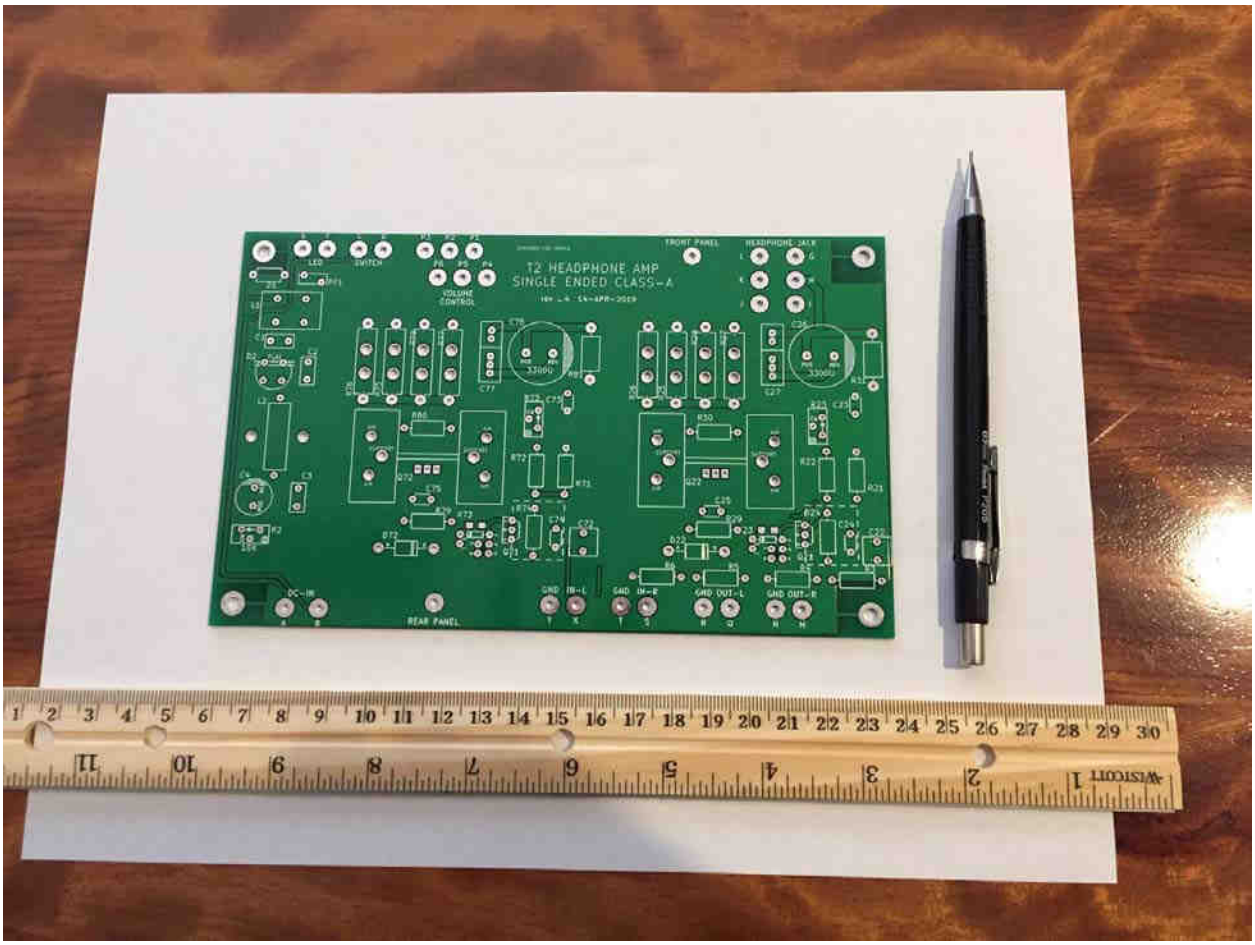
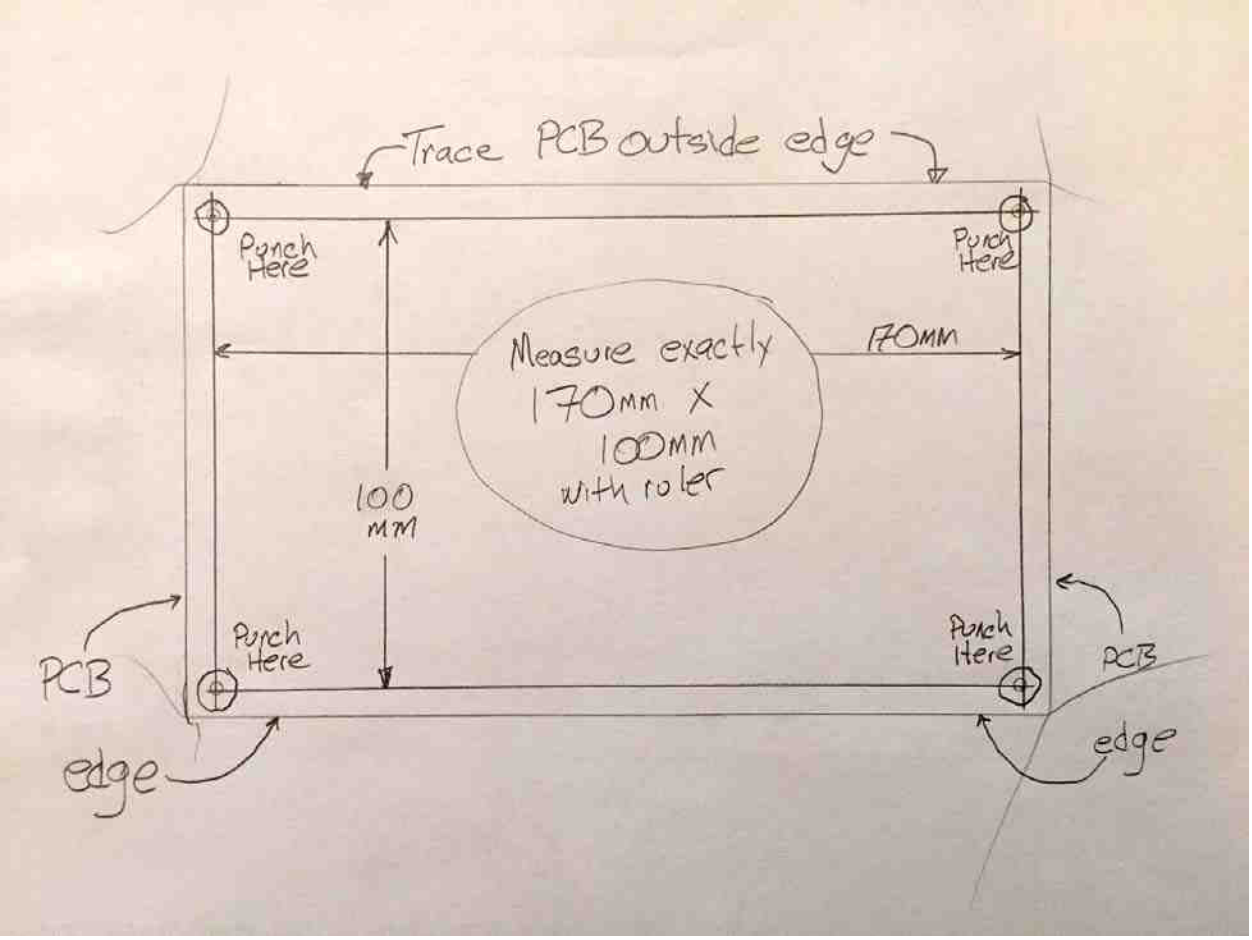


