Makenoise Maths
Manual Patch Ideas illustrated

by Demonam

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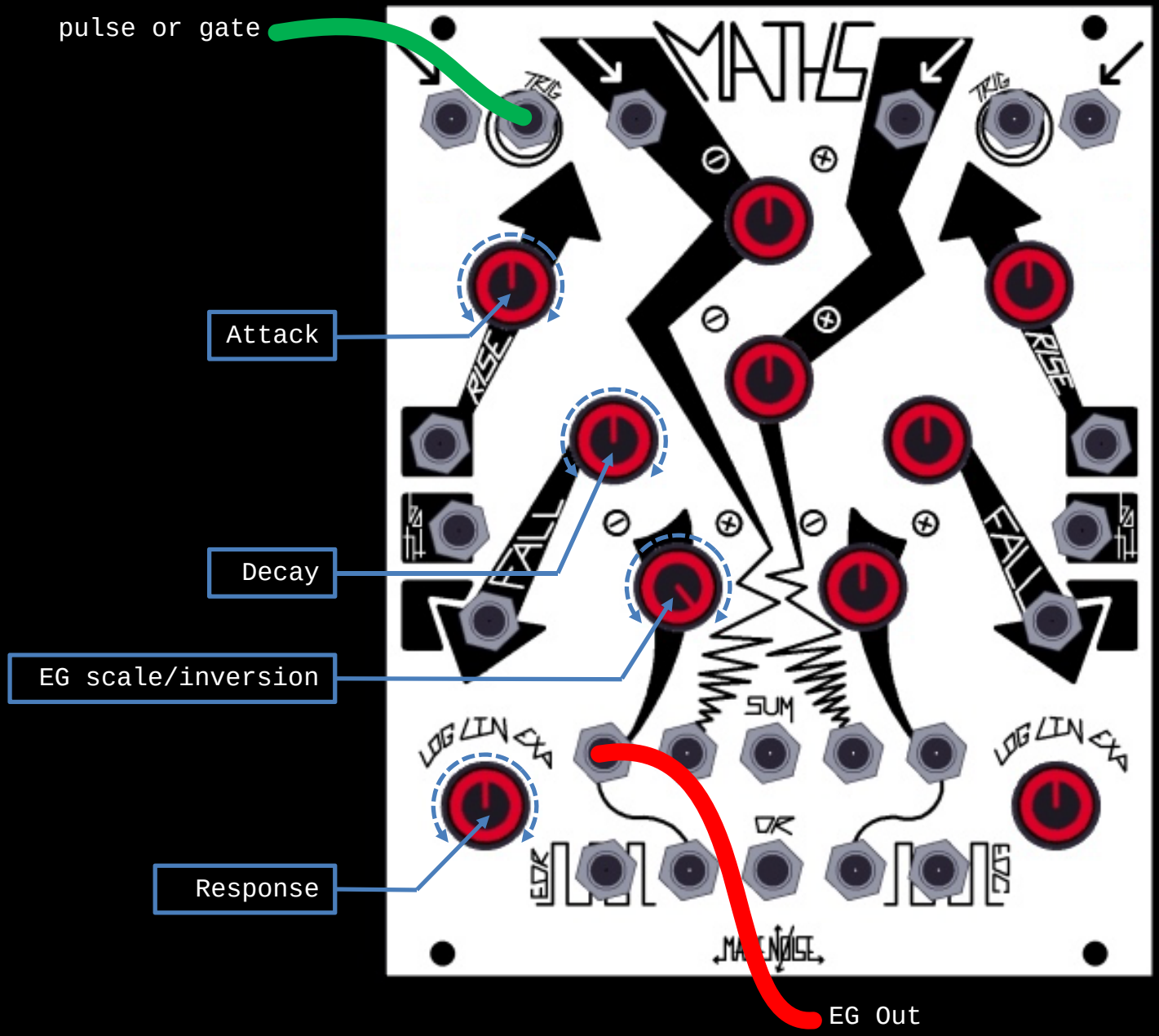
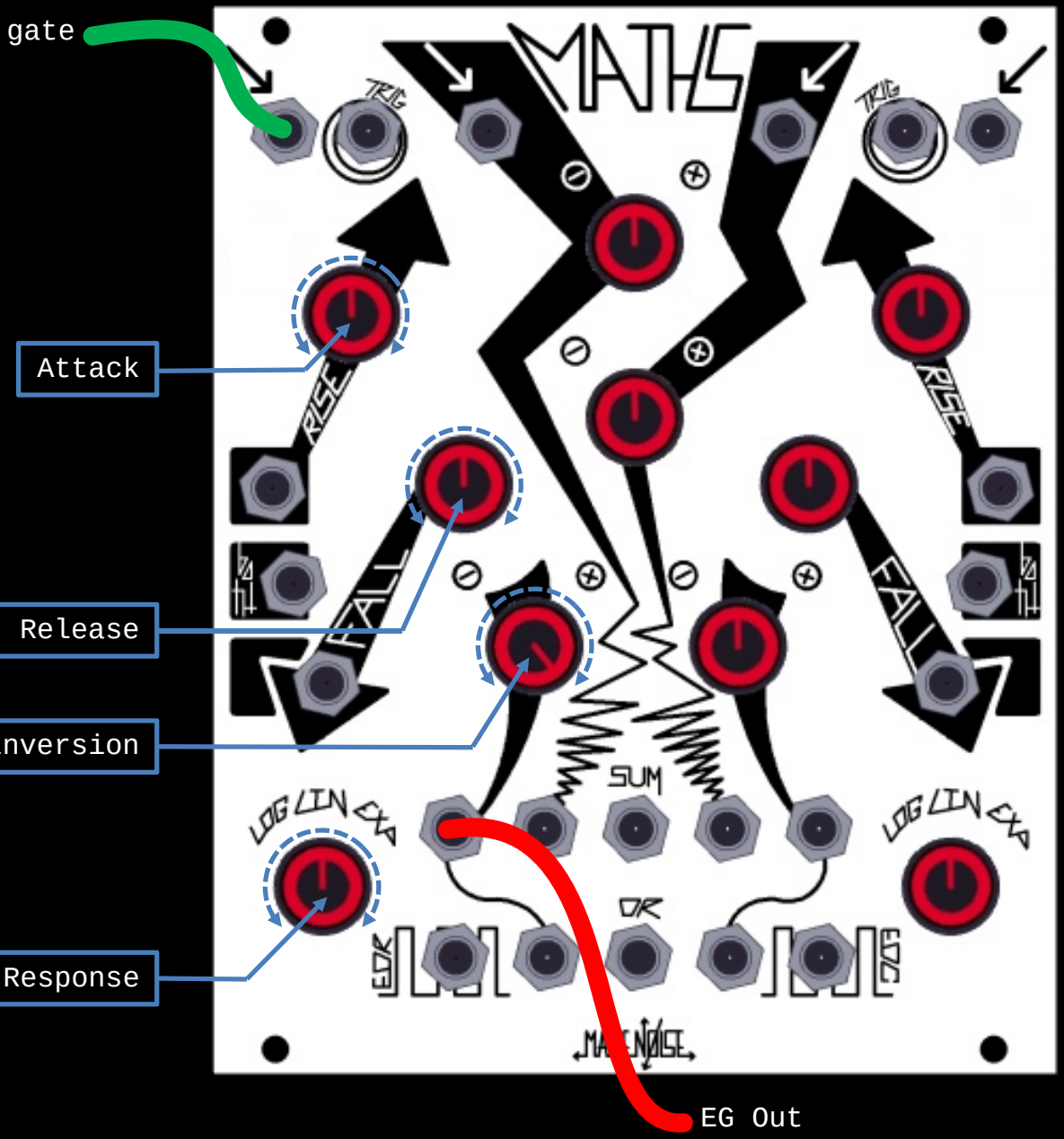
Voltage Controlled Transient Generator (Attack/ Decay EG)



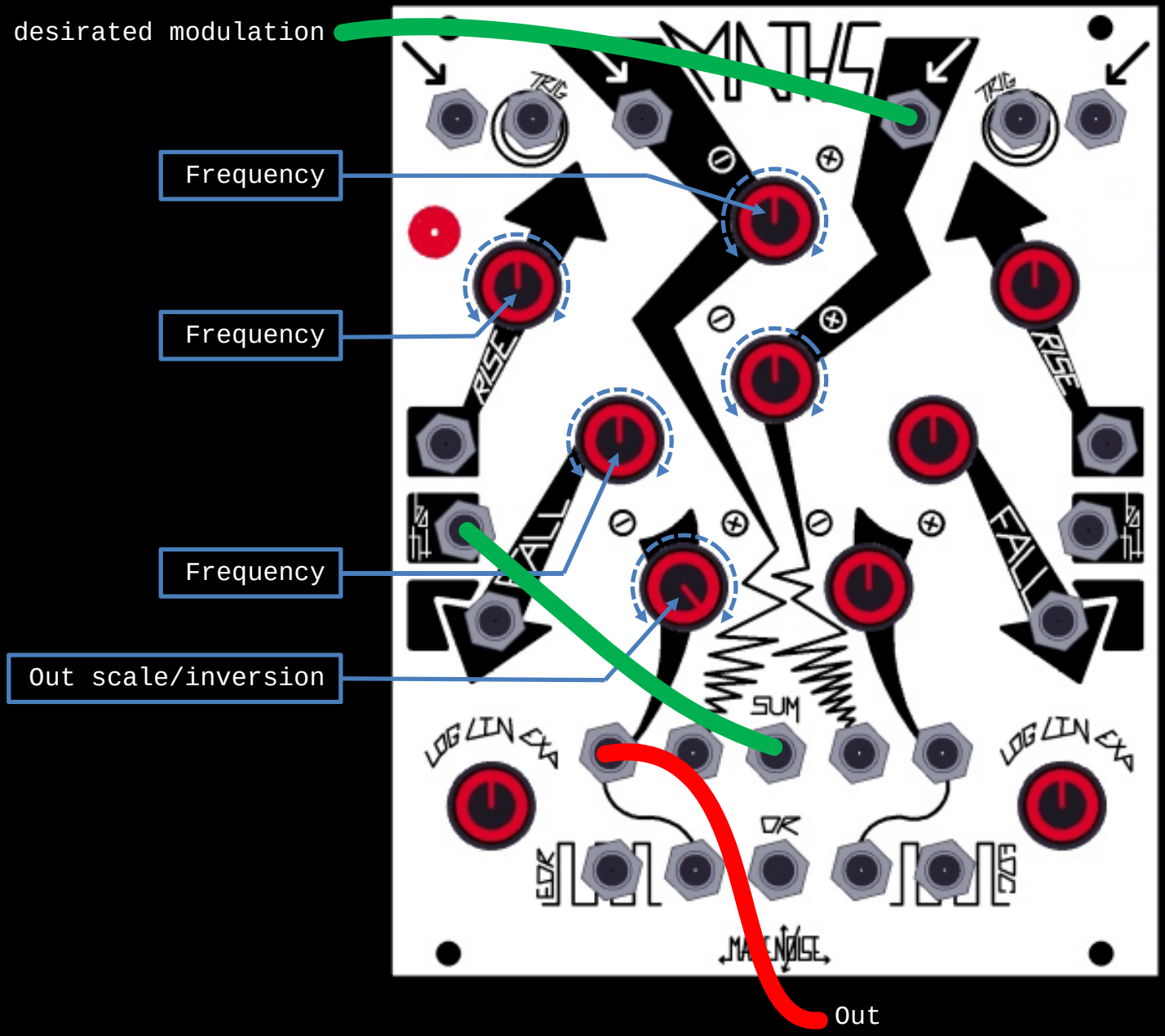
A pulse or gate applied to the Trigger IN of CH. 1 or 4 will start the transient function which rises from 0V to 10V at a rate determined by the Rise parameter and then Falls from 10V to 0V at a rate determined by the Fall parameter. This function is re-trigger-able during the Falling portion. Rise and Fall are independently voltage controllable, with variable response from Log thru Linear to Exponential, as set by the Vari-Response panel Control. The resulting function may be further processed with attenuation and/ or inversion by the Scale/ Inversion Panel Control.

Voltage Controlled Sustained Function Generator (A/S/R EG)



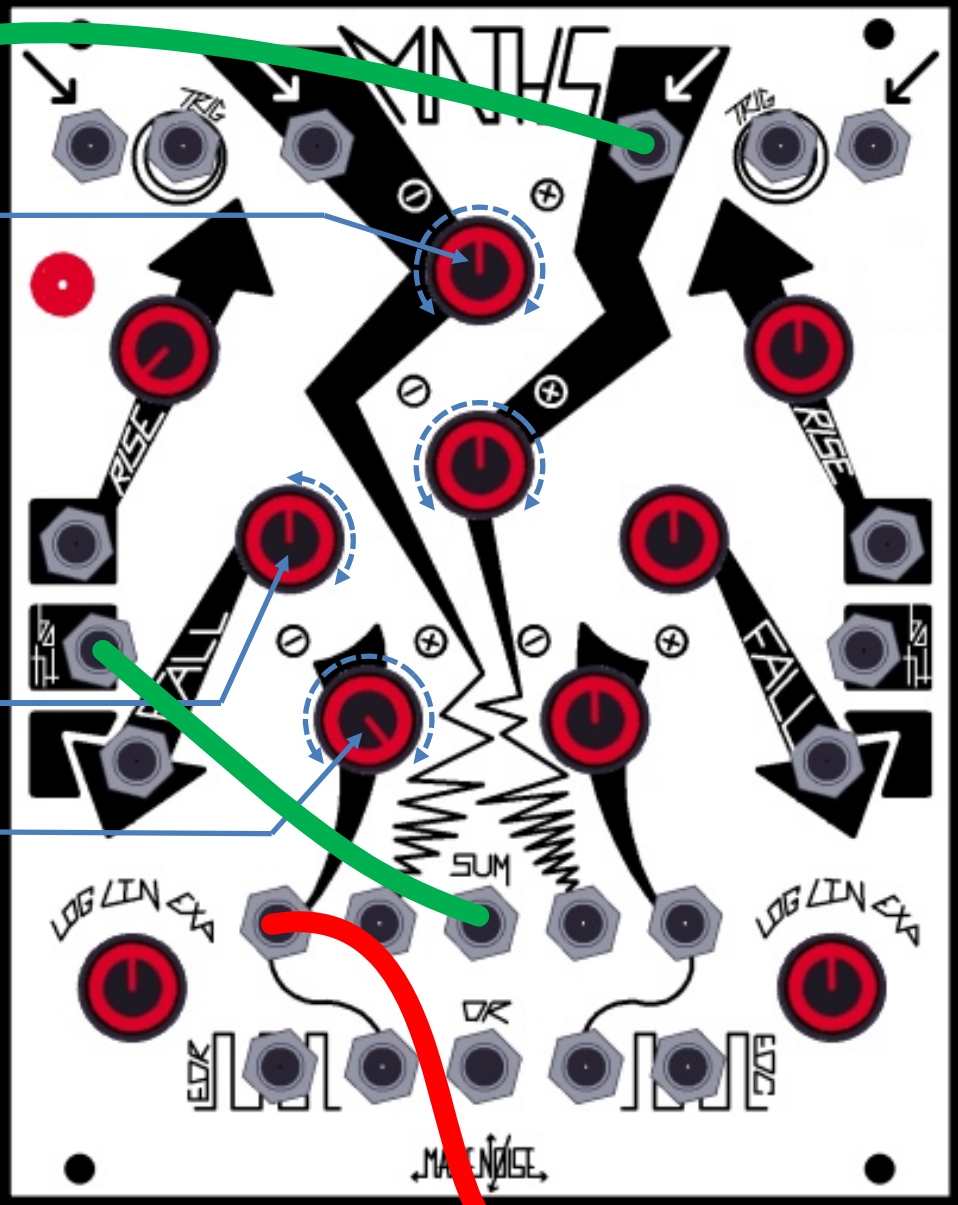
A gate applied to the Signal IN of CH. 1 or 4 will start the function which rises from 0V to the level of the applied Gate, at a rate determined by the Rise parameter, Sustains at that level until the Gate signal ends, and then Falls from that level to 0V at a rate determined by the Fall parameter. Rise and Fall are independently voltage controllable, with variable response as set by the Vari-Response panel Control. The resulting function may be further processed with attenuation and/ or inversion by the Scale/ Inversion Panel Control.

