

# GEODESICS

A modular collection for VCV rack by Pyer & Marc Boulé



What's new? – version 1.1.0

# **T O T H E R E A D E R**

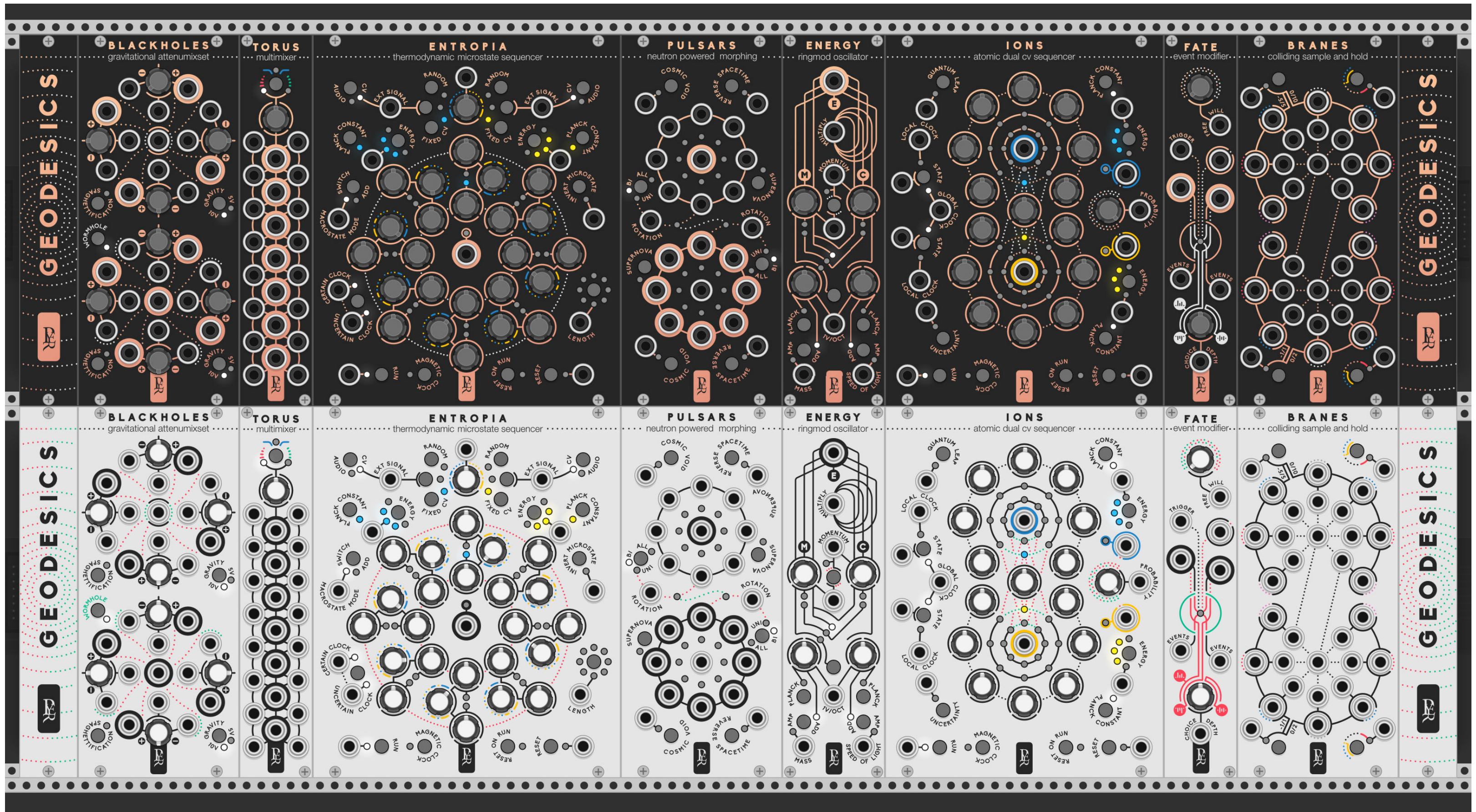
Notes on who is concerned...

This file is only intended to anyone who already read the manual of the previous version. It gathers all the changes that you need to know.

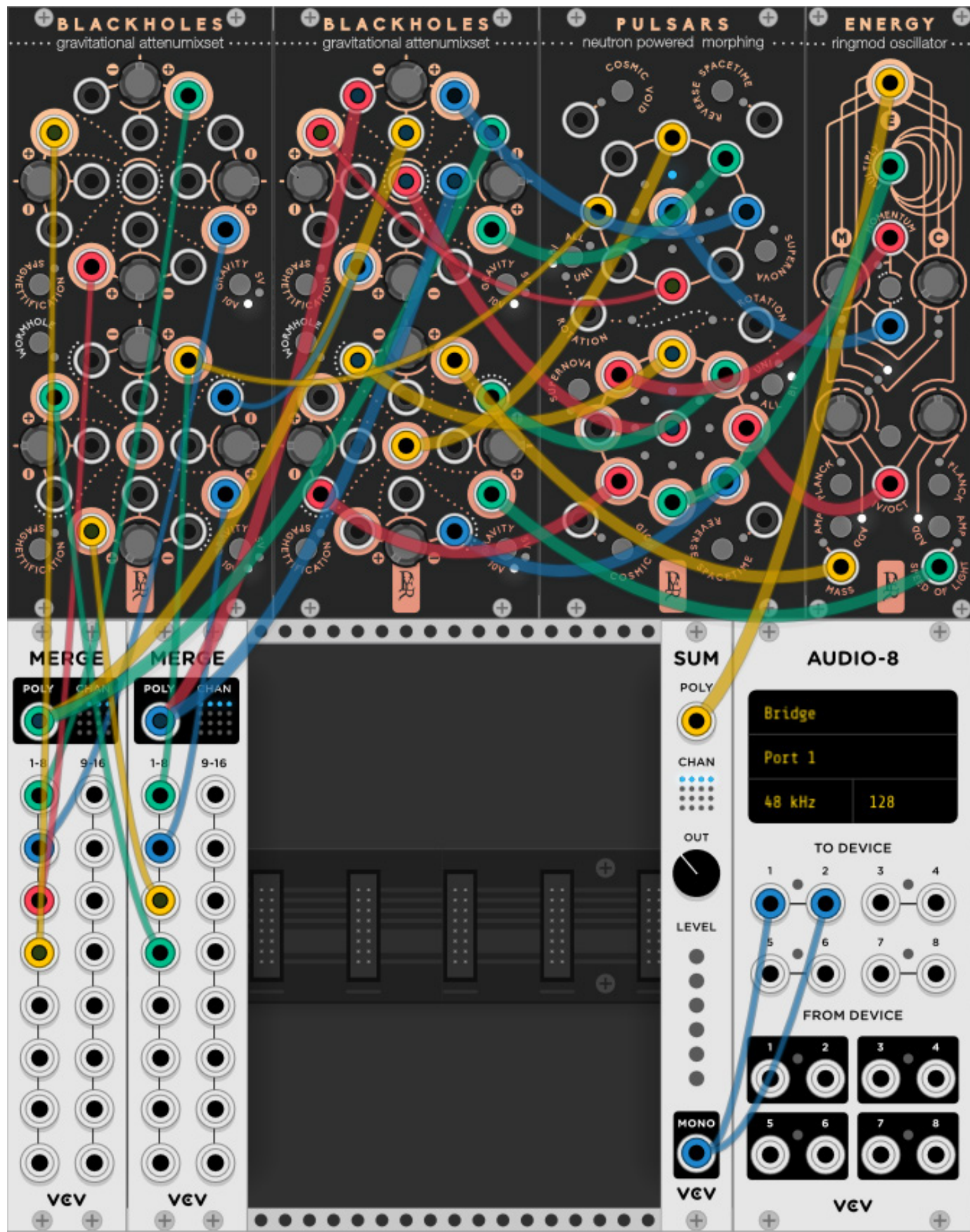
There is no point to read this if you are a new user, or if you haven't read the manual of the previous version. You would be then encouraged to read the complete manual of the current version.

