NONLINEARCIRCUITS

timbre generator

Build guide & BOM vers.2 (30/8/2015)

This module is based on the Buchla Timbre Generator. It is not an exact clone as input and output buffers have been added, plus a simple tri-to-sine sub-circuit is tacked on to one of the inputs. Also the PCB specifies commonly available PNP and FET transistors rather than the somewhat rare devices used in the original design.

There are no errors on the PCB, but there is one resistor marked '100k*'. This sets the amplitude of the output signal, if you install 100k here, your output signal will be around 4V p-p. To increase the amplitude install a larger value resistor, my module has 120k, which gives approx. 5V p-p. On the BOM, I will include an extra 120k and one less 100k.

Furthermore**, the 130k resistor specified in the original design may need to be changed**, depending on your FET. **After building many of these I think it is best to just install 100k**. You will know when adjusting the trimpot. If the panel pots are at zero and you cannot turn off the folding effect with the trimpot, you need to change the 130k,probably to 100k....or something else is wrong, such as input signal too hot see Mods section?

BOM

Component (quantity)	notes	Component (quantity)	notes
100k pot (2)		10k (2)	
jacks (5)	Kobiconn style	18k (1)	
TL074 (2)		22k (1)	
TL072 (1)		30k (1)	
BC557 (1)		33k (3)	
J112 (or J108) (1)	marked 'gsd' on PCB	39k (1)	
1N4148 (4)	any general diode ok	47k (1)	
10 pin connector (1)	Eurorack power connector	49k9 (3)	I used 51k
100k trimpot (1)		68k (2)	
100µF (1)	2.5mm spacing	75k (1)	
15µF (1)	2.5mm spacing, I used 10µF and 22µF, no difference	91k (1)	
10µF (2)	2mm spacing	100k (3)	100k* replaced with120k
100nF (3)	2.5mm spacing	120k (2)	
10nF (1)	4.5mm spacing	130k (1)	maybe just use 100k
47pF (1)	2.5mm spacing	150k (6)	
10R (2)		240k (1)	
1k (4)		470k (1)	
2k2 (1)		680k (1)	
3k3 (1)		1M5 (1)	
4k7 (1)		14 pin IC socket (2)	
6k8 (1)		8 pin IC socket (1)	

Notes:

Electros should be at least 25V rating, 35V or 50V is best.

Make sure diodes are installed in the correct direction:
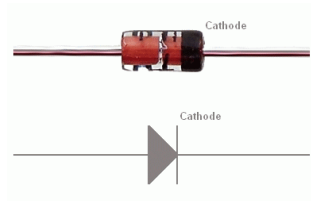
These pots from Tayda are good, part number A-1848:

These jacks from Tayda are ok, part number A-865, get better ones from Thonk if you like:

This trimpot from Tayda is ok, though it should read '104', part number A-2506

Mods

This version is designed to run with an input signal of 5V p-p (the original Buchla was designed for 1V p-p). Traditionally, back in the days of Electronotes, 5V p-p audio was standard, these days it is all over the place, Doepfer is 10Vp-p, and some others are 20Vp-p (eek!). If the audio signal into the Timbre is too large, the folding cannot be turned off as the audio is routed to control the FET along with the CV.

Anyway, say your signals are 10Vp-p, you could reduce the gain of the input buffer stage to 0.5 and increase the gain of the output buffer to 2x and get your signal back up again. The two resistors are circled in the attached pic; the one near the 'RED' should be reduced to ...say...51k. The other resistor should be increased to maybe 220k.
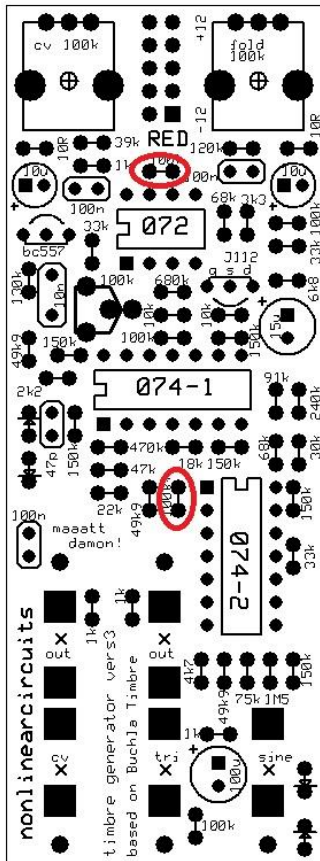
Building

No real tricks, with the upright resistors sitting next to each other, it is good to place them facing in different directions so there is less chance of their leads contacting if pushed together. See the build photos on

http://nonlinearcircuits.blogspot.com.au/2015/04/timbre-generator.html
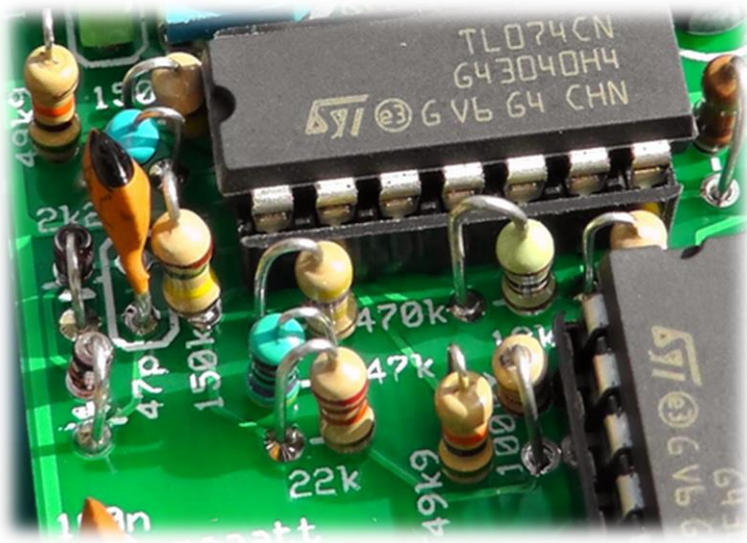
1. install IC sockets and 10 pin connector
2. install diodes
3. install resistors
4. install regular capacitors
5. install electro capacitors
6. install transistors
7. attach jacks to the panel
8. attach pots to the PCB, do not solder them yet
9. mate the PCB to the panel, ensure everything lines up nicely
10. solder on the pots and jacks
11. solder some leads to the ground tabs of the jacks, you may need to remove the PCB from the panel to do this.
12. tighten up the nuts, check for shorts
13. voila!

<u>Setup</u>

Run a 5V p-p sine or tri signal into the input, listen to the output or better watch on a scope. Turn the pots down to zero. Adjust the trimpot so the signal is not being affected, ie – still a sine wave. You want it tuned so nothing happens when the panel pot is at zero but the signal starts folding as soon as you move it off zero. This is quite easy to set-up, near enough is good enough, the worst that can happen is a bit of dead pot space. Buchla systems run on 1V audio signals, this module has been designed to run on 5V p-p audio signals. If you use larger signals, you will probably find the folding never turns off. Reduce the value of the resistor across 072b output and non-inverting input from 100k to something lower that suits your signal.