GEODESICS

A modular collection for VCV Rack by Pyer & Marc Boulé

User Manual

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 is feasible in the hardware world, interacting elements are only knobs, buttons, LEDs and serigraphy.

For a more immersive concept, each parameter uses some terms related to the scientific phenomenon that inspires the module. It might be confusing at first but this is why this manual is here. As every unusual musical instrument, a learning curve is required to make the best of it.

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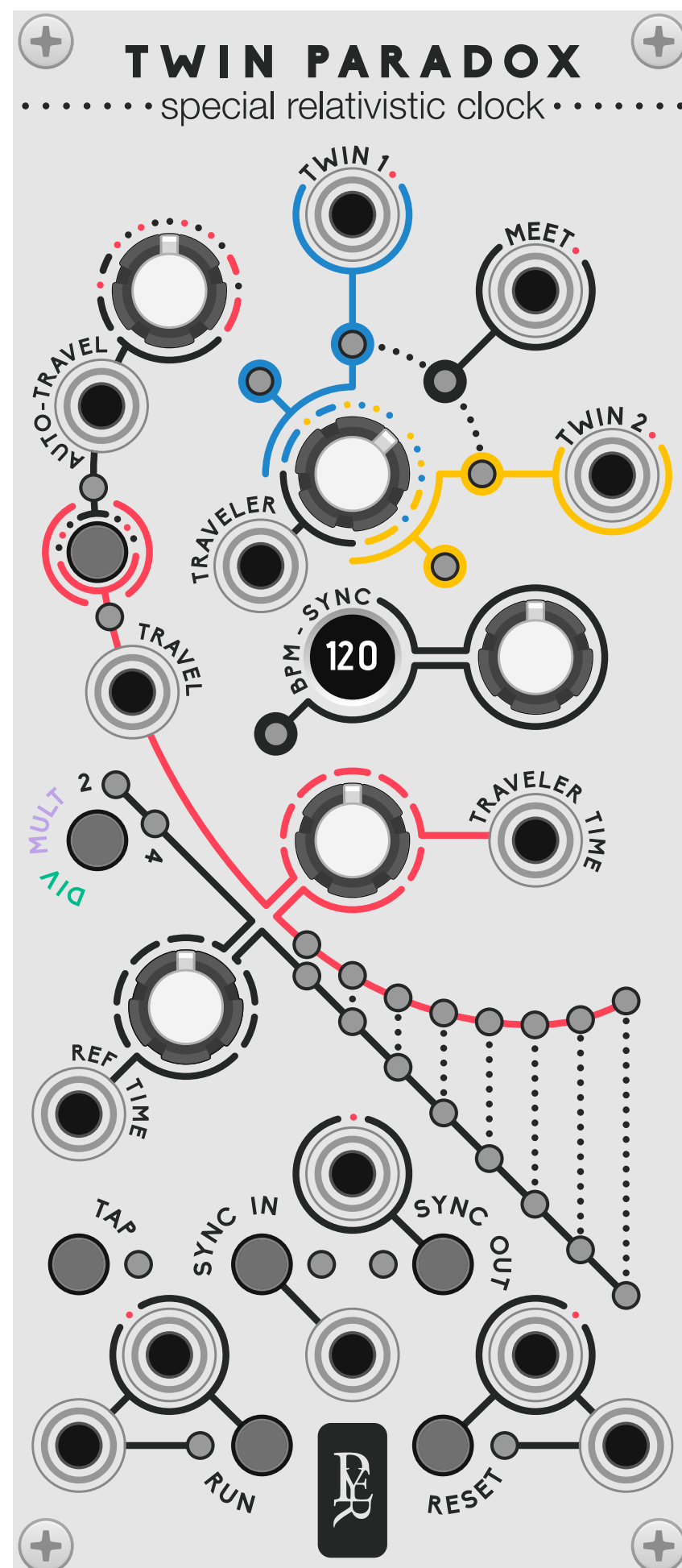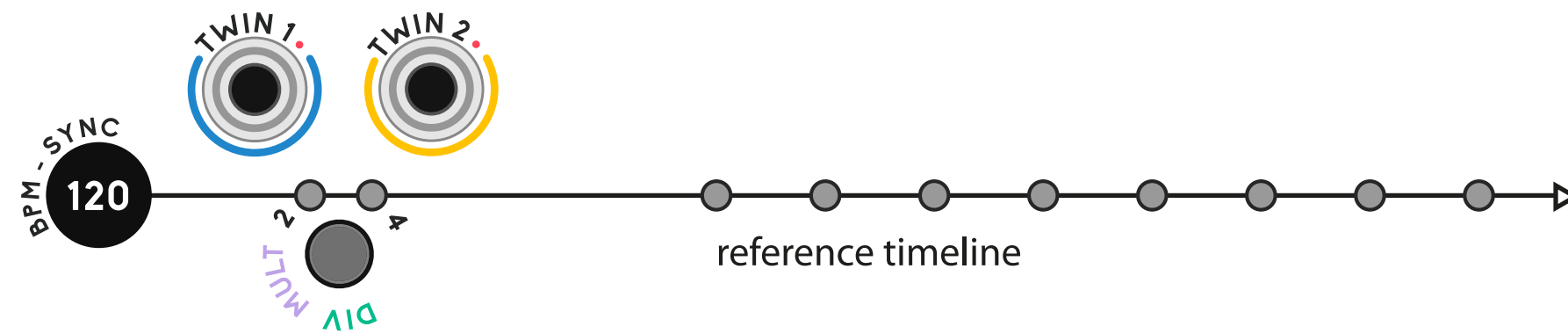
TWIN PARADOX

