LushOne Echo Synth Module
Quick Reference Guide

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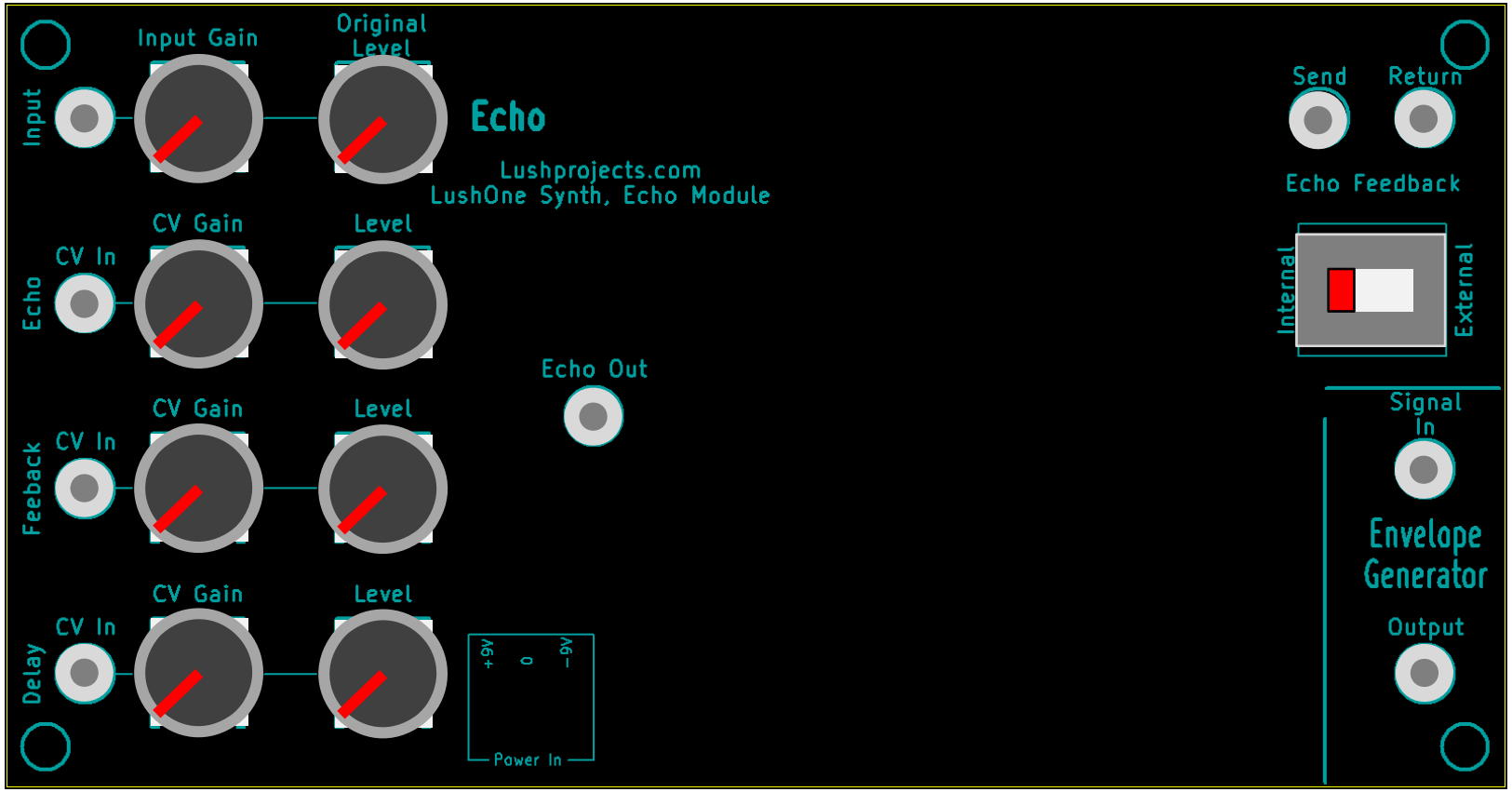
LushOne Echo



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LushOne Echo - Included effects

