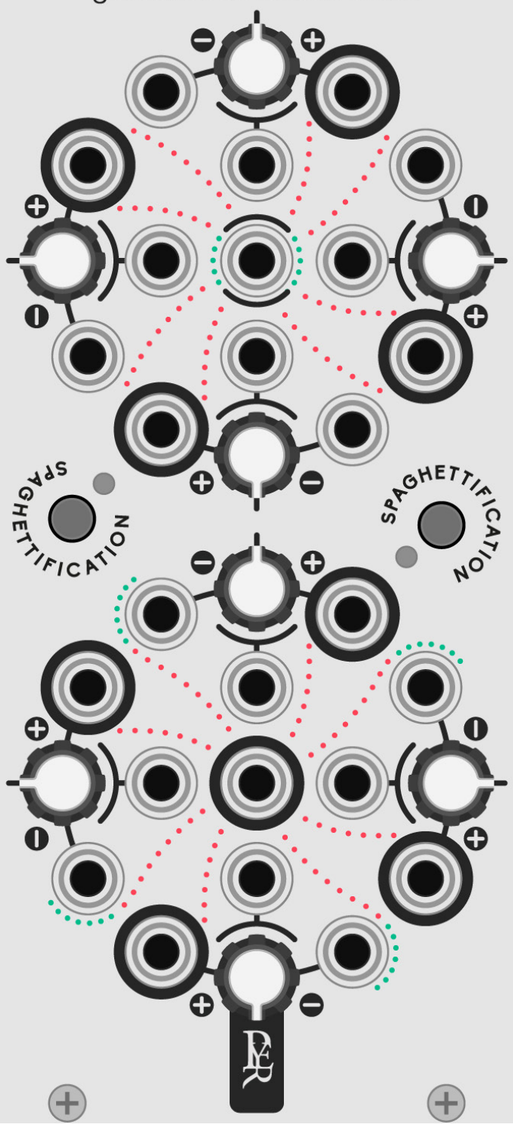
GEODESICS

A modular collection for VCV rack by Pyer & Marc Boulé

User Manual - Beta version 0.6.0

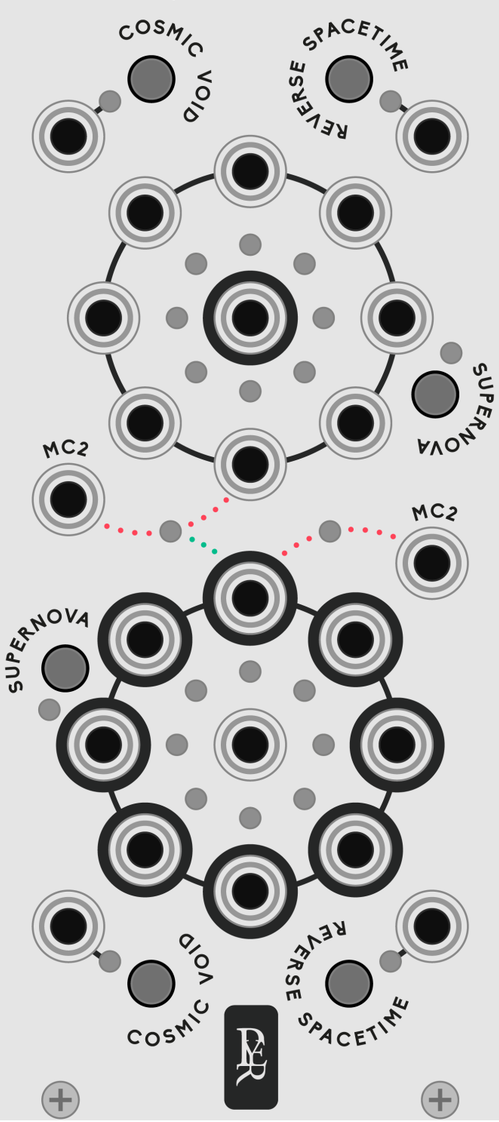
BLACKHOLES

gravitational attenumixset



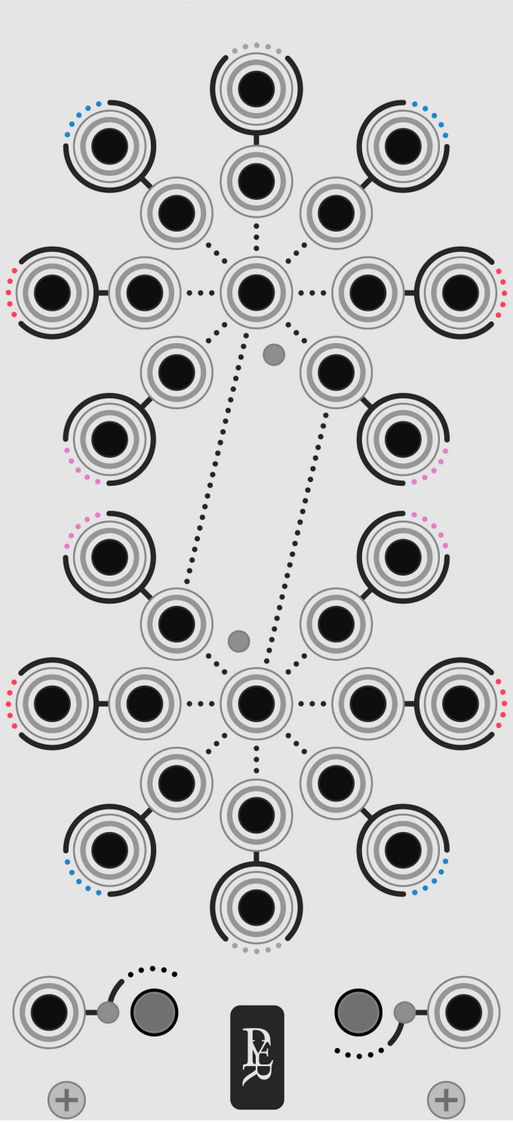
PULSARS

neutron powered crossfader



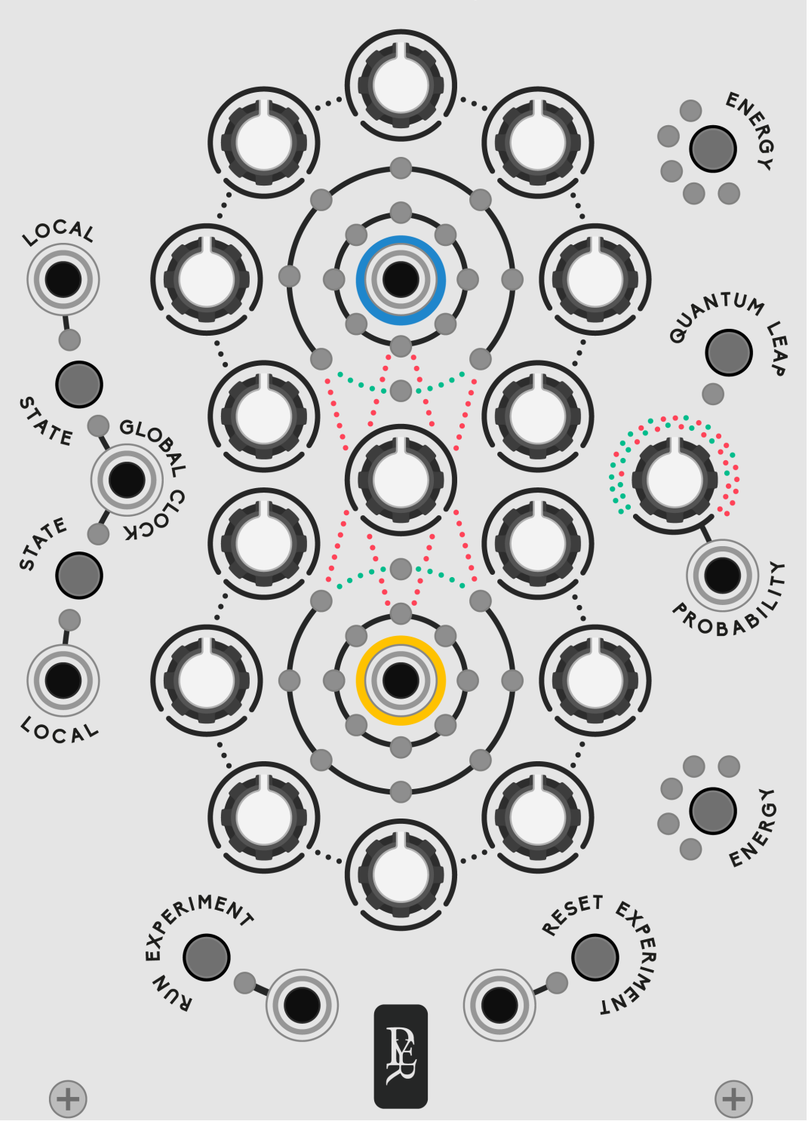
BRANES

colliding sample and hold



IONS

atomic dual cv sequencer



W.I.P.

A note to our dear beta testers

Thank you for your help in making this project real. Your feedback and feature requests are more than welcome.

The collection is still in the making and so is this user manual. I am not a native English speaker and my way to explain might be too confusing, too quick or too redundant.

Please tell me if you think this user manual can be enhanced in any way for a better understanding of the modules.

Marc and I hope you will have fun making music with this collection!

PHILOSOPHY

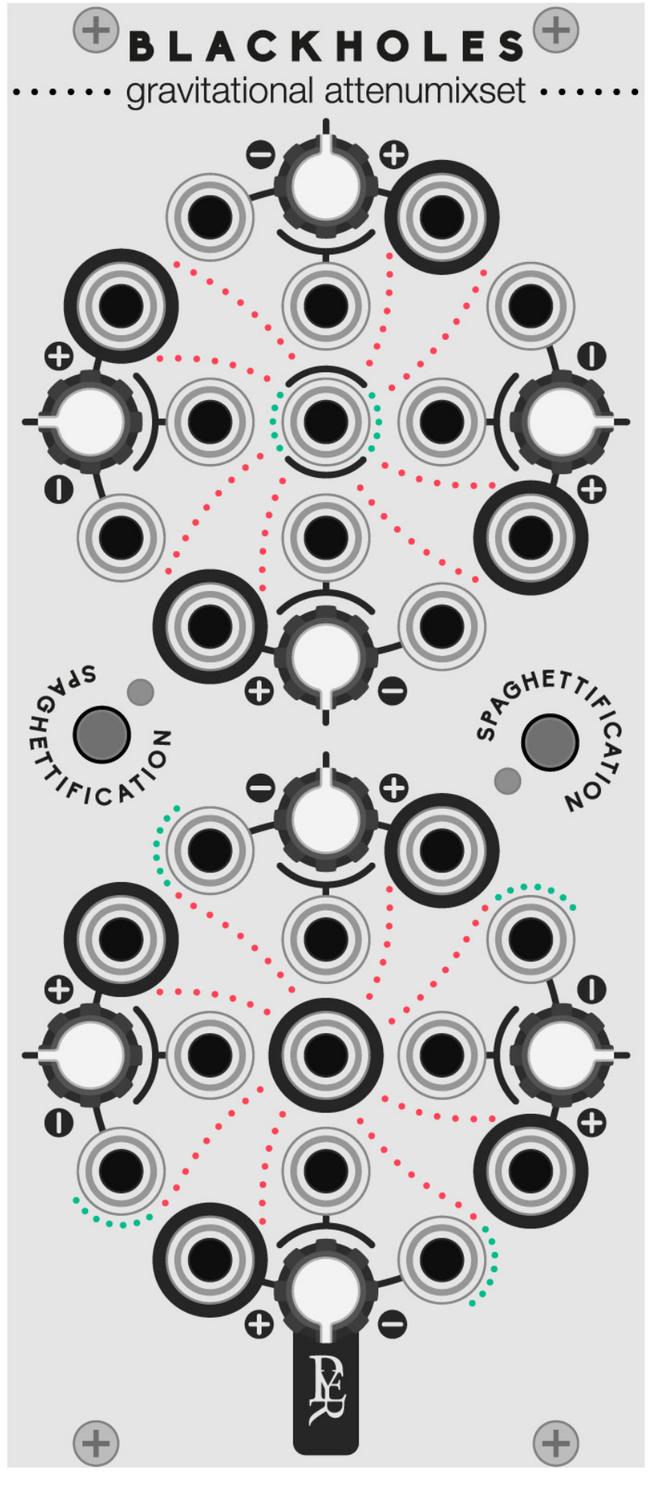
science inspires music

The modules are loosely inspired by astronomic events and physical theories. The goal is just to see how science can inspire us to create new music.

Every module must be feasible in the hardware world, interacting elements must be only knobs, buttons, LEDs and serigraphy. Right click must be avoided as much as possible.

For a more immersive concept, every parameter displayed uses terms related to the scientific phenomenon that inspires the module. It might be confusing at first but that's why this manual is here.

