

# B NEO TRINITY

AUTOMATABLE MODULATION HUB

BASTL INSTRUMENTS





# NEO TRINITY

## 6 CHANNELS OF GESTURAL MUSIC-MAKING

Neo Trinity is a 6 channel compact modulation hub with great musical complexity achievable with simple gestures. Each of the 6 channels can be either LFO, envelopes/envelope generator or a CV knob recorder, while their main parameter can be automated with the REC button. Each channel also features a recordable trigger generator with an algorithmic fill feature to get the inspiration started or to make things polymeric and keep your patches ever changing. Use the SHIFT button to change modulation shapes and sync selected or all channels to an internal or external clock.

Neo Trinity has been designed with performance in mind, so it includes channel mutes and allows for storing whole presets as banks.

While the core mechanics of the module are very simple, the inclusion of assignable CV inputs exponentially increases the complexity of the behavior of the module. Control some or all channels in different ways with the META IN, while channels E and F have dedicated inputs. The inputs can control the main parameter in positive or inverted way, control the output amplitude, act as an external trigger or a trigger for internal Sample & Hold function. The CV knob recorder mode also acts as a quantizer and when combined with the CV inputs it turns into a handy voltage processor.

## TECHNICAL DETAILS

- 8 HP
- PTC fuse and diode protected 10 pin power connector
- 24 mm deep
- Current consumption: +12 V: <100 mA; -12 V: <35 mA

## FEATURES

- Indication per channel
- Unipolar (0–5V) or bipolar (-5V to +5V) mode per channel
- LFO shapes (with smoothing): saw, triangle (sine), ramp, pulse, random (smooth)
- LFO range: 260s–180Hz
- LFO sync (RATE knob sets divider)
- ENV shapes: decay, attack, variable, pulse
- ENV range: 1ms–8s
- ENV retriggerable or non-retriggerable
- ENV slew limiter mode (or AHR envelope with GATES)
- CV mode with quantization (ON/OFF, 8 scales, 2V or 5V range, smoothing)
- All modes feature automatable RATE knob and trigger sequences
- Independent length of automation per channel (2–64 steps)
- Clock-quantized or non-quantized trigger recording
- Trigger algorithmic fill generator (6 algorithms with knob parameter)
- Mute per channel
- Memory for 6 banks (all settings and automations)
- Clock Reset input for automation (can be individually turned off – per channel)
- CLK channel for setting tempo or for dividing/multiplying external clock
- Internal CLK generator range: 35 BPM–420 BPM
- CLK IN and CLK OUT connectors
- META IN CV input – assignable independently to some or all channels
- Channels E and F feature dedicated CV inputs
- All CV inputs have adjustable function: positive/negative and attenuated RATE modulation, bipolar VCA at channel output, TRIG input (slew input), Sample & Hold (for triggered stepped waveforms)
- Firmware updates via USB-C
- User calibration of outputs and inputs (for quantizer precision)

# Quick Start

## 6 CHANNELS – 3 MODES

Neo Trinity is a 6-channel modulation source.

Each channel can be set to either **LFO**, **ENV** or **CV** mode.

**LFO** primarily serves for repeating simple modulation shapes.

**ENV** mode is for rhythmic triggered modulation.

**CV** mode serves for recording the knob movements and creating pitch sequences.

### 1. Channel outputs

Patch them to modulate stuff  
Lights indicate channel voltage

### 2. Channel buttons

Press to select the channel

### 3. MODE button

Press to change the mode of the selected channel

### 4. RATE knob

Adjust the main parameter of the selected channel

### 5. REC button

Hold REC+turn RATE to automate RATE

Hold REC+hit SHIFT to record triggers

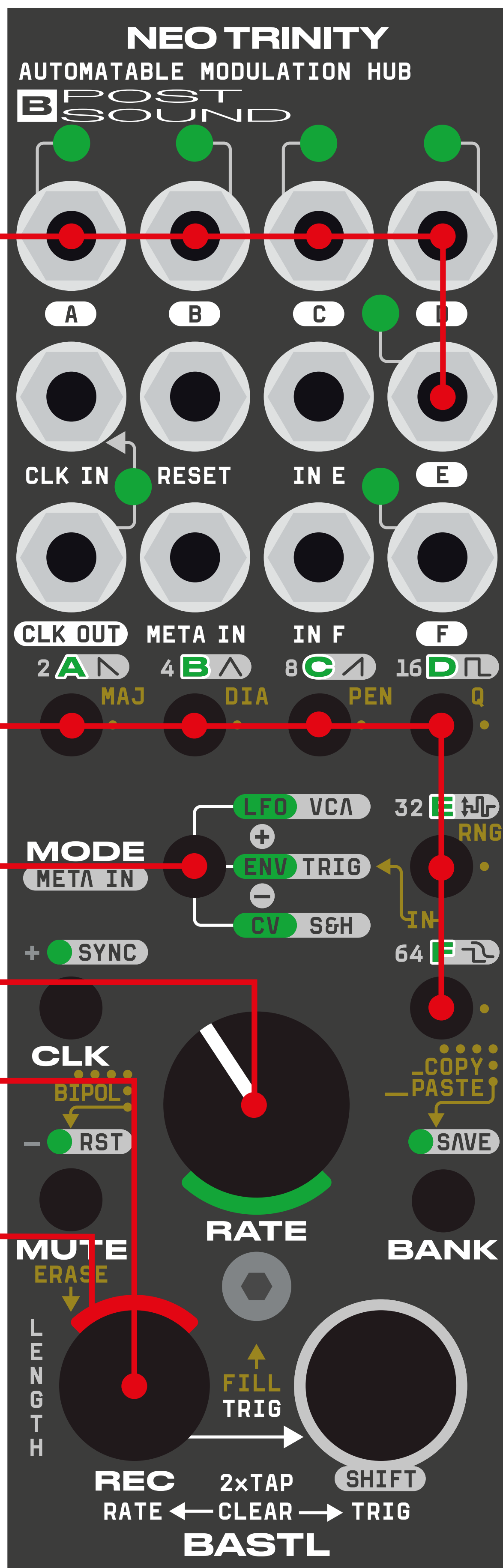
### REC light

Indicates active automation

### 6. CLEAR the automation

Double tap REC to clear the automation of RATE knob

Double tap SHIFT to clear the trigger automation



SHIFT +A/B/C/D/E/F = shape

The surface level operation is super easy:

# 1

Use the outputs to modulate your other modules.

# 2

To select a channel press one of the **A/B/C/D/E/F** channel buttons.

# 3

To change a mode of the selected channel press the **MODE** button.

# 4

Use the **RATE** knob to set the main variable of the selected channel.

## 5 AUTOMATE

Each channel has an independent sequencer for automating its **RATE** knob and for adding trigger events.

Hold **REC** and move the **RATE** knob to record automation.

Hold **REC** and tap **SHIFT** to record a trigger into the sequence.

## 6 CLEAR

Is it doing too much stuff?

**REC** light indicates that there is an automation present.

Double tap **RATE** to remove automation of the **RATE** knob.

Double tap **SHIFT** to remove all the recorded triggers on the selected channel.

## CHANGE SHAPE

Further you can change the shape or mode-specific settings by holding **SHIFT** and pressing the **A/B/C/D/E/F** buttons – see the symbols in the silver background on the panel.

## **SYNC**

Sync **LFO** to clock by holding **SHIFT** and pressing **CLK**.

Each channel is completely independent, but some or all can be influenced together either by the **CLK** or by the **META CV** input.

That is it for a quick introduction.

# Button Combos

## Channel Settings

mute/unmute channel	<b>MUTE+A/B/C/D/E/F</b>
channel shape	
/mode-specific settings	<b>SHIFT +A/B/C/D/E/F</b>
sync LFO to CLK IN	<b>SHIFT +CLK</b>
channel reacts to reset	<b>SHIFT +MUTE</b>
META IN mode	<b>SHIFT +MODE</b> (> 2s to disable)
E/F input mode	<b>EF+MODE</b> (> 2s to disable)
set channel bi-/unipolar	<b>A/B/C/D/E/F+MUTE</b>
quantize channel trigs	<b>A/B/C/D/E/F+CLK</b>

## CLK channel

start/stop clock	<b>MODE</b>
set CLK IN divider	<b>SHIFT +A/B/C/D/E/F</b>
adjust CLK IN divider	<b>SHIFT +CLK/MUTE (+/-)</b>
tap tempo	<b>REC+ SHIFT</b>

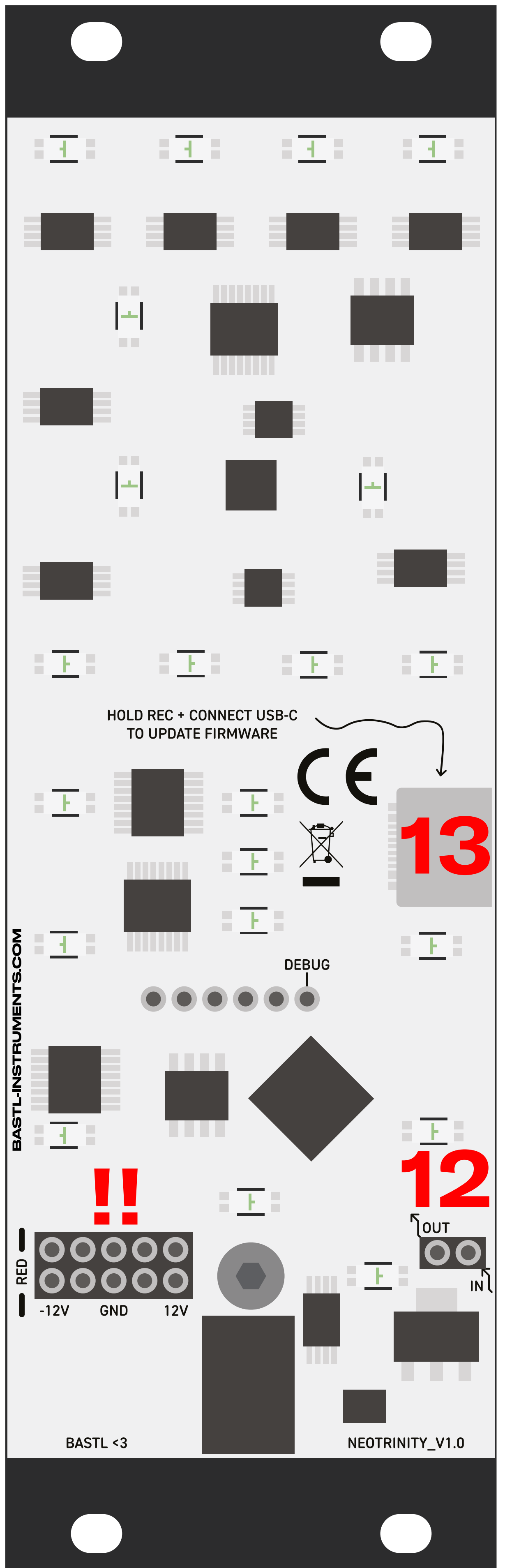
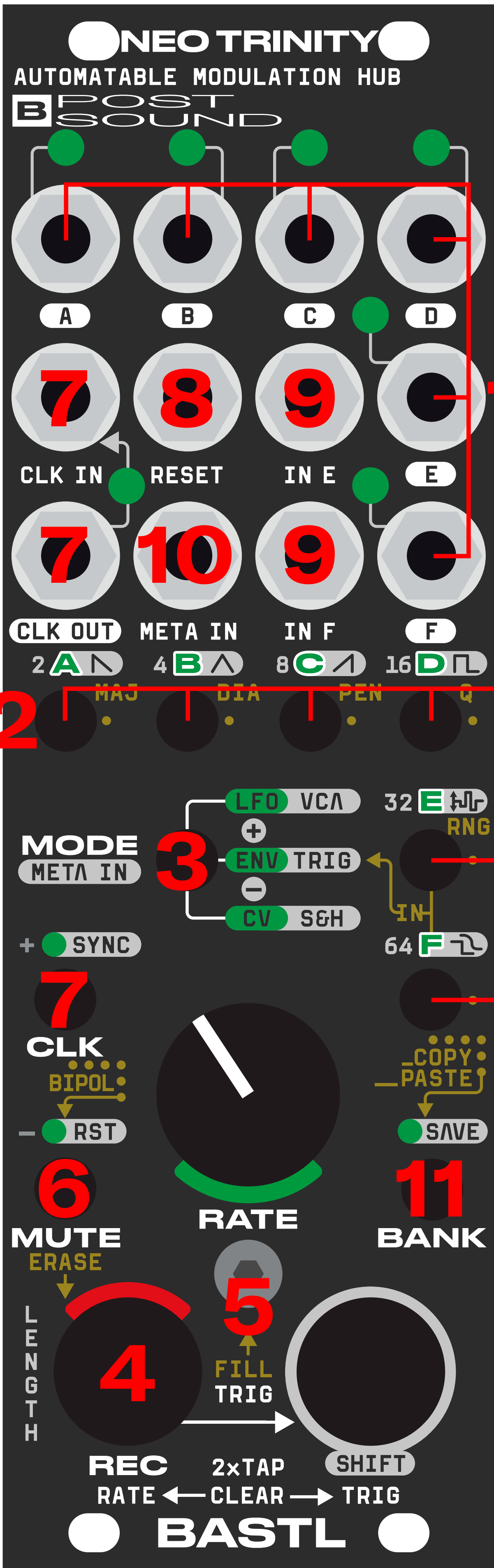
## Automation

record RATE automation	<b>REC+turn RATE</b>
clear RATE automation	2× <b>REC</b>
record TRIG automation	<b>REC+ SHIFT</b>
trigger without recordings	<b>SHIFT +REC</b>
clear TRIG automation	2× <b>SHIFT</b>
set automation length	<b>REC+A/B/C/D/E/F</b>
adjust automation length	<b>REC+CLK/MUTE</b>
generate trigger fill	<b>REC+ SHIFT +turn RATE</b>
trigger fill algorithm	<b>REC+ SHIFT +A/B/C/D/E/F</b>
rotate trigger sequence	<b>REC+ SHIFT +CLK/MUTE</b>
erase automation parts	<b>MUTE+REC</b> while held

## Memory

save bank	<b>SHIFT +BANK</b>
copy channel	< 2s <b>A/B/C/D/E/F+BANK</b>
paste channel	> 2s <b>A/B/C/D/E/F+BANK</b>
load bank	< 2s <b>BANK+A/B/C/D/E/F</b>
save bank to	> 2s <b>BANK+A/B/C/D/E/F</b>
load bank at the end of sequence	<b>BANK+CLK+A/B/C/D/E/F</b>







# Manual

## 1 CHANNEL OUTPUTS

Use the outputs for modulating CV destinations across your modular system.

The outputs have a range of -5V to +5V in bipolar mode and 0V to +5V in unipolar mode. They are updated at a rate of 4kHz (4000 times per second).

The lights at the outputs indicate the voltage by changing their intensity and polarity: green = positive, red = negative. The outputs can be calibrated to match the V/OCT inputs of your sound sources. See the [calibration section](#) for more details.

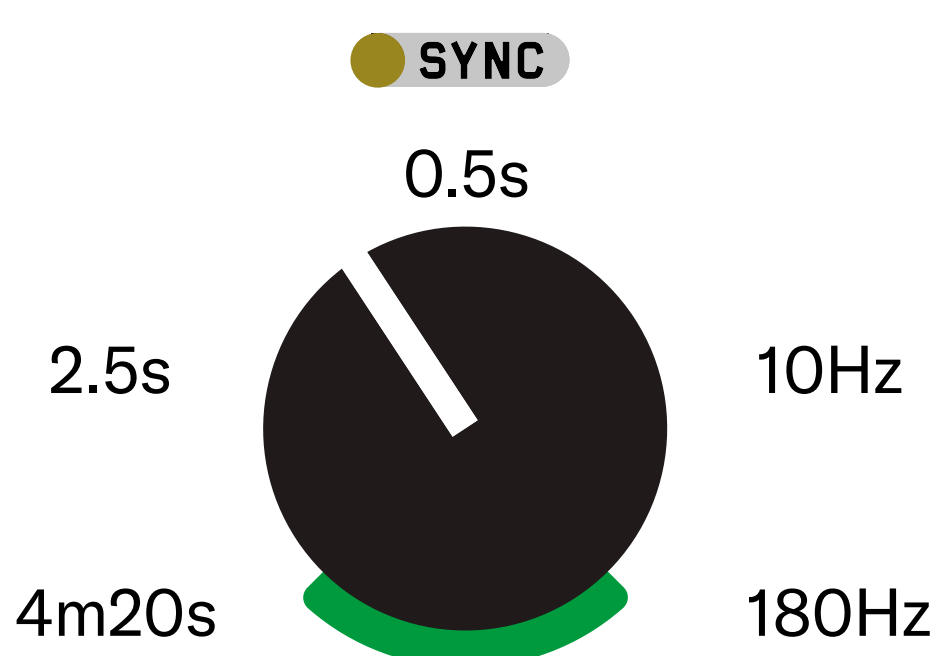
## 2 CHANNEL BUTTONS

Press the individual channel buttons to select a channel; the corresponding letter icon (A/B/C/D/E/F) will light up. All settings on the module are then applied to the selected channel. The light under the RATE knob indicates the voltage and polarity of the output of the currently selected channel.

