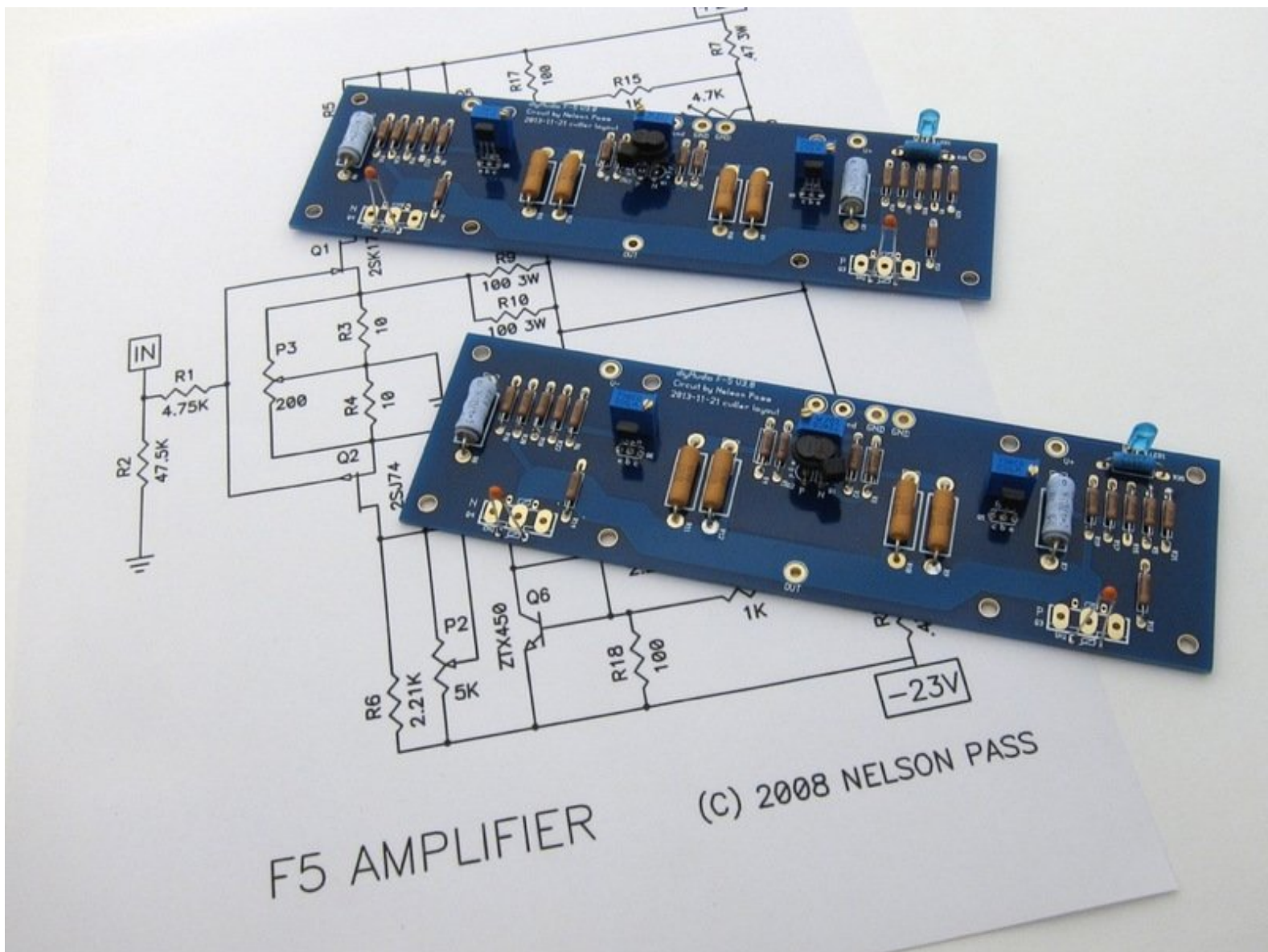


# diyAudio Guides

## Firstwatt F5 amplifier v3

DIY Amplifier F5 Pass Nelson Pass Firstwatt First Watt Amp Class-A Audio Hi-Fi Stereo Sound  
Music Build Project Electronics Solid State Push Pull