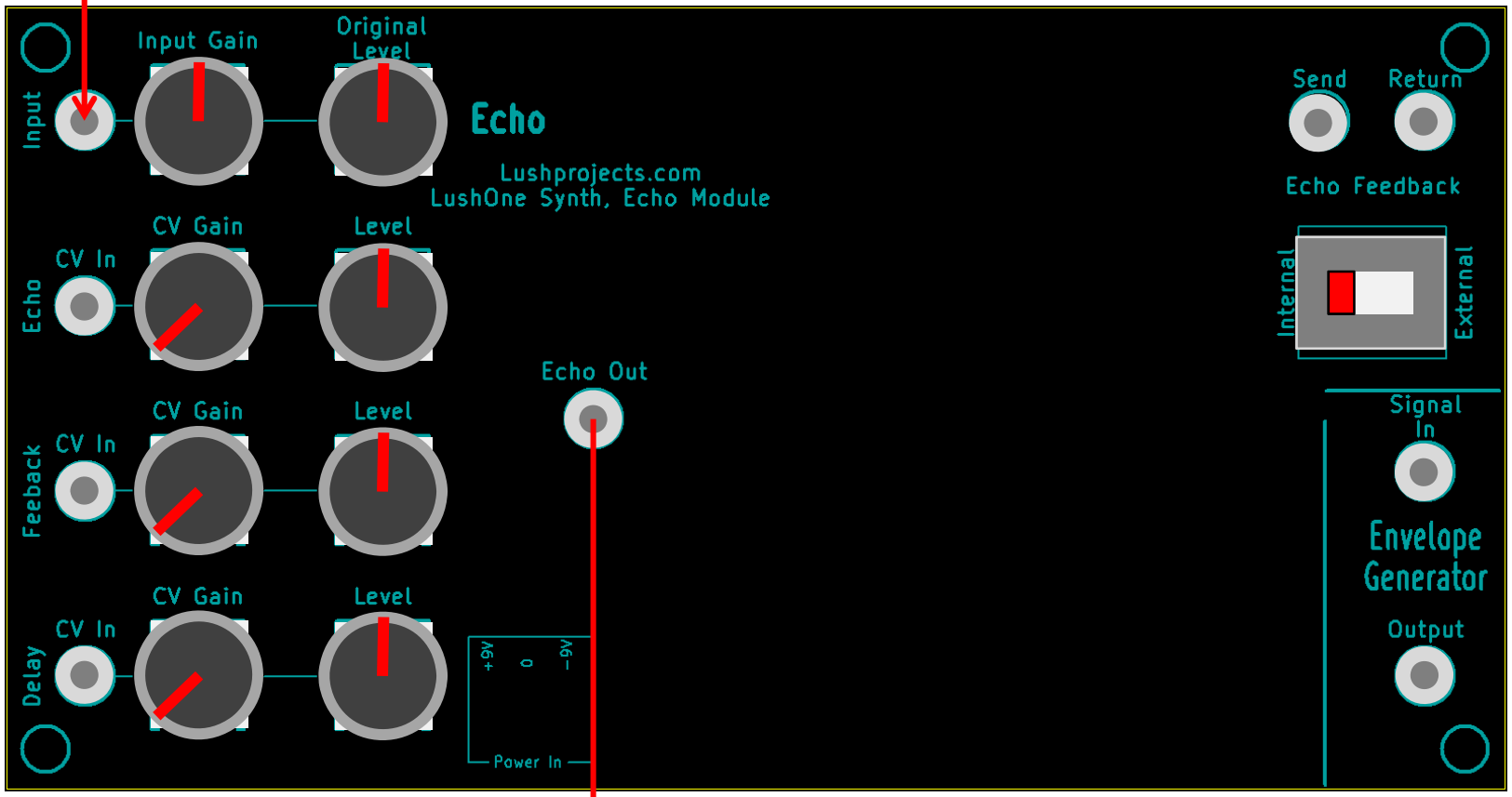
- Echo generator:
  - Variable sensitivity
  - Variable input level in output
  - Variable echo level in output with voltage control
  - Variable feedback with voltage control
  - Variable delay with voltage control
  - Switchable internal feedback or send/return for fx insertion
- Envelope generator
  - Amplitude control voltage from audio input

Echo Generator – Introduction

- Echo generator takes an input audio signal and adds a delay
- Output is a mixture of the original input and the delayed signal
- Output is also fed-back in to the input to add repeated echoes
  - If feedback level is too high the system is unstable!
- Effects circuits can be added as part of the feedback loop

Echo Generator – Quick Start

Connect audio input (eg LushOne Base, OSC1 Output)



Connect to next audio stage (eg LushOne Base, VCF In)

Set knobs and switch as shown. Connect input and output.