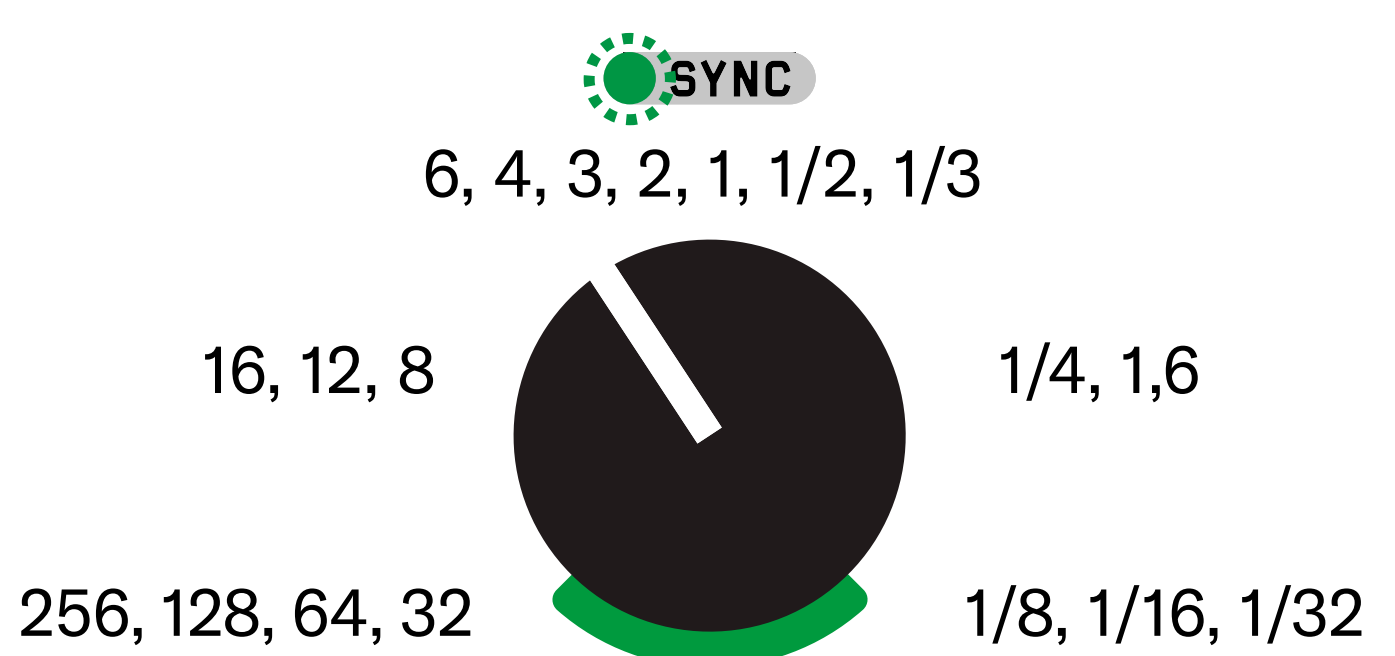
## 3 MODES

### LFO MODE

LFO MODE is primarily for repeating simple modulation shapes but with some exciting automation possibilities on top.



LFO DURATION/FREQUENCY



LFO CLK DIVIDER

Use the RATE knob to set the speed of the LFO. If SYNCed, the RATE knob sets the divider to the tempo.

## SYNC

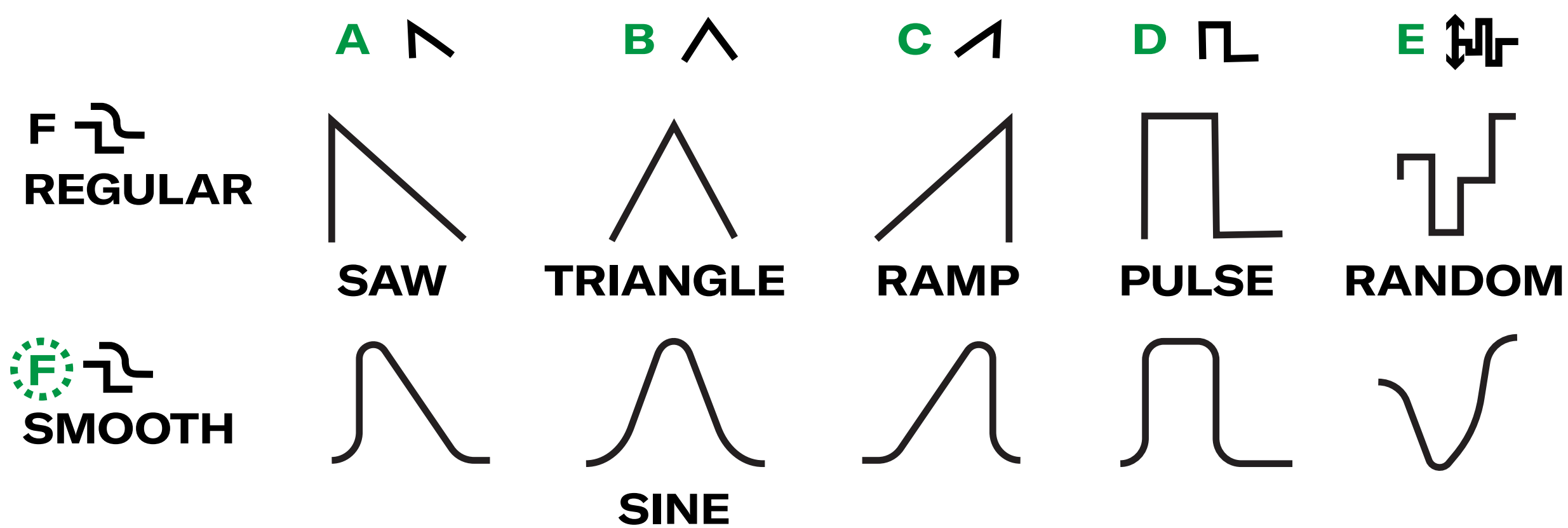
Hold SHIFT and press CLK to SYNC the LFO to the clock. While holding SHIFT, the SYNC indicator will light up if the function is on. Pressing SHIFT and CLK deactivates the SYNC function.

## SHAPE

Hold SHIFT and press the channel buttons A, B, C, D, E to select an LFO shape.

Holding SHIFT, press F for smoothing the selected shapes. That is especially useful to avoid clicks in the VCAs and other sensitive modulation destinations.

- A – saw (smooth saw)
- B – triangle (sine)
- C – ramp (smooth ramp)
- D – pulse (smooth pulse)
- E – random (interpolated random)
- F – enables/disables smoothing of shapes above.



## UNIPOLAR/BIPOLAR

Hold the respective channel button A/B/C/D/E/F and press the MUTE button to set the selected channel as BIPOLAR (MUTE light ON) with an amplitude of -5V to +5V or UNIPOLAR (MUTE light OFF) with an amplitude of 0V to +5V.



# AUTOMATE

You can create complex modulations by automating the RATE knob or by inserting LFO reset triggers.

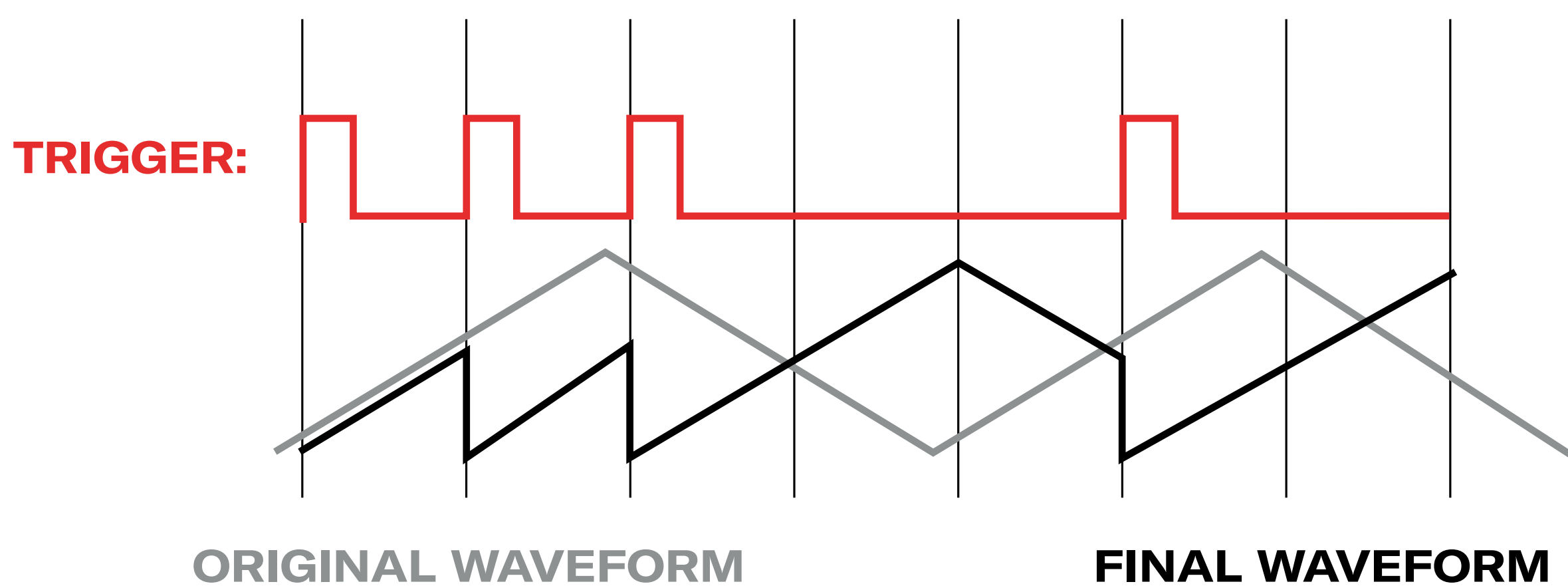
Automate the RATE knob by holding REC and turning the RATE knob (press 2x REC to clear the knob automation).

Automating synced LFO will result in rhythmical variations.

Record LFO reset triggers by holding REC and tapping SHIFT (press 2x SHIFT to clear the trigger automation).

Hold SHIFT and press REC to reset the LFO without recording triggers into the automation.

## LFO TRIGGER RESET





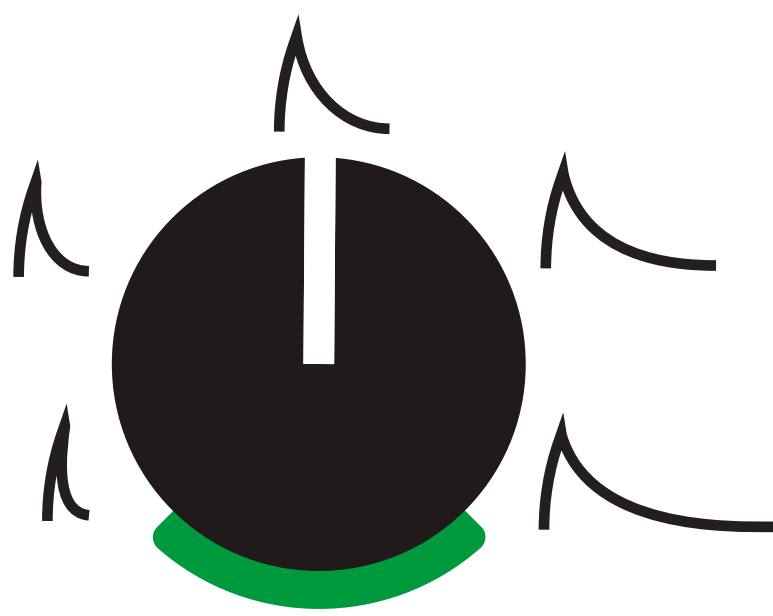
## ENV MODE

ENV MODE excels at rhythmic triggered modulation, but it can also be used as a slew limiter or to elongate triggers.

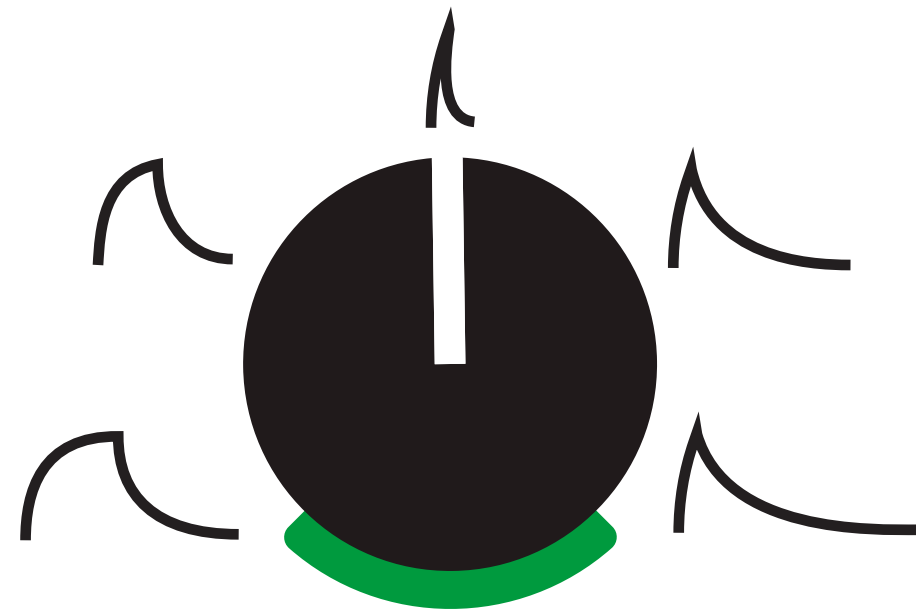
## RATE AND SHAPE

The RATE knob sets the duration of the envelope and it does it differently for the 4 different shapes: A/B/C/D.

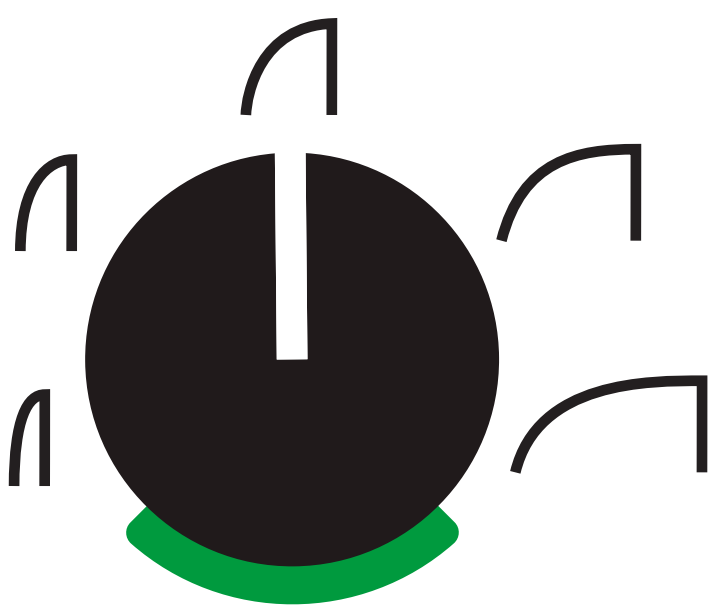
Hold SHIFT and press A/B/C/D to select the shape of the envelope.



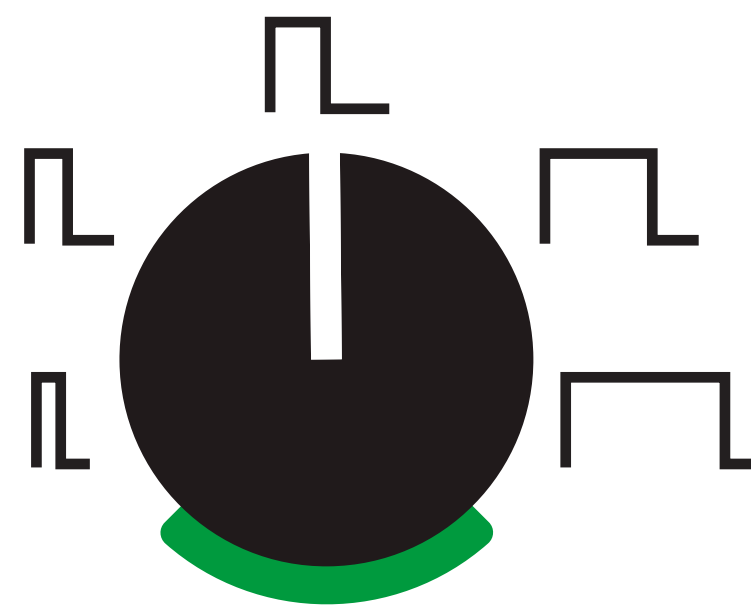
**A = DECAY ENVELOPE**



**B = VARIABLE SHAPE ENVELOPE**



**C = ATTACK ENVELOPE**



**D = PULSE**

- A – RATE sets the decay of the envelope
- B – variable shape envelope
  - RATE increases the decay of the envelope clockwise from the center position
  - RATE increases both the attack and decay of the envelope counter-clockwise from the center position
- C – RATE sets the attack of the envelope
- D – RATE sets the pulse duration

## TRIGGER

Hold SHIFT and press REC to trigger the envelope without recording triggers into the automation. When the envelope is in the slew/AR mode holding the REC button after holding shift will result in gates.