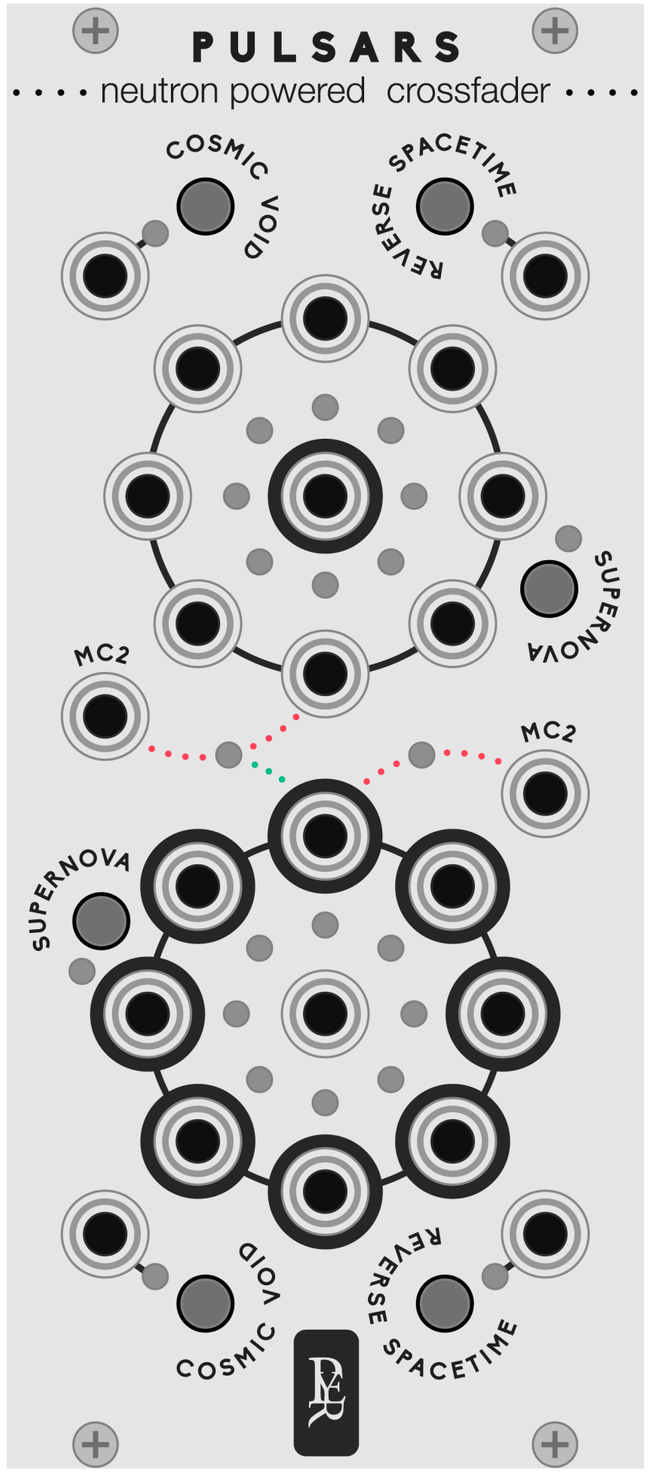
While a lot of advanced science is involved, the final purpose is to create musical and creative instruments, effective and friendly to use.



BLACK HOLES

gravitational voltage controled amplifiers

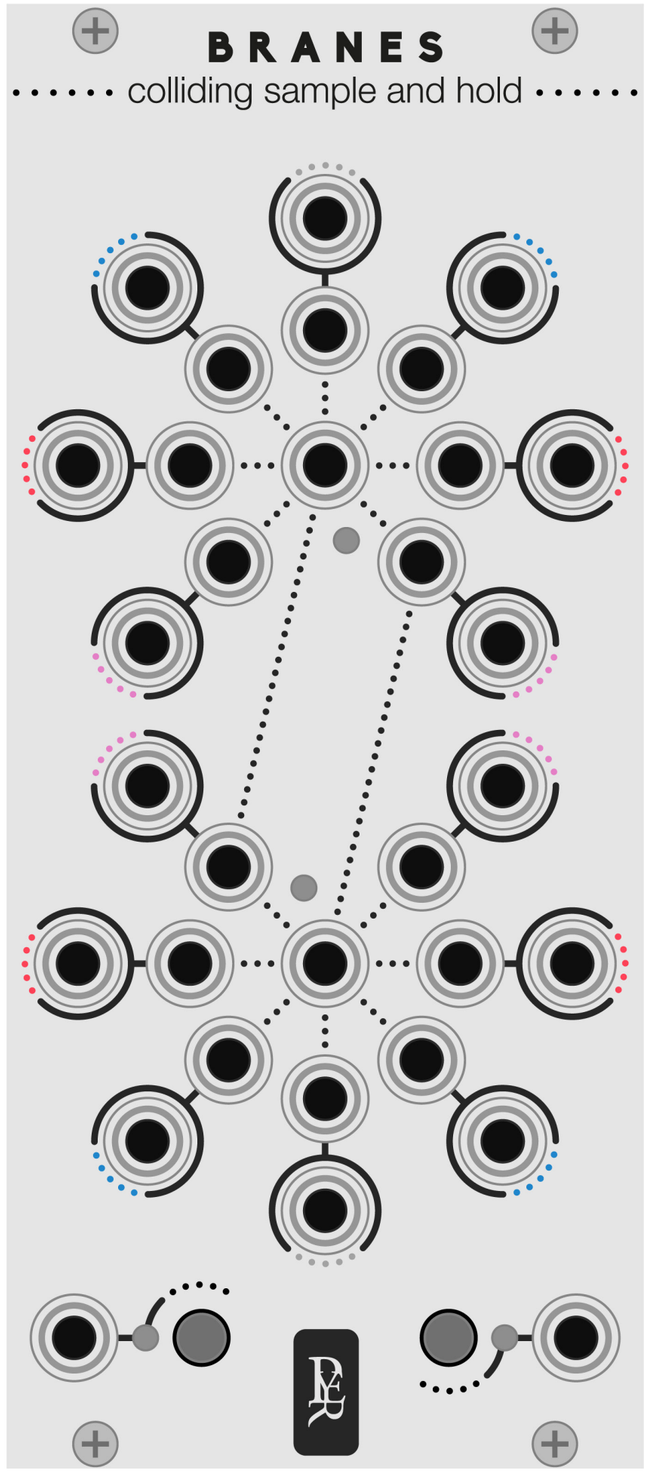
A black whole attracts everything that gravitates around to its centre, even audio and CV signals… **BLACK HOLES** is 8 vcas in two groups of 4, it's also two mixers with 4 channels each.



PULSARS

neutrons powered rotating crossfader

A pulsar is a star turning on itself and emitting very high and precise frequencies on its spinning axis. **PULSARS** is a rotating 8 to 1 and 1 to 8 selectors with crossfade in between each signal. It can be used to create cross fade mix of audio, complex wave tables with CV, standard sequential switch or extreme effects when turning at audio range speed.



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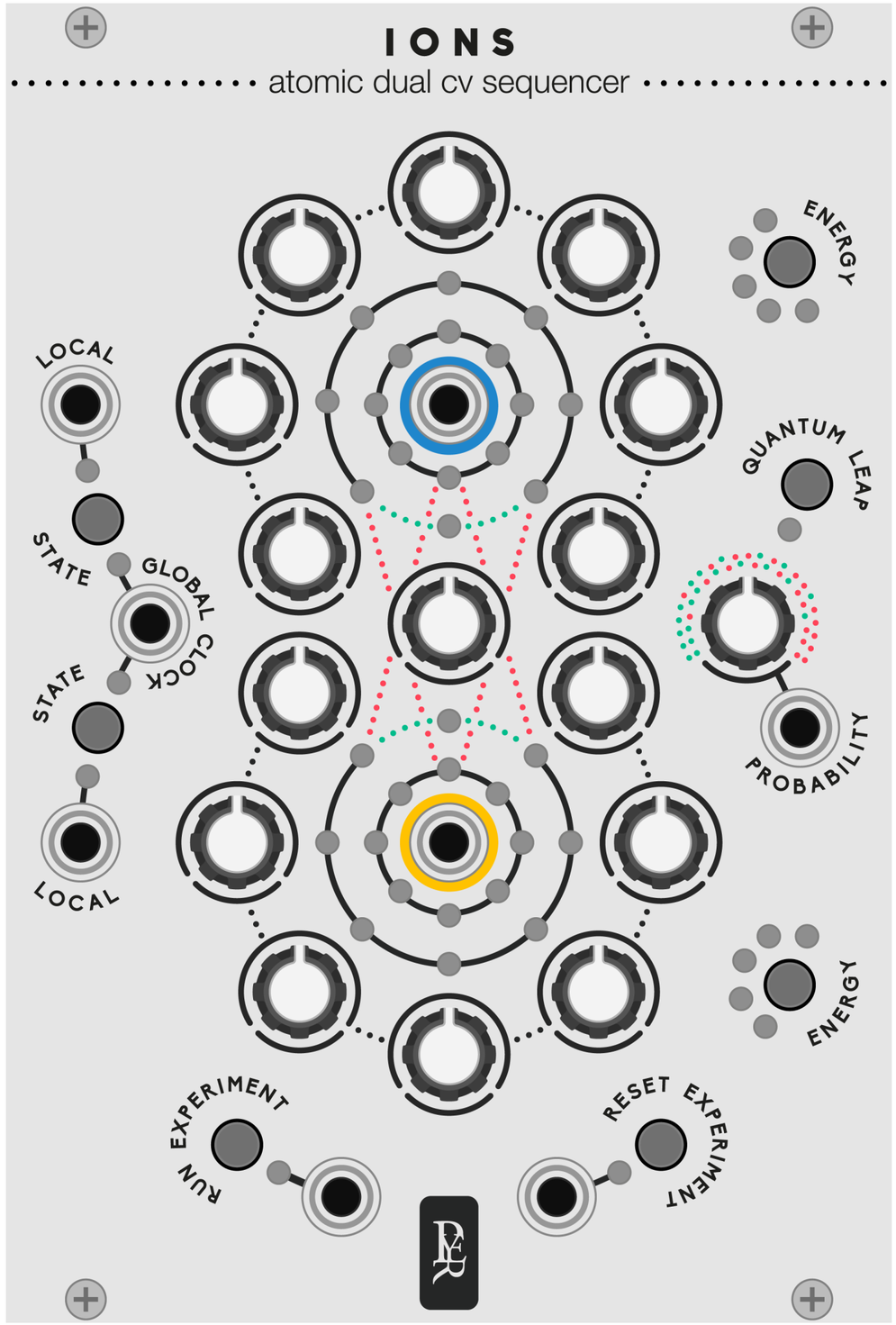


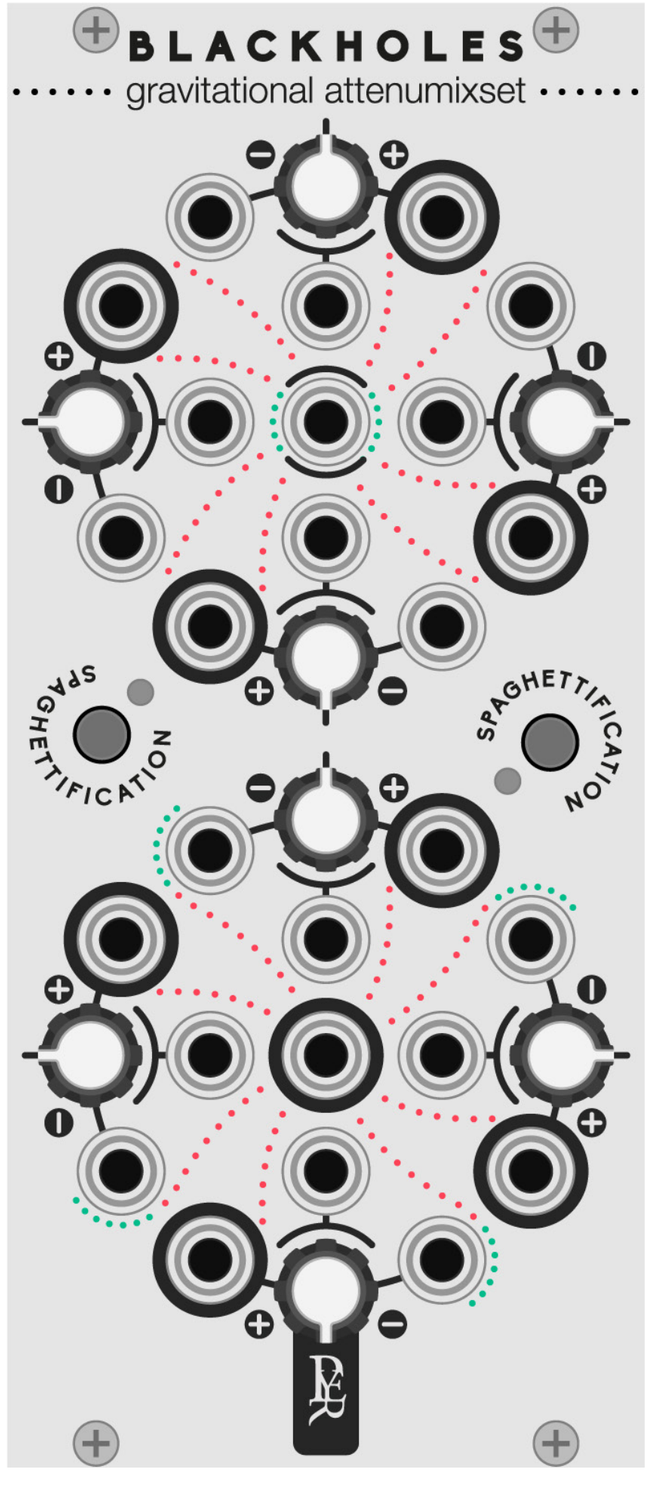
IONS

atomic duophonic voltage sequencer

An Ionic bond describes two atoms that exchanges electrons.
IONS is a two voices sequencer. While each voice has its own sequence, they can exchange their sequences as easily as an electron can jump from one atom to another.

