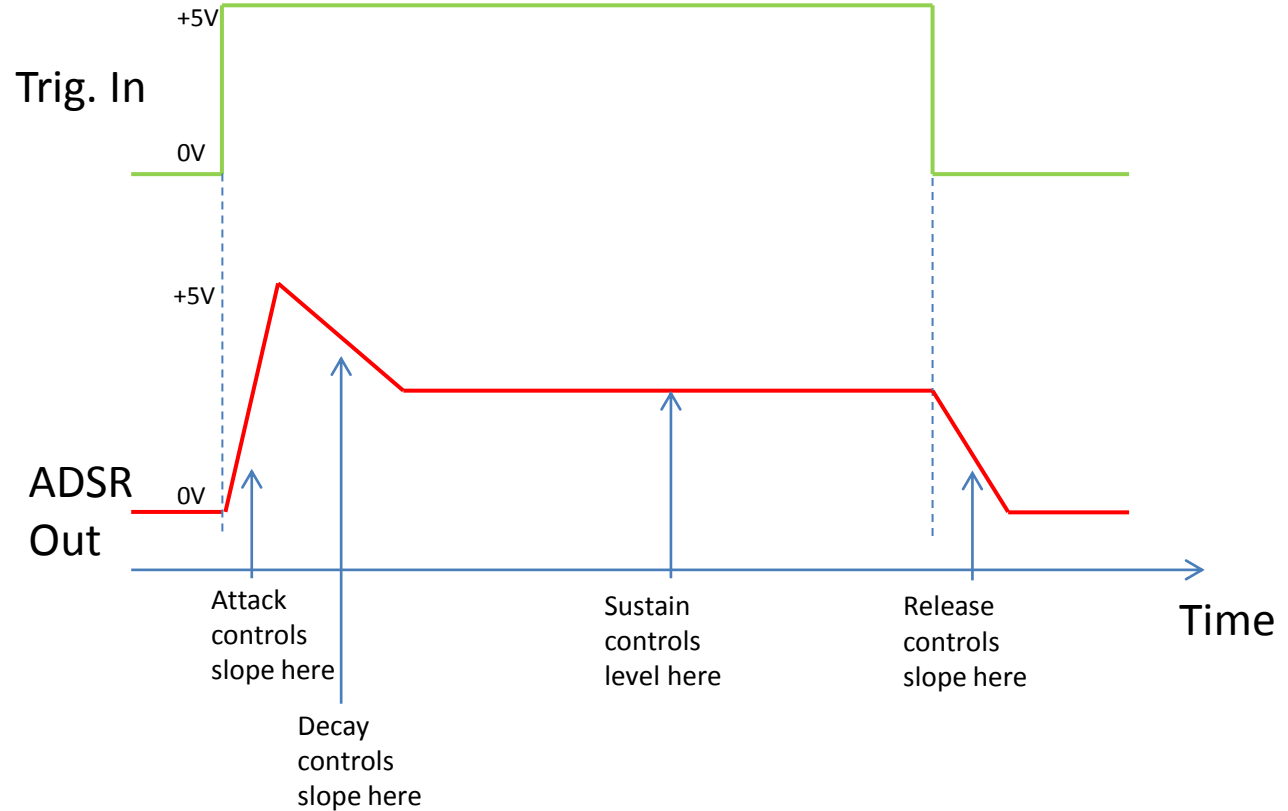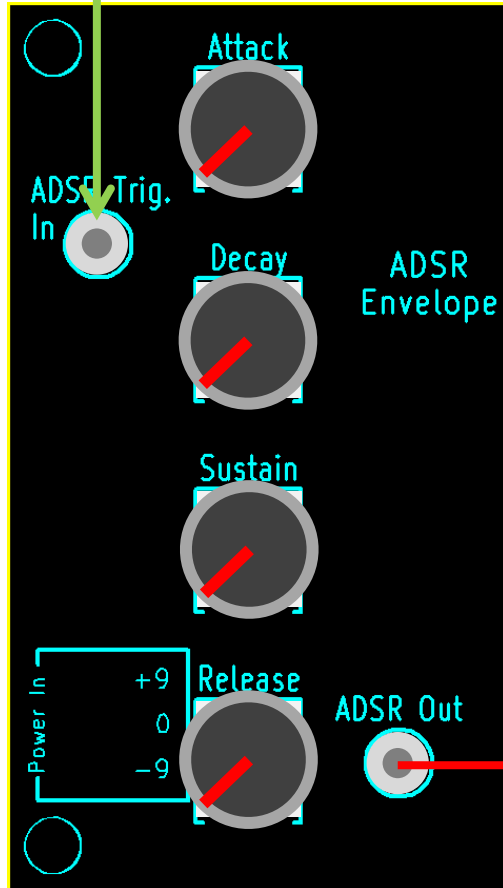# LushOne Contour Synth Module
Quick Reference Guide