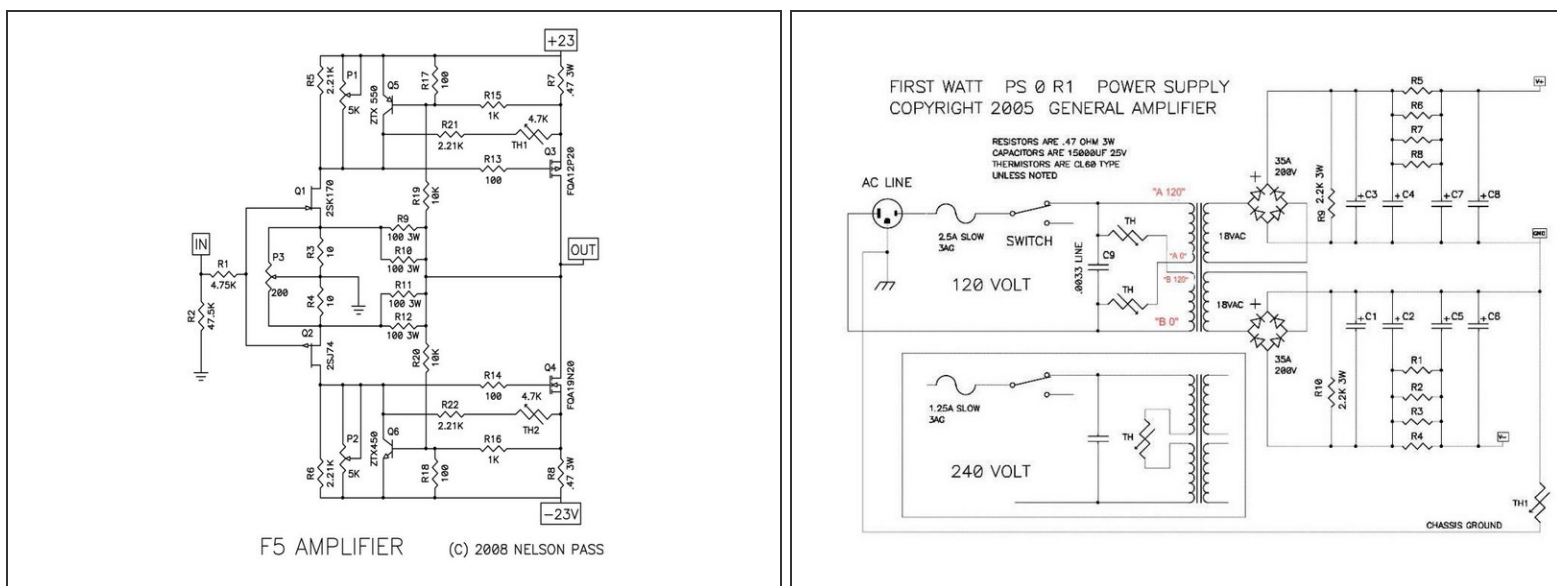
Written By: 6L6



## INTRODUCTION

This is a group of photos overviewing the basic steps necessary to build a DIY Firstwatt / Nelson Pass F5 Class-A amplifier. This build utilizes the v3 circuit board and the kit of circuit board parts available from [diyAudioStore.com](http://diyAudioStore.com)

## Step 1 — Schematic



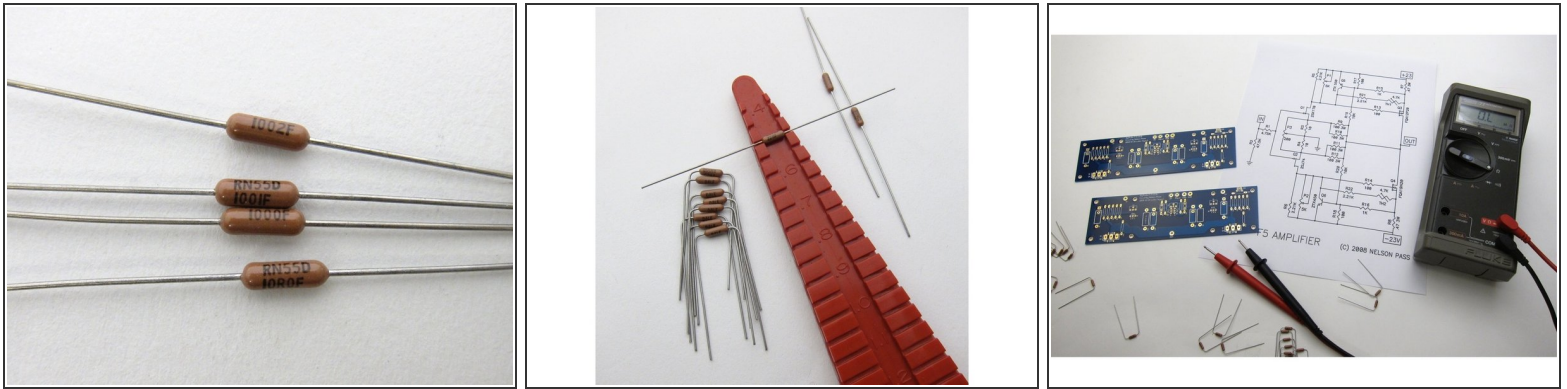
- Print this out and have in front of you at all times.
- Image 1) This is the schematic for the amplifier section.
- Image 2) Schematic for the PSU section.

## Step 2 — Amp PCBs and parts



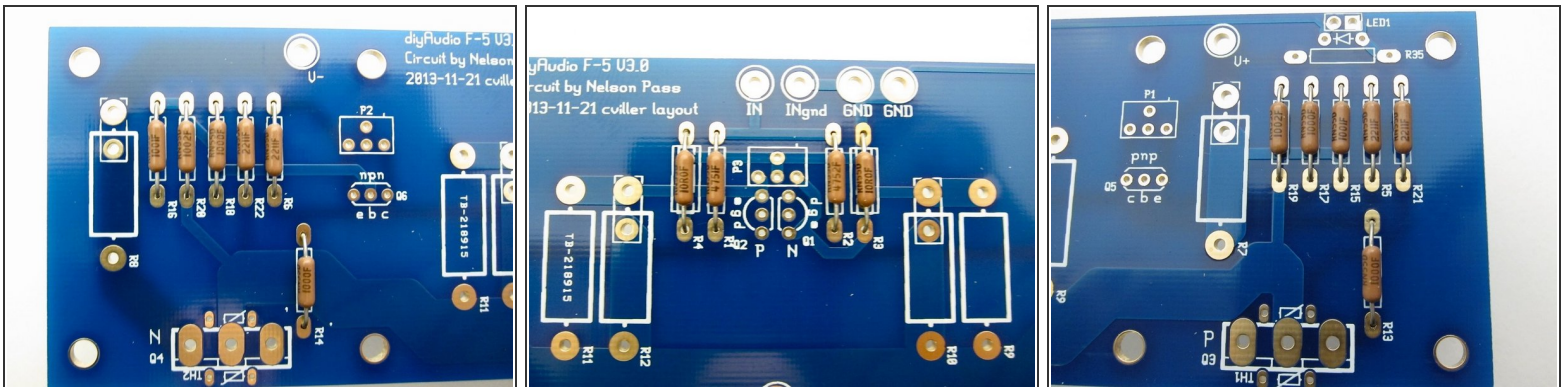
- Photo 1) The current F5 PCB from the diyAudio store. It has the inclusion of potentiometer P3, and is the third revision of this board, hence "F5v3"
- Photo 2) Right - PCB bag. Left - Kit of F5 parts.
- Photo 3) The parts kit includes everything for the amp PCBs except the input JFETs and the LED

## Step 3 — Resistors



- The Dale resistors have their value printed on the side, the code is 3-digit + multiplier at values greater than 100ohm, and below 100ohm the "R" is the decimal. So, from top to bottom you see 10K (100+2 zeros, 10000ohm) 1K (100+1 zero, 1000ohm) 100 ohm (100+0 zeros, 100ohm) 10.0 ohm (10R0, 10.0 ohm)
- Lead spacing for all small resistors is .5inch (12.7mm)
- Measure all resistors before inserting into the board. This greatly reduces errors.