Thanks.





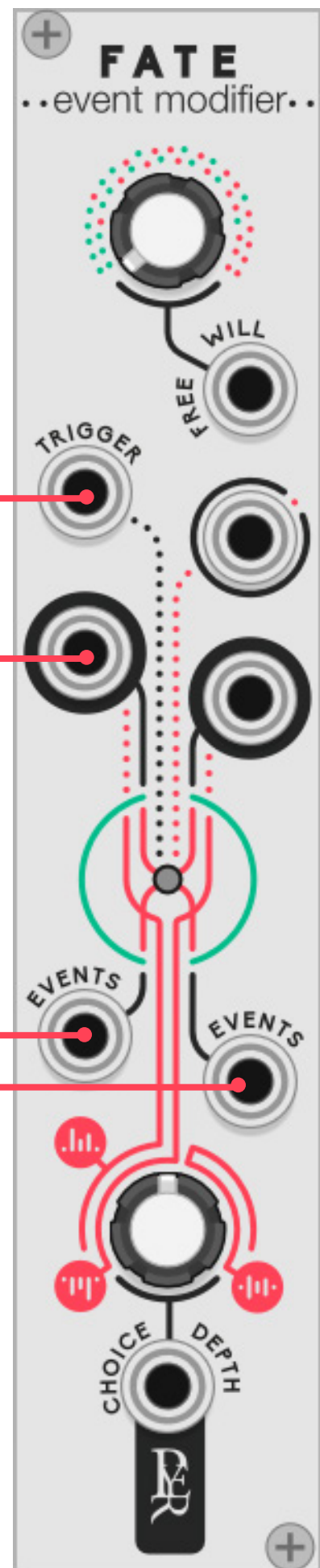
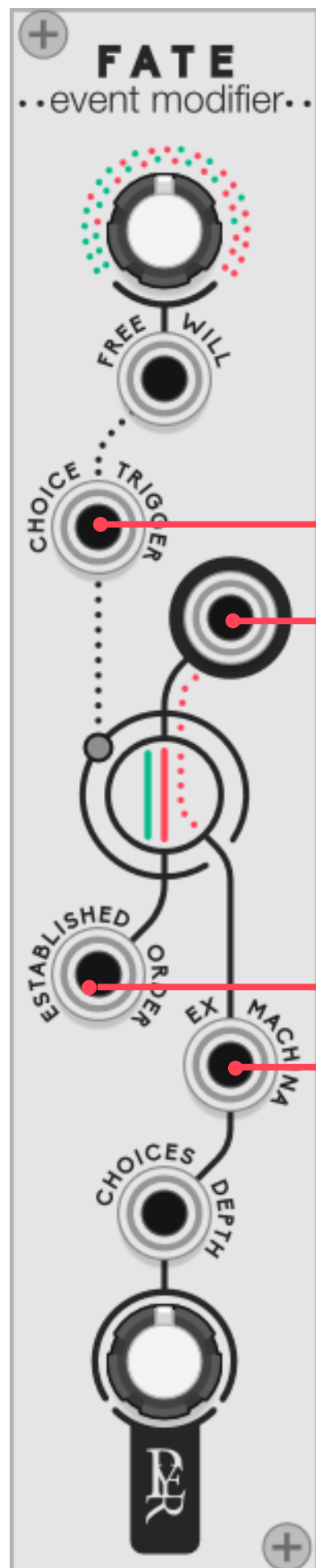




# POLYPHONY

**Energy** is now a 16 voices poly synth with multichannel CV control for each input. Feed the 1/oct input with a poly cable to enjoy polyphony.

**Pulsars** and **BlackHoles** are also polyphonic. You are encouraged to experiment with selfpatching, mono modulation on poly signal, mixing poly and mono signals, ...



Extra gate output. A trigger is emitted each time randomness happens

Extra output with its own flavor of random.

Ex machina is now a second channel of FATE with its own output. It can still be used for signal switch.

The depth knob is now bipolar. CW direction behaves like the former version. CCW outputs positive randomness in left out and negative randomness in right out.

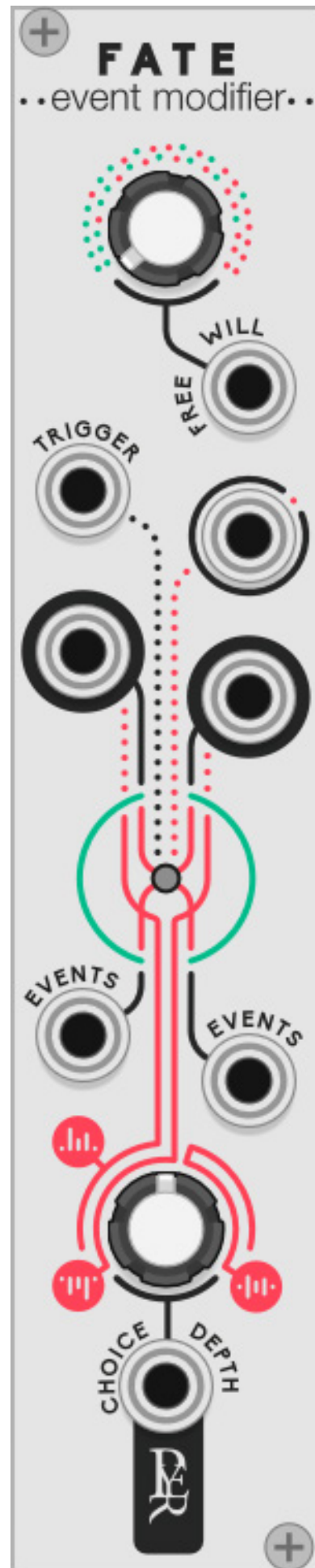
## FATE

Fate has been modified, based on observations of how composers use it, it's now both more powerful and easier to understand.

