from Impromptu

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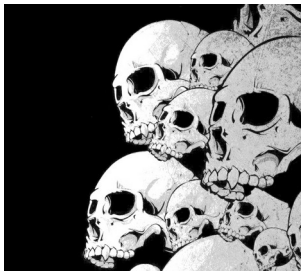
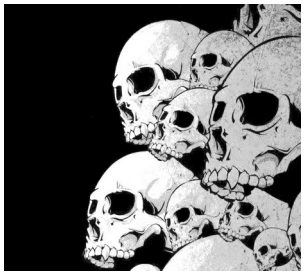


Drum Sequencer 2

Bass drum, snare, hit hat from SV modular
AUDIO-8 from Fundamental
PULSES from Fundamental
Sums from Mental
DelayPlus from AS

CC BY



Playing with randomness

Macro oscillator and Bernouilli gate from Audible Instruments

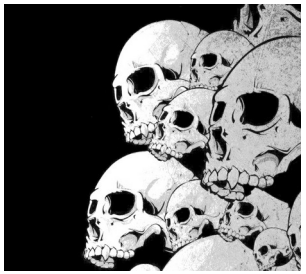
Clock from Impromptu

Bass drum from SV Modular

Mixer from AS

All the other modules from Fundamental

CC BY



Some melodies ?