## Step 4 — Stuff small resistors

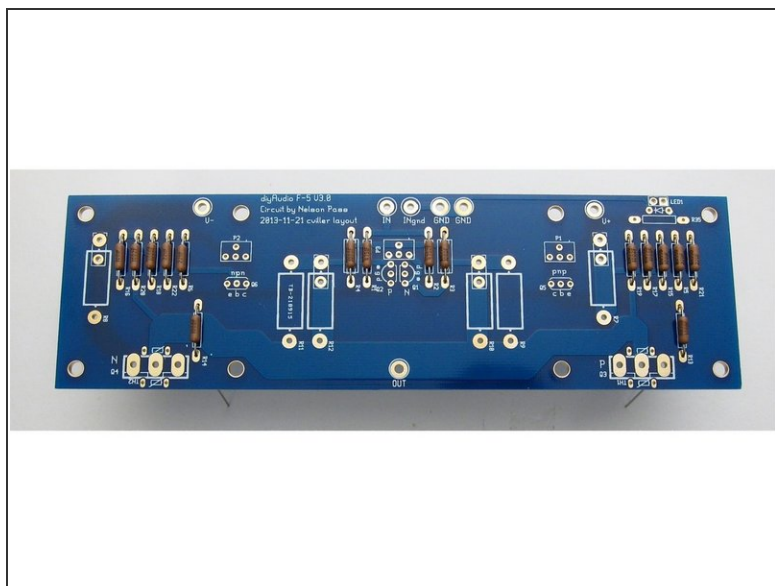
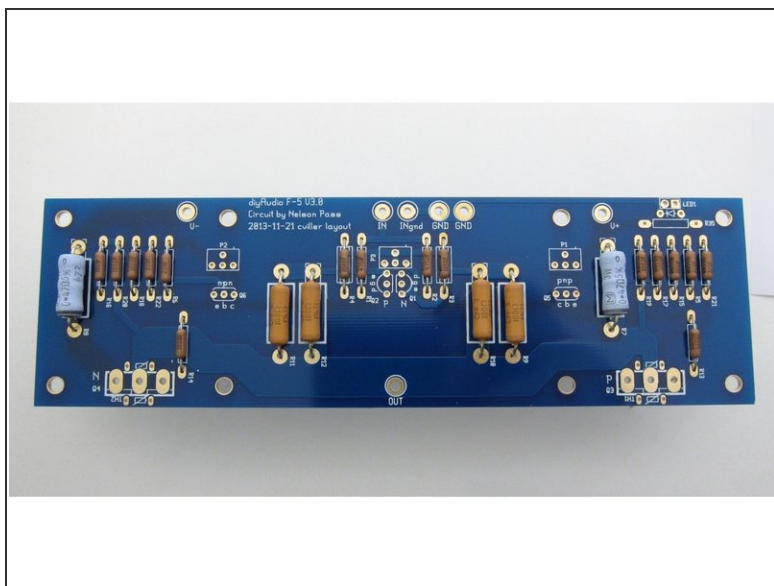


- Take the time to bend all the leads so the value is visible, and align them all the same way for easy reading.
- Photo 1) left side
- Photo 2) center
- Photo 3) right side

This document was generated on 2021-12-22 12:24:01 AM (MST).

