

Headphone amplifier

1. What does it do?

A headphone amplifier amplifies audio signal that's put into it, makes it stronger, and uses it to drive headphones. The direct result will be a better sound quality with deeper and more natural sound from your over-ear headphones.

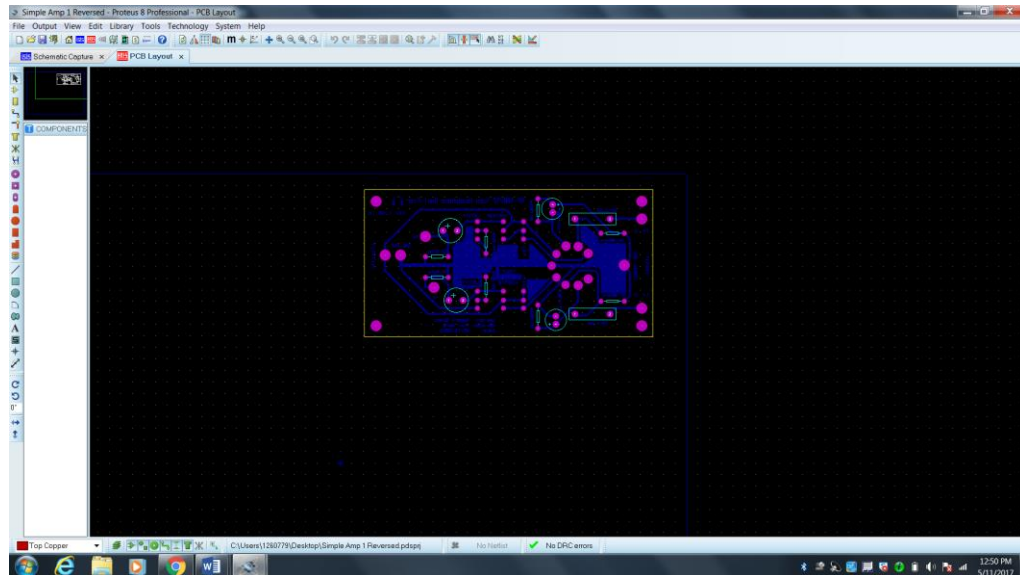
2. What is the thing sticking out?

That's a low-voltage pre-amplifying vacuum tube, or in short, a vacuum tube. The tube provides voltage gain, and adds flavor to the sound.

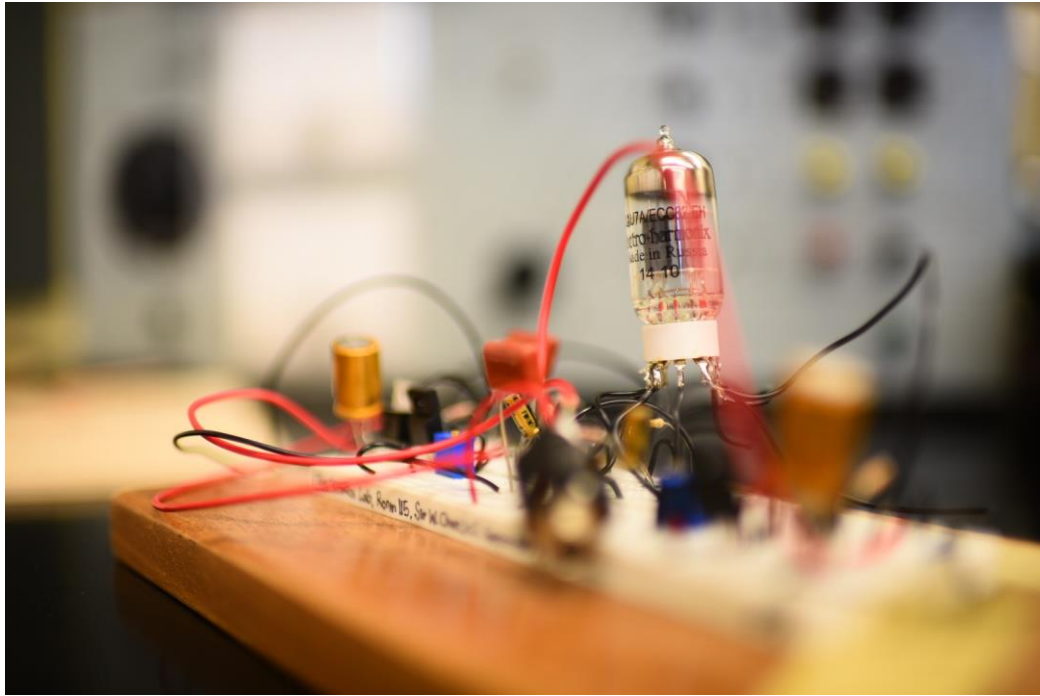
3. How was this made?

