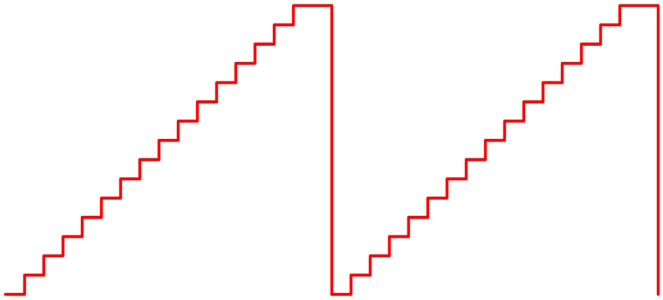
10 Step Complex Staircase Generator

This Reference PDF is to help explain the Blue Lantern Modules 10 Step Complex Staircase Generator.

This Sequencer is like no other and will aid you in creating interesting voltage patterns to modulate vco's or analog filters. There are 10 internal Staircase generators that must be clocked or manually pushed to begin their climb. There could have been 10 individual clock inputs specific for each staircase generator but that would have been expensive, bigger, and confusing. I instead made pairs. So 4 Clocks inputs are required instead of 10 of them.

What is a staircase wave?



When clocked at audio rates this is what a Staircase wave looks like. There are 16 'stairs'. So what that means is voltage is climbing increments of 16 steps and then dropping back to zero, and climbing again. When this staircase wave is modulating an external vco it will sound very quantized.

This Stair Case Wave can run at audio rate. It sounds great. With the use of the offset knob you can have it -5v/+5v or all positive, all negative DC shift.

If your goal is synchronization. A good many flavor clock divider will serve you well. Like that everything will sound musical. Otherwise if bizarre sequences is your poison then use many audio rate clocks or lfo's to patch. This module can use 6 clock sources + one CV modulation source for FM.

Now to explain the clock routing for the Stair Case Generators. Remember it is internally in pairs and I setup the pairs for musical purposes. Taking the Four on the Floor pattern for example the drum kick happens on Step 1 and Step 5. I used that for the template. Each clock can be divided by 2 or x1.

