

Based on Electric Druid design
<https://electricdruid.net/multimode-filters-part-2-pole-mixing-filters/>
CC BY-NC-SA 4.0

mods by Rich Holmes / Analog Output

Sheet: /
File: pmf.kicad_sch

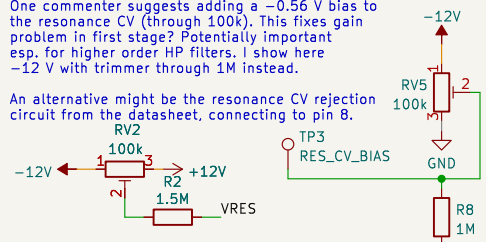
Title: Pole mixing filter

Size: USLetter Date: 2022-03-29

KiCad E.D.A. kicad-cli 7.0.0-rc1-unknown-7ab651f078-164-ubuntu22.04.1 Rev: 1/4

One commenter suggests adding a -0.56 V bias to the resonance CV (through 100k). This fixes gain problem in first stage? Potentially important esp. for higher order HP filters. I show here -12 V with trimmer through 1M instead.

An alternative might be the resonance CV rejection circuit from the datasheet, connecting to pin 8.



This bias trimmer has very little effect on CVres feedthrough.

Exclude from board for now.

Per datasheet formula, REE is 1.2k (ED had 1.1k).

Datasheet says make this variable to null frequency CV feedthrough which affects the DC offset of the output, NOT the gain as I at first thought.

Fixed resistor should be OK.

In original, this resistor was mistakenly omitted. ED says 51k but I like resonance CV behavior better with 120k.

Resonance compensation mixer

In initial breadboard tests, AC coupling INPUT going into resonance compensation improved behavior (CVres feedthrough?)

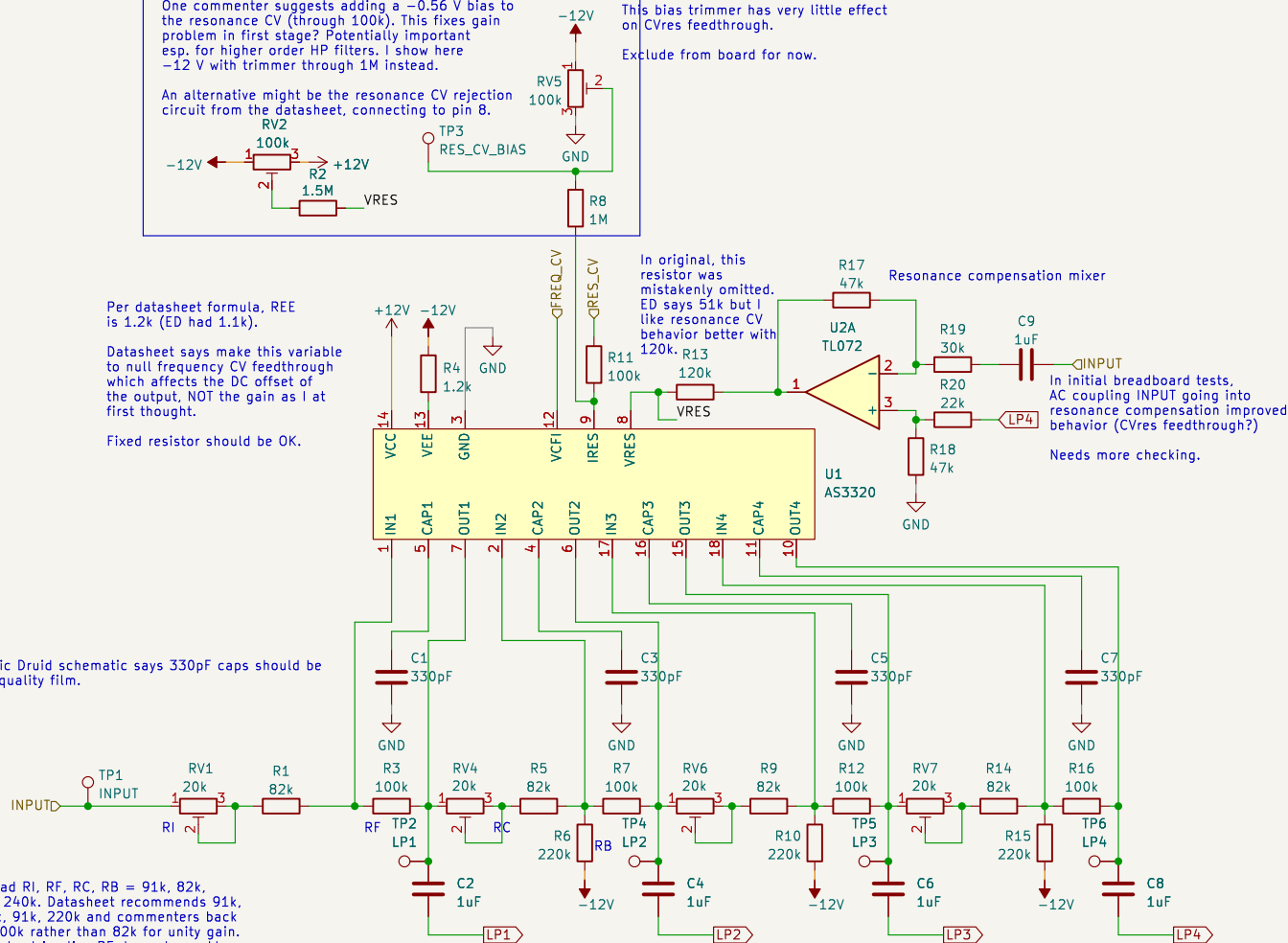
Needs more checking.

