

# nonlinear circuits

## Flipflop Chaos

build notes [version 2.2](#)

17 Mar 2015

Important – a few resistor values need to be changed from what is printed on the PCB, see mods section

On the version 3 PCB, there is a missing 100k resistor, the module will not work without it. See mods section for details

**BOM** - let me know if I missed something!

component	quantity	
100k pot	2	<i>see notes</i>
TL074	3	DIP
4013	1	DIP
BC547	3	any general NPN okay, pinout suits BC547
1N4148	5	any regular diode ok
<b>CAPS</b>		
10uF (25v or higher rating)	2	2.5mm pin spacing
10uF BP	1	2.5mm pin spacing, bipolar or non-polarised (NP)
100nF	3	1206 or 0805, marked '104'
1uF	1	thru-hole 4.5mm spacing
10nF	1	thru-hole 4.5mm spacing
3.5mm mono sockets	8	kobiconn type, Tayda has them
LED	4	use super/ultra brights
10 pin power connector	1	
<b>thru-hole resistors</b>		
10R	2	
<b><u>1206 or 0805 resistors</u></b>		
470R	2	
1k	6	
2k	3	
3k	1	
4k7	2	
5k6	1	
8k2	1	
10k	5	<i>marked 'd' on underside of PCB</i>
15k	1	
18k	1	
22k	1	
30k	2	
100k	11	<i>marked 'c' on underside of PCB</i>

150k	1	
220k	1	
RL	4	choose value to suit LED

## NOTES

### Building

#### pots

These ones from Tayda will do, though be careful none of the metal flaps/tabs are sitting on PCB traces, trim them back if so. You can find many brands of this type of pot, Alpha make nice ones too.

<http://www.taydaelectronics.com/potentiometer-variable-resistors/rotary-potentiometer/linear/100k-ohm-linear-taper-potentiometer-round-shaft-pcb-9mm.html>



The pots, LEDs and sockets are supposed to be mounted on the back of the PCB, check my blog for pictures on how NLC eurorack modules should be put together.

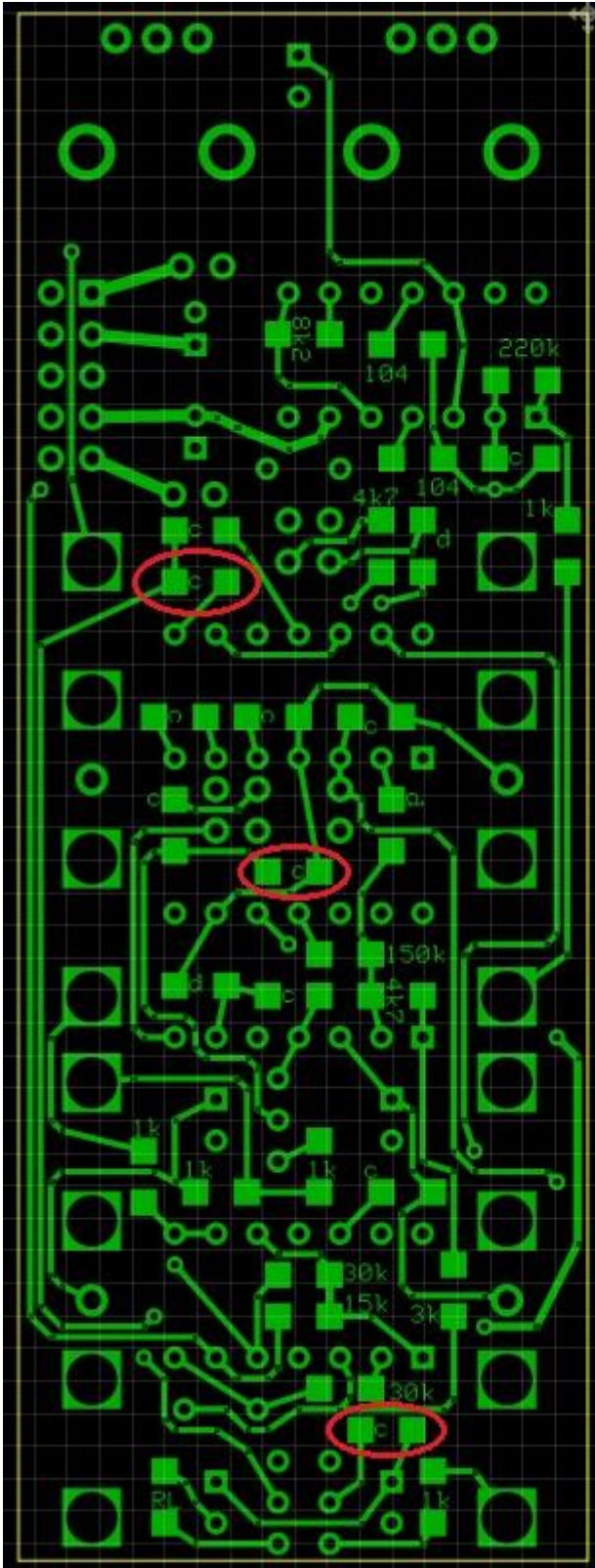
Using – feed a gate or trigger into the gate input, you should get a bunch of chaotic gates and CVs coming out. Add a CV signal into the CV in and adjust the pot to suit.