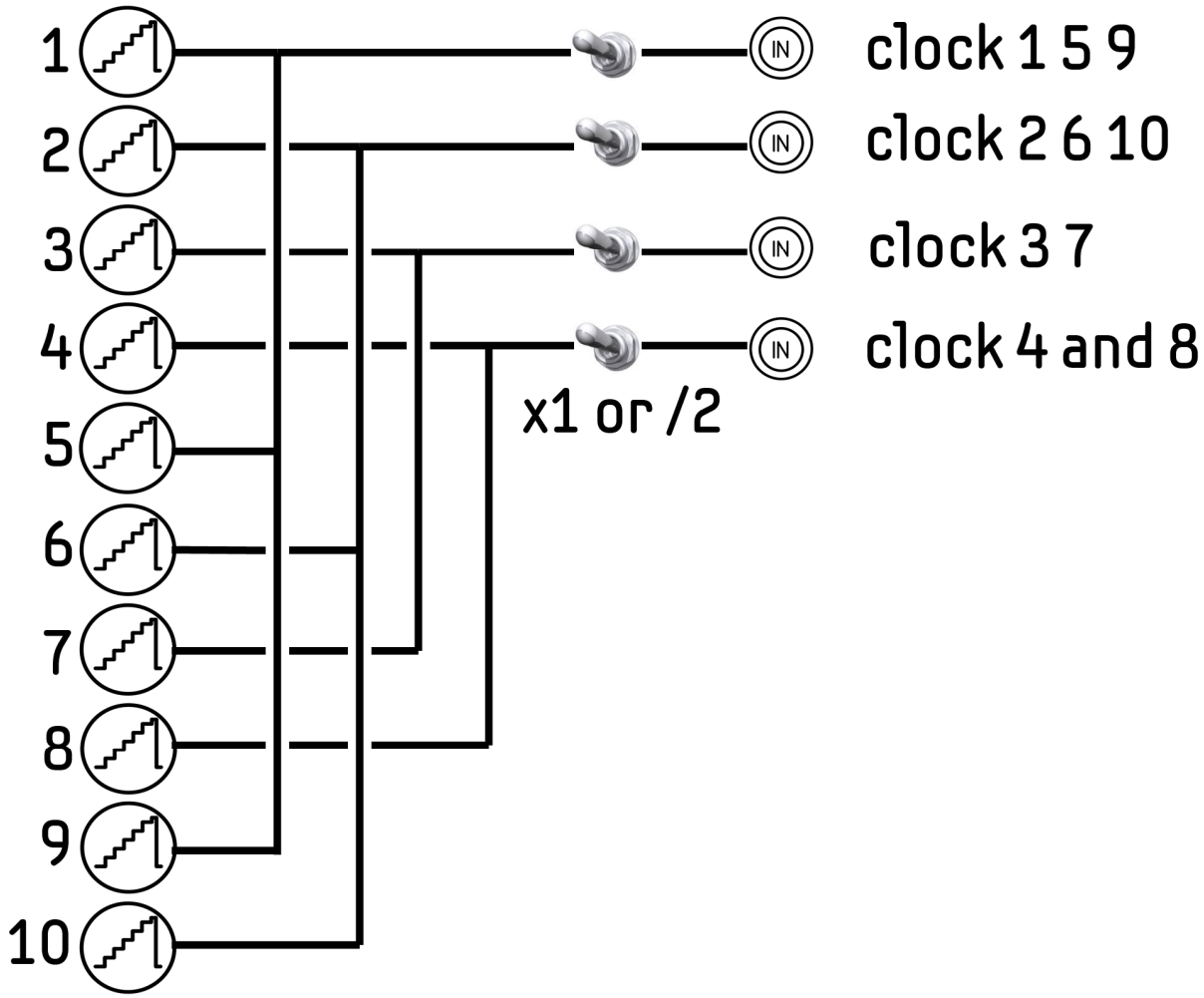
Clock 1: Step 1 and 5 and 9

Clock2: Step 2 and 6 and 10

Clock3: Step 3 and 7

Clock4: Step 4 and 8

Here is a diagram to help visualize the routing.



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It would have been boring to have all the 10 staircases perfectly climbing together on the same staircase step number always and forever. This is the reason why there are 10 buttons. You can push to manually climb stairs per generator to tell where the clock should begin. So for example patching into clock 1 could start climb on stair #2 on Generator (1), start climb on stair # 7 on generator (5), and start climb on stair # 3 on generator (9). The CV leds will visually aid you how synchronized they are climbing.

When the CV leds are off, it refers to zero volts. The brighter the LED the higher the voltage. Pushing the button 15 times will manually cycle through the stairs. Use a slow clock input if you don't want to push so many times.

Can this sequencer be used like the normal analog step sequencers?

It sure can. Think of it like this. If step number one generator LED is fully brite you can use the Number One Level Knob to adjust from 0-10v roughly, and use the offset knob to adjust the entire sum of the sequence. If the Led was off for the generator, that means zero volts so there is no voltage going to the Level Knob (a good trouble shooting tip to know about). To remedy give it some push button and get the sucker climbing.

