WAMOD #4 Lo-pass gate

8/7/2014 Artifactory

The task in this workshop is to build a version of the Buchla Low Pass Gate. This is one of the most popular modular synth circuits and best sounding filters ever. Many manufacturers make their own versions with various additions but despite the fruit, all are based on the Don Buchla design. This one has been designed to perform as a **very** Low pass filter and has a different resonance circuit that is a little less hysterical than most. This circuit can really scream. The switch is used to change the circuit from a low pass filter into a gate, which is the 'West Coast' terminology for a VCA. The middle position of switch is supposed to be half filter & half VCA, for me it is not very interesting but many people like it.

Building: There are a few tricks when attaching the panel mount components.

Please read and follow these instructions carefully. Tick off the boxes as you go. Otherwise you *will* fuck it up and have a shitty time de-soldering pots.
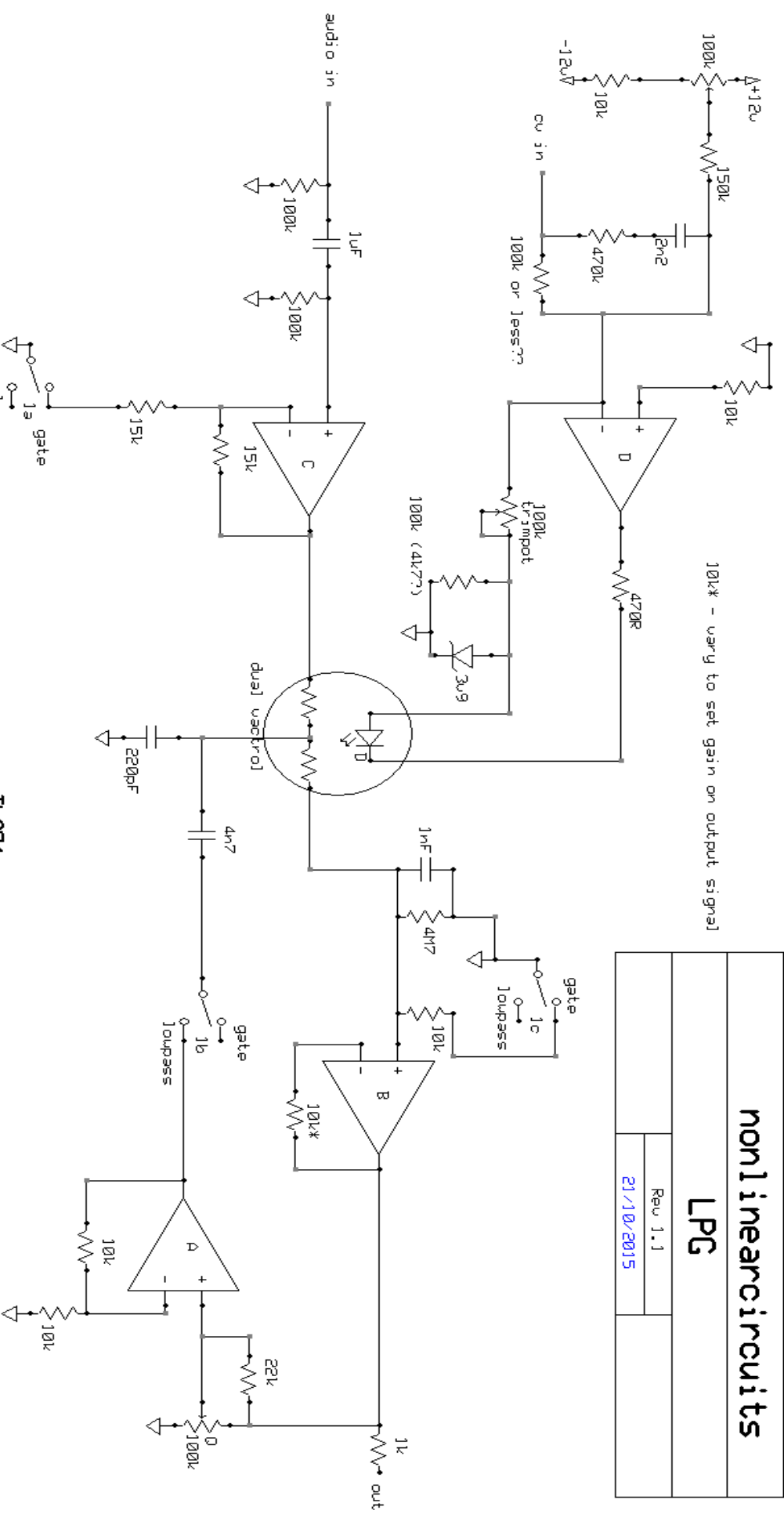
- ☐ Solder on the 14 pin IC socket and then the 10 pin power connector.
- ☐ Solder on all resistors
- ☐ Solder in the 3v9 zener diode, make sure the line on the diode is in the same direction as the line on the PCB (it is on the bottom of the components page).
- ☐ Solder on capacitors. For the two 10uF electros, the long leads go in the square holes.
- ☐ Solder on the vactrol (black lump with 5 leads). The side with two leads go into the A and K holes, *the longer lead into A*. Keep the 3 leads straight so the vactrol stands on these (like Jake the Peg …. sorry, is it too soon?) and bend over the two leads so they fit into their respective holes.
- ☐ Cut the lips off the pots, be careful the bits of metal do not fly into your eye or somebody else's. They launch and travel far. These are the little raised edges near the nuts and washers.
- ☐ Install the switch (so it switches up & down, **not** side-to-side) and two pots on the solder side of the PCB, **but do not solder them.**
- ☐ Place the washers on the pots (not the switch) and then attach the PCB to the panel, so the washers are between the pot and **the back** of the PCB.
- ☐ Attach the nut onto the switch and screw it down until finger tight. **Do not use pliers or spanner to tighten it or the switch will break.**
- ☐ (**Tricky bit**) Gently pull the pots upwards thru the panel so enough thread is showing thru to get the nuts on and the legs of the pot are still attached to the PCB. This may take a few goes to get right, ask for help if you want it. Tighten the nuts to finger tight.
- ☐ Now solder on the pots and switch.
- ☐ Remove the PCB from the panel. Attach the three sockets to the panel so they will line up with the holes on the PCB.
- ☐ Attach the PCB back onto the panel so the socket tabs go into position. Install the nuts on the pots and switch (**finger tight, do not use tools**) and make sure everything is lined up nicely. If it all looks good, solder on the sockets
- ☐ Get three wire clippings (from the legs of the resistors) and feed them thru the ground holes of the PCB so they go thru to the ground tabs of the sockets. Solder them onto the PCB
- ☐ Remove the PCB from the panel (for the last time ….maybe?) and solder the wire clippings to the ground tabs of the sockets.
- ☐ Attach the PCB back onto the panel, with the pot washers between the pot *and the back of the panel*. You can tighten the nuts on the pots and sockets as normal, but **be very careful with the switch**, maybe just a *little* bit over finger tight is enough for it.
- ☐ Install the TL074 IC and test your module.
- ☐ Enjoy bongo noises!

