PreConsonant 2021 build notes

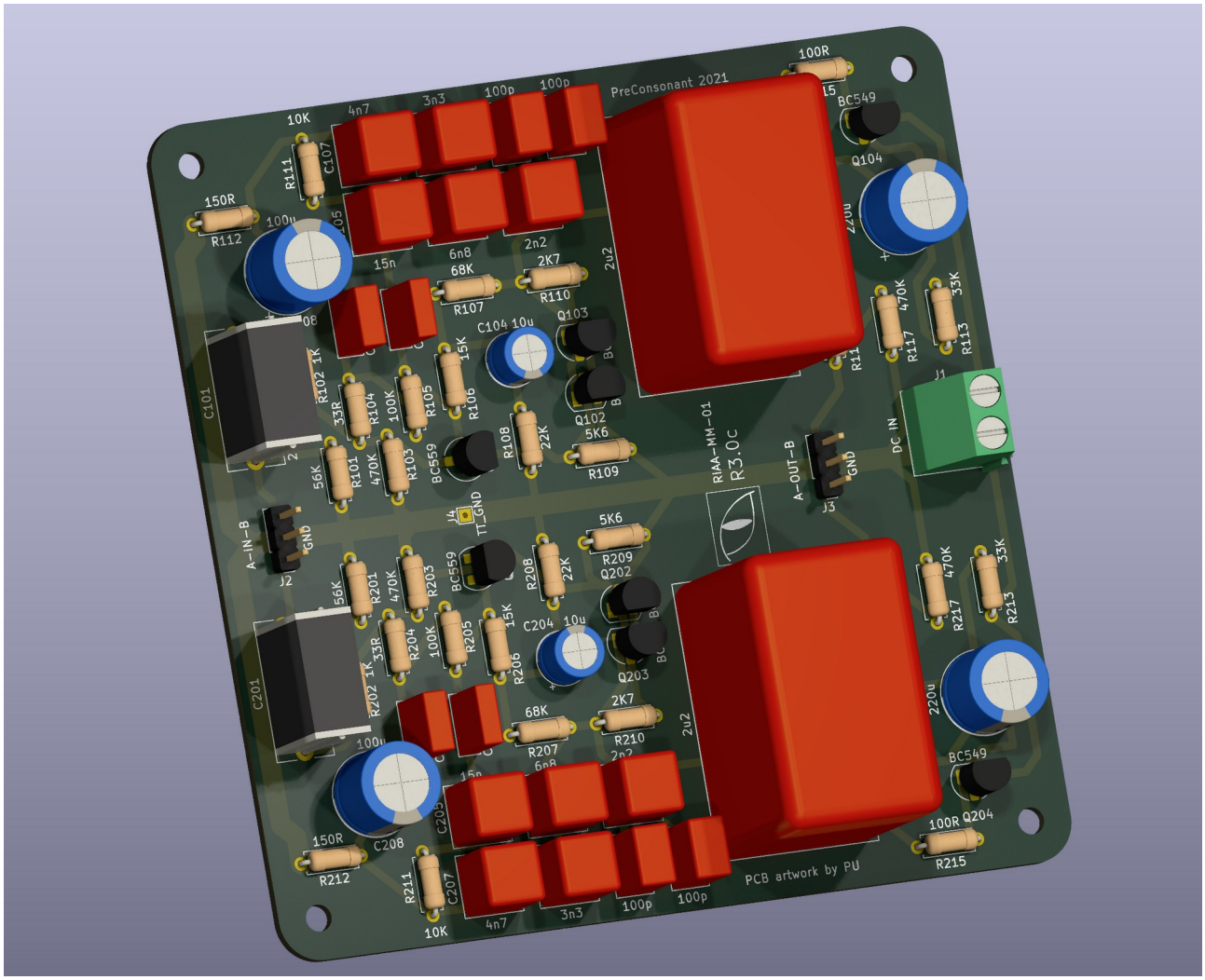

Figure 1: A fully assembled PreConsonant PCB should look something like this

Warning: these notes assume that you already know your way around the soldering iron. If you don't, it would be a good idea to watch a couple of soldering tutorials on YouTube.