## AUTOMATE

Record envelope triggers to the automation by holding REC and tapping the SHIFT button (press 2x SHIFT to clear the trigger automation).

Automate the duration of the envelope by holding REC and turning the RATE knob (press 2x REC to clear the knob automation).

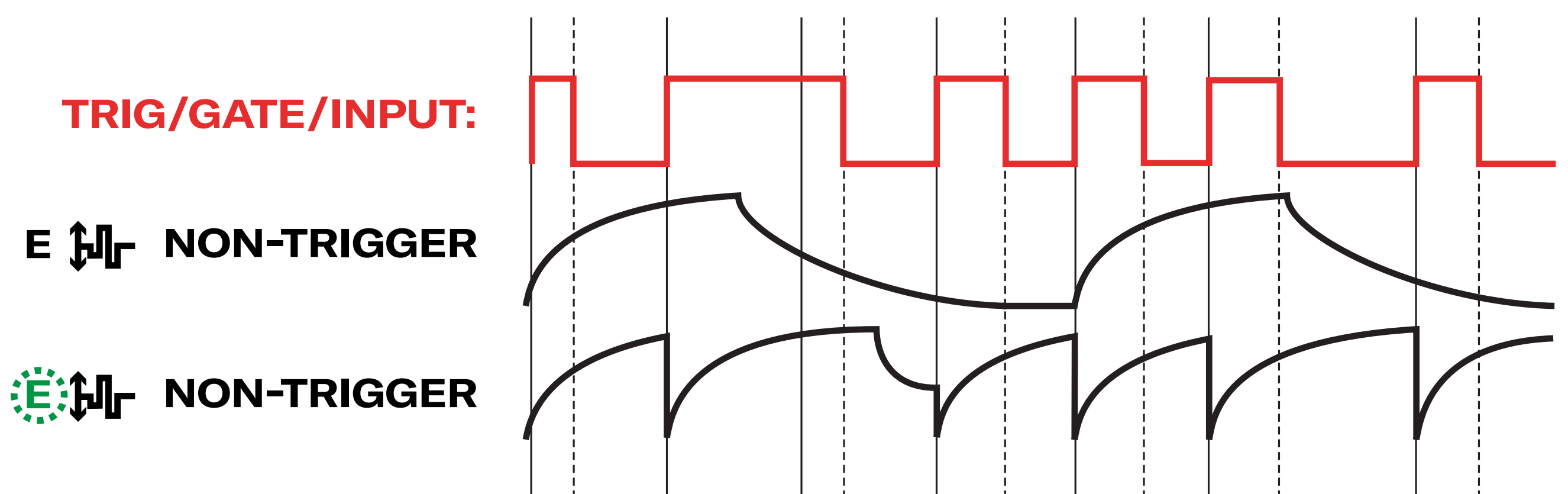
## BEHAVIOR

Hold SHIFT and press the E/F channel buttons to modify the envelope's behavior. While holding SHIFT, the E/F icon will light up, if the function is on:

- E – toggle retrigger enable/disable

When the envelope retriggers, it will reset to its beginning point with every detected trigger. This is useful for keeping the rhythm intact.

When the envelope does not retrigger, it will finish its shape before accepting new triggers. This is great if you want to use the envelope duration to alter the rhythm it produces. Combine it with RATE automation for the fullest potential.



- F – SLEW/AR mode

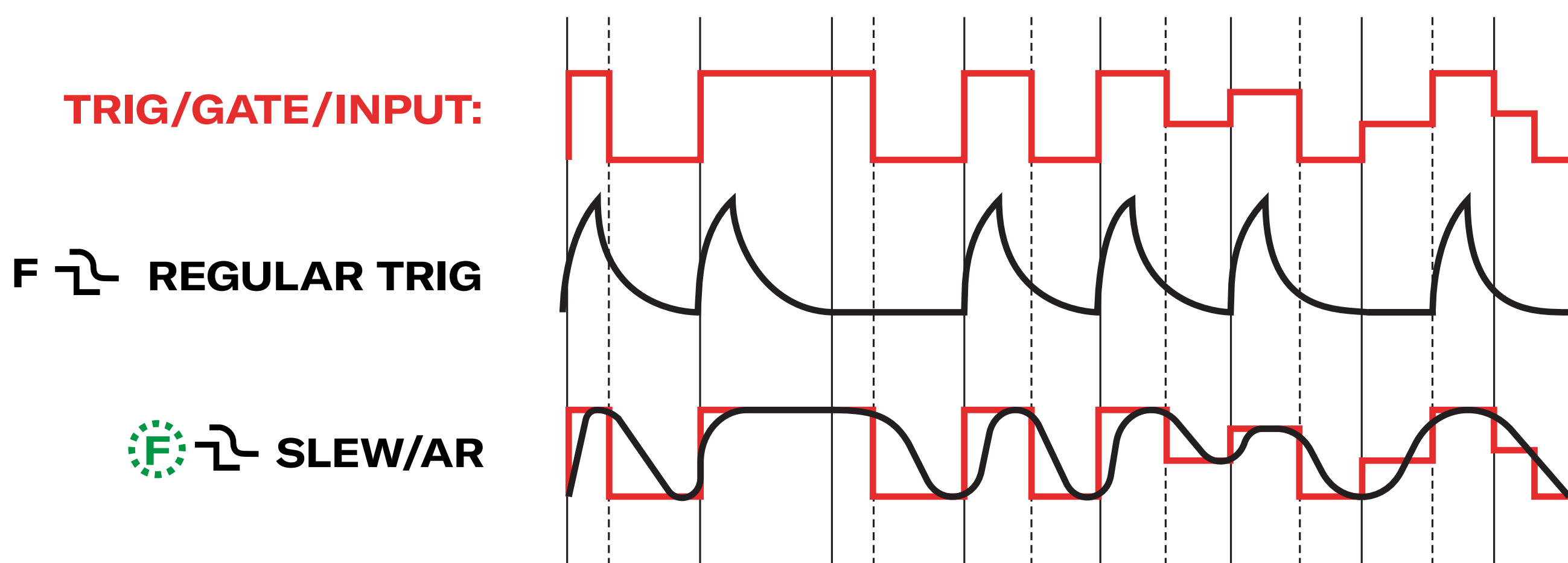
When the envelope is in the regular triggered mode, it will only detect triggers on the rising edge of the input and then it will render the whole envelope shape.

When the SLEW behavior is activated, the envelope will try to match exactly the input voltage, but slowly, with the attack and decay settings applied for the rising and falling times. This is useful for creating sliding sequences, and with the RATE automation, it can produce very interesting effects.

**NOTE:** The IN E/F or META IN has to be set to TRIG mode for the SLEW to take effect with various voltages.

This specific behavior allows you to use the envelopes as AR (attack-release) envelopes. Such an envelope will respect the duration of the input gate. It will render an attack when the gate goes high and a release when it goes low.

**NOTE:** With SLEW enabled, when recording trigger automation by holding REC and pressing and holding SHIFT, the sequencer records durational gates instead of trigger events.



**NOTE:** In ENV mode, the envelopes are always unipolar and cannot be switched to bipolar.



## **CV MODE**

CV MODE is designed for recording the knob movements and creating pitch and gate sequences. It can also serve as a powerful voltage processing utility.

## **RATE**

Use the RATE knob to set the voltage at the output.

## **AUTOMATE**

Automate the output by holding REC and turning the RATE knob (press 2x REC to clear the knob automation).

Hold REC and tap or hold SHIFT to record continuous output gates, instead of trigger events (press 2x SHIFT to clear the automation).

Hold SHIFT and press or hold REC to perform manual gates without recording triggers into the automation.

## **QUANTIZATION**

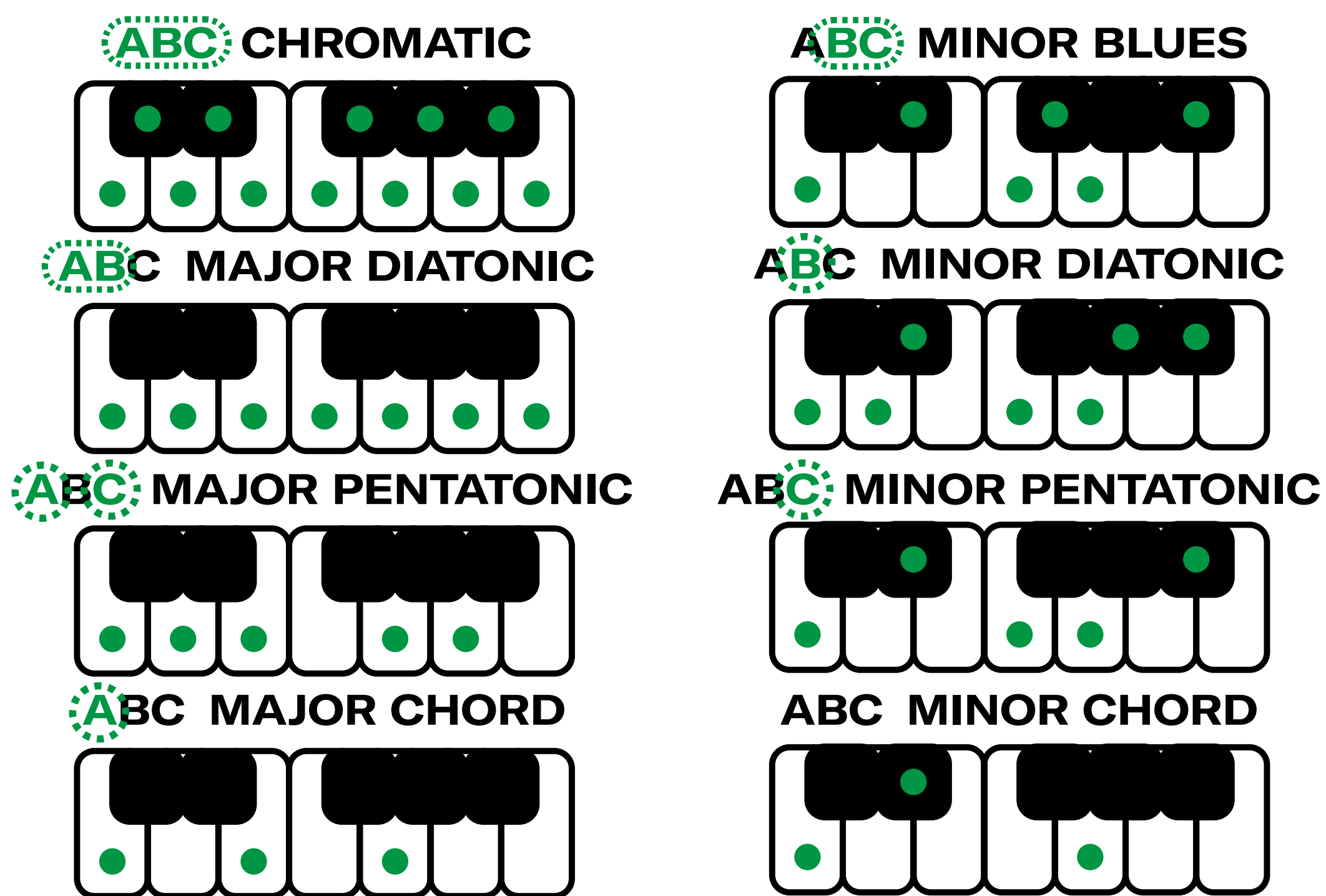
Hold SHIFT and press A, B, C, D channel buttons to control quantization:

- D – toggles quantization ON/OFF
- A – switch between major (light ON) and minor (light OFF) scale
- B&C – combinations of these select which kind of scale is used

**TIP:** In general, the more A/B/C lights are on, the more notes are in the scale.

Scale examples are in the key of C:

**A/B/C SCALE SELECTION**    **D [ ] QUANTIZE ON/OFF**  
**A MAJOR A MINOR**    **B DIATONIC**    **C MAJOR C MINOR**  
**MORE LIGHT = MORE NOTES**

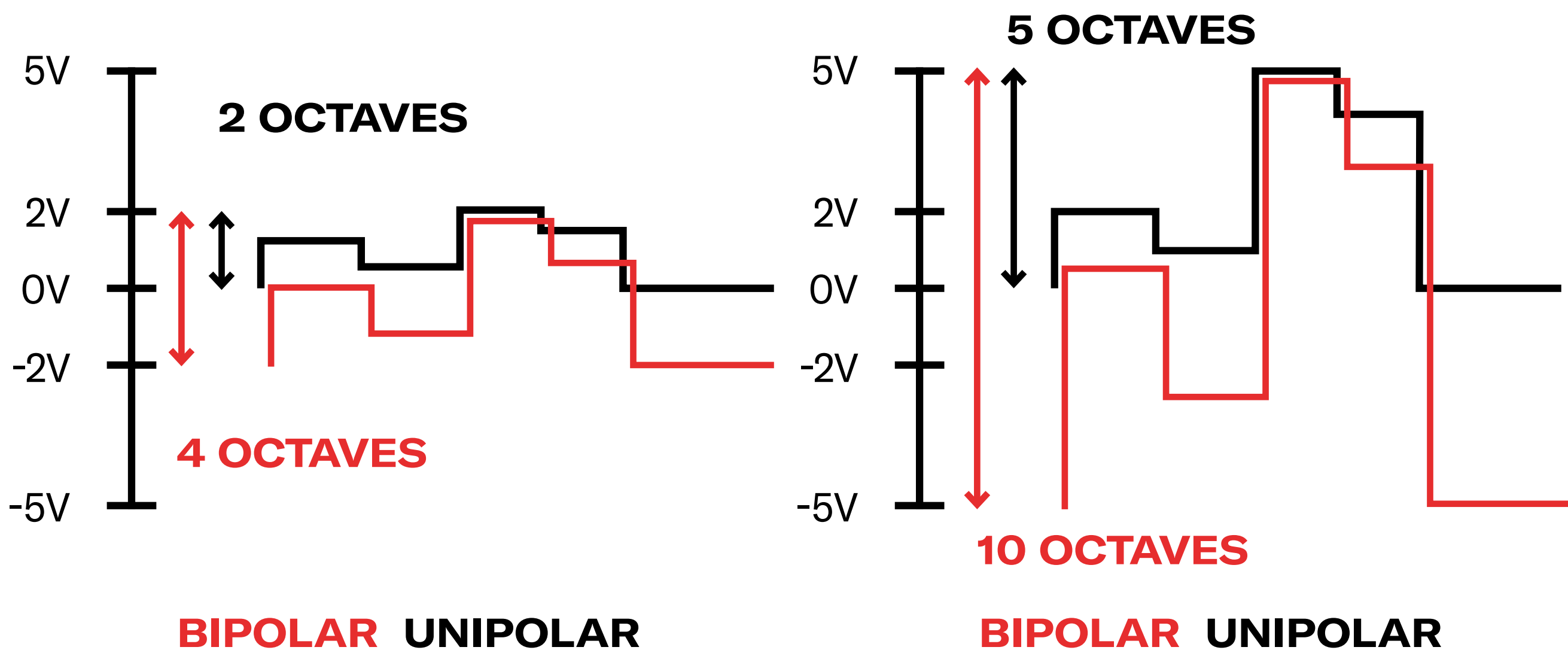


**NOTE:** To transpose into a different key, tune your oscillator's root note to the desired key. Refer to the calibration procedure to match your CV channel with your oscillator and ensure accurate tuning.