GEODESICS

In Depth Concept



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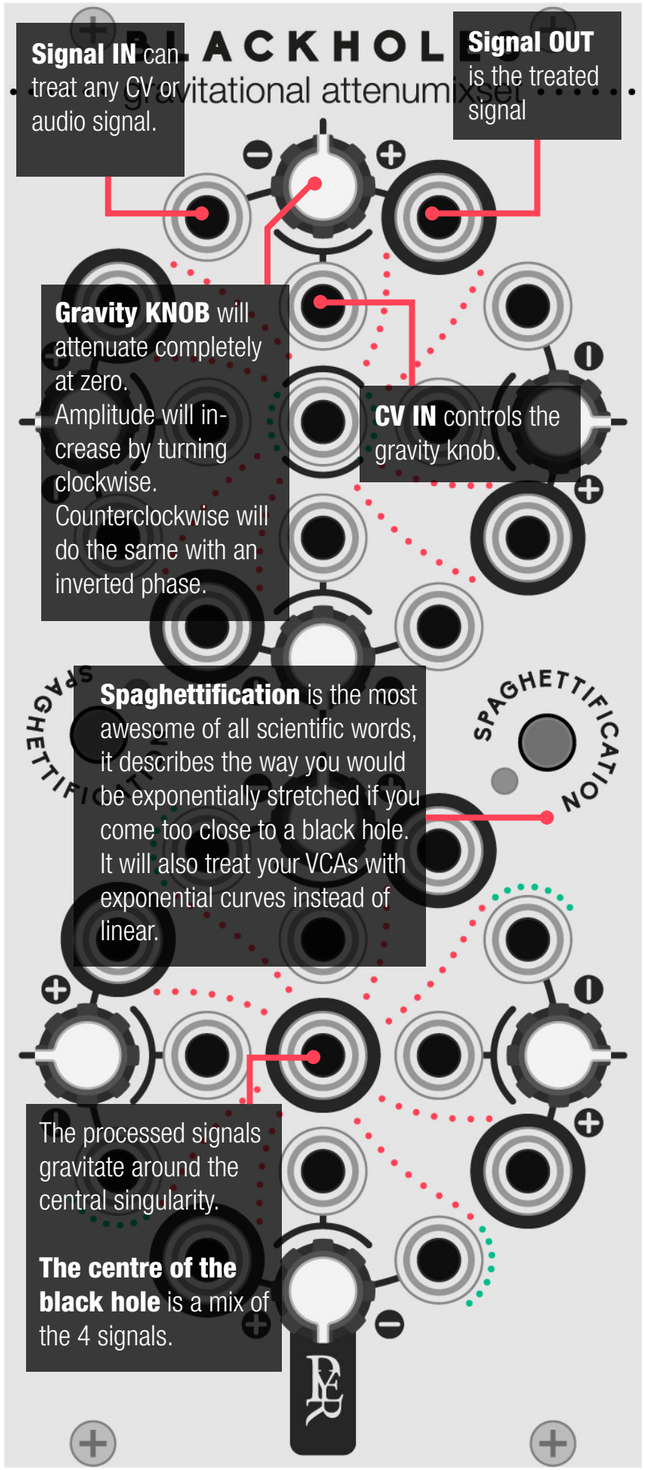

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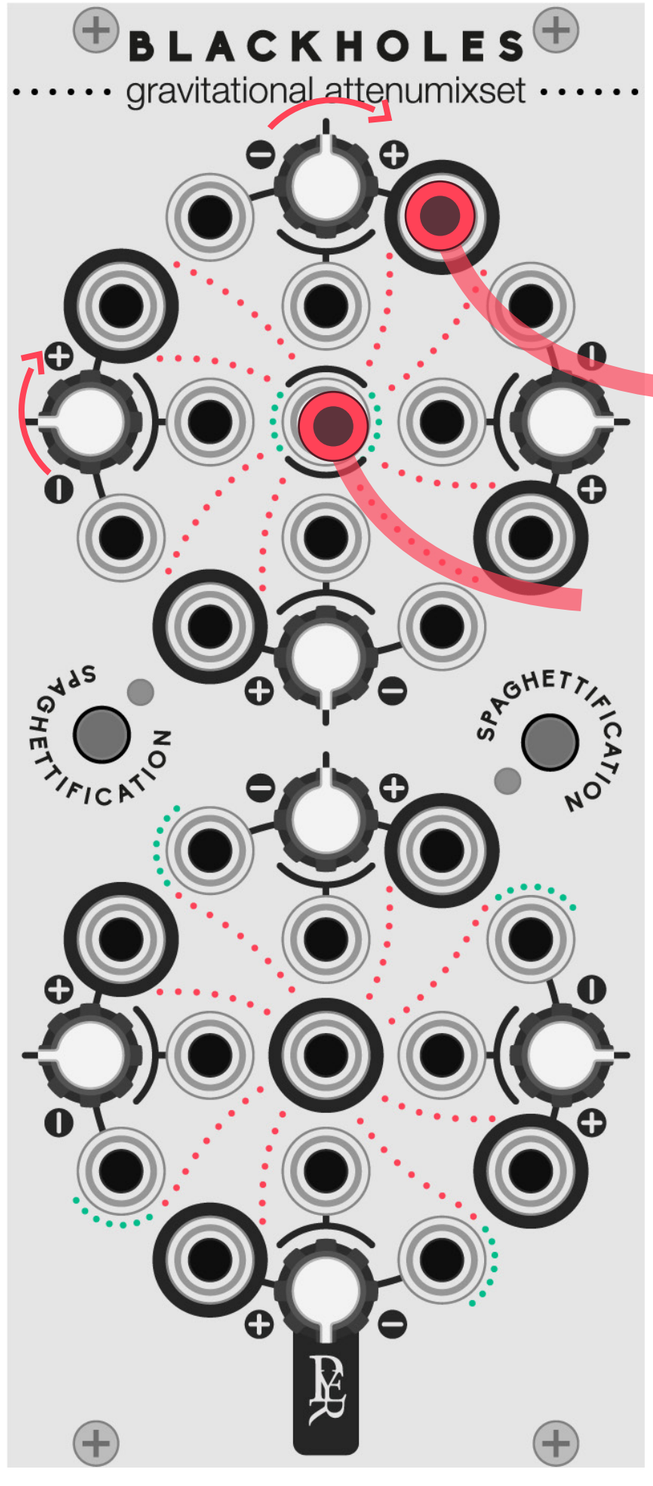
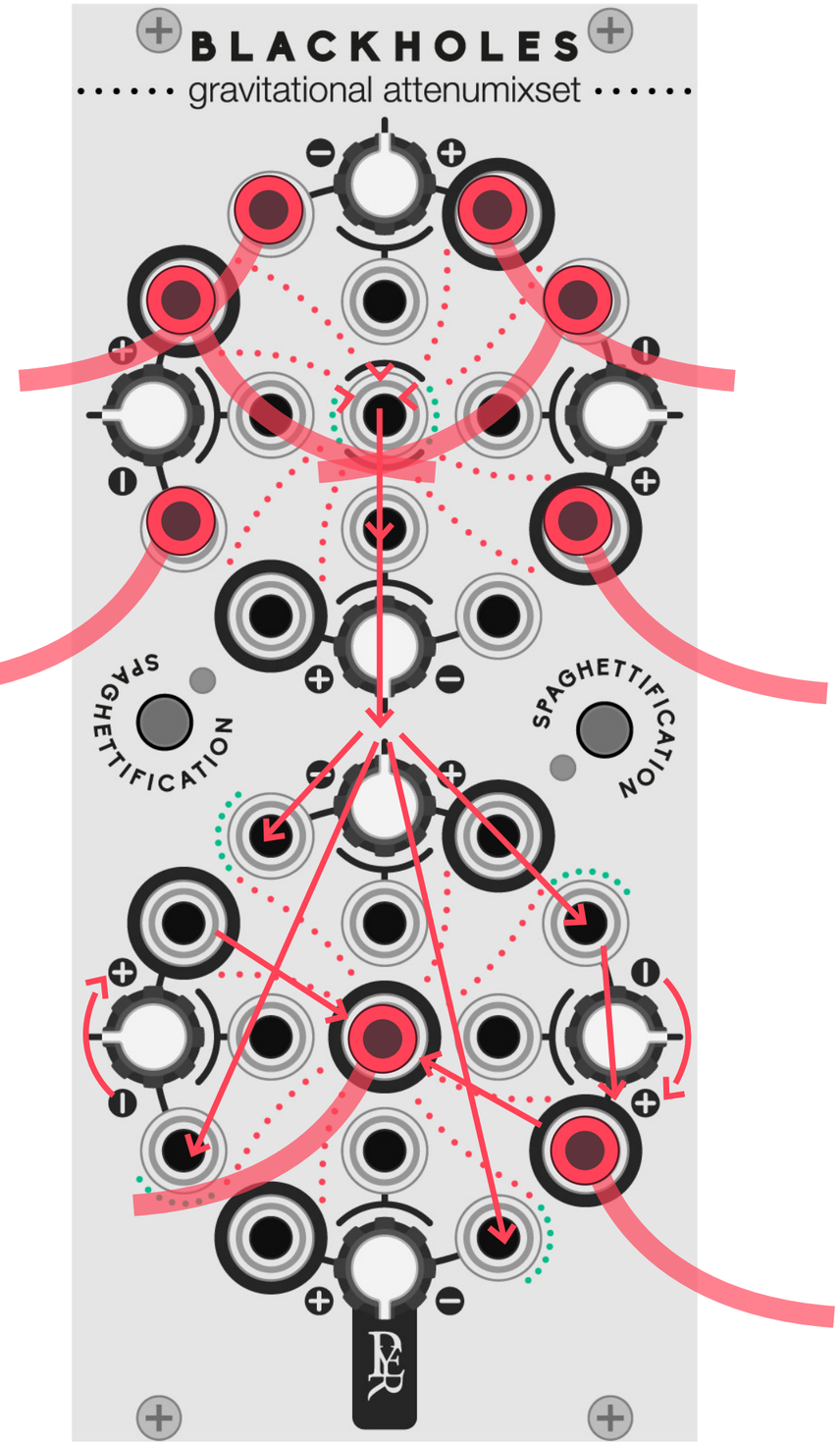


BLACK HOLES

gravitational voltage controled amplifiers

Gravity trick

When no input is plugged in, the knob acts to the output as a fixed CV generator. The centre still acts as a mixer. The values of the gravity knobs are all summed up in the mixer.



BLACK HOLES

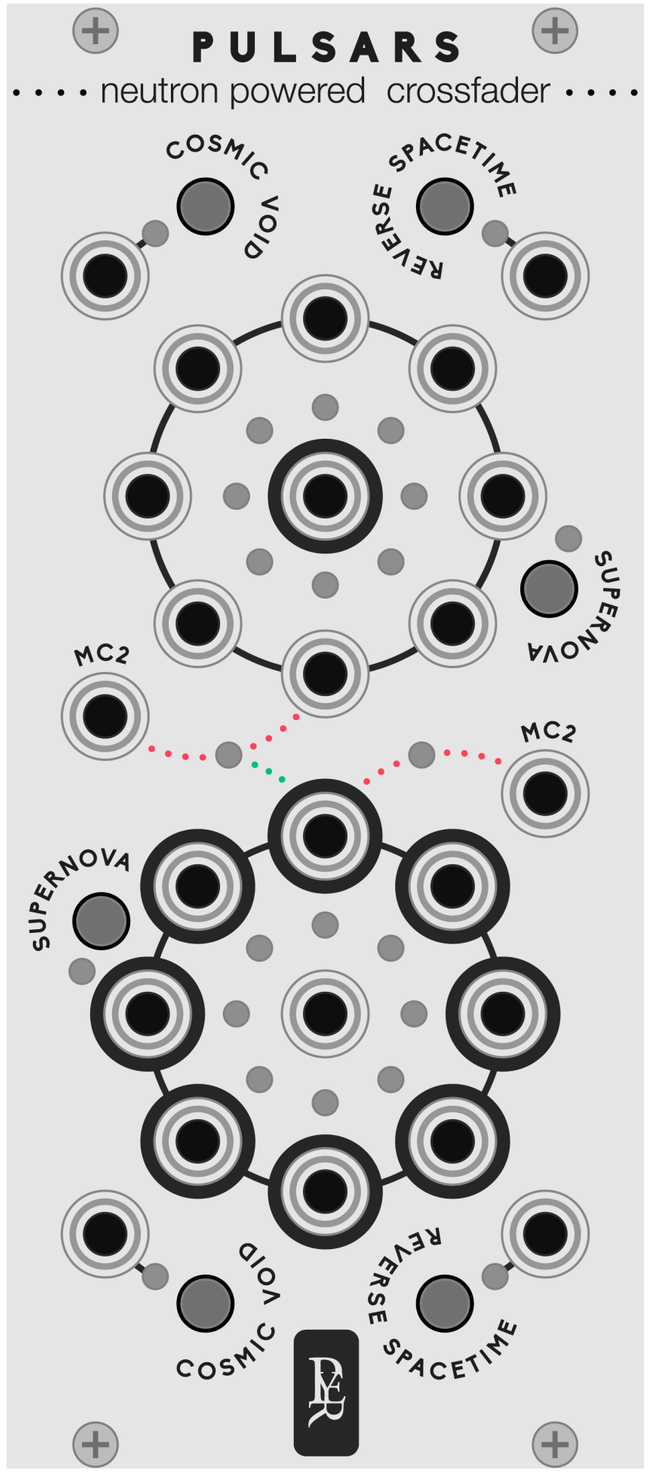
gravitational voltage controled amplifiers

Multidimensional trick

No one knows what is inside a black hole, some people think it could lead to another dimension.