A random generator from Squinky lavs

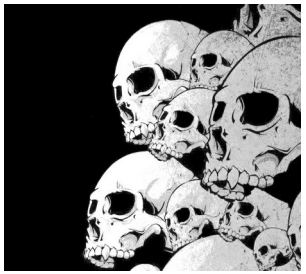
bCrush from aridacity

Slew Limiter from Befaco

Cloud Generators from Eseries

Clock from SV Modular

Macro oscillator from Audible Instruments



Chords progression

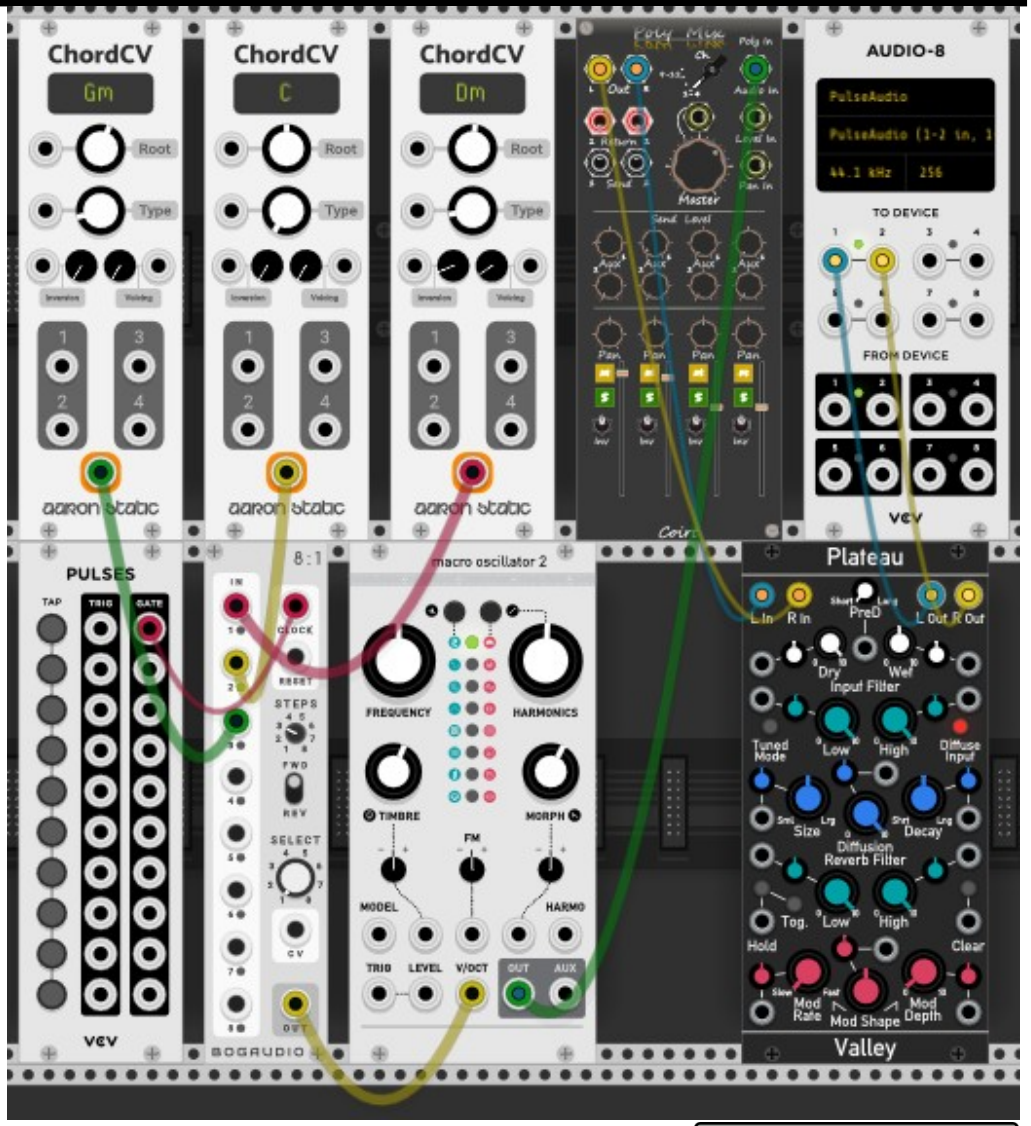
ChordCV from Aaron Static

8 to 1 from BogAudio

Macro Oscillator 2 from Audible Instruments

Plateau from Valley

Coirt from Bark (Poly to stereo mixer)



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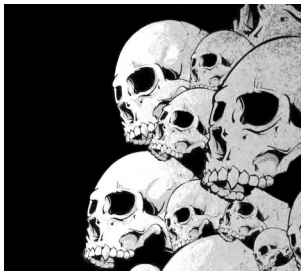
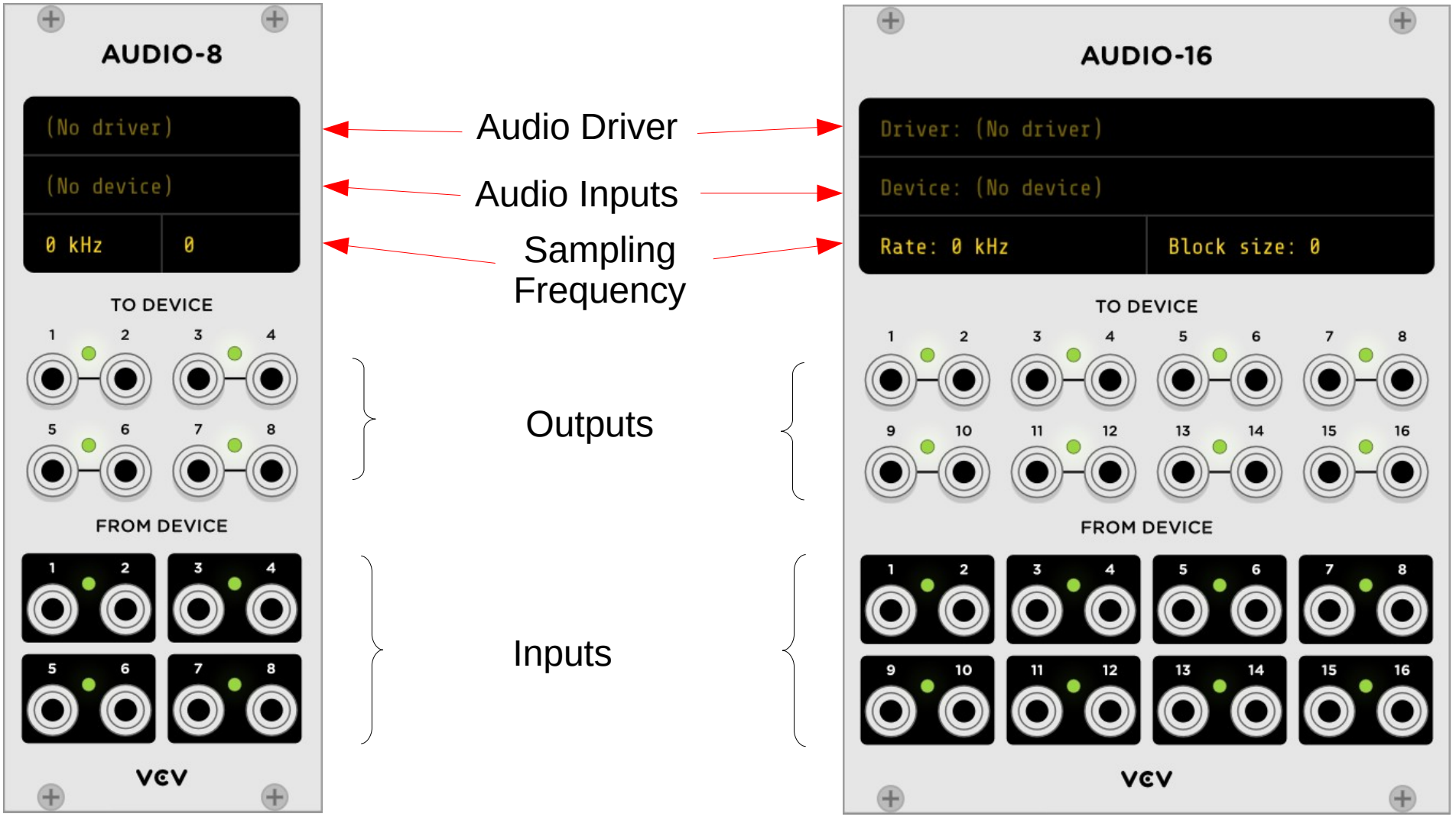