special relativistic clock

Consider two twin composers playing the same sequence on identical modular systems. One boards a spacecraft, traveling at near-light speed, and eventually returns home. Are their pieces still in sync?

TWIN PARADOX offers an answer with two synchronized clocks experiencing different time dilations based on irrational rhythms, while always meeting together at a defined point in time. The clocks can evolve, alternate, and exchange their timelines, constantly, or just long enough to come back into sync.
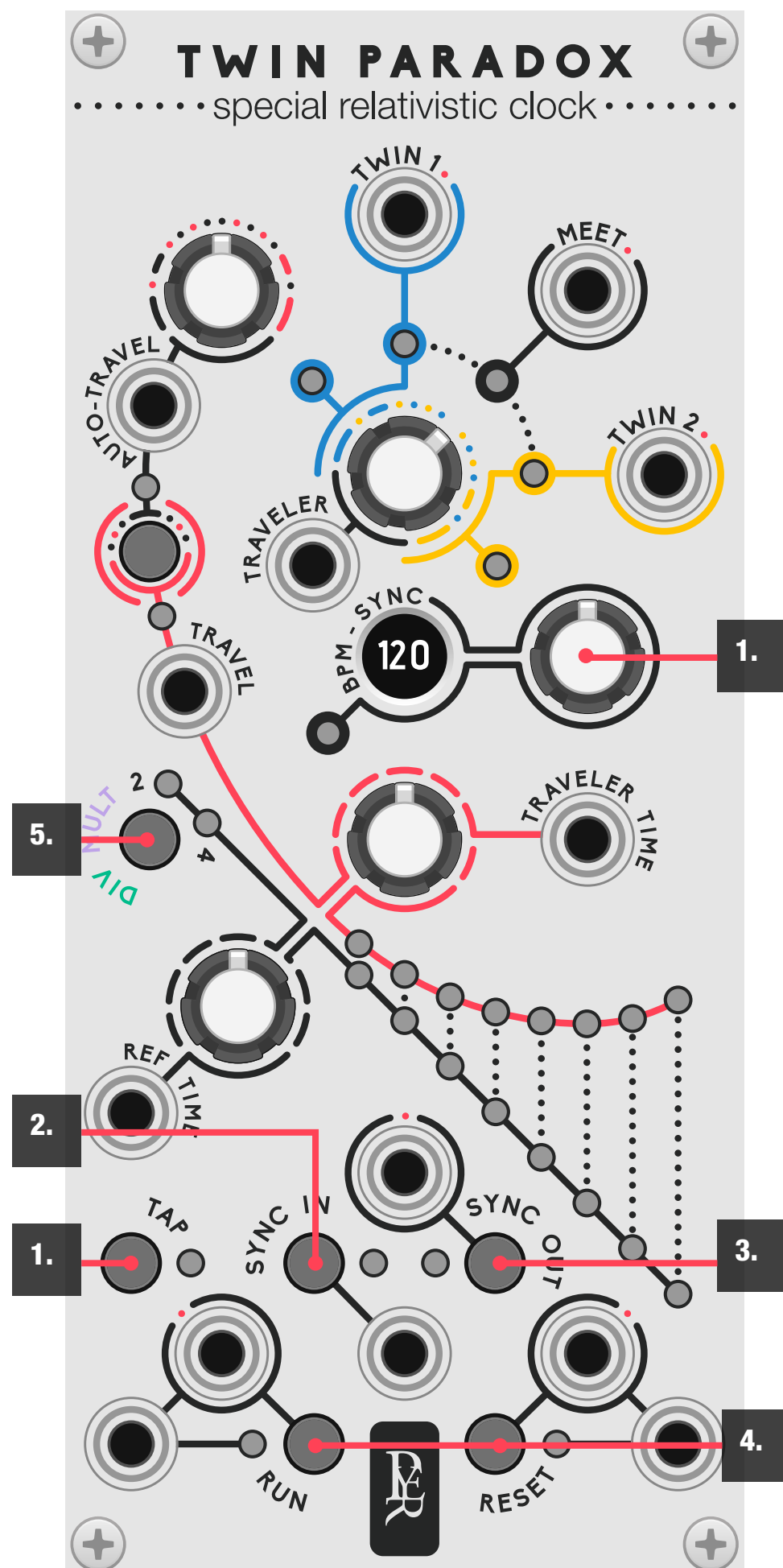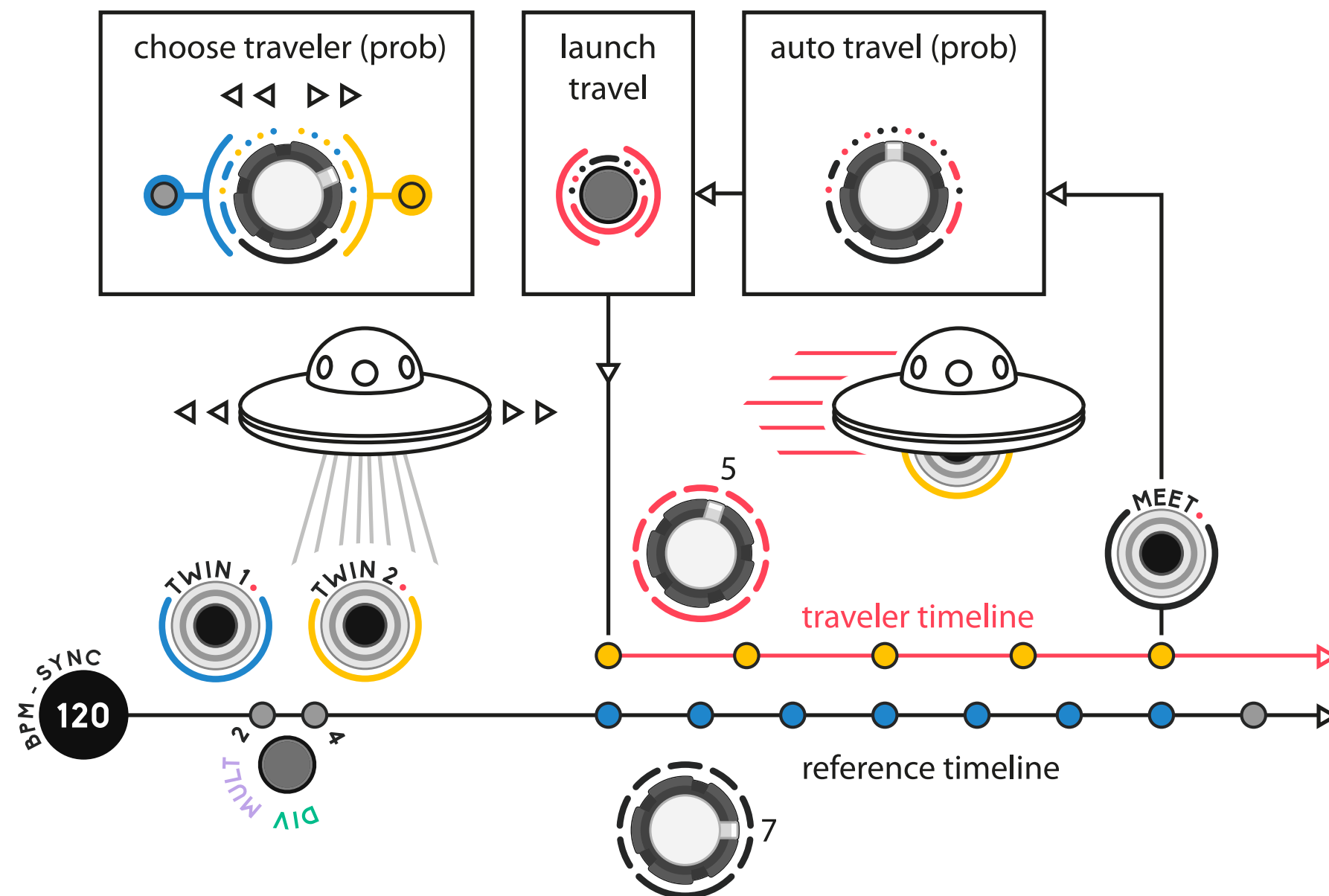
Clock controls