The old fate has been absorbed inside to avoid patch breaking, it will still perform your previous patch on the exact same way, but it proposes a new way to use random based on a dual uncorrelated generator. The former "ex machina" has its own output now, it's not an auxiliary input anymore but a second channel with its own random values. The two channels are exchanging information. A gate output has been added when random happen.

**The best is to forget everything that you knew about this module, and start fresh by reading the following pages to embrace a new FATE ...**





# FATE

non-deterministic event modifier

Is there such a thing as free will? While scientists and philosophers are debating the question, Geodesics proposes **FATE**, a dual event modifier that will bring any sequencer to life by making its own musical choices.

**FATE** alters any signal by adding a specific amount of randomness at some chosen points, or by switching in with another signal on a probabilistic way. Without any incoming signal, FATE acts as a dual probabilistic random generator and a Bernoulli gate.

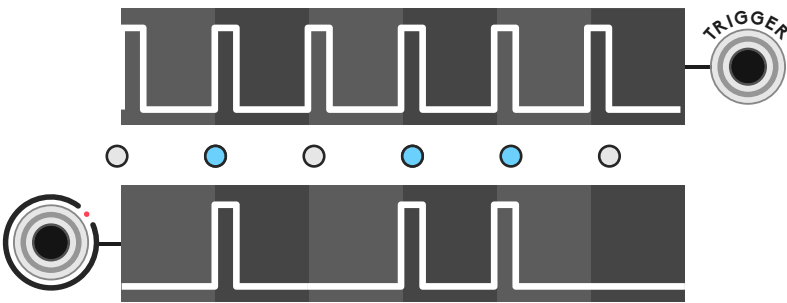
Main Concept

**FATE** is mainly made to alter a CV sequence but it can be used on LFOs, gate sequences, ...

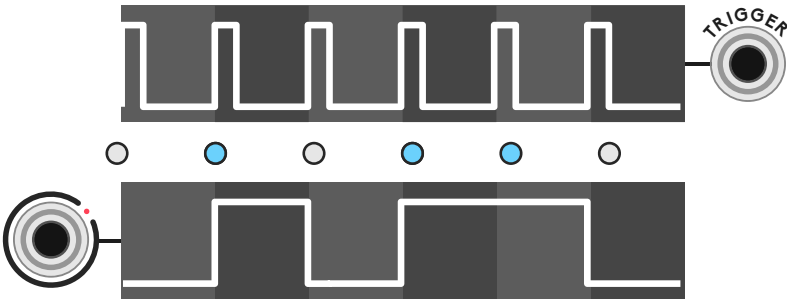
It needs a **trigger input** to make the choice of altering the incoming signal, preferably synced to the incoming signal.

A gate is emitted when the alteration happens. The **gate output** has two modes (right click):

- **Gate:** the original trigger signal passes through when random is active

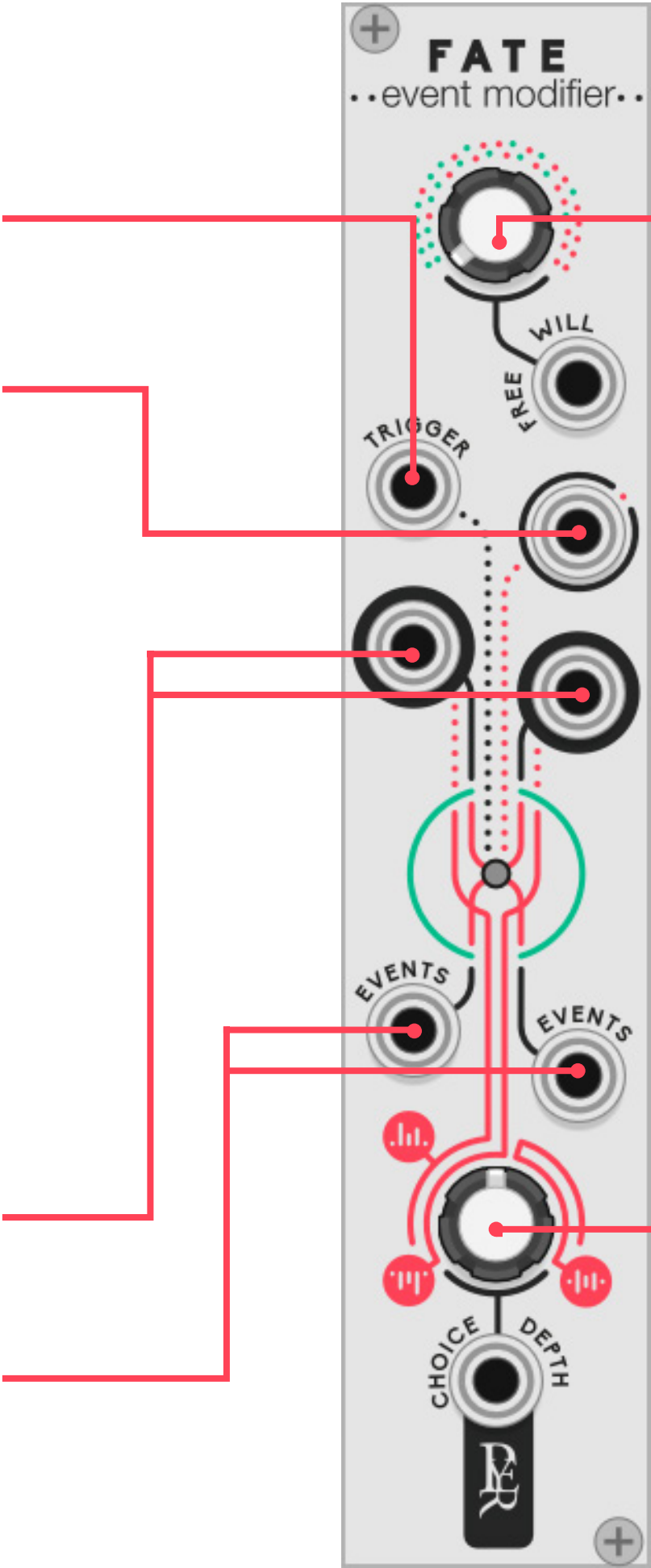


- **Hold trigger:** the gate is open when random is active.



It has two uncorrelated internal random generators, one for each **CV output**. They can be added to the original signal or used on their own.

When a single signal is used (no matter which one), it is normal to both outputs with different flavours of random. When two signals are used at the same time, FATE will switch the two signals together on a probabilistic way.