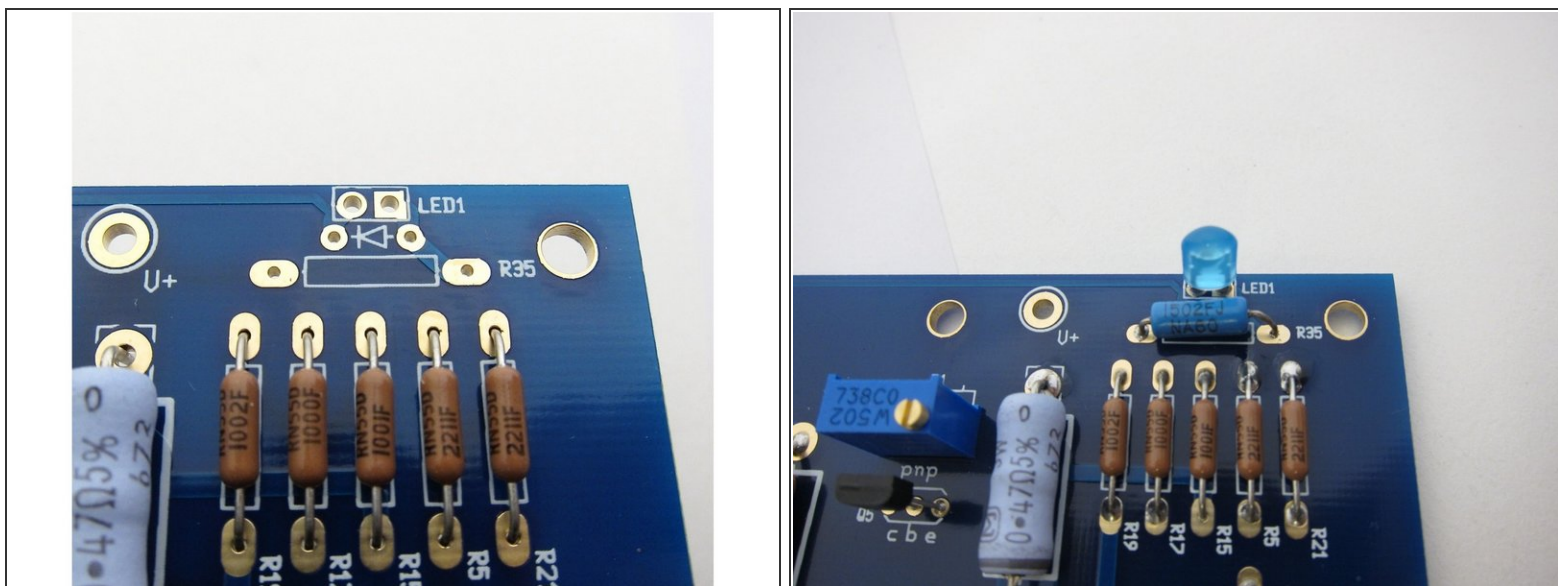


## Step 5 — Large resistors



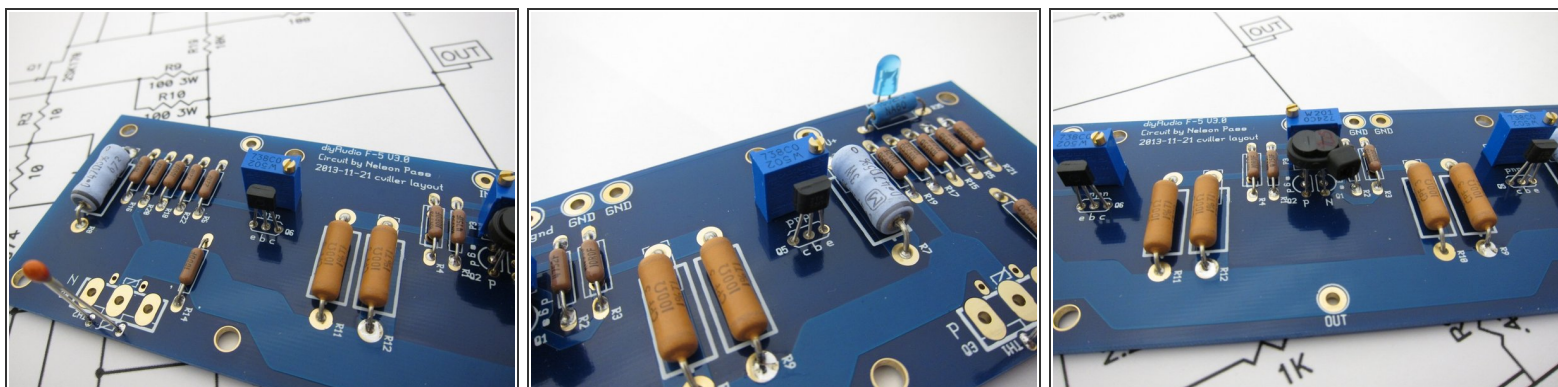
- Big resistors installed. Blue are 0.47ohm 3W, Orange are 100ohm 3W. Values printed clearly on the side of each resistor.
- Photo 2) PCB with just small resistors.

## Step 6 — LED



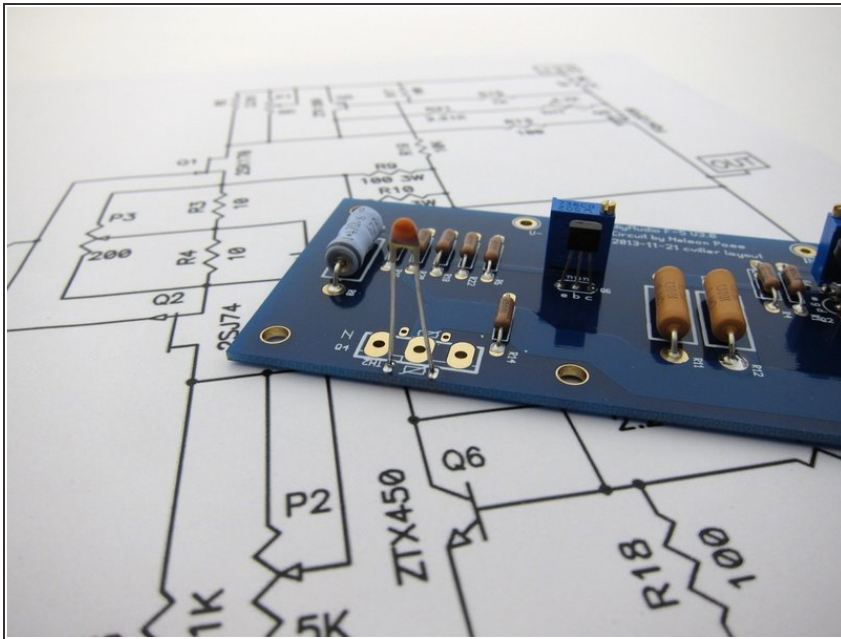
- Note that the parts kit does not include the LED or it's resistor, this is so you can choose that you prefer.
- I used blue and a 15K resistor