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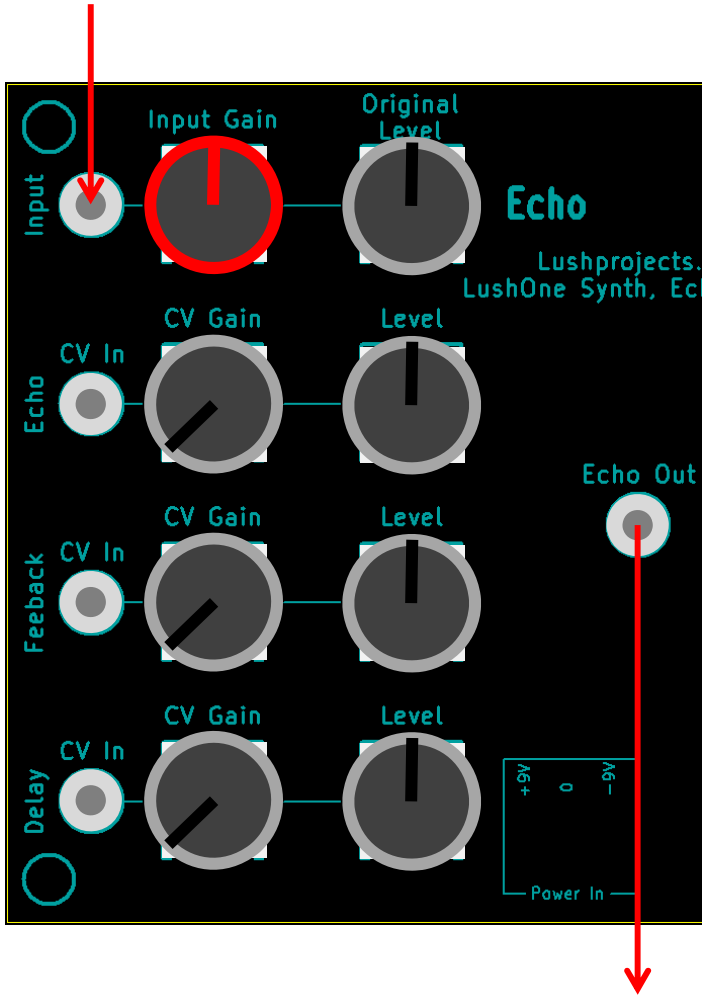
Echo Generator – Input Gain



- Use the Input Gain to adjust the sensitivity of the Echo circuit
- Too much gain and the circuit will clip leading to distortion
- Too little gain and the circuit will be noisy
- Adjust the Input Gain as high as you can without distortion
  - Unless you want distortion
- If the effect sounds distorted check the Input Gain

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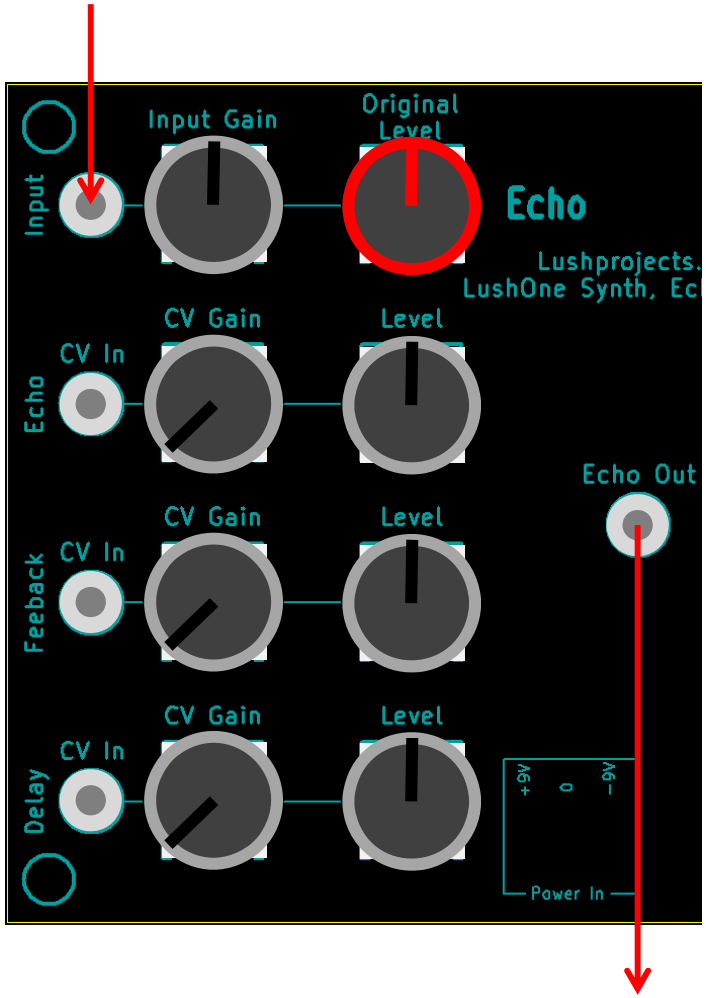
Echo Generator – Original Level