Typical Voltage Controlled Triangle Function



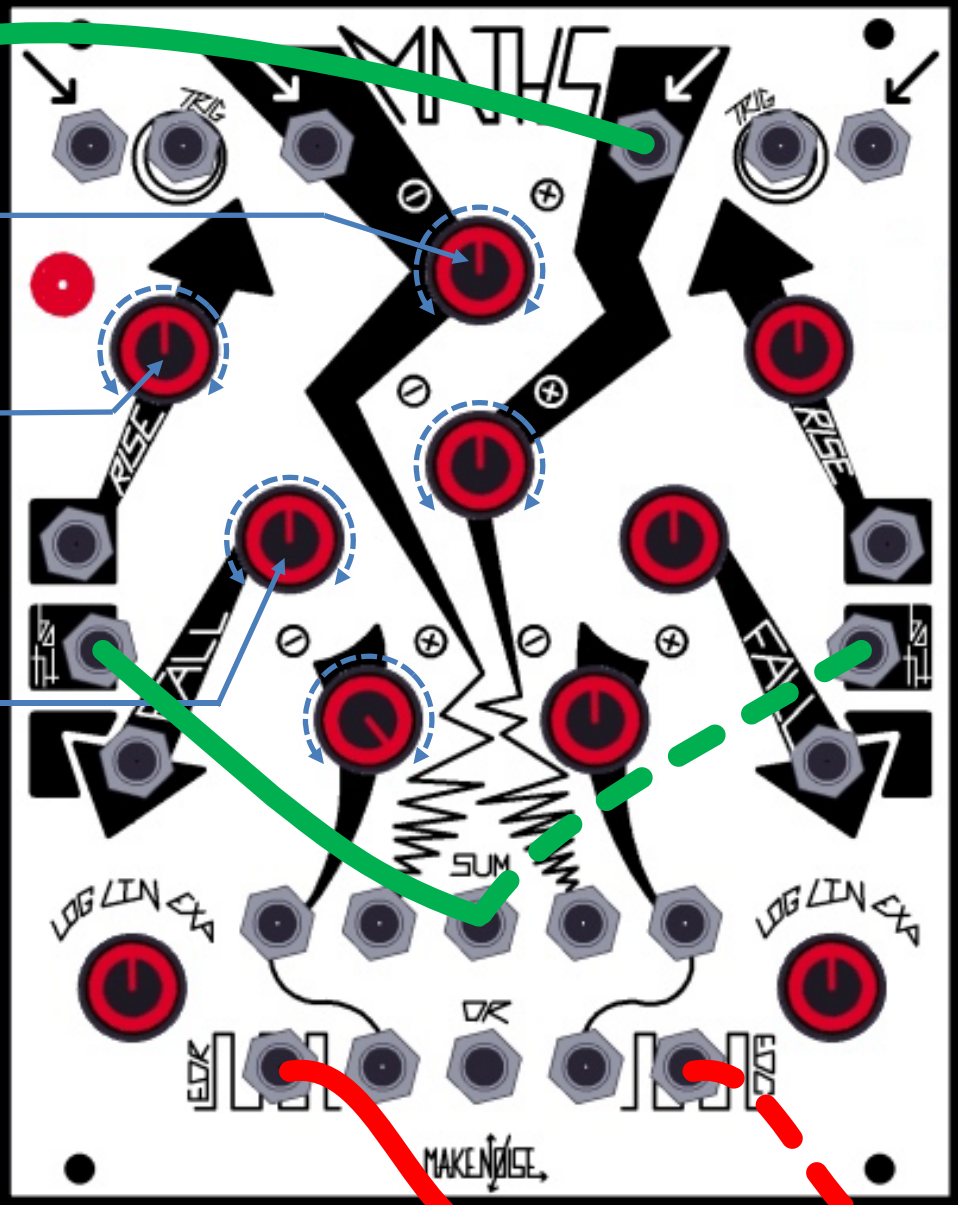
Set CH. 1 (or 4) to self Cycle. Set Rise and Fall Panel Control to NOON. Apply desired modulation to CH. 3 Signal Input. Set CH. 2 Scale/ Inversion Panel Control to NOON. Apply Voltage Offset and modulation as SUMmed, by patching SUM OUT to Both Control Input. CH. 2 Scale/ Inversion will set Frequency. OUTput is taken from Signal OUT of associated channel. Setting Rise and Fall parameters further CW will provide longer cycles. Setting these parameters further CCW will provide short cycles, up to audio rate. The resulting function may be further processed with attenuation and/ or inversion by the Scale/ Inversion Panel Control.

Typical Voltage Controlled Ramp Function



As above, only the Rise parameter is set FULL CCW, Fall parameter is set to at least NOON.

Typical Voltage Controlled Pulse



desirated modulation

Frequency

Frequency

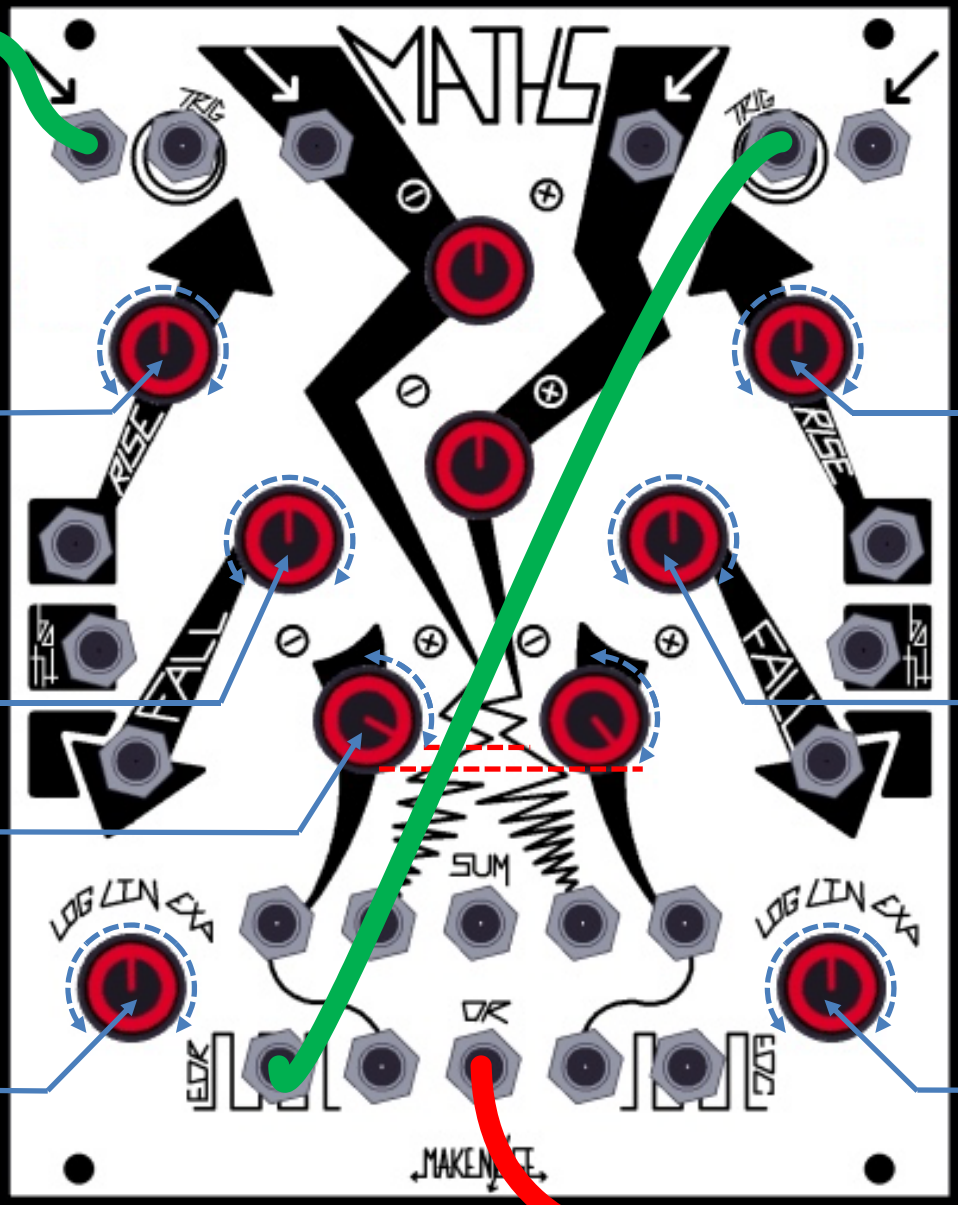
pulse width

Out

Out

Same as above, only the OUTput is taken from EOC or EOR. CH. 1, Rise parameter will more effectively adjust frequency, and CH. 1 Fall parameter will adjust pulse width. With CH. 4, the opposite is true where Rise adjust more effectively Width and Fall adjust frequency. In both channels all adjustment to Rise and Fall parameters will affect frequency.

Voltage Controlled ADSR (East Coast Envelope done West Coast style)



gate

Attack stage 1

Release

Sustain

Response

Attack stage 2

Decay

Response

Apply Gate signal to CH.1 Signal In. Set CH. 1 Scale/ Inversion Panel Control to less then Full CW. Patch CH. 1 End of Rise to CH. 4 Trigger IN. Set CH. 4 Scale Inversion Panel Control to Full CW. Take OUTput from OR bus OUT, being sure that CH. 2,3 are set to NOON if not in use. In this patch CH. 1 and 4 Rise will control the Attack Time. For typical ADSR adjust these parameters to be similar (Setting CH. 1 Rise to be longer then CH. 4 will or vice-versa, will produce two attack stages). CH. 4 Fall parameter will adjust the Decay stage of the envelope. CH. 1 Scale/Inversion Panel Control will set the Sustain level, which MUST be lower then that same parameter on CH. 4. Finally CH. 1 Fall will set the Release Time.

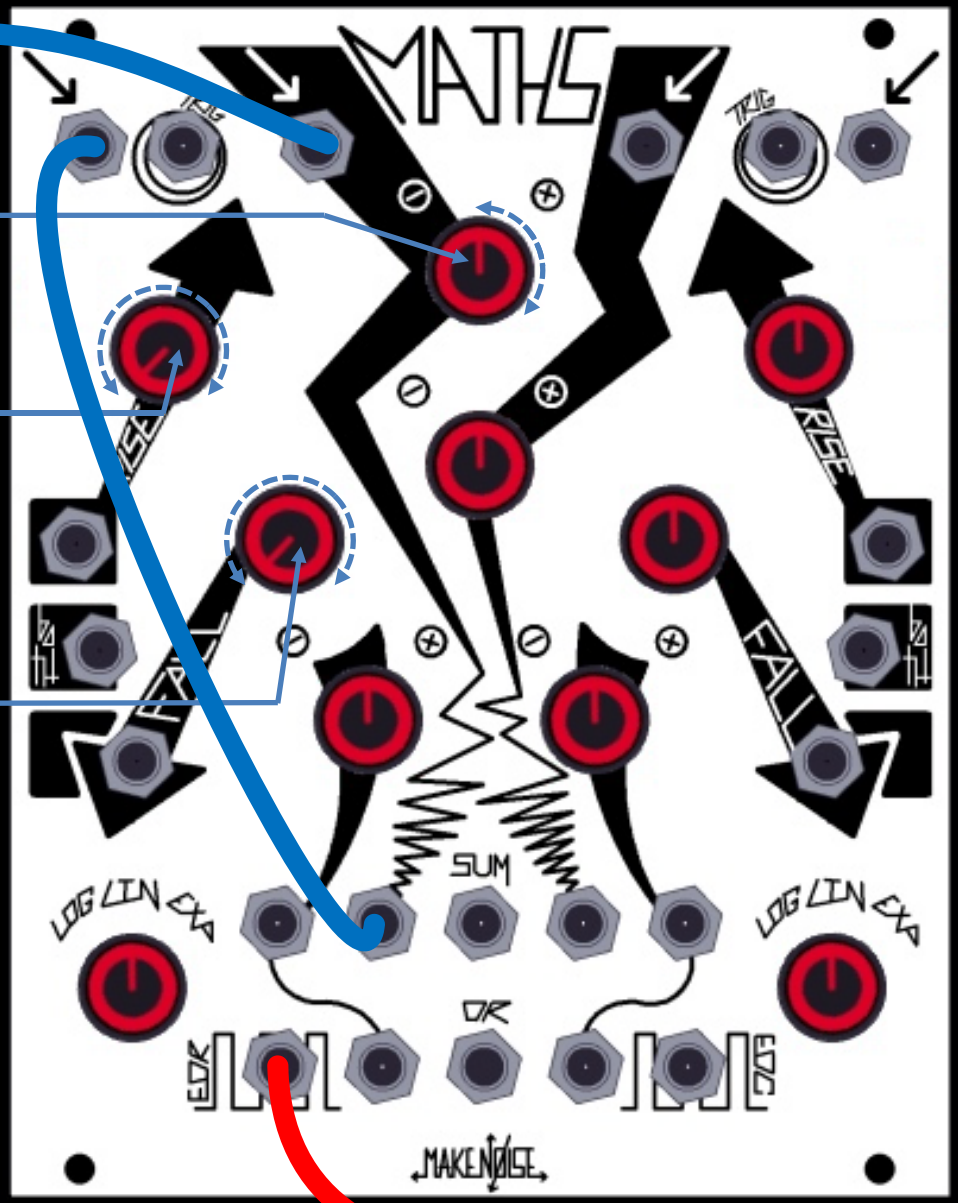
Voltage Comparator/ Gate Extraction w/ variable width