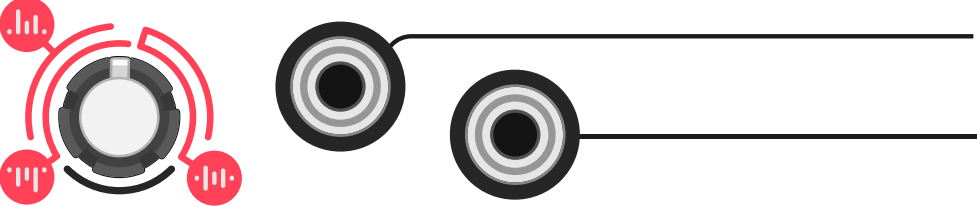


Controlling FATE

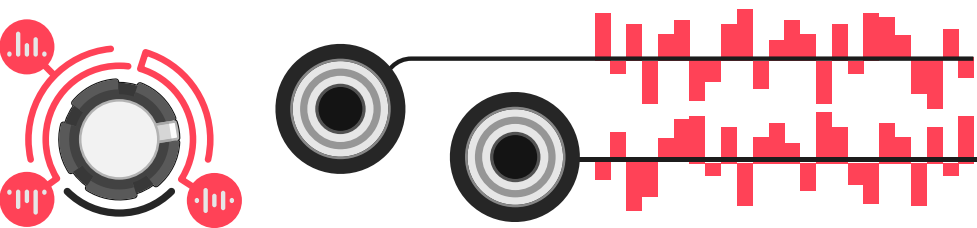
The module has its own will but gives control over two parameters:

- **Free Will** is the probability to alter the source: How often randomness will be added. a non-zero probability will always trigger both generators at the same time, but giving different values of random at each output.
- **Choices depth:** the range of the random values. The knob is bipolar with different behaviour for each side.

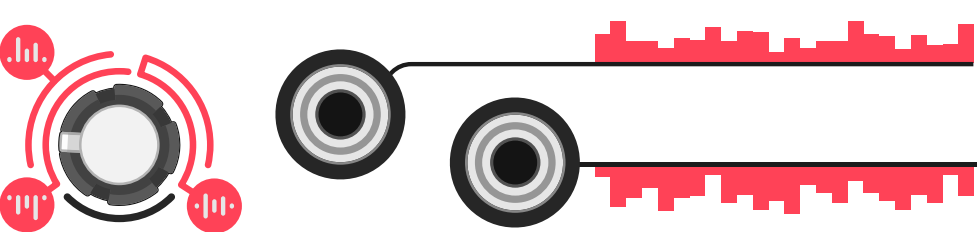
**Zero:** no random is emitted, this is useful as a probabilistic switch for two signals without adding random.



**Clockwise direction:** each output emits bipolar uncorrelated random values with a knob range from zero to -5/+5 volts.



**Counter-clockwise direction:** left output emits random values with a knob range from zero to +5 volts. Right output emits random values with a knob range from zero to -5 volts.



**FATE as a dual random CV generator and Bernoulli gate.**

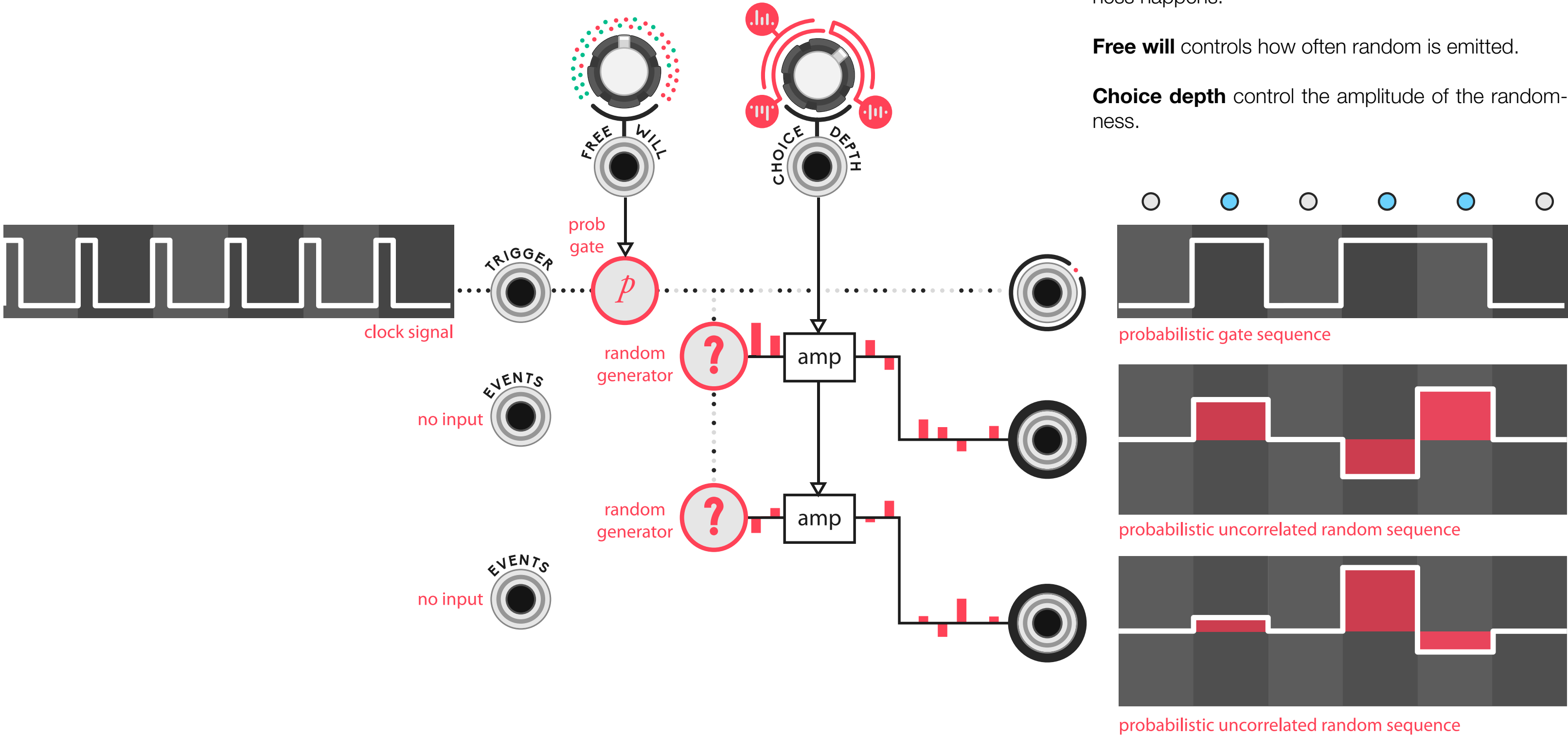
**FATE** only needs a clock to be effective.

The two CV output emits uncorrelated random values.

The gate output emits a gate each time the randomness happens.