Before starting the assembly, make sure that you have all the necessary parts by checking the bill of materials. When assembling the preamplifier, you don't need to cross-reference the BOM because all component values are clearly marked on the PCB itself.

Make sure that you use high quality components. I highly recommend using capacitors with 1% tolerance for the RIAA equalisation networks (C105-107/205-207 and C111-114/211-214). Capacitors with looser tolerances should work as well, but the frequency response won't be as good. All resistors should be 1% metal film. Avoid using carbon composition resistors, they are noisy and their values typically drift over time. Use transistors from reputable manufacturers because generic equivalents are not guaranteed to perform to the same standard.

Assembling the PCB

In general, when assembling any printed circuit board, you should start by populating components with the smallest height first. In the case of PreConsonant 2021, this probably means resistors.

After that install pin headers or JST connectors for the input and output (J2 and J3), if you plan on using them.

The next components to be installed should be plastic film capacitors for the RIAA EQ (C105-107/205-207 and C111-114/211-214), transistors (Q101-104/201-204), electrolytic capacitors and the terminal block for connecting the power supply (J1).

Finish assembling the PCB by soldering the input and output coupling capacitors (C101/201 and, C110/210).

If you have assembled the preamplifier PCB correctly using the recommended components, it should "just work" without any adjustments.

Power supply considerations

The phono preamplifier must be powered from a power supply providing a single voltage rail between 20 and 24V DC. I highly recommend using a 24V PSU, this would improve the overload margin of the circuit.

For the best possible results, the power supply should be external to avoid magnetically coupling transformer hum into the sensitive preamplifier circuitry. At the very least, the power supply transformer should be located outside of the preamplifier chassis.

While the PreConsonant has a reasonable power supply rejection ratio (PSRR) thanks to the built-in gyrators, it is recommended to power it from a well-regulated linear power supply. If you're using an external switch mode PSU (a so-called "wall wart"), at the very least use a simple RC filter to get rid of any high frequency residuals (see Fig. 1).

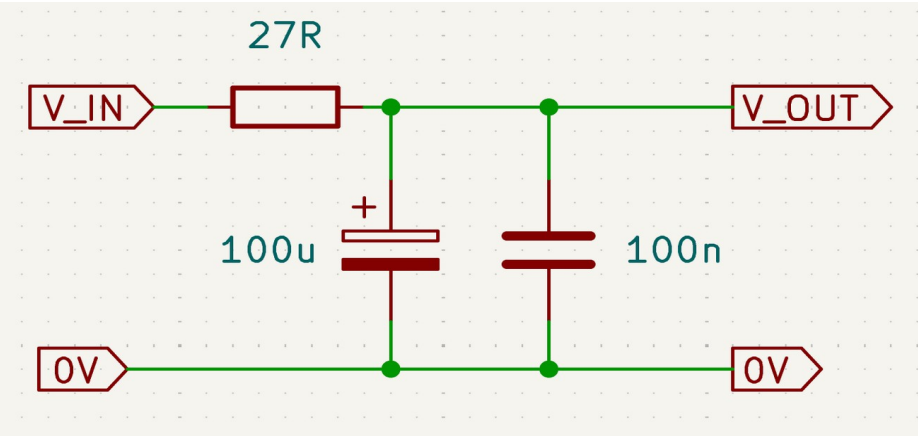

Figure 2: an RC filter to improve power supply ripple

Wiring and grounding

RCA input and output jacks should be insulated from the preamplifier case. The same applies to the power input connector.

The metal case of the preamplifier should be grounded by connecting it to the 0V line. **There should be only one connection between the case and the 0V line.** The ground wire of your turntable should also be connected to the same spot. The preamplifier PCB provides a separate connection for the grounding post (marked TT_GND), alternatively you could connect it directly to the power supply 0V (after the RC filter if you're using it).