op amp - TL074

switch 3PDT on-on

audio in

100k

1uF

100k

1a gate
lowpass

15k

15k

C

+
-

-12v

10k

100k

150k

+12v

cv in

470k

2n2

100k or less??

10k

D

-
+

470R

100k (4k7?)

100k
trimpot

3v9

dual vactrol

220pF

4n7

1b gate
lowpass

1nF

4M7

gate
lowpass
1c

10k

B

-
+

10k*

10k

10k

A

-
+

22k

100k

1k
out

nonlinearcircuits
LPG

Rev 1.1

21/10/2015

10k* - vary to set gain on output signal

component	quantity	RESISTORS
10R	2	
470R	1	
1k	1	
10k	6	
15k	2	
22k	1	
100k trimpot	1	33k* on vers.1 PCB
100k	4	
150k	1	
470k	1	
4M7	1	
		CAPS
4.7n (472)	1	4.5mm lead spacing
220p (221)	1	4.5mm lead spacing
1n (102)	1	4.5mm lead spacing
2n2 (222)	1	4.5mm lead spacing
1u (105)	1	4.5mm lead spacing
10u electro	2	2mm lead spacing
		DIODE
3v9 zener	1	

3PDT toggle switch – 1 (http://www.taydaelectronics.com/electromechanical/switches-key-pad/toggle-switch/mini-toggle-switch-3pdt-on-on.html)

TL074 – 1

100k pot – 2(http://www.taydaelectronics.com/potentiometer-variable-resistors/rotary-potentiometer/linear/100k-ohm-linear-taper-potentiometer-round-shaft-pcb-9mm.html)

Kobiconn style sockets – 3 (http://www.taydaelectronics.com/hardware/3-5mm-plugs-jacks/3-5mm-mono-enclosed-socket.html)

dual vactrol 5C3/2 - 1