When Black Hole 2 doesn’t receive any direct signal, it will receive the mix signal of BlackHole 1. Black Hole 2 then becomes a 1x8 multiplier for BlackHole 1’s mix out and can be treated differently by each attenuverter of the BlackHole 2. T

The gravity trick combined with the multidimensional trick will manage both amp and offset of an external signal.



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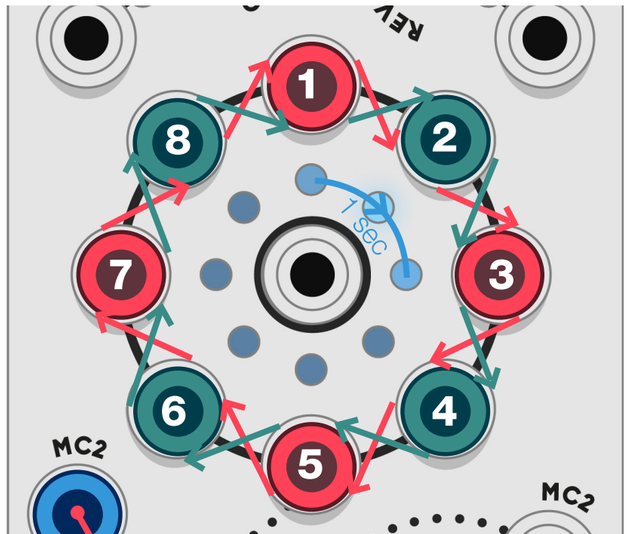
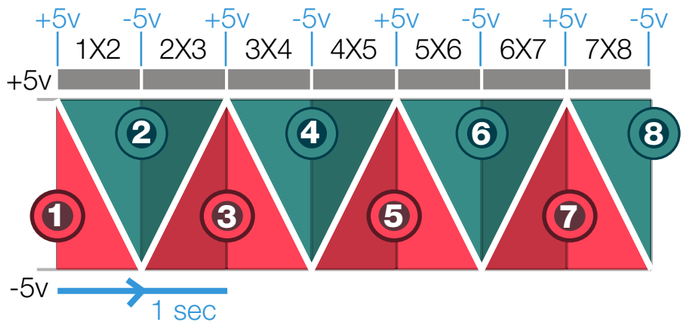
neutrons powered rotating crossfader

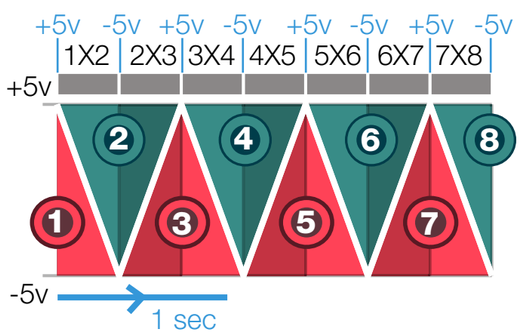
A pulsar is a star turning on itself and emitting very high and precise frequencies on its spinning axis. **PULSARS** is a rotating 8 to 1 and 1 to 8 selectors with crossfade in between each signal. It can be used to create cross fade mix of audio, complex wave tables with CV, standard sequential switch or extreme effects when turning at audio range speed.



white line on the graph +/- 5 volts



At each peak, PULSAR starts another crossfade sequence. Any value between +5 and -5 will be interpreted as a mixed value between the first and the second source.



The speed of the sequence is defined by the rate of the MC2 Signal.

PULSARS

neutrons powered rotating crossfader

MC2 is the energy needed for a pulsar to spin on itself.

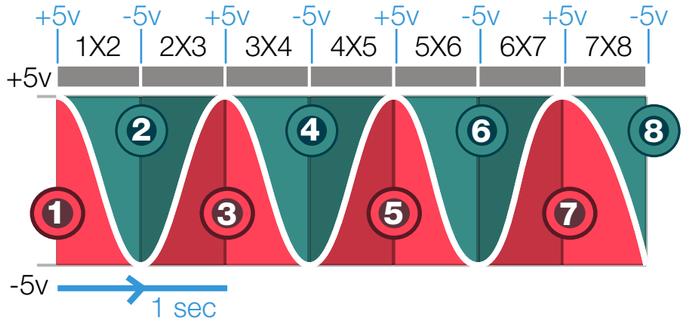
Pulsars needs a 5v binaural CV signal to power its rotation (**MC2 IN**).
When no MC2 is connected to the second pulsar, they are both driven by the first MC2

The first connected cable defines the start of the cycle

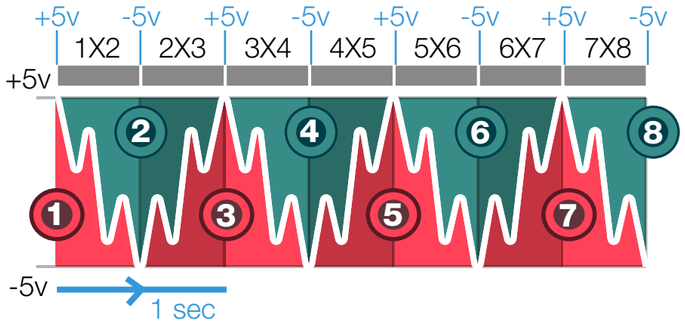
The rotation starts at **source 1** when it receives +5v.

It will reach **source 2** when he receives –5v

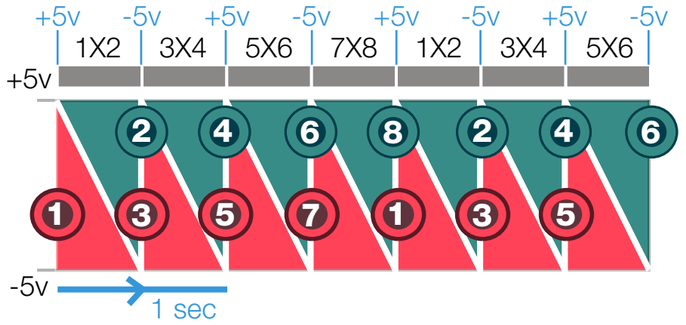
It will reach **source 3** when he receives +5v…



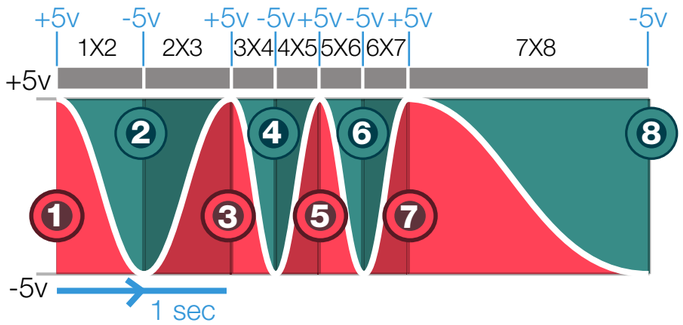
A triangle wave will make linear crossfade, while a **sinus wave** will create an exponential cross-fade



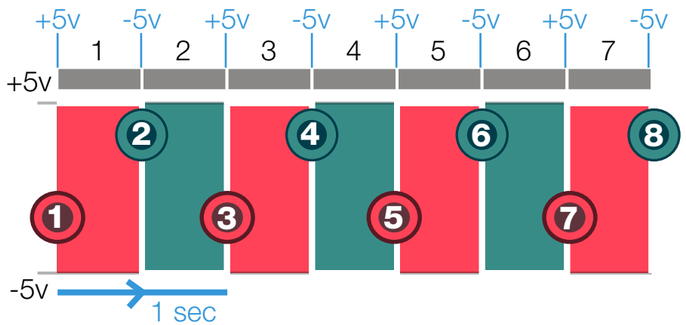
A folded wave source will create back and forward effects



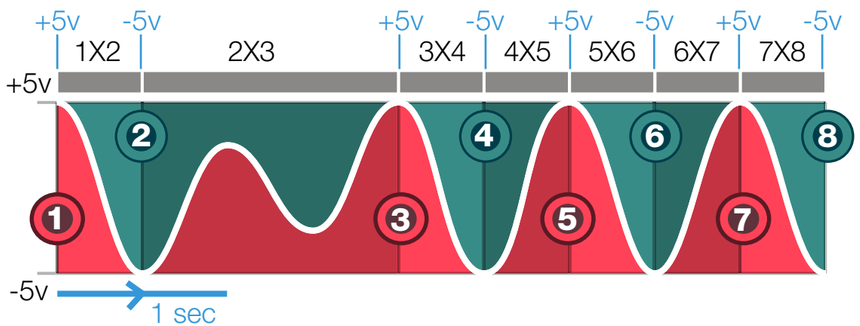
A sawtooth wave will switch from one step to another without transition



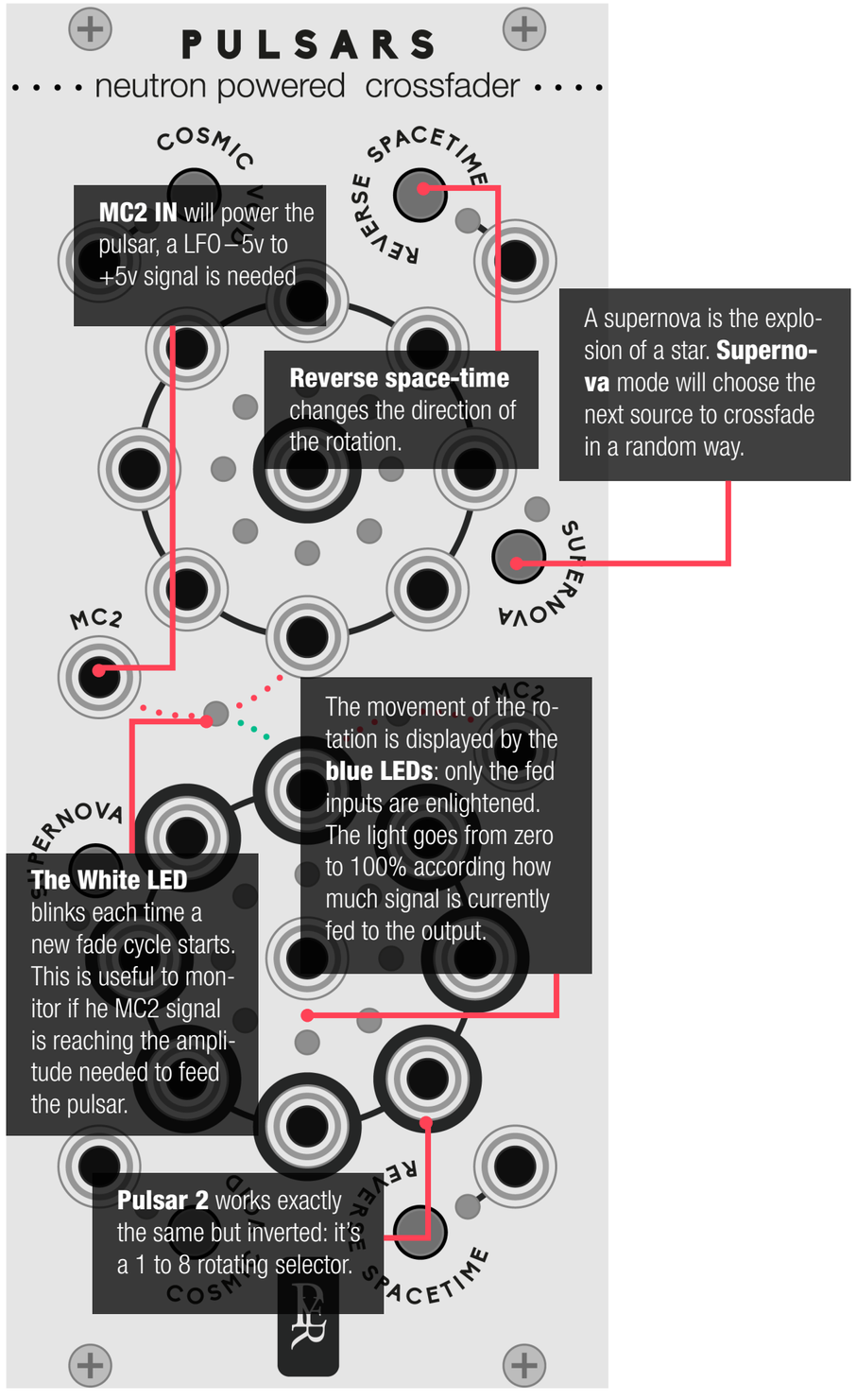
Modulating the rate of the signal will make some steps shorter and can create some rhythmic variations



A square wave won't create a cross fade effect, it can then be used as a standard sequential switch.