Contour - Included effects

- Attack, Decay, Sustain, Release (ADSR) Envelope
  - Control voltage that changes during a note
- Voltage Controlled Amplifier (VCA)
  - Change volume of note under control of a control voltage
  - Multiply control voltages together
- Ring Modulator
  - Multiply input signal by a sign-changing control voltage
- Low Frequency Oscillator (LFO)
- Break-in/Breakout

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ADSR Envelope

Trigger Input
(0V – off, +5V high)

Trig. In

+5V

0V

ADSR Out

+5V

0V

Attack controls slope here

Decay controls slope here

Sustain controls level here

Release controls slope here

Time

ADSR Control Voltage Out (0V to +5V)

Trigger input is normally connected to "MIDI Gate Out" of the LushOne base

Attack

ADSR Trig. In

Decay

ADSR Envelope

Sustain

Power In +9 0 −9

Release

ADSR Out

Application Suggestion: Connect ADSR Out to a VCF CV input on the LushOne base for a filter that changes during the note
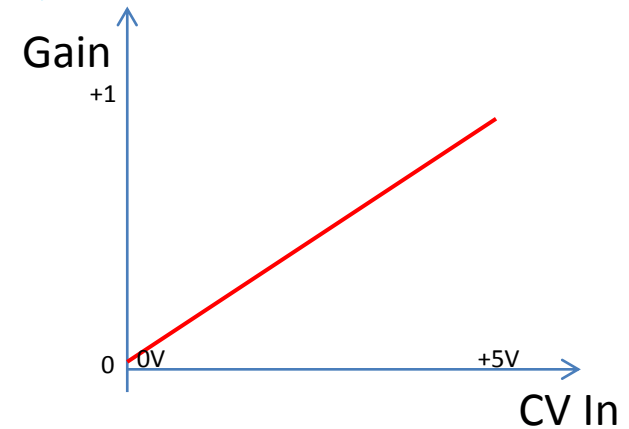
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Voltage Controlled Amplifier (VCA)

Audio In
(-1V to +1V)

Adjust what Control Voltage has zero gain
(Centre is approximately 0V CV = zero gain)

VCA In   CV Offset   VCA

VCA CV In   VCA Out

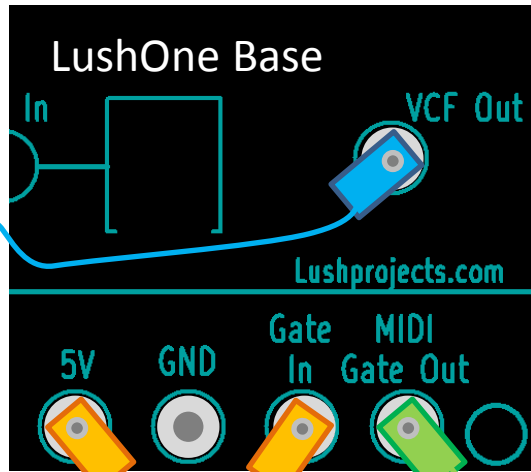Audio Out (-1V to +1V)

Gain
+1

0   0V   +5V

CV In

Control Voltage In
(0V to +5V)

