

# Rhythmi Information Package



## Short Intro

Rhythmi is a Eurorack drum sequencer that allows you to dial in your groove, and explore it by evolving the pattern and modulating the energy. It allows for rhythmic inspiration and creativity without the burden of step programming. The evolve parameter enables smooth transitions between related rhythms through the use of *branches*. New branches can be generated at the push of a button, loading up a whole new branch of related rhythms to explore. The Evolve parameter is the heart of Rhythmi, its inspiration, and defining feature. Allowing rhythms to shift, transform, and melt into one another.

The Clock Section provides internal or external clocking with division or multiplication. The Customize Section shapes individual drum elements through density and syncopation. The Global Section introduces macro-level control over the rhythm via the Energy, Evolve, Length and Swing parameters, dynamically shaping fills and variations. Rhythmi has a jumper cable connector on the back to pair up seamlessly with Beatsi, the drum voice it was designed alongside with.

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## Deeper Technical Dive

### **DEFINITIONS:**

Non-syncopated hit: A trigger that occurs for a particular piece (hi hat, snare, kick, tom, crash) on the clock pulse.

Syncopated hit: A trigger that occurs for a particular piece in between two clock pulses.

Swung hit: A trigger that occurs for a particular piece on every second clock pulse when the swing is non zero. Swung hits are non-syncopated.

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### **MODULE WALKTHROUGH:**

## Clock Section:

In: External clock input.

Reset: Resets the module to the beginning of the loop.

Speed: When no external clock is patched in, the module will generate its own clock, whose speed can be set by turning the encoder, as displayed on the vertical LED strip. When an external clock is patched in the encoder will act as a clock divider/multiplier. The clock can be multiplied or divided by up to ten times, as displayed on the vertical LED strip.

Out: Outputs the clock used by the module, including the clock dividing/multiplying and the swing.

## Customize Section:

CHH: Closed hi hat.

OHH: Open hi hat.

Synco: Sets the approximate ratio of non-syncopated, and syncopated hits that occur for a particular piece.

Density: Sets the total amount of hits that occur for a particular piece given the syncopation setting.

Tom Amount: Sets the number of available pitches for the tom to play. Akin to how many different tom drums our drummer has available to them.

## Global Section:

Length: Sets the length of the loop, from 2 to 32 clock pulses, as displayed on the vertical LED strip, in groups of 8.

Energy: A macro control over the kick, snare and tom densities and syncos. As the energy is increased, the densities of the kick, snare and tom will increase until the cursor on the vertical LED strip turns red. At this energy level, the crash and kick will be triggered at the beginning of each loop. If the energy is increased past this point, the synco will be biased towards 50-50, bringing in more syncopated or non-syncopated hits depending on the position of the corresponding pieces synco knob.

Progress LEDs: The horizontal strip of LEDs found next to the word "GLOBAL". They indicate, from right to left, where the module is in the loop. Their color

indicates the base pattern.

**Base Pattern:** Refers to where in the loop the specific hits start playing as the density is increased. There are 5 different base patterns, each with their own unique feel. To change base patterns, long press the encoder knob. For example, the orange base pattern: With low snare density, (with 0% sync and a loop length of 4) the snare will start playing on the 3rd clock pulse of the sequence. Turning up the density will introduce snare hits on the 1st clock pulse, then on the 4th, then on the 2nd. In contrast, the yellow pattern will introduce the lowest density snare hit on the 4th clock pulse, then on the 2nd, then the 3rd, then the 1st.

**Root Rhythm:** Defined as the rhythm that is dialed in using the density and sync knobs, when the evolve and energy are at minimum.

**Evolve:** Turn the encoder to explore variation of the drum pattern. These variations will persist as the module loops. Turn the encoder counter clockwise to return to the root rhythm. Modulating between the evolved (varied) patterns and the root rhythm can be achieved by turning the encoder, or using CV. Short pressing the encoder will randomize the variations, but the pattern can always be returned to the root rhythm by minimizing the evolve. Randomizing the variations is also possible through CV. To enable this, press the evolve encoder while holding down the speed encoder, and the progress LEDs will (temporarily) turn from red to green to enable CV randomization. To randomize with CV, take the evolve value above 75% and the randomization will occur (shown by the animation on the vertical LEDs). To disable CV randomization, press the evolve encoder while holding down the speed encoder, and the progress LEDs will (temporarily) turn from green to red, disabling CV randomization.

**Swing:** Sets the placement of every second clock pulse from 50% at minimum (equally spaced from the previous and next clock pulses, or "no swing") to 90% at maximum.

### **Out Section:**

Outputs for the different pieces. The CRASH, SNARE, TOM and KICK outputs are triggers.

The HI-HAT output jack outputs gates and triggers, depending on whether an open hi hat or closed hi hat is played.

The TOM CV output jack outputs the pitch of the tom, with v/oct tracking, quantized to a minor pentatonic scale.

### **Module state saving:**

Pausing the clock causes Rhythmi to record the speed of the clock, the clock division, the amount of EVOLVE, instantaneous EVOLVE CV status, and the base pattern to its permanent memory, making it easier to pick up where you left off after turning off your case.

### **MODULE THEORY:**

Rhythmi creates drum patterns using the concepts of syncopation and non-syncopation. Every piece (other than the closed hi hat) has syncopation control. When placed in context of a larger musical system, this will give control over the off beat syncopation feel of every individual piece. However, the specifics of exactly when each piece is playing is handled by the module, freeing up the user to make more global decisions.

Rhythmi uses the same output to communicate open and closed hi hat hits. This works by having the hi hat sound be triggerable by a gate where the gate on-time sets the length of the open hi hat. Imagine a noise source being attenuated by a VCA controlled by the gate coming from the hi hat output on Rhythmi. The noise will be let through in a very short blip when a trigger is sent, simulating a closed hi hat. If a gate is sent, an open hi hat will be simulated as a longer sound will be played. This means that any range of open hi hats can be played, all the way to a closed hi hat with a very short gate (trigger), all with one signal.

The energy control of the module is essentially a macro over the density and the synco settings of the kick, snare and tom. Increasing the energy setting increases the number of times the pieces will play in an intelligent way. The kick and the snare are boosted for the beginning half of the loop before trailing off, and the tom begins to be boosted near the end of the loop, creating fills. The tom pitch is also biased towards a decreasing pattern near the end of the loop to further reinforce the feel of the fill. After a certain threshold (cursor turns red) the crash output jack will send a trigger. This is useful not only to play a crash sound, but also mult out to the rest of the system to signal a global change (for example; the resetting of LFOs).

The evolve setting randomly varies the presets from the base pattern (see Base Pattern section in the module walkthrough). Meaning that the pieces will come in at different points as the density is increased. These random variations remain constant and are made more powerful as the evolve is increased. Pressing the evolve encoder will generate a new set of variations (or using the CV function discussed in the evolve section of the module walkthrough). Bringing the evolve down to zero will minimize the effects of these random variations bringing the pattern back to the root rhythm.

The swing shifts any hits that occurs on every second clock pulse later in the pattern, even past the following syncopated hits, giving some really neat rhythmic effects.