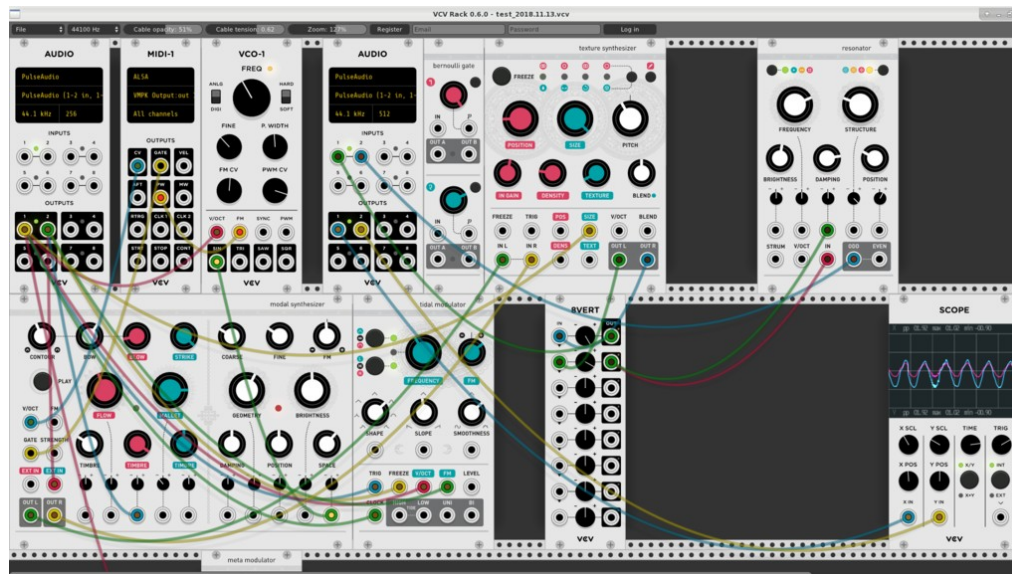


VCVRack

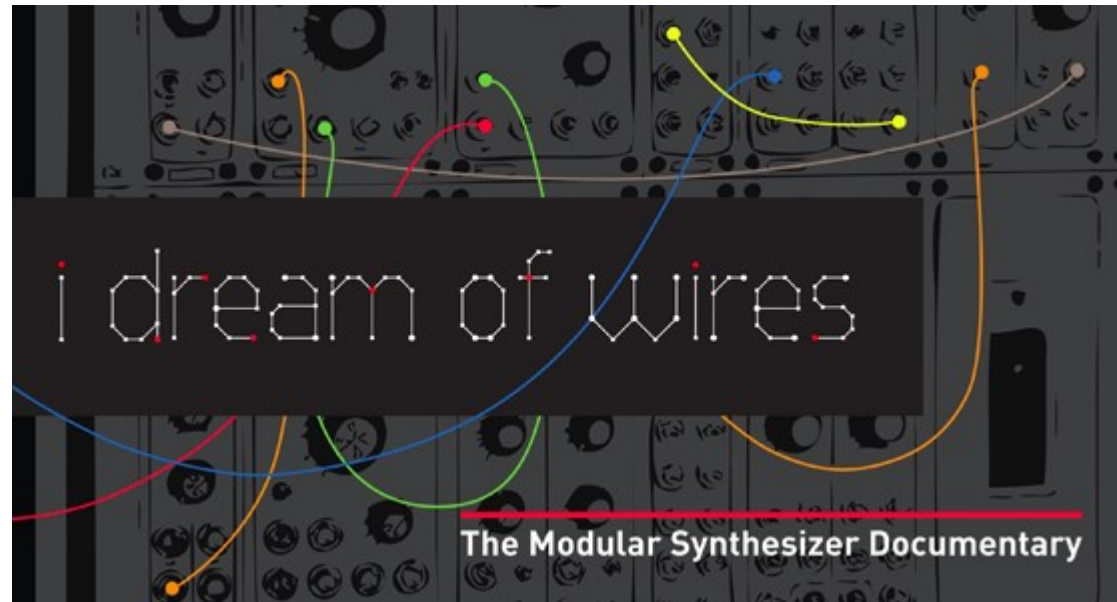


Y. Collette (ycollette.nospam@free.fr)
<http://ycollette.free.fr>



Modular Synthesis

<http://www.idreamofwires.org/>



A documentary on modular synthesis.