First we'll create a paper template that shows EXACTLY where to center punch the PCB mounting holes on the bottom plate (floor) of the chassis.

Start with a piece of paper, pencil, ruler, and the T2 printed circuit board.

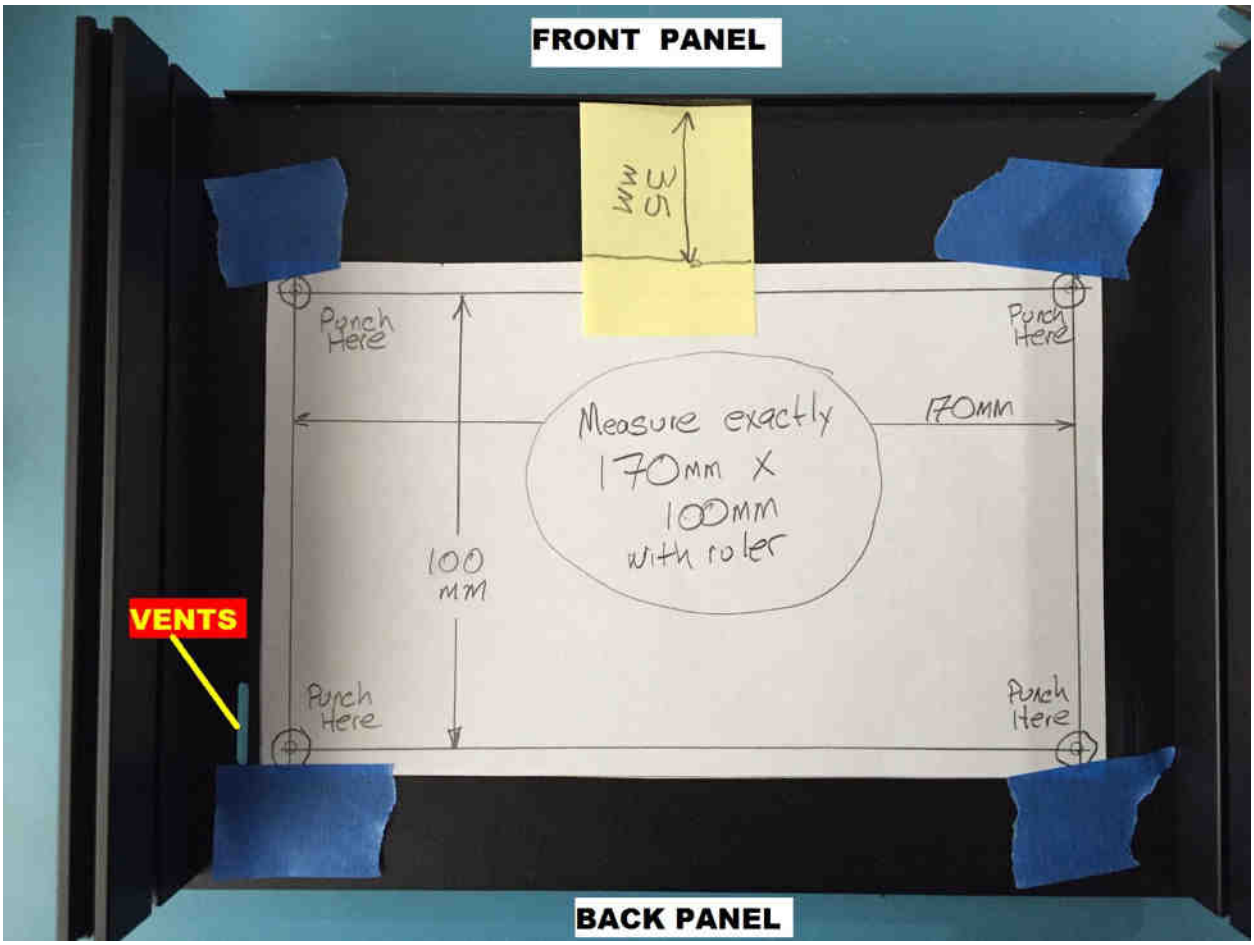
Use the pencil to trace the outline of the PCB.