The Core Plugins

https://vcvrack.com/manual/Core



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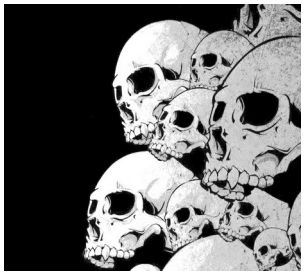
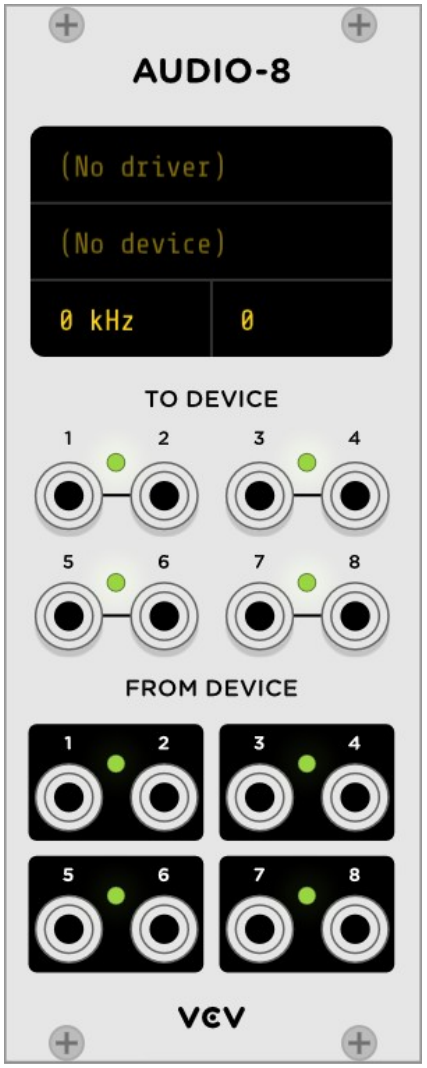
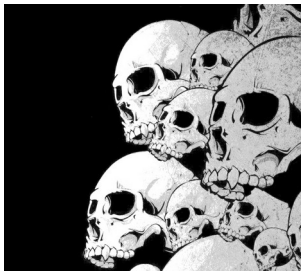