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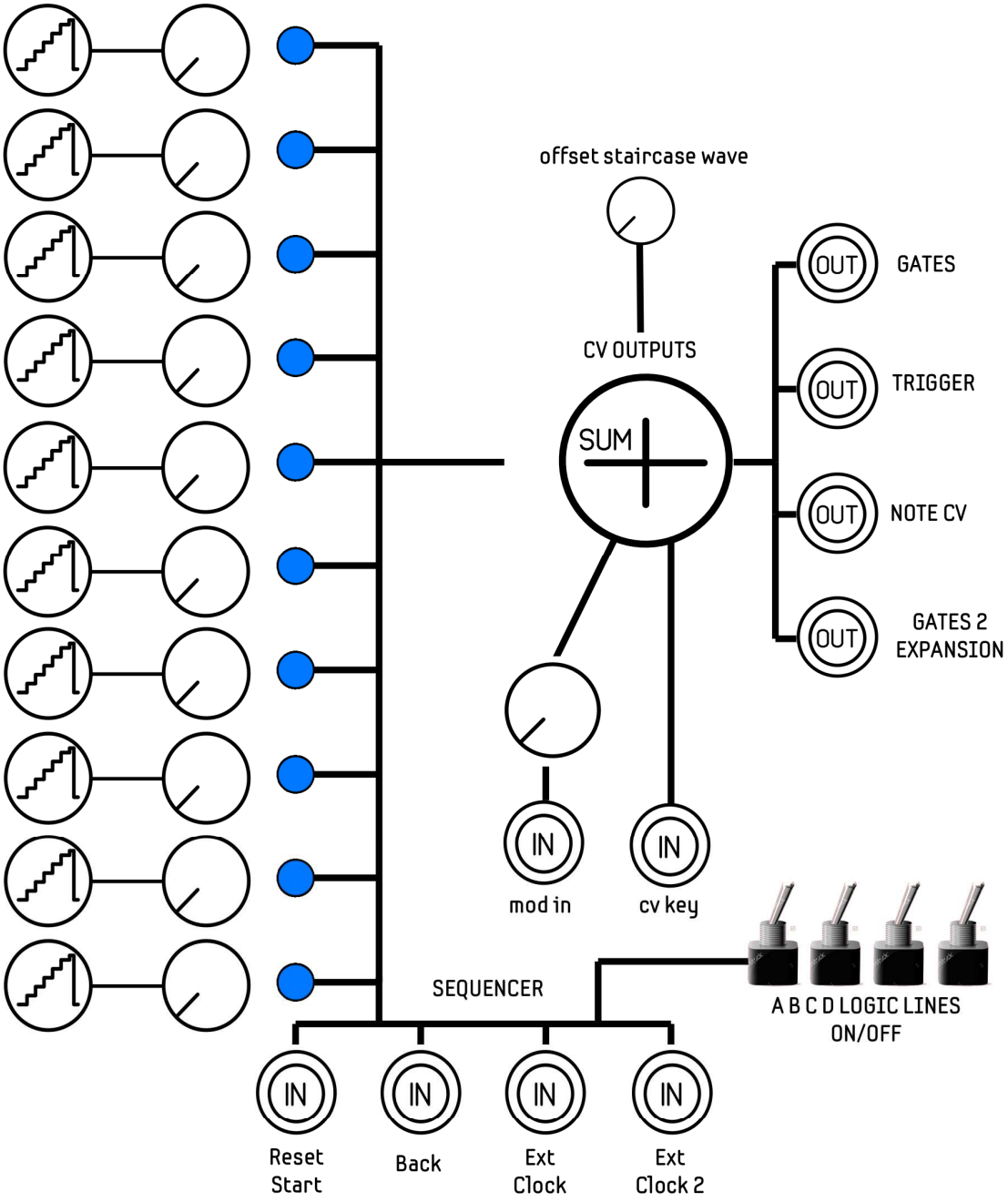
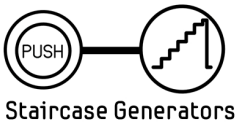
Here is a Diagram showing how the sequencer is routed.





Staircase Generators

Push button to manually step up from 16 stairs.

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The key in understanding this sequencer is knowing the difference between a sequencer step and Stair case Step. The Sequencer step simply switches to the next attenuated 'Level' Knob. The Staircase step can be running (clocked) or stopped on a stair.

The Sequence Step can be switched by these modes: cycle forward and reset on step N, cycle forward and reverse on step N, cycle forward and stop on step N.

