Build Your Own Clone
TMB18
Kit Instructions

(Revision 1.0)

WARNING!!! HIGH VOLTAGE!!!!

Tube amplifiers contain high voltage that can cause injury and even death. Please use extreme caution and common sense when building this kit. Do not attempt to do anything to your amp while it is plugged in other than take voltage readings as necessary or actually playing an instrument through it as it was intended.

Don't just turn the power off!!! Always unplug the power cord from the socket before working on your amp!!! The mains supply can still electrocute you AND the power filter capacitors can still retain a charge powerful enough to kill you. Always unplug the power cord from the socket before working on your amp.

DISCLAIMER

Build at your own risk!!! BYOC, Inc. is not liable or responsible for any damages, injuries, or deaths that may incur from or while building this kit. It is your own responsibility to follow proper safety precautions. Never attempt to build, modify, repair, or perform any sort of maintenance on your amplifier while the power cord is plugged into an AC power source.

BEFORE BUILDING, READ THIS INSTRUCTION FILE IN ITS ENTIRETY.

Warranty:

BYOC, Inc. guarantees that your kit will be complete and that all parts and components will arrive as described, functioning and free of defect. Soldering, clipping, cutting, stripping, or using any of the components in anyway voids this guarantee. BYOC, Inc. guarantees that the instructions for your kit will be free of any majors errors that would cause you to permanently damage any components in your kit, but does not guarantee that the instructions will be free of typos or minor errors. BYOC, Inc. does not warranty the completed kit as a whole functioning unit, nor do we warranty any of the individual parts once they have been used. If you have a component that is used, but feel it was defective prior to you using it, we reserve the right to determine whether or not the component was faulty upon arrival. Please direct all warranty issues to: sales@buildyourownclone.com This would include any missing parts issues.

Return:

BYOC, Inc. accepts returns and exchanges on all products for any reason, as long as they are unused. We do not accept partial kit returns. Returns and exchanges are for the full purchase price less the cost of shipping and/or any promotional pricing. Return shipping is the customer's responsibility. This responsibility not only includes the cost of shipping, but accountability of deliver as well. Please contact sales@buildyourownclone.com to receive a return authorization before mailing.

Tech Support:

BYOC, Inc. makes no promises or guarantees that you will successfully complete your kit in a satisfactory manor. Nor does BYOC, Inc. promise or guarantee that you will receive any technical support. Purchasing a product from BYOC, Inc. does not entitle you to any amount of technical support. BYOC, Inc. does not promise or guarantee that any technical support you may receive will be able

to resolve any or all issues you may be experiencing.
That being said, we will do our best to help you as much as we can. Our philosophy at BYOC is that we will help you only as much as you are willing to help yourself. We have a wonderful and friendly DIY discussion forum with an entire section devoted to the technical support and modifications of BYOC kits.
www.byocelectronics.com/board
When posting a tech support thread on the BYOC forum, please post it in the correct lounge, and please title your thread appropriately. If everyone titles their threads "HELP!", it makes it impossible for the people who are helping you to keep track of your progress. A very brief description of your specific problem will do. It will also make it easier to see if someone else is having or has had the same problem as you. The question you are about to ask may already be answered. Here is a list of things that you should include in the body of your tech support thread:
1. A detailed explanation of what the problem is. (Not just, "It doesn't work, help")
2. Photo that clearly shows your circuit board.
3. Photo that clearly shows the tube-side of inside of the chassis.
4. Photo that clearly shows the inside of the front of the chassis.
5. Photo that clearly shows your wiring going from the circuit board to the pots and any other switches (only if your kit has non-PC mounted pots and switches).
6. Does the indicator light come on?
Also, please only post photos that are in focus. You're only wasting both parties' time if you post out of focus, low-resolution photos from your cell phone.

Credits: Written by: N.W. Kenning & K. Vonderhulls; Artwork & Photography by: N.W. Kenning & K. Vonderhulls
Revision Notes: None

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TMB18 KIT
INSTRUCTION INDEX

Parts Checklist for TMB18 Kit

Resistors:

1/2watt Metal film:

4 – 820 Ohm (Gray/Red/Black/Black/Brown)
2 – 8.2K (Gray/Red/Black/Brown/Brown)
1 – 22K (Red/Red/Black/Red/Brown)
1 – 33K (Orange/Orange/Black/Red/Brown)
2 – 56K (Green/Blue/Black/Red/Brown)
2 – 68K (Blue/Gray/Black/Red/Brown)
6 – 100K (Brown/Black/Black/Orange/Brown)
5 – 470K (Yellow/Purple/Black/Orange/Brown)
2 – 1M (Brown/Black/Black/Yellow/Brown)

2watt Metal Film:

1 – 100 Ohm (Brown/Black/Black/Black/Brown)
1 – 2.2K (Red/Red/Black/Brown/Brown)
1 – 8.2K (Gray/Red/Black/Brown/Brown)

5watt Metal Oxide:

1 – 1.5K (Brown/Green/Red/Gold)

10watt Wire-wound:

1 – 150 Ohm (Large rectangle says ‘10W150’ on body)

Capacitors:

1 – 500pF (Black with ‘500’ on the body)
1 - .0022 axial leaded film (says ‘222’ on body)
2 - .0047 axial leaded film (says ‘472’ on body)
5 – 0.01uF axial leaded film (says ‘103’ on body)
1 – 0.022uF axial leaded film (says ‘223’ on body)

2 – 1uF/63V Electrolytic
1 – 16uF/450V Electrolytic
1 – 22uF/450V Electrolytic
1 – 100uF/50V Electrolytic
1 – 32+32 Electrolytic (Really big with three terminals)

Potentiometers:

2 – A1M (Bass, Master Volume)
1 – B25K (Middle)
1 – B250K (Treble)
3 – A500K (Volume, Tone, Volume)

Hardware:

1 - Chassis
1 - Circuit board
4 - Circuit board standoffs w/matching screws and nuts (M3 size thread)
1 – Rotary Switch
2 – ON/OFF SPST Toggle switch
8 – Knobs
3 - 9 pin tube sockets w/shield
3 - 9 pin tube socket w/spring retainer
5 - Audio Jacks
1 - Indicator Lamp
1 - 6' 3-conductor power cord
1 - Power cord socket
2 – Power cord socket screws (small black screws)
1 - Panel mounted fuse holder
1 - Mains Fuse (2A Slow-Blow)
1 – 3-lug terminal strip
1 – 6-lug terminal strip

2 - Rubber Grommets
1 - Capacitor Retainer Ring
2 - #8 screws (Output Transformer mounting)
4 - #8 lock washer (Transformer mounting)
6 - #8 nuts (Transformer mounting)
3 - #8 Internal lock washer w/ Solder terminals
1 – ½ inch #4 screw (Terminal Strip mounting)
1 - #4 nut (Terminal Strip Mounting)
1 - #4 lock washer (Terminal Strip Mounting)
23 - M3 screws
1 – M3 nut
2 - Wire nuts

Wire:

3’ – Green 18AWG or 22AWG
4' - White 20AWG
4' - Black 20AWG
5' - Yellow 20AWG
4' - Brown 20AWG
1' - Red 20AWG
1.5' - Bare Bus

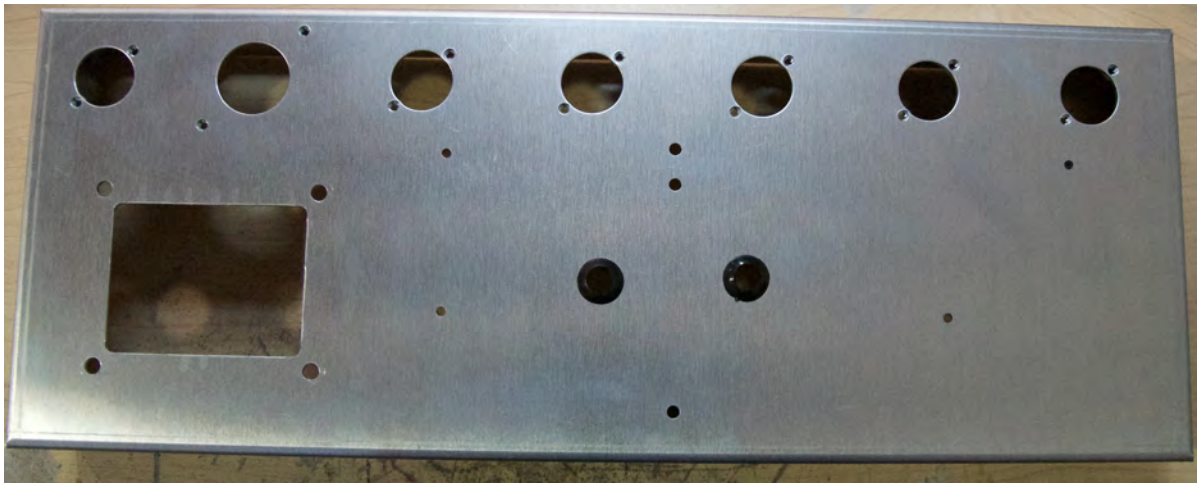
Tubes:

3 - 12AX7 or ECC83
2 – EL84 or 6BQ5
1 – EZ81

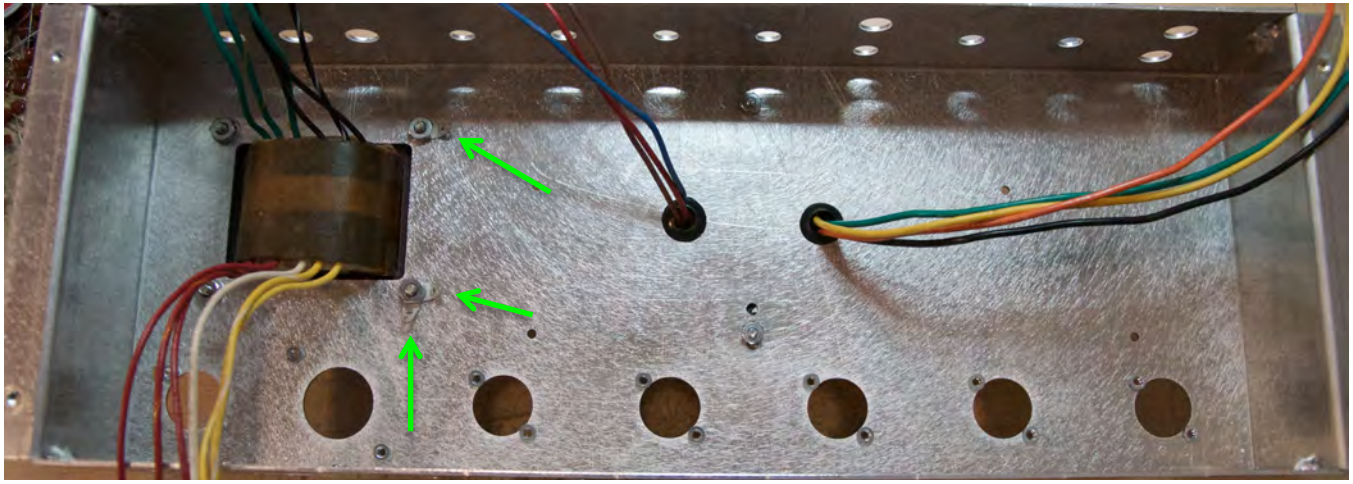
Transformers:

1 – Power Transformer (Classic Tone™ 40-18035)
1 – Output Transformer (Classic Tone™ 40-18037)

Assembling the Chassis and Wiring Chassis Mounted Components



Step 1: Add the two rubber grommets.

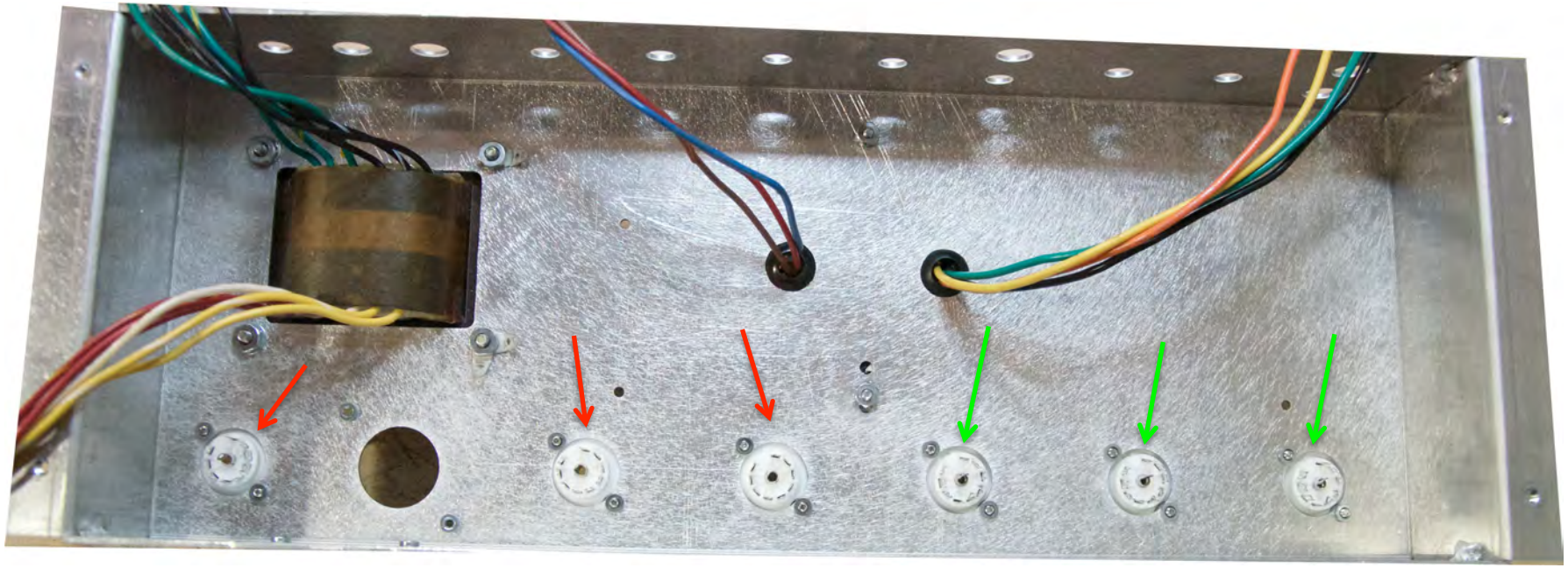


Step 2: Add transformers. Orient the power transformer so that the red and yellow wires are pointing towards the back side of the chassis. Orient the output transformer so that the red/blue/brown wires are pointing towards the power transformer. Use #8 screws, nuts and lock washers. Note: The power transformer already has screws installed in it. Use the terminal washers instead of regular lock washers on the 2 power transformer screws on the right side.