- Use Original Level to control how much of the original input (non-delayed) appears at the output
- Turn hard left (ACW) for no original at the output

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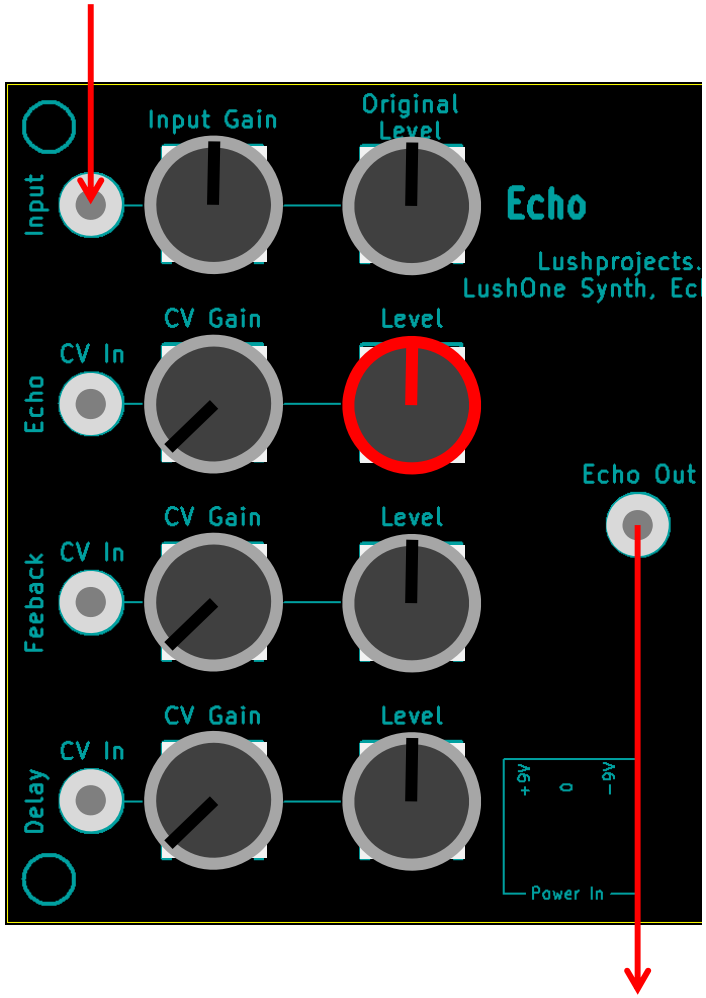
Echo Generator – Echo Level



- Use the Echo Level control to control how much of the delayed signal appears at the output
- Hard left (ACW) for no echo at the output