Then swirl and wiggle the pencil inside the four mounting holes to mark (approximately) where they go.

Use the ruler to draw a new rectangle exactly 170 mm by 100 mm, with the corners of the rectangle indicating the drill hole positions.

Use scissors to cut out the paper template along the PCB edge lines.



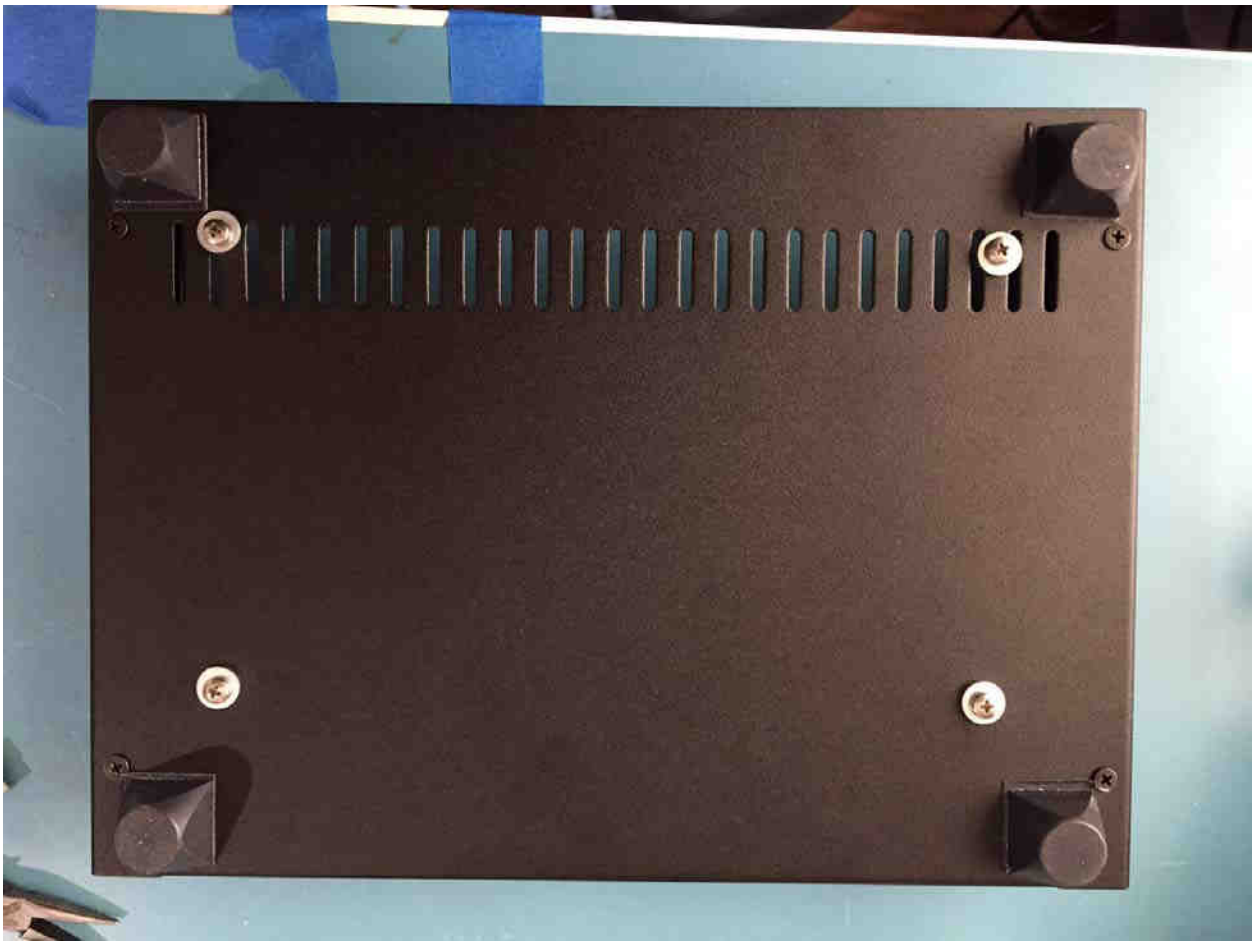
Tape the template to the bottom plate (floor) of the chassis as shown. It should be centered left-to-right, and it should be 35mm from the front panel bent “lip” of the bottom plate.

Advanced builders will want to peek two photos ahead, to observe that it is possible to arrange the circuit board left-to-right so that one of the drill holes falls exactly in between ventilation slots. This hole is easier to drill.