The Core Plugins

https://vcvrack.com/manual/Core



Scarlett 4i4



The Core Plugins

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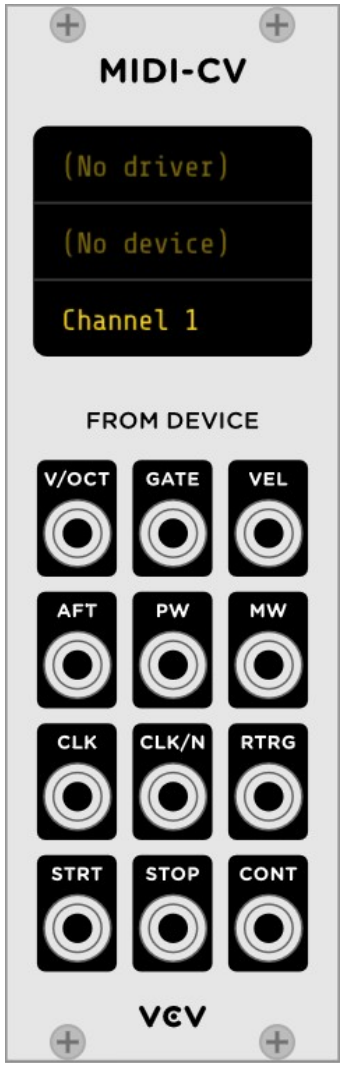