## BEHAVIOR

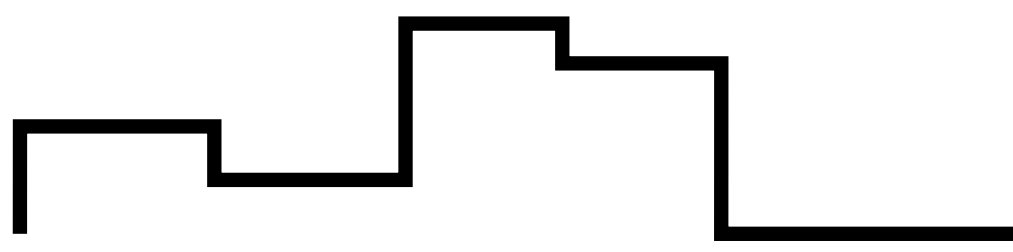
Hold SHIFT and press the E/F channel buttons to modify the behavior of the CV mode:

- E – toggles the voltage range between 5V (ON) and 2V (OFF). When you combine this behavior with the unipolar/bipolar setting (A/B/C/D/E/F+MUTE), it provides various octave ranges.

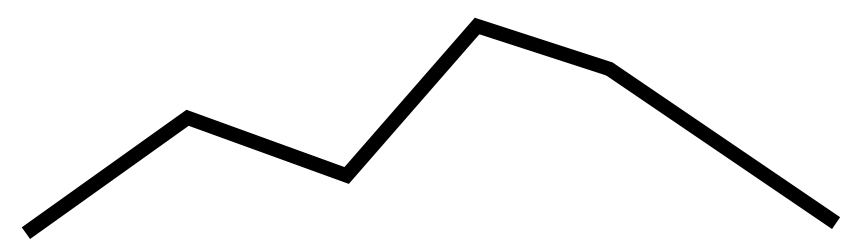


- F – toggles between smooth/linearly-interpolated automation (ON) and a regular stepped sequence (OFF)

F  REGULAR



  SMOOTH



## UNIPOLAR/BIPOLAR

Hold the respective channel button A/B/C/D/E/F and press the MUTE button to set the selected channel as BIPOLAR (MUTE light ON) with an amplitude of -5V to +5V or UNIPOLAR (MUTE light OFF) with an amplitude of 0V to +5V. Combine it with the range setting (SHIFT+E) to achieve varying octave range.

## CV MODE AS A VOLTAGE PROCESSOR UTILITY

You can utilize IN E/F or META IN as inputs for the CV mode, allowing you to process external voltages. Here are some tips:

1. Use regular or inverted input modes (or attenuated versions of them) to offset input signals with the RATE knob. It also comes in handy for voltage inversion.
2. Same as No.1 but with the quantizer activated, this mode functions as a quantizer. Using multiple channels in CV mode via META IN allows you to create quantized linked polyphonies.
3. Switch the selected input into VCA mode with quantization OFF (SHIFT+D), set to bipolar (A/B/C/D/E/F+MUTE), and 5V range (SHIFT+E). In this configuration, the RATE knob will attenuvert the incoming signal. Since it operates as a bipolar VCA, the signals essentially multiply each other, and it doesn't matter which signal is which.
4. Use no input and solely adjust the RATE knob to create a positive or negative voltage offset. This way, you'll be able to reconfigure various modules.



# ATTENUATION/ATTENUVERSION

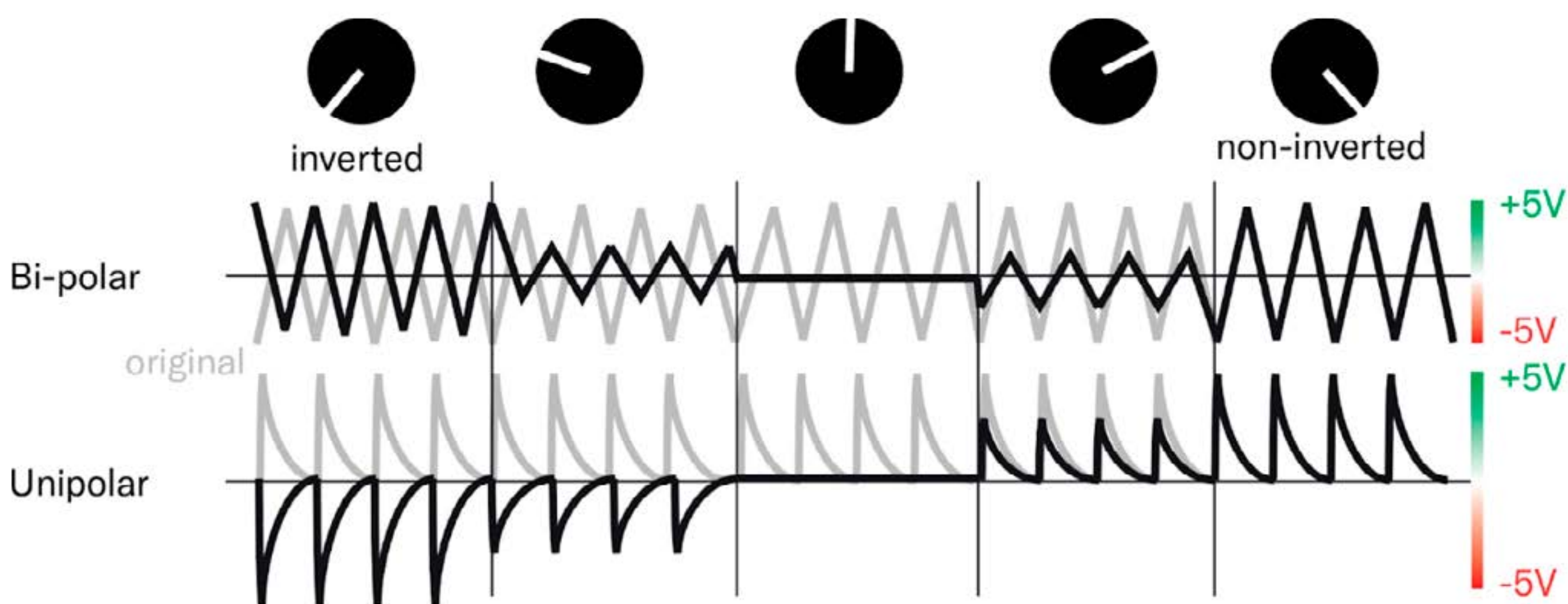
Modulation depth is very important in the modular context and although the Eurorack format typically requires the inputs to have attenuators/attenuvertors, many of the modern modules have simple open inputs. Therefore, NeoTrinity comes with built in solutions that don't require any external modules.

You can attenuvert the channel output by holding the A/B/C/D/E/F button and turning the RATE knob. Fully clockwise is the default un-attenuated signal. It gets attenuated towards 12 o'clock and inverts counter-clockwise.

**NOTE:** Changing channel MODE or changing the UNIPOLAR/BIPOLAR setting will reset the attenuversion value to fully positive (CW).

**NOTE 2:** When using CV mode with Quantisation ON, the attenuversion will be done before the quantizer, so you can use it creatively to adjust your melodies without the melodies going out of tune.

## Attenuversion A/B/C/D/E/F + RATE



# 4 AUTOMATION

There are two components to automation in each of the modes:

1. **RATE AUTOMATION:** Hold the REC button and turn the RATE knob to start recording the automation for the main parameter. It will influence the channel speed, decay, or value in the various channel modes.
2. **TRIG AUTOMATION:** Hold REC and tap the SHIFT button to input rhythmic information into the automation sequencer. It will add resets, envelope triggers, or gates in the various channel modes.

Once either automation is recorded, the REC light turns ON.

After recording RATE automation, use the RATE knob to offset the recorded sequence. Park the RATE knob in the middle to maintain the original recorded automation sequence.

Double tap REC to **CLEAR** the recorded RATE automation. Double tap SHIFT to **CLEAR** the TRIG automation.

While holding MUTE, press and hold REC to **ERASE** only specific parts of the automation (erasing while holding both buttons).

## AUTOMATION LENGTH

Hold REC and press channel buttons A/B/C/D/E/F to change the length of the automation sequence to 2/4/8/16/32/64 steps.

Hold REC and press CLK (+) or MUTE (-) to adjust the length of the sequence in finer steps.

**NOTE:** The CLK light blinks shortly at the beginning of the recorded automation sequence.

# TIME-QUANTIZED / NON-QUANTIZED

## TRIG AUTOMATION

By default, all recorded triggers (or gates) are quantized to the clock. You can toggle the quantization OFF/ON separately for each channel.

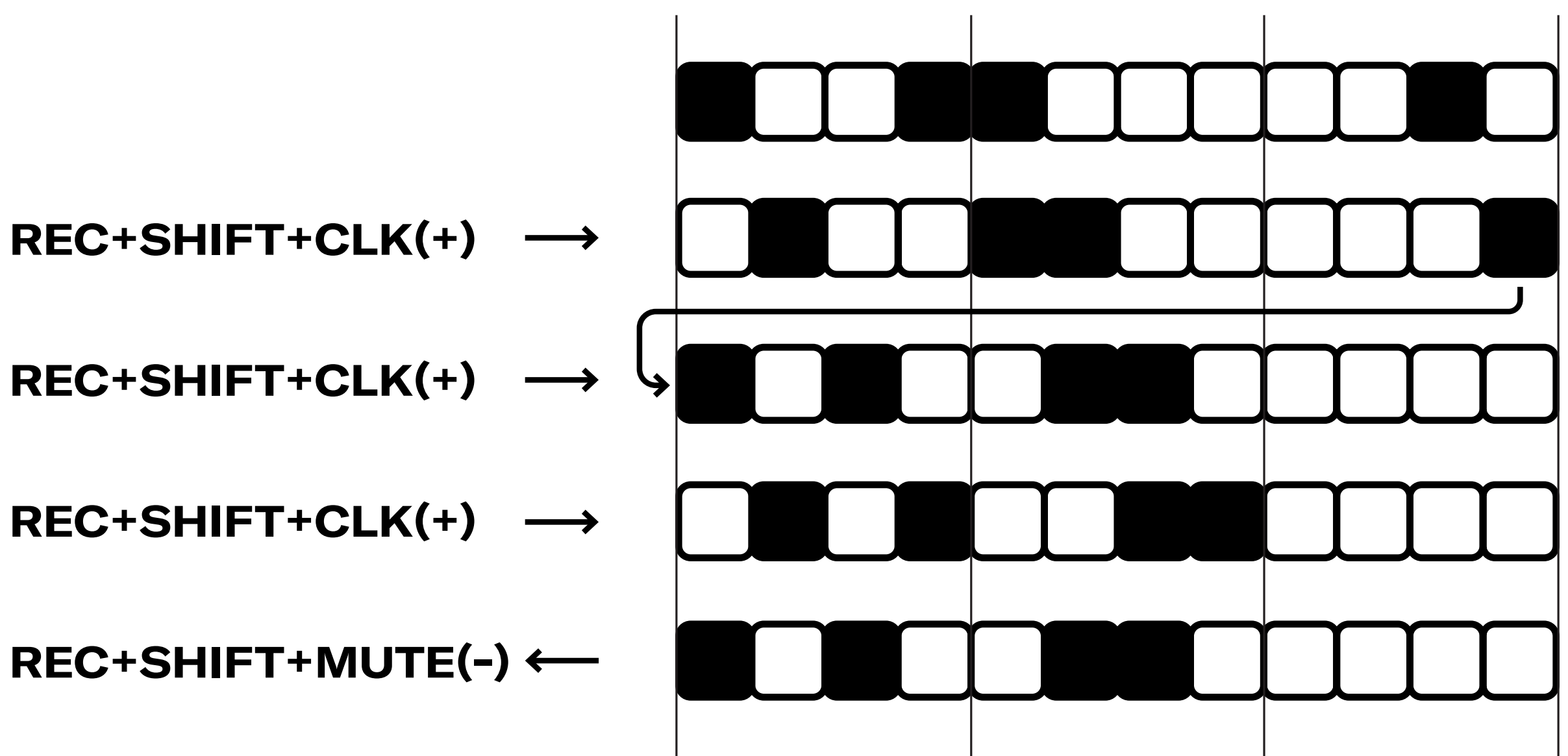
Hold the channel button A/B/C/D/E/F and press the CLK button to make the corresponding channel's triggers **QUANTIZED** (CLK light ON) or **NON-QUANTIZED** (CLK light OFF).

**NOTE:** "Non-quantized" triggers are technically still quantized, but the resolution is very high (24x the clock cycle).

## TRIGGER ROTATION

You can shift the entire TRIG automation sequence forward or backward by holding both REC and SHIFT and pressing CLK (+) or MUTE (-). Each tap represents one step.

### TRIGGER ROTATION:





# 5 ALGORITHMIC TRIG FILL GENERATOR

Hold REC, press and hold SHIFT, and don't release them. Now, press one of the channel buttons A/B/C/D/E/F to select an algorithm that will be used to generate the sequence. Then, when you move the RATE knob, you will generate an algorithmic TRIG FILL sequence based on the position of the knob.

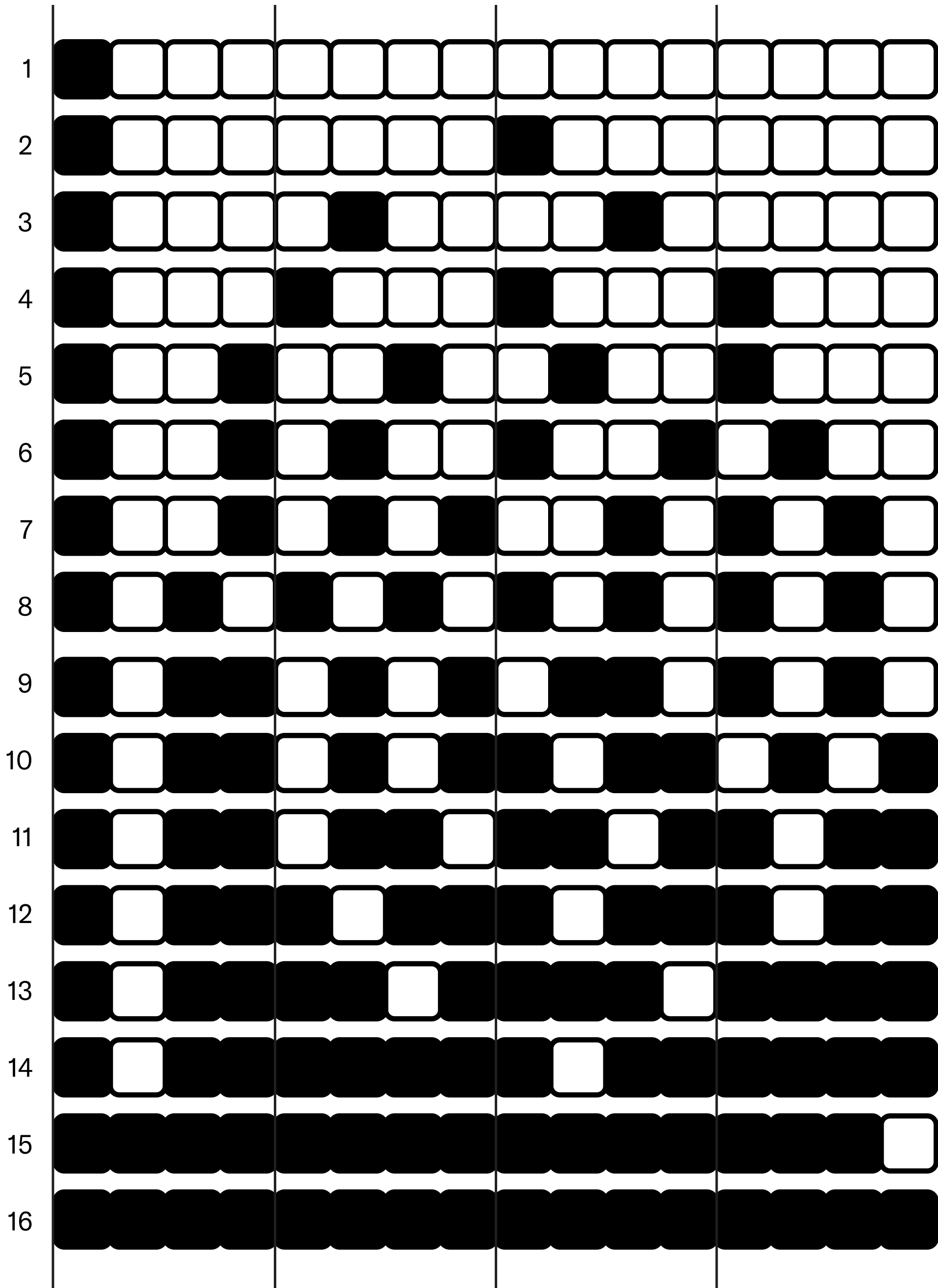
The generated algorithmic TRIG automation behaves the same way as the manually recorded one. That means generating triggers in ENV mode, gates in CV mode and resets in LFO mode. You can also shift, clear or erase the algorithmic automation.