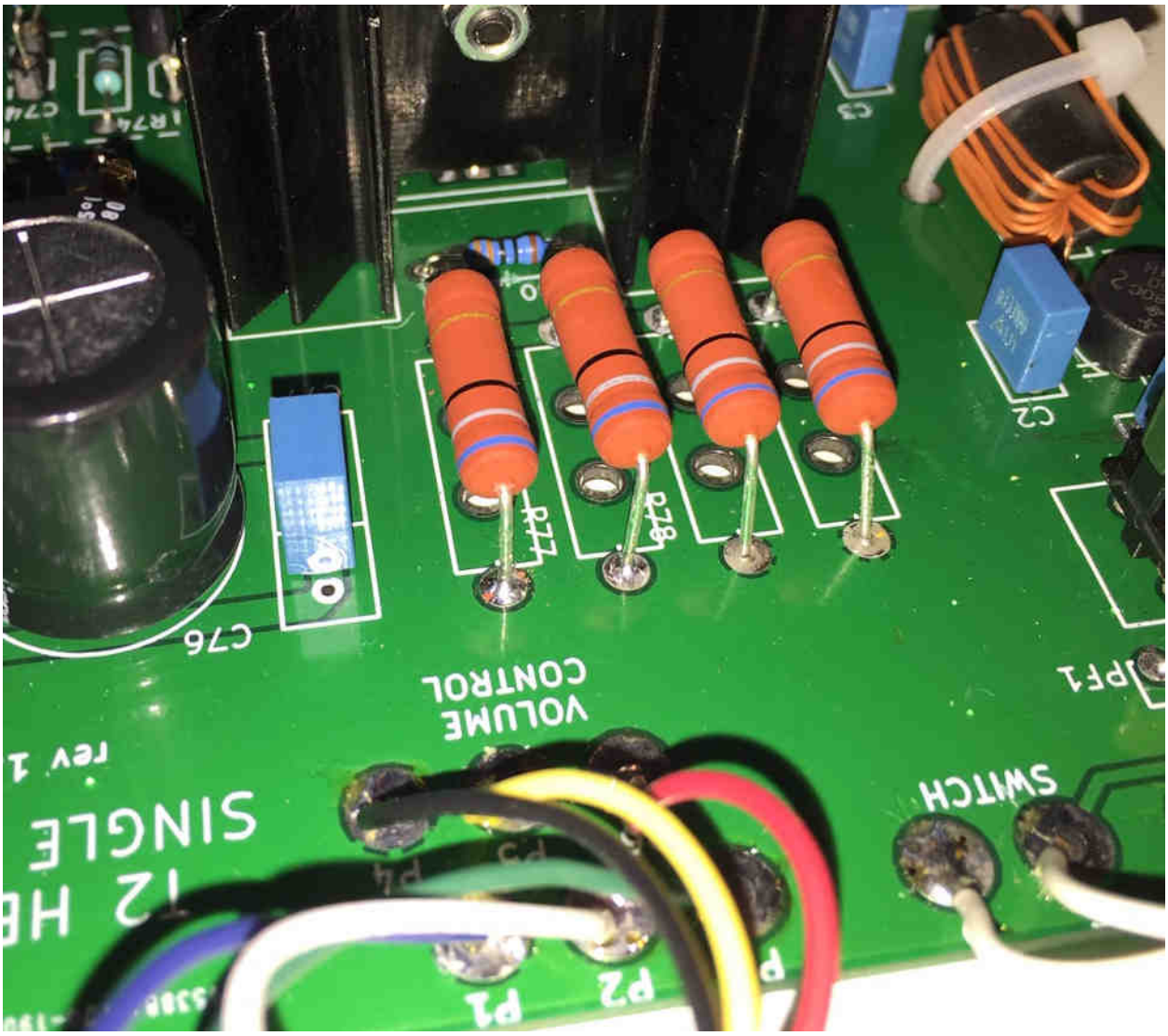
Caution: the chassis is made of sheet metal and can be warped by the pressure of center punching and/or drilling. Ask me how I know this. Always support it from below with a large solid piece of scrap wood, when drilling or punching.

After drilling, use relatively coarse sandpaper to remove the black paint and expose the shiny steel, surrounding the drill holes, on the inside of the chassis. (No need to do it on the outside of the chassis). This exposed metal lets the mounting posts make good electrical contact to the bottom plate, extending the Faraday Cage which surrounds T2 and blocks hum.

Here's a close-up after drilling and sanding. Do you see that the metal has been deflected (warped) downward? I put a huge stack of newspapers between the metal and the wood when drilling. Big mistake, the newspapers had a lot of "give" but what I wanted was Support. The metal deflected. Oops!