- Modify volume of audio based on control voltage
- With CV Offset central then:
  - 0V CV = zero gain
  - +5V CV = gain of one
- Turning CV offset to left raises the CV voltage that has zero gain (makes the VCA less sensitive)
- Application Suggestion:
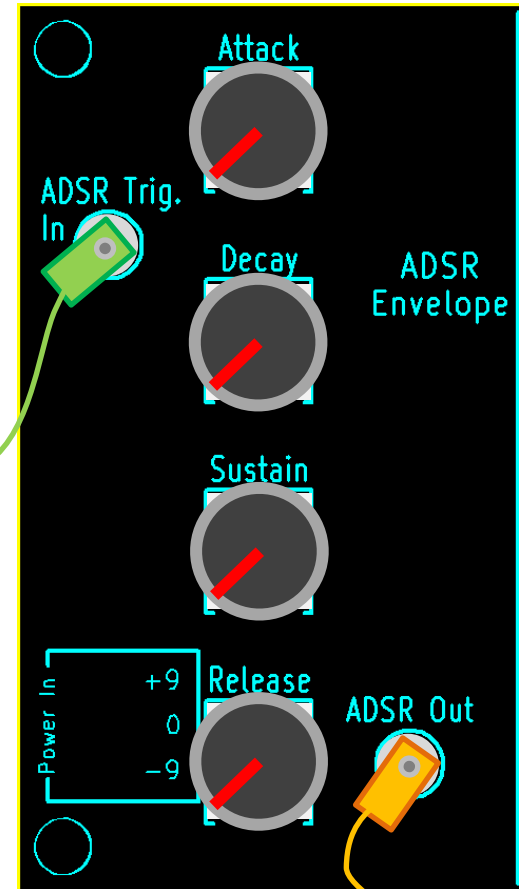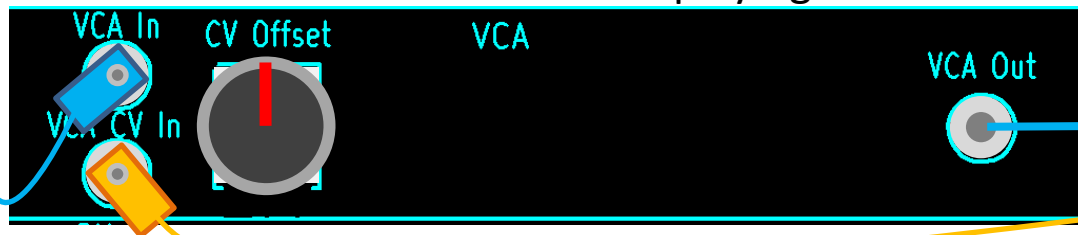 Provide CV from LFO for tremolo effects or from ADSR for note dynamics

Lushprojects.com

Classic note envelope on the LushOne

Use this type of patch to make a note that responds naturally to a keyboard stroke

LushOne Base

In

VCF Out

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5V   GND   Gate In   MIDI Gate Out

Signal when note is held

Attack

ADSR Trig. In

Decay

ADSR Envelope

Sustain

Power In   +9   0   -9   Release

ADSR Out

Patch "Gate In" to 5V to override LushOne gate on audio – we are now gating using the VCA