**Free will** controls how often random is emitted.

**Choice depth** control the amplitude of the randomness.





**FATE as a one channel event modifier.**

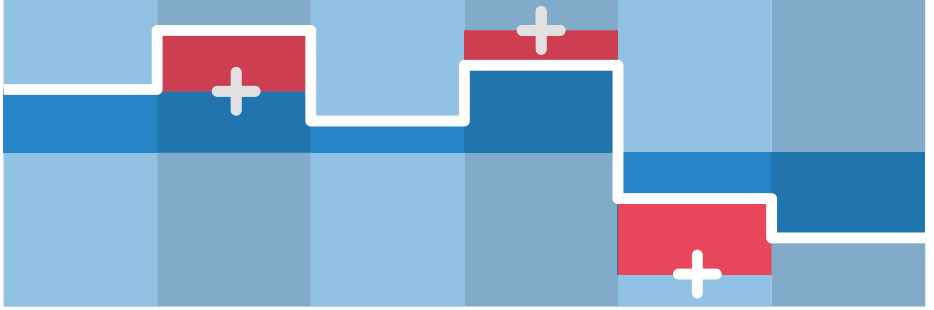
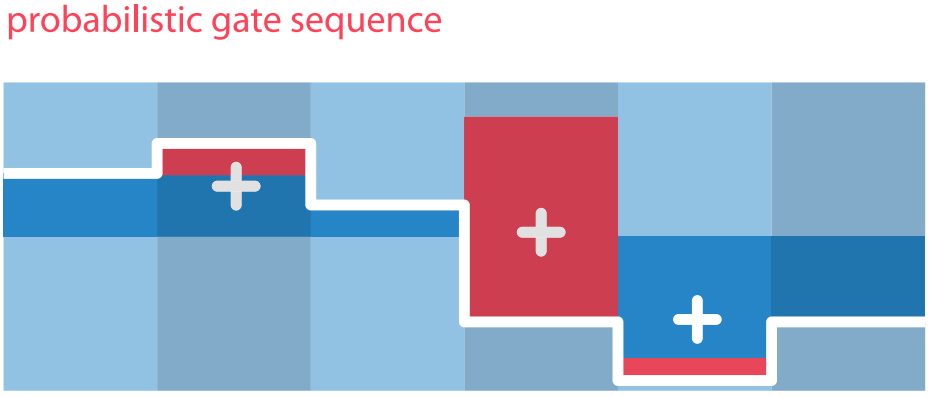
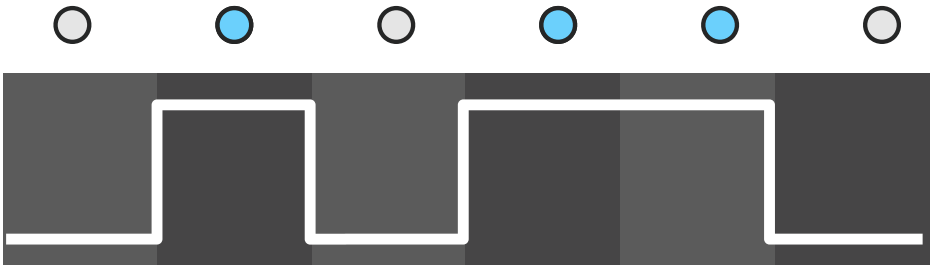
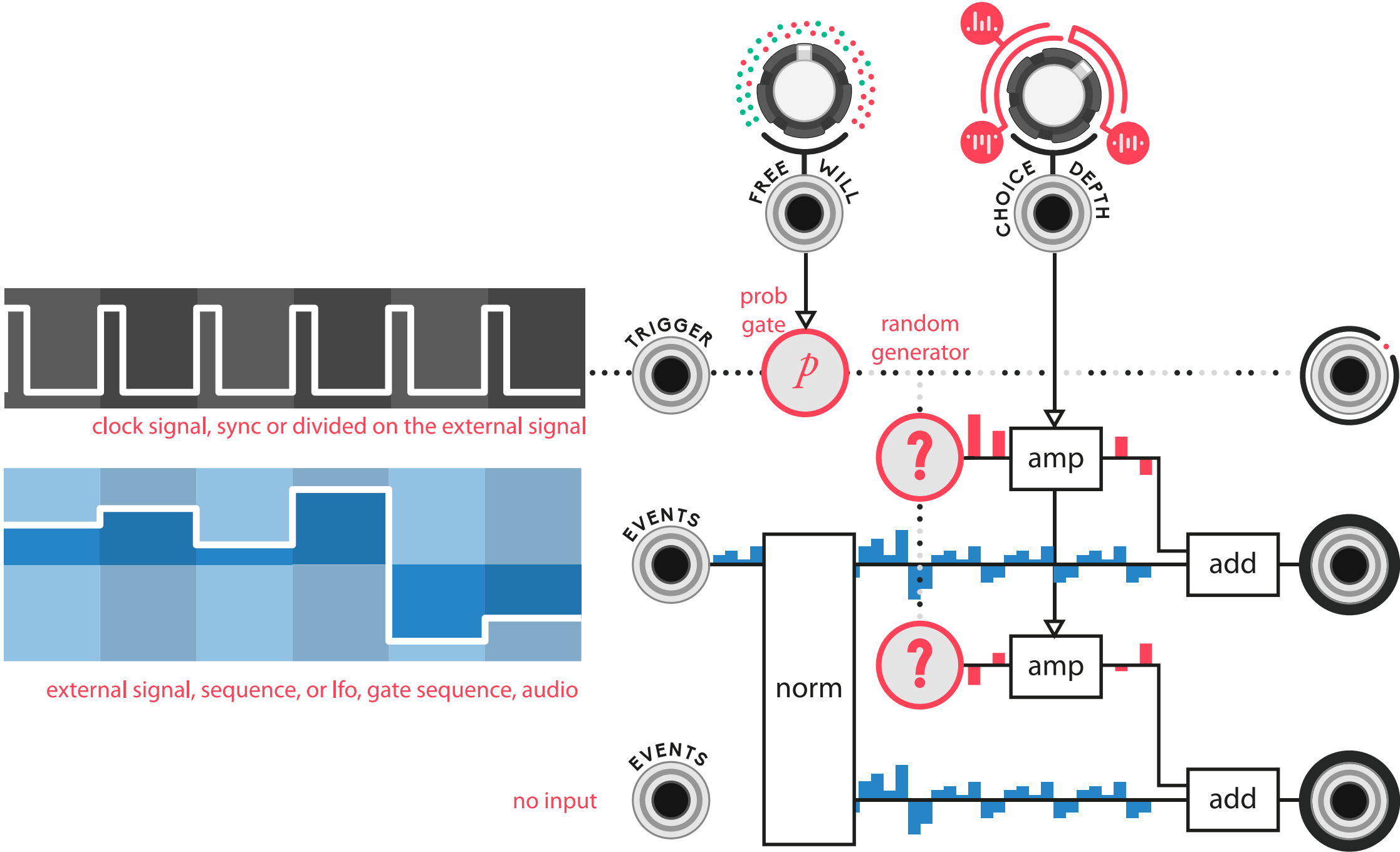
It doesn't matter which input is connected; they are normalised to each other.

Each output will give its own altered version of the original signal.

The gate output emits a gate each time the randomness happens.