signal to be compared

threshold

derivate gate Delay

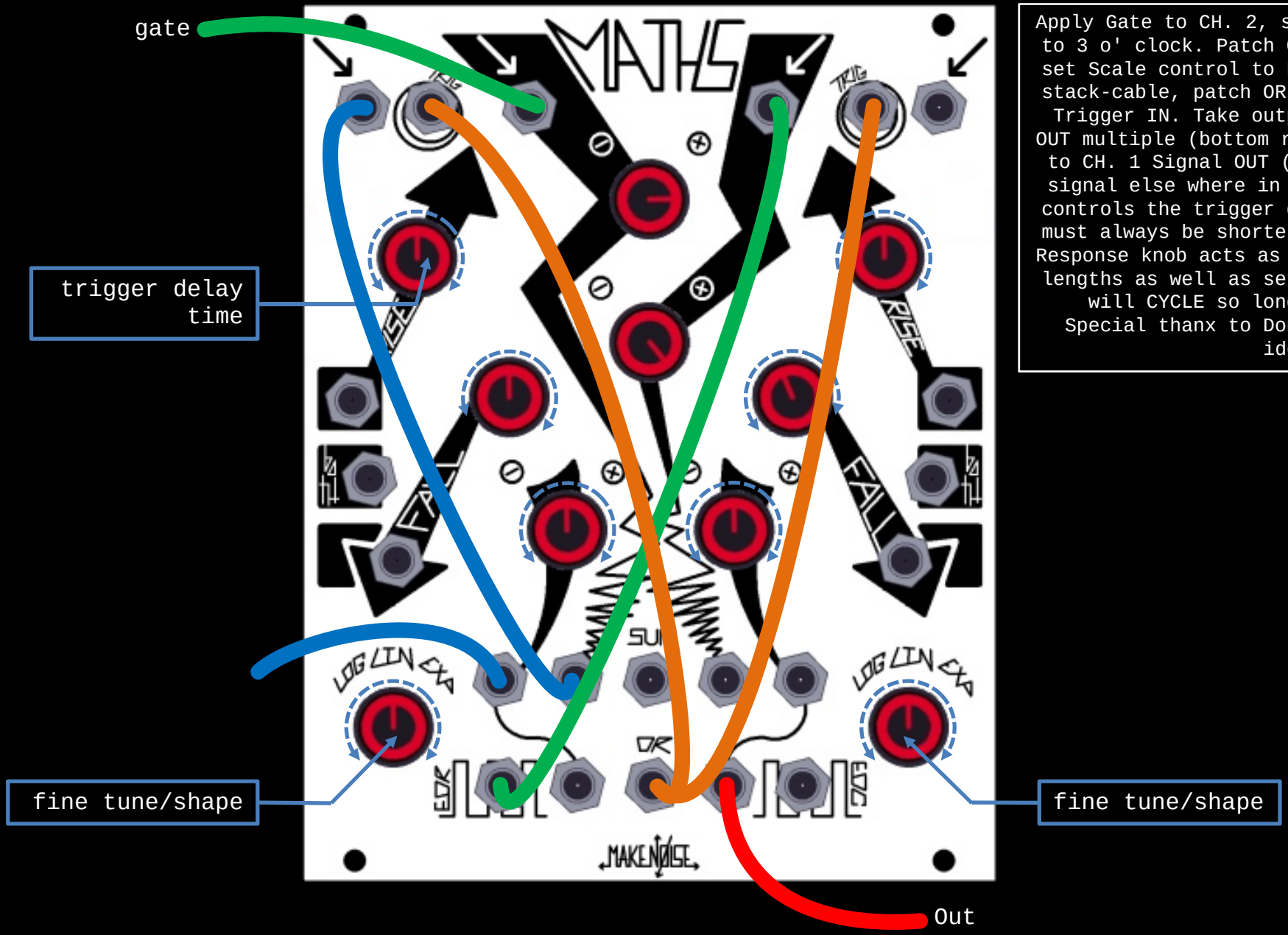
derivate gate Width



extracted gate

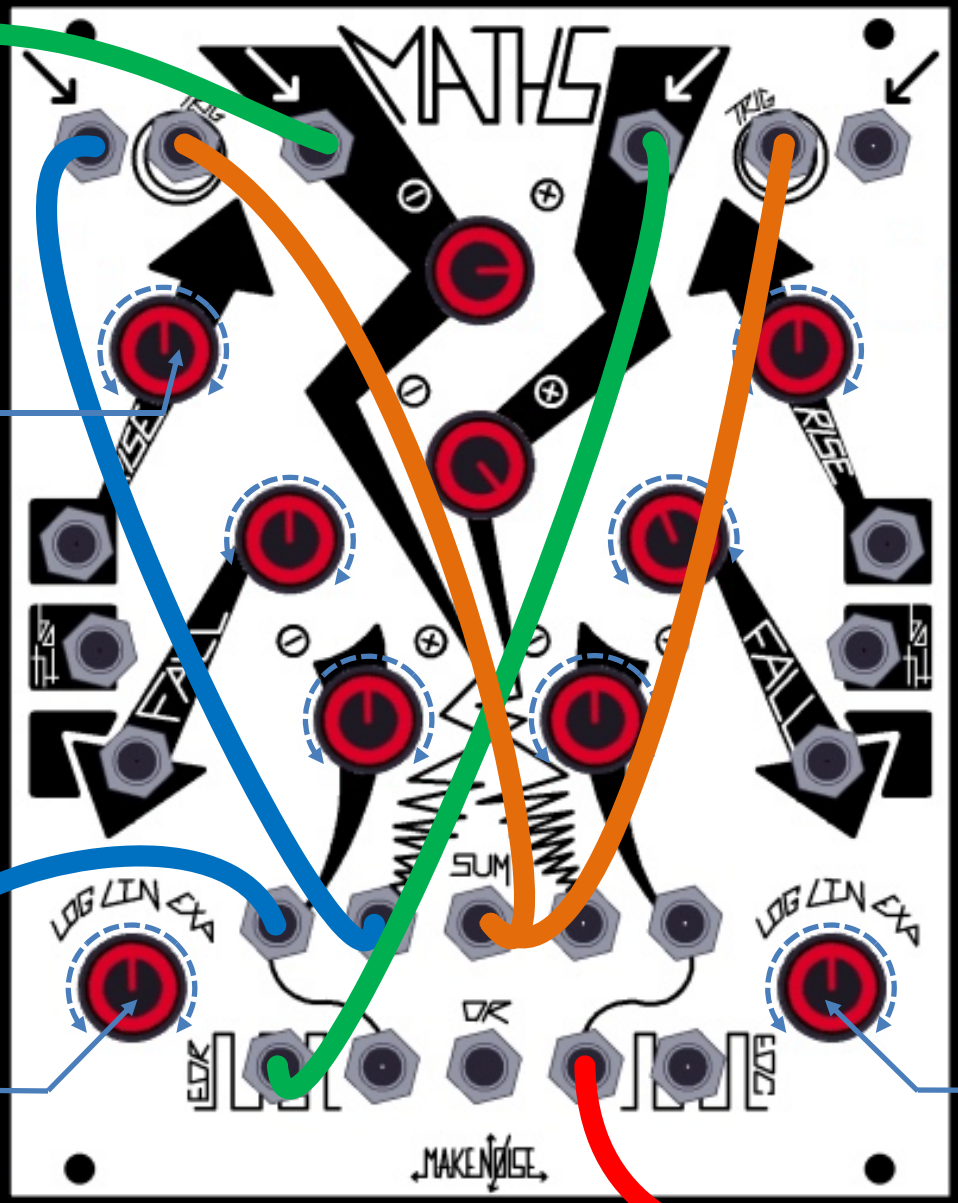
Apply signal to be comparated to CH. 2 Signal IN. Patch CH. 2 OUT to CH. 1 Signal IN. Set CH. 1 Rise and Fall to full CCW. Take extracted Gate from EOR. CH. 2 Scale/ Inversion acts as the Threshhold setting, applicable values being between NOON and Full CW. Values closer to NOON will be HIGHER thresholds. Setting the Rise times CW, you will be able to Delay the derived gate. Setting Fall times CW you will vary the width of the derived Gate. Use CH. 4 for Envelope Follower, and CH. 2 & 1 for Gate extraction, and you have a very powerful patch for external signal processing.

Gate Controlled CYCLE



Apply Gate to CH. 2, set CH. 2 Scale control to 3 o' clock. Patch CH. 1 EoR to CH. 3 and set Scale control to Full CW. Using mult or stack-cable, patch OR OUT to both CH. 1 & 4 Trigger IN. Take output form CH. 4 Signal OUT multiple (bottom row). Patch dumby cable to CH. 1 Signal OUT (top row), or use this signal else where in the patch. CH. 1 Rise controls the trigger delay time. CH. 4 Fall must always be shorter then CH. 1 Fall. The Response knob acts as a fine tune for timing lengths as well as setting the shape. Pathc will CYCLE so long as Gate is HIGH.
Special thanx to Don Kim for this patch idea.

Toggled Delayed CYCLING



gate

trigger delay time

fine tune/shape

fine tune/shape

Out

This is the patch that from which my idea for the above Gate Controlled CYCLE patch originated. Set up the above patch but take the SUM OUT and mult to both CH. 1 & 4 Trigger IN. instead of the OR OUT. Gate must be longer in duratation then the CYCLE time as set by Rise and Fall of CH. 1 and CH. 4. This patch works great with Pressure Points, utilizing on of Gate OUTs on that module. Special thanx to Don Kim for this very unique patch idea.

Envelope Follower

signal to be followed

response

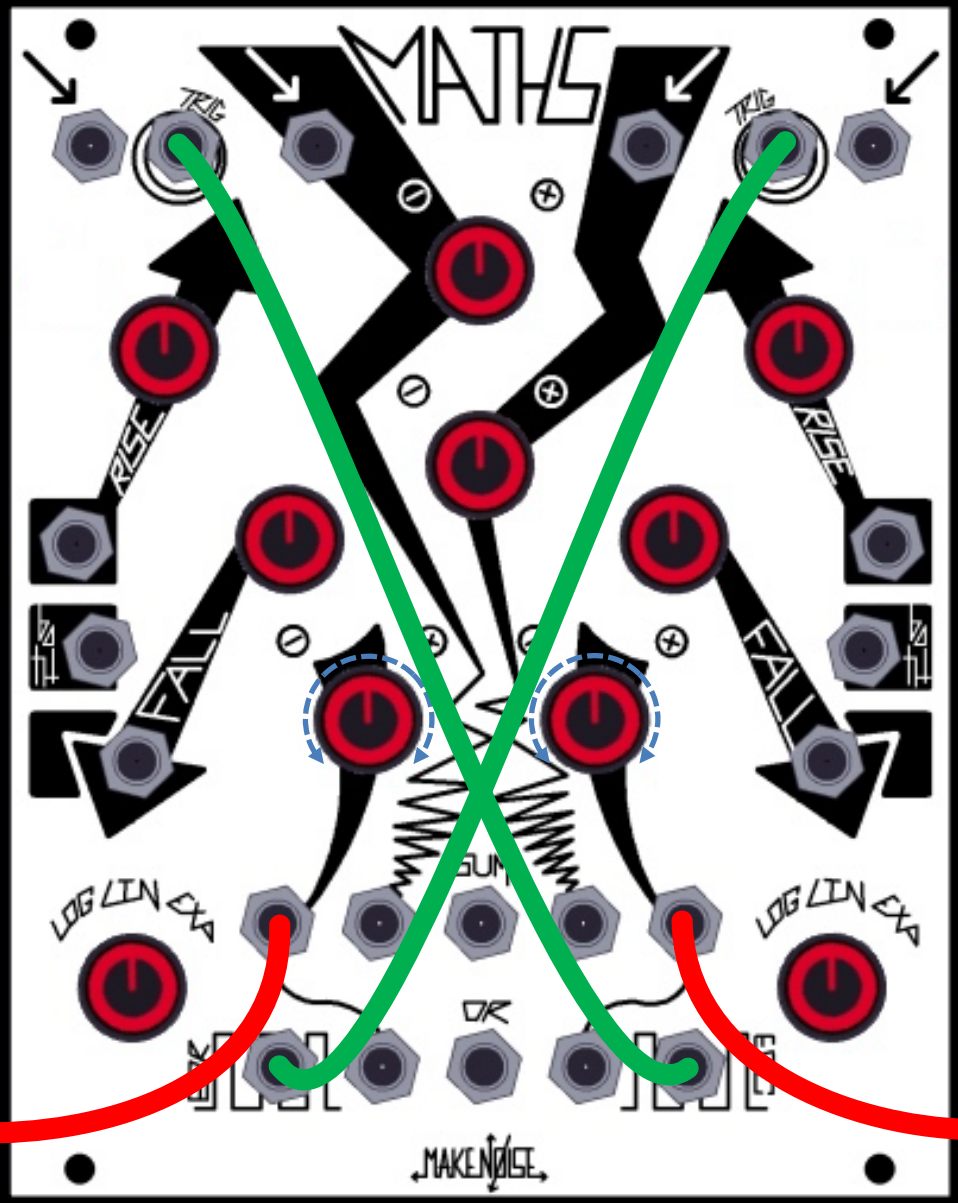
scale/inversion

positive/negative Out

positive only Out

Apply Signal to be followed to Signal IN CH. 1 or 4. Set Rise to NOON. Set and or modulate FALL Time to achieve different responses. Take output from associated channel Signal OUT for positive and negative Peak Detection. Take output from OR buss OUT to achieve more typical Positive ONLY Envelope Follower function. If gain is needed, pathc signal to CH. 2 or 3, and set Scale/ Inversion to full CW. Take output from associated channel OUT.

281 “Quadrature Mode” (West Coast Swirly Bird)



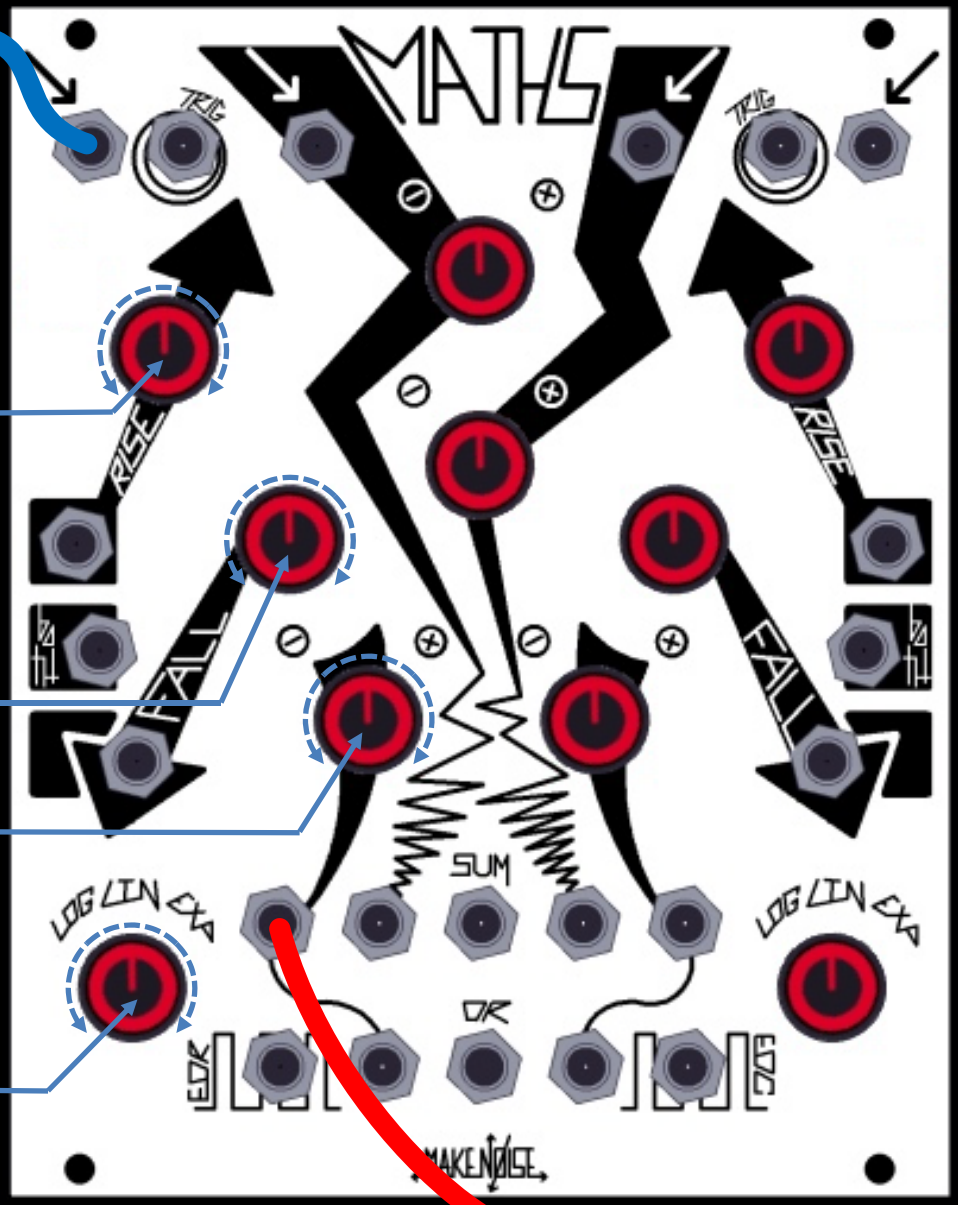
In this patch, CH. 1,4 work in tandem to provide functions shifted by ninety degrees. With both Cycle Switches UN-ENGAGED, Patch End of Rise (CH. 1) to Trigger IN CH. 4. Patch End of Cycle (CH. 4) to Trigger IN CH. 1. If both CH.1 and 4 do not begin cycling, engage CH. 1 Cycle Briefly. With both channels cycling, apply their respective Signal OUTputs to two different modulation destinations, for example two channels of the QMMG.

modulation destination

modulation destination

VC LAG/ Slew Processor

signal to be slewed



slew RISE

slew FALL

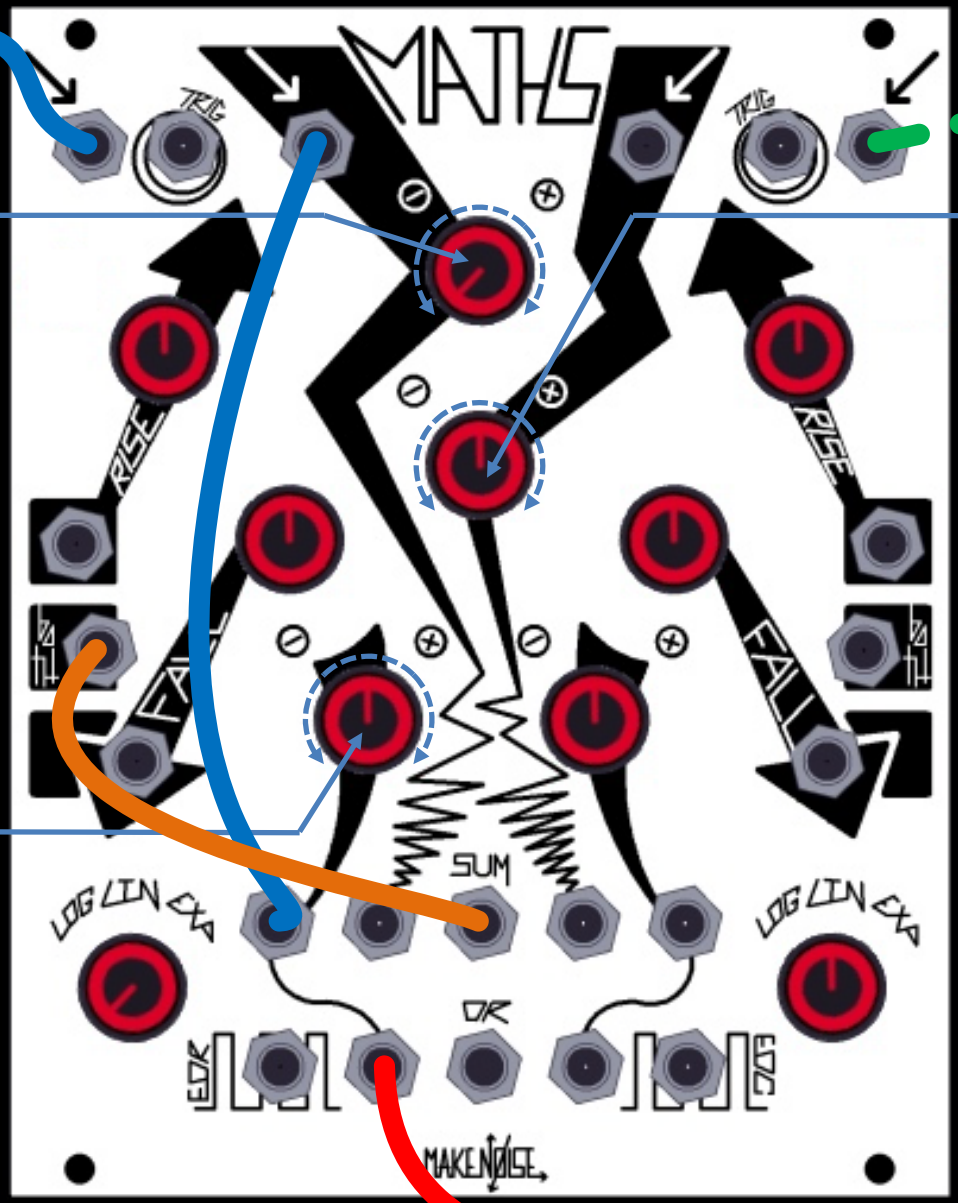
scale/inversion

response

Out

A signal applied to the Signal IN, is slewed according to the RISE and FALL parameters. Variable response from Log thru Linear to Exponential, is as set by the Vari-Response panel Control. The resulting function may be further processed with attenuation and/ or inversion by the Scale/ Inversion Panel Control.