1. BPM (tempo) can be set manually using the **BPM endless knob**, or by tapping the rhythm on the **TAP button**.

2. Tempo can also be set externally using the **sync input.** Press the SYNC IN button to cycle through the different options:

- **P24/P48:** Expects 24 or 48 pulses per quarter note to set the tempo.
- **CV:** A fixed voltage defines the tempo (0V = 120 bpm). This is the most reliable method to sync multiple TWIN PARADOX modules.

3. The **sync output** provides a stable clock. Press the SYNC OUT button to cycle through the different options:

- **X1**: An extra clock output matching the BPM.
- **X24/X48:** Useful to drive GEODESICS VULTIVERSE HEXAQUARK.
- **CV:** A fixed voltage defines the tempo (0V = 120 bpm), ideal for syncing several TWIN PARADOX modules.

4. The **run** and **reset** outputs are the recommended sources to synchronize all sequencers. Their exact behavior can be customized via **right-click**, to ensure the best communication with many other known lifeforms. These settings are borrowed from human technology found in the IMPOROMPTU MODULAR CLOCKED module. Please refer to that manual for further explanation if needed.

5. The **div/mult** button allows you to alter the main outputs in five variations:

- Divided by 2 or 4 (green LED)
- Standard (LED off)
- Multiplied by 2 or 4 (purple LED).

Dual timeline concept

TWIN PARADOX features two clocks, "**TWIN 1**" and "**TWIN 2**". These can travel along different timelines.

The primary timeline is the **reference time**, set by the BPM and the mult/div button, indicated by a straight oblique line — this is the reference time (Earth time if you are human). Both twins use this timeline by default, it is never altered.

TWIN 1   TWIN 2

BPM - SYNC

120

MULT 2   4   DIV

reference timeline

choose traveler (prob)

◁ ◁   ▷ ▷

launch travel

auto travel (prob)

At any time, one of the two twin clocks can be become **the traveler,** moving along an alternate timeline depicted as a curved line, where time is either expanded or compressed. At the end of the journey, both twins meet again, and a new travel can begin.

The traveler timeline uses a ratio system defined by the REF TIME and TRAVELER TIME knobs: each sets **a group from 1 to 8 beats**.

Both groups are always of equal length. The traveler's group adapts its length to match the length of the reference group. While R beats passed on the ref planet, T beats passed for the traveler twin.