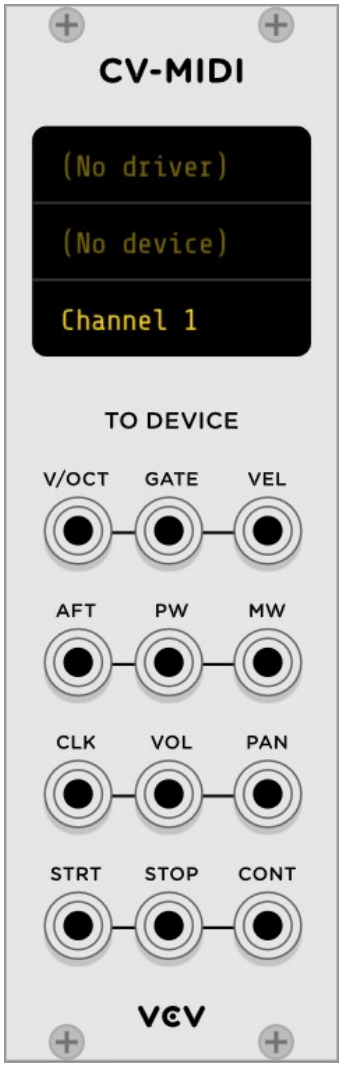

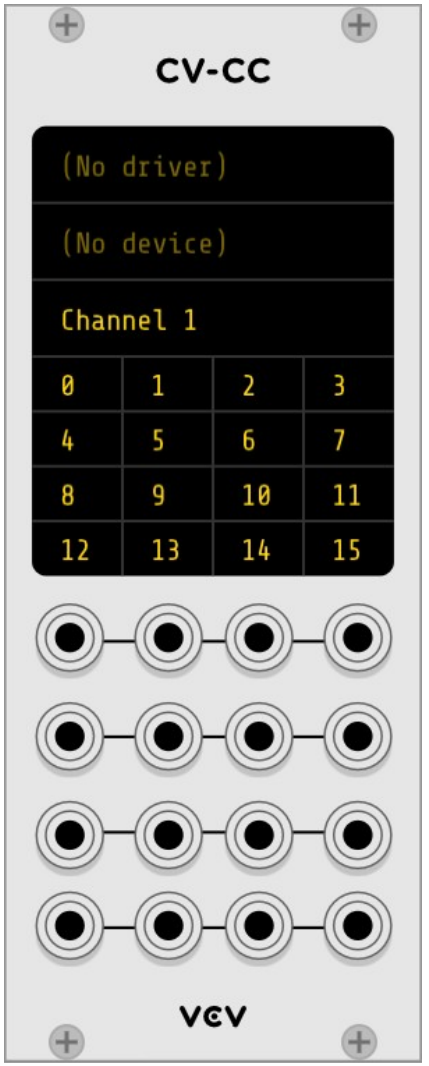

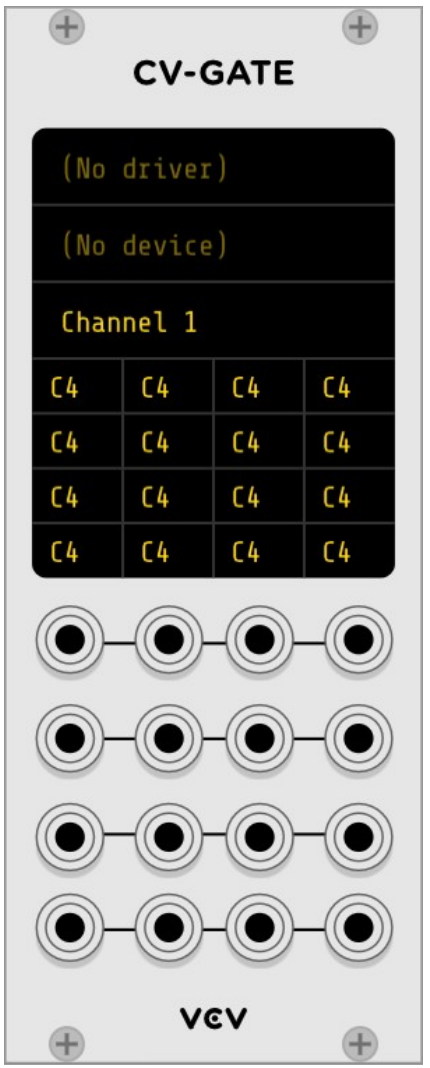

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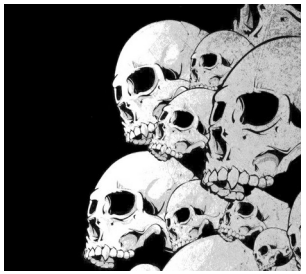

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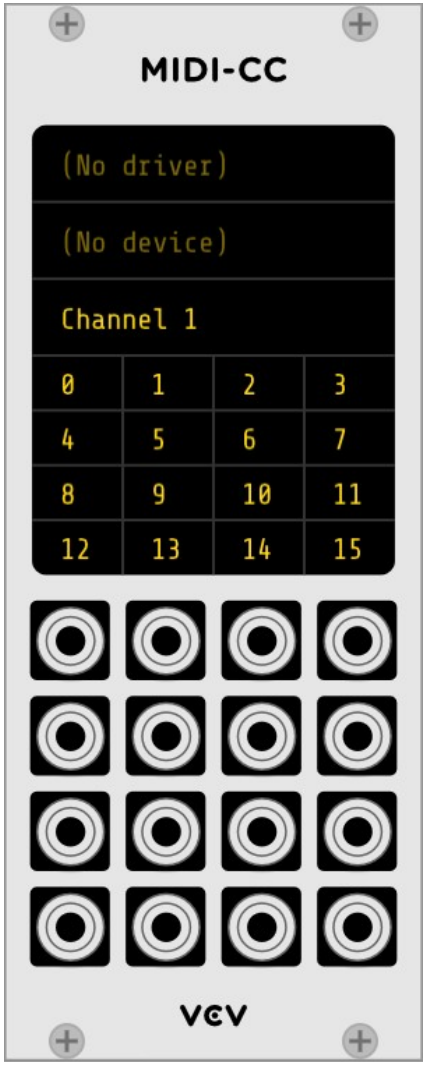