East Coast Portamento



signal to be slewed

control signal

extremeness of the LOG response

portamento rate

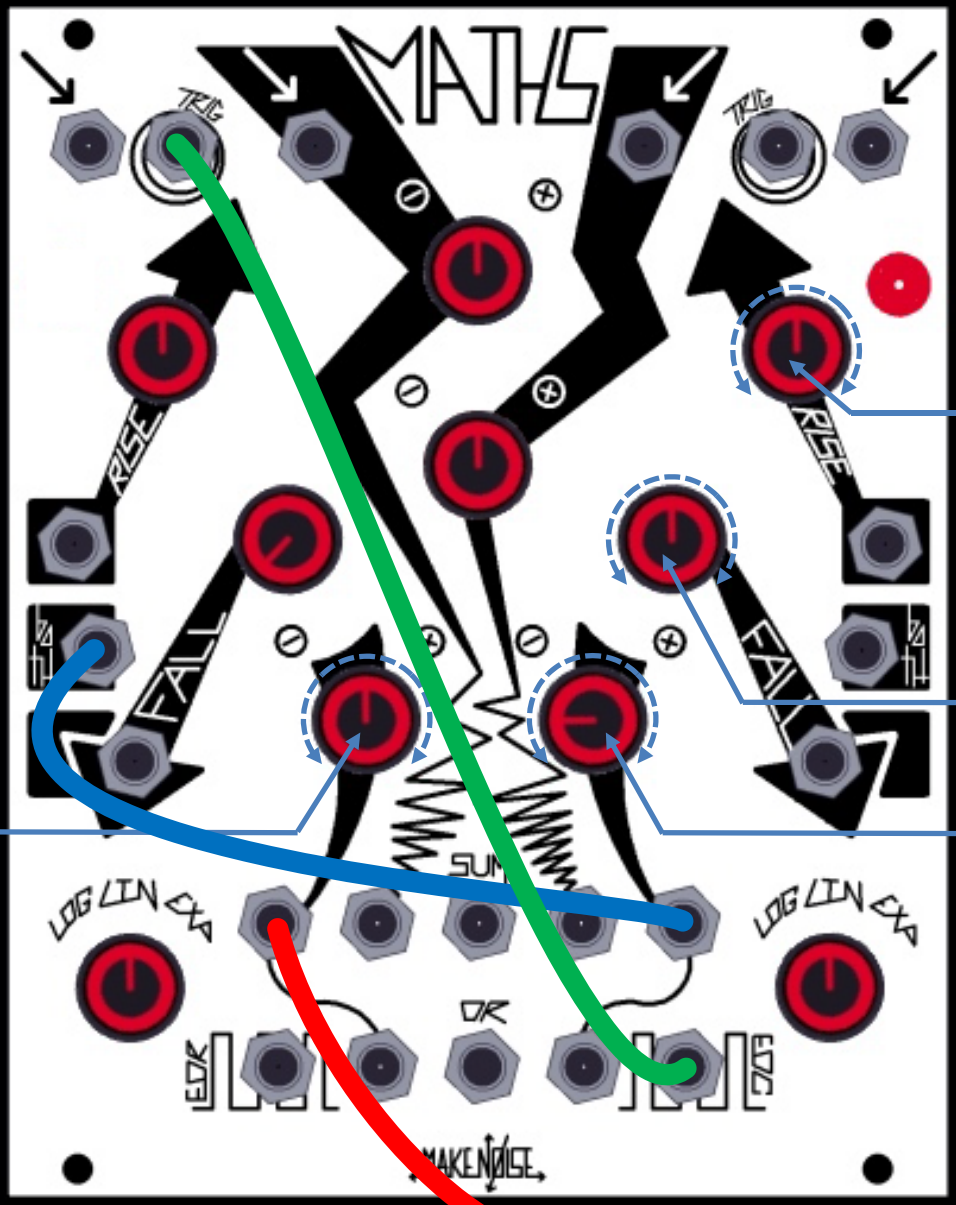
scale/inversion

Out

Set CH. 1 Rise and Fall to NOON, Vari-Response to Full CCW. Patch CH. 1 Signal OUT (top row) to CH. 2 Signal IN, set CH. 2 Scale to Full CCW, patch SUM OUT to CH. 1 BOTH Control IN. Set CH. 3 Scale panel control to NOON. Patch CV to be slewed into an Obie like portamento to CH. 1 Signal IN. Take output from CH. 1 Signal OUT, bottom row. In this patch CH. 2 Scale panel control will set the extremeness of the LOG response, Full CCW being the most extreme. CH. 3 Scale panel control will set rate of the portamento, CW being faster and CCW being slower.

If you wanted to get even fancier, you could patch the mod-wheel from your CV Keyboard (or Press CV from Pressure Points) to CH. 4 Signal IN, and use mod-wheel or Pressure to influence and control the portamento rate (just be sure nothing is patched to CH. 4 OUT, top row, so that the signal is sent to the SUM BUSS, and if you use CH. 4 for something else, be sure to utilize the TOP Row output to break the normalization.

Arcade Trill



Set CH. 4 Rise and Fall to NOON, scale/ Inversion to 9 o'clock. Patch EOC to CH. 1 Trigger IN. Patch CH. 4 Signal OUT to CH. 1 Both IN. Set CH. 1 Rise to NOON, Fall to full CCW. Engage CH. 4 Cycle switch. Apply Signal OUT CH. 1 to modulation destination. CH. 4 Scale/ Inversion, Rise and Vari-Rsponse Parameters vary trill.

trill

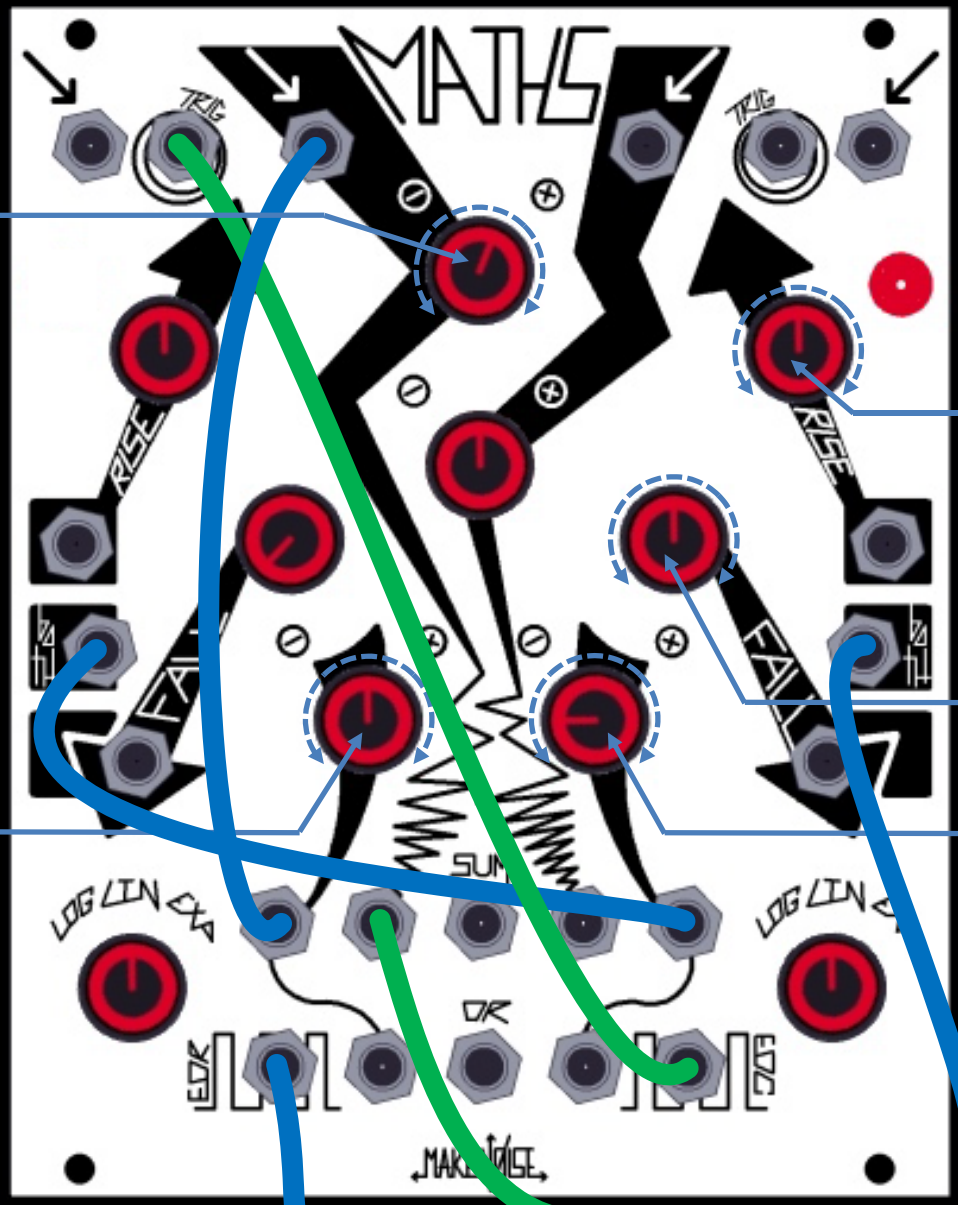
trill

trill

scale/inversion

Out

Chaotic Trill (requires QMMG or other Direct Coupled LP filter)



chaos

scale/inversion

trill

trill

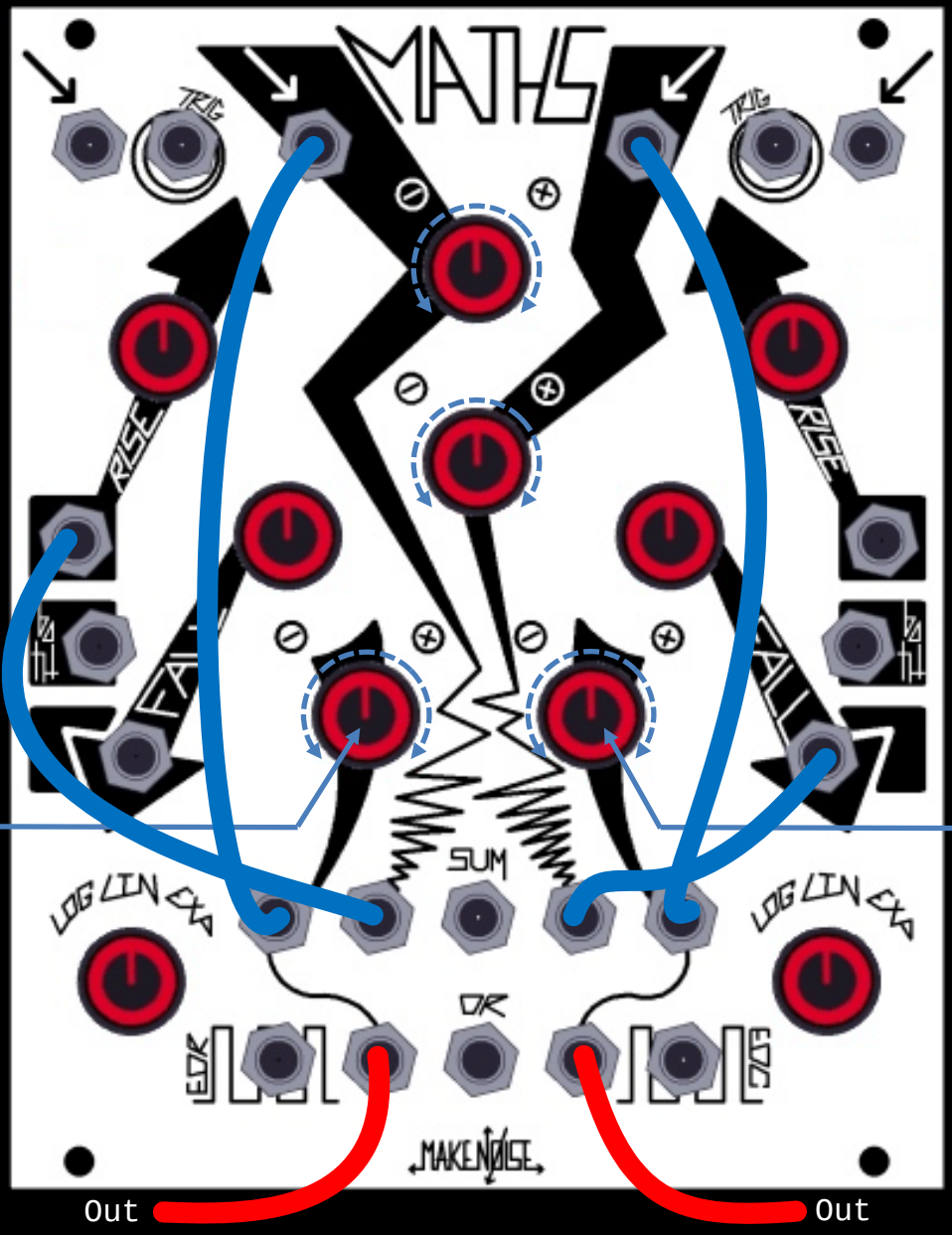
trill

LPG CV in

LPG signal in/LPG signal out

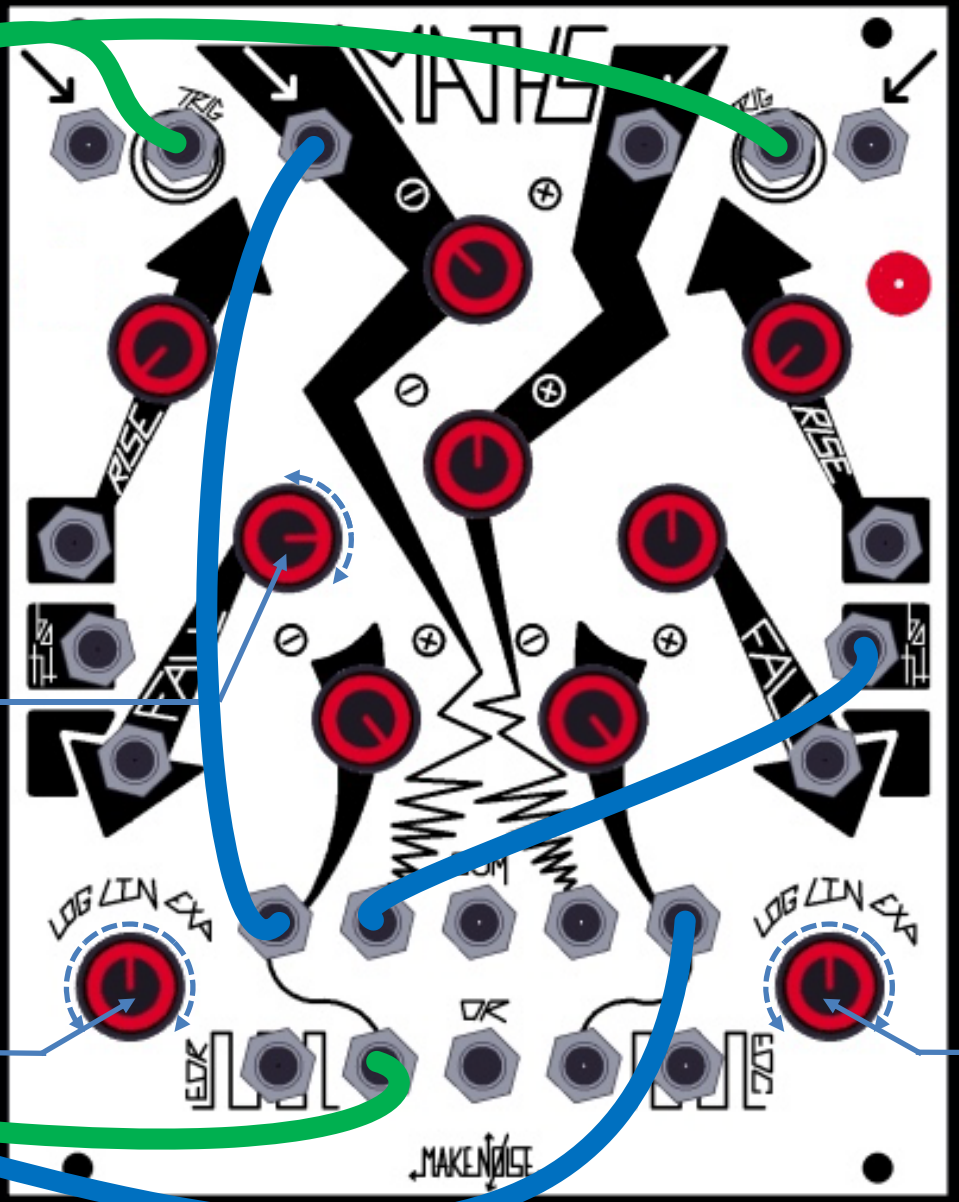
Begin with Arcade Trill patch. Apply MATHS CH. 1 Signal OUT to MATHS CH. 2, setting Scale/ Inversion to 1 o'clock. Apply CH. 2 Signal OUT QMMG CH. 1 Control IN. Patch EOR to to QMMG CH. 1 Signal IN, set to LP mode, no feedback, starting with Offset at full CCW. Apply QMMG CH. 1 Signal OUTput to MATHS CH. 4 Both IN. QMMG Offset and MATHS CH. 2 Scale/ Inversion panel controls will be of interest.