### Mods

There are three mods required to get **version 1** of this PCB working correctly, yes you got a proto-type!

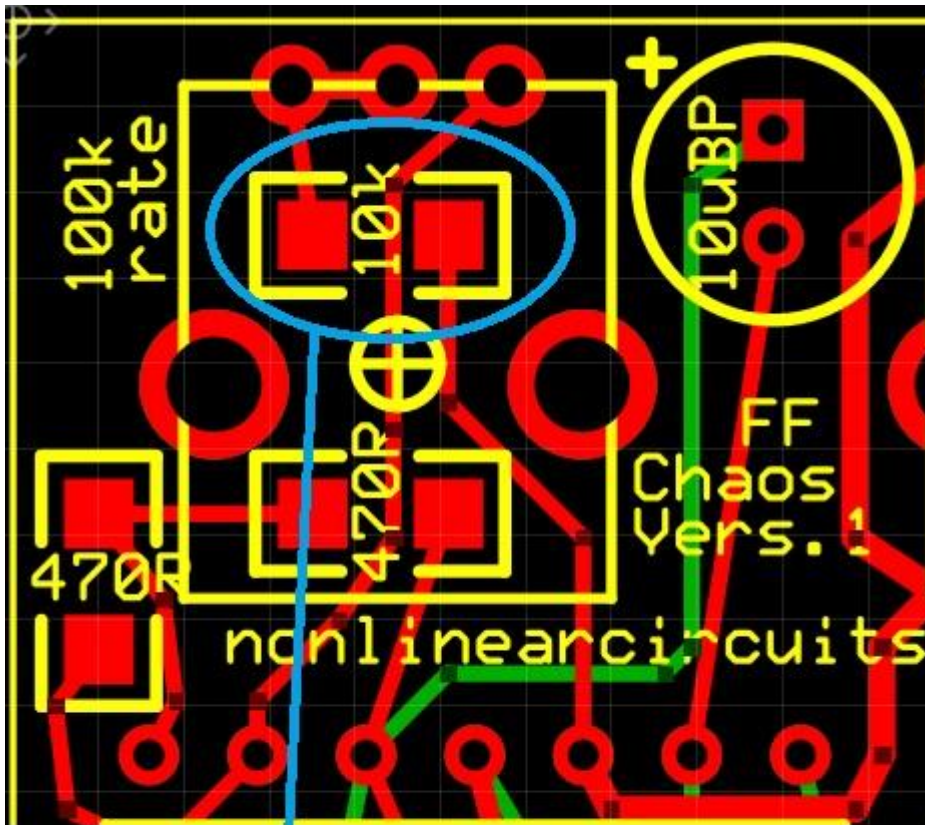
For **version 3** owners these are done, but you need to add a resistor, jump to the next section.