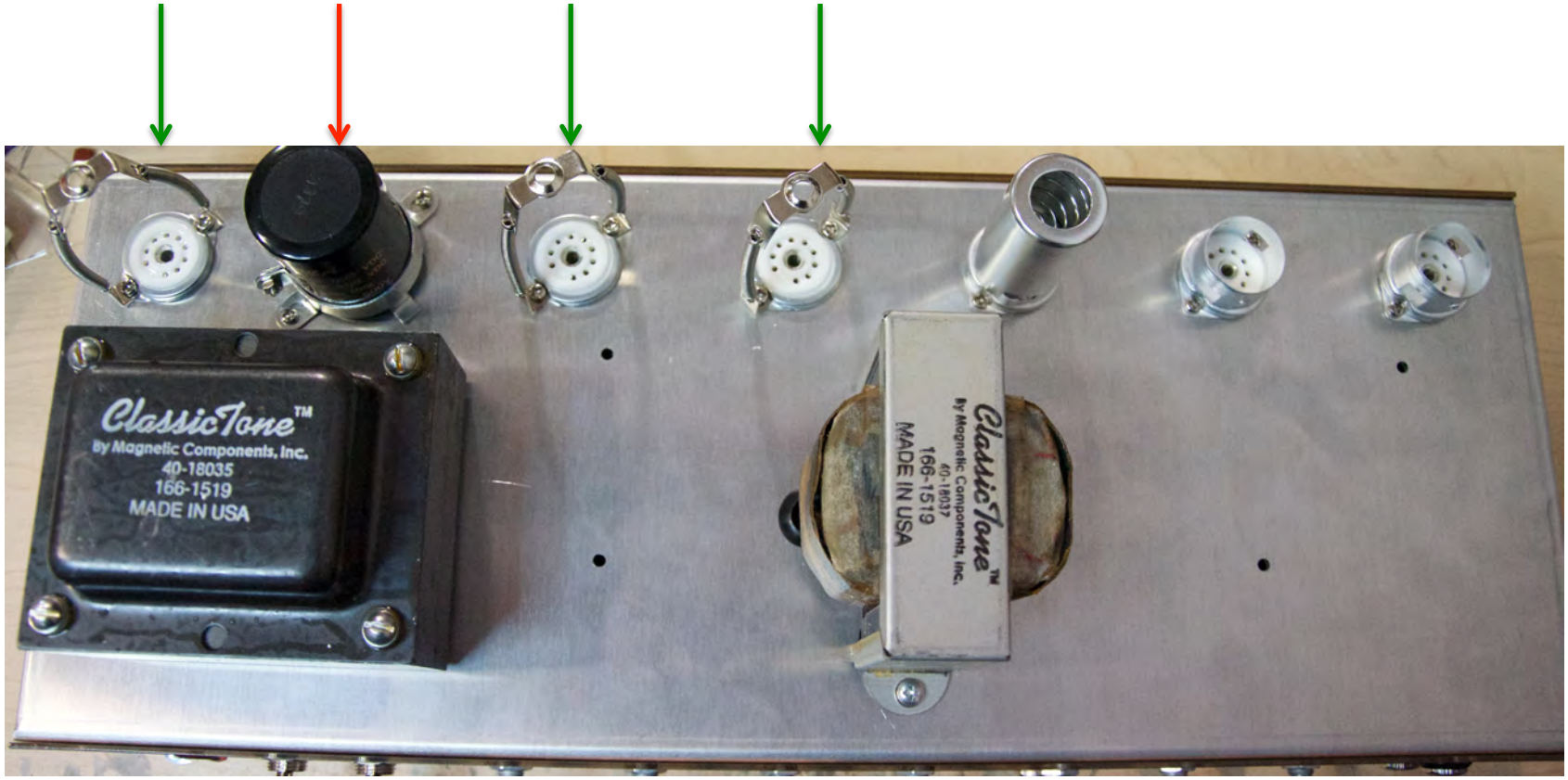
Step 3: add the preamp tube sockets. NOTE: these sockets are different from the 3 other 9-pin sockets for the power and rectifier tubes. These will have a base for the shield cover to connect to.

Crimp pins 4 & 5 of the preamp tube sockets together with a pair of pliers before mounting to the chassis. DO NOT do this to the power/rectifier tube sockets.

Close up of spring retainer attached to power/rectifier tube socket.



Mount the preamp tube sockets to the chassis (green arrows). Use M3 screws. The red arrows indicate the 9 pin power and rectifier tube sockets.



Step 4: Mount the power and rectifier tube sockets/spring retainers indicated by the green arrows. Use M3 screws.