Each time the beat groups complete, the twins meet and a trigger is sent from the **MEET output**. This can be configured in **right-click** to trigger only after a travel, acting as an "end of travel" event. Using this to stop the module can generate interesting burst effects.
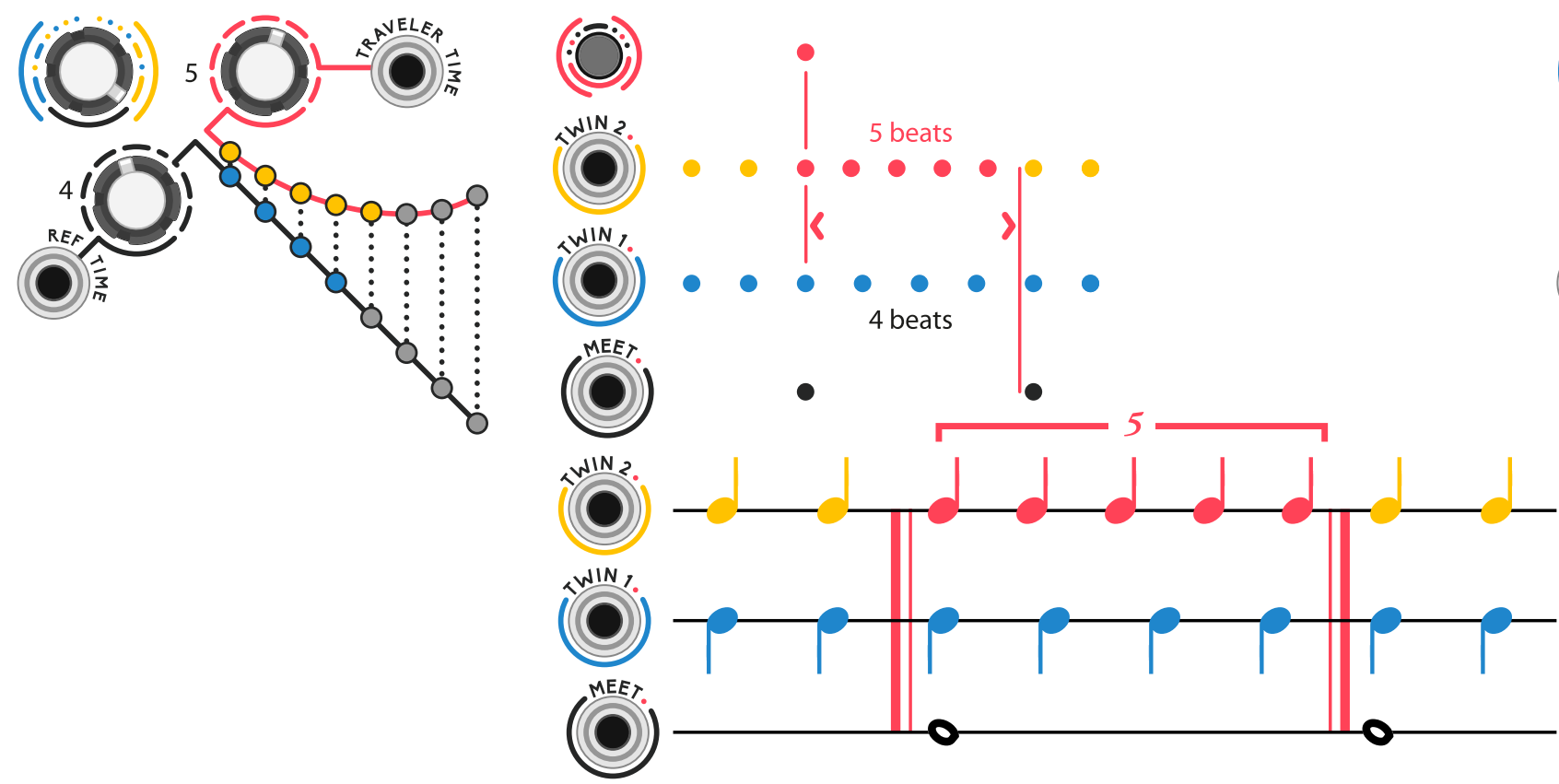
◁ ◁   ▷ ▷

