

# nonlinearcircuits

## giant B0N0 build & BOM VERS2

This module has its roots in the NLC DelayNoMore and Vactrol PiLL. It was partly inspired from reading several research articles on chaos in PLL circuits. It seems many PLLs can be chaotic but usually only in narrow windows, so they are usually designed to avoid operating in these regions. Of course the giant B0N0 does the exact opposite and makes matters worse by having a severely overdriven delay chip in its feedback path.

The **mix** output is comprised of the PLL VCO signal and the delay chip's main output. **VCO** output is the raw PLL VCO. **PC1** (phase comparator) is a 0-6V square wave, usually at audio rates. **PC2** is a lot more sporadic and is best used as a burst generator. **Saw** out taps the signal on the PLL's timing capacitor and it runs at approx. double the frequency of the PLL VCO, a pretty dirty filthy sawtooth tho. **CV** output is ..... a CV; again it is pretty hairy but somewhat representative of whatever the circuit is doing.

Mostly, as the name implies, this module will make a lot of crappy noise and is only controllable in the sense of how crappy it sounds: nutty chunks or liquid baby green. It is fun to ram anything into the input: gates/triggers/CV/audio and see what happens. Sync expects a gate or trigger, but anything is okay. The CV inputs will affect the delay and PLL sub-circuits; the PLL circuit is tuned to 1V per Couric.

**UPDATE – 26 May 2016** – found an error on the PCB, fixing this will give better range on the Courics pot. See section after the BOM.

**UPDATE – 2 Jan 2017** – found a very good mod to do.see section after Fix.

## 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 (c) means 100k resistors are marked on the PCB with just a 'c'. Get extras, it is easy to drop surface mount parts or some other mishap!

component	quantity	notes	component	quantity	notes
100kB pot	6	Tayda: A-1848	1nF (102)	1	0805
3.5mm kobiconn style socket	10	Tayda: A-865	10nF (103)	1	0805
			47nF (473)	2	0805
			100nF (104)	10	0805
10 pin eurorack power connector	1		1uF (105)	2	0805
TL074	1	SOIC 0.050 pitch			
PT2399	1	DIP	1k	12	0805
4046	1	DIP (4000 series CMOS)	2k2	8	0805
BC847	3	SOT-23 Tayda: A-1339	10k	7	0805
78L05	1	thru hole	47k	7	0805
1N4148 diode	1	thru hole	100k (c)	5	0805
10R resistor	2	thru hole	220k	1	0805
			1M	3	0805
10µF 25V (or more) electro	5	thru hole, 2 mm pin spacing			
single vactrol	2	any will work	10k	1	thru-hole (see MOD)

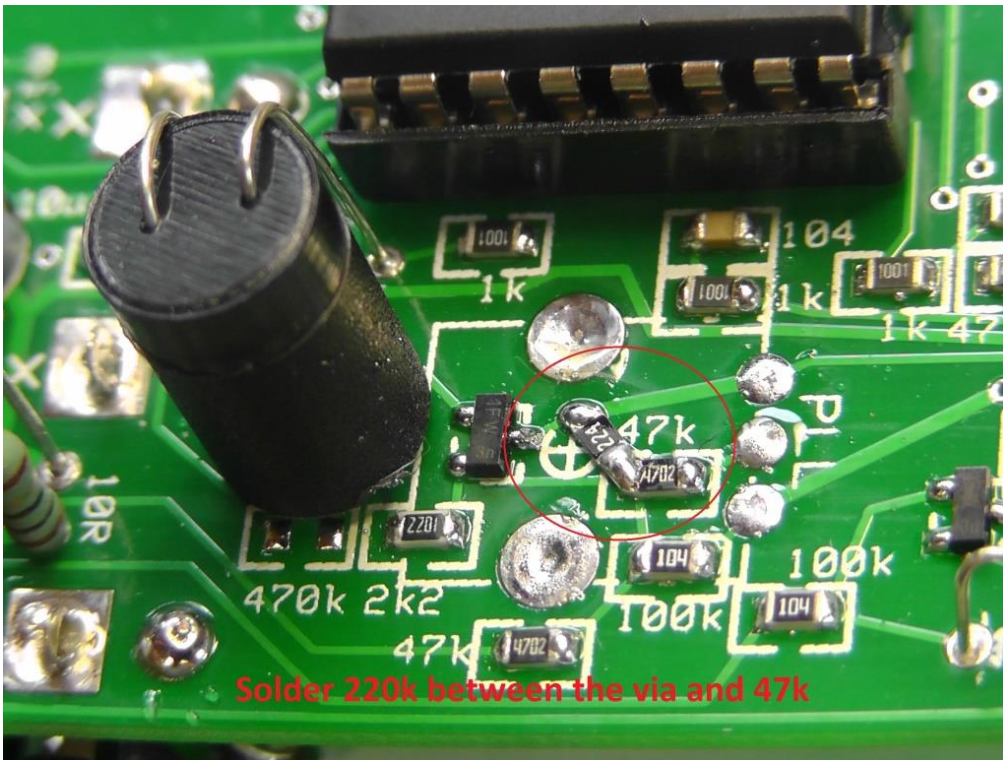
The 78L05 does get hot because it is dropping the voltage down from 12V to 5V, so the excess is washed off as heat. I have had these running for several hours with no shutdown (78L05 will turn off if too hot). So don't worry about it.