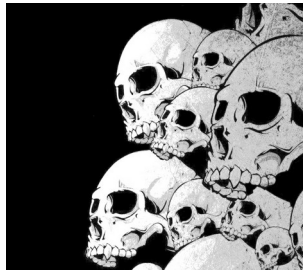


Modular Synthesis

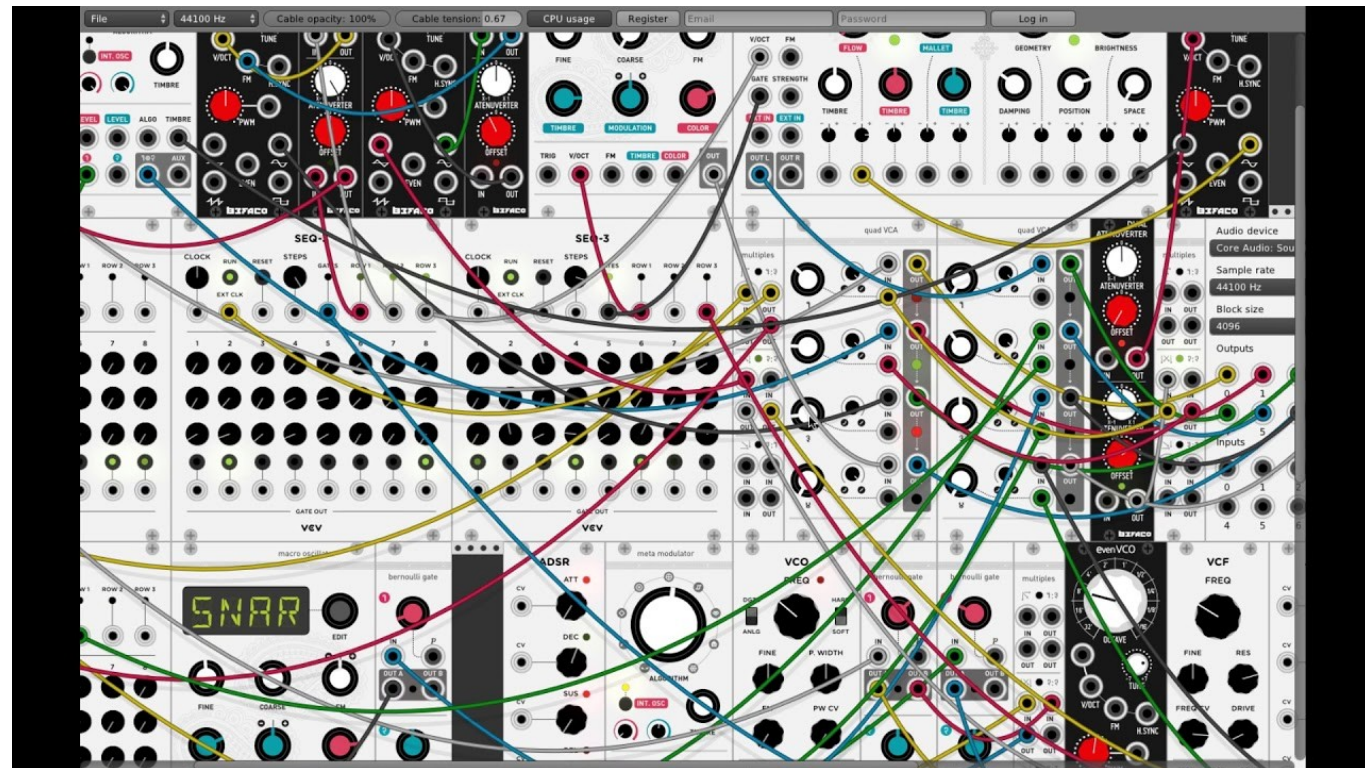
<https://sisterswithtransistors.com/>



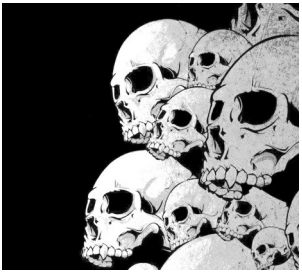
A documentary on the female pioneers of modular synthesis.



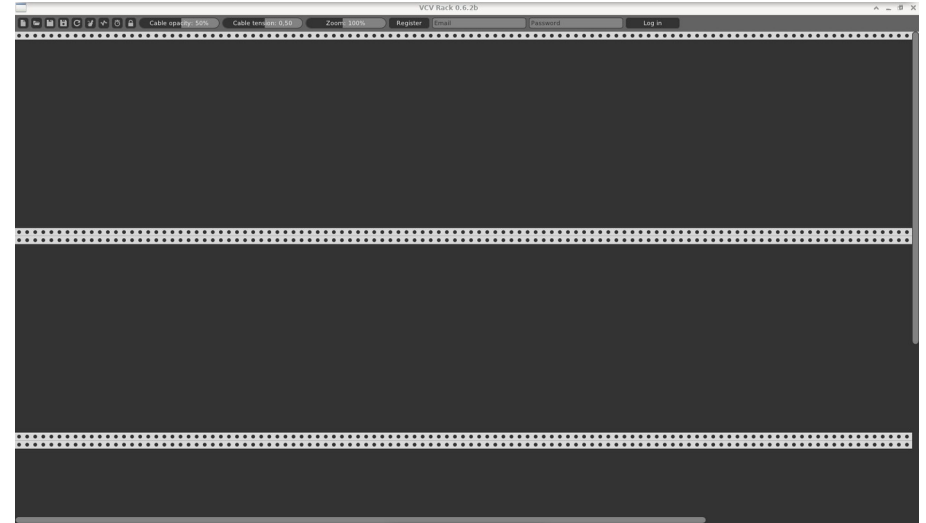
VCVRack



<https://vcvrack.com/>



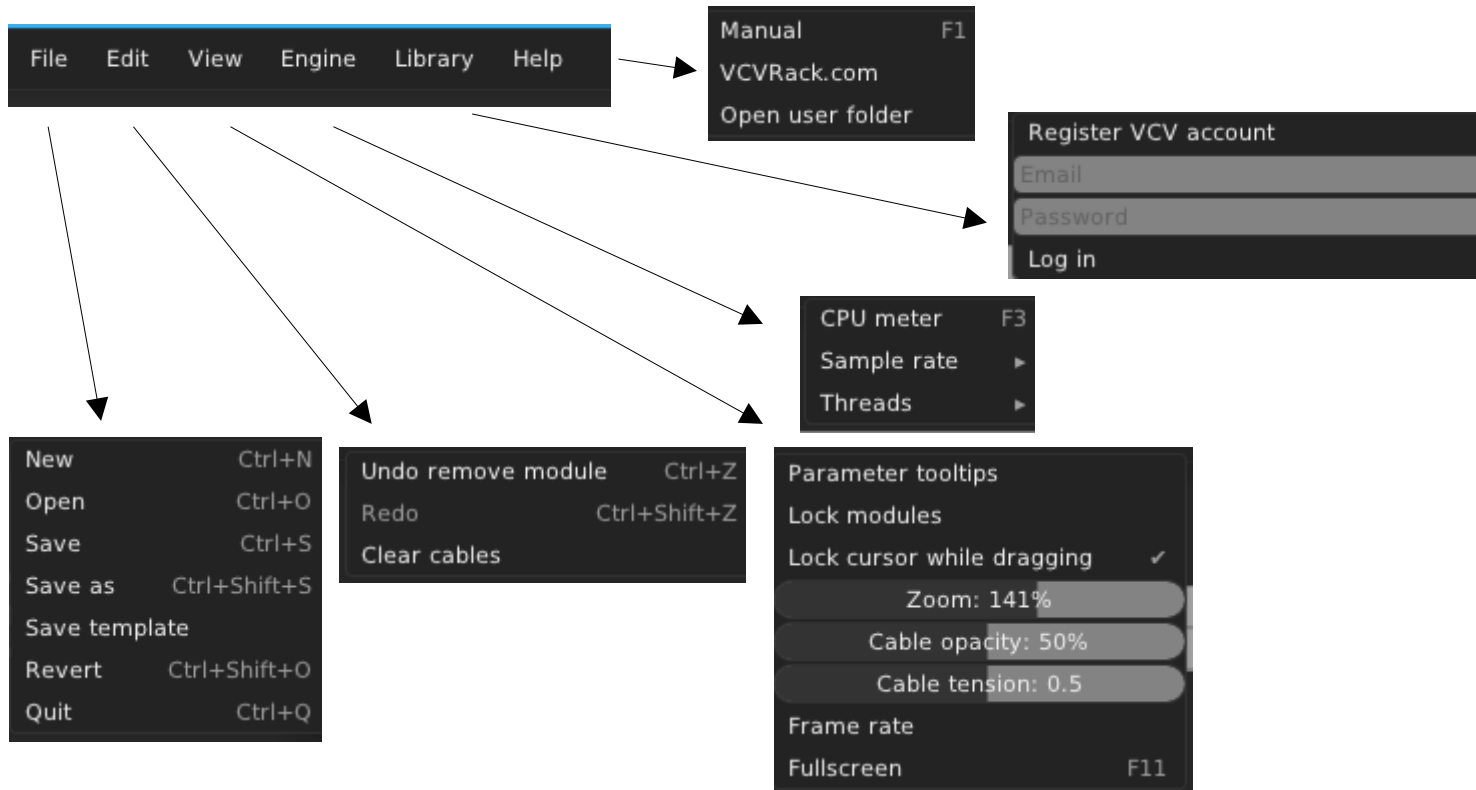
The starting Window



\$ Rack &



Menu bar

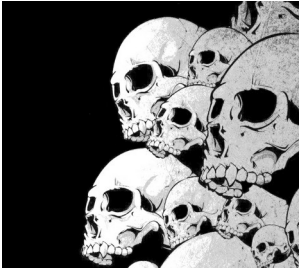




Before we start

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>



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 performed and once this is done, you will have to restart VCV Rack.