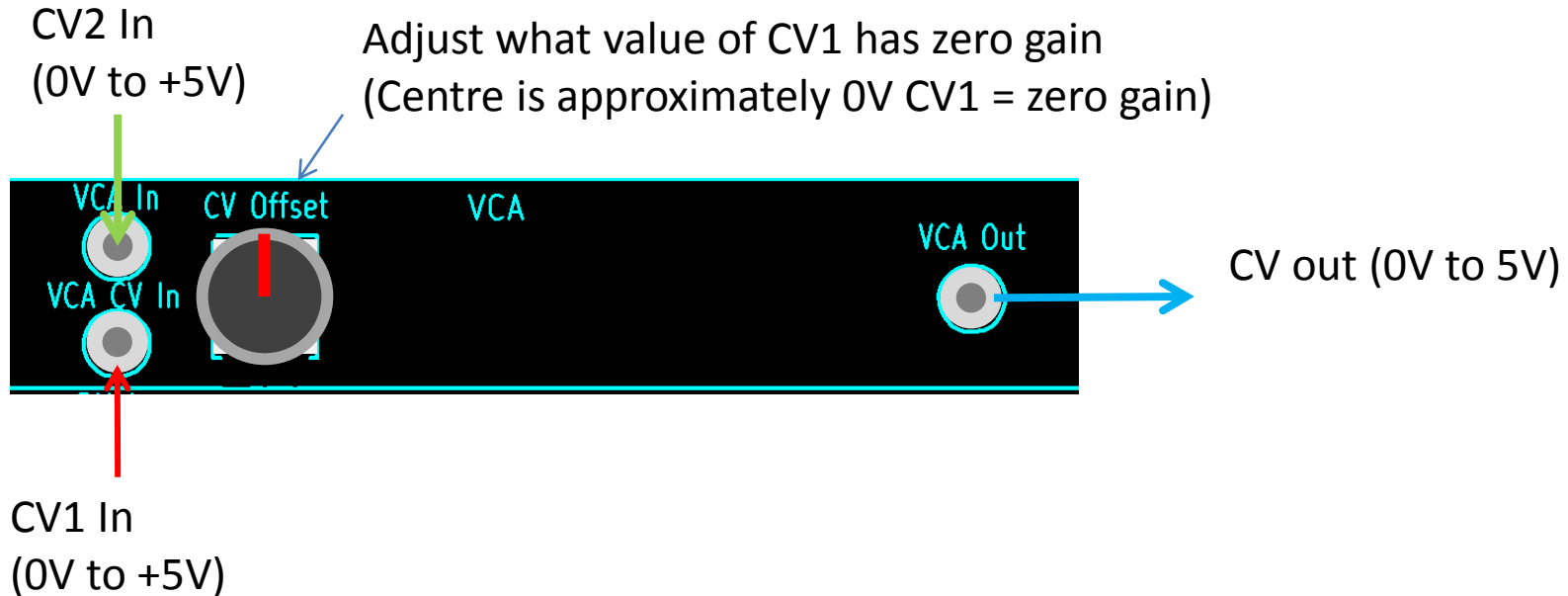Adjust "CV Offset" so output is just silent when no note is playing

VCA In   CV Offset   VCA

VCA Out

Audio Out

VCA CV In

ADSR envelope that tracks note

Lushprojects.com

VCA as control voltage multiplier

CV2 In
(0V to +5V)

Adjust what value of CV1 has zero gain
(Centre is approximately 0V CV1 = zero gain)

CV out (0V to 5V)

CV1 In
(0V to +5V)

- The VCA accepts 0V to +5V on both inputs and is DC coupled so can be used as a CV multiplier
- With CV Offset central then:
  - CV out ≈ (CV1 x CV2) / 25
- Turning CV offset to left raises the CV1 voltage that has zero gain (makes the VCA less sensitive)
- Only does positive multiples for positive values of the CVs
- Application Suggestion: Try multiplying two LFOs together for some weird effects

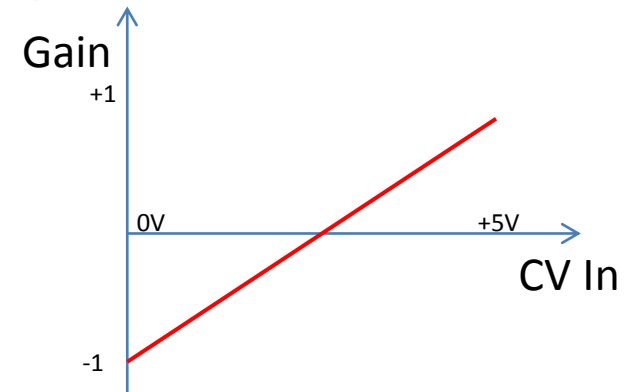Lushprojects.com

Ring Modulator (RM)

Audio In
(-1V to +1V)