Independent Contours



By processing the Signal OUT of CH. 1, 4 with CH. 2,3 and feeding that signal back into CH. 1, 4 at RISE or FALL Control IN, independent control of the corresponding slope is achieved. Best to have the Response panel control set to NOON.

Bouncing Ball (requires QMMG or Dual VCA)



gate/trigger

Restitution

Gravity

VCA 1 CV IN

VCA 1 signal IN

VCA 1 signal OUT

signal to be bounced

Out

Gravity

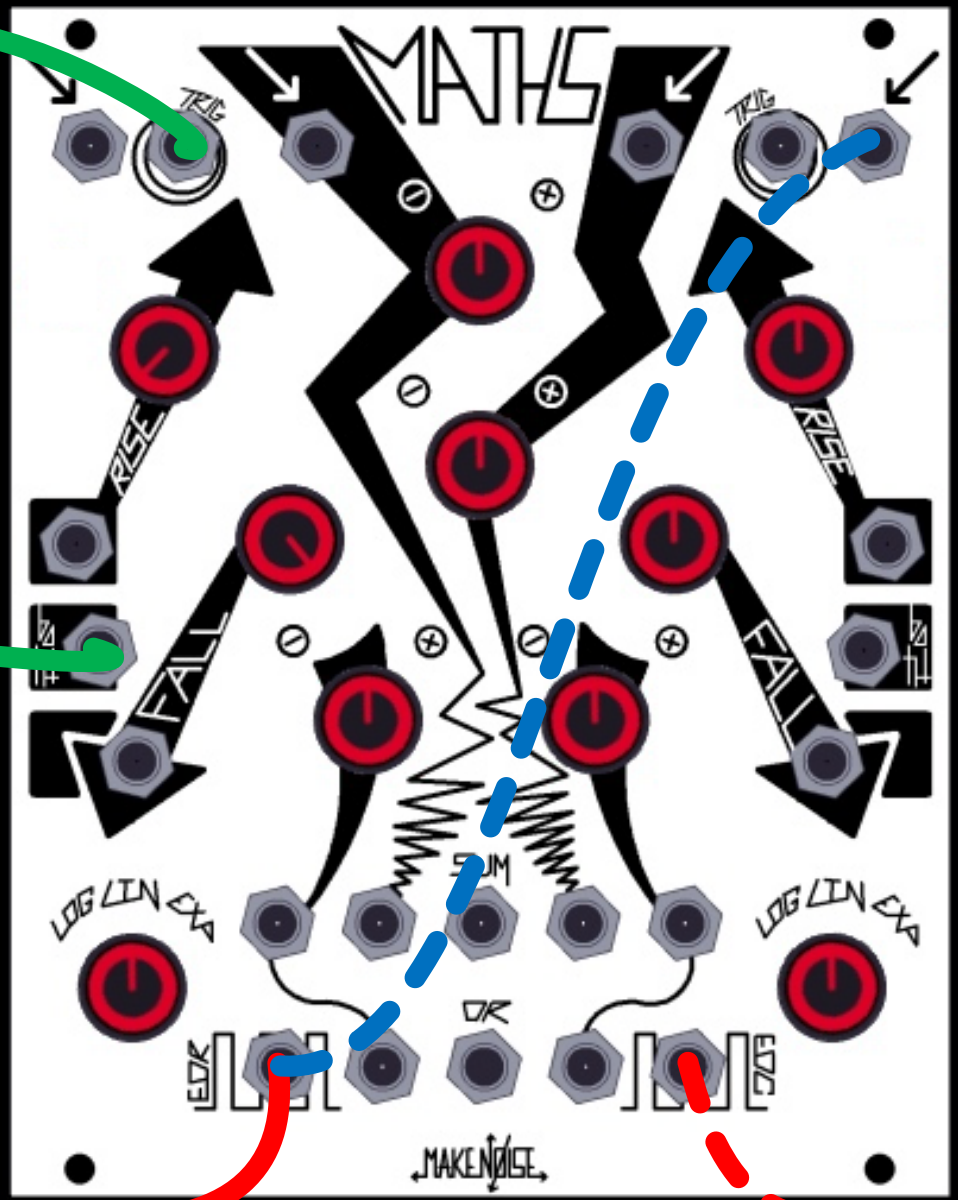
VCA 2 signal OUT

VCA 2 signal IN

VCA 2 CV IN

Apply same trigger or Gate to CH. 1 CH. 4 Trigger IN. Set Rise to full CCW and Fall to 3 o'clock, Scale/ Inversion to full CW. Patch CH. 1 Signal OUT to CH. 2 Signal IN. Set Ch. 2 Scale/ Inversion to 10 o'clock. Apply CH. 2 signal out to CH. 4 Both IN. Set CH. 4 Rise full CCW, Fall set to NOON, Scale/ Inversion to Full CW and engage Cycle Switch. Patch CH. 4 Signal out to QMMG CH. 1 Signal IN. Patch MATHS CH. 1 Signal OUT Multiple to QMMG CH. 1 Control Signal IN. Set QMMG CH. 1 Offset to full CCW, Feedback to 9 o'clock, set mode to VCA. Apply Signal to be bounced to QMMG CH. 2 Signal IN where Offset is set to full CCW and feedback is set to 9 o'clock, mode is Both. Patch QMMG CH. 1 Signal OUT to QMMG CH. 2 Control Signal IN. Monitor QMMG CH. 2 Signal OUT. MATHS Vari-Response panel controls will act as a sort of Gravity parameter, where both should be set similar and more Logarithmic response will be less gravity. MATHS CH. 1 Fall parameter is a sort of Restitution control. Increasing Fall parameter means the ball will bounce more times. Shorter Falls times will bring fewer bounces. Setting Fall to before NOON will result in no bouncing. High Gravity settings combined with fewer bounces yields a reverb like sound effect with QMMG.

FLIP-FLOP (1-Bit Memory)



Gate/logic

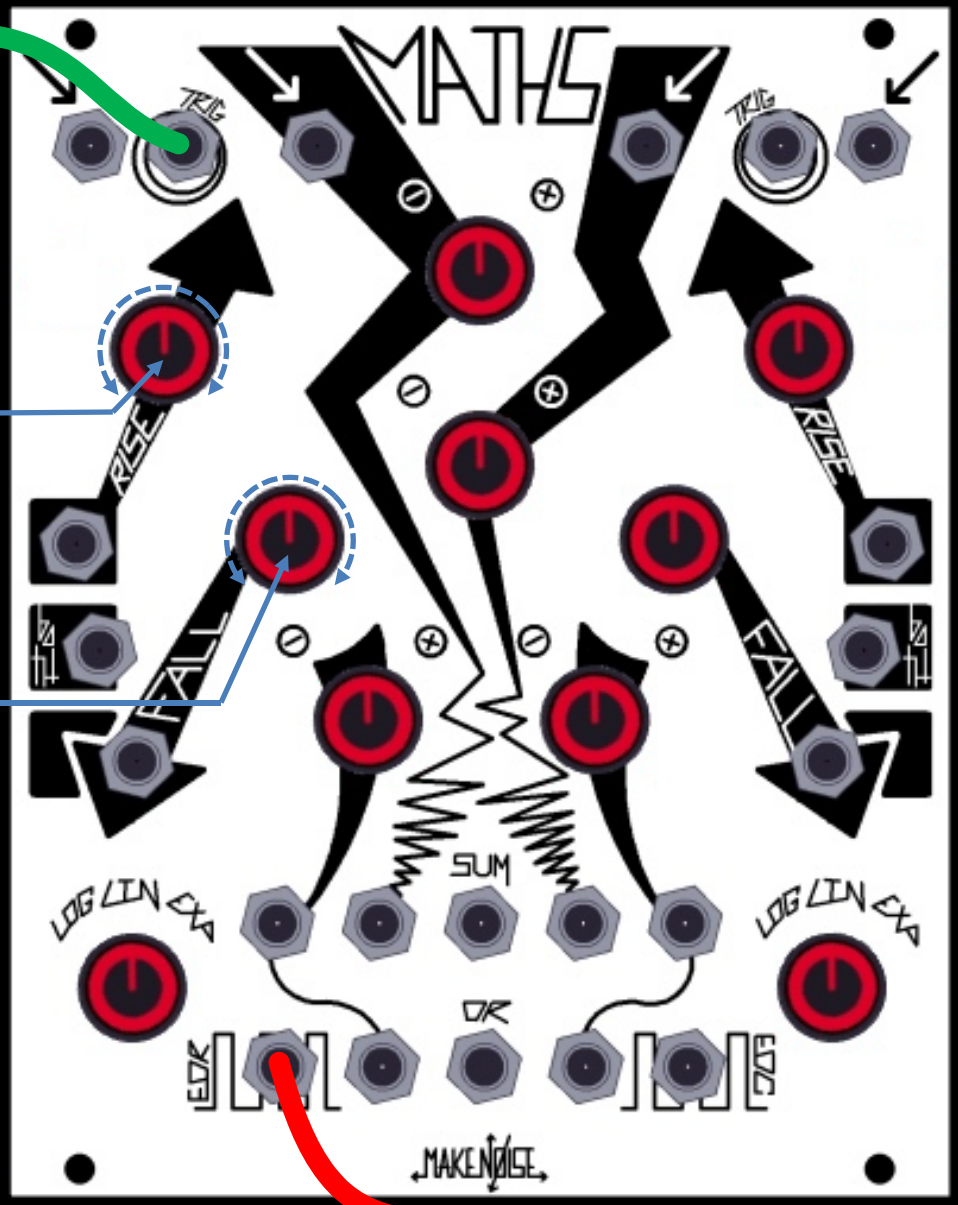
Reset

"Q" Out

"NOT Q" Out

In this patch CH. 1 Trigger IN acts as the “Set” input, and CH. 1 BOTH Contrl IN acts as the “Reset” input. Apply Reset signal to CH. 1 BOTH Control IN. Apply Gate or logic signal to CH. 1 Trigger IN. Set Rise to Full CCW, Fall to Full CW, Vari-Response to Linear. Take “Q” output from EOC. Patch EOC to CH. 4 Signal to achieve “NOT Q” at the EOC OUT. This patch has a memory limit of about 3 minutes, after which it forgets the one thing you told it to remember.

Voltage Controlled Pulse Delay Processor



Trigger or Gate

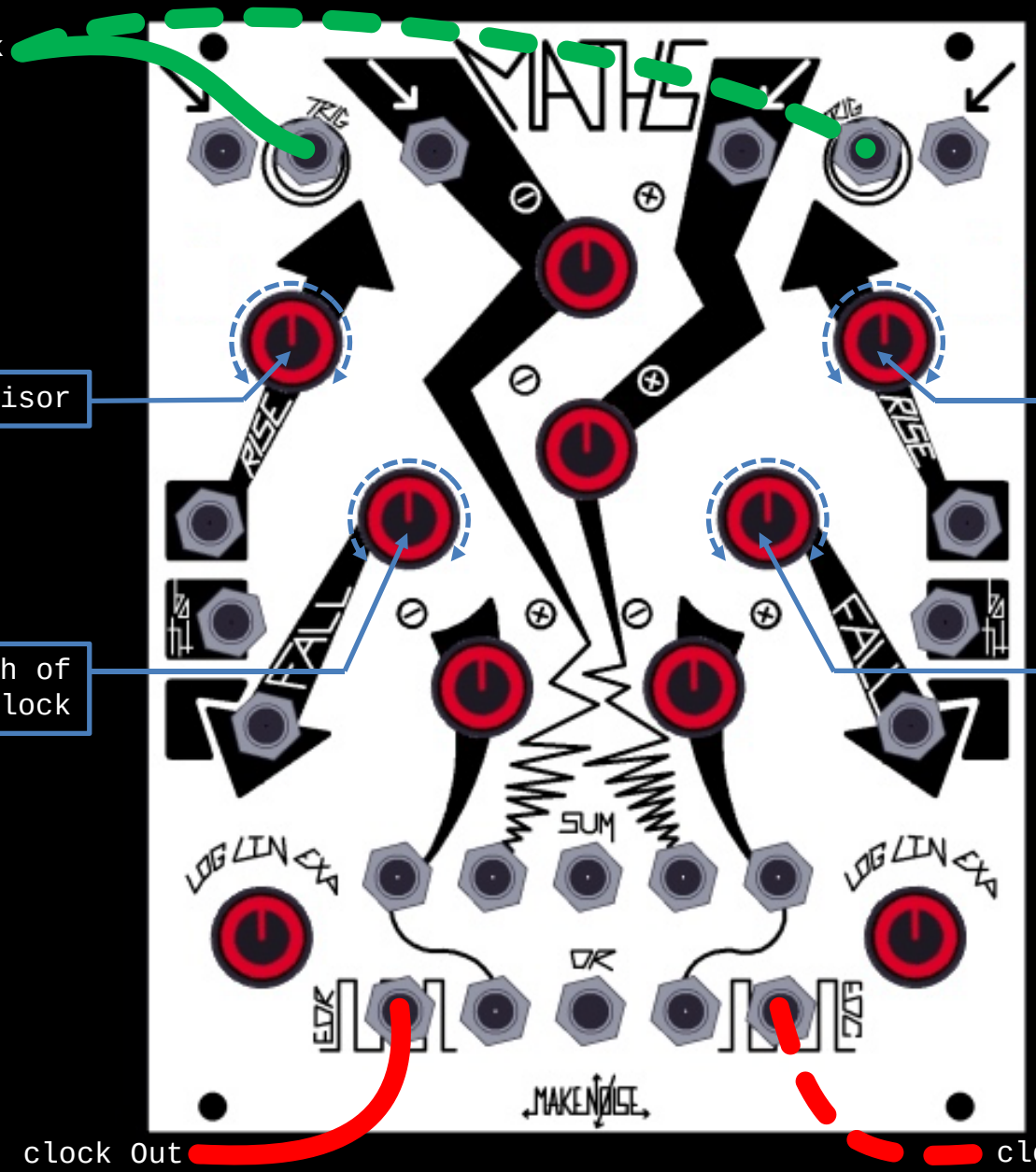
delay

width of delayed pulse

Out

Apply Trigger or Gate to Trigger IN if CH. 1. Take output from End Of Rise. RISE parameter will set the delay and Fall parameter will adjust width of the resulting delayed pulse.