The process of designing and manufacturing the amplifier lasted for a year.

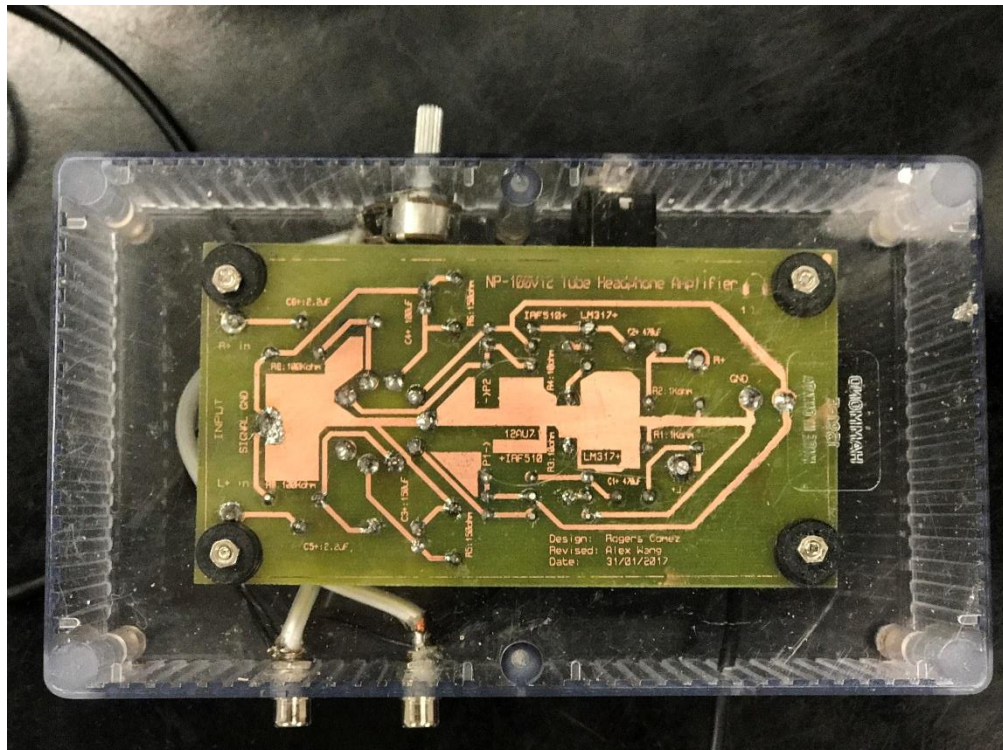
The first step is designing the amplifier. According the schematics drawn by Rogers Gomez, I made the PCB design in Proteus. Designing and debugging the schematic and making custom part for the circle-like vacuum tube socket were tricky.



The second step is testing the design on a breadboard. Following the design, we wire all parts together on a breadboard and test if a signal goes through.



The third step is masking and etching the PCB. We used a chemical etchant tank to produce a board that looks like:



Then, we populate the PCB with components, and wire the headphone jack, RCA ports and volume knob (potentiometer).