Modulating the amplitude of the signal can create some interesting rhythmic effects as it only switches to the next step when it reaches +/- 5 volts.



PULSARS

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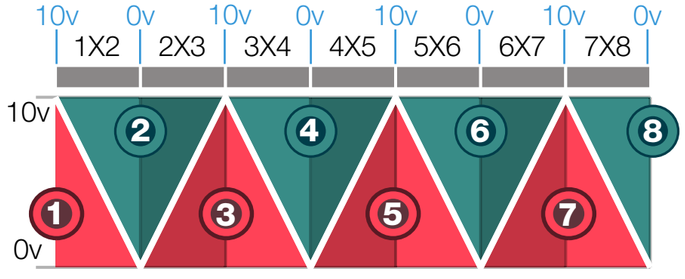
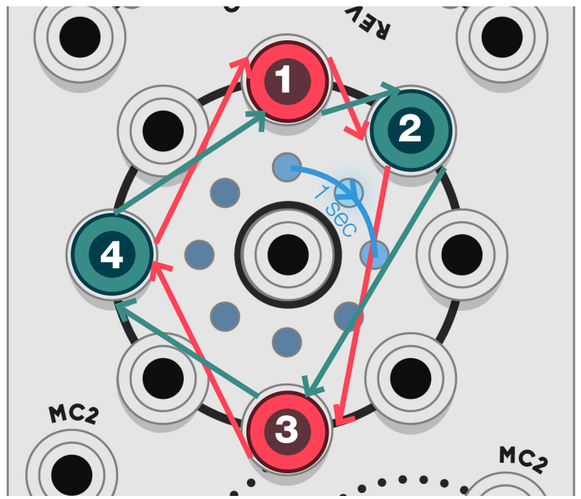
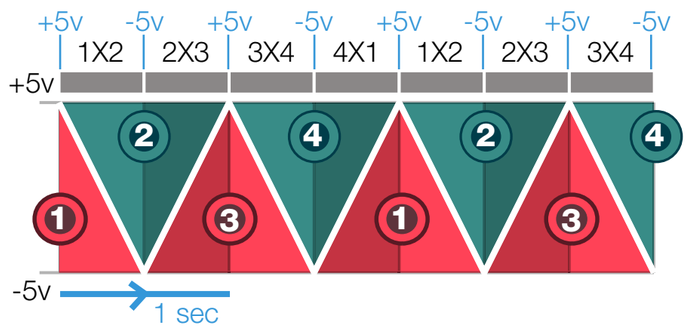
Right Click

Right click will configure Pulsars to receive a 0/10v to react with enveloppe generators. A new cycle will be started each time the MC2 Signal reaches 0 or 10 Volt.



Cosmic void mode **OFF**





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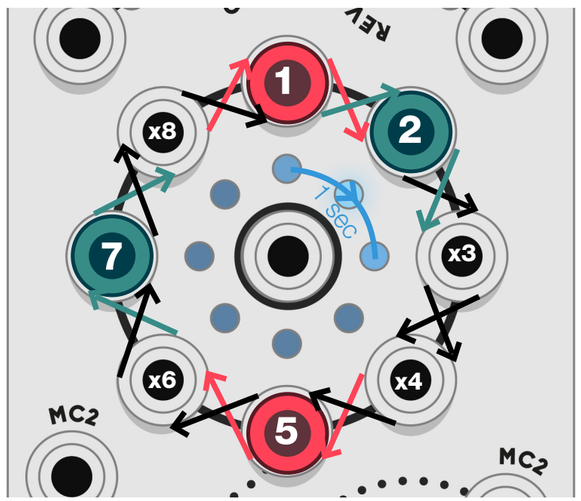
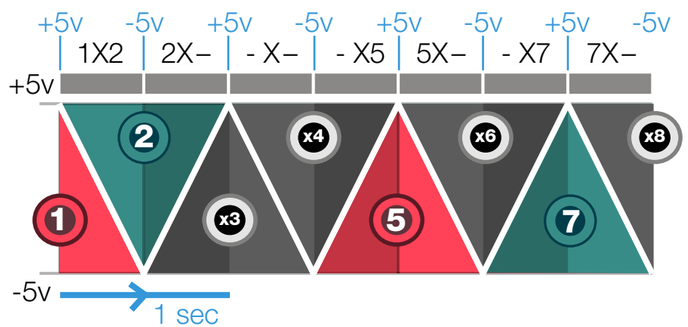
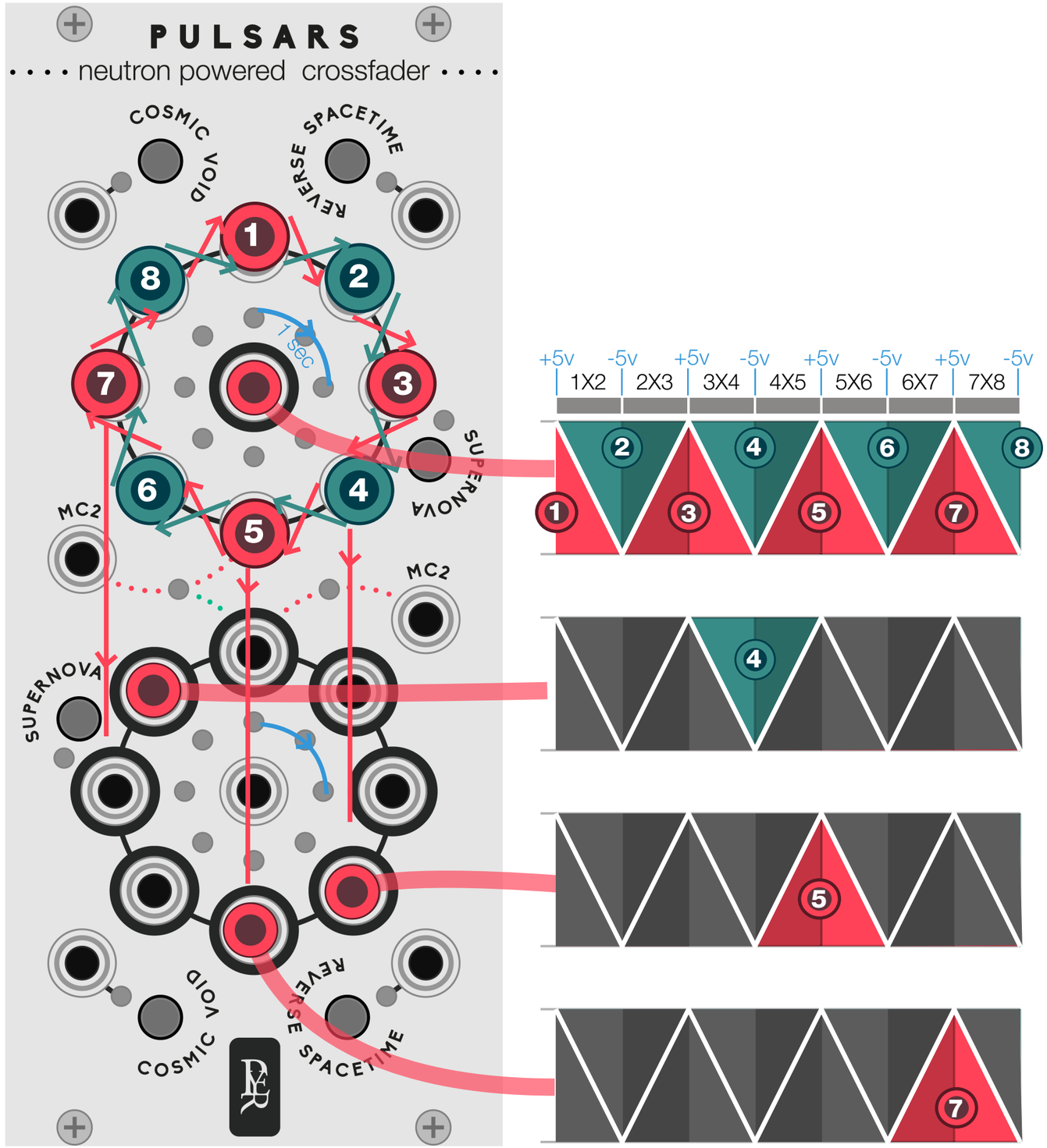




Cosmic Void mode

By default, Pulsars takes only account of the fed inputs, wherever they are plugged along the way. If only 3 inputs are fed, Pulsar will be a 1 to 3 switch.

When the cosmic void mode is on, PULSARS take account of the empty inputs, it will always be a 1 to 8 switch, and if it goes through a non-fed input, it will send a zero volts signal. This mode is useful to create rhythmic or tremolo effects.



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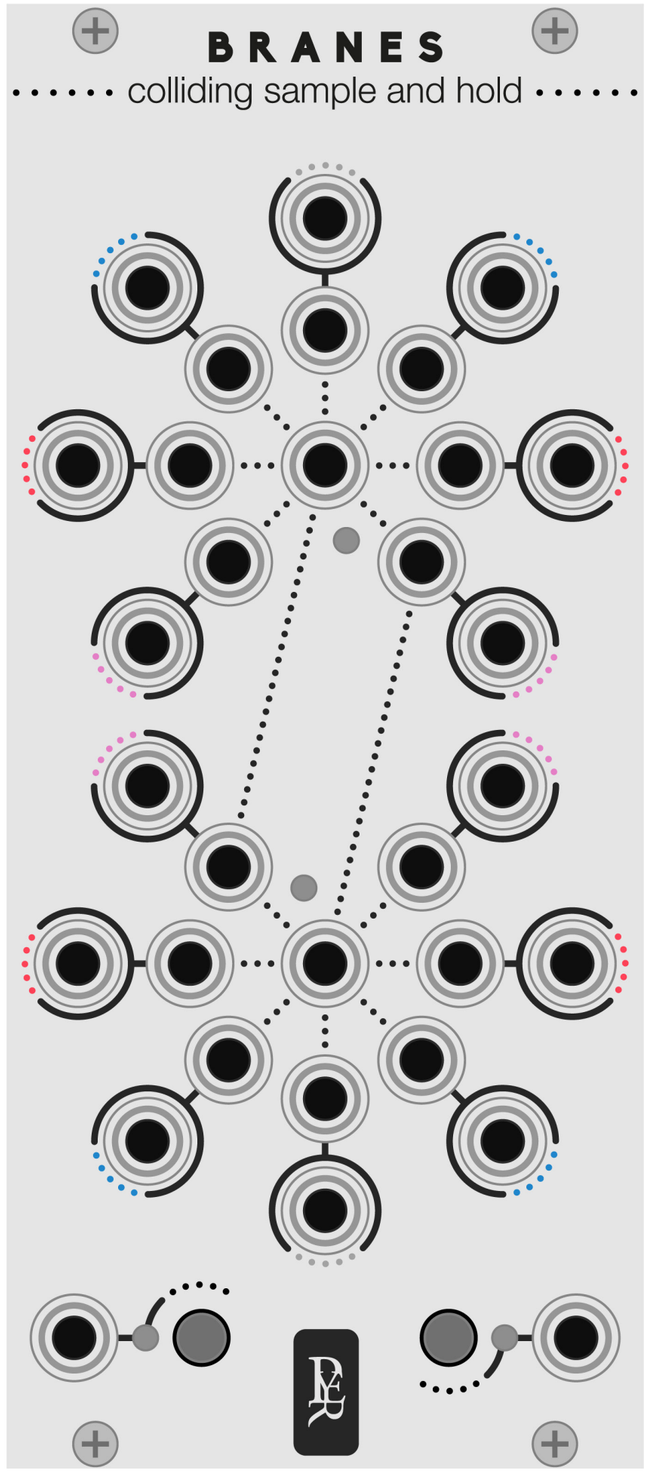
Multidimensional trick

f no input is connected to Pulsar 2, it will send the separate input of Pulsar1 amplified by its rotation. This is useful if you want to have stereo effect of post treatment of each source.