Voltage Controlled Clock Divider



Clock

divisor

width of resulting clock

clock Out

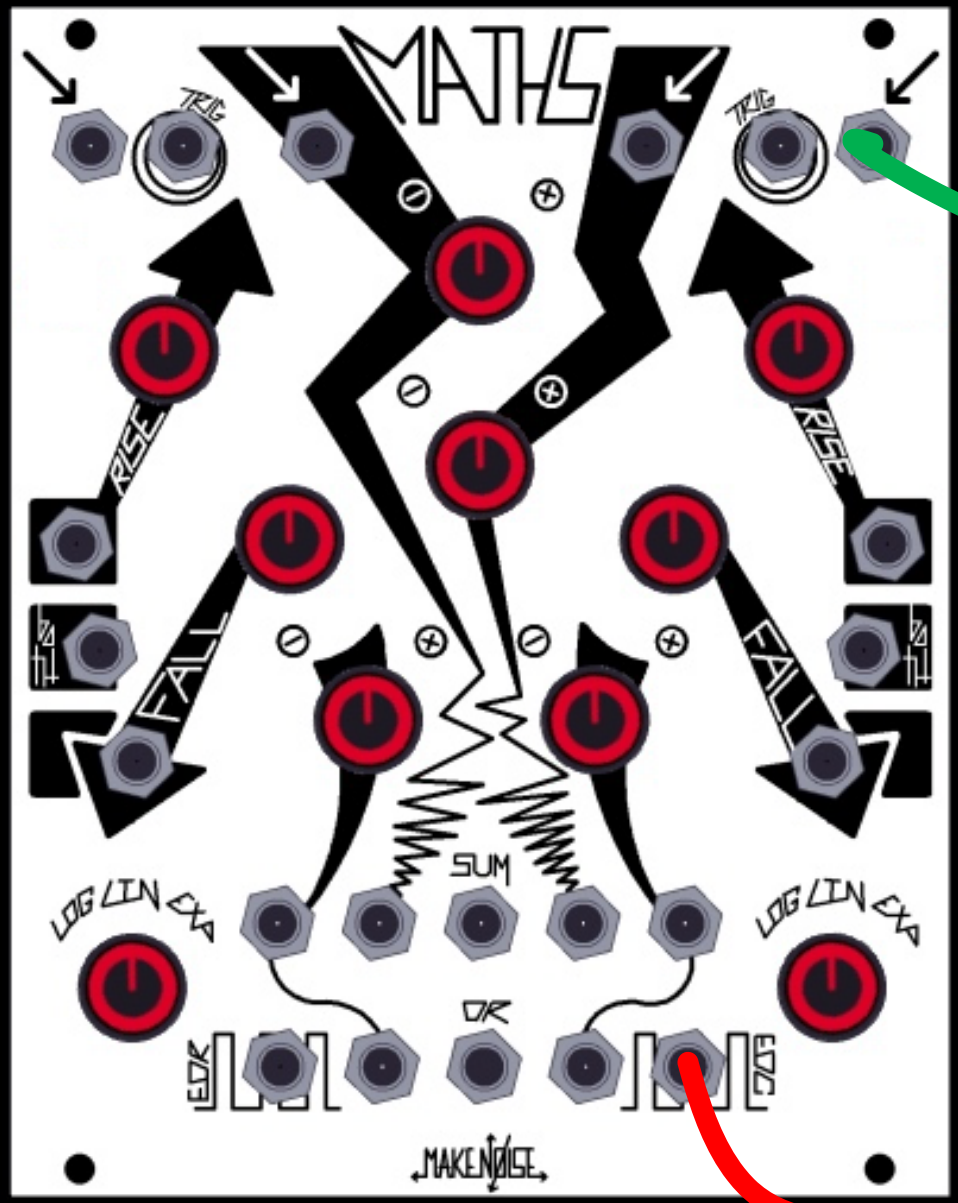
Clock signal applied to Trigger IN CH. 1 or 4 is processed by a divisor as set by Rise parameter. Increasing Rise sets divisor higher, resulting in larger divisions. Fall time will adjust the width of the resulting clock. If the Width is adjusted to be greater the the total time of the division the output will remain “high.” Take output from EOR or EOC.

divisor

width of resulting clock

clock Out

Logic Invertor



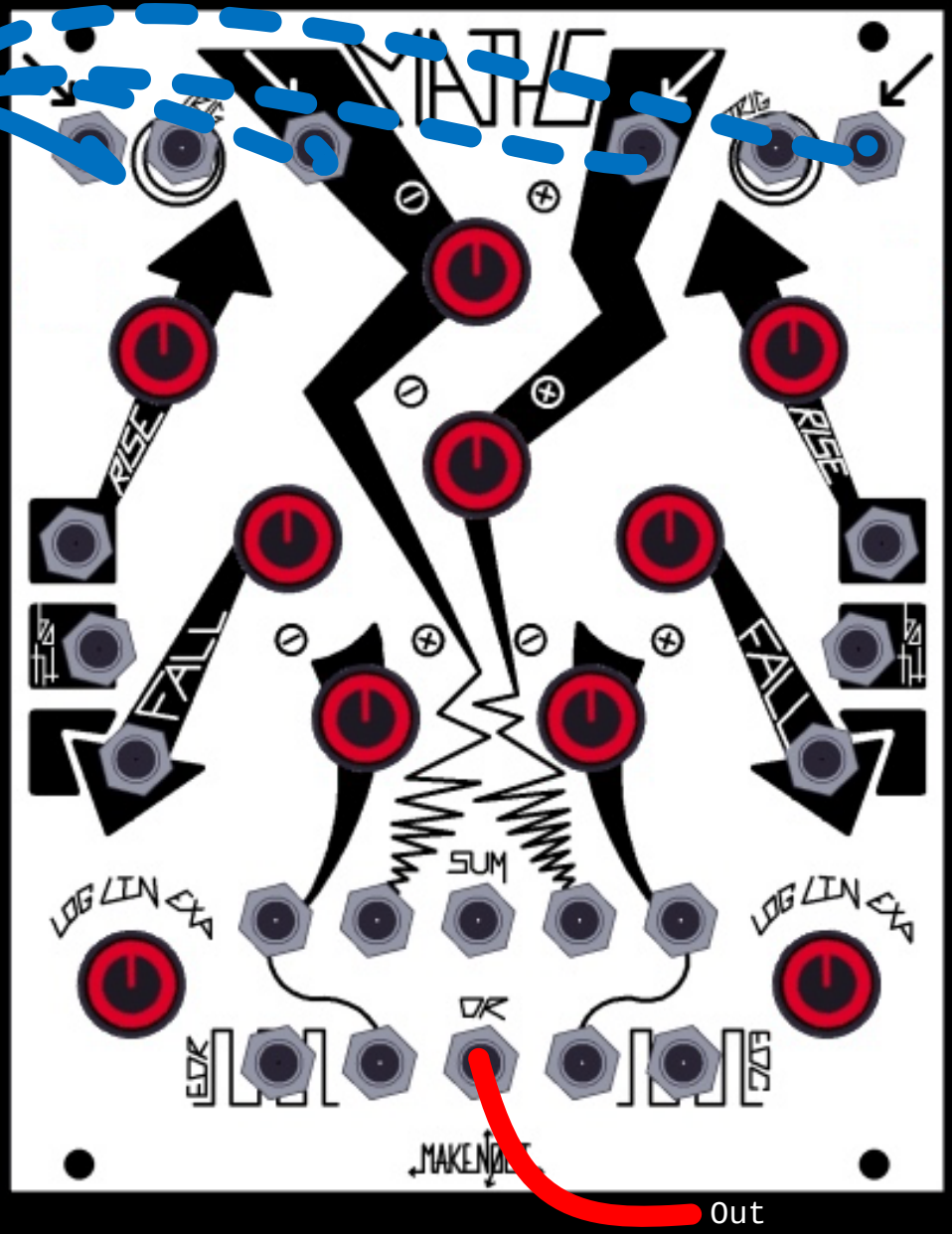
Apply logic gate to CH. 4 Signal IN. Take output from CH. 4 EOC.

logic gate

Out

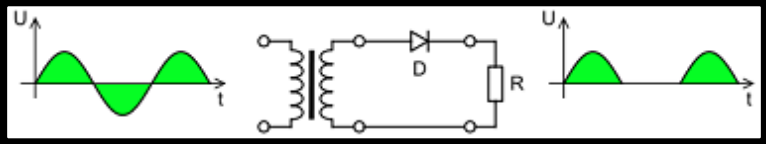
Half Wave Rectification

bi-polar signal



Out

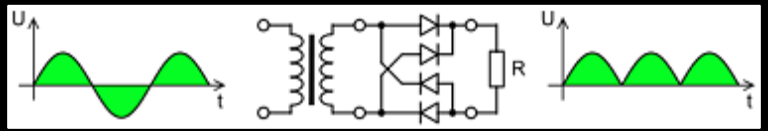
Apply bi-polar signal to CH. 1, 2, 3, 4 IN. Take output from OR out. Mind the normalizations to the OR buss.



Full Wave Rectification

signal to be rectified

Mult signal to be rectified to both CH. 2 and 3 IN. CH 2 Scaling/ Inversion set to Full CW, CH. 3 Scaling/ Inversion set to Full CCW. Take output from OR Out. Vary the Scaling.



ADD, Subtract Control Signals

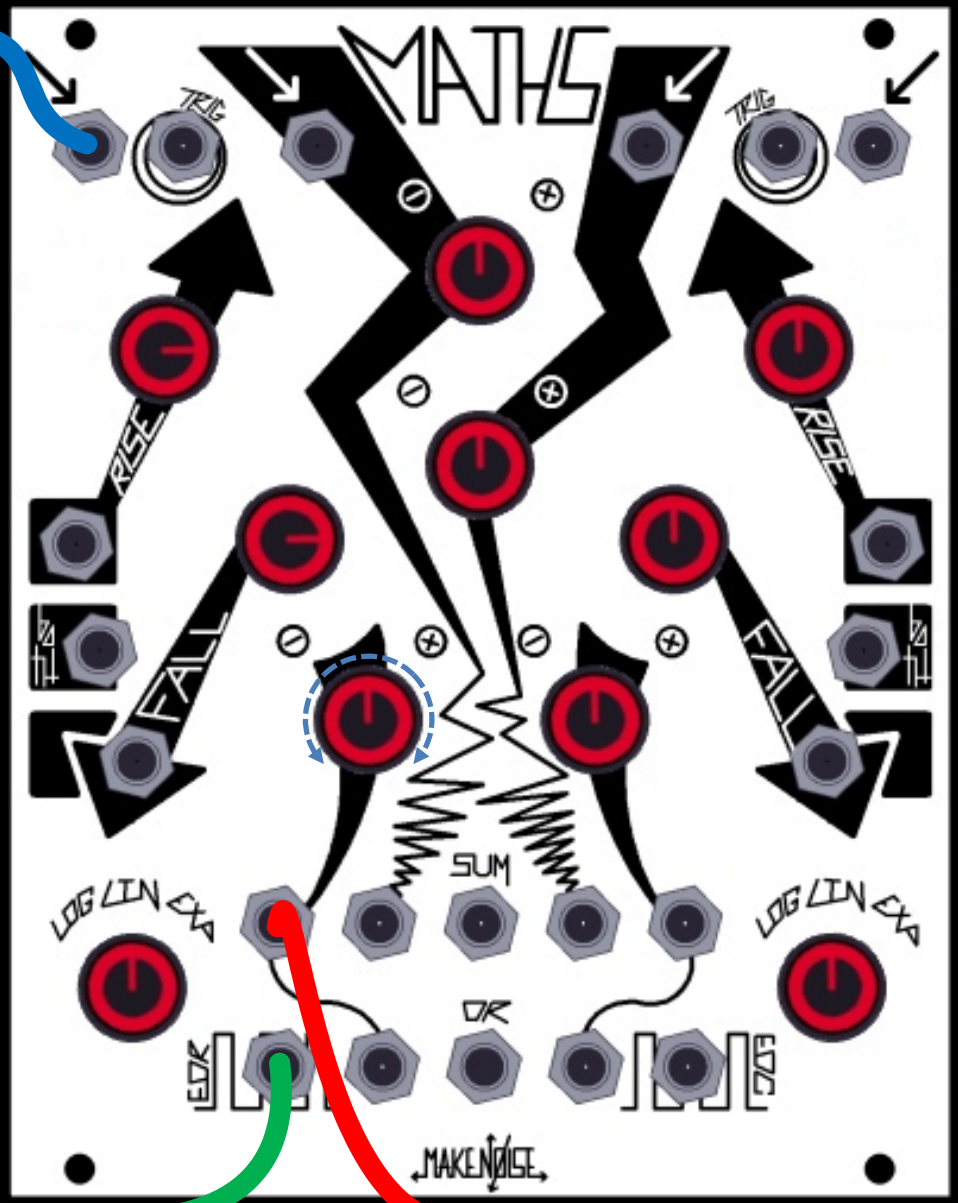
signal(s) to be substracted

signal(s) to be added

Apply signals to be added/ subtracted to any combination of Signal IN CH. 1,2,3,4 (when using CH. 1,4 Rise and Fall must be set to full CCW, and Cycle switch not engaged). Set Scale/ Inversion panel controls for channels to be added, to full CW. Set Scale/ Inversion panel controls for channels to be subtracted to full CCW. Take output from SUM OUT.

Peak Detector

signal to be detected



Gate Out

Out

Patch signal to be detected to CH. 1 Signal IN. Set Rise and Fall to 3 'o' Clock. Take output from Signal OUT. Gate out from EOR OUT.

Voltage Mirror

control signal
to be mirrored

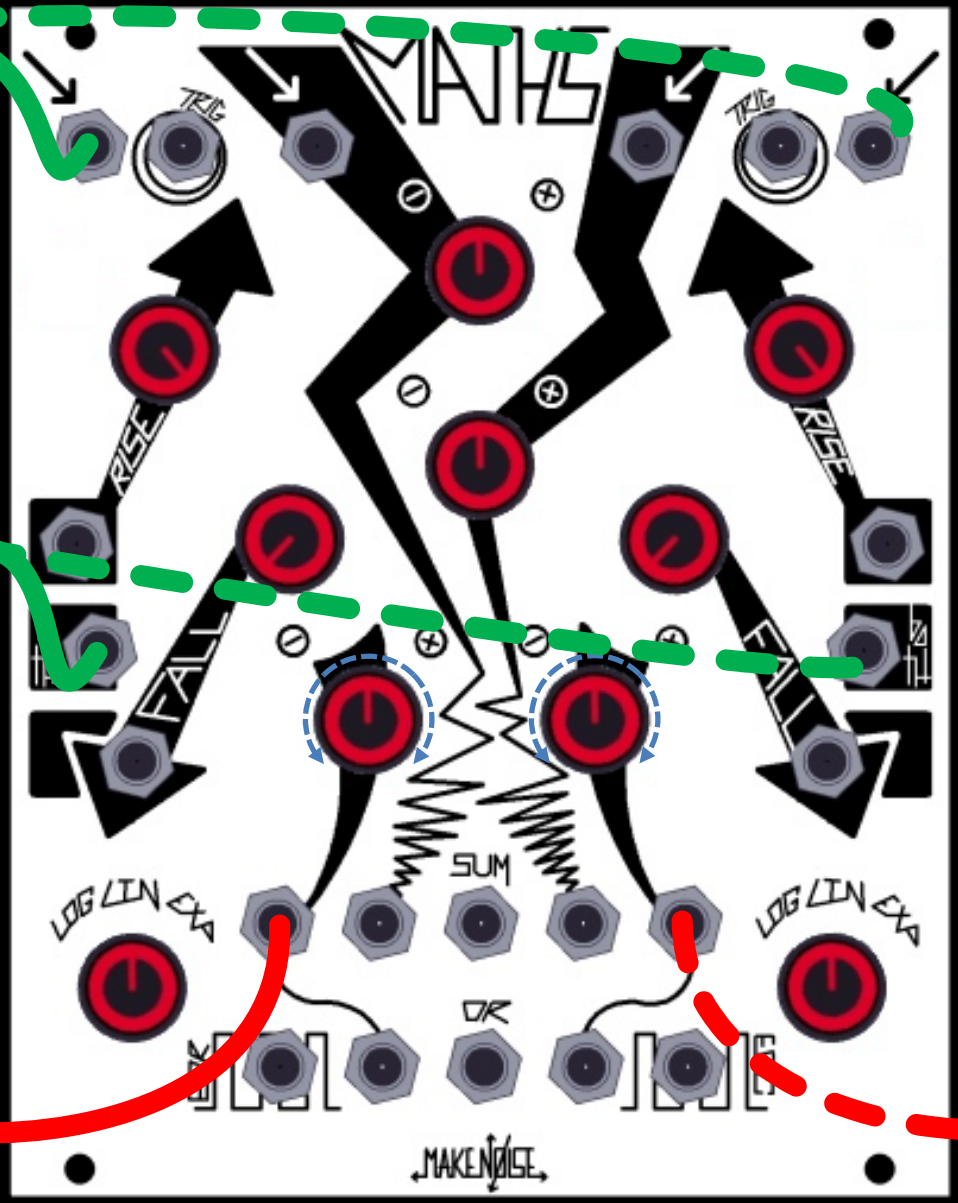
Out

Apply Control Signal to be mirrored to CH. 2 Signal IN. Set CH. 2 Scale/ Inversion panel control to Full CCW. With nothing inserted at CH. 3 Signal IN (so as to generate an offset), set CH. 3 Scale/ Inversion panel control to full CW. Take output from SUM OUT. This patch will also work as a Logic Invertor.