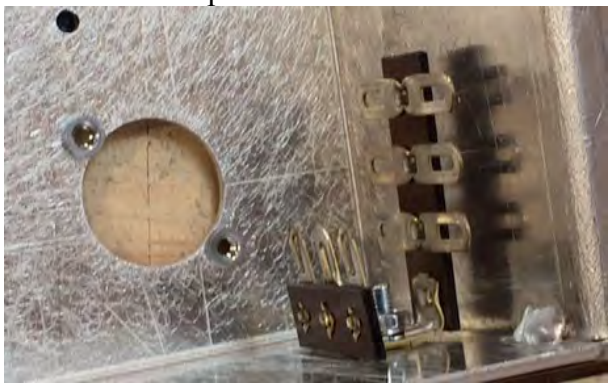
Step 5: Mount the 32uF+32uF multi –capacitor using the capacitor clamp ring indicated by the red arrow. Mount the clamp ring to the chassis using M3 screws. Insert the capacitor into the clamp ring. Tighten the clamp ring by adding an M3 screw and nut.

STOP!

Before going any further, inspect the 32uF+32uF capacitor to make sure the lugs are NOT touching the chassis. If they are, twist the capacitor a little until there is clearance. If it is too close for your comfort, twist the capacitor a little until there is clearance. DO NOT continue if there is a chance the lug will short against the chassis.

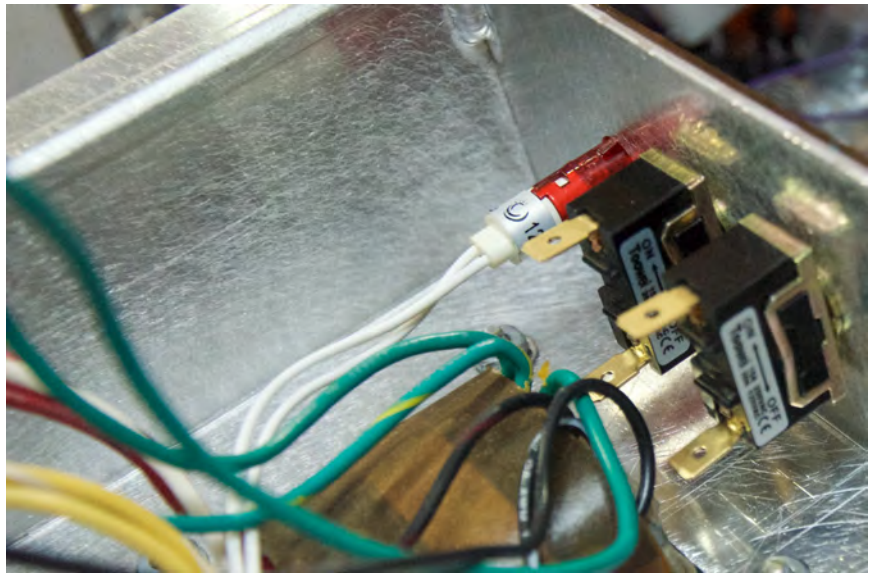
Be aware of the clearance when wiring the capacitor to avoid any sort of high voltage short.

Step 5: Attach the rear plexi panel. BE VERY CAREFUL. These plexi panels are very fragile. Use ½ inch #4 screw for rear plexi panel as shown