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colliding sample and hold

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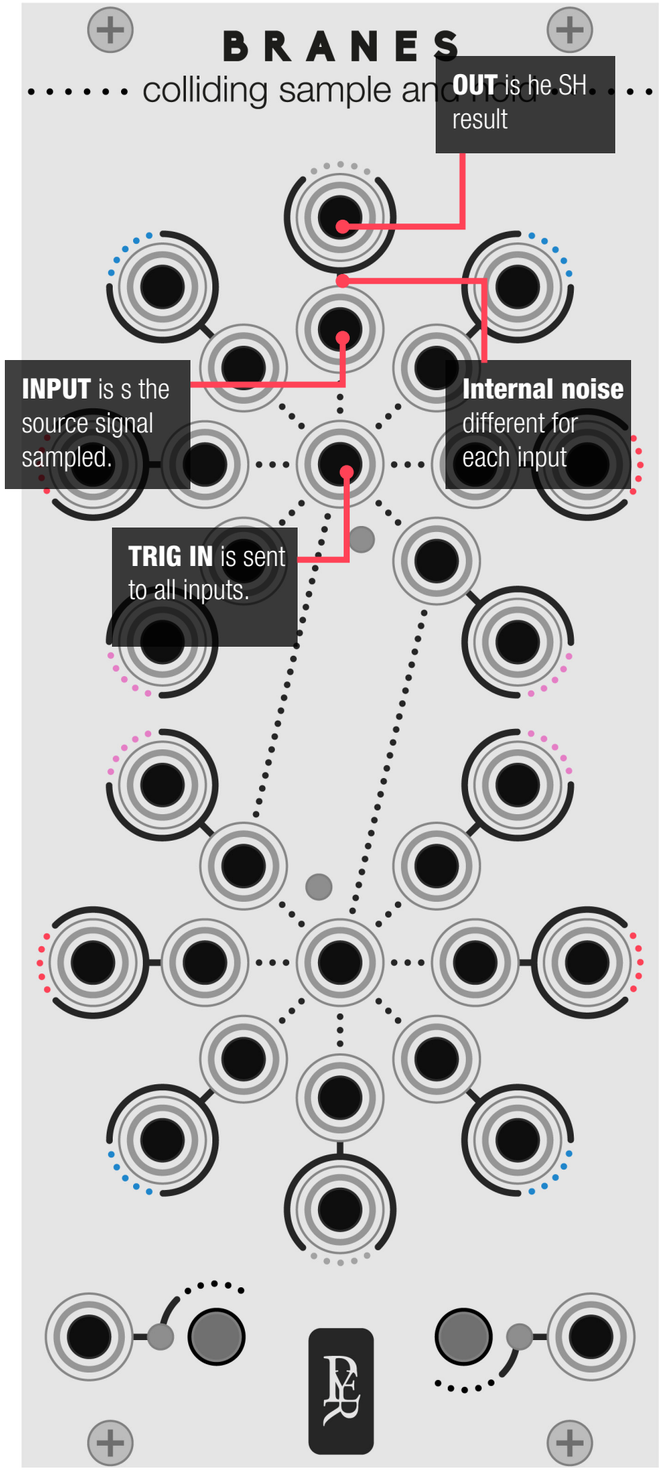


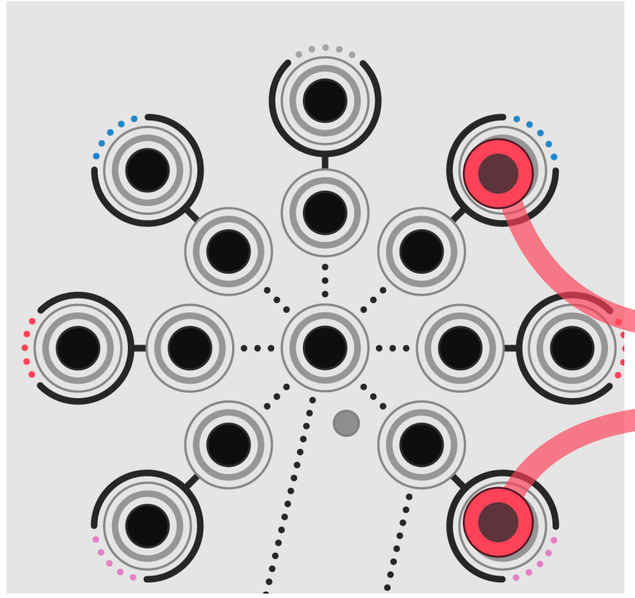
BRANES

colliding sample and hold

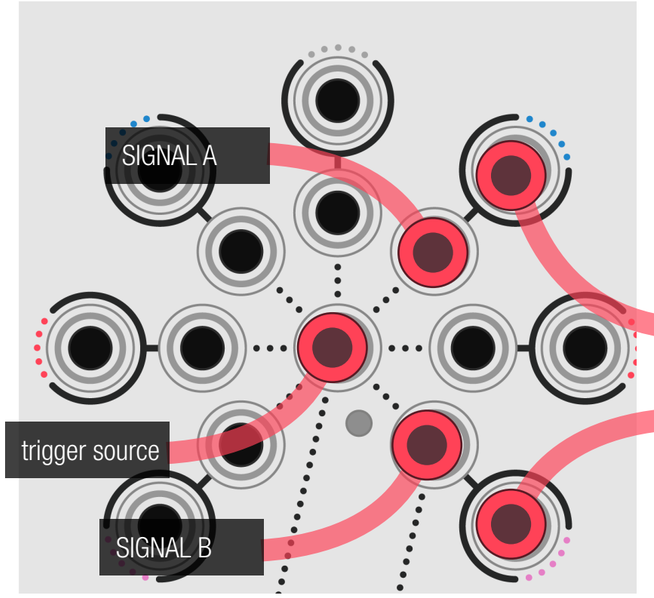
The Idea came from the Buchla Music Easel with its 4 uncorrelated random sources: random and different

Each output has its own internal noise generator, with different colours so you can have 7 different random CV driven by the same trigger without any external input.

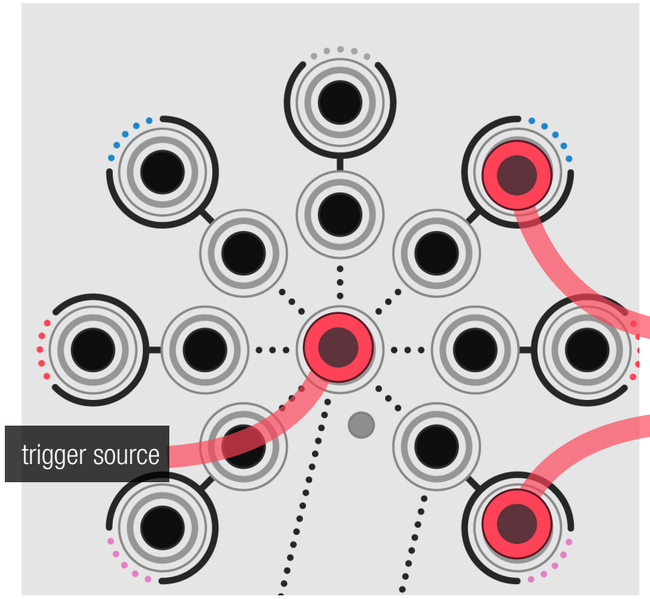
The noise generator is bypassed when an input source is connected.



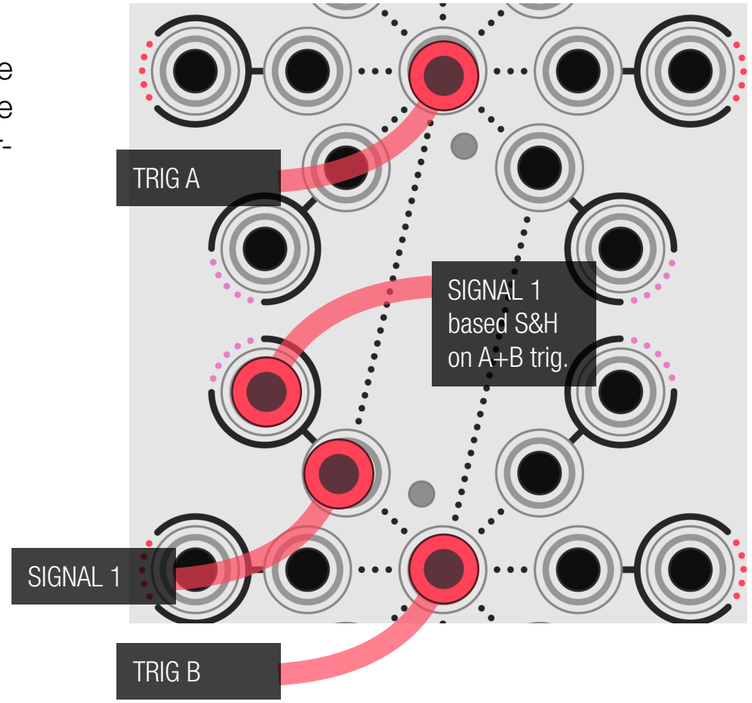
When no trigger or input source is connected: The outputs are just noise sources, different kinds of noise for each.



When a trigger and an input are connected, the noise generator is bypassed, and the S&H uses the input as material.

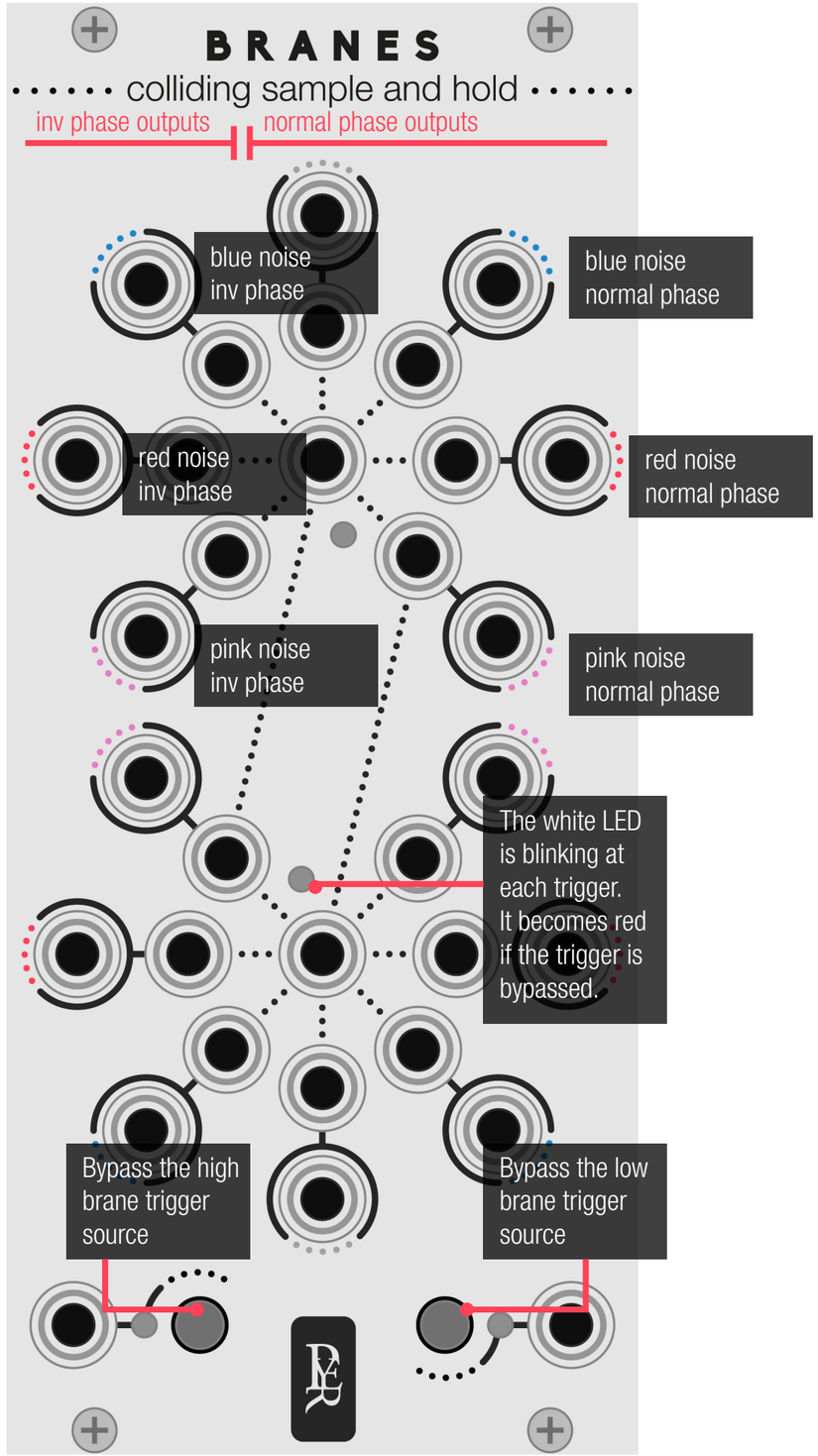


When a trigger is connected, the outputs use the trigger to sample and hold their internal noise generator and send random CV.



The two Colliding SH

They work as expected, but their trigger source is an addition of the two trigger sources. It allows you to create polyrhythmic melodies.



The inverted phase noise generators

Every noise generator on the left-hand side is the inverted phase version of the right-hand side.

