

Build notes for BINDUBBA 3 up/down/sideways/forward/backward SEQUENCER

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This sequencer has two sets of inputs, a CV out, inverted CV out, random out, inverted random out and 16 gate outs.

If the pots/LEDs/gates are laid out in a 4x4 matrix, one set of inputs controls horizontal movement, the other vertical. Each set of inputs has a clock input, reset and up/down. The clocks can be linked so the horizontal clock will drive the vertical section on every 16th step.

More interesting is to have two quite different clocks driving the circuit to get complex patterns forming. If the clock signals are coming from a single module, such as the CGS Master Divider or Pulse Divider the stepping is regular, if two separate clock sources are used you will find the pattern has irregular steps which may or may not be good.....eventually the listener will be able to identify a pattern in there somewhere.

An example of counting would be: 1, 2,v 7, 8,v 9, 10, 11,v 16, 13, 14,v 3, 4...The 'v' indicates a vertical clock pulse.

Then you can start messing with the up/down direction to really get a groove on!

The counters can be manually or gate controlled to count up or down. The reset inputs can reset the count back to the 1st stage or be switched to random reset, in this case the Q3, Q4 outputs of the 4029 counters will determine the reset point, but there is no easy way of knowing what that will be, so it is essentially random.

The LEDs and current limiting/gate resistors have been left off the PCB, these are to be mounted on the panel. It is assumed the gate jacks and LEDs will be positioned next to each other, so it is quite simple to connect these with resistors.

This method saves connecting 32 wires from the PCB to panel and reduces PCB real estate.

The random outs are derived from a resistor D/A network on the Q1-Q4 outputs of the 4029 counters. The D/A network is split over the two counters, Q1-Q4 of U3 supplying the LSB half and Q1-Q4 of U6 supplying the MSB half. As the two counters will be running of different clocks, and may be counting forwards or backwards, it means the voltage coming from the D/A network will be difficult, if not impossible to predict.

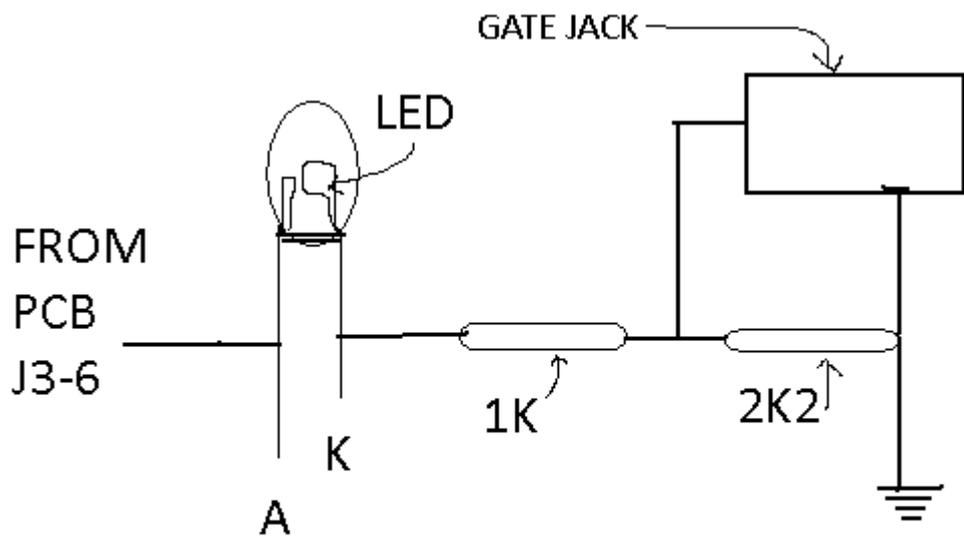
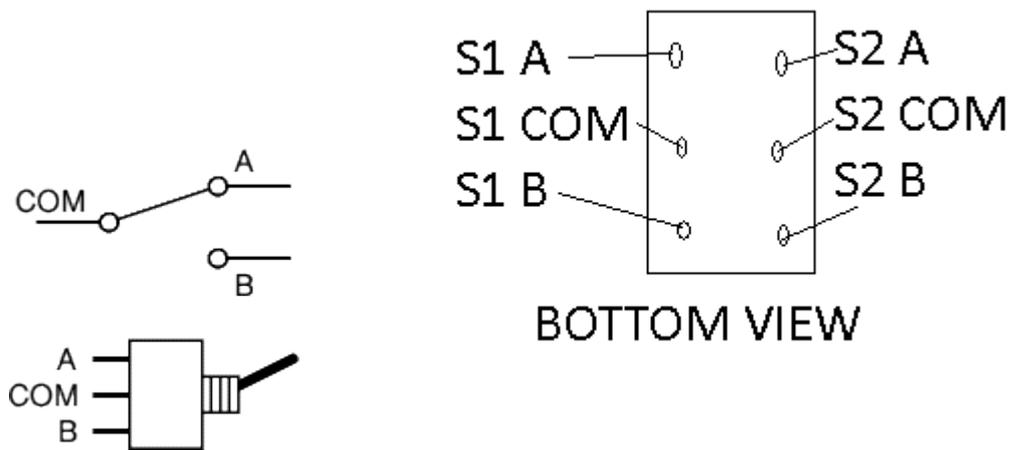
The PCB is double sided.

Connectors

<u>Connector/pin</u>	1	2	3	4	5	6
J1: gate inputs for horizontal control	Up/down	reset	clock	ground	X	x
J2: CV outputs	CV out	CV out	Inv CV out	Ext CV input to mix	X	x

				with output CVs		
J7: gate inputs for vertical control	Up/down	reset	clock	ground	X	x
J8: random outputs	ground	Inv rdm out	Rdm out	X	X	x
J12: Power input	-12V	ground	+12V	X	X	X
J13: DPDT on-on switch, to select internal or external clock (horizontal)	S 1 B	S 1 COM	S 1 A	S 2 B	S 2 COM	S 2 A
J14: DPDT on-on switch to select reset to zero or random reset (horizontal)	S 1 B	S 1 COM	S 1 A	S 2 B	S 2 COM	S 2 A
J15: Up/down switch SPST on-off (horizontal)	+12v	Up/down switch (horizontal)	X	X	X	x
J16: Up/down switch SPST on-off (vertical)	+12v	Up/down switch (vertical)	X	X	X	x
J17: DPDT on-on switch to select reset to zero or random	S 1 B	S 1 COM	S 1 A	S 2 B	S 2 COM	S 2 A

reset						
(Vertical)						



PANEL MOUNTED COMPONENTS X16

Choose resistors to give a gate signal as you need, for a larger gate signal change the 2k2 shown above to 1k.

Caps

C1, C2 10nF (103)

C3, C4 10uF 25V (35, 50V okay)

All other caps (13 of them) are for decoupling so **100n** (104) is okay

ICs

U1 TL074 Quad op amp package
U2 TL074 Quad op amp package
U3 4029 Presettable up/down counter
U4 4052 Dual 4 channel mux/demux
U5 4052 Dual 4 channel mux/demux
U6 4029 Presettable up/down counter
U7 TL072 Dual op amp package

+ four quad op amps for the led/gate subcircuits, I used LM324 as I have a lot of them, TL074 or TL084 will do too.

Pots

total: 17X 100k linear (50k okay too)

To use as follows:

16 for setting CV levels

1 for attenuating the external CV input.

Diodes

16 LEDs

10 regular signal diodes (1N4148)