## **The available algorithms are:**

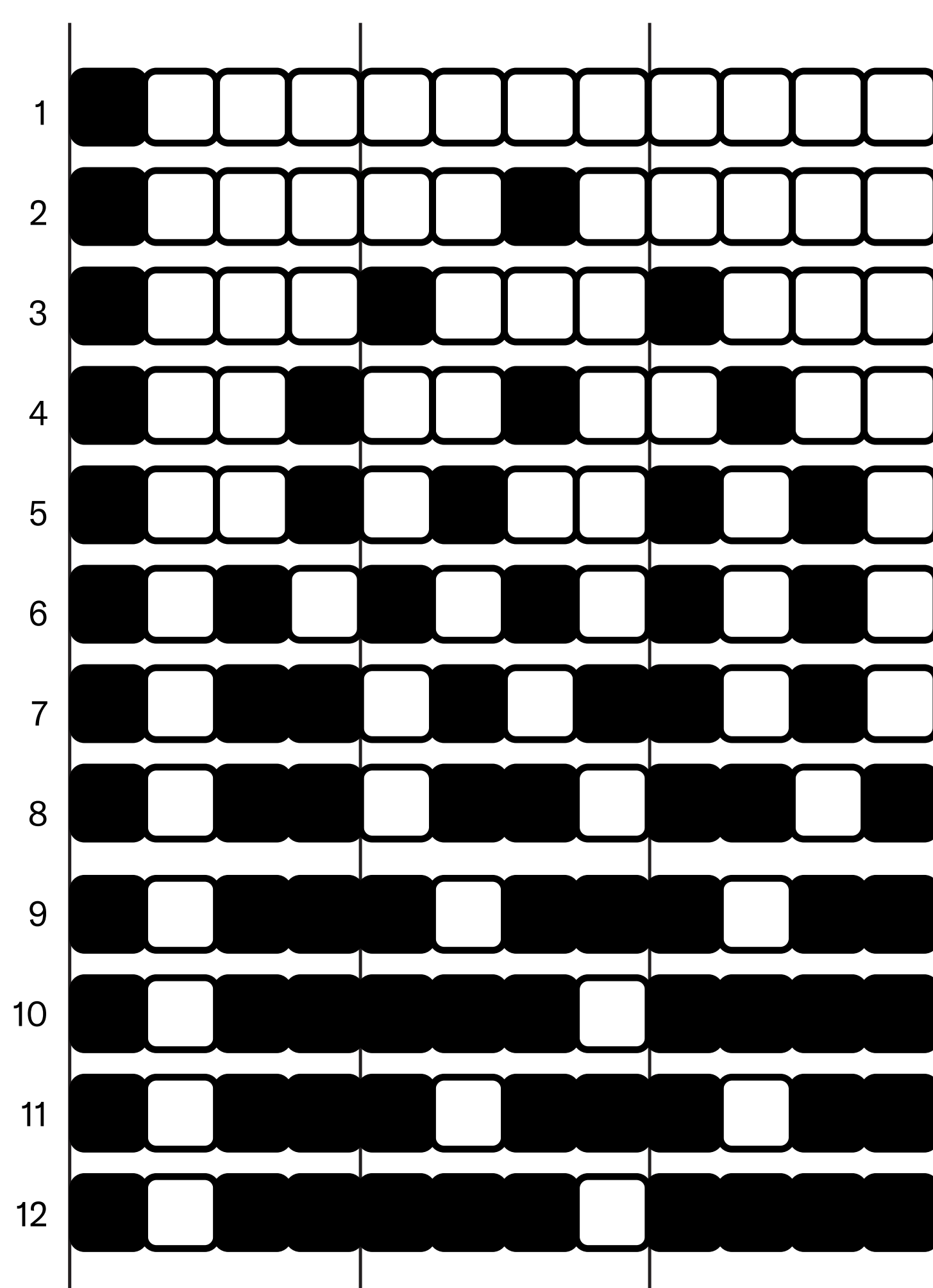
- A – 8 common kick drum patterns (the RATE knob selects the pattern)
- B – 8 common snare drum patterns (the RATE knob selects the pattern)
- C – 8 common hi-hat drum patterns (the RATE knob selects the pattern)
- D – divider algorithm will generate regular triggers similar to clock/divider patterns. When using non-quantized TRIG automation, the dividers can also create clock multiplications.
- E – euclidean pattern generates the most equal distribution of a number of triggers (set by the RATE knob position) over a number of steps (the automation length)
- F – random pattern generates a number (set by the RATE knob position) of randomly placed triggers over a number of steps (the automation length)



### EUCLIDIAN PATTERNS 16 STEPS



### EUCLIDIAN PATTERNS 12 STEPS



# 6 MUTE

Hold the MUTE button and press corresponding channel buttons to mute (light OFF) or unmute (light ON) any channel.

**NOTE:** When the selected channel is muted, then holding SHIFT and pressing REC will result in gate outputted at the channel's output regardless of the MODE.

# 7 CLK CHANNEL

The clock channel controls the module's clock.

Press CLK to enter clock channel settings. Press CLK again or press any other channel button A/B/C/D/E/F to leave.

CLK OUT sends out the clock Neo Trinity is running on and indicates it with the nearby light. The output voltage range is 0V to +5V.

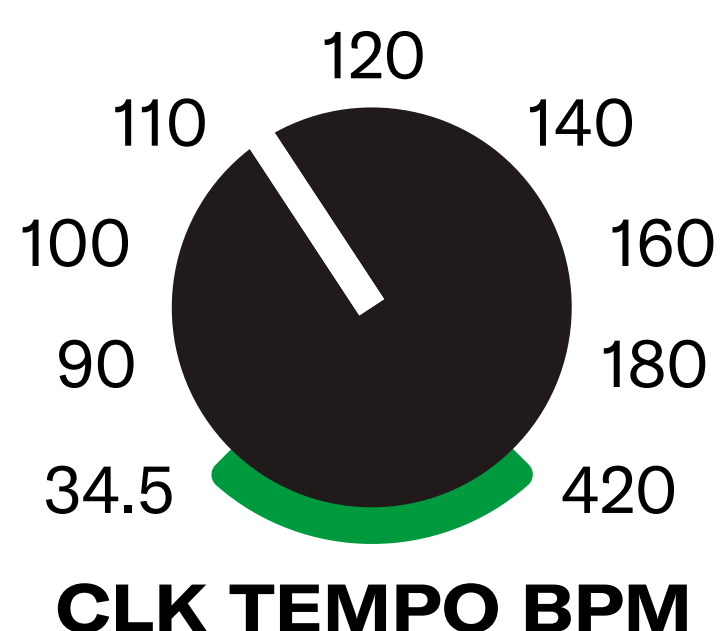
CLK IN receives an external clock. The maximum accepted clock frequency is 50Hz.

If CLK IN is not connected, the module generates its own clock = **INTERNAL CLK MODE.**

If CLK IN is connected, the CLK channel acts as a divider/multiplier = **EXTERNAL CLK MODE.**

## INTERNAL CLK MODE

Turn the RATE knob to select the clock speed.



Hold REC and tap SHIFT to define the TAP Tempo (set the speed by tapping SHIFT). The final clock will be 4 times faster, assuming the clock is 16th notes and you are tapping quarter notes.



## EXTERNAL CLK MODE

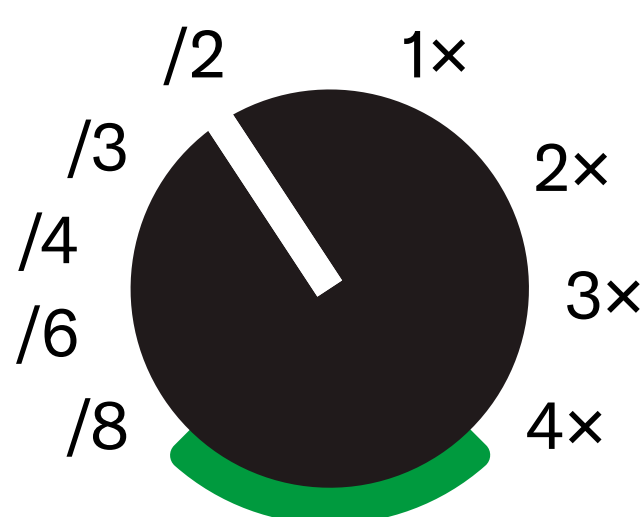
The internal clock is ignored when a jack is plugged into CLK IN. Select the external clock multiplier/divider factor by holding SHIFT and pressing one of the channel buttons A/B/C/D/E/F:

- A – 8 divider  
substep 6 divider
- B – 4 divider  
substep 3 divider
- C – 2 divider
- D – normal 1x
- E – 2x multiplier  
substep 3x multiplier
- F – 4x multiplier

Hold SHIFT and press CLK (+) or MUTE (-) to browse the substeps with odd numbered divider/multiplier factors.

**NOTE:** The multiplier/divider change may take a few clock cycles to finish, since the module is first completing the current multiplication/division cycle.

Turn the RATE knob to select a multiplier/divider.



**CLK DIVIDER/MULTIPLIER**

Hold REC and tap SHIFT to enter the multiplier/divider factor by tapping as in the internal clock mode(TAP Tempo). The clock rate will be multiplied by 4 and the closest multiplier/divider will be selected.

## **START/STOP**

Press MODE to start/stop the clock and the automation sequences. The automation sequences will start playing from the beginning when you re-start the clock. Recording any automation on any channel will re-start the clock if it was stopped.

**NOTE:** The CLK light blinks shortly at the beginning of the automation sequence of the selected channel.

## **8 RESET**

Use the RESET input to reset the automation sequencers (they go to their beginning = first step). All channels have the possibility to ignore the reset input and run independently.

Hold SHIFT and press the MUTE button to set the selected channel to listen to the RESET input (MUTE light ON) or ignore it (MUTE light OFF).

**NOTE:** When any channel is the ENV mode and it listens to RESET, it will produce a trigger on the first step when Neo Trinity was previously stopped manually (pressing MODE on CLK channel) and starts playing.

## **INPUTS**

The straightforward mechanics of Neo Trinity attain vast complexity with the use of its configurable inputs.

Channels E and F have their dedicated inputs, while the META IN can affect one or several channels at once in various ways.

See the [Patch Tips section](#) to learn the core ideas behind the individual input modes.

# 9 IN E AND IN F

Channels E and F have their dedicated inputs affecting only their respective channels.

Hold the channel button E or F and short-press MODE to cycle through the available **INPUT MODES** (see below).

Hold the channel button E or F and long-press MODE to disable the input for the selected channel.

# 10 META IN

META IN is an input that can affect some, none or all the channels.

Hold SHIFT and short-press MODE to cycle through the **INPUT MODES** for the selected channel.

Hold SHIFT and long-press MODE to **DISABLE** the META IN for the selected channel.

**NOTE:** All the inputs are continuously updated at a rate of 4kHz (4000 times every second).

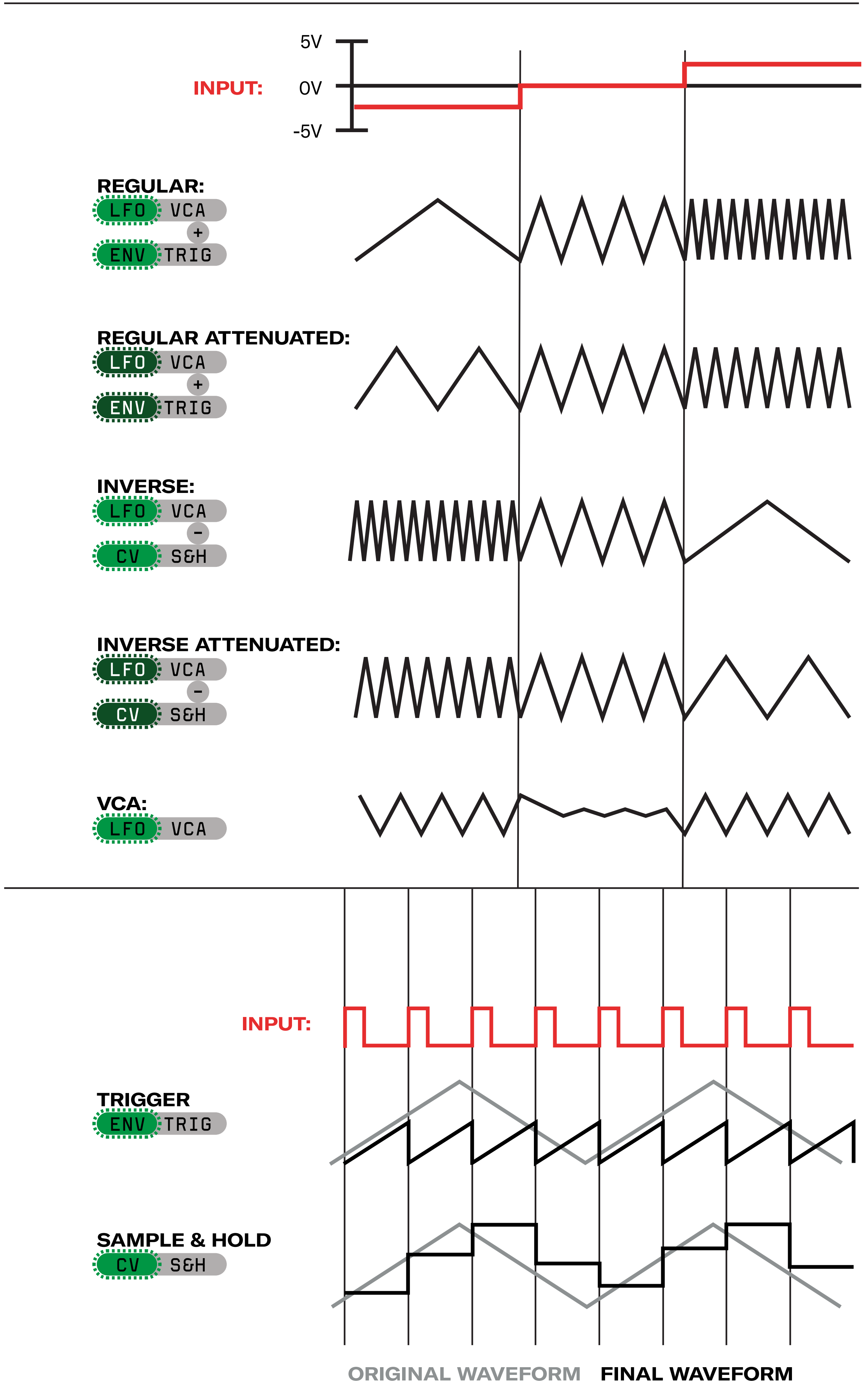
## INPUT MODES

The same input modes are available for IN E/F and META IN. You will cycle thru these different modes:

- **REGULAR:** affects the position of the RATE knob (LFO+ENV lights ON)
- **REGULAR ATTENUATED:** affects the position of the RATE knob, but less (LFO+ENV lights dimmed)
- **INVERTED:** inversely affects the position of the RATE knob (ENV+CV lights ON)
- **INVERTED ATTENUATED:** inversely affects the position of the RATE knob, but less (ENV+CV lights dimmed)
- **VCA:** affects the output amplitude of the channel – the input voltage is proportional to the output amplitude (behaves as a bipolar VCA, the input and the channel output get multiplied)  
0V = silent output, +5V = normal output, -5V = inverted output  
(LFO light ON)
- **TRIG:** detects the rising edge of trigger signals and then triggers the envelope or resets the LFO. Trigger is detected when the voltage on the input passes a threshold from below 2V to above 2V.  
When ENV is in the SLEW mode, it detects the various voltages the envelope slews to.  
(ENV light ON)
- **SAMPLE & HOLD:** On the rising edge at the input, S&H remembers the current output value of the channel and holds it until the next rising edge is detected. S&H is only rendered if a jack is detected at the corresponding input; otherwise the channel will be unaffected.  
(CV light ON)



**SHIFT +MODE = META IN MODE**  
**EF+MODE = E/F INPUT MODE**



## V/OCT

In LFO and CV mode, the regular input mode acts as a V/OCT input. For LFO mode, it means that applying 1V will make the LFO 2x faster, 2V will make it 4x faster etc. Using the LFO in audio rate can turn it into a lo-fi audio oscillator.

# 11 BANKS

Neo Trinity offers 6 banks (A/B/C/D/E/F) that can hold all settings of all channels, including the RATE and TRIG automation.

The currently selected bank is signaled when holding down the BANK button.

Hold BANK and press a channel button A/B/C/D/E/F to load a bank.

Hold SHIFT and press BANK to save the currently selected BANK (or hold BANK and press SHIFT).

Hold BANK and long-press a different channel button to save the current BANK to that selected bank slot.

Hold BANK and CLK and then press a channel button A/B/C/D/E/F to load that selected bank at the end of the automation sequence.

## **COPY AND PASTE**

You can copy and paste the settings of a single channel at a time.

To copy a channel, hold the corresponding channel button A/B/C/D/E/F and short-press the BANK button.

To paste the copied channel, hold the destination channel button A/B/C/D/E/F, and then press and hold BANK for more than 2 seconds.