## Step 7 — Potentiometers and small Transistors



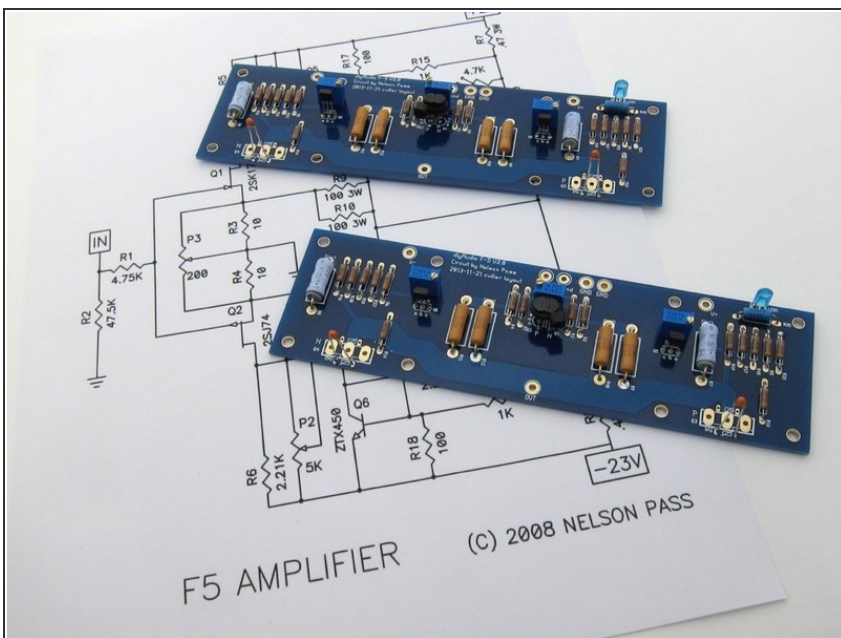
- Install the 5K pot and the ZTX450 on this side (Q6). Note the orientation of the transistor. The potentiometer value is almost the same code as the resistors - 502 is 50+2 zeros , 5000 ohms
- Q5 is the ZTX550, note orientation, and use another 5K pot here.
- The 200ohm pot mounts in the center, and the Jfets install as shown. The K170 is the N-channel, the J74 is the P-channel.

## Step 8 — PCB Thermistors



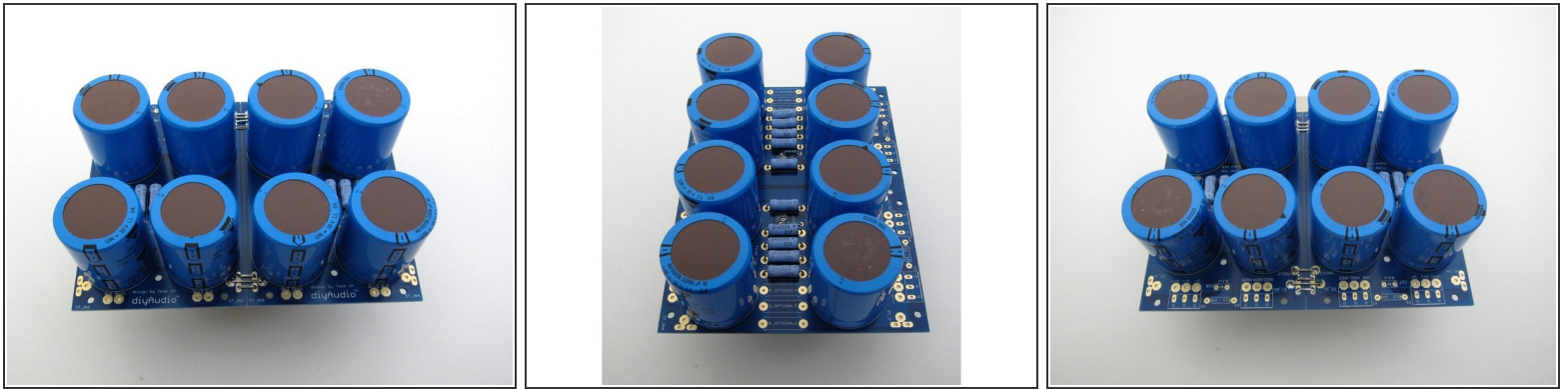
- Mount the thermistors as shown and don't bend them yet.

## Step 9 — Stuffed PCBs



- At this point the amplifier PCBs should look like this - all components stuffed except power transistors, and the thermistors not bent.

## Step 10 — PSU



- This is the PSU board from the store, the diode section is snapped off and chassis mount diode bridges will be used to save space.
- Photo 1) input side
- Photo 2) center
- Photo 3) output side

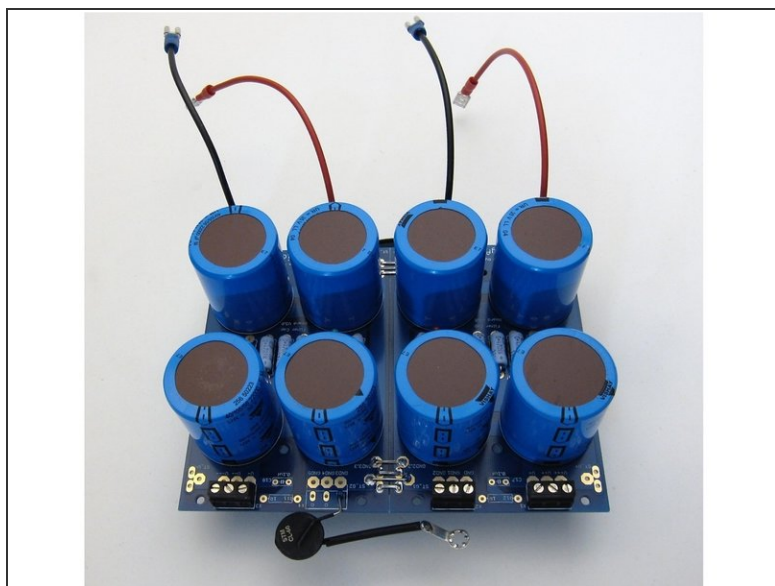
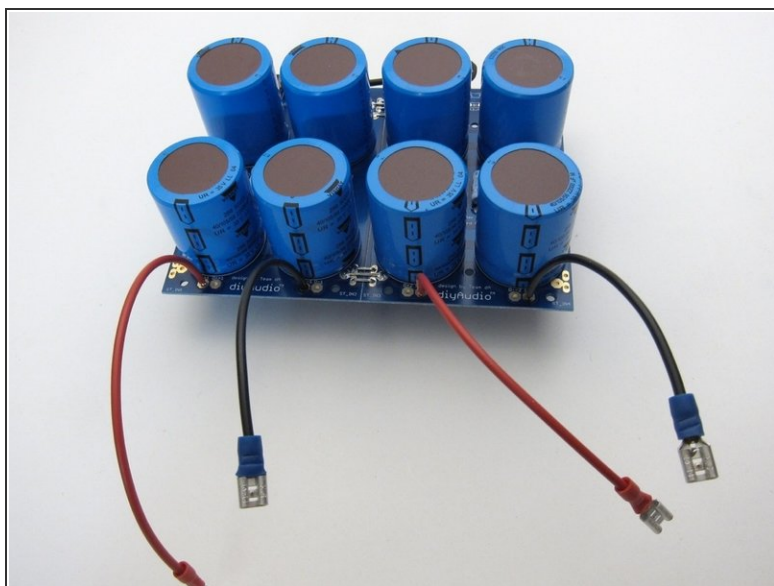