Electric Druid schematic says 330pF caps should be good quality film.

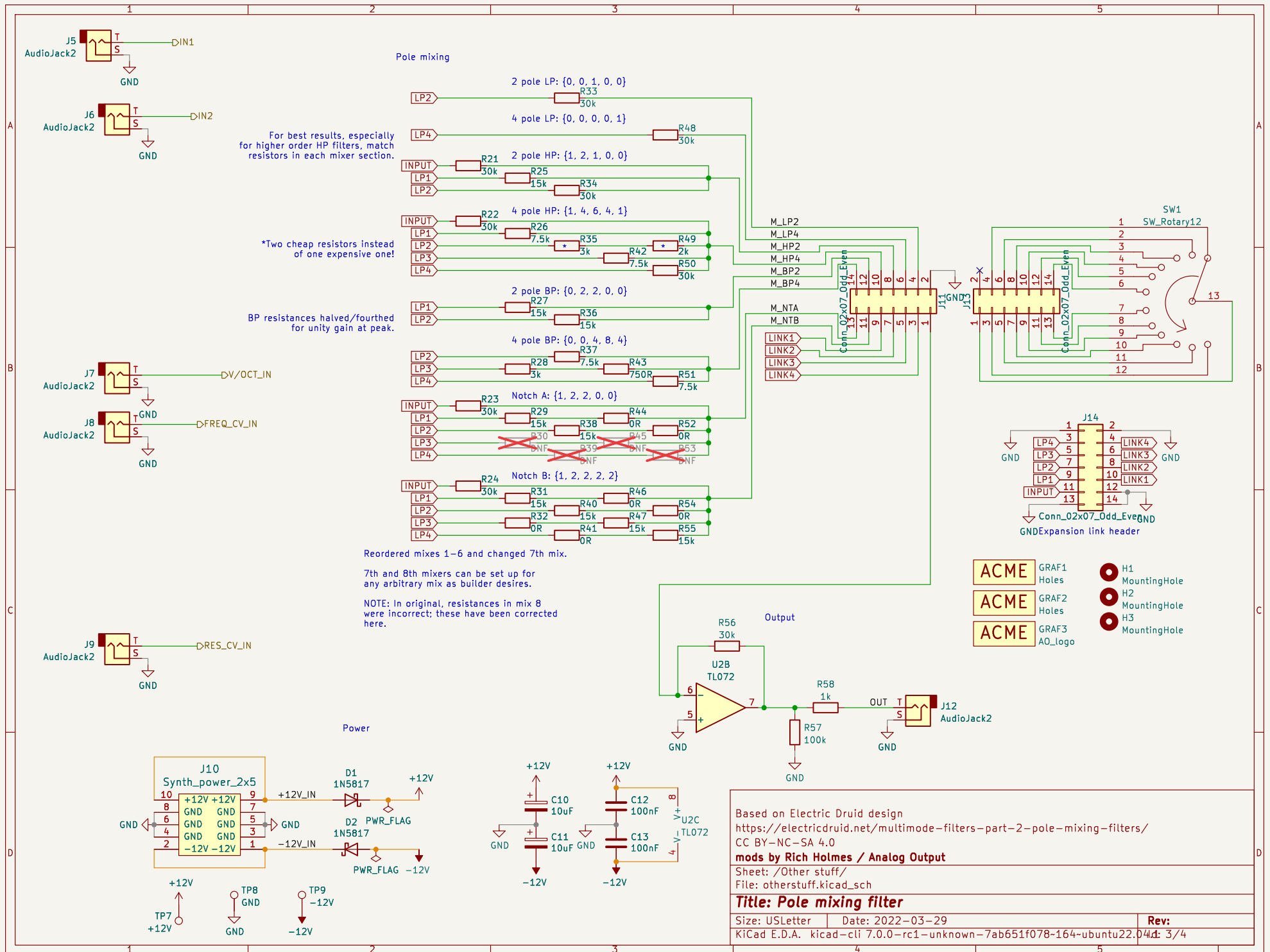
ED had RI, RF, RC, RB = 91k, 82k, 91k, 240k. Datasheet recommends 91k, 100k, 91k, 220k and commenters back up 100k rather than 82k for unity gain. Datasheet implies RF depends weakly on VCC and VEE, 3% change so 220k should be fine.

