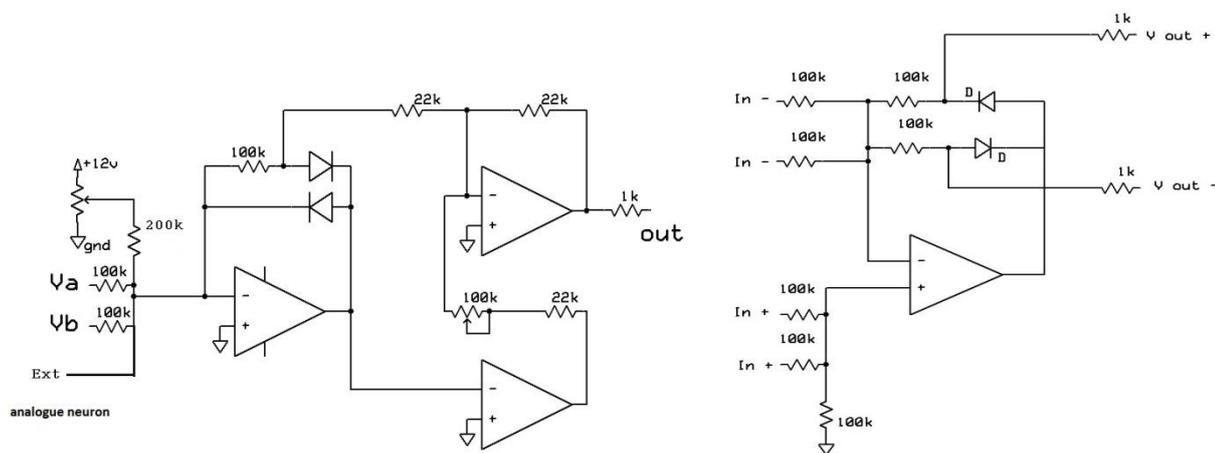


## Neuron/difference rectifier PLEASE READ EVERYTHING BEFORE STARTING

This neuron was inspired by a paper on neural computing and is a variation of a typical analogue neuron circuit. It can be used as a complex audio waveshaper, gate or pulse generator, CV shaper or to generally mess things up.

The diff-rect is a hybrid of two basic op amp ‘building blocks’ – a difference circuit and a rectifier. Not sure if I have ever seen the two merged together before. It is probably a bad idea except for synth use, where it is a wonderful idea!

Install IC socket 1<sup>st</sup>, then resistors, then diodes, then capacitors.



This BOM is for the small PCB that requires wiring to the panel components.

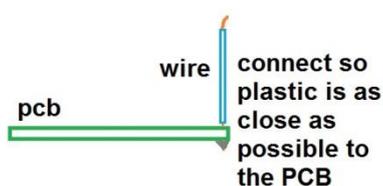
See BOM on next page for the 8HP Euroack version

<u>Resistors</u>	<u>Diodes</u>	<u>Pots</u>	<u>Capacitors</u>	<u>IC</u>
10Ω - 2 (10R)	4	100k - 2	104 - 2	TL074 - 1
22kΩ - 3			10uF - 2 (long leg in square hole)	
1kΩ - 3				
100kΩ - 11 (these are the unmarked resistors on the PCB)			<b><u>the ‘link’ is a piece of wire, just use a leg off a resistor</u></b>	
200k - 1				

**The two pots are soldered to the back of the PCB.** It is a little tricky as there are only solder pads on one side, so you must solder the pots on the same side of the PCB that they are attached. Plus the PCB/pots should be attached to the panel when you do this so everything lines up nicely. So:

1. attach pots to PCB (Do NOT solder them)
2. attach PCB to panel
3. try to solder the side tabs or pins of the pots, enough so they are held in place. Just solder whatever you can easily reach
4. remove the PCB from the panel and finish soldering the pots.

**WIRING – yes it sucks** The aim is to have a minimum amount of copper wire showing, copper corrodes and then breaks. So push the wires thru the PCB so that the plastic sheath is pressing against the PCB (see pic). Same for the connection to the sockets, you do not want 1 or 2 cm of bare wire between the socket tab and the plastic sheath, you want it shielded all the way.



1. Use a piece of bare wire to connect the ground tabs of the sockets

2. Cut 11 pieces of wire to length, strip about 5mm off the ends, twist the strands together and ‘tin’ them (put some solder on them)
3. The upper 4 connections marked “i, i, i, o” are for the diff-rect i=in and o=out. It does not matter which i goes to which socket.
4. The connection marked “gnd” goes to the ground wire from 1.

5. There are 6 wires for the neuron, “i+” goes to \_\_\_\_\_ on  
 “in+” on the panel, “o+” goes to “out+” and so

**8HP Eurorack PCB BOM**

10Ω	2	thru-hole 0.125W or higher rating	Tayda: A-2198
1k	3	thru-hole 0.125W or higher rating	
22k	3	thru-hole 0.125W or higher rating	
100k	11	thru-hole 0.125W or higher rating	
200k	1	thru-hole 0.125W or higher rating	
100nF capacitor	3	any type ok: ceramic, MCC	Tayda: A-214
10uF electrolytic capacitor	2	min. 25V rating	Tayda: A-971
1N4148	4	thru-hole	Tayda: A-157
1N400x	2	rectifier diode, x = 1,2,3,4 all good	Tayda: A-162
TL072 or TL082	2	DIP	Tayda: A-209
10 pin power connector	1		Tayda: A-198
3.5mm sockets	10	Thonkiconn or from	Tayda: A-865
100k pots	2		Tayda: A-1848