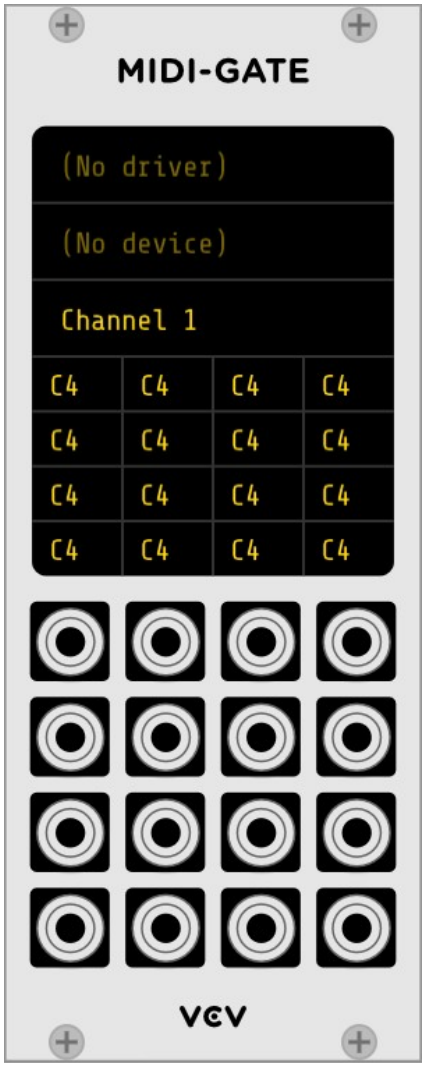

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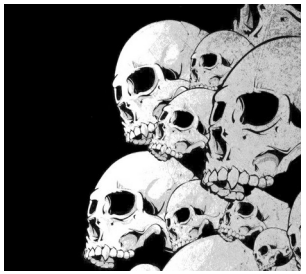


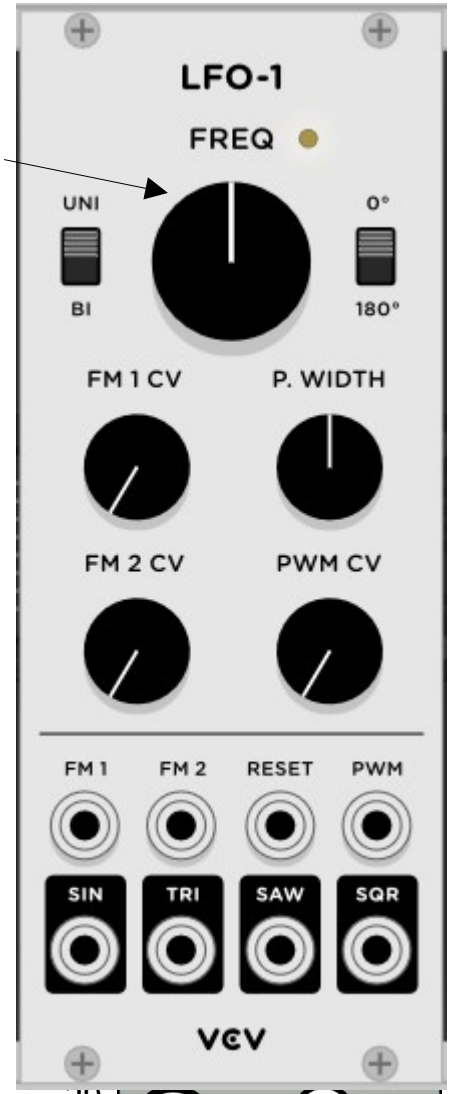
Control via MIDI

Click on one empty space

Rotate the knob

Rotage the knob in the module

And now the real knob is connected to the VCV Rack knob



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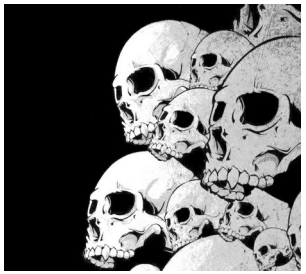

Cardinal

Cardinal is a monolithic version of VCV Rack. Not with all the modules, but as a standalone application and as VST3 / CLAP plugins

You can try it live :
https://cardinal.kx.studio/live

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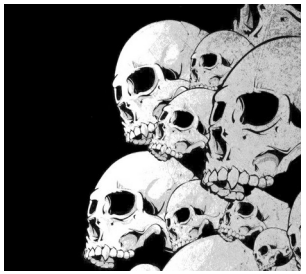

Webbography

VCV Rack : https://vcvrack.com/

Forum : https://community.vcvrack.com/

Omri Cohen : https://www.youtube.com/channel/UCuWKHSHTHMV_nVSeNH4gYAg

Fedoramagazine article : https://fedoramagazine.org/vcv-rack-modular-synthesizers/

Eurorack :
- FR : https://fr.wikipedia.org/wiki/Eurorack
- EN : https://en.wikipedia.org/wiki/Eurorack

Mutable Instruments :
- https://mutable-instruments.net/

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