clee Looping Gain Sequencer

The Looping Gain Sequencer is an arbitrary transfer function generator. A voltage addressed sequencer is tied to a balanced modulator, modulating an input voltage from inverted unity to positive unity. The sequencer can be caused to loop through the 8 stages multiple times for the same voltage input by using the loops CV or pot. Its main use is as a wave folder but can work at dc as well.

Modulation section

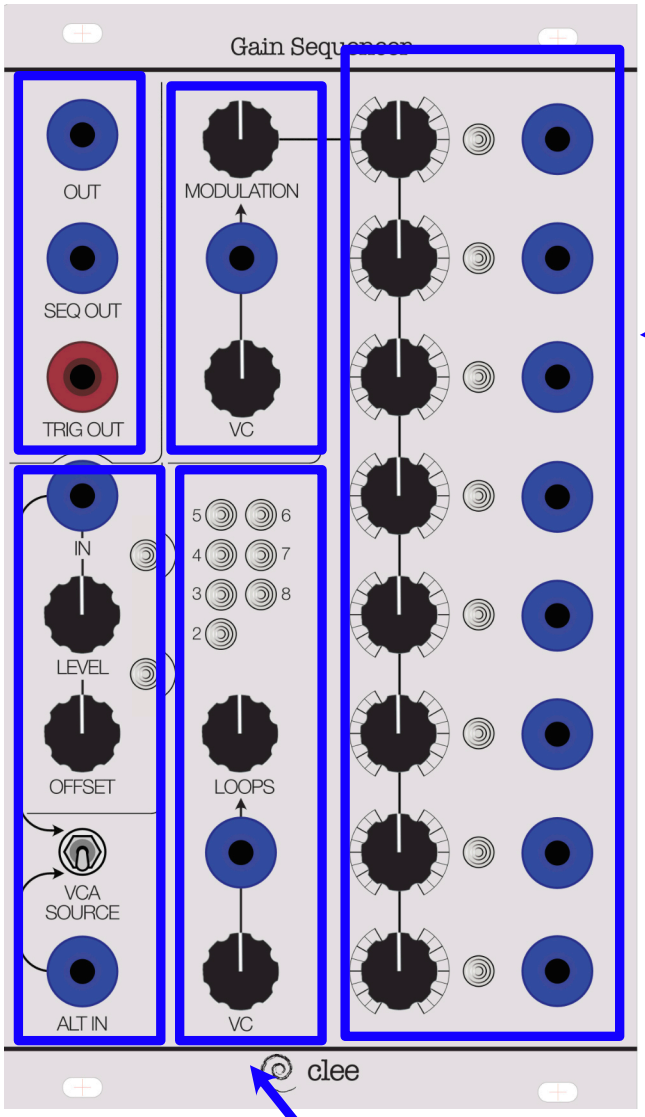
Manual or voltage control will control how much of the sequencer is sent to the balanced modulator CV input

Outputs

OUT: output of the VCA/ balanced modulator.

SEQ OUT: the output of the sequencer pots.

TRIG OUT: a short trigger pulse every time the sequencer changes stage



Sequencer section

Output at SEQ OUT and controls gain in the balanced modulator

Input control

LEVEL and OFFSET adjust the volume of IN

Over and under LEDs are used to adjust the level of IN with LEVEL and OFFSET

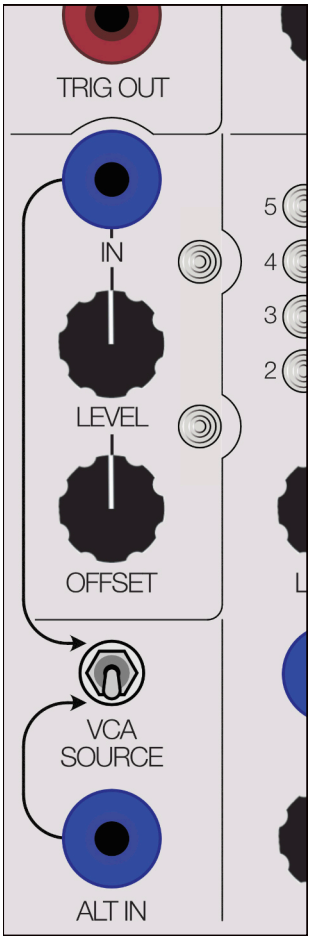
VCA SOURCE: controls the input to the balanced modulator

ALT IN: the switch will control if IN or ALT IN goes to the input of the balanced modulator

Loops section

Controls how many times the sequencer loops for the same voltage change at IN

clee Looping Gain Sequencer



Input section:

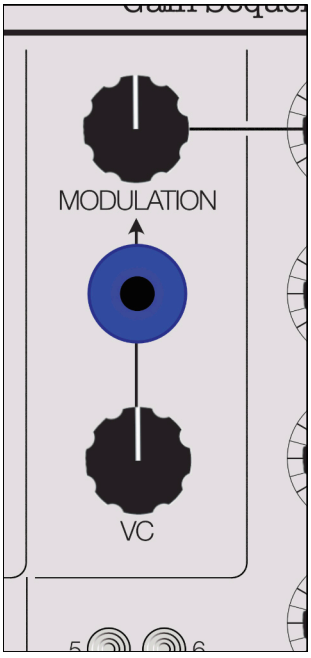
IN is DC coupled so it can be an audio signal (the main application), an LFO, a sequencer, or any other source.

Adjust the LEVEL and OFFSET pots so the full range of input doesn't light the OVER or UNDER LEDs but almost does. The module will work fine with any setting here but the LOOP function will not match the pot or CV settings if the LEDs light.