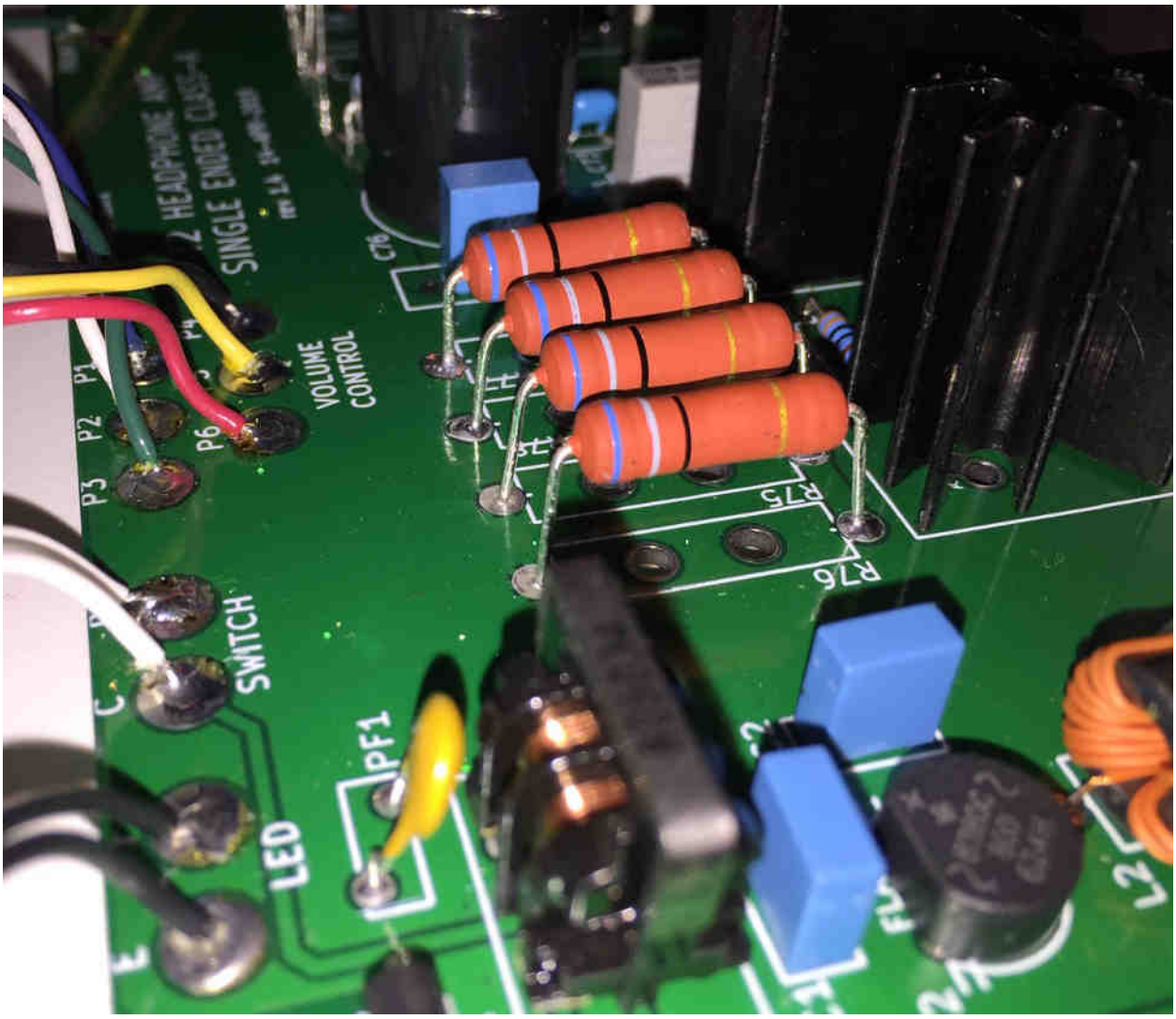


Thus is the outside (exterior) face of the chassis bottom. M3 bolts and shoulder washers are inserted from the outside towards the inside. Tall feet are used to get the T2 chassis far above the tabletop. This improves airflow and reduces the chance of burning or scorching whatever the T2 is sitting upon.

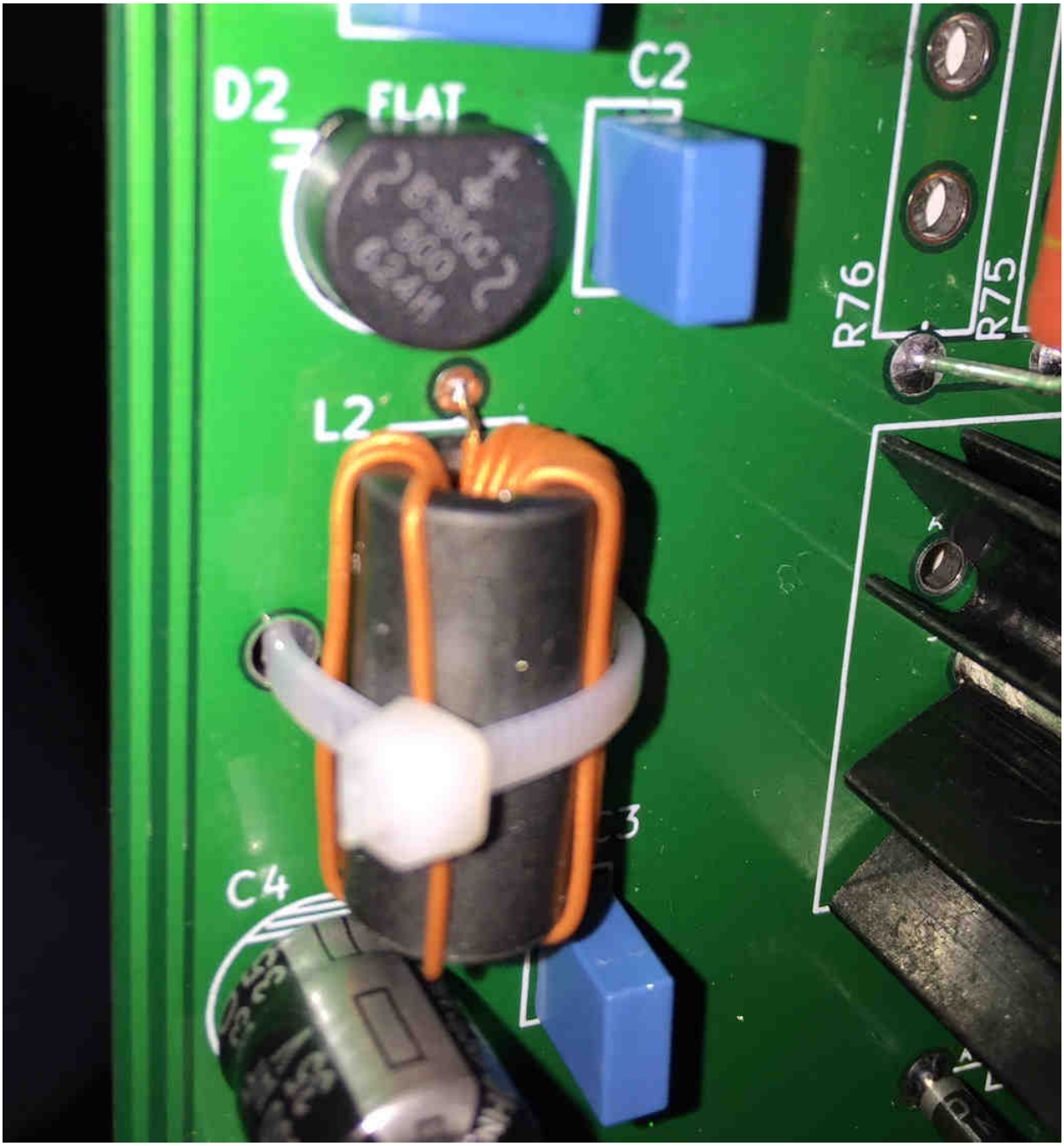


The 68 ohm, 3 watt resistors get hot. I mean HOT. This is a class A amplifier and those resistors are running at high current without a heatsink. Mommy's little favorite, the MOSFET, gets a big huge aluminum heatsink with tall fins and lots of radiator area. These resistors get nothing, nada, bupkis.