**NOTE:** You can also change BANKS between copy and paste and then paste the copied channel to several locations.

# 12 IN/OUT EXPANSION HEADER

The In/Out header is a digital interface for future interaction between multiple Bastl modules. Currently, it's not in use; please don't connect any signals to the header to prevent damage to your Neo Trinity.

# 13 FIRMWARE UPDATE

1. Disconnect the module from your rack. Hold the REC button and plug in a USB-C cable connected to your computer. The REC light should glow red, and the CLK OUT light pulse slowly.
2. Neo Trinity will show up as a mass storage device on your computer.
3. Copy the firmware update \*.uf2 file to the Neo Trinity virtual disk drive. Wait and don't disconnect the module until a successful update is indicated by the module automatically resetting and displaying the new firmware version number.

## **FIRMWARE VERSION (ON STARTUP)**

The initial release version 1.0 is indicated by the channel A light ON at startup. The next firmware version will be indicated as "B" and so on. See the [Release Notes](#) for more information.

The exact firmware build number is accessible in [Factory Test Mode](#).

# User calibration

## OUTPUT CALIBRATION

The goal of the user calibration is to pair the V/OCT inputs of your oscillator with one of the Neo Trinity channels. This way allows the quantizer to achieve a much higher level of precision.

1. Hold MODE at power-up to enter User calibration mode.
2. Connect a tuner so it listens to your oscillator. Tune the oscillator to a root note of your choice in the bass region.
3. Connect the output of the desired Neo Trinity channel to the V/OCT input of your oscillator.
4. Press the corresponding channel button to select the calibrated channel.
5. Use the MODE button to cycle between:  
0V (CV light ON), 2V (ENV light ON) and 5V (LFO light ON).
6. Use the CLK (+) and MUTE (-) buttons for fine increments/decrements of the calibration. Hold the SHIFT button and press +/- buttons for larger steps.
7. With every octave tuning point, check your tuner and use the +/- buttons to tune your Neo Trinity perfectly. Go through the tuning points several times.
8. Hold the MODE button for over 5 seconds to leave User calibration mode. The calibration is stored in the memory.



## **INPUT CALIBRATION**

Hold MODE at power-up to enter the User calibration mode.

To calibrate any of the CV inputs (META IN, IN E or IN F), use the output of a selected channel and plug it into any of the three CV inputs. These inputs will be calibrated automatically, and the REC light will blink to confirm.

Hold the MODE button for over 5 seconds to leave User calibration mode. The calibration is stored in memory.

# **Boot settings**

## **FORMAT MEMORY**

Hold BANK on power-up. All the custom banks, channels and clock settings are erased.

## **FACTORY CALIBRATION**

Hold BANK+MODE on power-up. Factory calibration is cleared. Now, you need to calibrate the unit to use the module again. Channel A is being calibrated automatically. Wait for the blinking. When the blinking starts, Neo Trinity is waiting for you to:

1. Connect Channel A to META IN
2. Unplug the cable from META IN and plug it into IN E
3. Unplug the cable from IN E and plug it into IN F
4. Unplug the cable from Channel A and plug it into Channel B
5. Unplug the cable from Channel B and plug it into Channel C
6. Unplug the cable from Channel C and plug it into Channel D
7. Unplug the cable from Channel D and plug it into Channel E
8. Unplug the cable from Channel E and plug it into Channel F

The device is now calibrated and continues into Factory test Mode.

Hold MODE or power-cycle the module to exit the test mode.

## **FACTORY TEST MODE**

Hold SHIFT on power-up to enter the Factory test Mode, where you can test the user interface. Most inputs and outputs are already tested during the Factory calibration.

When you press a button, the light close to the button should temporarily turn ON; the REC and CLK OUT lights should turn ON when the REC button is pressed. Pressing the MODE button cycles through the Mode lights.

RATE knob controls the RATE light below it and cycles all outputs between -5V and 5V in 1V steps (light intensity and color varies accordingly).

CLK IN can be tested by patching a cable from CLK OUT into CLK IN – when CLK IN receives a clock signal (by tapping REC), the CLK light will come ON. The RESET input can be tested in the same way, by patching a cable from CLK OUT into it. MUTE light goes ON when the RESET input receives a signal.

**NOTE:** When the test mode is starting, the exact firmware build version is shown as a right-aligned binary number (A-F).

Exit the test mode by long pressing MODE or power cycling the module.

# **! POWER !**

Before connecting the ribbon cable to this module, disconnect your system from power! Double-check the polarity of the ribbon cable and that it is not misaligned in any direction. The red wire should match the -12V rail both on the module and the bus board.

## **! PLEASE MAKE SURE OF THE FOLLOWING:**

- you have a standard pinout eurorack bus board
- you have +12V and -12V rails on your bus board
- the power rails are not overloaded by current
- this module requires current: +12V: <100 mA; -12V: <35 mA

Although there are protection circuits on this device, we do not accept any responsibility for damages caused by the wrong power supply connection.

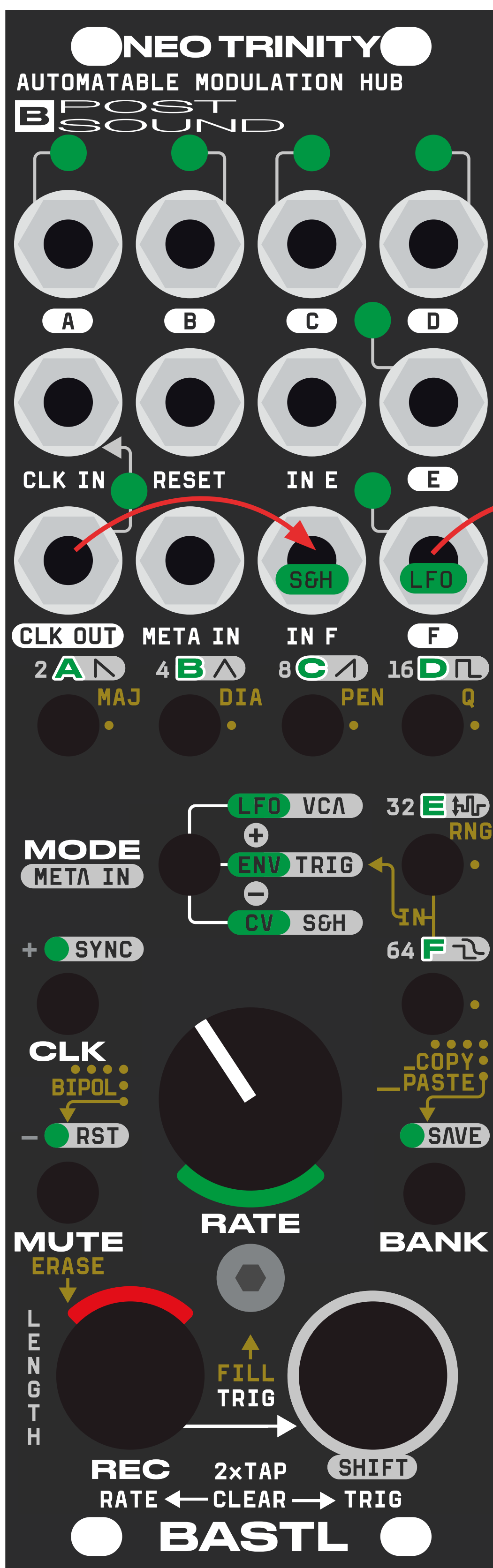
After you've connected everything, double-checked it, and closed your system (so no power lines can be touched by hand), turn on your system and test the module.

# Patch Tips

## STEPPED LFO

- Set Channel F to TRIANGLE LFO (SHIFT+B)
- Set IN F to S&H mode (F+MODE)
- Patch CLK OUT to IN F

The triangle signal at the output F makes a new step each time the clock is dispatched, creating a staircase-shaped modulation.



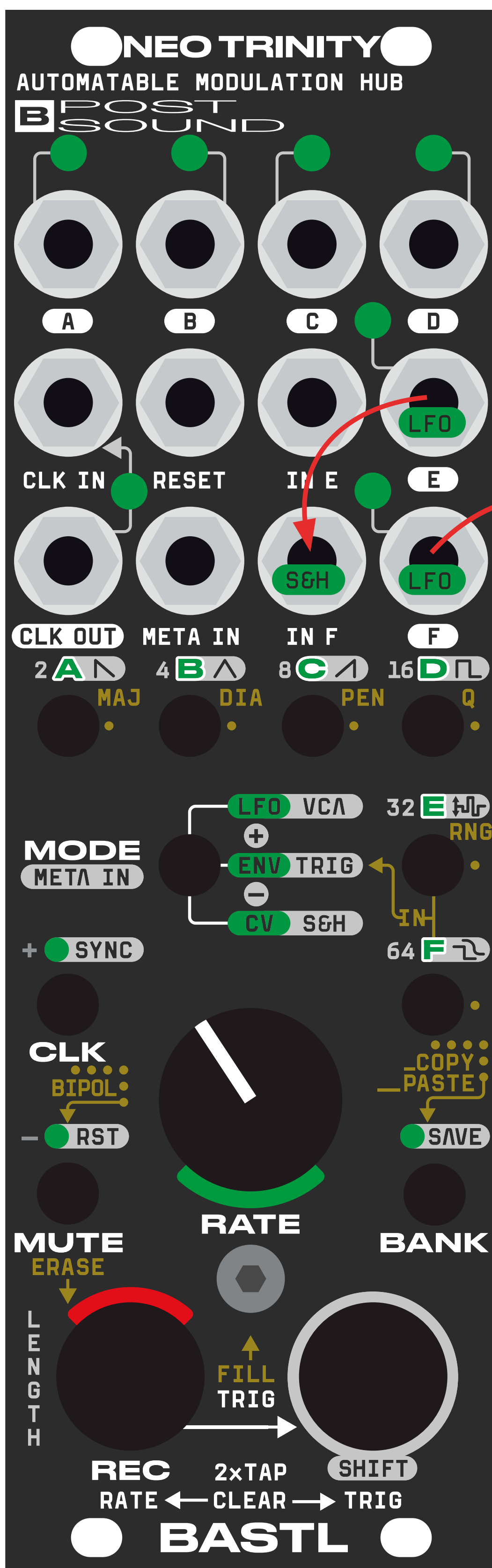
**FILTER CUTOFF**



# INTERFERENCE STEPPED LFO

- Set Channel F to TRIANGLE LFO
- Set IN F to S&H mode (F+MODE)
- Patch Channel E output to IN F
- Set channel E as PULSE LFO

Use the output F to modulate filter cutoff or anything else. Play with the two frequencies of LFO E and LFO F (sync'd or unsync'd) to create various interference stepped patterns at the output F.



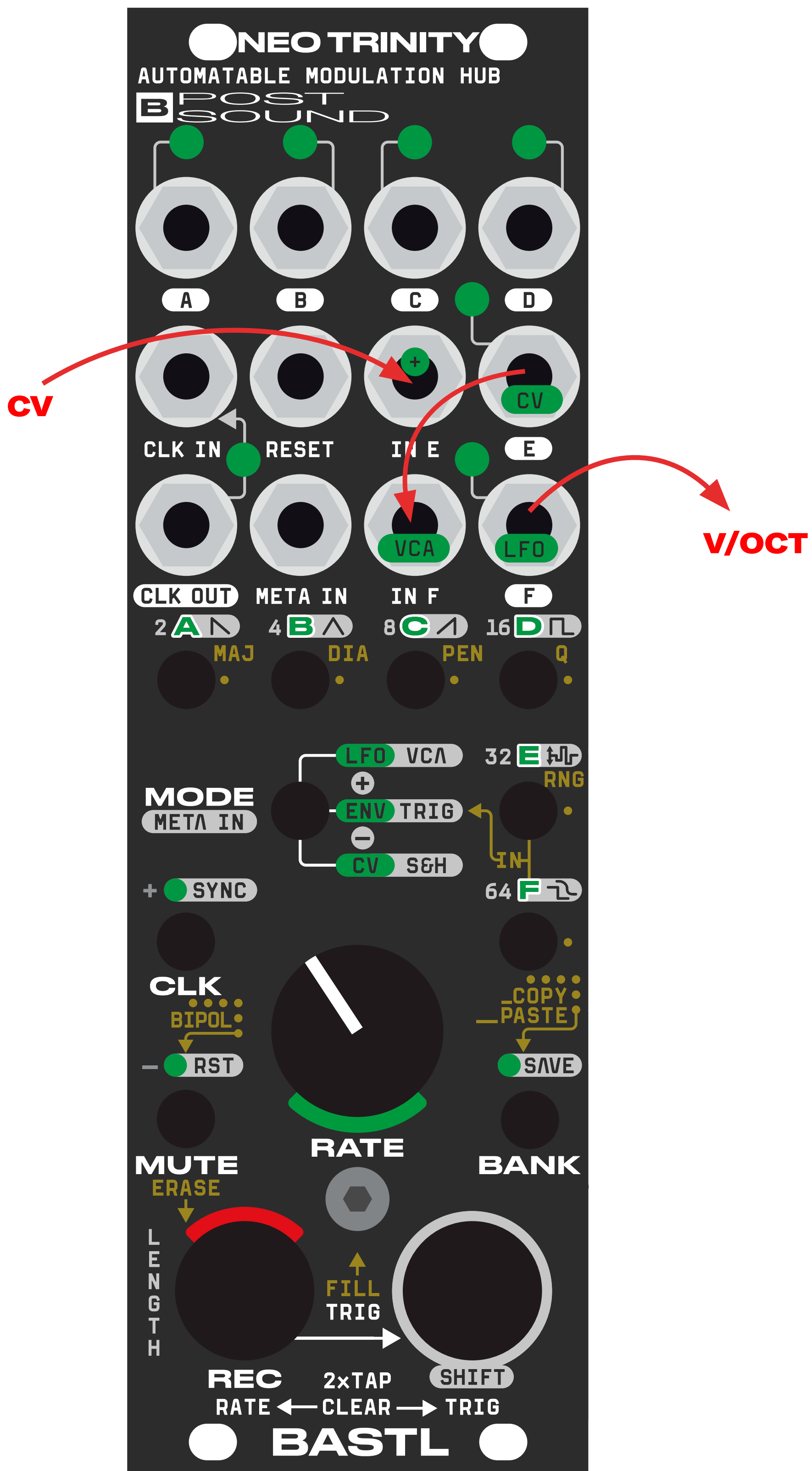
**FILTER CUTOFF**



# MODULATED ATTENUVERSION

- Set channel F to LFO mode (triangle or any shape: SHIFT+A/B/C/D/E)
- Set IN F to VCA mode (F+MODE)
- Set channel E to CV mode
- Patch E to IN F
- Set IN E to + mode (E+MODE)

If output F is modulating a filter, then the RATE knob on channel E would function as an input attenuverter for that filter. Use channel E to automate the depth of the filter modulation or patch an external CV to IN E for external modulation.



# DETUNED LFOS

- Set channels A, B, C and D in LFO mode (triangle or any shape: SHIFT+A/B/C/D/E)
- Set A, B, C, and D RATE to a similar frequency (select channel+move RATE)
- Set META IN for A to regular, for B to regular attenuated, for C to inverted attenuated, and for D to inverted mode (select channel and press SHIFT+MODE)
- Turn off META IN for channels E and F (select channel and long-press SHIFT+MODE)
- Set channel F to CV mode
- Patch channel F into META IN

Use F to detune the A, B, C, and D LFOs.





# TRIGGERED MULTI-RANDOM

- Set channels A, B, C, and D to LFO mode (random shape: SHIFT+E)
- Set A, B, C, and D RATE to high frequency (select channel+move RATE)
- Set META IN for A, B, C, and D to S&H mode (select channel and press SHIFT+MODE)
- Turn off META IN for channels E and F (select channel and long-press SHIFT+MODE)
- Patch a trigger into META IN

Channels A, B, C, and D will generate new random voltage each time a TRIG arrives at the META IN.



# MULTI-AMPLITUDE LFO CONTROL

- Set channels A, B, C, and D to LFO mode (triangle or any shape: SHIFT+A/B/C/D/E)
- Set META IN for A, B, C, and D to VCA mode (select channel and press SHIFT+MODE)
- Turn off META IN for channels E and F (select channel and long-press SHIFT+MODE)
- Set channel F to CV mode
- Patch channel F into META IN

Use the channel F output to set the amplitude of all A, B, C, and D LFOs.