On Linux / Fedora :

```
$ 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 &.



Fundamental Modules





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 ...





VCV Rack Control Voltage / Gate / Trigger

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

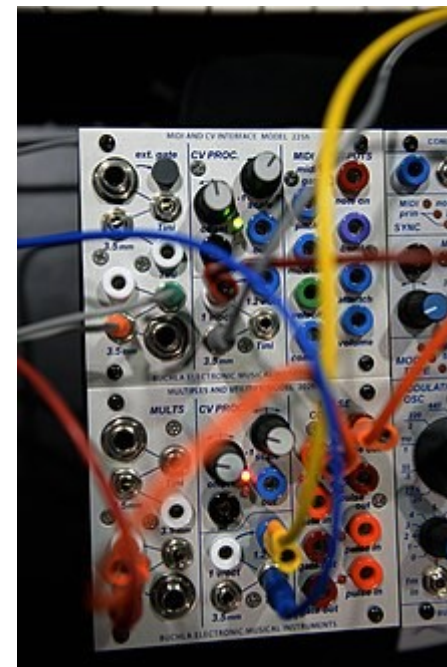
The **CV** (in octave per volt), which Robert Moog invented, is used by the majority of modular synth manufacturer, and also by the EuroRack norm.

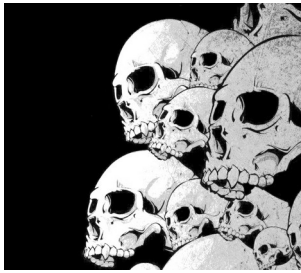
To go to the next octave, you just have to add one volt (this will multiply by 2 the frequency), and subtract one volt to go to the lowest octave (this will divide the frequency by 2).

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

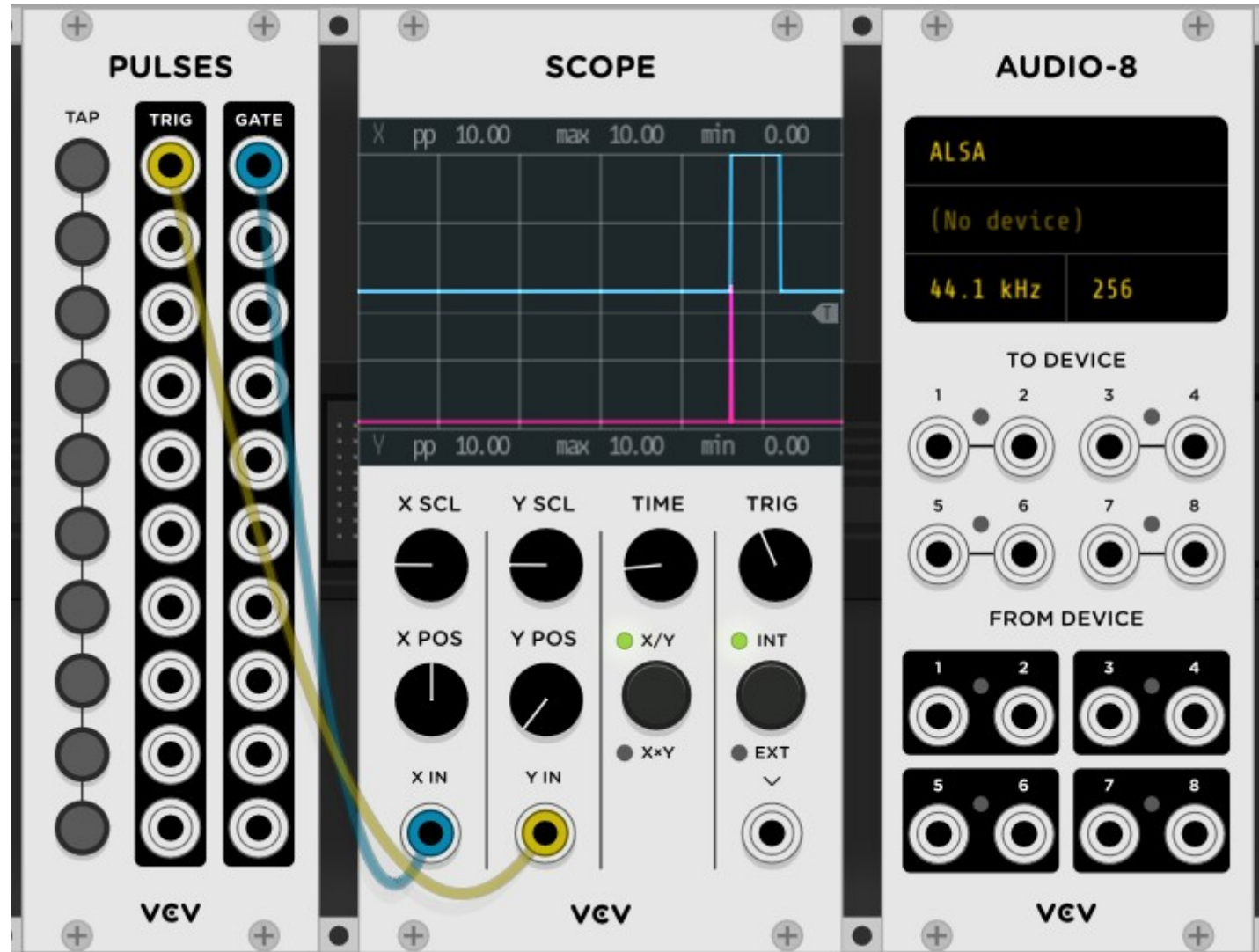