### FIX

Do not install the 470k resistor, leave the pads empty. Instead install a 220k resistor between the via and the 47k as shown in the photos.

If you solder blobs of solder on via and the pad of the 47k closest to the via, it is easy to place the 220k resistor between them and stretch the solder across to connect to it. See pics:

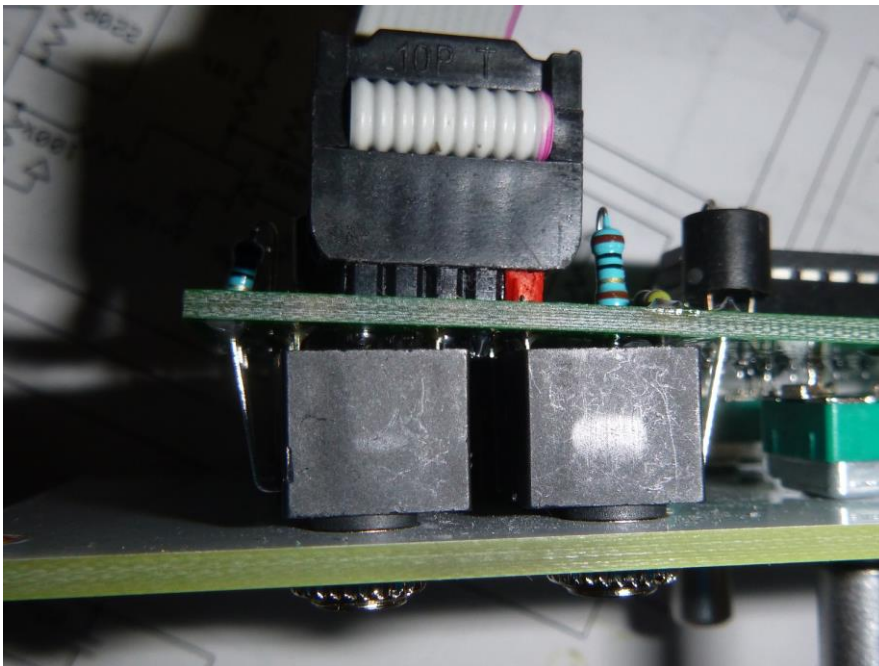




### MOD

I have found the power pins sit too close to the input and delay CV sockets. It is important to clip the two -12V pins on the bottom of the PCB so they are quite flat and install the sockets so they sit a little bit off the PCB.

This pic shows enough gap so there is no short –



When this happened the B0n0 went quite crazy, so the mod is to connect the switching pin of the input socket to -12V via a 10k resistor. This is easily done as shown below; there are 2 nearby places to solder the 10k resistor.

This mod makes the B0n0 run by itself without the need for an input signal, the Courics pot acts as a frequency control. Try it, you will like it.



connect 10k  
from switching pin of input socket  
to -12V. either one of the pads circled will do.

ALSO - be very careful the 10 pin power  
connector is not shorting on the input or Delay CV  
jacks