# TRIGGERED ENVELOPE

- Set channel E to ENV mode
- Set IN E to TRIG mode (E+MODE)
- Send a trigger to IN E

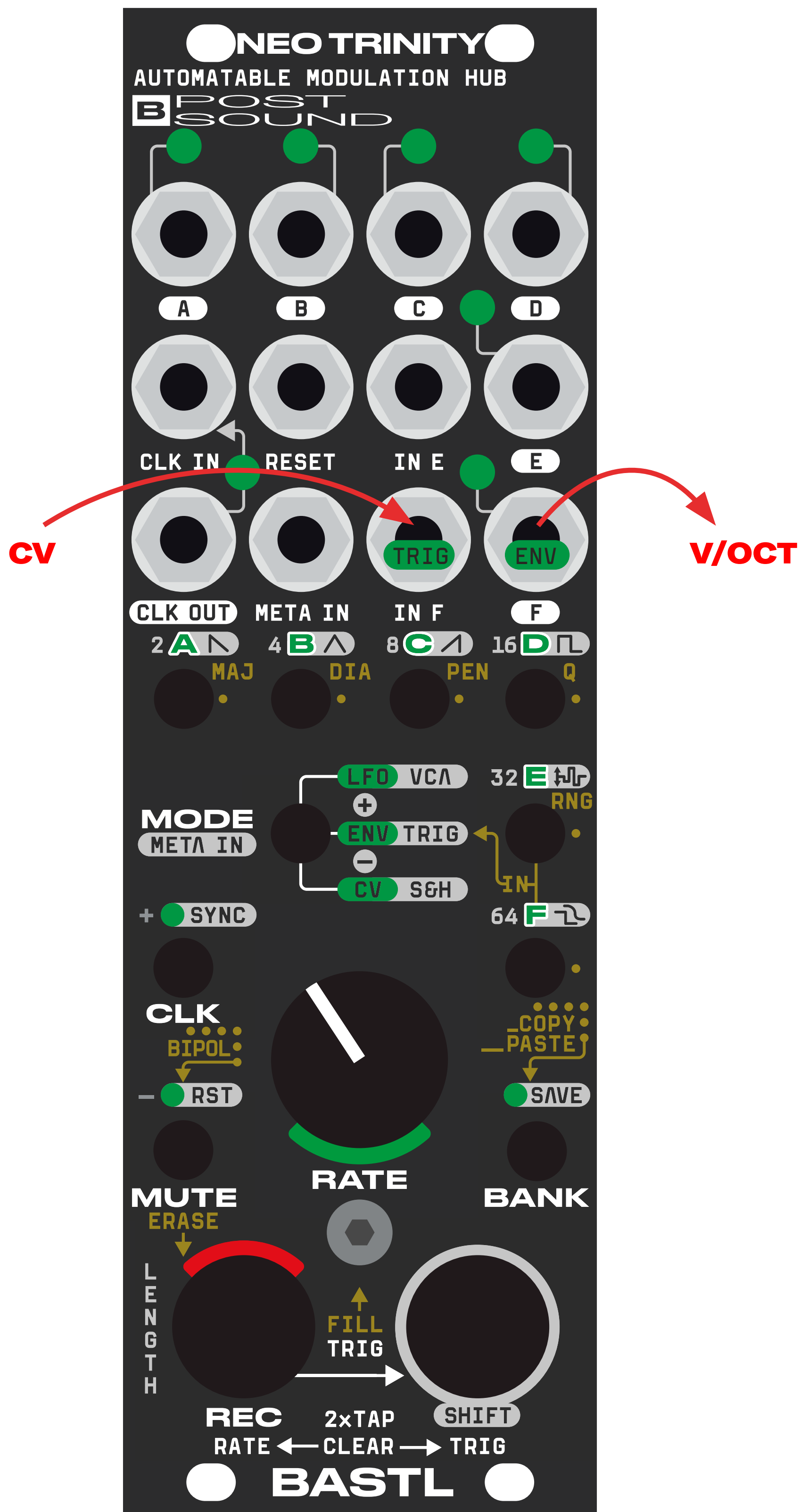
Use an external trigger to trigger the channel E envelope. The envelope will function as an AD envelope. Activate the SLEW mode (SHIFT+F) and use gates instead, and the envelope will behave as an AR envelope (best used as the variable shape envelope).



# SLEW GENERATOR

- Set channel F to ENV mode
- Set IN F to TRIG mode (F+MODE)
- Set ENV shape to variable (SHIFT+B)
- Activate SLEW mode for channel F (SHIFT+F)
- Send a CV to IN F

Use channel F as a slew limiter for the external CV. Automate the RATE knob of channel F to have a variable slew in time.





# TRIG TO GATE RHYTHM VARIATOR

- Set channel F to ENV mode
- Set IN F to TRIG mode (F+MODE)
- Set ENV shape to PULSE (SHIFT+D)
- Set ENV to NON-RETRIG mode (SHIFT+E)
- Send a trigger to IN F

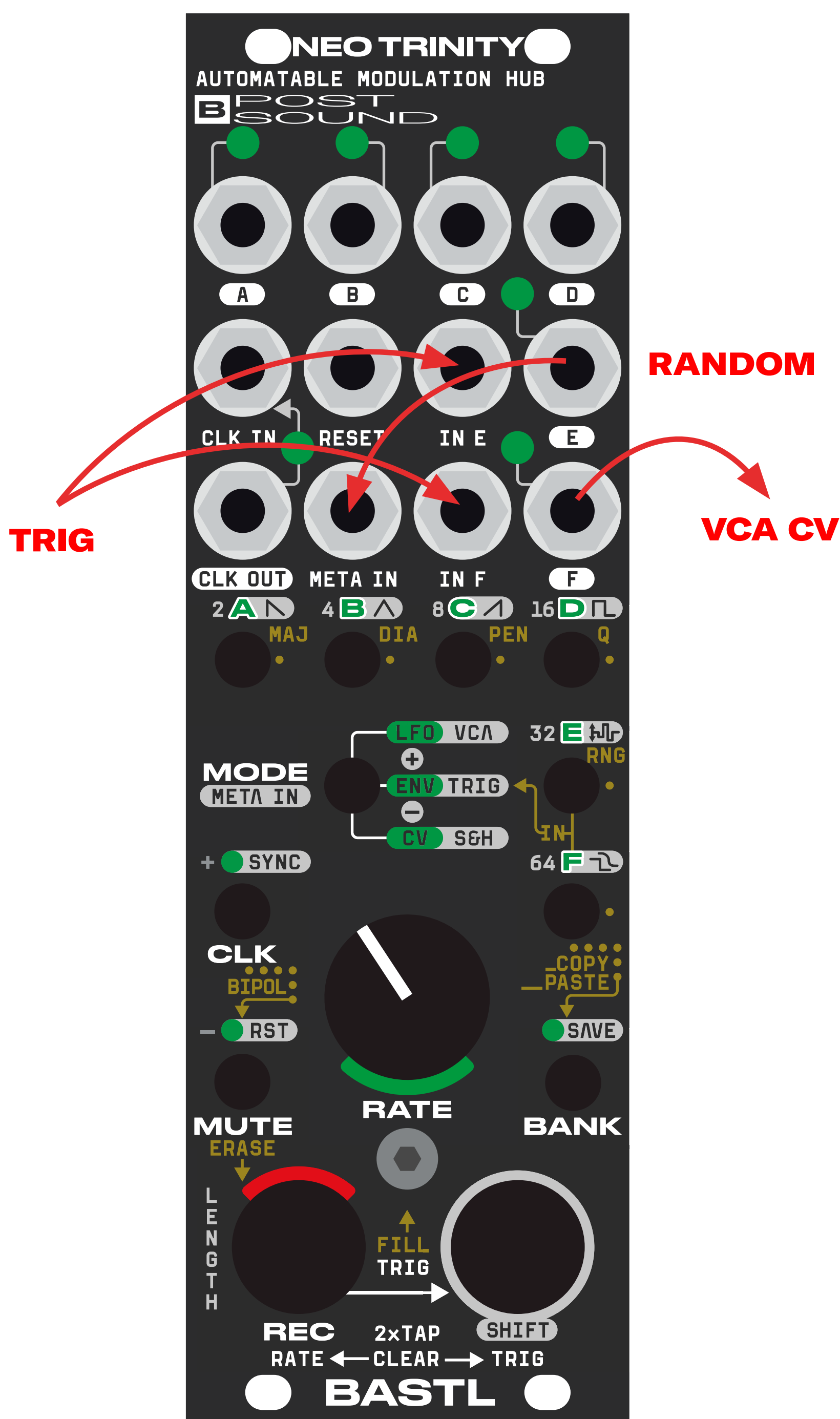
Use an external trigger to trigger the channel F envelope. RATE sets the gate length, and the envelope will only retrigger when the GATE ends. This will start skipping incoming triggers, adding variability to your rhythm. Automate the RATE knob for the most variability.



# RANDOM AMPLITUDE ENVELOPE

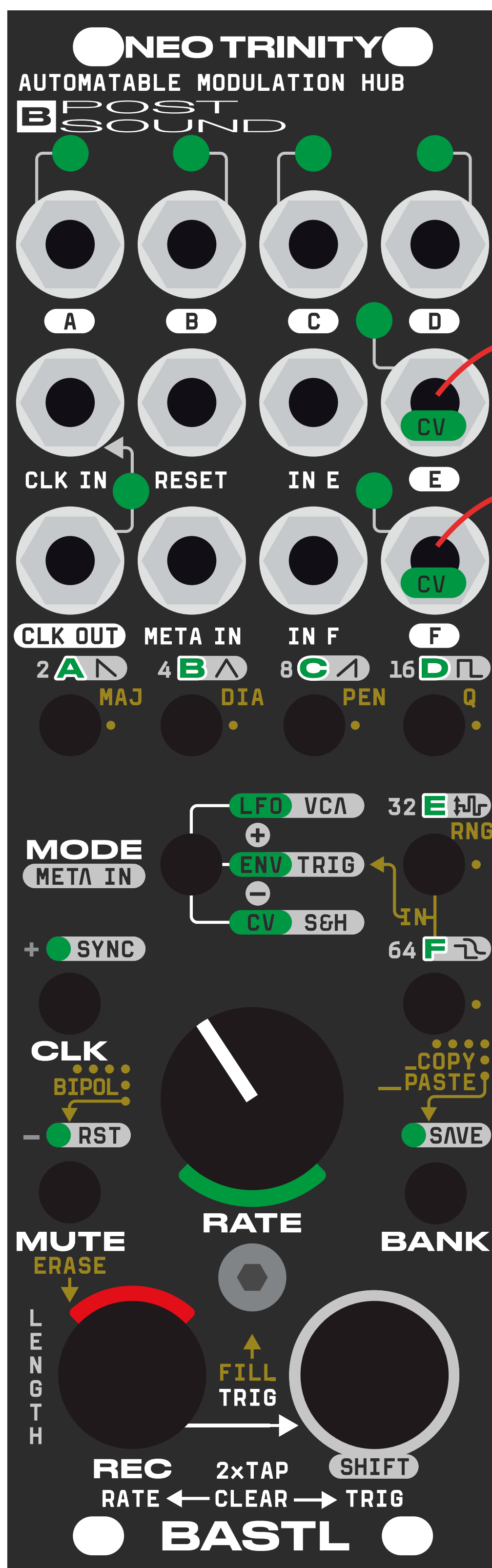
- Set channel F to ENV mode
- Set IN F to TRIG mode (F+MODE)
- Set ENV shape to variable (SHIFT+B)
- Set META IN for channel F to VCA (SHIFT+MODE)
- Deactivate META IN for all other channels (select channel and long-press SHIFT+MODE)
- Set channel E to LFO mode (RANDOM or other shape: SHIFT+A/B/C/D/E)
- Set channel E to unipolar mode (E+MUTE)
- Set IN E to S&H mode (E+MODE)
- Patch E to META IN
- Send a trigger to IN E and IN F

Channel E will randomly control the amplitude of the envelope generated by channel F, producing a new amplitude only when a new trigger comes in (due to the S&H).



# CV AND GATE SEQUENCER

- Set channels E and F to CV mode
  - Use channel F with quantizer (SHIFT+ D) and automate its RATE
  - Send output E to the V/OCT pitch input of your oscillator
- Use channel E as a gate recorder (REC+SHIFT) for rhythm information for your envelopes.



GATE

V/OCT

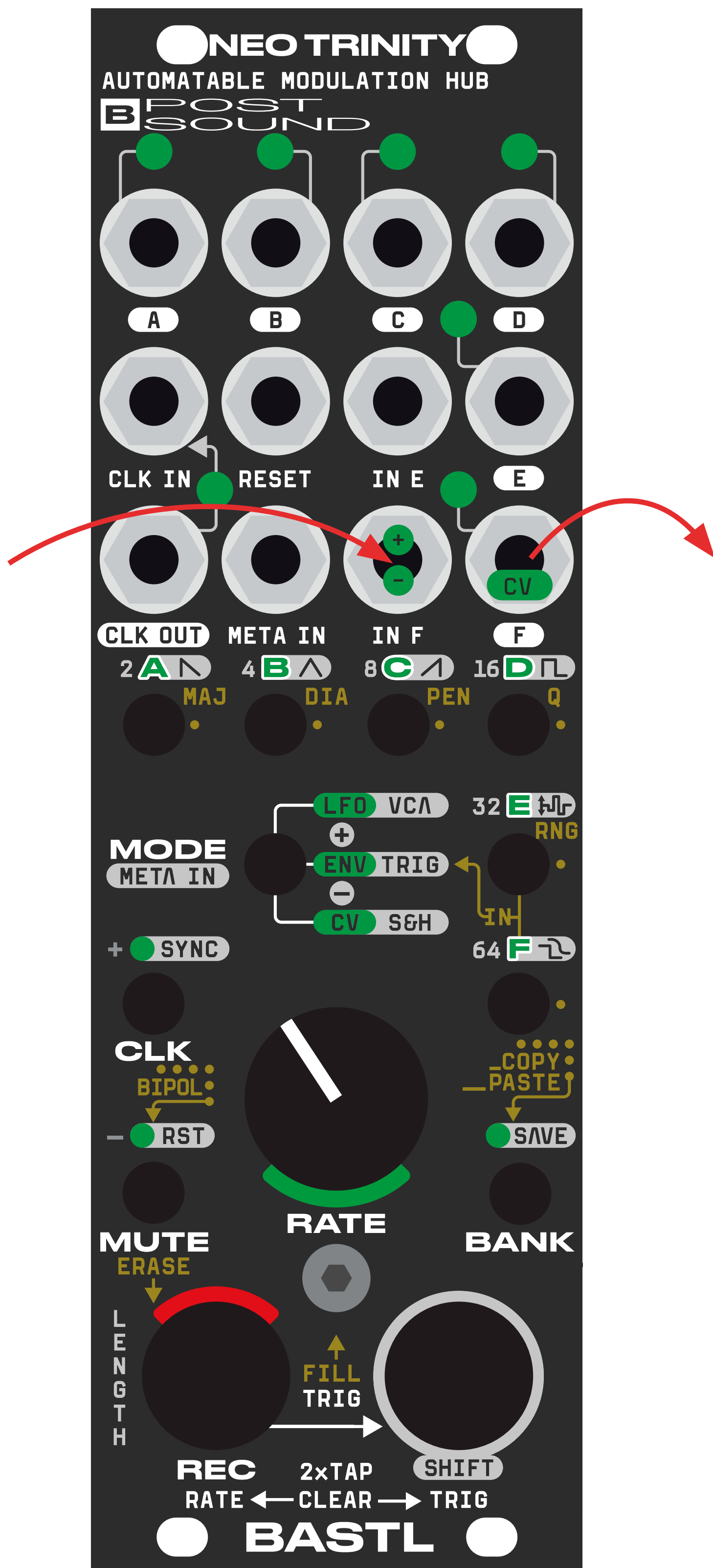
# VOLTAGE PROCESSOR

- Set channel F to CV mode
- Set IN F to regular or inverted mode (F+MODE)
- Send a signal to IN F

Use the channel F output to create a processed CV. This is useful if you want to offset a CV with the RATE knob.

If you want to attenuate and offset (convert a bipolar signal to unipolar), then select regular attenuated mode for IN F.

You can also invert signals by setting IN F to the inverted mode. Inverted offset conditioning is also possible by combining the RATE offset and the inverted input mode. This is useful for ducking/side-chain compression envelopes and such.



# ATTENUVERTER

- Set channel F to CV mode
- Set channel F to bipolar mode (F+MUTE)
- Set IN F to VCA mode (F+MODE)
- Send a signal to IN F

Use the F output to create an attenuated version of the input signal by turning the RATE knob. This works because, in the bipolar VCA mode, the CV and processed signals are interchangeable. Combine this with the Voltage processor patch above, or automate the RATE and get creative.