The **TRIGGER** signal is a pulse notifying the switching on / off of an action.

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

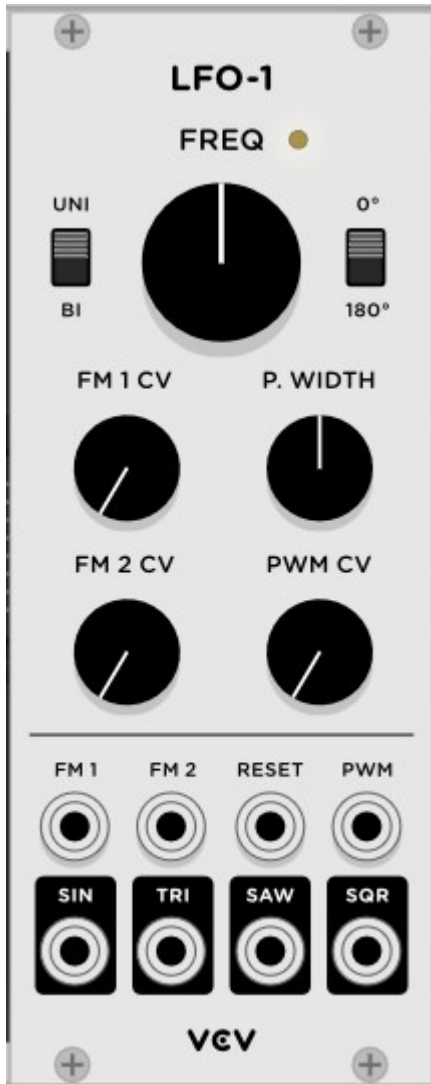




Gate / Trigger

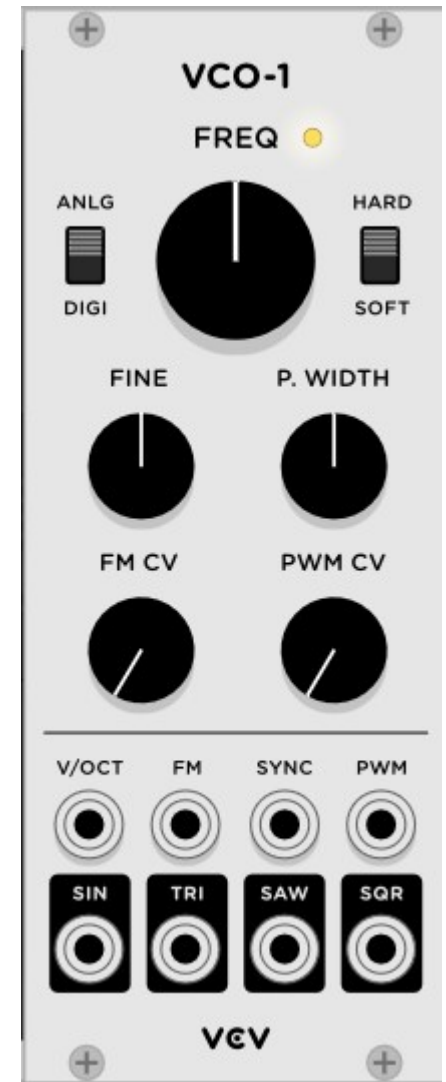


VCO / LFO



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.





A Simple Example



Fundamental
LFO1

Fundamental
VCO1

Core
Audio

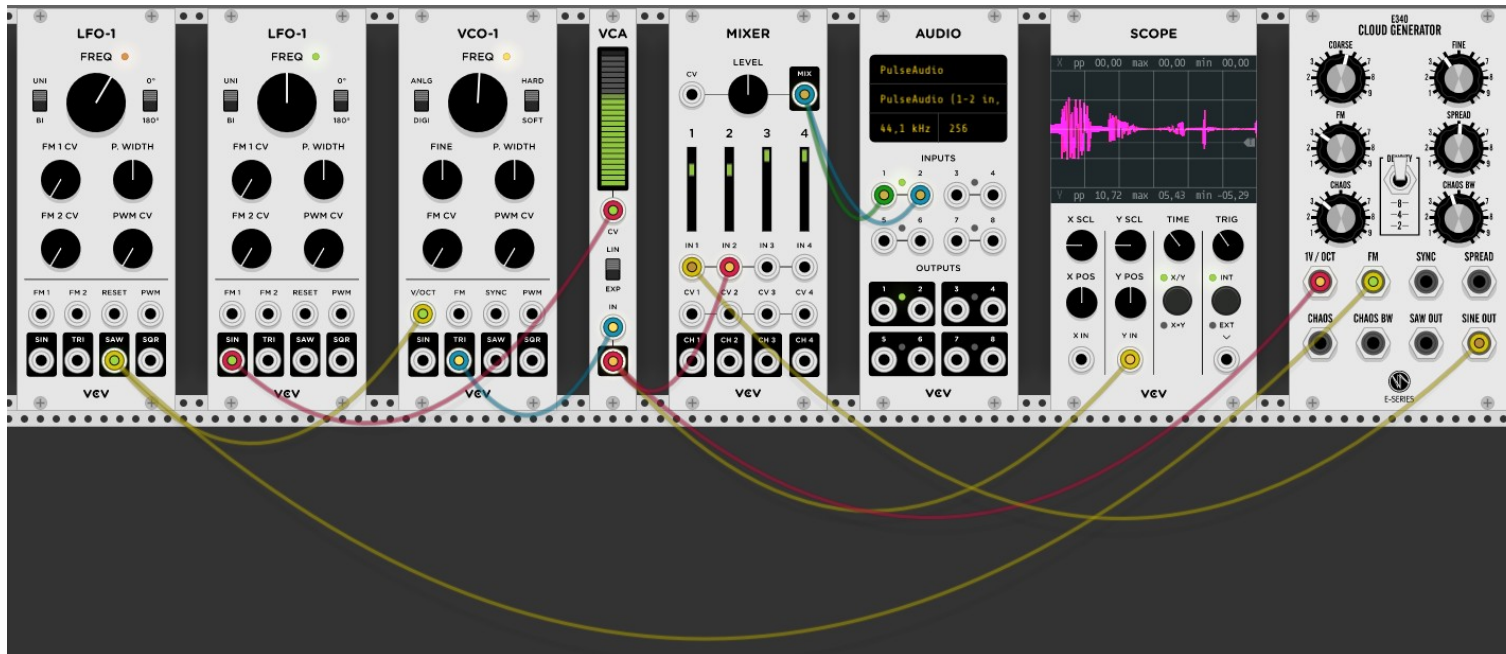
Fundamental
LFO1

Fundamental
VCA1

Fundamental
Scope



An Example with the Cloud Generator



Fundamental
LFO1

Fundamental
VCO1

Fundamental
Mixer

Fundamental
Scope

Fundamental
LFO1

Fundamental
VCA1

Core
Audio

Befaco
Cloud Generator



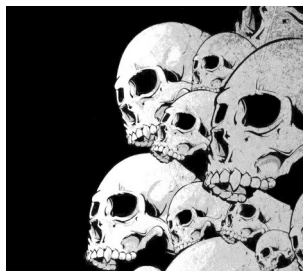
VCO / LFO Example

You can use an attenuverter

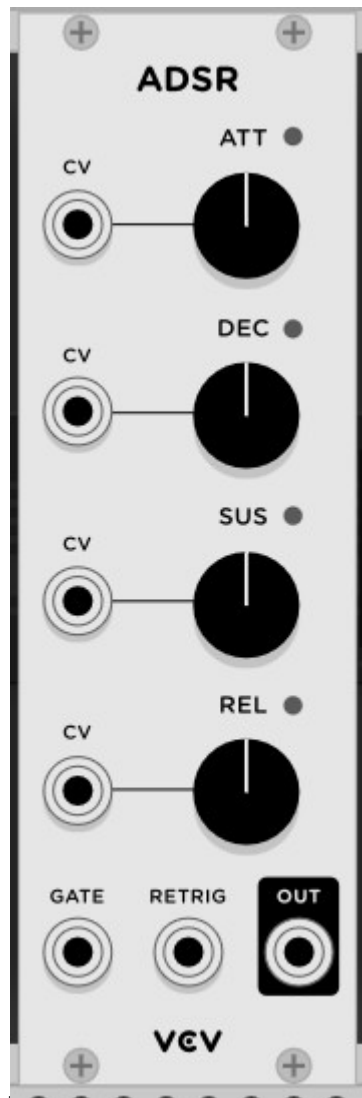