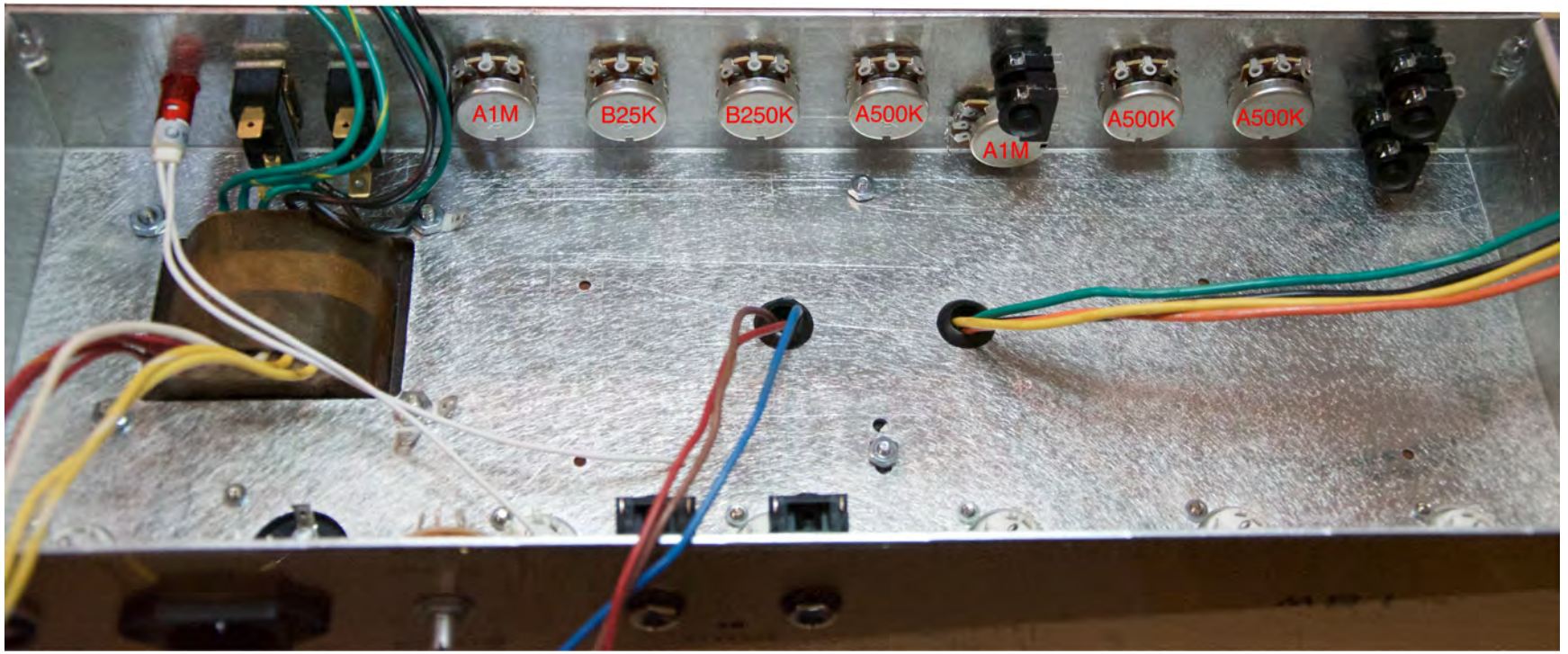


Step 6: Attach the two terminal strips to this screw. Use a #4 nut and lock washer to secure.

Step 7: Add the rest of the rear panel parts. Use the small black flat head screws for the power cord socket.