- Echo Level does not change the feedback which is controlled separately

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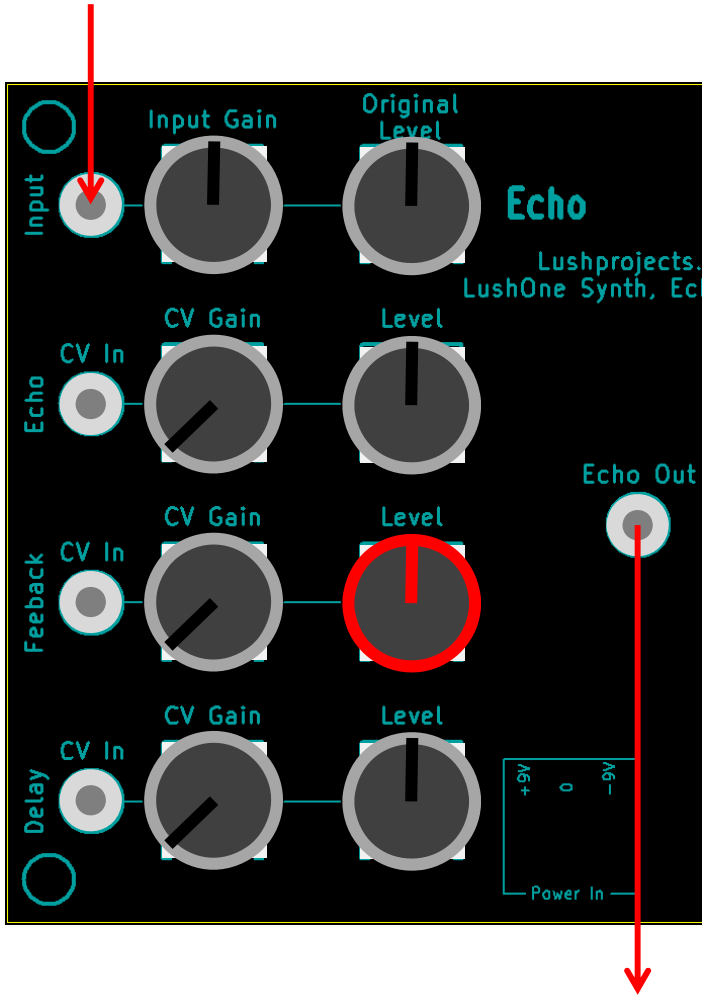
Echo Generator – Feedback Level



- Use the Feedback Level control to control how much of delayed signal is fed back in to the echo loop
- Hard left (ACW) for no feedback
  - Just one echo
- Turn to right for multiple echoes. Rate of decay will depend on the setting
- Too much feedback will make the circuit unstable and echoes will increase!

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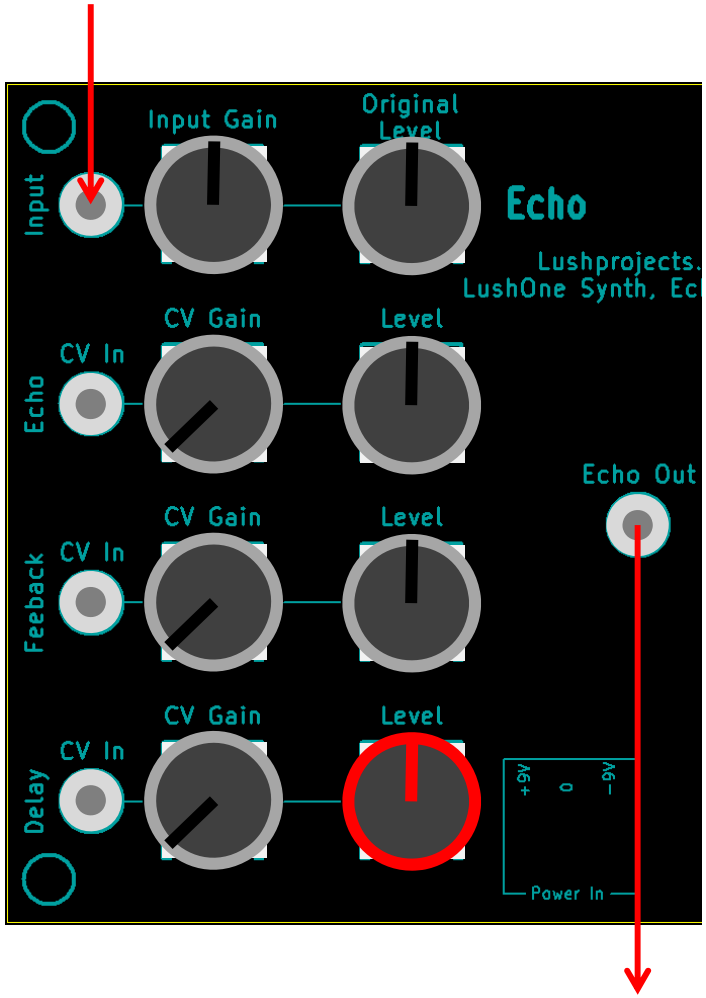
Echo Generator – Delay Level



- Use the Delay Level control to control the delay of the circuit
- Hard left (ACW) for long delay
- Hart right (CW) for short delay
- Circuit will add noise and distortion for long delays
  - It's a feature, not a bug! We make long delays beyond the spec. of the devices available for your experimentation.

