

nonlinearcircuits

BEAT FREQS build & BOM

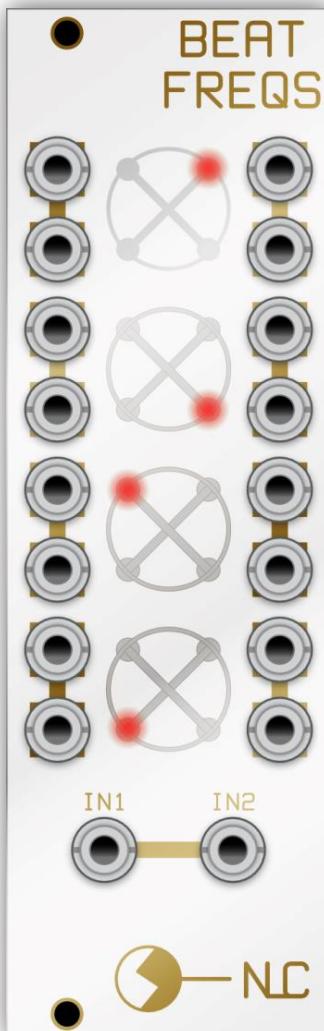
The idea for this module came from a schematic that has been floating around the web for years - 'beat frequency indicator' This version drops the CV, pots and XNOR output of the 'Beat Freq' and instead gets 12 extra gate outputs and a lot more flashing LEDs.

The idea is to feed the circuit two signals and depending upon which one had the higher frequency the ring of 4 LEDs would light up in a clockwise or anti-clockwise direction. The speed of rotation would indicate how close or disparate the frequencies are. If the signals have the same frequency then just one LED is lit.

In operation this module is quite unique; gates come in spurts. The circular LED displays jerk around. Sometimes they complete several revolutions confidently and then stutter between two stages, sometimes they shimmer on one spot.

At both audio rates and clock rates, this module can be quite unpredictable but always seems to be putting out useful patterns.

It is easy enough to see the patterns from the 4 sets of LEDs. The topmost one is the main output, the 2nd one down runs at half the rate, the 3rd one jitters across diagonal LEDs, stepping between pairs. The bottom set, runs at a similar pace as the topmost but does it in bursts, rather than a continuous pattern.



BOM – The Tayda & Mouser part numbers are given as examples

VALUE	QUANTITY	DETAILS
220pF	2	0805 – must be 220pF
100nF	4	0805
10uF	2	0805 25v or higher voltage rating
220R	2	0805
2k2	32	0805 can be anything from 2k to 5k1, just keep them all the same
10k	3	0805
100k	5	0805
2M2	2	0805
RL	16	0805 see notes
4555	2	soic Mouser: 595-CD4555BNSR
40193	1	Soic Mouser: 595-CD40193BNSR
4070	1	Soic Mouser: 595-CD4070BM96
TL072 or TL082	1	Soic Tayda: A-1139
BC847	16	Tayda: A-1339
LL4148	2	Tayda: A-1213
3mm LED	16	bright ones!
Eurorack 10 pin power connector	1	Tayda: A-198 cut to size
Schottky, power rectifier or 10R, optional - for reverse voltage protection...or not	2	SMD SEE NOTES #1. dot on PCB indicates CATHODE (stripe on component). My current fave is BAT54GWX, Mouser: 841-BAT54GWX
3.5MM SOCKET Kobiconn style	18	Tayda: A-2563 or Thonkiconn Jacks (PJ301M-12) from Thonk, Synthcube or Modular Addict

Additional notes:

1., Schottky (best option) or standard power rectifier diode 50-600v 1A or more, or use a resettable fuse or just a 10R (worst option). Examples: BAT54GWX, PMEG2005EGWX, AEC-Q101, 20V, SOD-123, PMEG2005EH DIODE, SCHOTTKY, 0.5A, 20V, 1N400x or S1JL or similar.

2. The chips, resistors, caps are cheapest from Tayda. Schottky diodes, CMOS & 1uF, 10uF 25v 0805 caps from Mouser/E14/Farnell/etc.

3. Join the Nonlinearcircuits Builders Guild on FB:
<https://www.facebook.com/groups/174583056349286/> and ask questions there if you have any. If you prefer not to FB then email is fine.

4. RL means – *select a resistor value to suit the LED's brightness.* Use a lower value than usual for RL as the LED has to shine thru the PCB. I just use 2k or 2k2 with LEDs that usually require 10k for RL

5. when installing LEDs and jacks, it is easiest to install LEDs 1st. I have the LEDs sitting 2-4mm off the PCB and solder just one leg. Then check the LEDs are all level and pointing straight up, not on an angle or to the side. When it all looks good, solder on the other leg. Then place the jacks in their holes and attach the PCB to the panel. Once it is all sitting nicely, solder on the jacks.