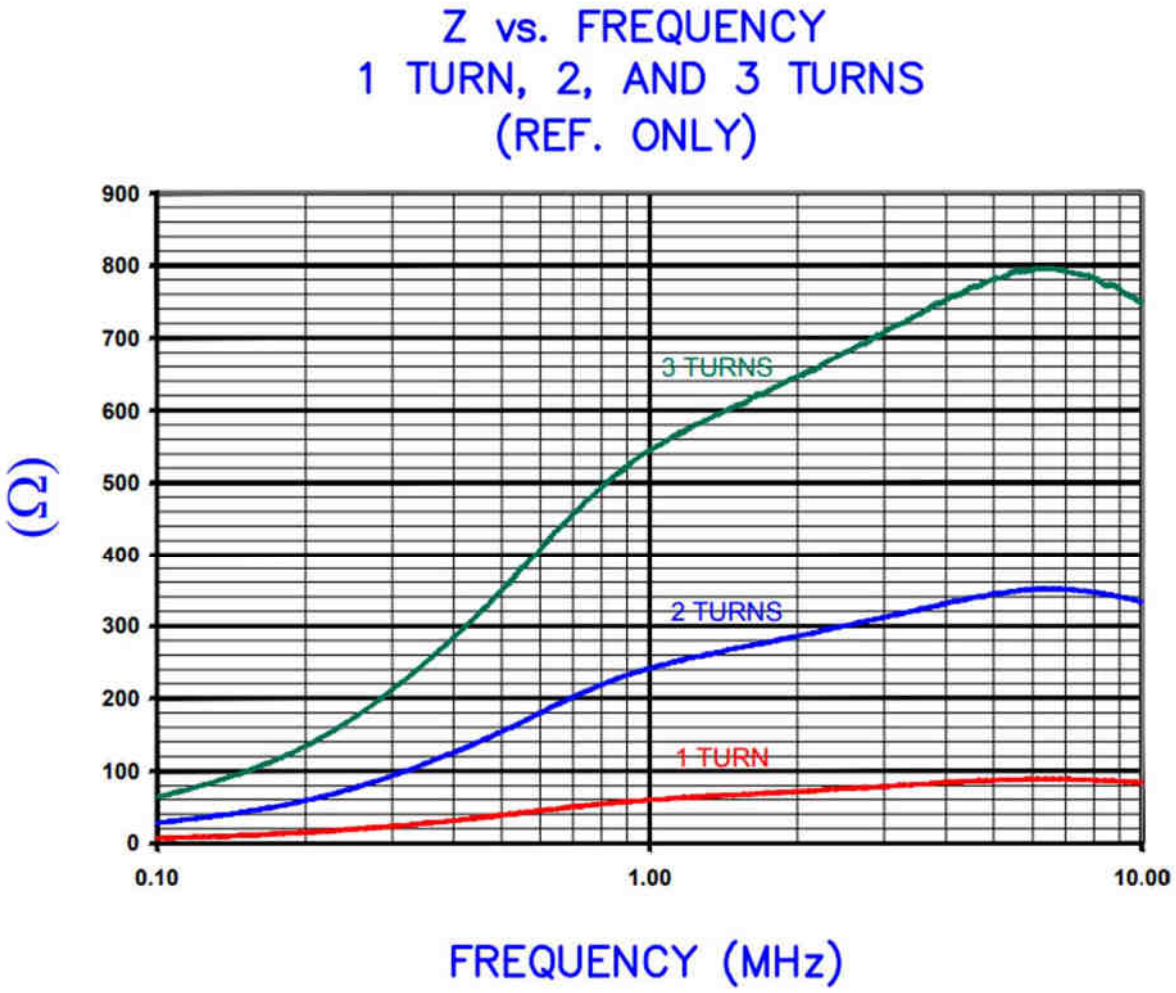
So we deliberately raise the resistors above the PCB. How much above? Exactly the diameter of a yellow pencil (I used a Dixon Ticonderoga #2). I broke the pencil in half and taped the two pieces side-by-side to the board. Then I stuffed the resistors, snugged them against the pencils, and soldered their lead wires. Presto, the resistors are now exactly one pencil-diameter above the board.



HOWEVER, we need to perform this step early in the build, otherwise it becomes impossible to remove the pencil halves after soldering! You can see that the blue box capacitors and the common mode choke, block the pencils from sliding out. Solution: do the pencil soldering operation before the blocking components are mounted. Like, right after soldering the super low profile resistors and diodes.

