

Boozhound Laboratories JFET Phono Preamp

Assembly manual (rev.3)

The Boozhoundlabs Philosophy

The plan here is to offer kits that let the curious audiophile experience designs that they would otherwise have to build from scratch. The parts used in this kit are for the most part considered obsolete and are probably no longer being manufactured. I source this stuff from overseas via eBay.

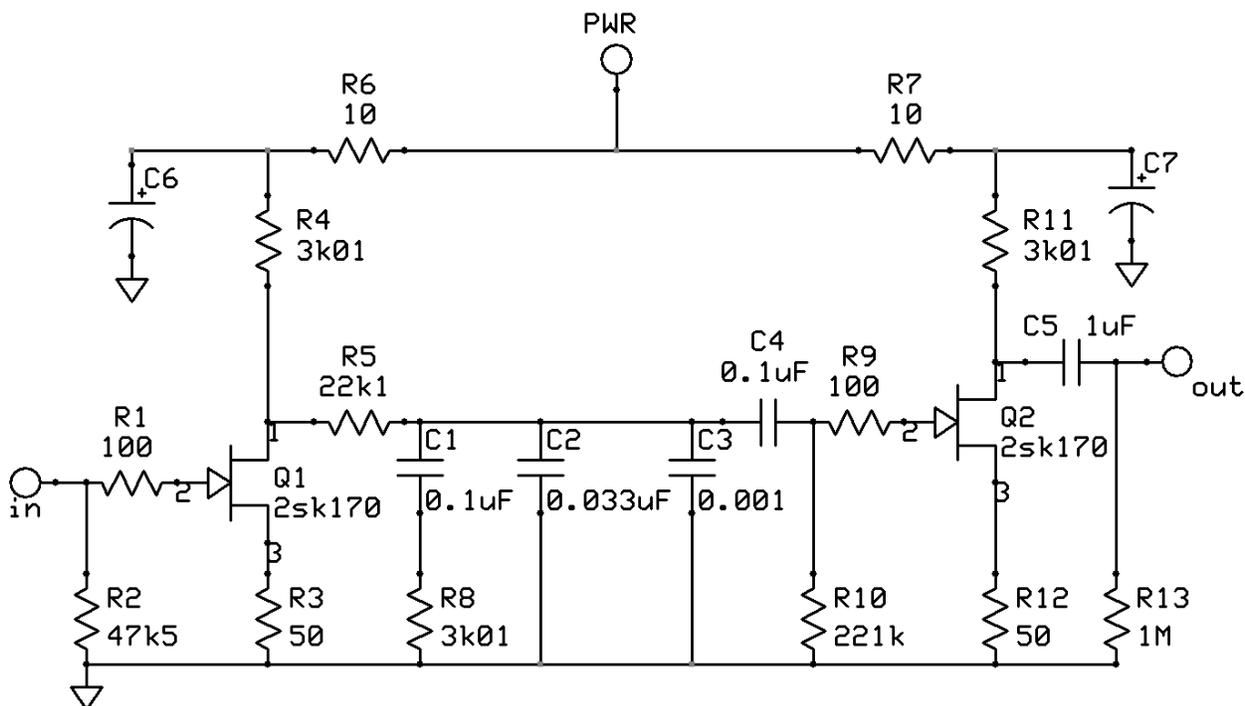
I think simplicity is a huge part of why classic equipment sounds so good, and modern stuff can sound so bad. In the days when capacitors and transformers were expensive, designers minimized the parts count in any design, and this approach is audible even when designing with modern devices. And for those of us who not only want to build stuff, but to understand how it works, simple designs are much more comprehensible, with no "black boxes" that we only understand through the abstraction of a spec sheet.

Why not have fun building stuff instead of just pouring dollars into your system on the quest for ultimate-ness? Part of the fun for me is the ability to try something new without having to shell out the big bucks.

The JFET Phono Preamp

This is just about the simplest circuit possible that will accomplish what we need - reverse-RIAA equalization with gain. This is 2 JFET gain stages with a passive (no feedback) RIAA equalization network sandwiched between them.

For more info, and to see how other builders have done something similar, you can search for a circuit called "Le Pacific" which is the same topology, but with a slightly different EQ section and parts values.



Pretty nifty, huh? Only 22 parts per channel including the power supply filter stuff. The JFET gain stages are straight from any electronics textbook. The RIAA filter section made up of R5, R8, C1, C2, and C3 are calculated using standard formulas. Nothing special here – except that almost nobody does it like this.

Gain is approximately 40dB (about 30dB per gain stage, minus about 20dB for the RIAA EQ).

Inventory

Start by verifying that you have all of the parts you need. I endeavor to make sure I send only complete kits, but it is always possible I missed something. If I screwed up and left something out, please email me immediately at jsn@boozhoundlabs.com and I will make it right.

Here is what is included with each kit, with checkboxes to make it easy to verify that you have all of this stuff:

- 1 Printed Circuit Board
- 4 2sk170 transistors
- 4 220uF electrolytic capacitor Nichicon Muse
- 4 0.1uF PIO capacitor Russian K40Y
- 2 0.033uF PIO capacitor Russian K40Y
- 2 0.001uF PIO capacitor Russian K40Y
- 2 1uF PIO capacitor Russian K42Y
- 4 10 ohm resistor
- 4 49.9 ohm resistor
- 4 100 ohm resistor
- 6 3.01k resistor
- 2 22.1k resistor
- 2 47.5k resistor
- 2 221k resistor
- 2 1M resistor

Assembly

This is almost self-explanatory, but I will offer a few tips, and a few photos.

It is generally a good idea to install the little stuff first and the big stuff afterwards, so that you aren't melting the big stuff trying to get to the little stuff. Start with the resistors and the JFETs.

I like to solder from the bottom of the board because it is easier to get to things, and the odds of overheating a part are lower because you are that much further from the part itself. Be sure to heat the pad and the leads sufficiently to let the solder flow all the way to the top of the board though. These boards have through-plated holes, so it will be easy.

These boards have traces only on one side, leaving the bottom side to be nothing but a huge ground plane. This will reduce grounding problems and make this a very quiet design.

The points where the components do attach to the ground plane will take a bit more heat to solder properly since the ground plane will act as a heat sink.

Next install the capacitors. Or instead of "next" I should say "last" because you are done!

The only thing left to do is visually inspect the solder joints to make sure everything looks good and there are no solder bridges or obvious cold solder joints.

Integration

Connecting this to the various inputs and outputs is also super easy. The in and out pads are obvious. There is one more pad labeled "gnd" that is for a wire to connect to the chassis, ideally at a ground lug where you connect the ground wire from your turntable.

The pwr pads need to be connected to a source of roughly 18-24 volts filtered DC. There is a bit of filtering (more like decoupling) on the board, but not enough to filter AC. You can use a switch mode wall wart power supply, or a bunch of AA batteries for this. The BHL Power Supply is also great.

In my experience, wall wart power supplies can either be just fine, or be very noisy. It is always a gamble to try one of these.

There is no onboard fuse. The wall wart power supplies I imagine almost everyone will be using for this are internally current limited. If you use another power supply, a fuse might be a good idea. Current draw is less than 50 mA.

I include the standard 47k load resistor, but feel free to change that to something that is better matched to your cartridge or stepup transformer or whatever.

The mounting holes at the corners are designed for 4-40 thread screws.

Now go play a couple of those Steely Dan albums you buy every time you see them in the thrift store!

-jsn