Adjust what Control Voltage has zero gain
(Centre is approximately 2.5V CV = zero gain)
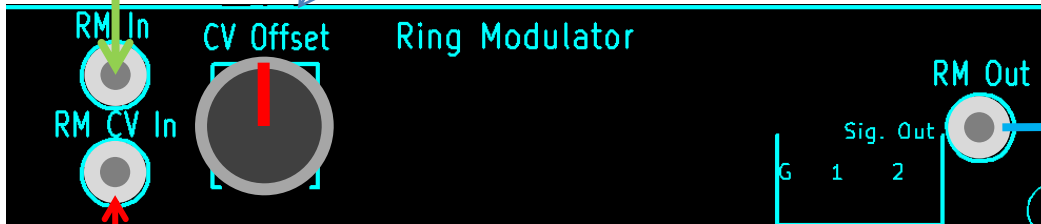
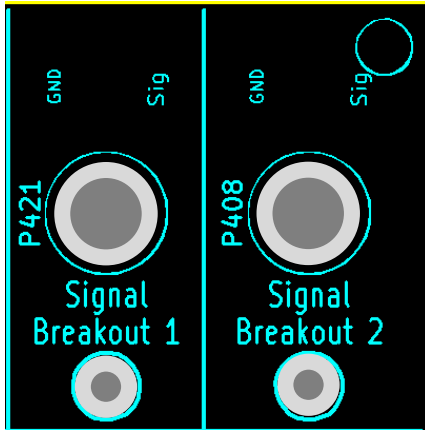Control Voltage In
(0V to +5V)

Audio Out (-1V to +1V)

- A ring modulator does a signed multiply of the input and the CV
- With CV Offset central then:
  – CV of less than +2.5V are treated as increasingly negative and invert the input
  – CV of +2.5V sets the gain to zero with no output
  – CV of more than +2.5V are treated as increasingly positive and increase the output without inversion
- Turning CV offset to left raises the zero point on of the control voltage
- Application Suggestion: Try a CV that is an LFO output or a frequency almost the same as the input

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Low Frequency Oscillator (LFO)

Triangle Out
(0V to +5V)

Square Out
(0V to +5V)
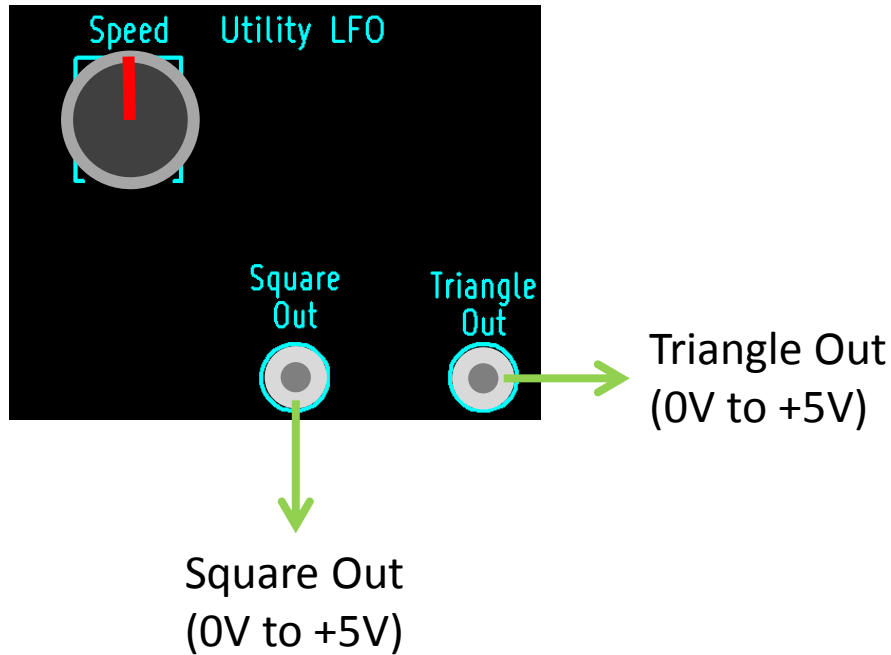
- Utility LFO useful as input to the VCA or Ring Modulator

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Signal break-in/breakout

RCA/Phono socket

2mm Jacks

- Passive connector to break signals in/out of LushOne
- 2mm socket is connected to centre pin of phono socket
- Ground of phono socket is connected to GND on LushOne
- When the Contour is in use then the final output will probably not be the output of the VCF on the LushOne base
  – 3.5mm jack output on LushOne base is no longer useful
  – Use a breakout connector to connect to external amp/speakers instead

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