**Free will** controls how often randomness is added to the signal.

**Choice depth** controls the amplitude of the randomness.

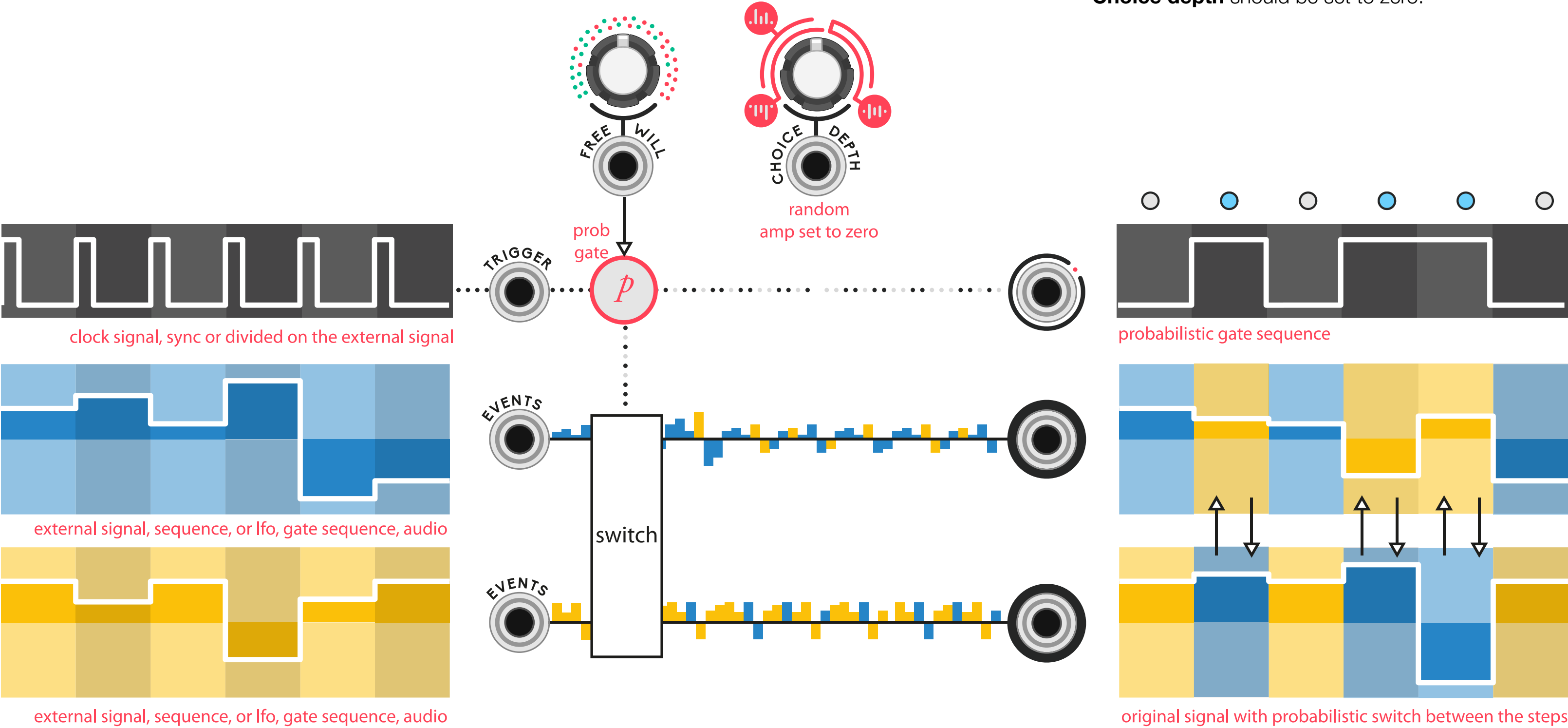


**FATE as a probabilistic two signal switcher.**

The gate output emits a gate each time the switch happens.