With DC input, expect a change at INPUT to give an equal magnitude change at test points LP1, LP2, LP3, LP4. (There will be an offset.) Any inequality will not be canceled out in HP filters, leading to incorrect low frequency behavior.

On breadboard, different (~10%) gains are seen on different stages. Use trimmers for RI and RC.



Based on Electric Druid design https://electricdruid.net/multimode-filters-part-2-pole-mixing-filters/ CC BY-NC-SA 4.0 mods by Rich Holmes / Analog Output	
Sheet: /Filter core/ File: core.kicad_sch	
Title: Pole mixing filter	
Size: USLetter	Date: 2022-03-29
KiCad E.D.A. kicad-cli 7.0.0-rc1-unknown-7ab651f078-164-ubuntu22.04	
Rev: 2/4	



Signal input

Freq CV input

Res CV input

Added 2nd stage to preserve phase

CV input on 3320 is 18 mV/oct. Range should best be $-25 - +155$ mV (total range 180 mV).

Here 12 V knob range is divided down by $1/52$ to $1/62$, giving 231 to 194 mV.

ED design seems to assume positive CV since it has only negative offset capability. I changed this.

± 5 V would divide down to ± 96 to 81 mV. 0 - 10 V becomes 0 - 192 to 161 mV.

H4 MountingHole
H5 MountingHole
H6 MountingHole

Based on Electric Druid design
<https://electricdruid.net/multimode-filters-part-2-pole-mixing-filters/>
CC BY-NC-SA 4.0

mods by Rich Holmes / Analog Output

Sheet: /Pots board/
File: pots.kicad_sch

Title: Pole mixing filter

Size: USLetter Date: 2022-03-29

KiCad E.D.A. kicad-cli 7.0.0-rc1-unknown-7ab651f078-164-ubuntu22.04.1

Rev:

4/4