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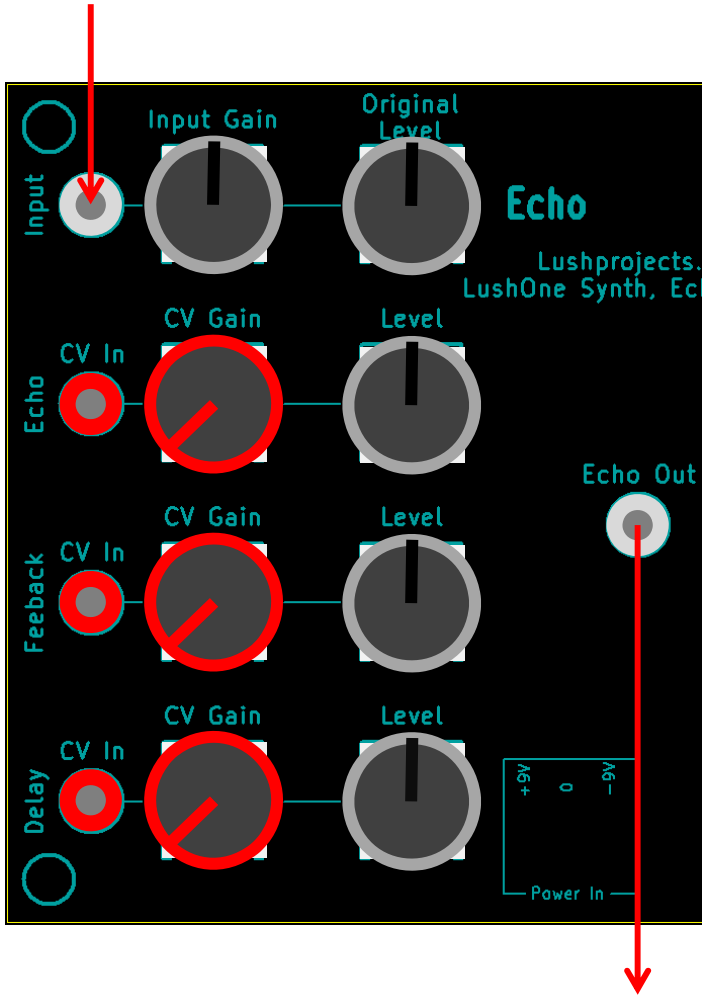
Echo Generator – Control Voltages



- Control Voltages can be used to adjust the Echo, Feedback and Delay by sending a signal to the CV Input next to the label.
- The CV input is added to the baseline value set by the “Level” control
- The CV Gain control next to each input controls the CV sensitivity
  - Hard left (ACW) for no sensitivity
  - Hard right (CW) for maximum sensitivity
- CV Inputs are scaled for a 0V to 5V CV to give full range of control at maximum sensitivity
- CV inputs are tolerant of voltages beyond the 0V to 5V range