TWIN 1   TWIN 2

BPM - SYNC

120

MULT 2   4   DIV

5

MEET

traveler timeline

reference timeline

7

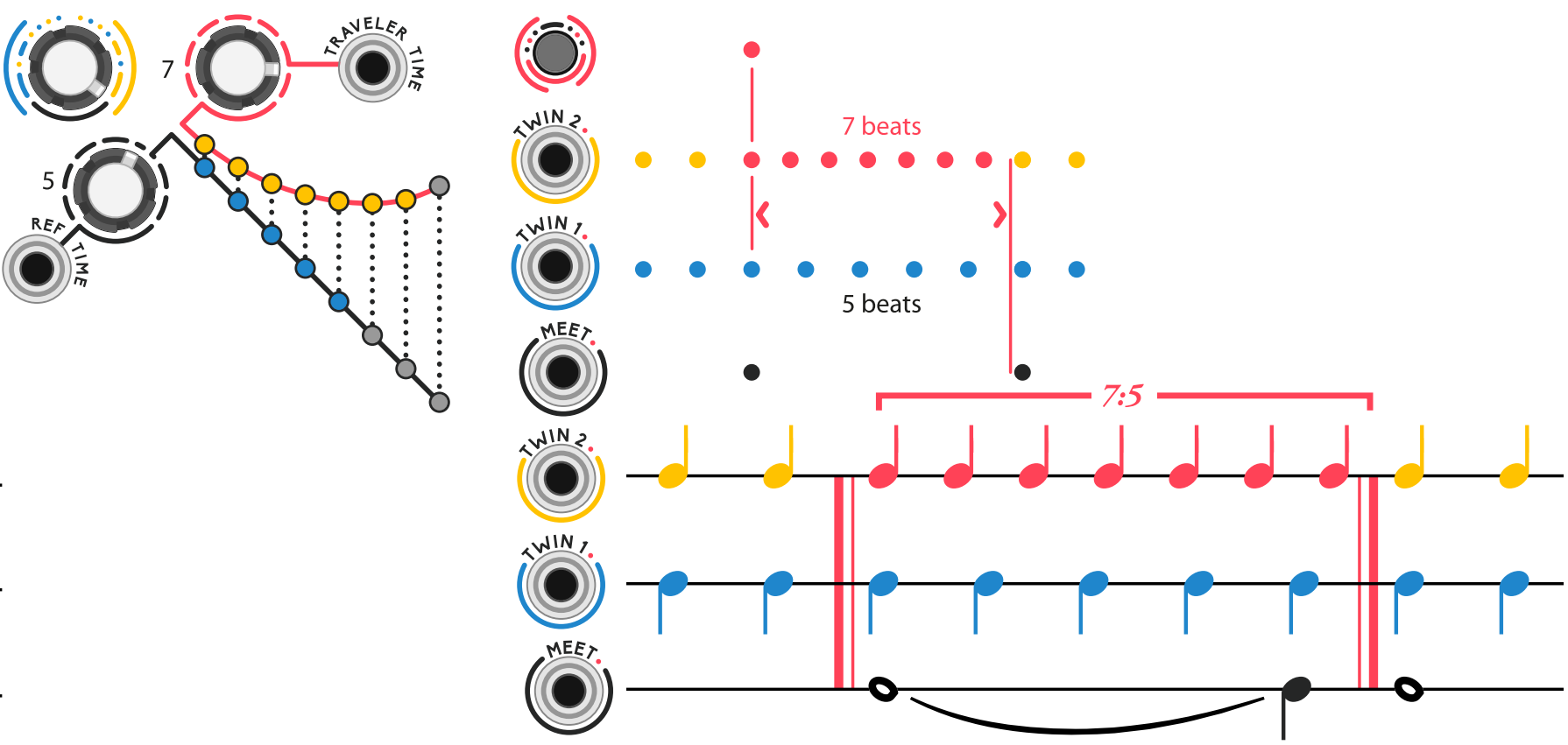# Setting ref to 1 and traveler to 2 makes a x2 clock multiplier