Attenuator

Audio-8
Input / Output



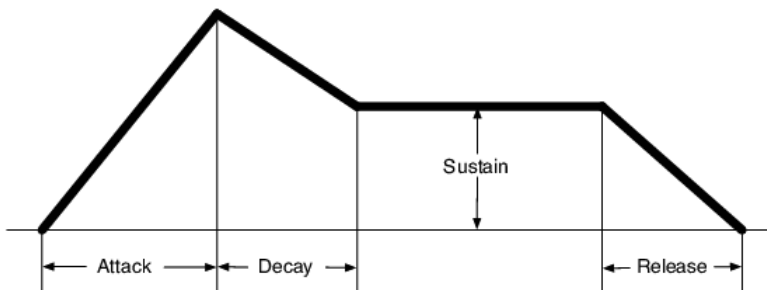


ADSR / VCA



ADSR :

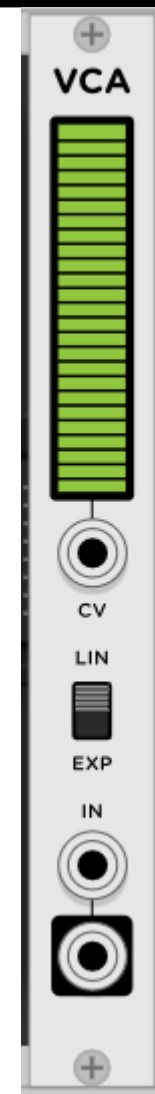
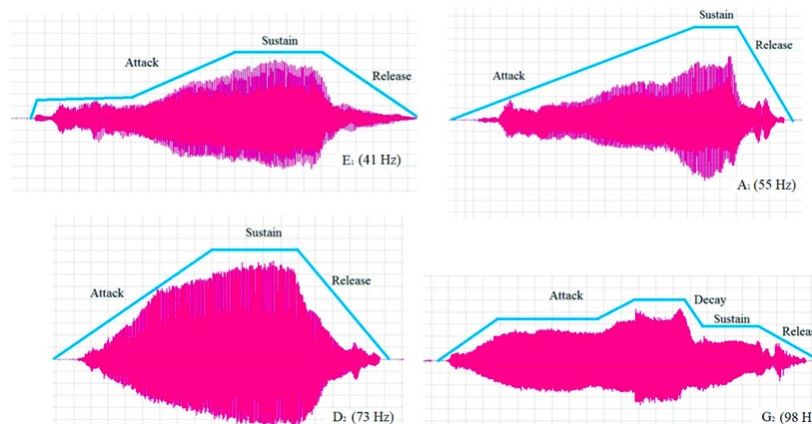
Attack
Decay
Sustain
Release

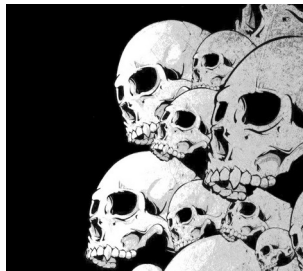


Produces a signal which will be used to control the amplitude of a sound

VCA : Voltage Control Amplifier

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





ADSR / VCA Example

Pulses generator

This button will trigger the sound modulated by the envelope



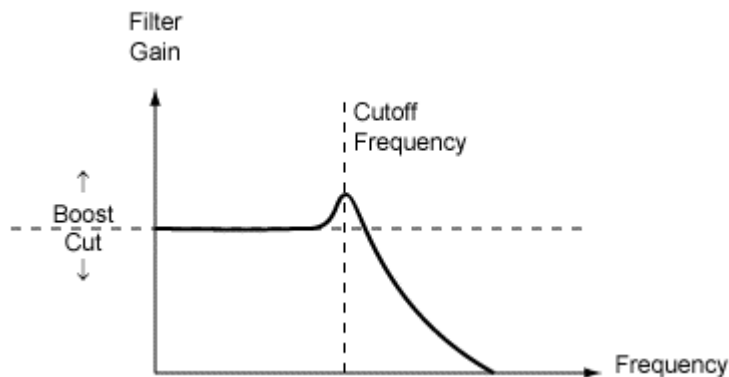
VCF Example

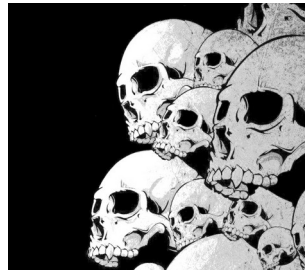
VCF : Voltage Control Frequency

A filter (low pass or high pass) controlled 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