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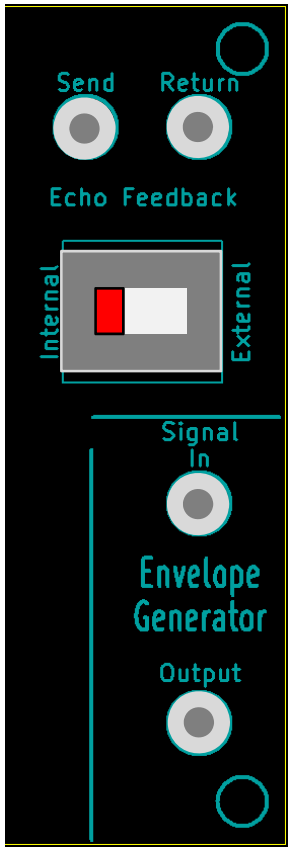
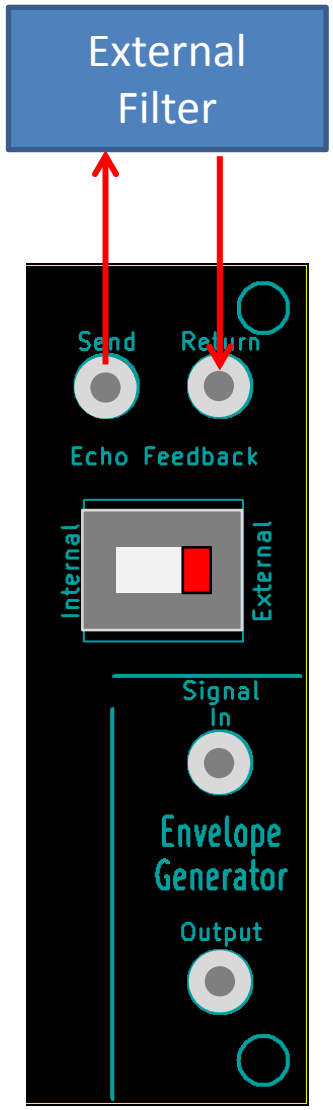
Echo Generator – feedback source



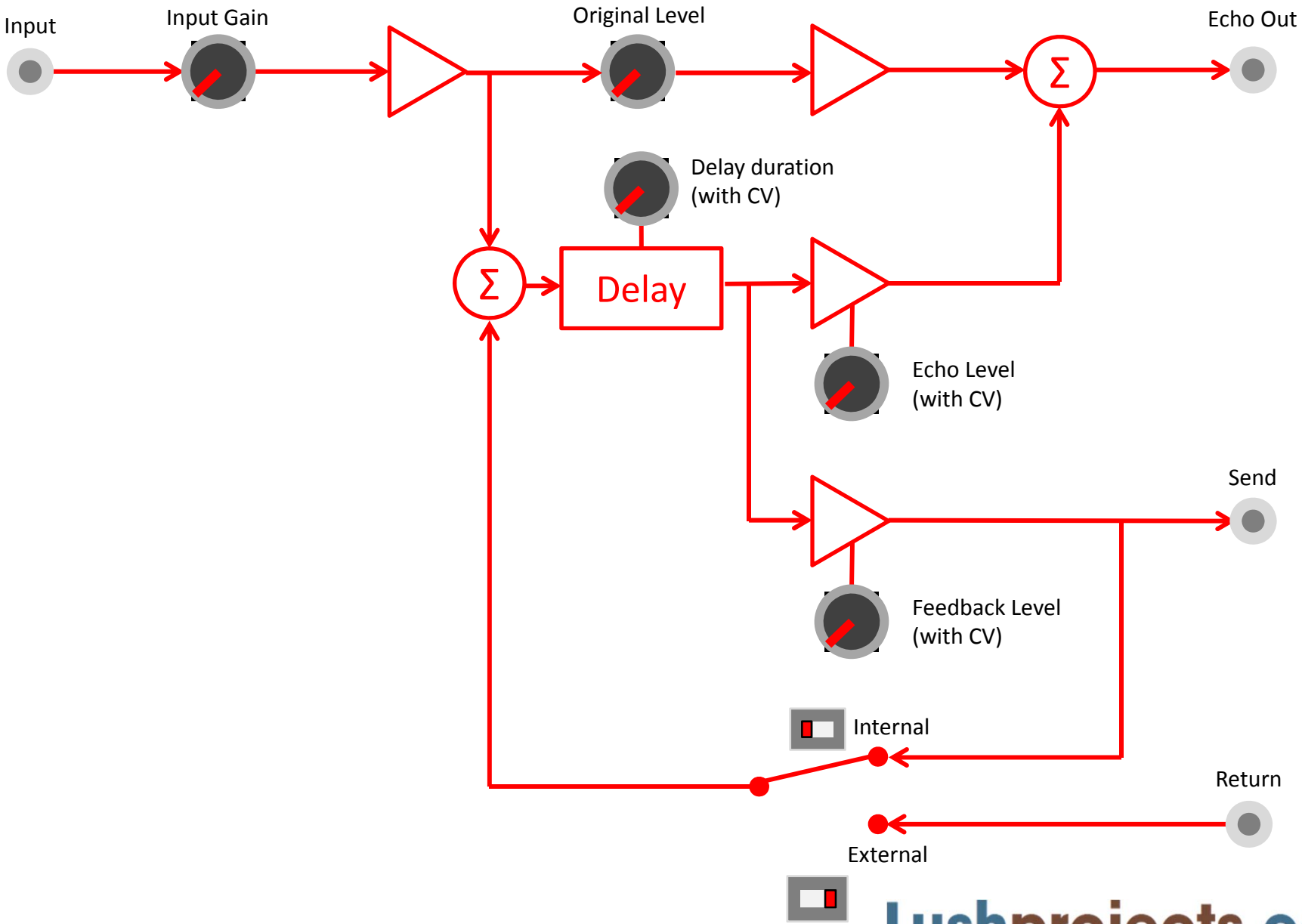
- Echo Feedback switch allows the source of feedback to be selected
- Normal operation is “Internal” when feedback goes through the internal circuits without modification (except gain control)
- “External” allows external processing to be added to feedback