**Free will** controls how often the signals are switched and altered.

**Choice depth** should be set to zero.



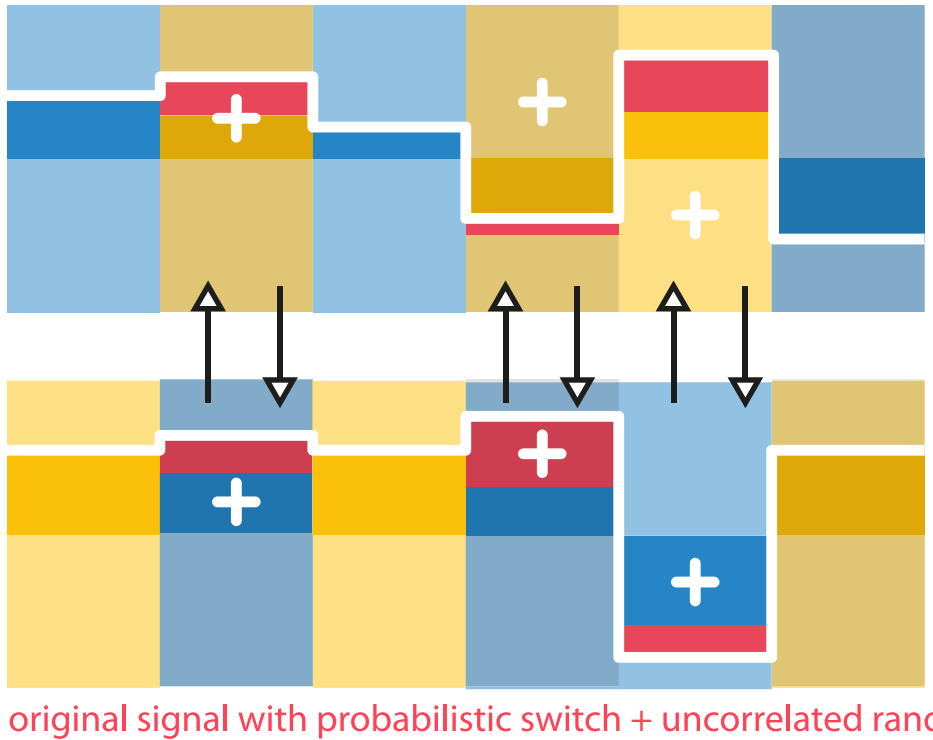
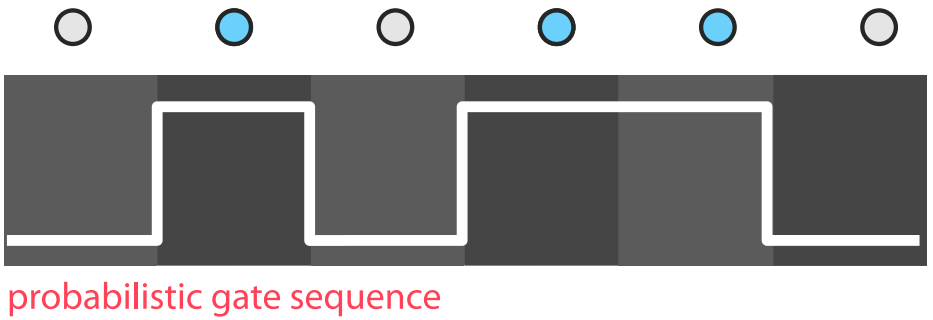
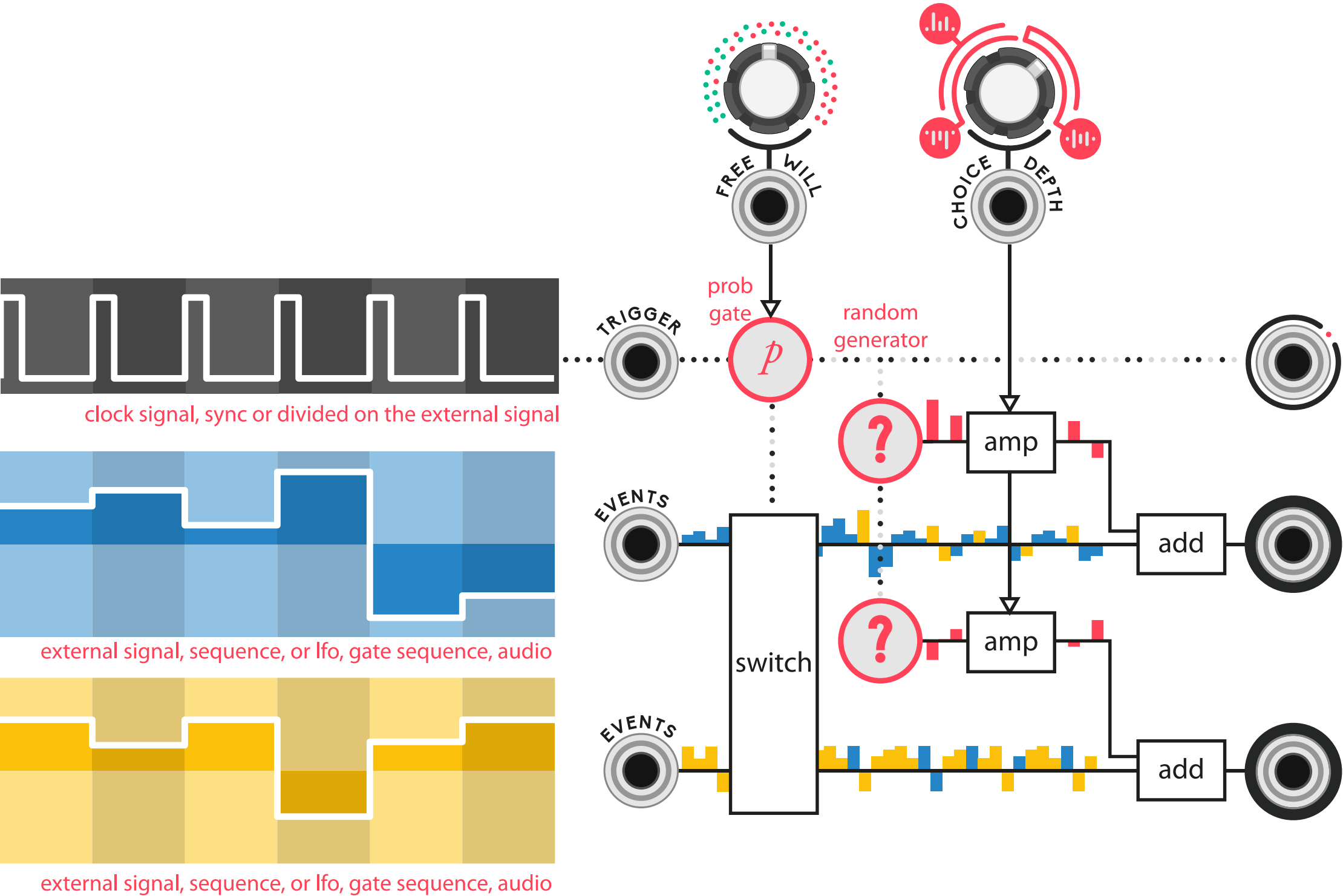


**FATE as a probabilistic two signal switcher and modifier.**

The gate output emits a gate each time the switch happens.

**Free will** controls how often the signals are switched and altered.

**Choice depth** control the amplitude of the randomness.

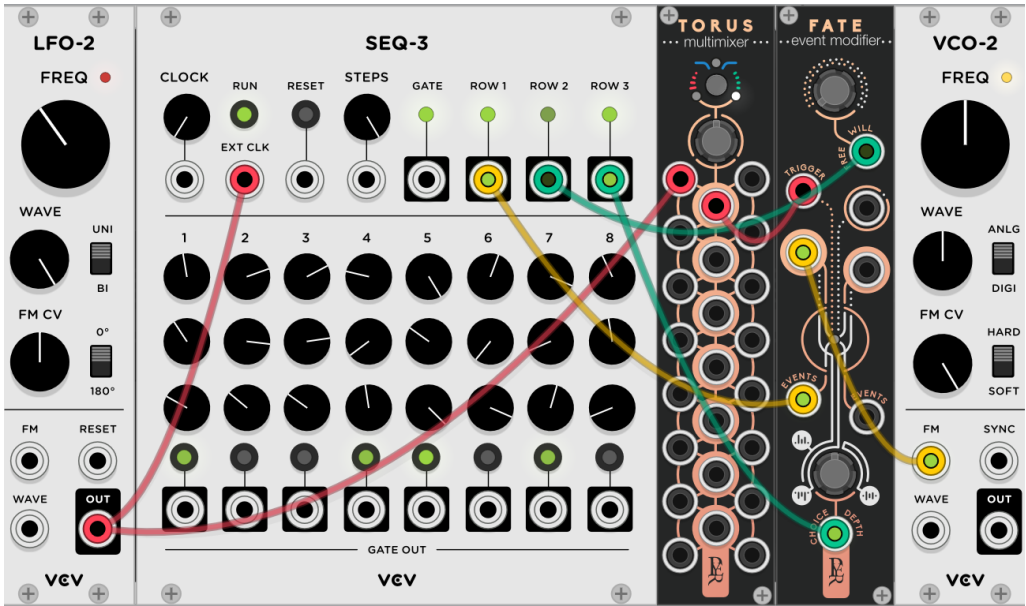


FATE with a multi-channel sequencer.