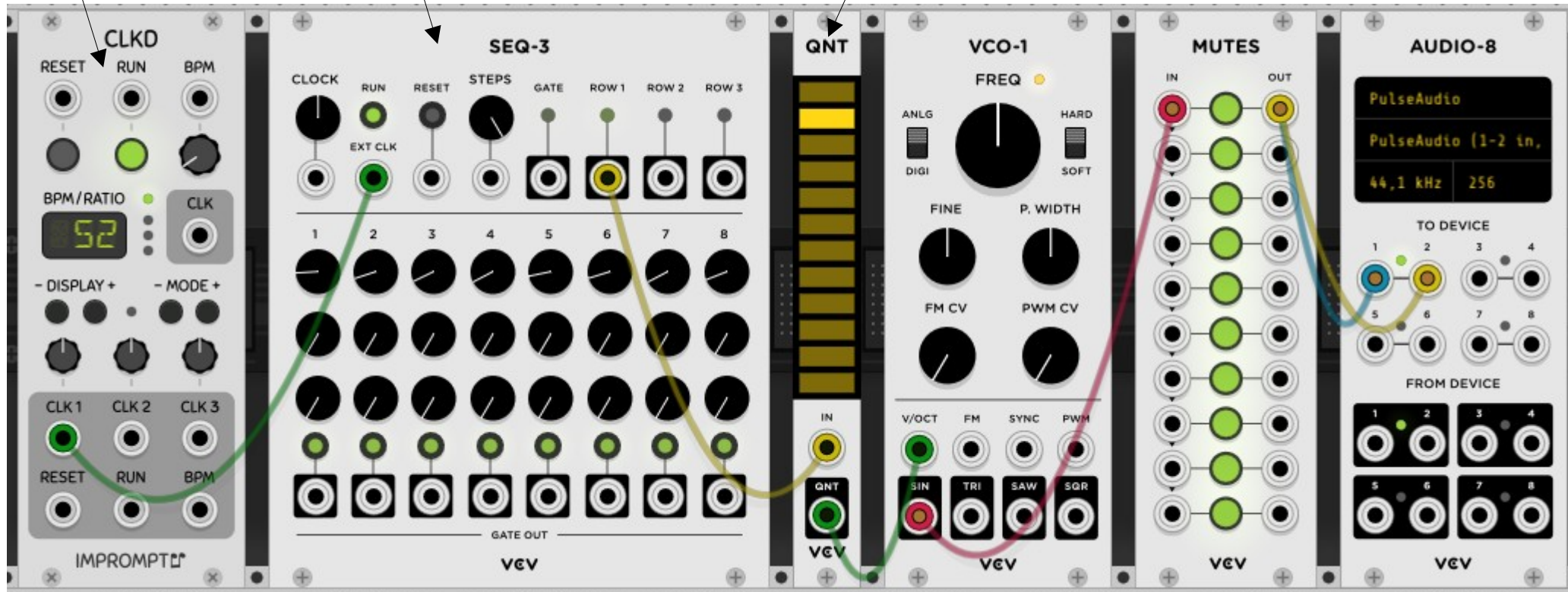
Sequencer Example

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





Drum Sequencer

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

Mixer and Reverb from AS

Clock from Impromptu





Drum Sequencer 2



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



Playing with randomness

Macro oscillator and Bernoulli gate from Audible Instruments

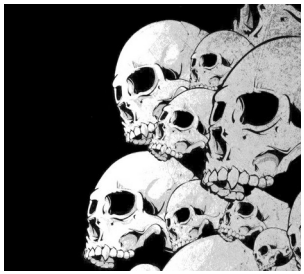
Clock from Impromptu

Bass drum from SV Modular

Mixer from AS

All the other modules from Fundamental





Some melodies ?

A random generator from
Squinky labs

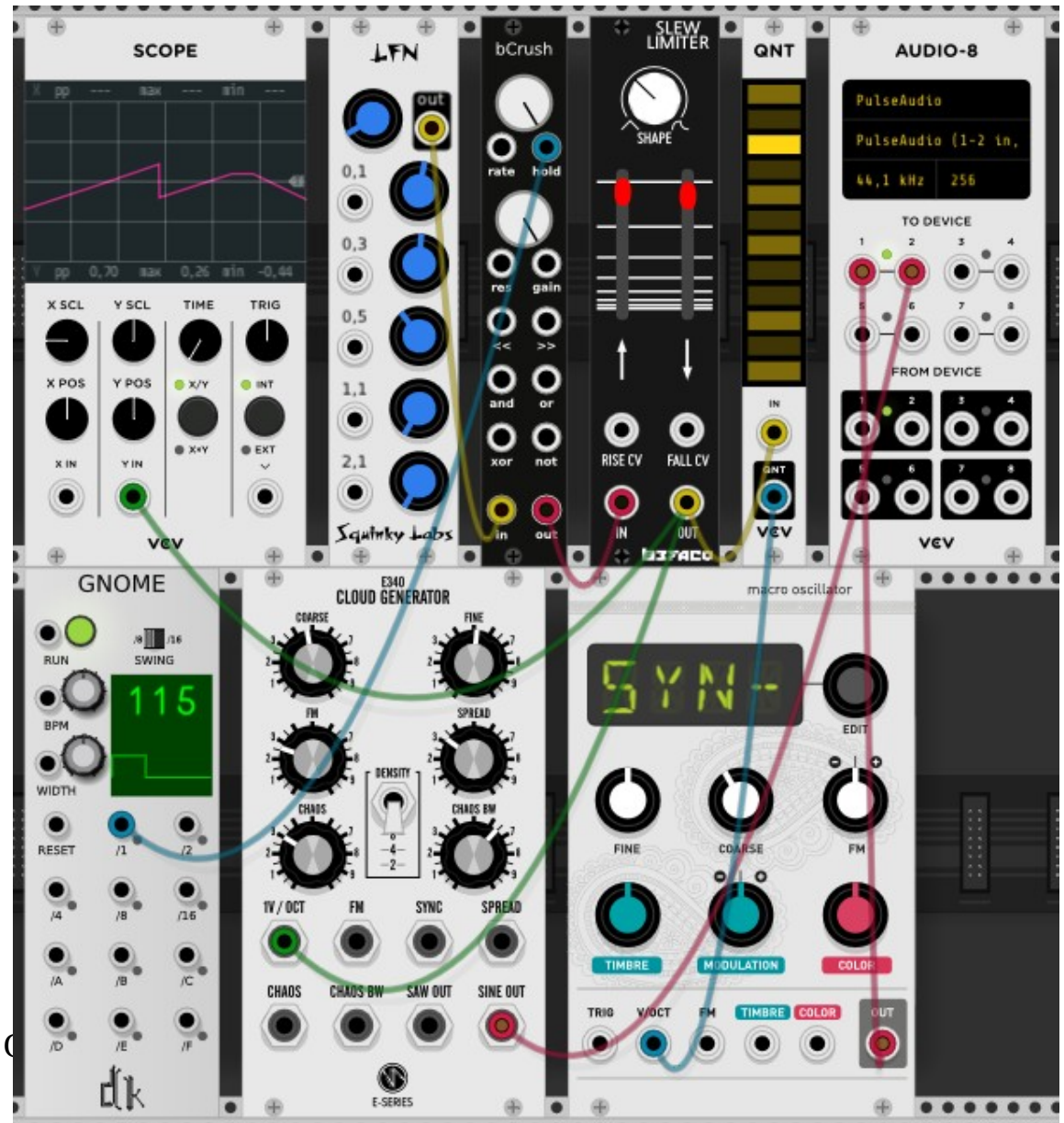
bCrush from aridacity

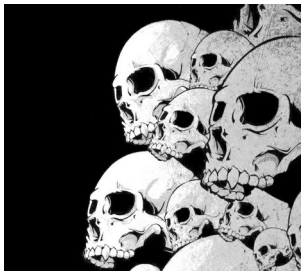
Slew Limiter from Befaco

Cloud Generators from Eseries

Clock from SV Modular