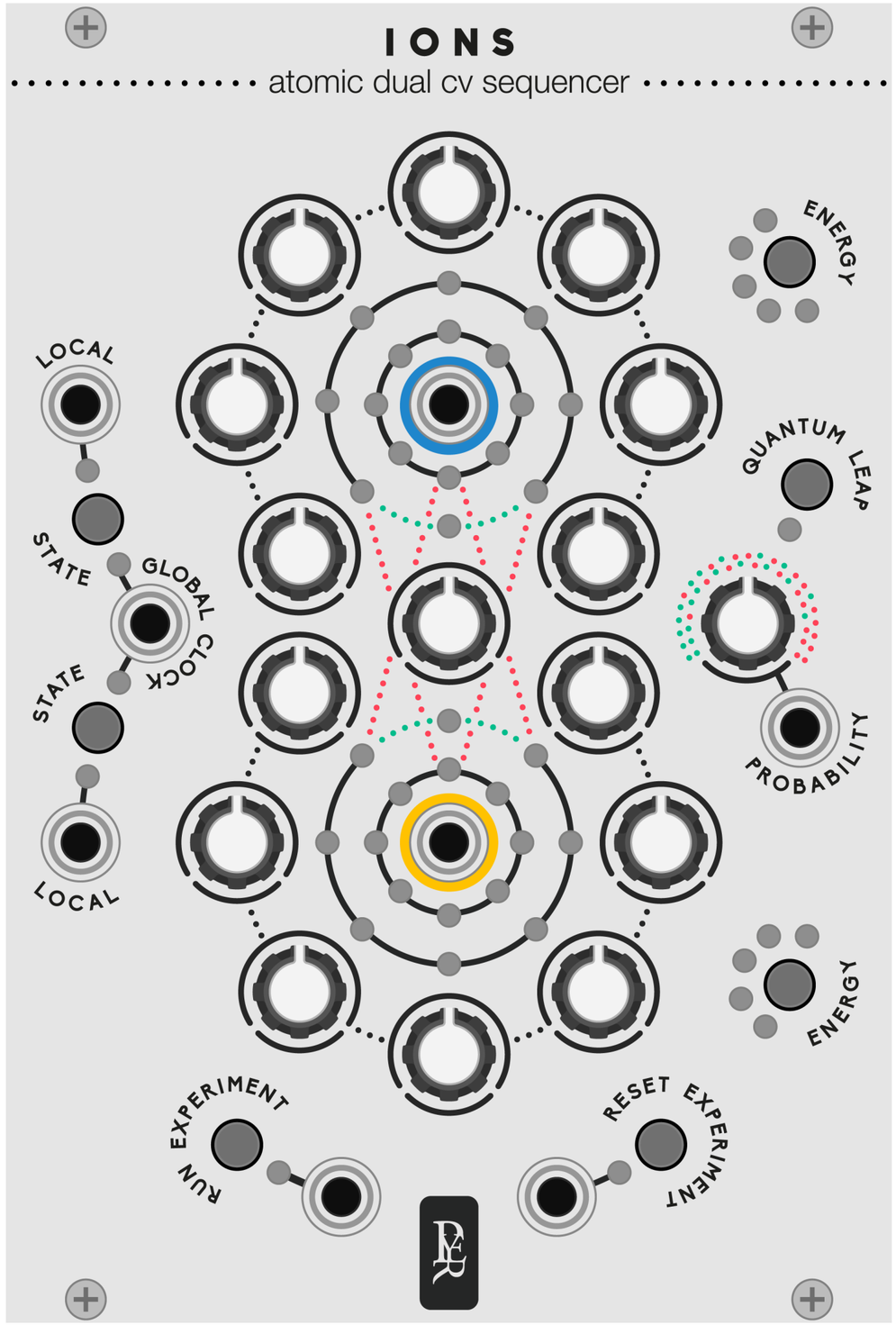
It is not really useful as a noise source, but when a trigger source is fed, the noise is sampled and then every left-hand side output will provide the opposite value of the right-hand side.

The Trigger bypass

When the trigger source is bypassed, every output will send the unsampled source input or noise.

This is useful to switch between the original signal and the quantised one.

It can also be used to momentary bypass one of the two triggers of the colliding outputs.



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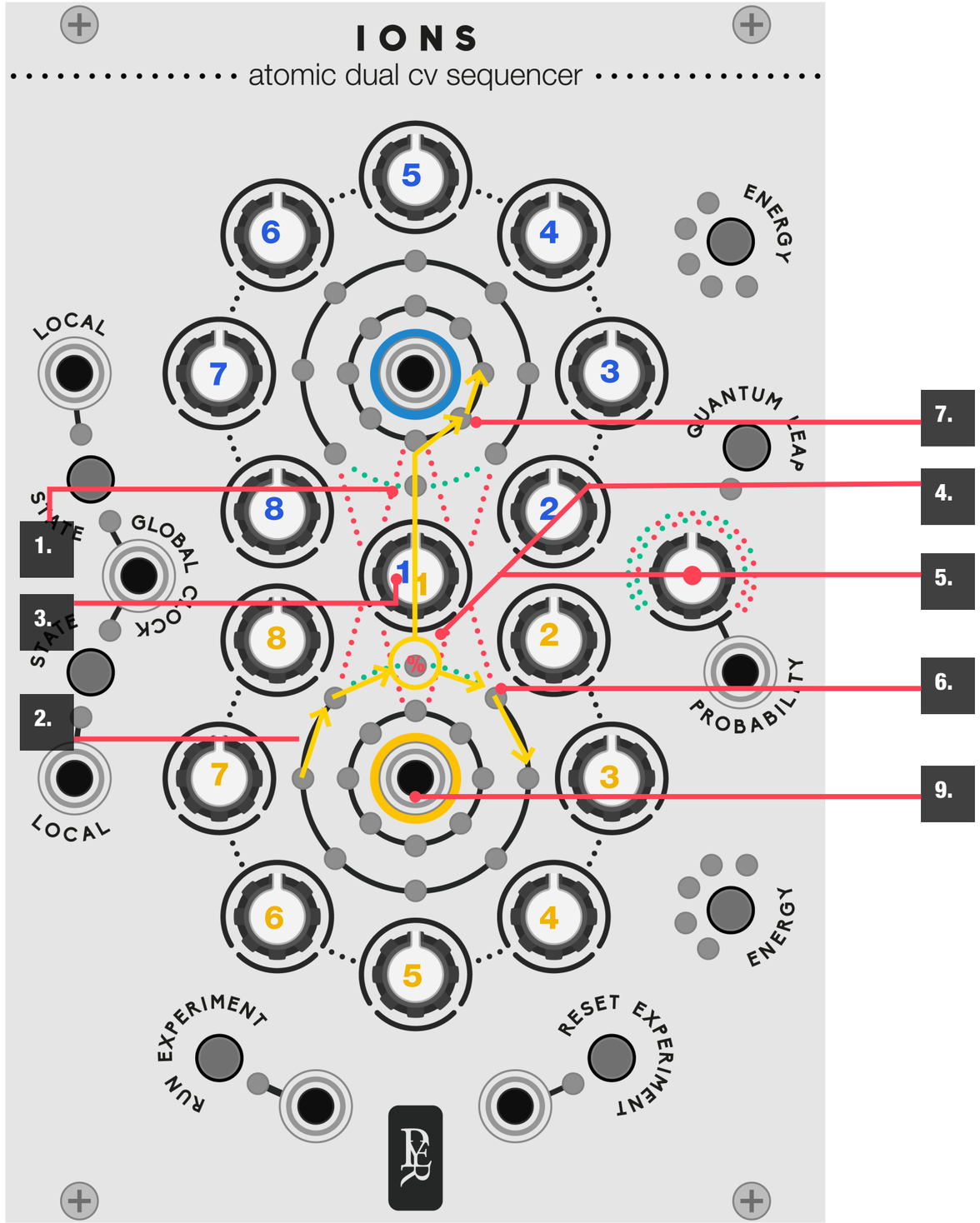


How it handles the sequence

1. The two CV voices are the blue electron and the yellow electron, they each gravitate around their blue and yellow core (CV OUT).

2. The electrons are both cycling through their own 8-step sequence.

3. They share the first step of their own sequence.

4. Each time they pass through step 1, they have a **probability to switch to the other core** and run on through the other sequence. The electron still emits from its original output, but it steals the notes from the other sequence.

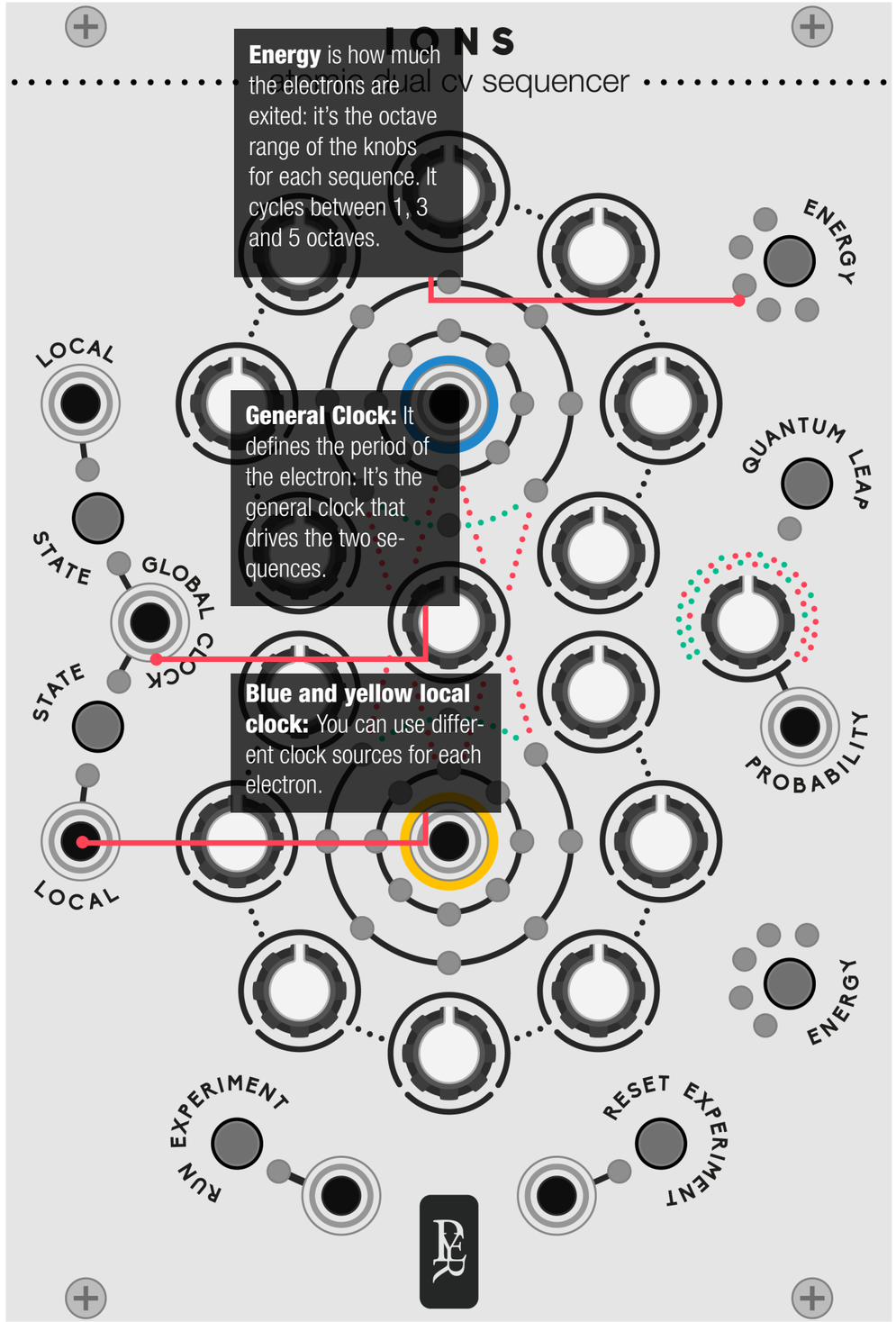
5. The probability to switch is controlled by the probability knob. And can be automated. While they share the same probability knob, they don't have the same engine, so they might be both together on the same core.

6. With a **probability of zero**, they will never switch and always stay a proper 2 voices **8 steps seq**.

7. With a **probability of 100**, they will always switch and always stay a proper 2 voices **16 steps seq**.

8. Energy is how much the electrons are exited: it's the octave range of the knobs for each sequence.

9. The Core is always linked to the original electron. The yellow core is always emitting the CV values that the yellow electron is passing through, even when it gravitates around the blue core.