## Step 11 — PSU 2



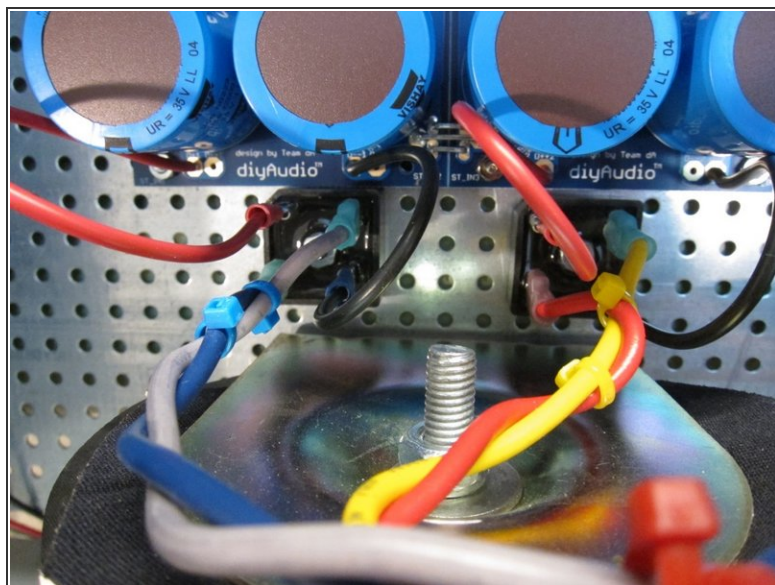
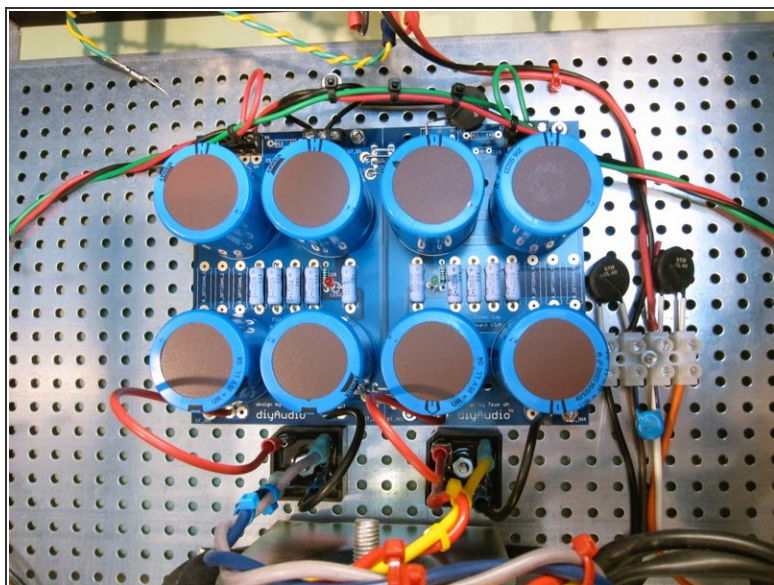
- Photo 1) Please connect the two sides of the ground as shown - it won't work properly without it. Use a few wires or lead cut-offs, to insure a solid, quiet, and low-impedance ground.
- Photo 2) Filter resistors, bleeder resistor, LED resistor. LED not stuffed, choose whichever color you like, you could color code V+ and V-, or make them bright blue to fill the vent holes with color, it's up to you.
- You can stuff both connector blocks on ground, but if you use one, you will have all the grounds closer to the same place, acting somewhat as a 'star ground'.
- The CL-60 is acting as a ground loop breaker, elevating the amplifier circuit with a resistance above mains earth, but can flow current if there's a fault.

## Step 12 — PSU 3



- PSU ready for installation. Blocks installed, wires to connect to diodes ready, thermistor with star washer.