Macro oscillator from Audible
Instruments





Chords progression

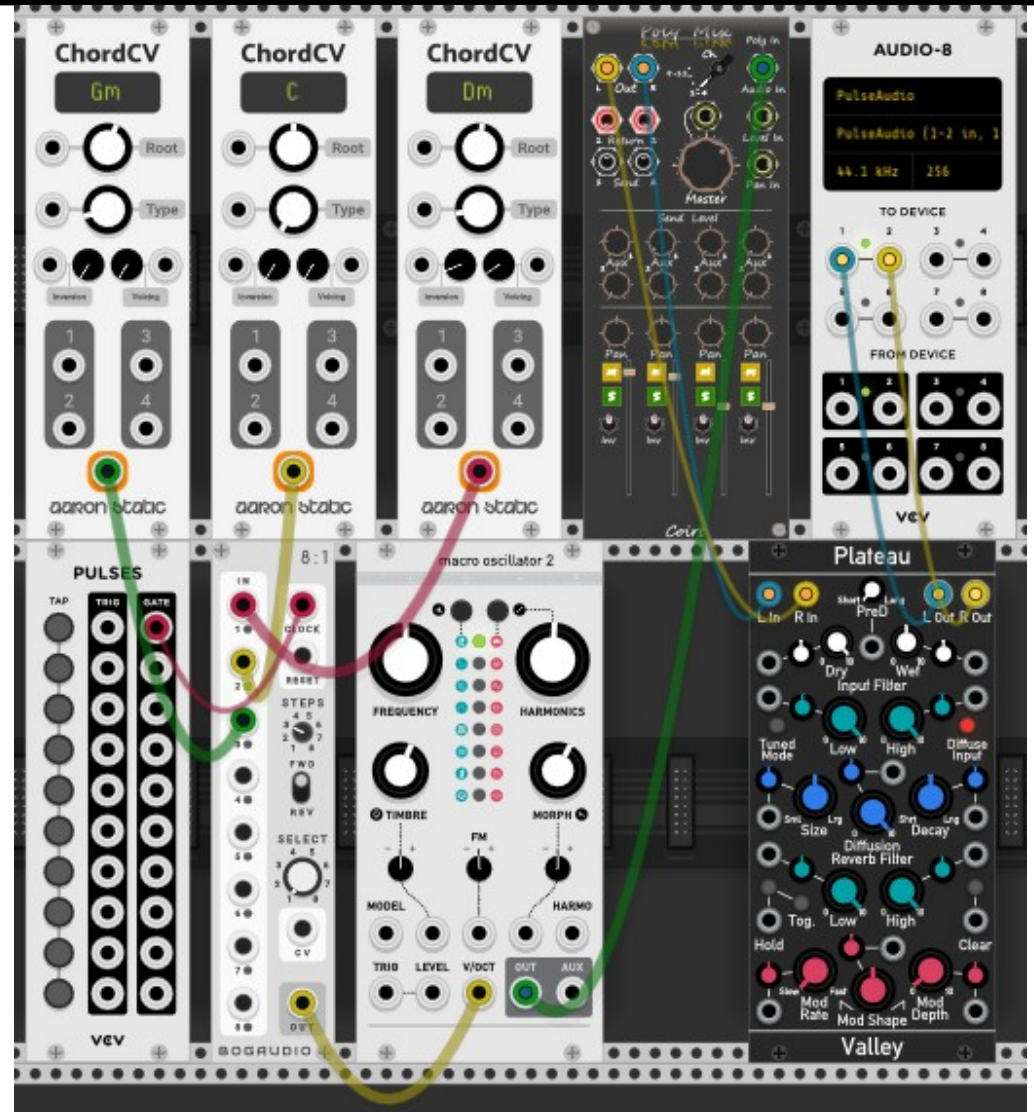
ChordCV from Aaron Static

8 to 1 from BogAudio

Macro Oscillator 2 from Audible Instruments

Plateau from Valley

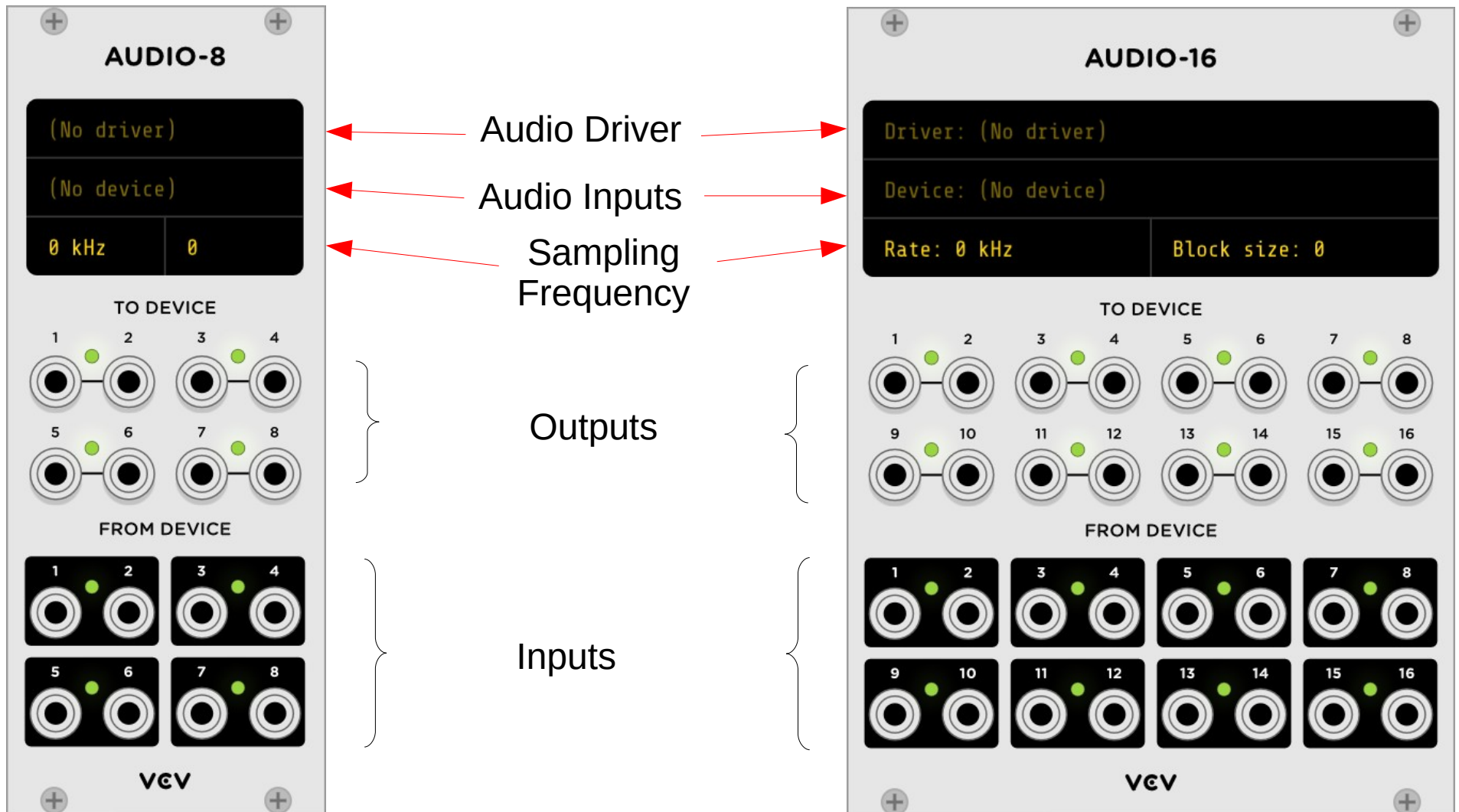
Coirt from Bark (Poly to stereo mixer)





The Core Plugins

<https://vcvrack.com/manual/Core>

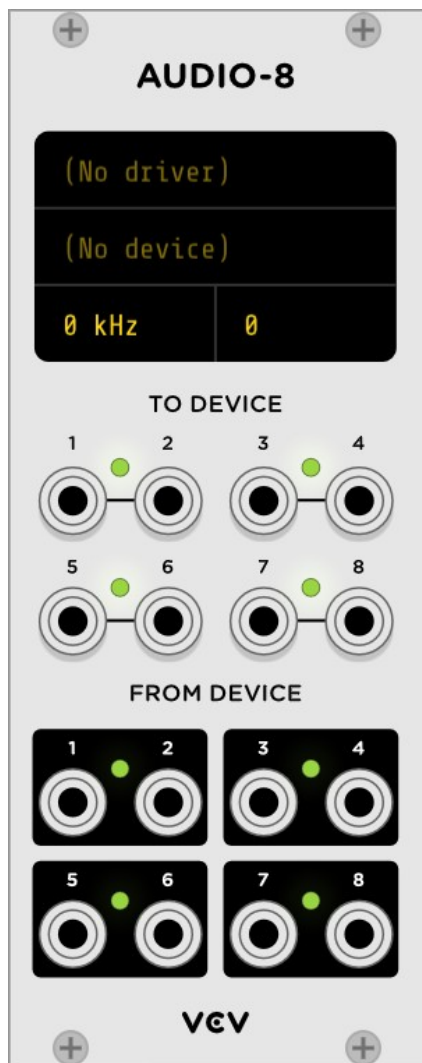


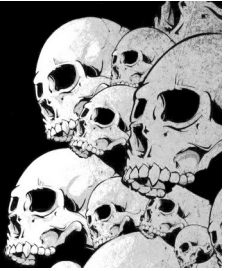


The Core Plugins

<https://vcvrack.com/manual/Core>

Scarlett 4i4





The Core Plugins

<https://vcvrack.com/manual/Core>

MIDI-CV

(No driver)
(No device)
Channel 1

FROM DEVICE

V/OCT	GATE	VEL
AFT	PW	MW
CLK	CLK/N	RTRG
STRT	STOP	CONT

VCV

CV-MIDI

(No driver)
(No device)
Channel 1

TO DEVICE

V/OCT	GATE	VEL
AFT	PW	MW
CLK	VOL	PAN