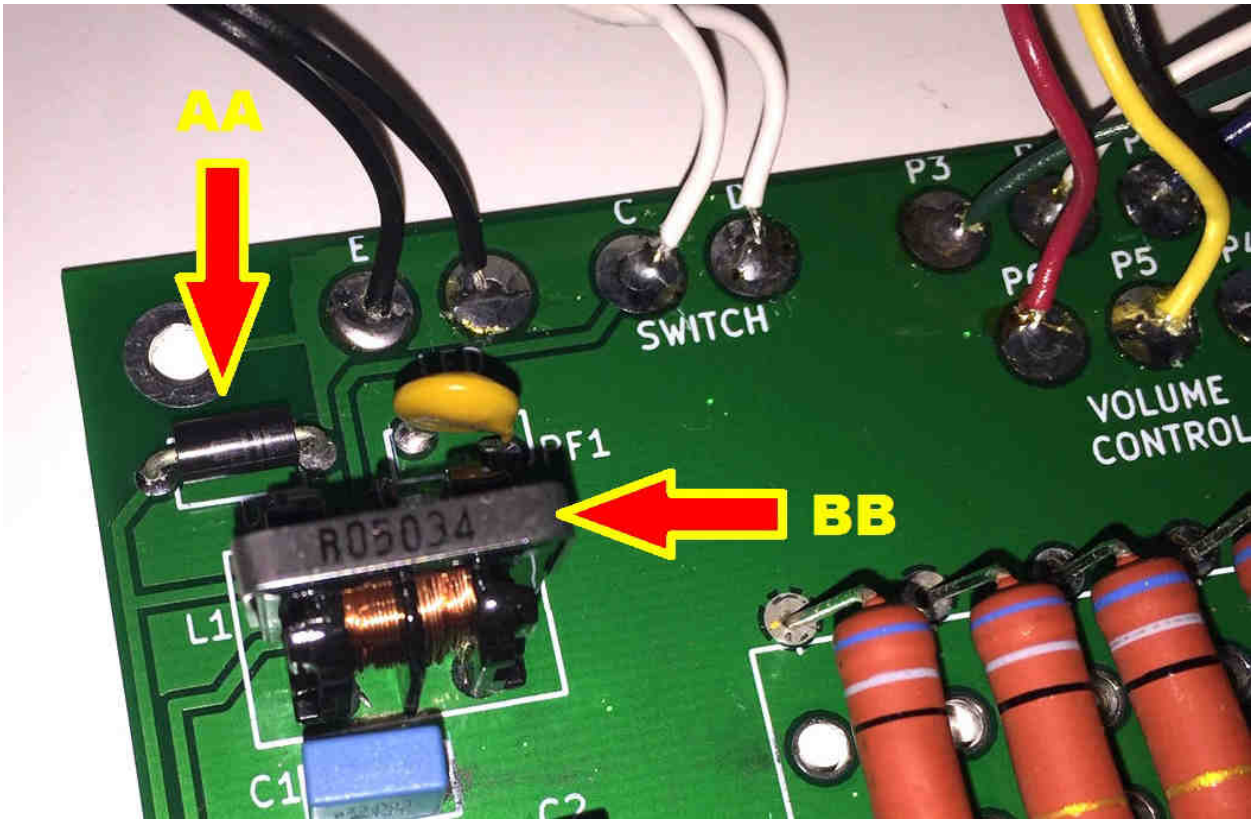


This photo shows the ferrite choke mounted to the PCB. Eleven turns of AWG-28 wire are wrapped around the core. The insulation is stripped from the ends of the terminal wires, and they are soldered to the PCB. Then a zip-tie is threaded through the PCB and pulled snug, to hold the choke securely. The goal is to prevent the mounting wires from having to support the weight of the core, and to make the assembly robust during shipping, rough handling, or vibrations.



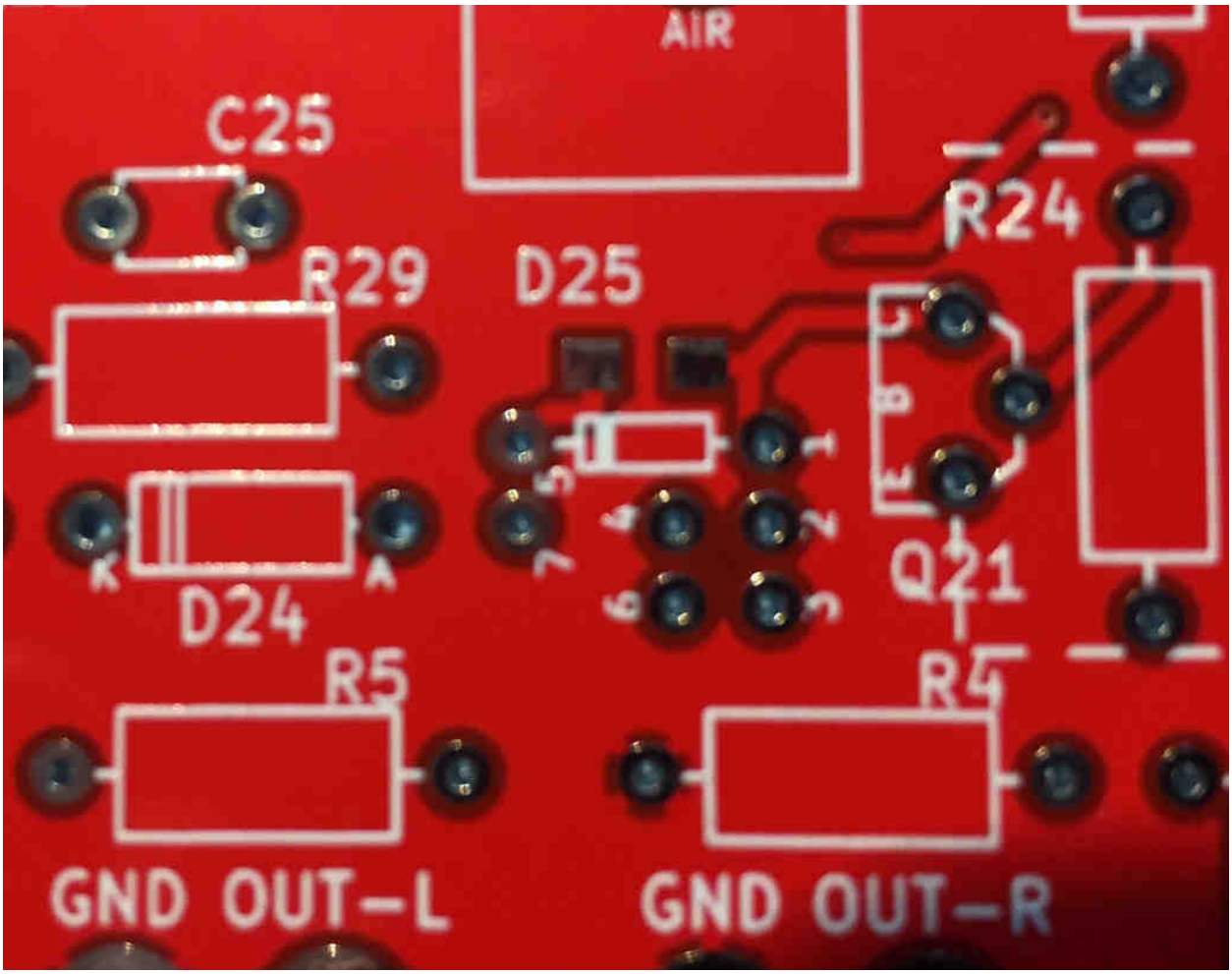
AGILENT E4991A RF Impedance/Material Analyzer
HP 16092A Test Fixture REF #2606