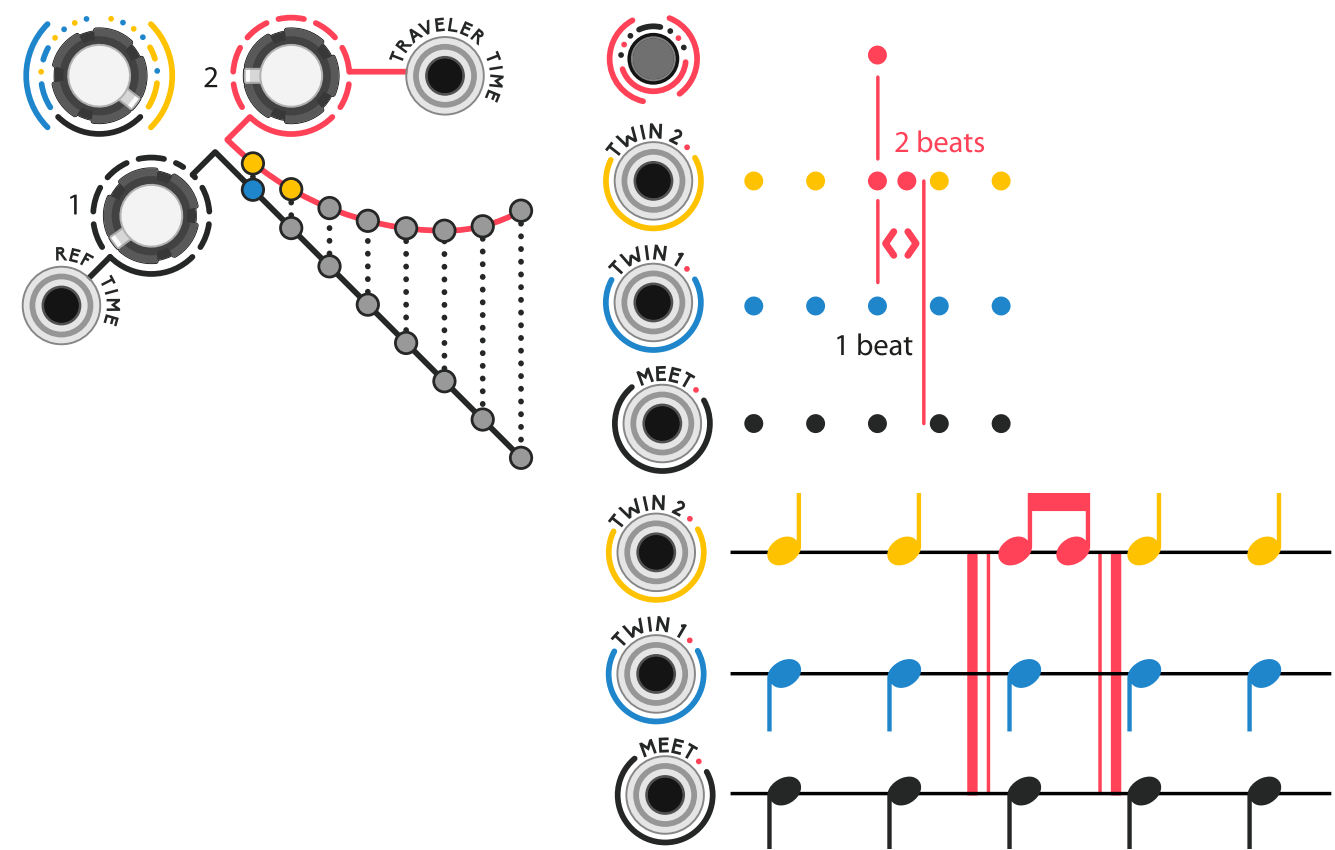
Setting ref to 2 and traveler to 1 makes a /2 clock divider
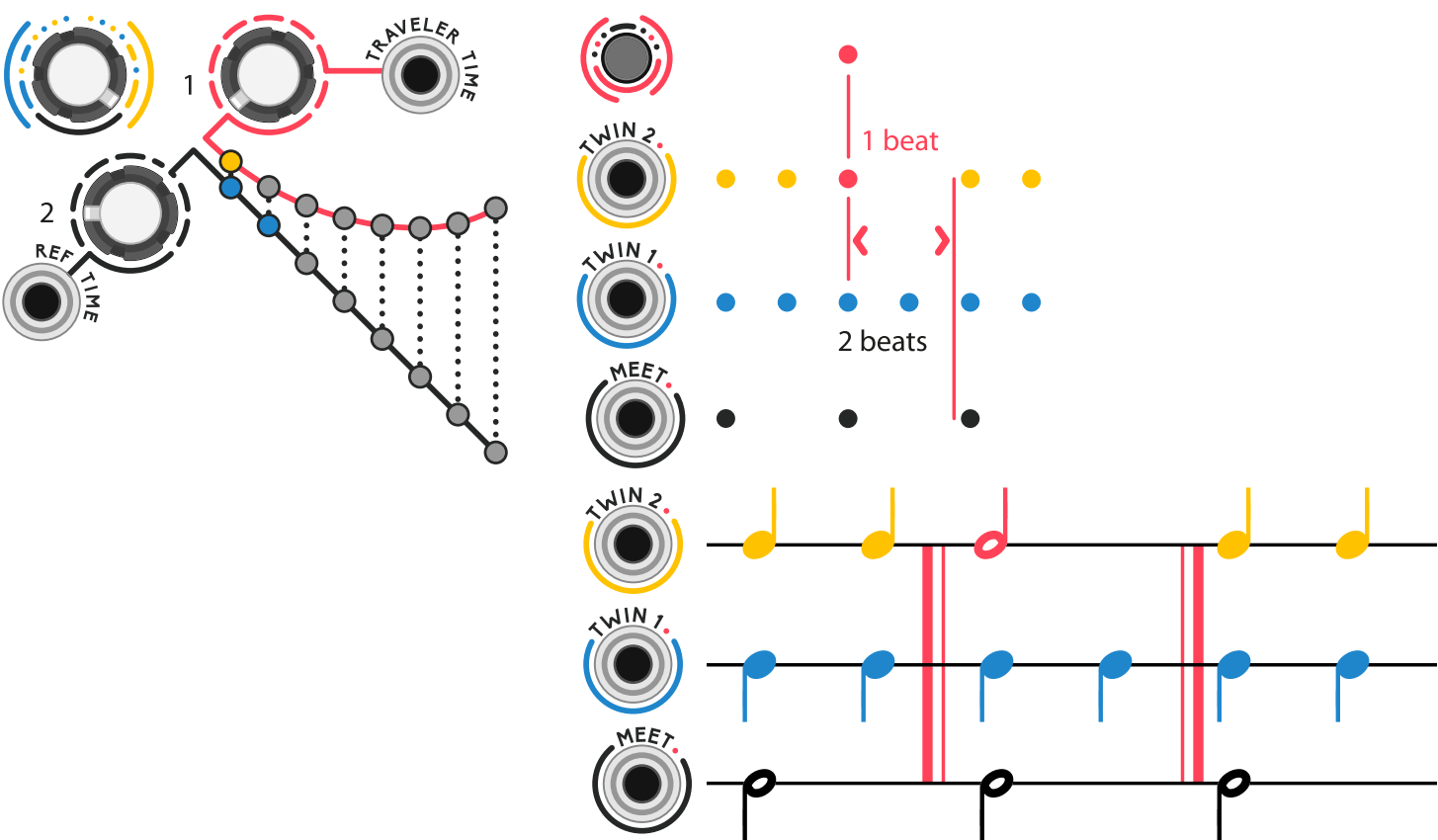
Setting ref time to 4 and traveler to 5 produces quintuplets