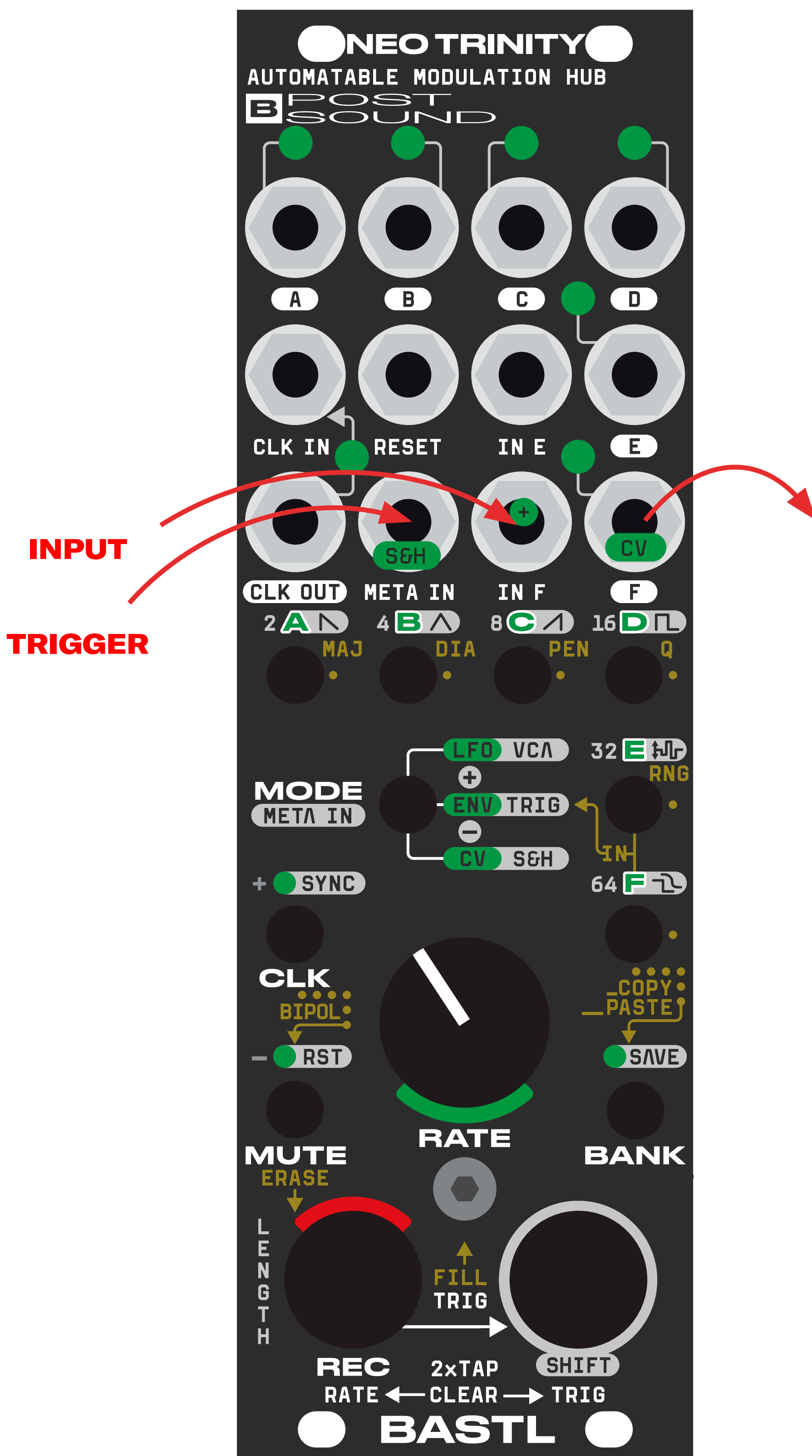




# TRIGGERED QUANTIZER

- Set channel F to CV mode
- Set IN F to regular (+) mode (F+MODE)
- Set META IN to S&H mode for channel F and turn it OFF for all other channels (SHIFT+MODE)
- Send a signal to IN F

The idea of this patch is to change pitch only when a new trigger is detected. This could be useful for rhythmically precise pitch quantization or for creating melodic variations.





# ENVELOPE WITH LINEAR/SUPER-EXP. CURVE

- Set channel F to ENV mode
- Set IN F to regular or inverted mode (F+MODE) or their attenuated variants Self-patching the envelope into its RATE input will alter the curve of the envelope.

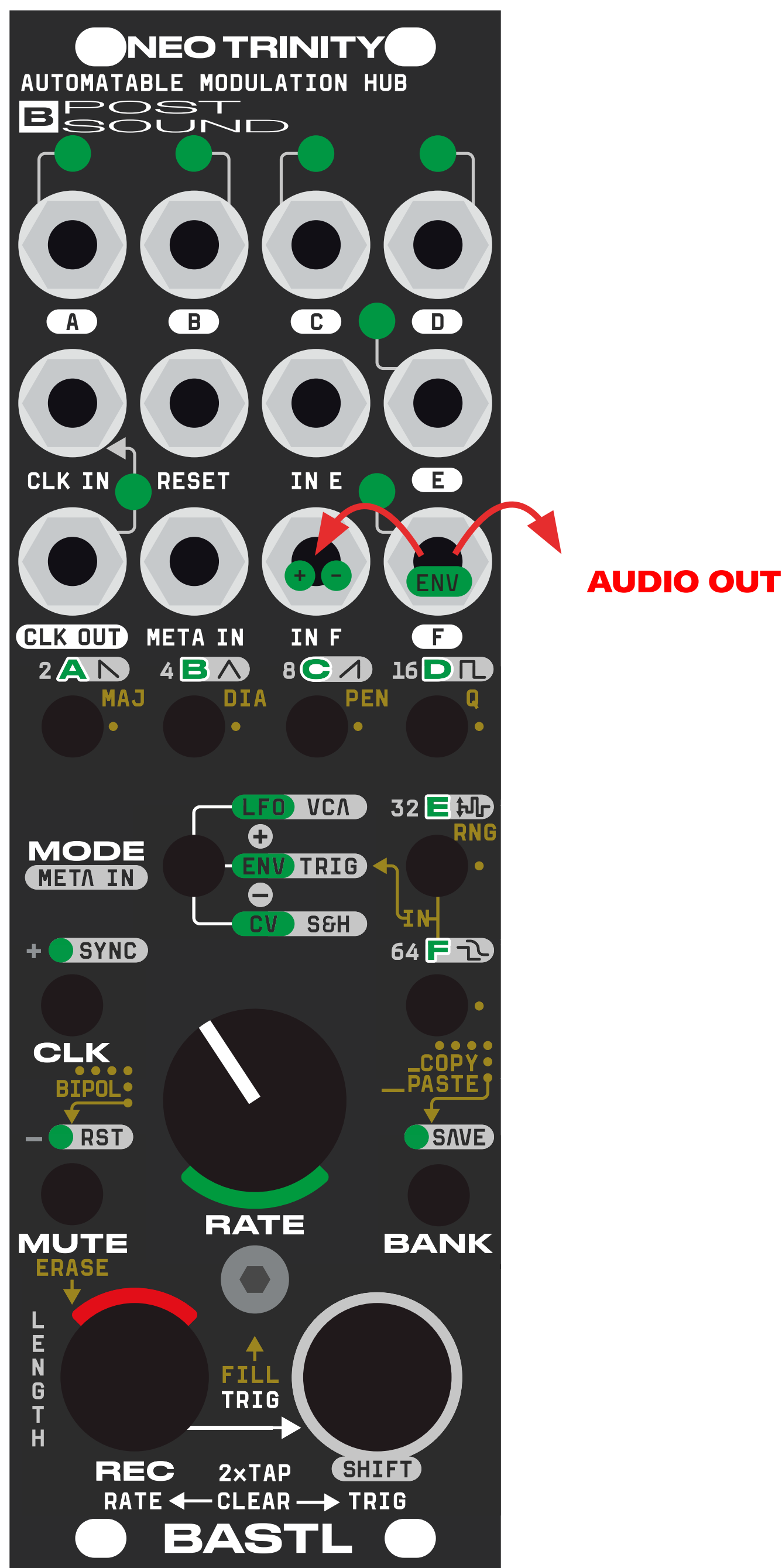
The regular (+) mode will make the envelope linear.

Regular attenuated (+) mode will make it something between linear and exponential.

The inverted mode will exaggerate the exponential curve, while the inverted attenuated mode will do it a little bit less.

Please note that all these patches will influence the envelope duration set by the RATE knob.

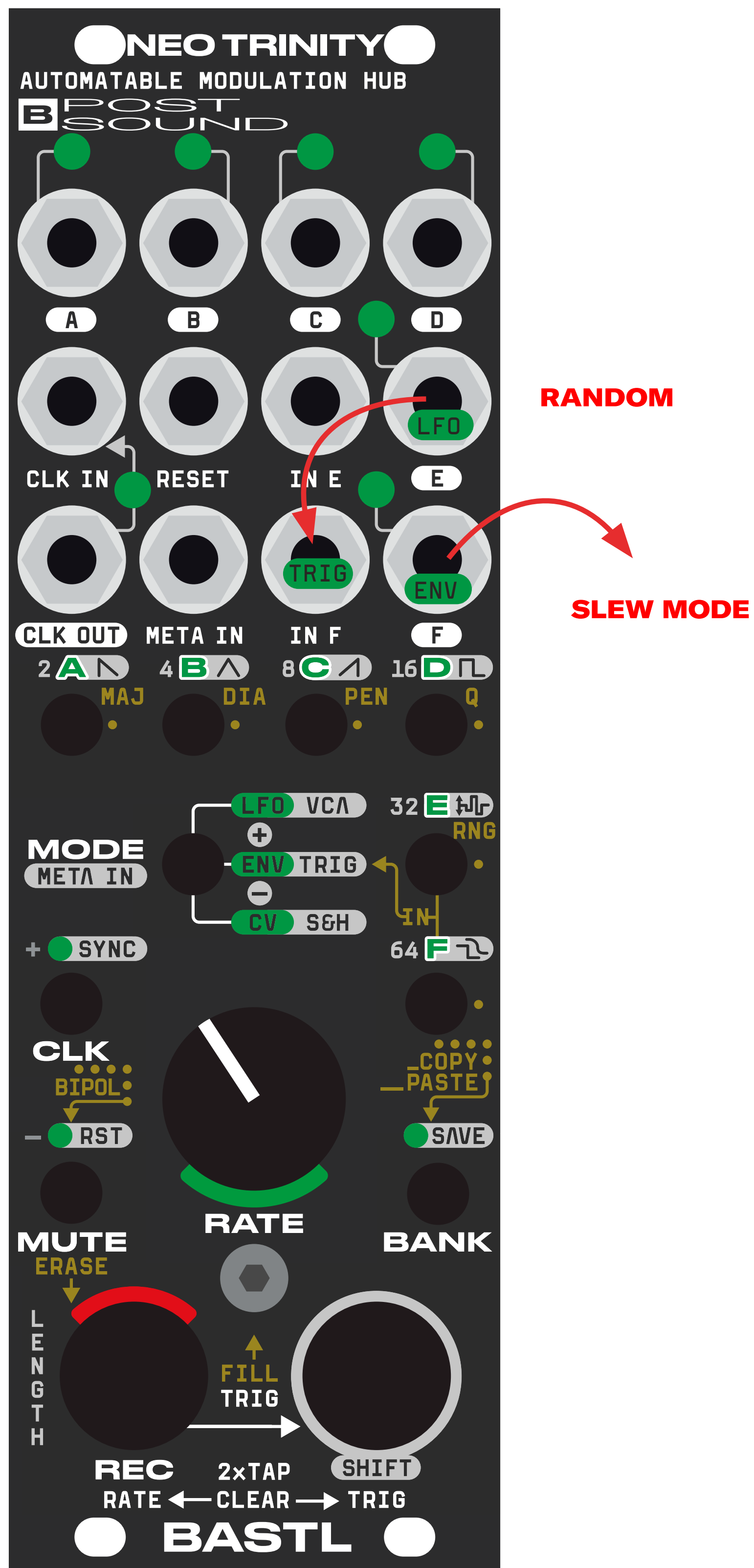
**NOTE:** This patch will not work as expected for the variable shape because its rate control has a macro on it, but it will create some unusual shapes.



# SLEWED SMOOTH RANDOM

- Set channel E to LFO mode (random, no smoothing: SHIFT+E)
- Set channel F to ENV mode with the SLEW behavior ON (SHIFT+F)
- Set variable shape envelope for channel F (SHIFT+B)
- Set IN F to TRIG mode (F+MODE)
- Patch E to IN F

Use channel E to generate stepped random voltages. Channel F will act as a slew limiter – turn the RATE knob to the left. Fine-tuning the RATE of channels E and F will yield various results of slewed smooth random voltage.



# CREDITS

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**MANAGEMENT:** John Dinger

**GRAPHIC DESIGN:** Anymade Studio

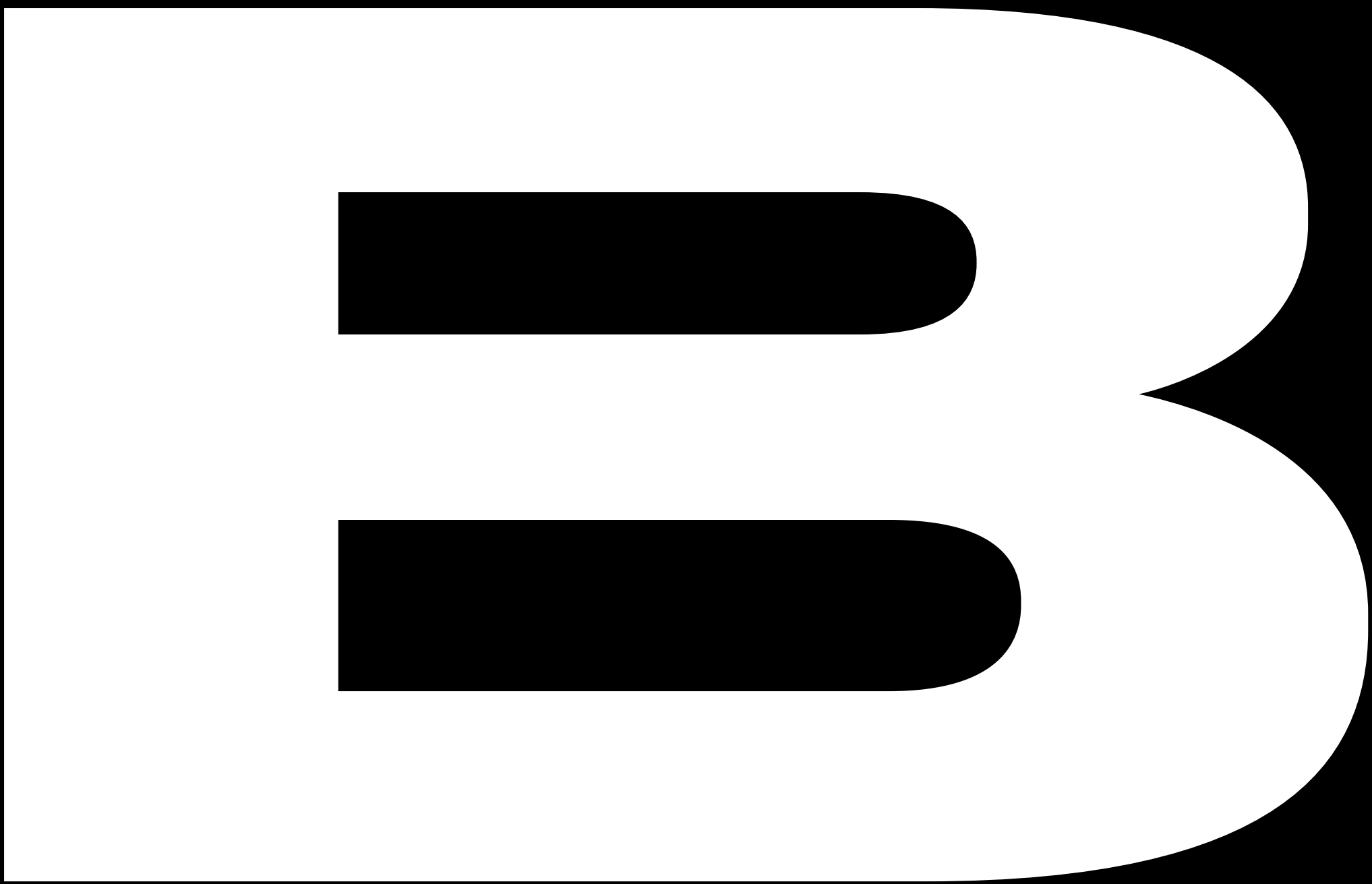
The idea turned into reality thanks to everyone at Bastl Instruments and thanks to the immense support of our fans.



# BASTL

more info  
and video tutorials

[www.bastl-instruments.com](http://www.bastl-instruments.com)

A large, bold, white letter 'B' is centered on a solid black rectangular background. The 'B' has a thick, rounded top and a thick, rounded bottom, with a horizontal bar in the middle that also has rounded ends. The overall style is clean and modern.