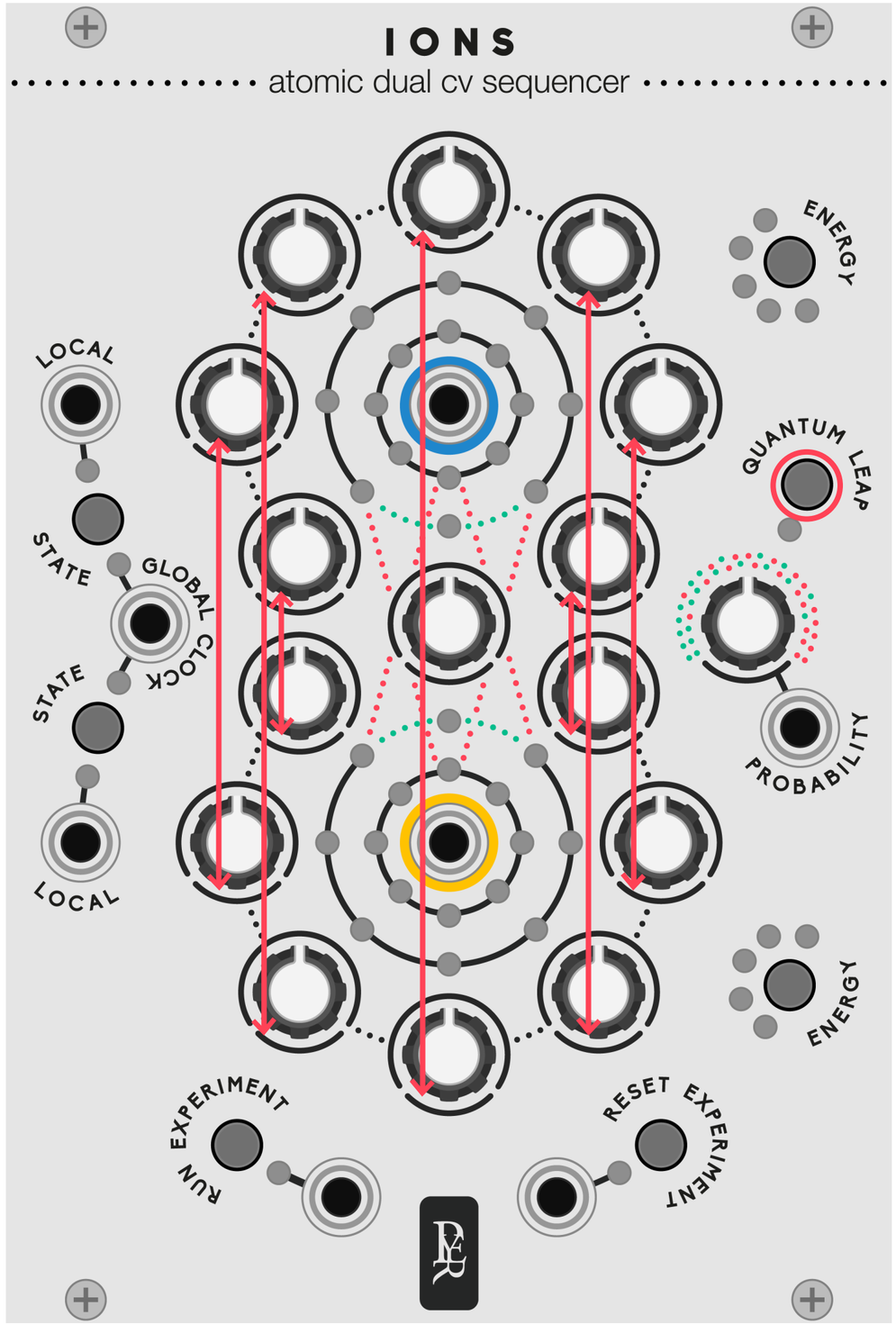
IONS

atomic duophonic voltage sequencer

How it handles the clock:

IONS doe not have an internal clock. You can use a clock for driving both sequencer at the same time, or a different clock for each sequencer … or both at the same time.

The State button: in our world, nothing can be two opposite things at the same time. But in the quantum world, an electron can have one status, or another … or both at the same time.
The state button cycle between 4 stages: each electron can be driven by the general clock, or their own clock … or the addition of both, for polyrhythmic effects.



IONS

atomic duophonic voltage sequencer

Alternate modes

Quantum leap introduces weird effect from quantum physic. Every step can be a gate to switch to the other core. By a smart automation of the probability knob, you can run an 8 step seq and decide to steal some notes from the other seq to have some variations.

Plank constant (right click): this will quantise every CV value to a chromatic scale.

Super Symmetry (right click): This mode makes the yellow electron act as a perfect mirror of the blue electron. For this purpose, the yellow clock is disabled.

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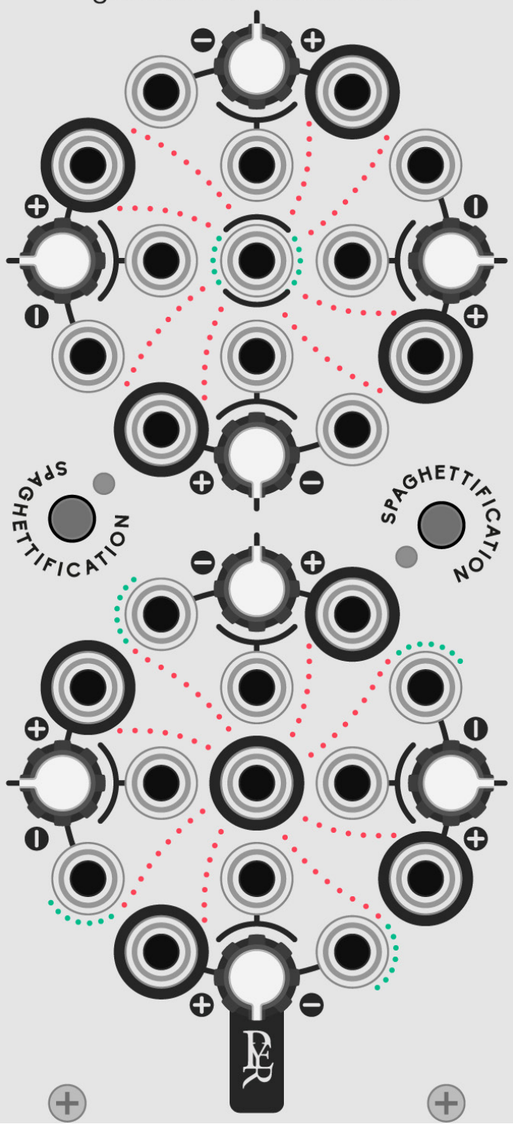

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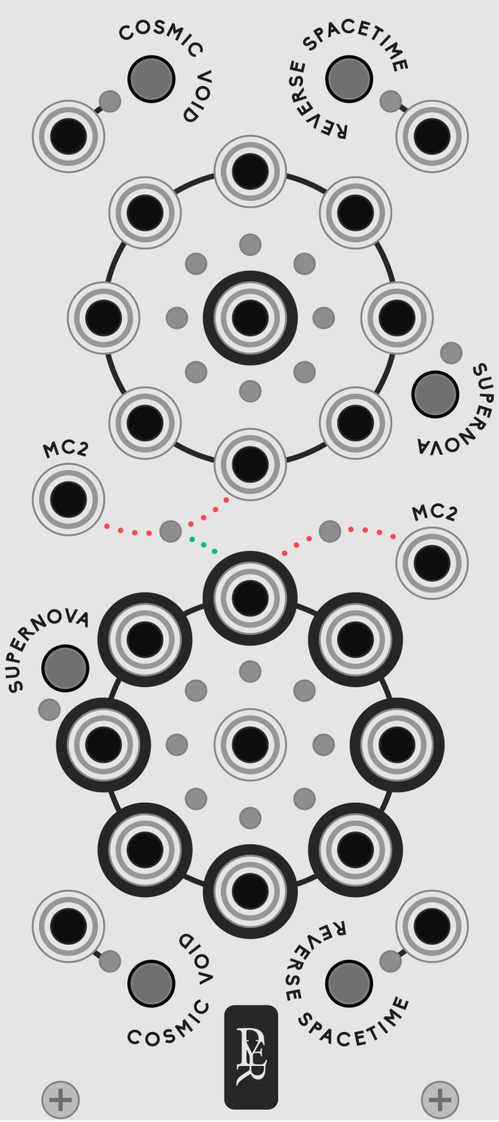
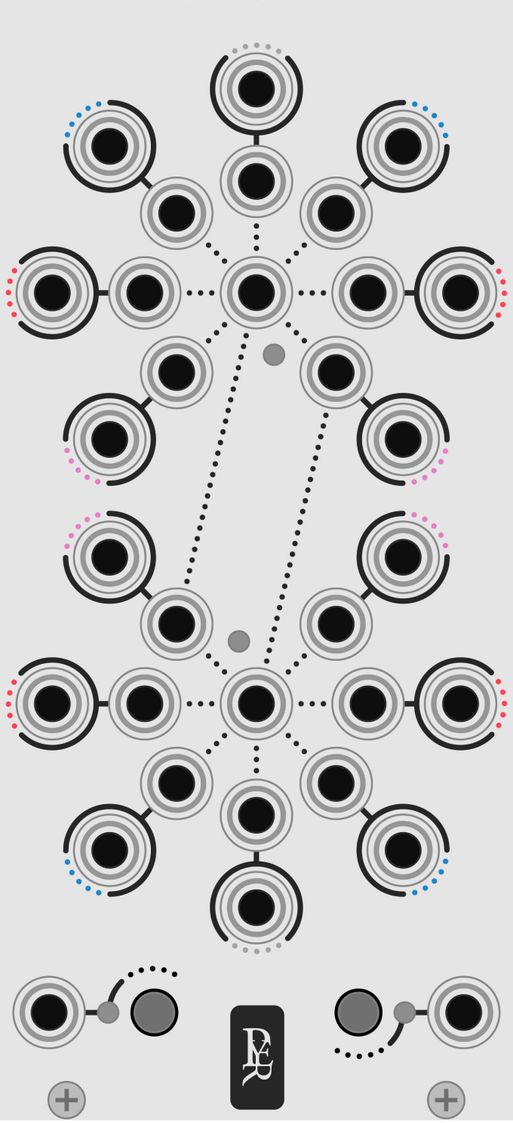


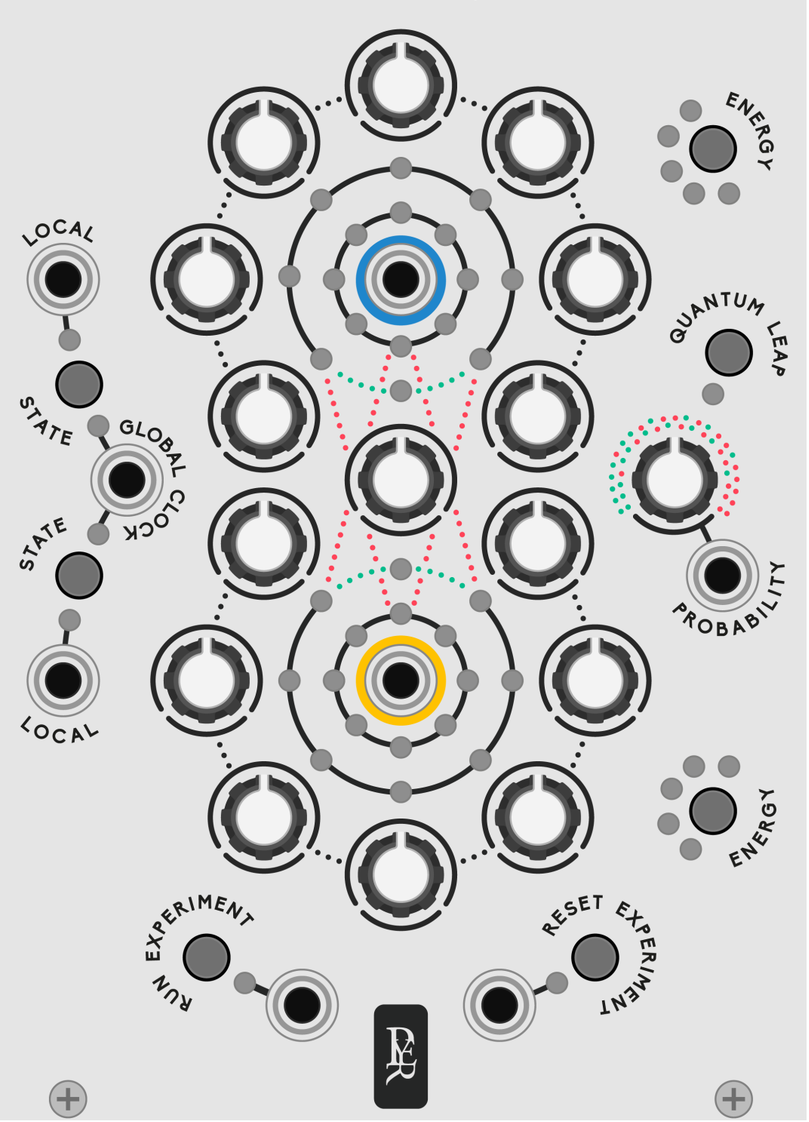
BRANES

colliding sample and hold



IONS

atomic dual cv sequencer



GEODESICS

A modular collection for VCV rack by Pyer & Marc Boulé

Entirely coded by Marc Boulé