Multiplication

positive control signal to be multiplied

positive multiplier control signal

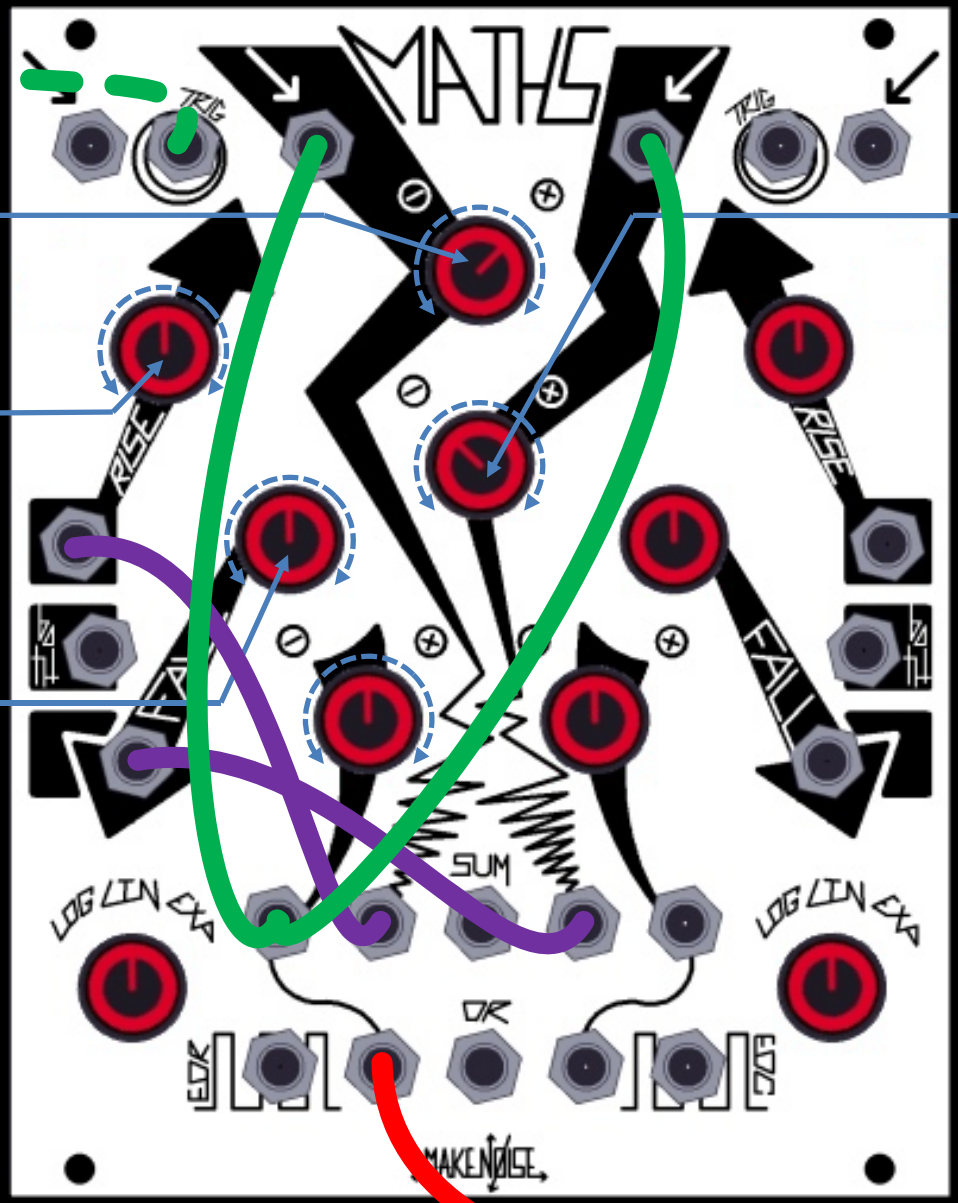


Out

Out

Apply positive going Control Signal to be multiplied to CH1 or 4 Signal IN. Set Rise to full CW, Fall to Full CCW. Apply positive going, multiplier Control Signal to BOTH Control IN. Take output from corresponding Signal OUT.

Patch Tips #1 - Maths Slope Control (from navs.modular.lab)



gate/trigger

severity/polarity of the Attack response

Attack

Decay

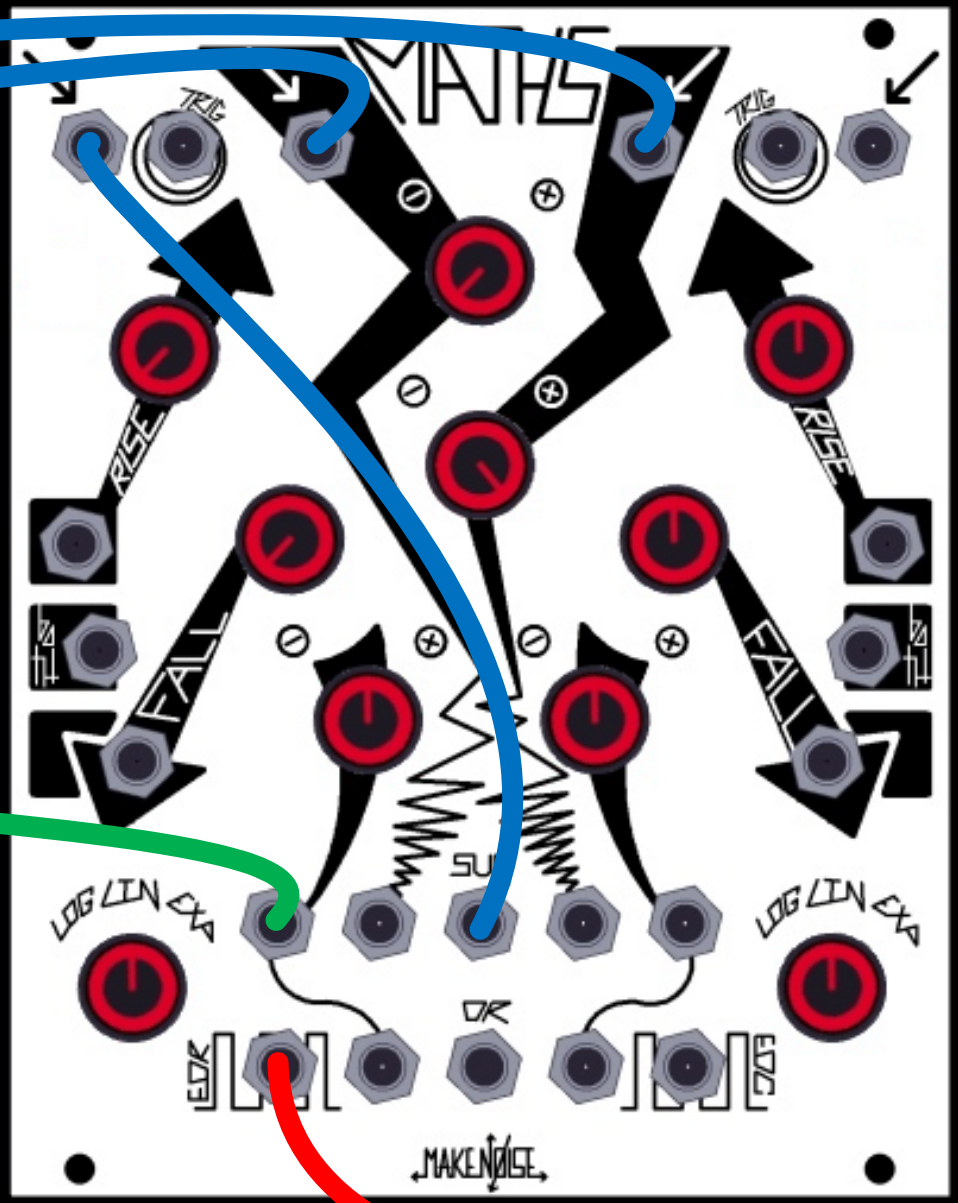
severity/polarity of the Decay response

EG Out

Set Maths' response knob to linear/ noon. Take two mults of the envelope output and patch one to Maths' channel 2, the other to channel 3. Set channel 2's output to about two o'clock (+) and patch it to the rise CV-in, set channel 3 to ca. ten o'clock (-) and patch to the fall CV. This will give you a logarithmic rise and exponential fall. Increasing the amount of positive or negative feedback will increase the severity of the response, flipping the polarity to the CV-ins will yield an exponential rise and logarithmic fall. If you want to go really mad, use Doepfer's A-133 Dual Polarizer instead of Maths' 'attenuverters' to gain voltage control over these parameters.

2 Signals Comparator (from muffwiggler)

2 signals to be compared



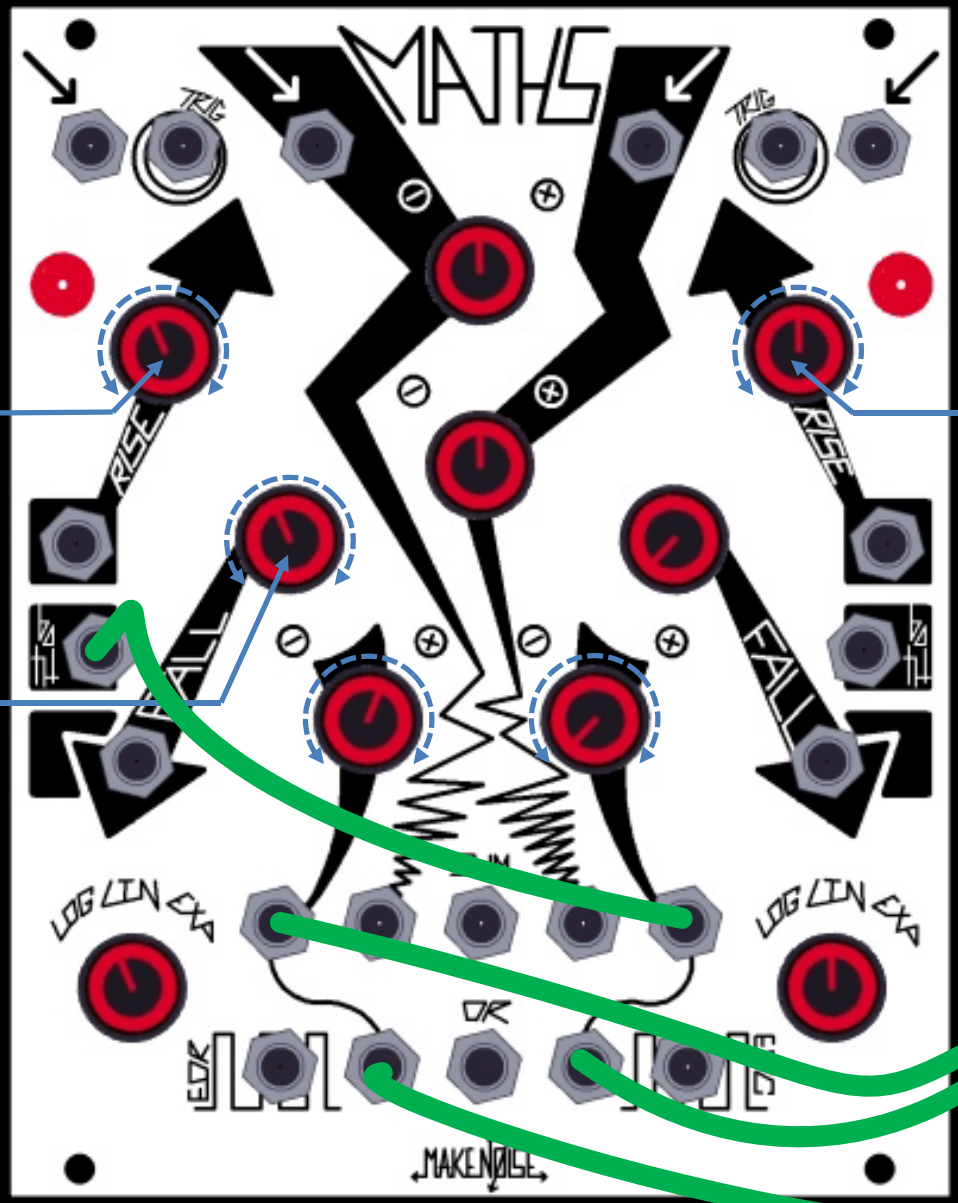
dummy cable

Gate Out

1. Patch the 2 signals you want to compare into channel 2 & 3 of your Maths.
2. Invert CH 2 by turning it full CCW and turn CH 3 full CW.
3. Patch the SUM into signal in of CH1 (not trig in).
4. Set Attack and Decay on CH1 to full CCW and the Response knob to LIN.
5. Patch a dummy cable into the first output of CH 1 (so that the envelope of CH 1 is taken out of the SUM)
6. Take the gate signal from EOR

The gate you get from EOR is when the signal patched into CH3 is higher than the signal patched into CH2.

Strange Stepped LFO/Seq patch



Sequence length

Sequence length

Sequence speed

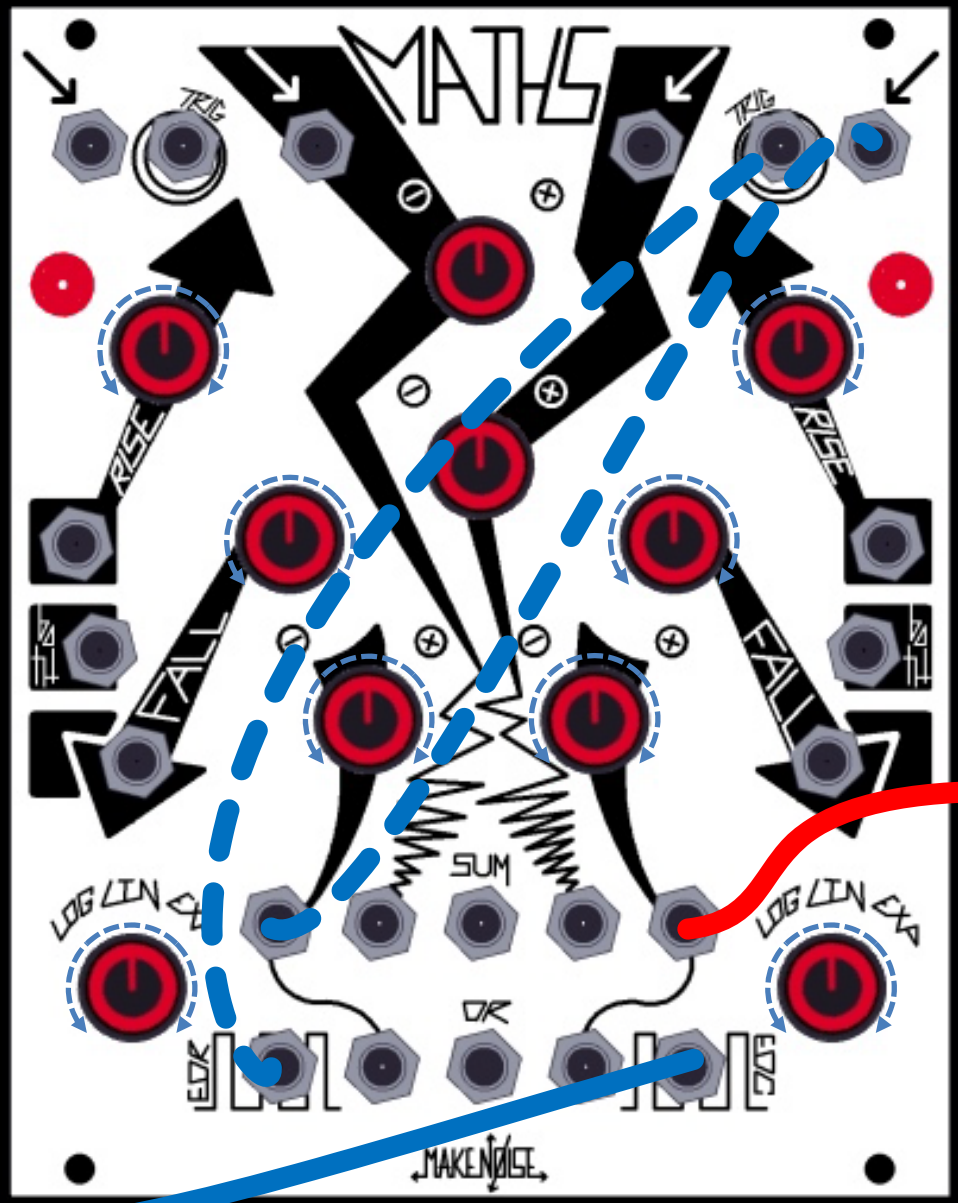
Maths Channel 4 set up as fast square-ish LFO (Lin curve, mid Rise, zero Fall, full negative negative output)
Chan 1 patched to Oscillator CV in and Filter cutoff
Chan 4 patched to Chan 1 Both and Filter cutoff
Osc-to-filter-to-out
This patch creates a strange-behaving stepped LFO sequence. Sequence length can be varied with Ch 1 Rise/Fall controls. Sequence speed can be varied with Ch4 Rise control.

filter cutoff / filter in / filter out

osc CV in / osc out

Out

Maths Hack! (from muffwiggler)