1. Do not install the three 100k resistors shown below, leave the pads empty. They are all on the underside of the PCB.



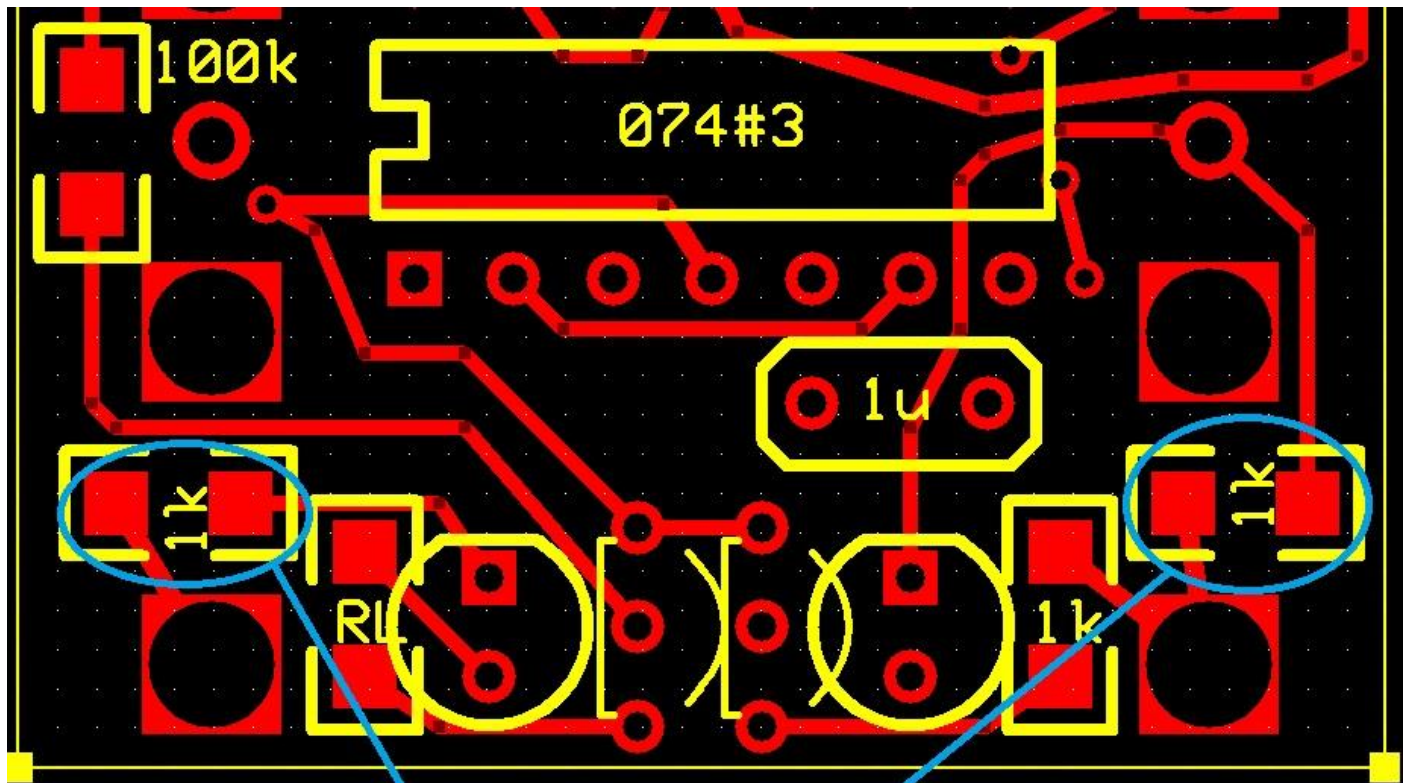
**do not install  
leave empty**

2. Replace 10k with 22k, this removes a dead zone at the bottom of the rate pot

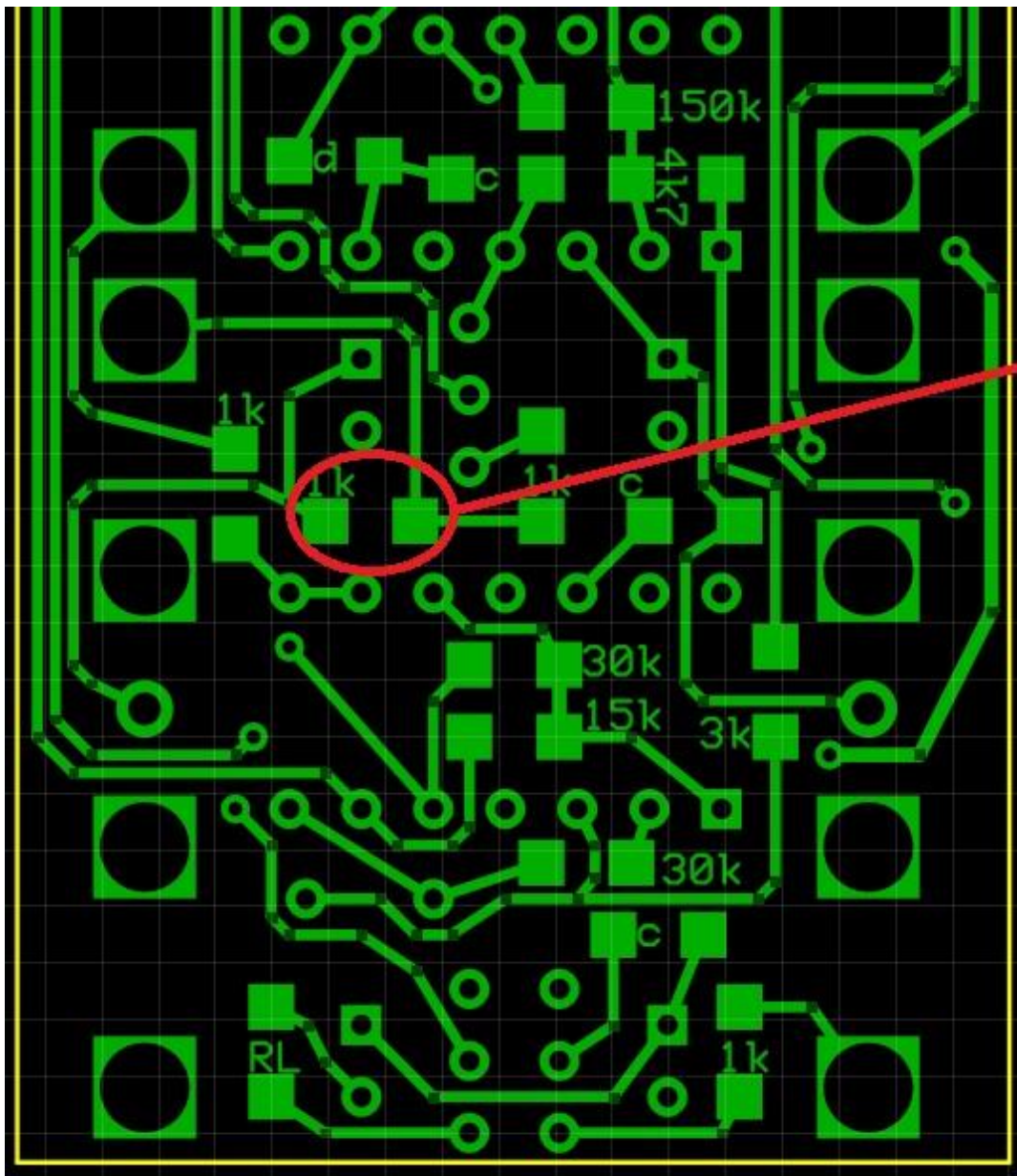