This figure is from Laird's datasheet for their ferrite core "LFB095051" used in the T2 power supply filter. Impedance (on the Y axis, in ohms) rises with frequency, which means that the HF noise generated by the wall wart's switchmode power supply circuitry, is greatly attenuated. Notice that impedance grows as more and more turns are added. (In fact it grows quadratically). This is why the T2 circuit design uses small diameter wire, AWG-28. It allows us to fit a larger number of turns within the narrow ferrite core. I was easily able to fit eleven turns of AWG-28 into one of these cores. If you are able to fit twelve or more turns: wonderful, everything just keeps getting better.



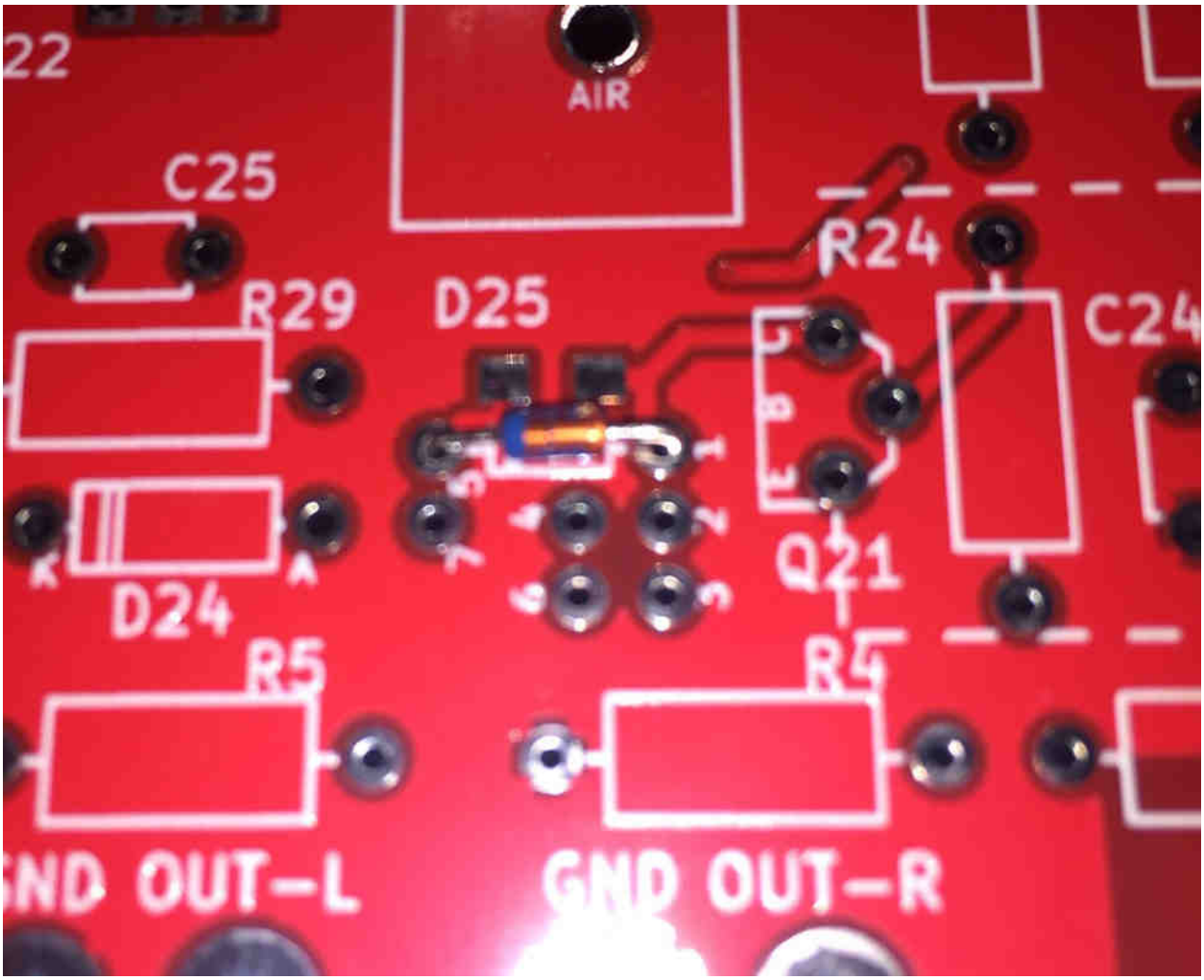
Component D1 is a <u>bidirectional</u> Transient Voltage Suppressor (“TVS”), so it has no white band at one of the package body, designating Cathode. There is no Cathode on a bidirectional TVS. Just like a resistor, you can stuff and solder the part either way; both are equally good. See arrowhead AA in the photo.

Component L1 is a common mode choke with a ferrite core. Install it with the printed text oriented the same way as the white silkscreen text on the PCB. Right side up, not upside down. See arrowhead BB in the photo.



Diodes D25 and D75 have a bit of an unusual “footprint” on the PCB. The plethora of extra pins provides test points (access to interior circuit nodes) and also gives the option to use a surface mount version of the diode, if desired.

The diode is stuffed and soldered as shown on the white silkscreen text layer. Cathode (blue band) to hole#5 on the left, anode to hole#1 on the right. Also see the next picture.



Here is Diode D25 soldered to the PCB. The end with the blue band (the cathode) is soldered in hole#5 and the other end is soldered in hole#1. This photo also makes it abundantly clear that an SMD footprint of the diode (complete with rectangular pads) is present.