Echo Generator – external feedback



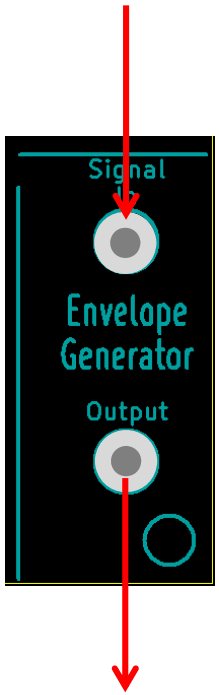
- The “Send” output always sends an audio signal which is the delayed signal after the feedback gain control
- When “External” is selected then the “Send” signal should be sent though a processor (eg a filter) and sent back to the “Return” input.
- If the feedback appears not to be working check you have not accidently set the switch to “External”!

Echo Generator – Block Diagram

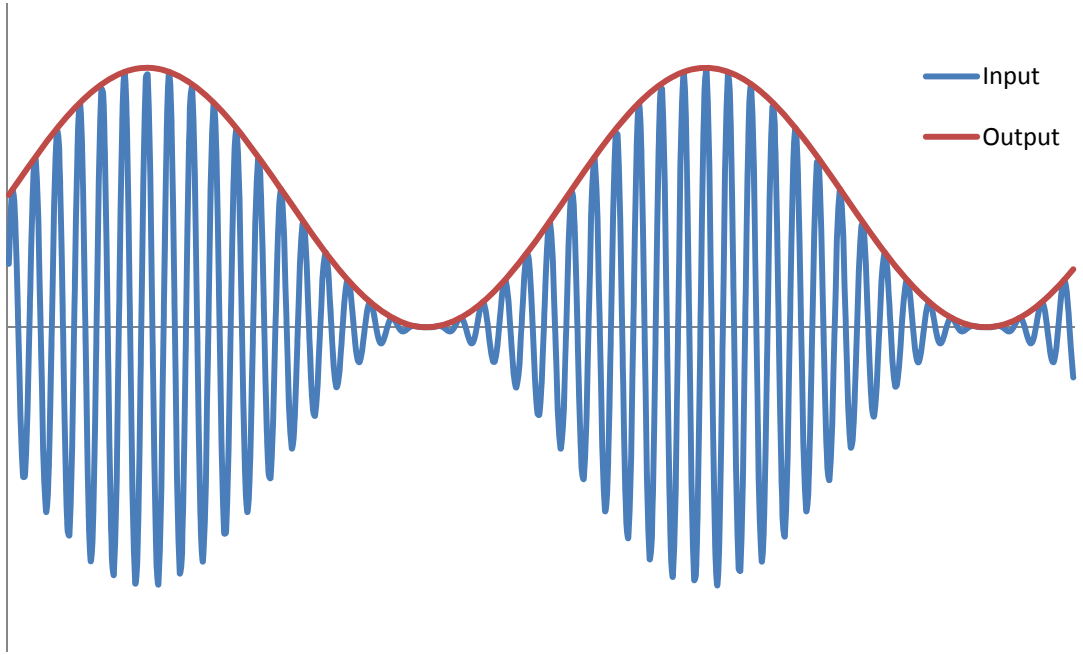


Envelope Generator

Audio signal in



Control Voltage Out



- Create a control voltage based on the amplitude of an audio signal
- Envelope is created by a combination of precision rectification and low pass filtering