STRT	STOP	CONT

VCV

CV-CC

(No driver)
(No device)
Channel 1

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

VCV

CV-GATE

(No driver)
(No device)
Channel 1

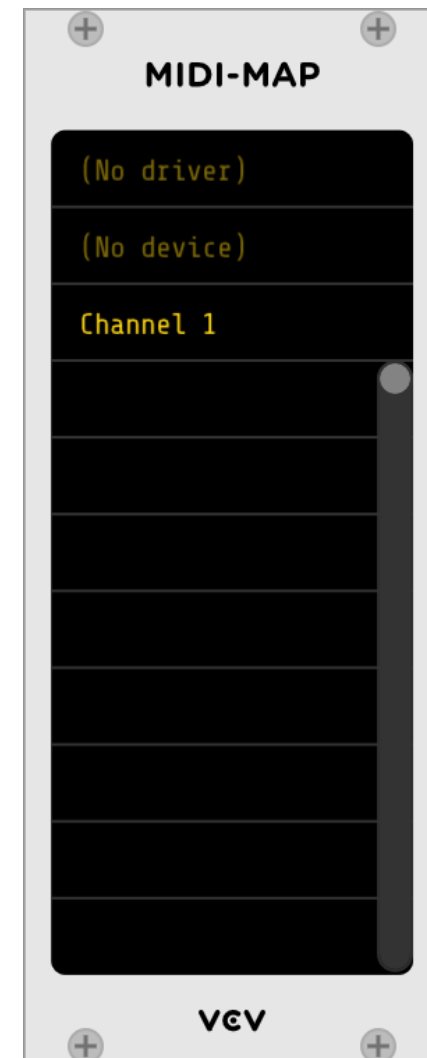
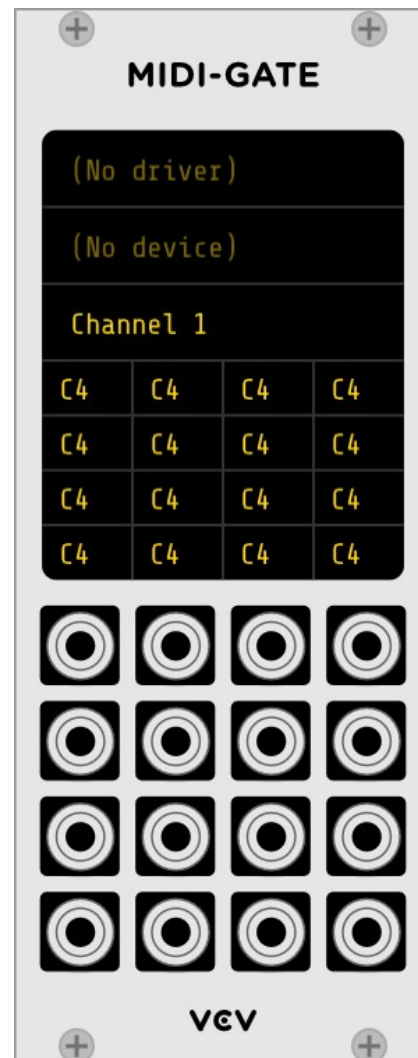
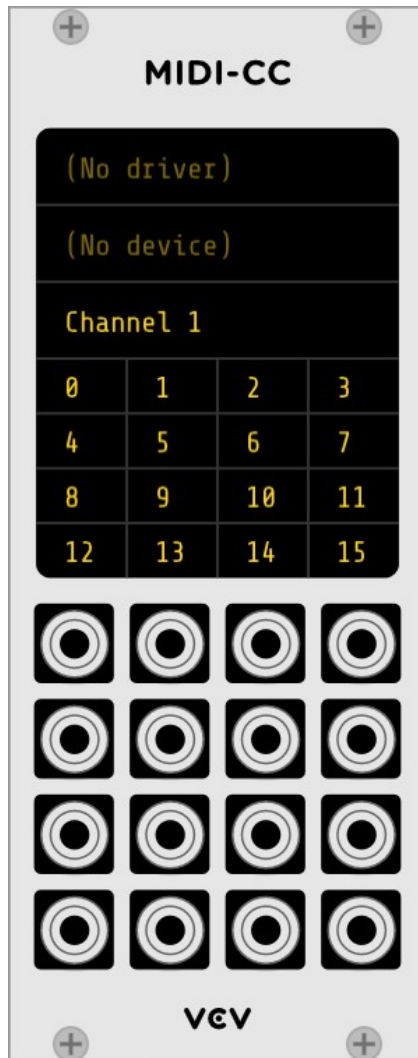
C4	C4	C4	C4
C4	C4	C4	C4
C4	C4	C4	C4
C4	C4	C4	C4

VCV



The Core Plugins

<https://vcvrack.com/manual/Core>





Control via MIDI

Click on one empty space

Rotate the knob



MIDI-MAP

(No driver)

(No device)

Channel 1

VCV

Rotate the knob in the module

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

LFO-1

FREQ

UNI



BI

0°

180°

FM 1 CV

P. WIDTH



FM 2 CV

PWM CV



FM 1

FM 2

RESET

PWM



SIN

TRI

SAW

SQR



VCV





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/>