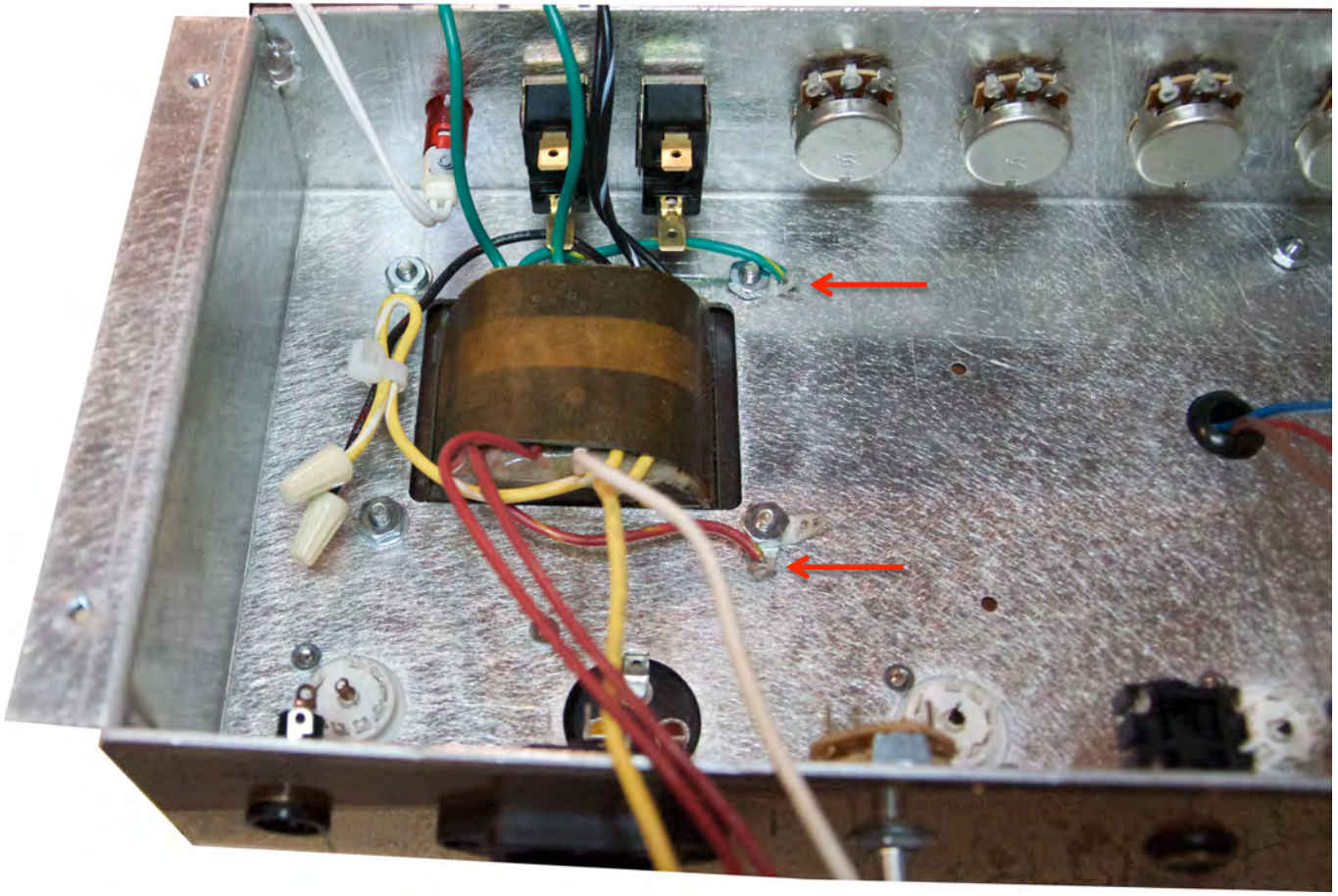


Step 8: Add the front plexi panel. Add the Switches and lamp to hold it in place. Orient the toggle switches so that the "ON" side is facing up

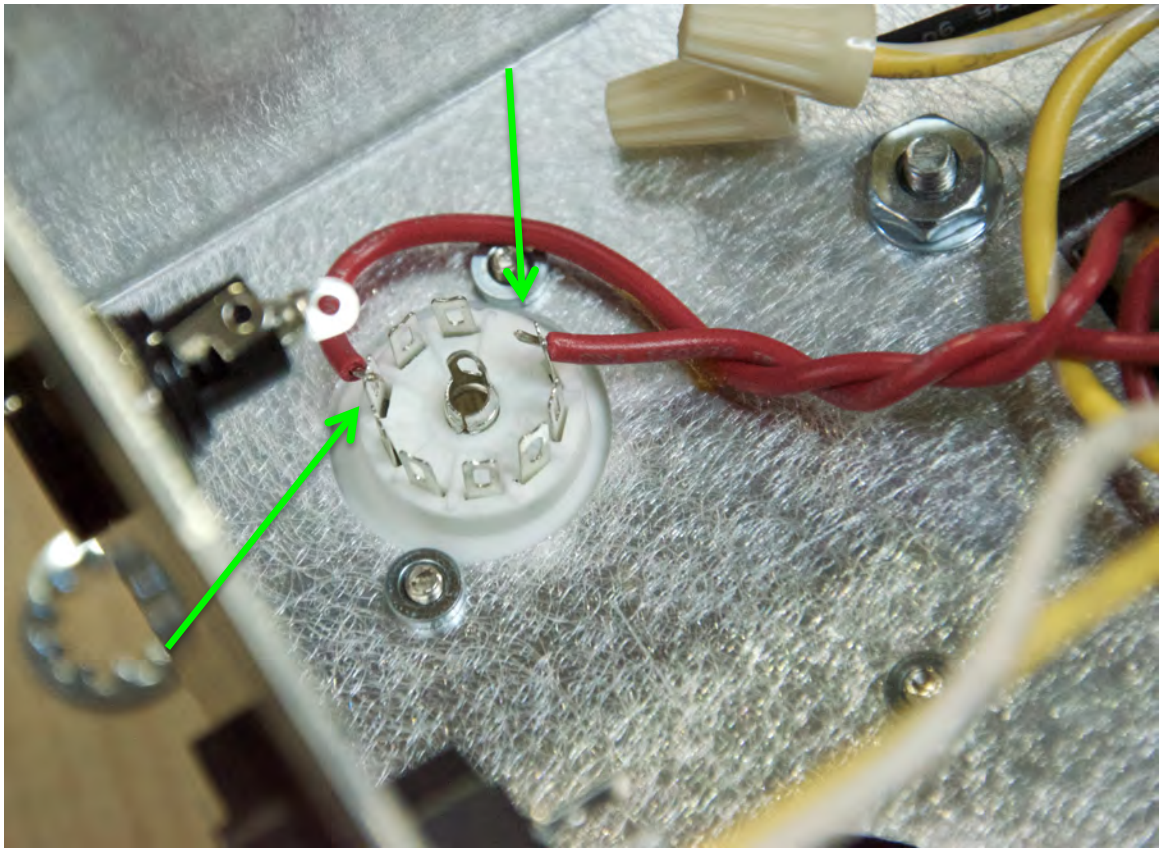


Step 9: Add the rest of the front panel parts. Orient the potentiometers and jacks like the photo above, and be sure of their values.