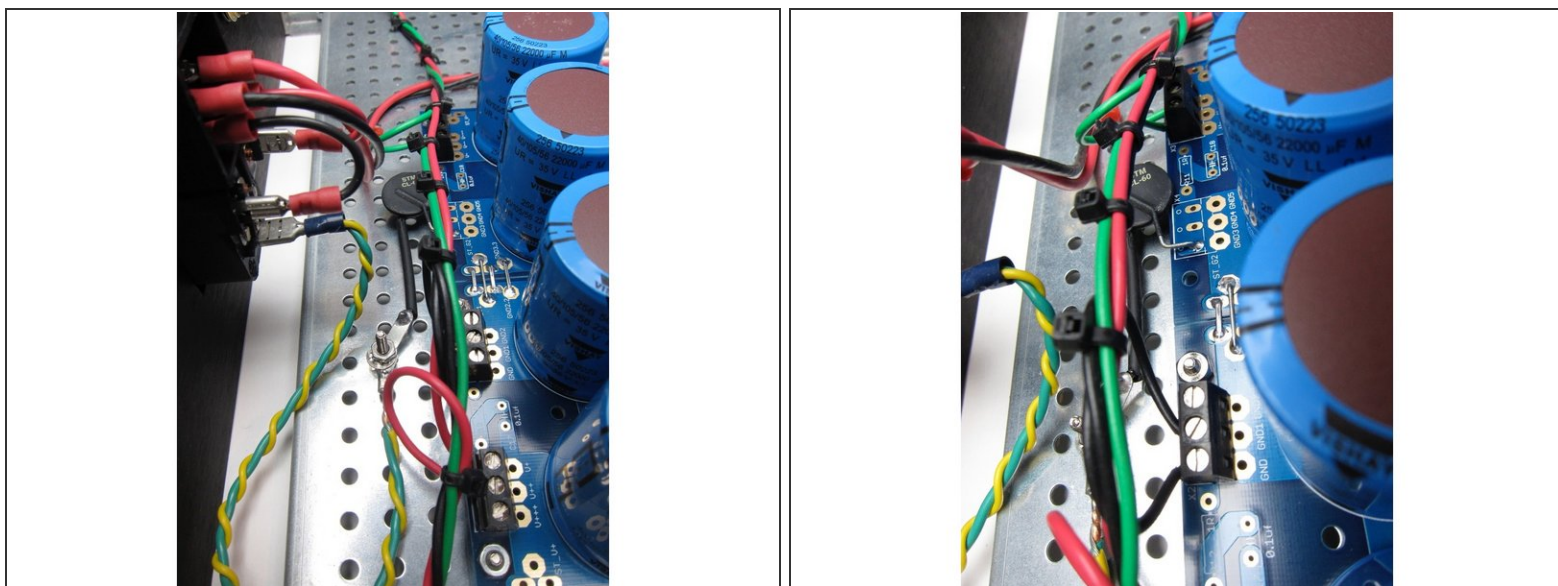
## Step 13 — PSU / diode wiring



- Diode bridges to PSU board.

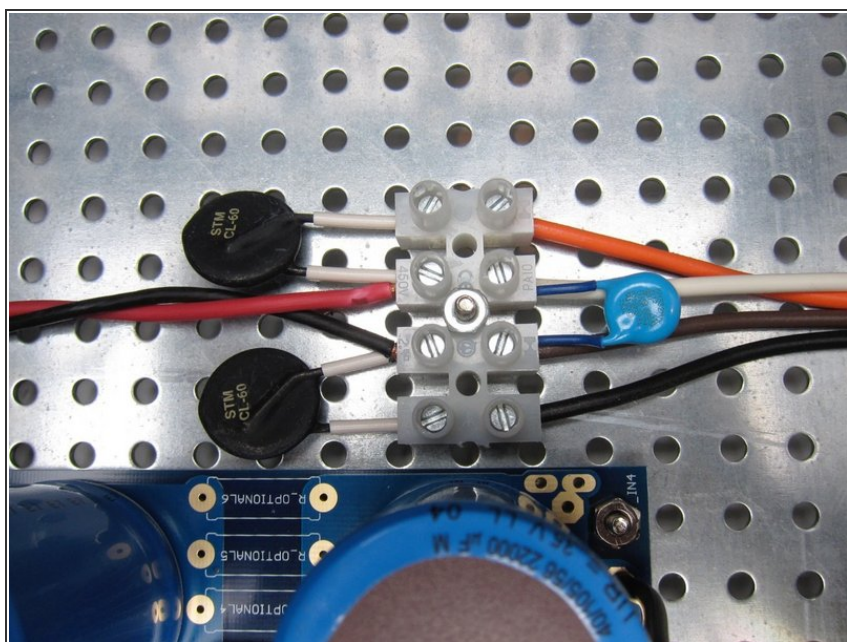


## Step 14 — Safety Earth / Ground connections



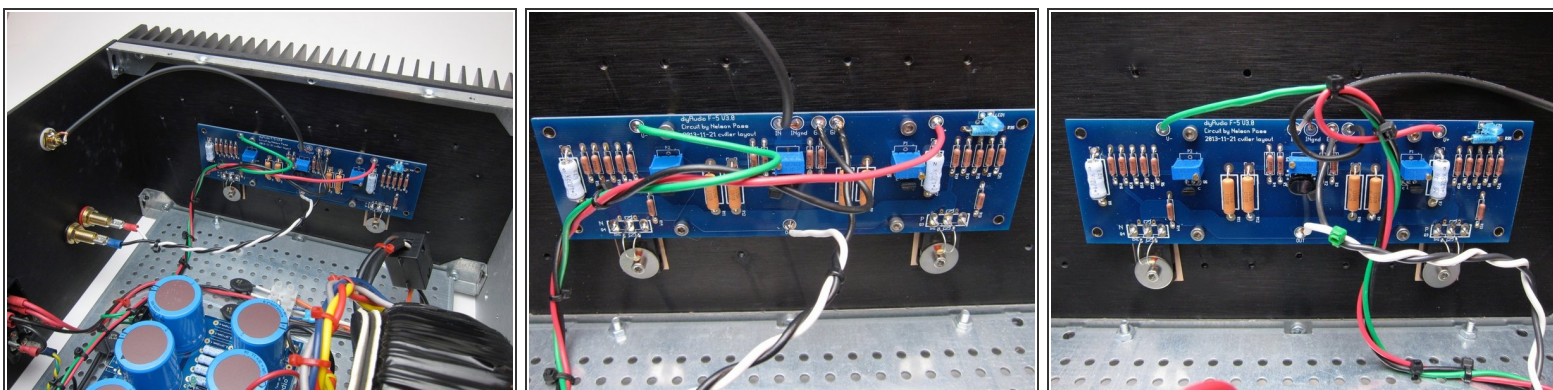
- Safety earth (Green Yellow) is connected from the power switch module to the chassis. Use a star washer to ensure a solid connection.