# Setting ref time to 5 and traveler to 7 produces an irrational rhythm of nested tuplets.

Triggering the travel

A travel must be triggered for a twin to switch to the traveler timeline. Travel always starts at the beginning of a new beat group, as set by the REF TIME knob.

1. Travel can be triggered manually or by CV/gate using the TRAVEL button.

2. Travel can be triggered probabilistically. The AUTO TRAVEL knob sets the probability of triggering a travel at each new group. At maximum, travel loops are constant, keeping the traveler timeline always active.

Picking the traveler

3. When a travel is triggered, a twin is selected to travel. The TRAVELER knob defines the probability to pick one twin over the other: minimum and maximum values ensure a consistent traveler, while intermediate values let the twins alternate use of the traveler timeline.
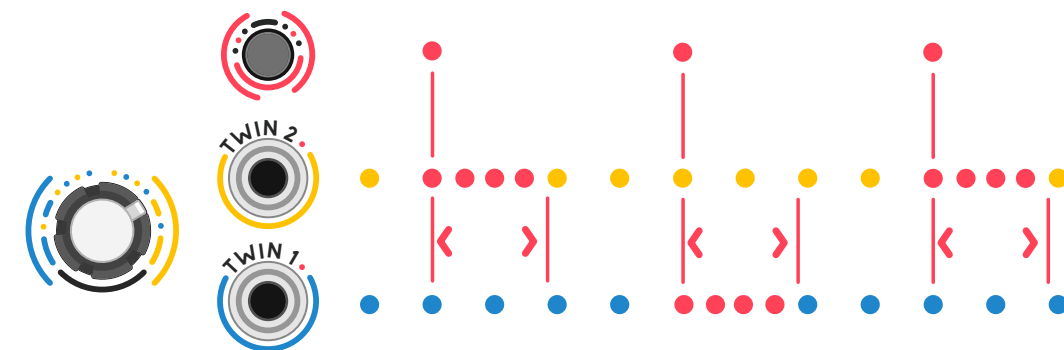
G E O D E S I C S

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**, **Ghalebor, Stephen Askew, Lars Bjerregaard, Richard Squires, Lorenzo Fornaciari, Adi Quinn, NO rchestra, Poxbox23** and **Ananda Bhishma.**

Geodesics links
www.pyer.be/geodesics
vcvrack.com/plugins.html#Geodesics
github.com/MarcBoule/Geodesics

Creations from composers using Geodesics:
https://www.youtube.com/playlist?list=PLEh-5QLxa-BlqLl9rBcncUTFm2Lk-ZMgvZ

Tutorials on Geodesics by Omri Cohen:
https://www.youtube.com/playlist?list=PLEh-5QLxa-Blr4dsurkkwUehFsNl7T_Jv-

Marc's work links
github.com/MarcBoule/ImpromptuModular

Pierre's work links
www.pyer.be

Coded and released by Marc Boulé – Concept and visuals by Pierre Collard