

nonlinearcircuits

Squid Axon build & BOM

The Squid Axon is a circuit based on the Hodgkin-Huxley equation describing the chaotic behaviour observed in giant squid axons. The inspiration for the module came from a 2003 paper by T. Matsuzaki & M. Nakagawa, titled - 'A Bipolar Logistic Chaos Neuron and Its Hardware Implementation'.

Basically it is a four stage analogue shift register with two feedback paths, one nonlinear and one linear (I do try to walk the line). If you turn the feedback paths down to zero, you get a regular ASR. Turn up the feedback to get more complex and staggered patterns from the 4 CV outputs; these are a lot more obvious with higher frequency clock rates. It will happily run at audio rates as well.

Mod – The four 103 (10n) capacitors in a row between the transistors and 4017 ic can be replaced with a lower value for a cleaner sample. 1n, 2n2 or 4n7 will all work well. This is not included in the BOM, but is a good mod to do.

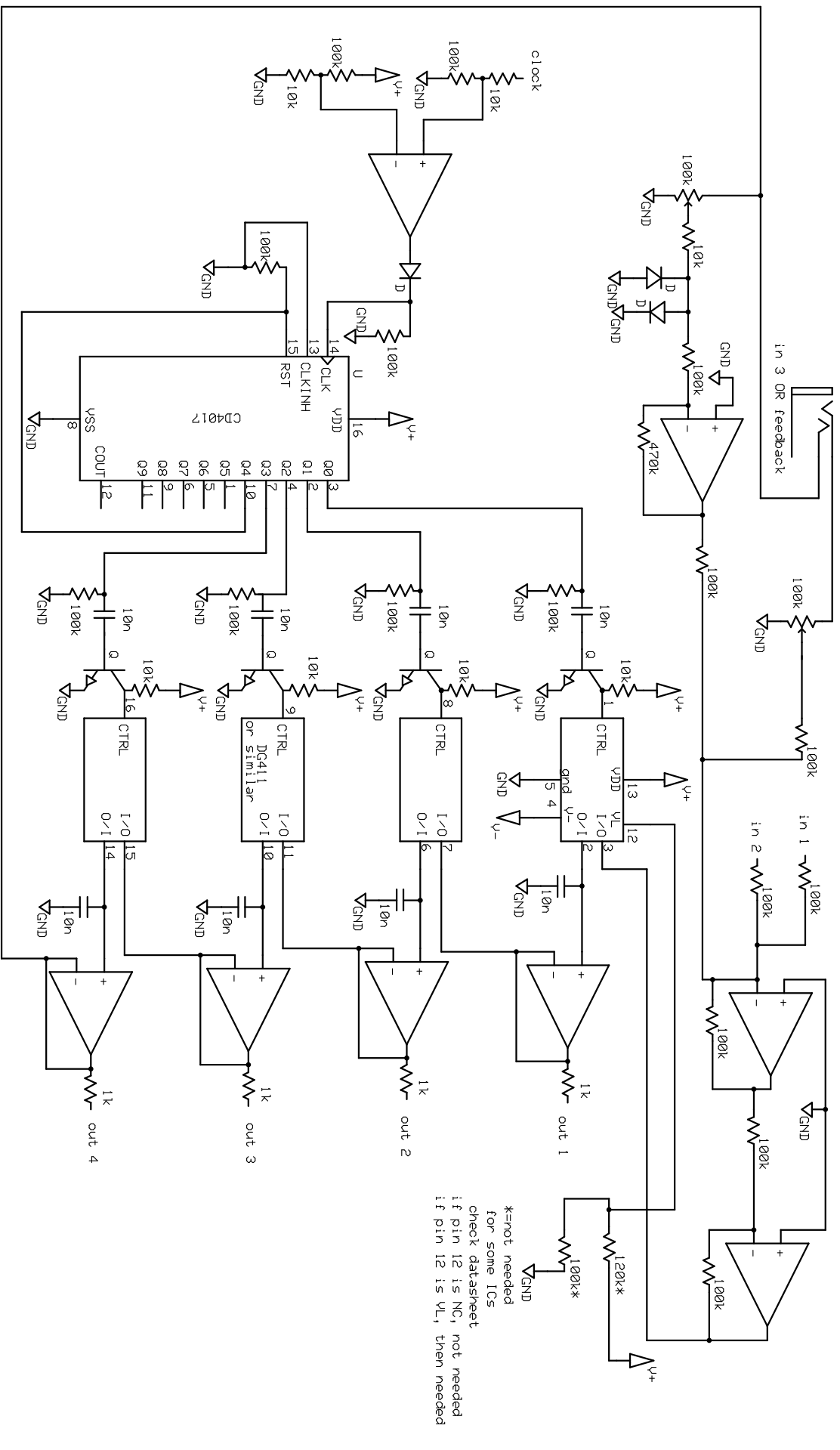
BOM

(Check <http://www.taydaelectronics.com> or Mouser to see what kind of pots & jacks you need, part # given in notes, of course you can buy these anywhere, but the pictures show what type will suit)

The () after the component indicate how the component is labelled on the PCB. For example (d) means 10k resistors are marked on the PCB with just a 'd'. Get extras, it is easy to drop surface mount parts or some other mishap!

component	quantity	notes
100kB pot	2	Tayda: A-1848
3.5mm kobiconn style socket	8	Tayda: A-2563 or A-865
10 pin eurorack power connector	1	
4017	1	DIP, CMOS
DG411	1	SOIC 0.050 pitch
TL074	1	SOIC 0.050 pitch
TL072	2	SOIC 0.050 pitch
BC847	4	SOT-23 Tayda: A-1339
1N4148	3	thru-hole diode
10nF (103)	8	0805 (see mod)
100nF (104)	4	0805
10Ω	2	thru-hole
1k (1)	4	0805
10k (d)	7	0805
100k (c)	17	0805
120k	1	0805
470k	1	0805

The 100k* and 120k* are not required with some brands of DG411 (new series Maxim), check the datasheet to see if pin 12 is labelled 'NC'. If so, it means 'no connection' and you do not need to install these components. There are similar chips to the DG411 that will work in this circuit, check pinouts, NO/NC setups and voltage ratings.



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