## Step 15 — PSU mains - primary wiring, thermistor, line cap



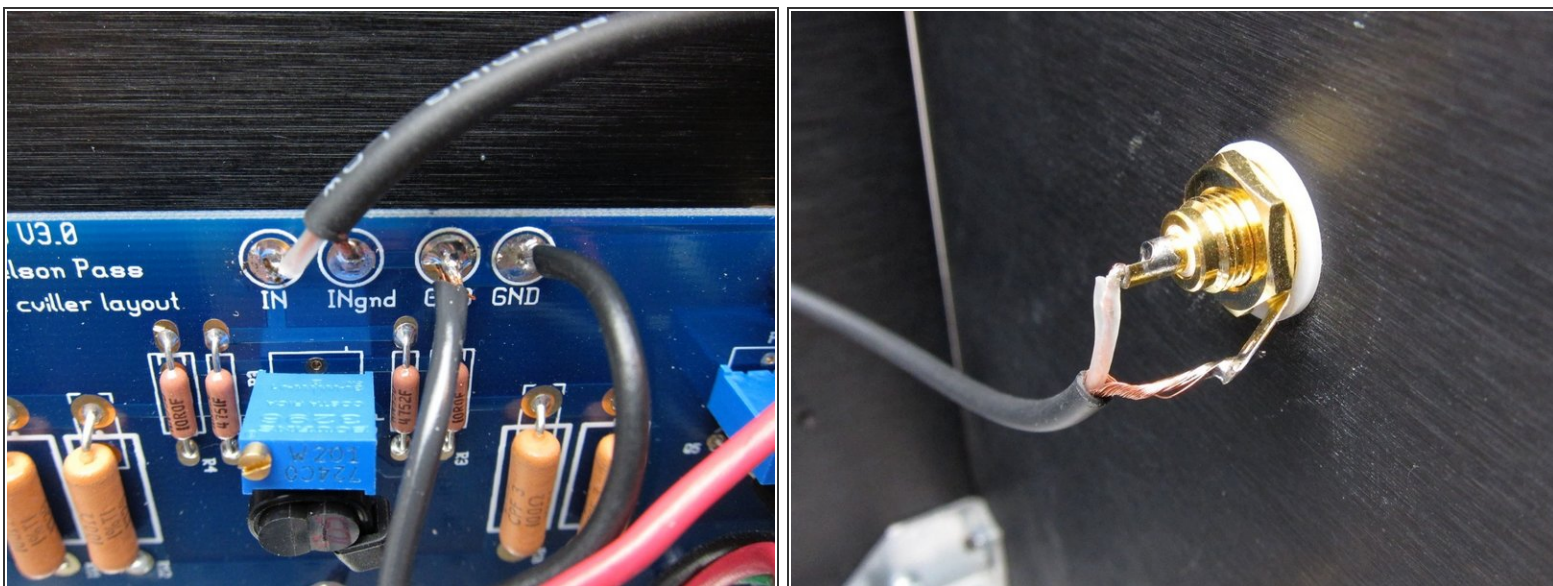
- Terminal block. **120VAC wiring shown.** AC from switch in from left (Red Black) CL-60's, the blue disc is the X1/Y1 rated capacitor, and transformer primaries are out the right.

## Step 16 — Amplifier PCB connections



- Connections from amp PCB to back panel.
- Try to arrange the wires so they are not in the way of the potentiometers. Zip-ties are your friend!
- Note the small thermistors are bent down now and touch the washers holding the Mosfets.

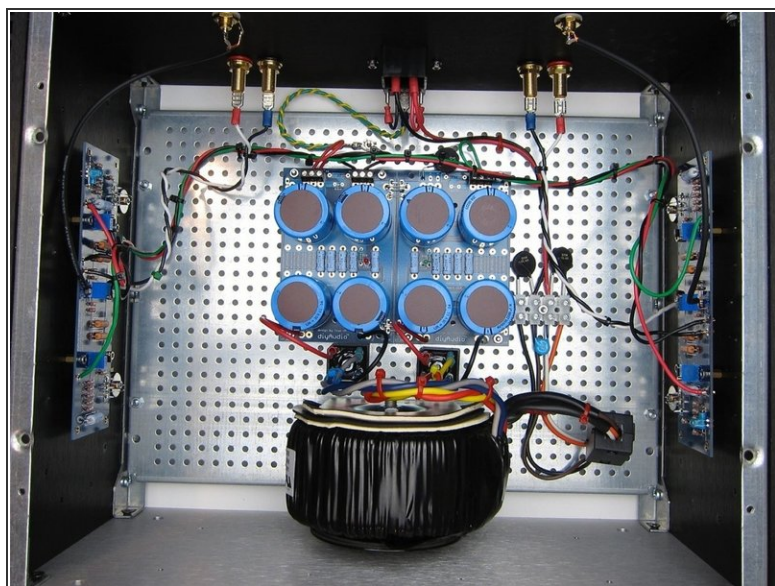
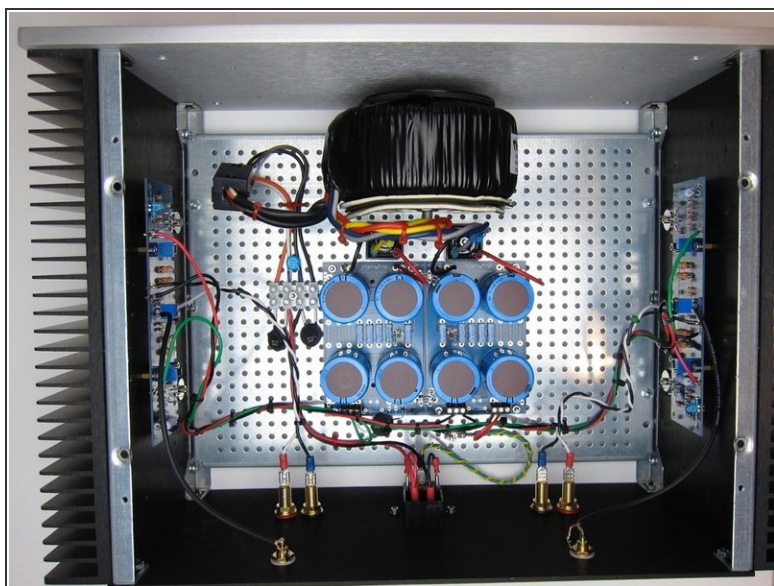
## Step 17 — Input connections



- The PCB connections to GND are all tied together, but it's still nice to have individual holes for the wires. Input ground from the RCA jack, speaker, PSU.
- Photo 2) RCA wiring



## Step 18 — Completed amp overview



- Photo of completed amp.