With the VCA SOURCE switch up the signal at IN will be sent to the balanced modulator input (unmodified by the LEVEL and OFFSET pots)

With the VCA SOURCE switch down, the signal at ALT IN will be sent to the balanced modulator input. This way you can modulate a second signal, ALT IN being the input and IN being the modulation in.

The amount of modulation in either switch position is controlled by the Modulation section



Modulation section:

As the line from the Sequencers to the Modulation pot shows, this section controls how much of the sequencer is sent to the voltage control input of the balanced modulator. It can be adjusted both manually and by external voltage control.

With modulation set full (pot fully CW or about 5V at the CV in) the balanced modulator output is full inverted unity gain with the sequencer pots full CCW and full positive unity gain with the sequencer pots fully CW. The Modulation section doesn't control the output of the balanced modulator, it controls how much of the sequencer signal is sent to its control voltage input.

With the modulation set to zero the MAIN OUT will pass IN or ALT IN (depending on the source switch) unchanged.

There is no other way to modulate the gain of the balanced modulator.

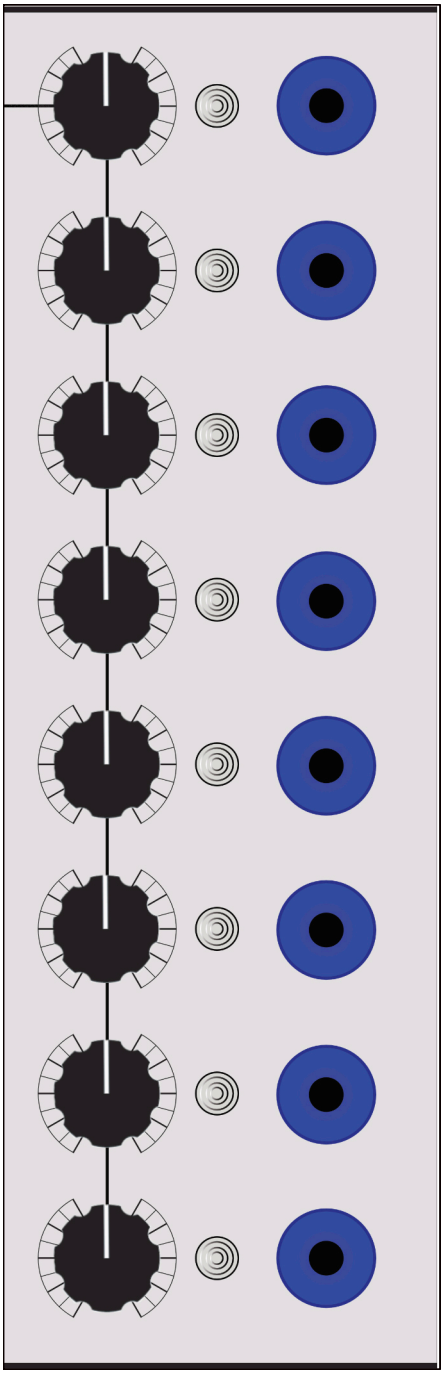
clee Looping Gain Sequencer

Sequencer section:

The sequencer is voltage addressed. With LOOPS at fully CCW and OVER and UNDER properly set, the sequencer will step through 1 (bottom) to 8 (top) with the input going from zero to full.

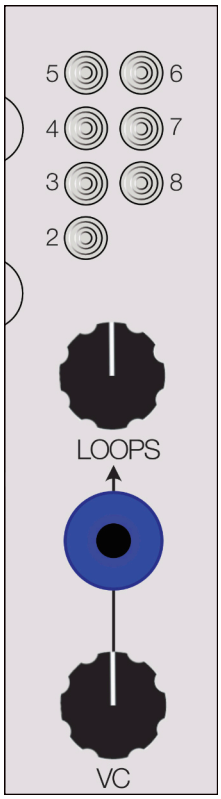
The active pot position will be output at SEQ OUT (high with pot CCW, low with pot CW) and will be sent to the Modulation section. The matching LED will light and the matching GATE OUT will be high.

Further behavior of the sequencer is controlled by the Loop section



clee Looping Gain Sequencer

Loops section



LOOPS controls how many times the sequencer is stepped through given IN going from zero to full. With LOOPS full CCW and no CV input, the sequencer will go from 1 to 8. With LOOPS exactly at 2 the sequencer will loop twice looping from 8 back down to 1 at about half way.

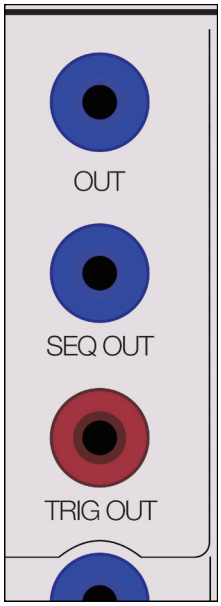
It will loop up to 8 times.

It will loop between even numbers. For example at a certain voltage it will loop twice and then 3 more stages.

LEDs show how many loops the sequencer is doing.

This will control both the Modulation input and the voltage at SEQ OUT.

Outputs



OUT is the main module output. It will be either IN or ALT IN (depending on the VCA SOURCE switch) modulated by the sequencer. The input is sent to the VCA/Balanced Modulator unmodified and both inputs are DC coupled.

SEQ OUT is the output of the sequencer pots. It's high when the active pot is fully CCW and low when the pot is fully CW.

TRIG OUT outputs a short trigger pulse every time the sequencer changes stage. At some audio rates and loop multiplications the pulses will run together and the output will stop pulsing.