Step N is determined by a fancy digital switch button.

Your select N options are: STEP 4, STEP 5, STEP 8, AND STEP 10. Step 10 would cycle the sequence all ten steps.

Digital Logic Lines and ABCD Switches.

There are four toggle switches on the far left, and this time the second clock generator is included on the module. On my previous sequencers you needed two units to use the ABCD feature.

What does this do for me?

The toggle switches communicate with the main sequencer by 'brute forcing' some bits as the main sequencer was moving along.

How is this done?

I added a small second core sequencer circuit that will take a separate clock input.

When no second clock is patched in, experimenting with the toggle switches will bounce around the sequence. Sometimes the sequence will lock if all four toggle switches are on, that's normal.

When a second clock is used, experiment with fast audio rate clocks to have it do crazy.

Random Toggle Switch.

Toggle this one to have the sequence do true random. You can still use the ABCD switches too to increase more unpredictability.

Hail Generator and Probability.

A hail generator is a spike wave generator running at a random clock. At fast rates it sounds like white noise.

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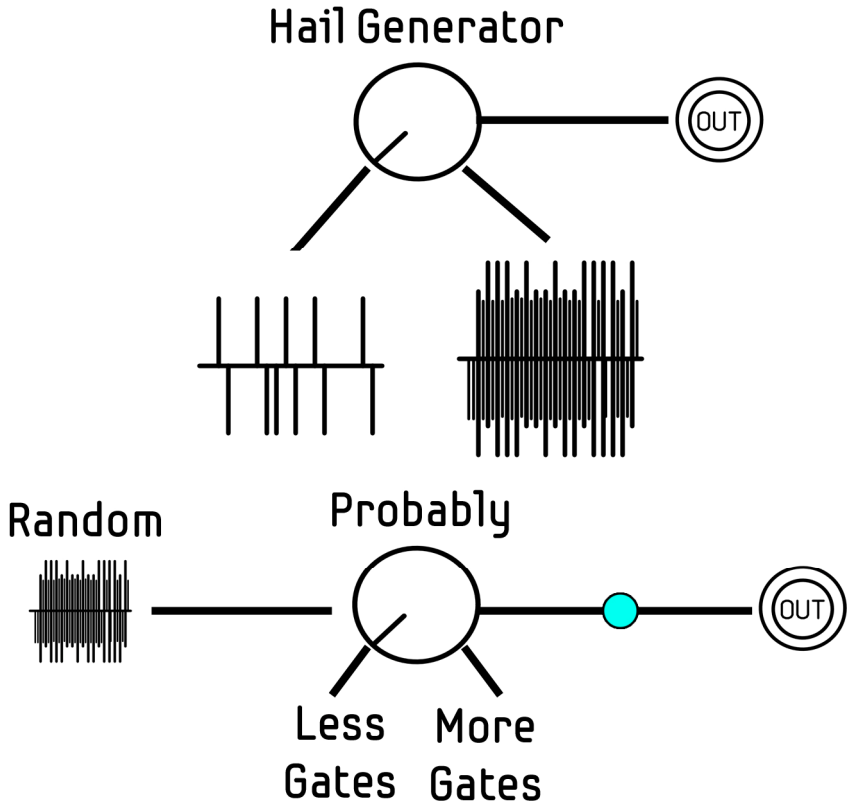
Probability generator is a random gate generator. Use this to supply random unsteady clocks, or trigger stuff randomly.

Here is a diagram to show you how to work them:



Expansion Port and Muted Gates.

On the back of the modules there is an expansion port to use a Tad Pole Expansion Module.

The Tadpole Expansion uses 16 steps, the module I am discussing here only uses 10 steps. It is still compatible, it will just only use 10 switches. This will allow you to mute individual gate steps.

The ABCD Lines on the Tadpole Expansion are not used on the 10 Step Complex Staircase Generator Module.