replace with 22k

3. Change three 1k resistors to 2k. Two are on the upper side of the PCB, one is on the bottom



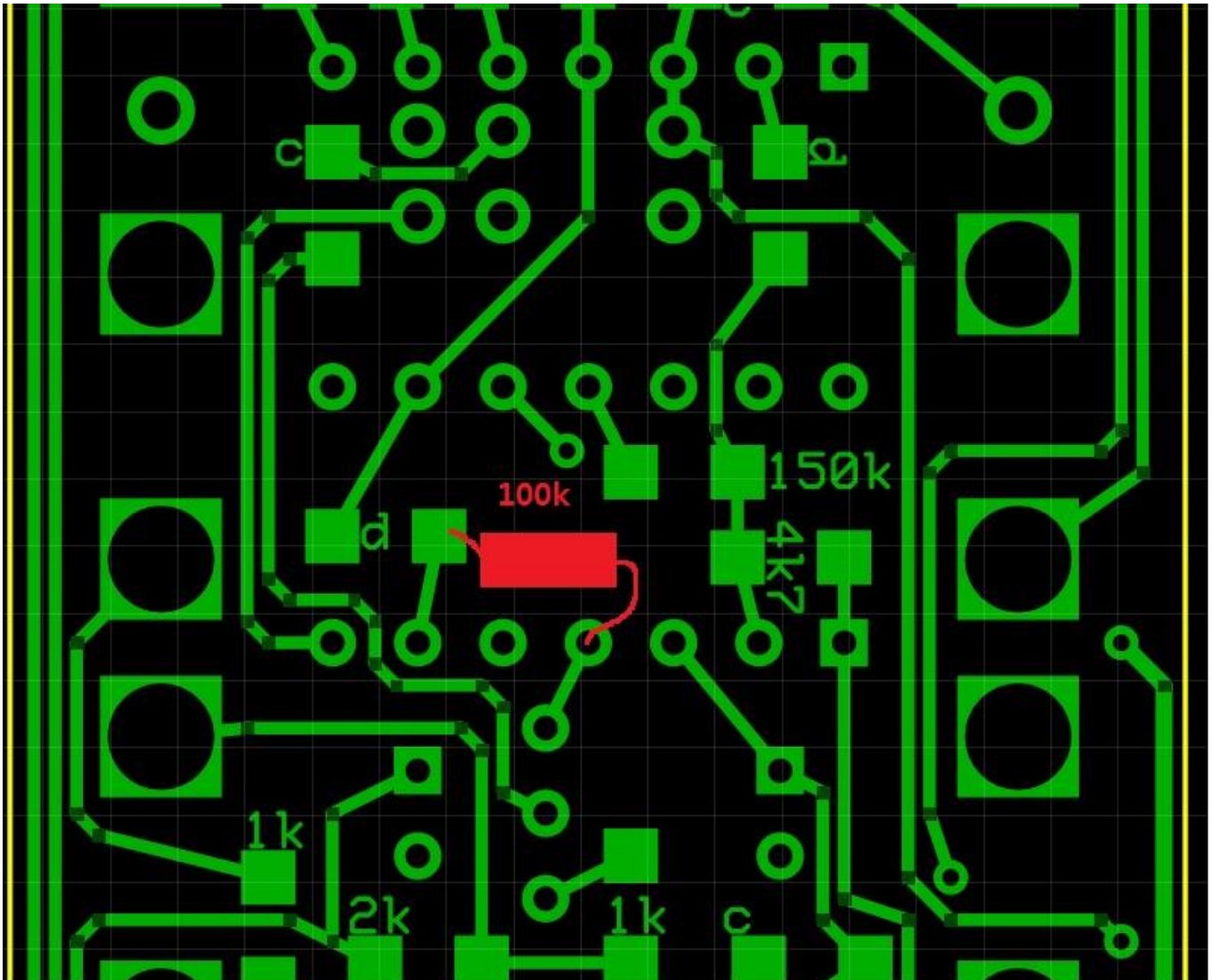
replace with 2k



replace with 2k

Mods done for version 1! 👁

**For version 3 owners**, when updating the V3 PCB with the above mods, I got a bit carried away and removed an extra 100k 1206 resistor from the bottom of the PCB. See image below:



**add 100k between the 10k (d) and pin4 of the TL074 (+V). You should be able to angle a 1206 resistor across the gap with the corners reaching the points it needs to be soldered to.**