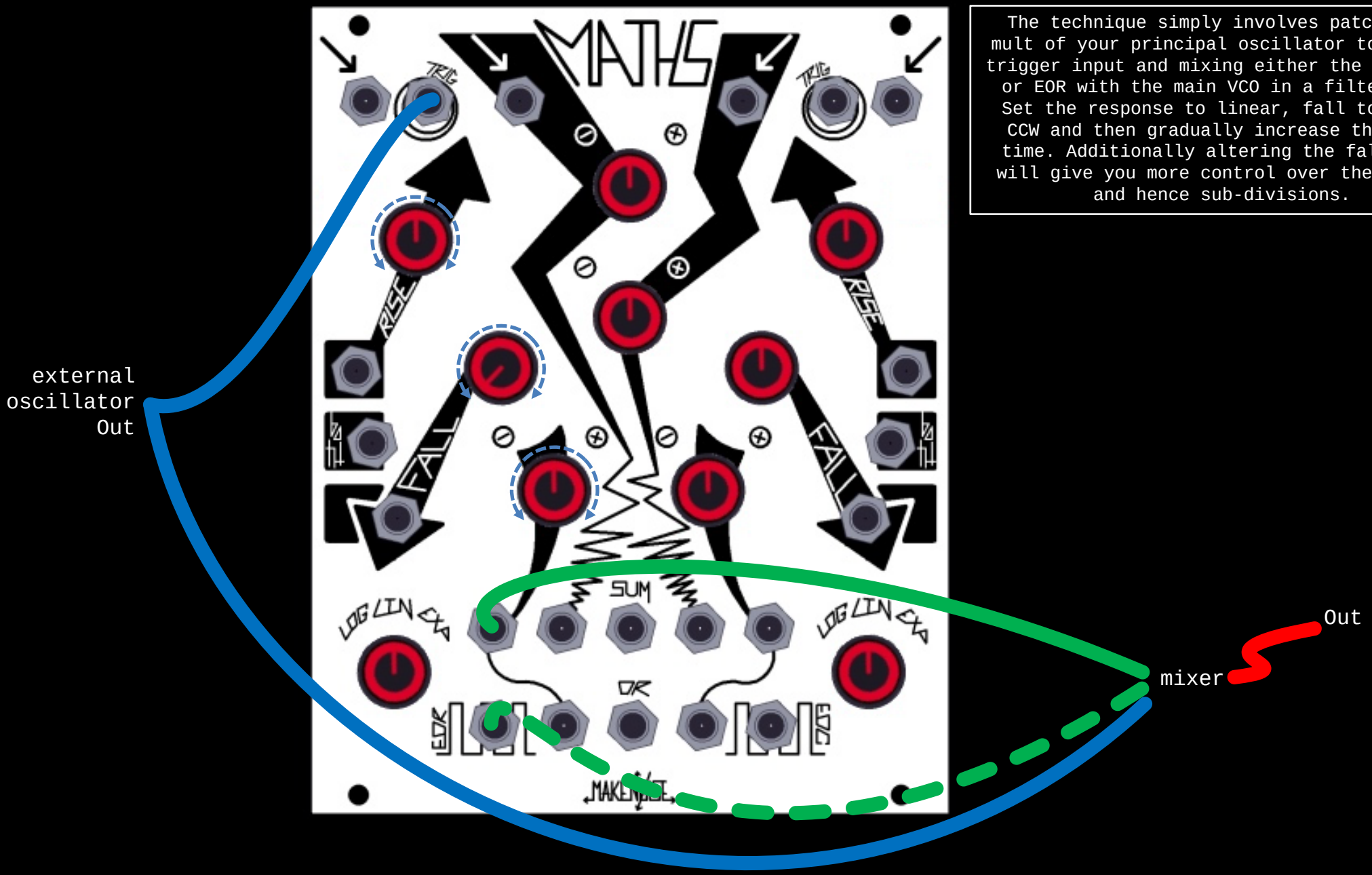
Set channel 4 to self cycle at audio frequency and route the output to your mixer.
Now try applying a separate oscillator output (not channel 1) to the EOC output! You get a different behavior/tone than if you put it to channel 4's input!

Ok, now add another oscillator to channel 4's input at the same time (this one can be channel 1 self cycling).
Just play around with the frequencies of these two oscillators for a while...

Out

external oscillator Out

Patch Tips #14 - Sub-Harmonic Division (from navs.modular.lab)



The technique simply involves patching a mult of your principal oscillator to Maths' trigger input and mixing either the envelope or EOR with the main VCO in a filter etc. Set the response to linear, fall to fully CCW and then gradually increase the rise time. Additionally altering the fall time will give you more control over the timing and hence sub-divisions.

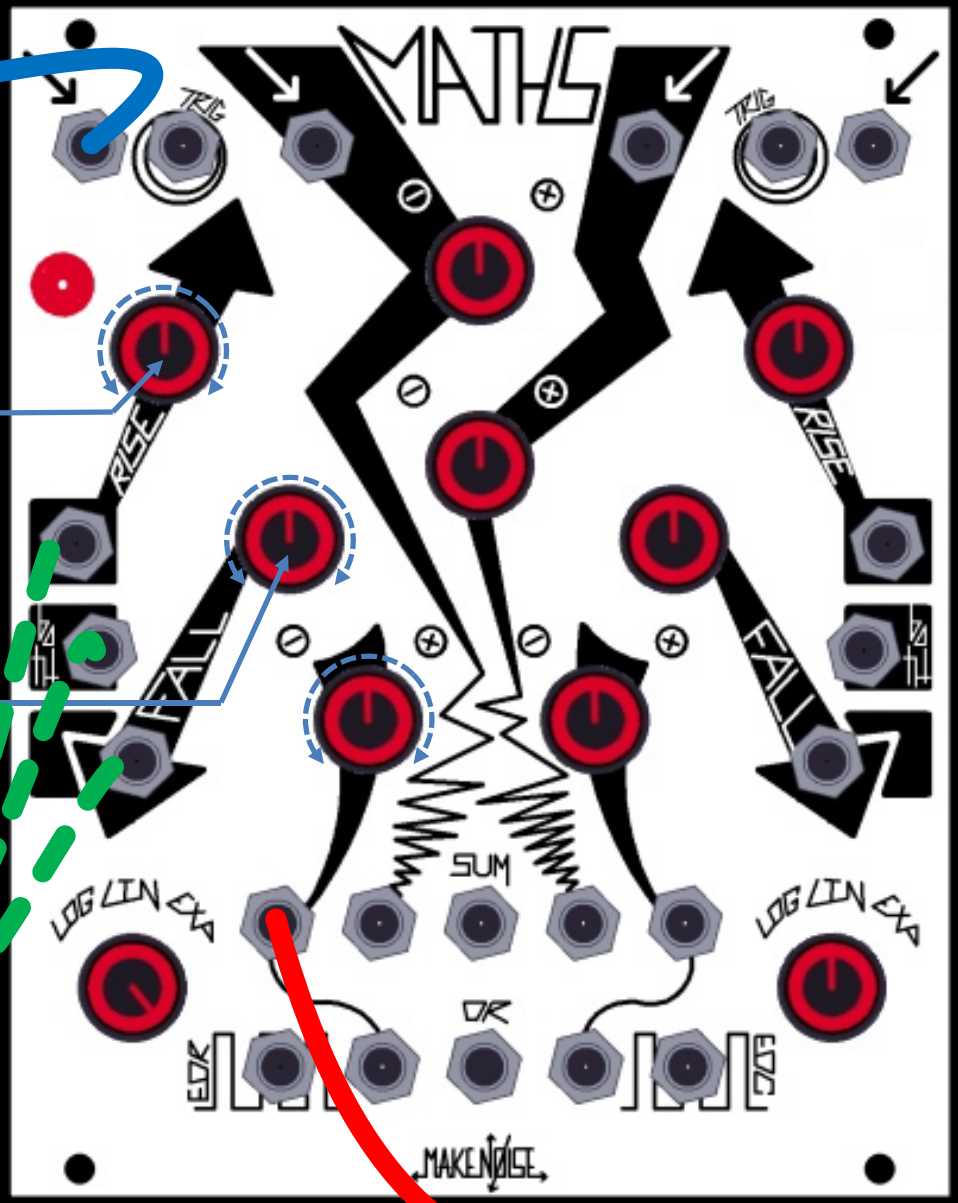
Soft Sync Sounds (from muffwiggler)

external oscillator Out (sawtooth)

sync sound range feel

sync sound range feel

gentle LFO modulation



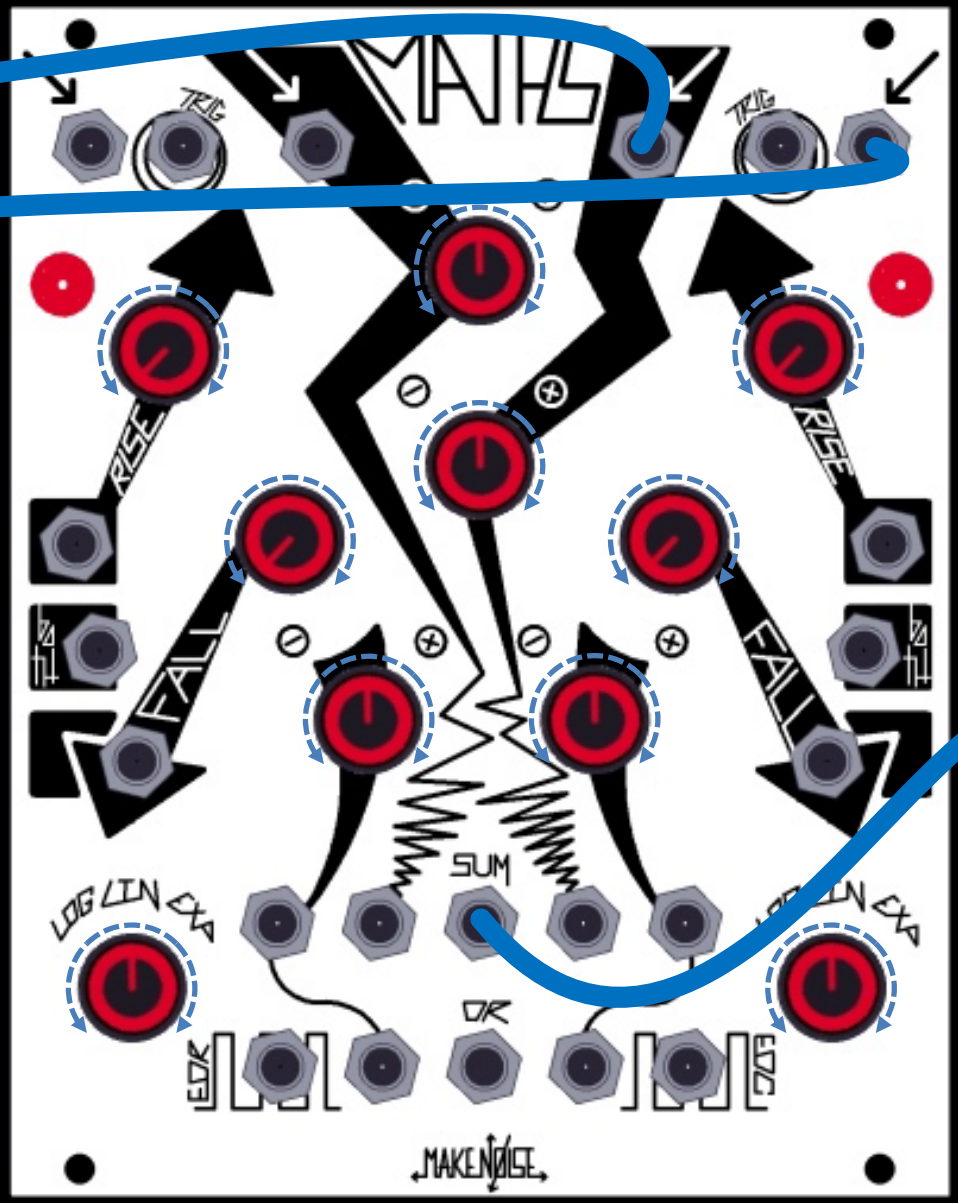
Out

- Cycle channel 1 or 4 at high audio rate.
- Set it to full Exp
- Plug an external OSC (preferably sawtooth) into the lag input (not the trig).
- Play with the Rise and Fall controls to get a feel for the range of the sync sound.
- Apply some gentle LFO modulation to the Rise, Fall, or Both

Drone (from muffwiggler)

external oscillator Out

external oscillator Out



Cycle ch 1 and 4 of Maths by pushing in the cycle button to make them oscillate. Start in Lin mode, and have fall and rise full counter clockwise and adjust from there.

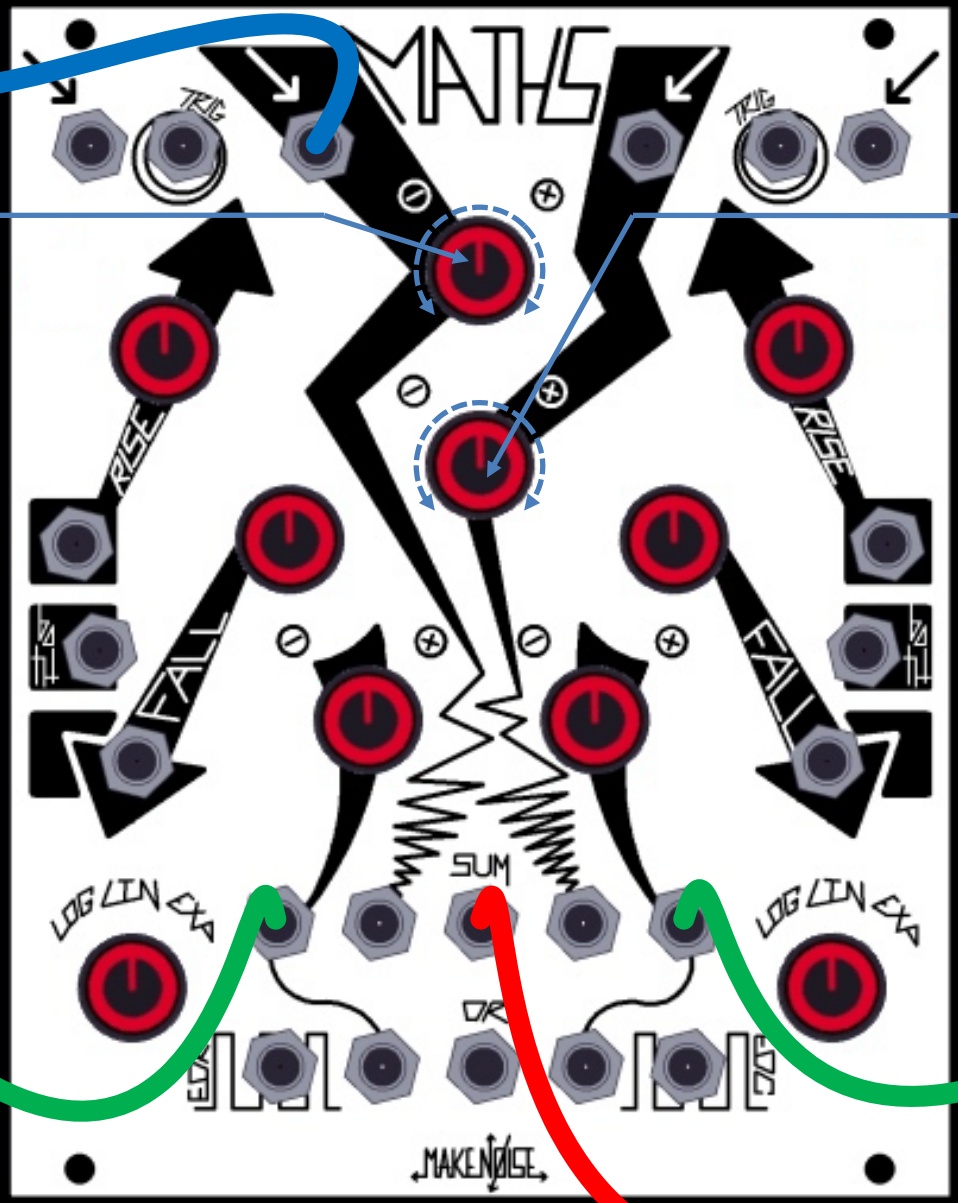
Plug an oscillator or two from your Dark Energy into the Maths ch 3 or 4.

Take SUM out of Maths into a channel (or a few) of the QMMG for filtering, then output from there.

Out

filter in / filter out

Offset Signal



signal to offset

scale/inversion

add pos/neg offset

Patch signal to offset in Maths CH. 2 IN. Patch dummies cables to CH. 1&4 OUTs (up row). Take output from SUM.

The CH. 2 Panel Control adjust scale/inversion for incoming signal. CH. 3 Panel Control adjust the amount of offset added to the incoming signal.

dummy cable

dummy cable

Out

Thanks

radiokoala from muffwiggler for "Half Wave Rectification" and "Full Wave Rectification" illustrations
Navs for "Patch Tips #1 - Maths Slope Control" and "Patch Tips #14 - Sub-Harmonic Division"
Petur from muffwiggler for "2 Signals Comparator" patch
George Cochrane for "Strange Stepped LFO/Seq" patch
breakscience from muffwiggler for "Maths Hack!" patch
Kodama from muffwiggler for "Soft Sync Sounds" patch
N59 from muffwiggler for "Drone" patch