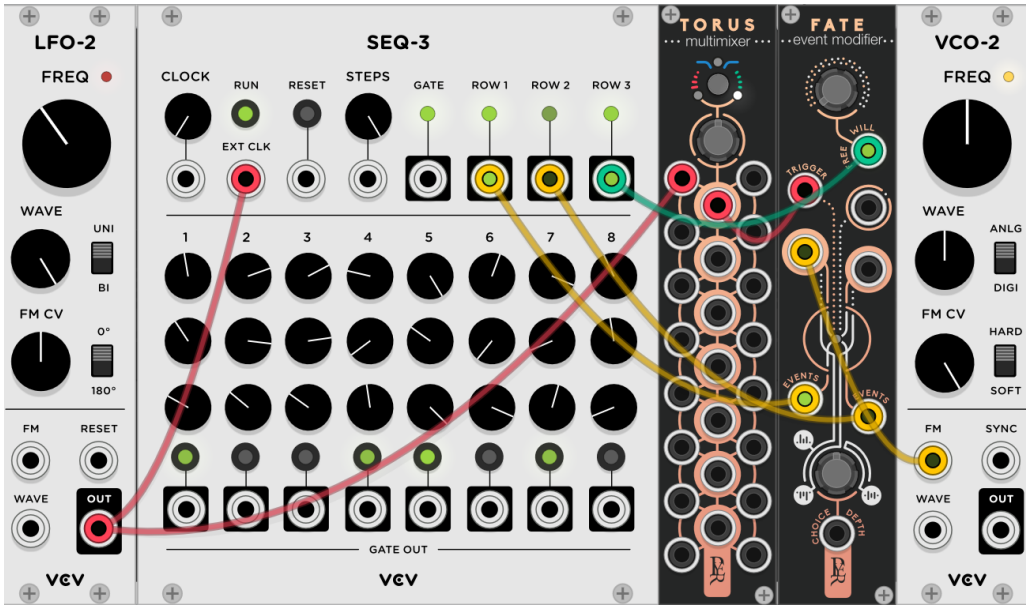
When FATE is used to alter a CV sequencer, **Free will** and **Choice depth** can be controlled by other CV sequences to make the random happen on specific notes of the sequence. FATE can then turn any multi-channel sequencer in our Entropia sequencer.

VCV introduces one sample of latency trough each cable and module. In order to sequence the CV inputs of FATE in sync with the source signal, the clock should have a one sample delay compared to the sequencer. This delay can be intrduced with any multiple module such as TORUS

- Add randomness to a sequence (input 1, output 1).
- Use a second sequence to control which step should be randomised (Free will CV in).
- Use a third sequence to control which step should have a wider random (Choice depth CV in).



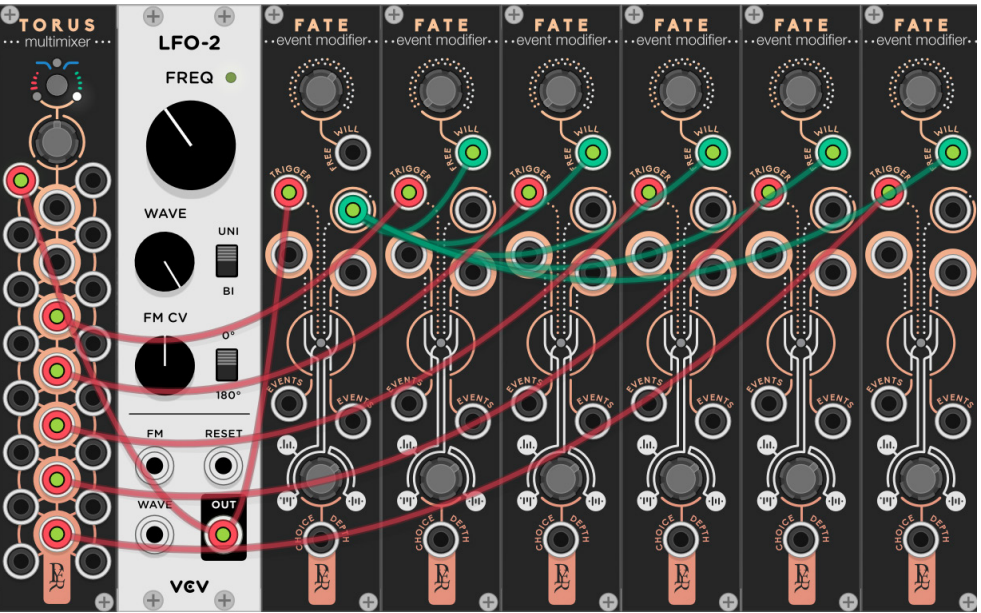
- Switch between two sequences (inputs 1 and 2, output 1)
- Use a third sequence to control which step should be switched (free will cv in)



Infinite FATE

FATE modules can be chained together for a one knob control to an infinite number of channels, generating uncorrelated random values on the same probability.

- All modules should be connected to the same clock. A multiple is needed to compensate latency between the main module and the other ones. All free will knobs are set to zero. the gate output mode should be set to **flip flop** (right click)
- Connect the **gate output** of the main fate module to the other FATES **Free will** CV input.
- Each time the first module will make a choice, it will output a 10 V gate to the probability control of the probability control of the other modules, forcing them to generate randomness at the same time
- All of the FATE modules are triggered and responding to the same probability, based on the main module's **Free will** knob.





# G E O D E S I C S

A modular collection for VCV Rack by Pyer & Marc Boulé

Geodesics has been created in July 2018 by **Pierre Collard** (industrial and graphic designer based in Brussels) and **Marc Boulé** (developer and creator of Impromptu Modular based in Montréal).

Just like many projects within VCV Rack, Geodesics is also a community effort and it would not have been possible without the help of many users, composers and developers participating one way or another to enhance the quality of the project.

Among them we would like to address a special thank to those who helped us in the beta testing phases, who made tutorials, who proposed their help in any way and those who brought the collection to life with some great pieces of music: **Omri Cohen, Georg Carlson, Xavier Belmont, Steve Baker, Marc Demers, Adi Quinn, Ben De Groot, Latif Karoumi, Espen Storo, Synthikat, Dave Phillis, Carbonic Acid, Martin Luders, Ghaleb, Stephen Askew, Lars Bjerregaard, Richard Squires, Lorenzo Fornaciari, Adi Quinn, NO rchestra, Poxbox23 and Ananda Bhishma.**

## Geodesics links

[www.pyer.be/geodesics](http://www.pyer.be/geodesics)  
[vcvrack.com/plugins.html#Geodesics](http://vcvrack.com/plugins.html#Geodesics)  
[github.com/MarcBoule/Geodesics](https://github.com/MarcBoule/Geodesics)

## Creations from composers using Geodesics:

<https://www.youtube.com/playlist?list=PLEh-5QLxa-BlqLI9rBcncUTFm2Lk-ZMgvZ>

## Tutorials on Geodesics by Omri Cohen:

[https://www.youtube.com/playlist?list=PLEh-5QLxa-Blr4dsurkkwUehFsNI7T\\_Jv-](https://www.youtube.com/playlist?list=PLEh-5QLxa-Blr4dsurkkwUehFsNI7T_Jv-)

## Marc's work links

[github.com/MarcBoule/ImpromptuModular](https://github.com/MarcBoule/ImpromptuModular)

## Pierre's work links

[www.pyer.be](http://www.pyer.be)