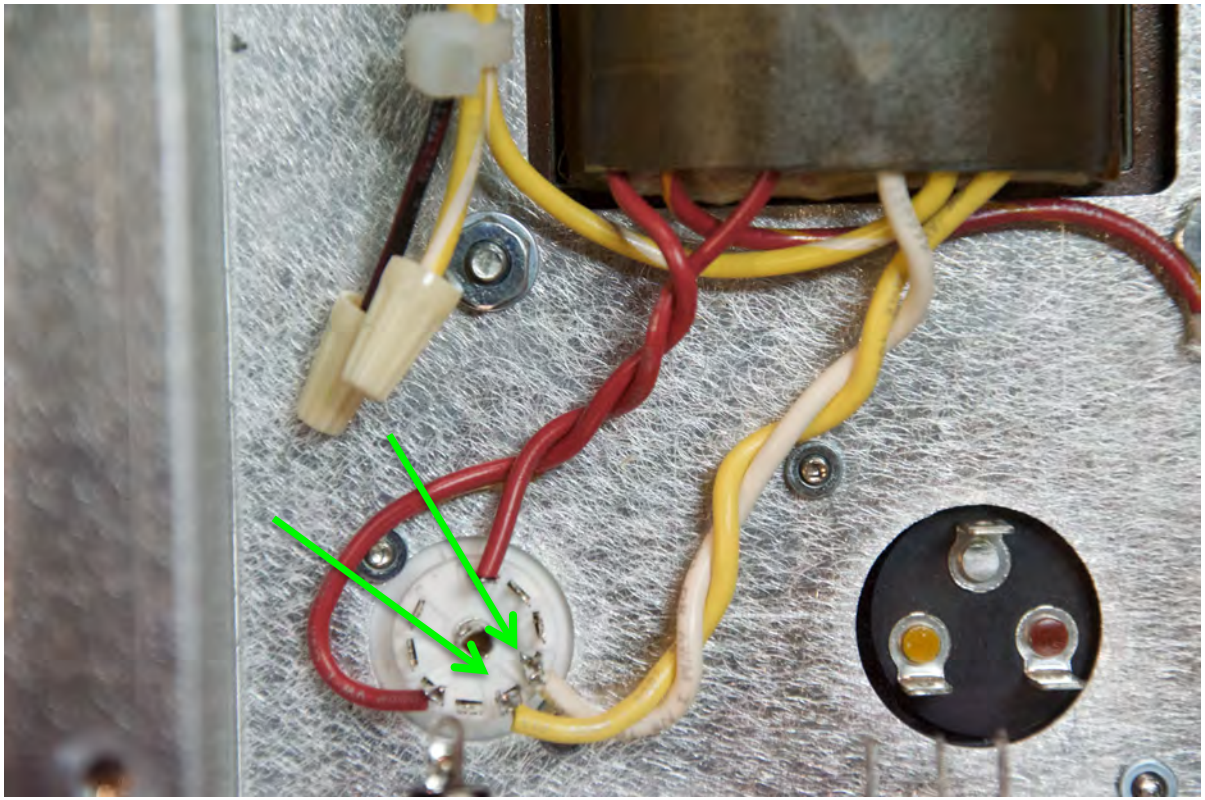
VERY IMPORTANT!!! If you are using a 120VAC power supply, you will use the BLACK/WHITE power transformer wire. If you are using 240VAC, you will use the BLACK/RED power transformer wire.



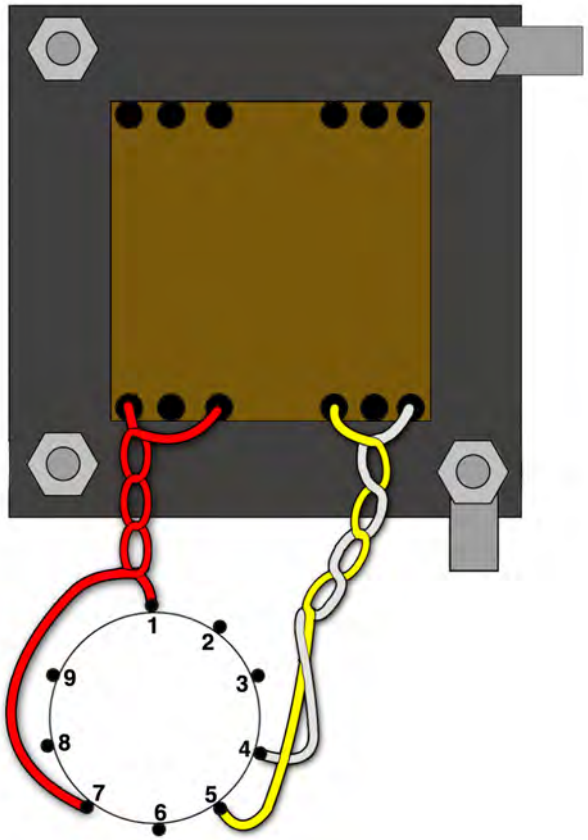
Step 10: Cut and cap the black/red (or black/white if you are in a 240VAC country), and yellow/white wire. Insert the Green/Yellow wire to the upper ground solder terminal, and the Red/Yellow wire to the lower ground solder terminal (red arrows). Do not solder these yet. More wires need to be inserted into these solder terminals. You will solder them later.



Step 11: Twist the red wires together and place them into pins 1 and 7. It does not matter which red wire goes to which pin. Solder both connections.



Step 9: Twist the yellow and white wires together and place them into pins 4 and 5. Make sure the white wire is in pin 4, and the yellow is in pin 5. Solder both wires.


1
2
3
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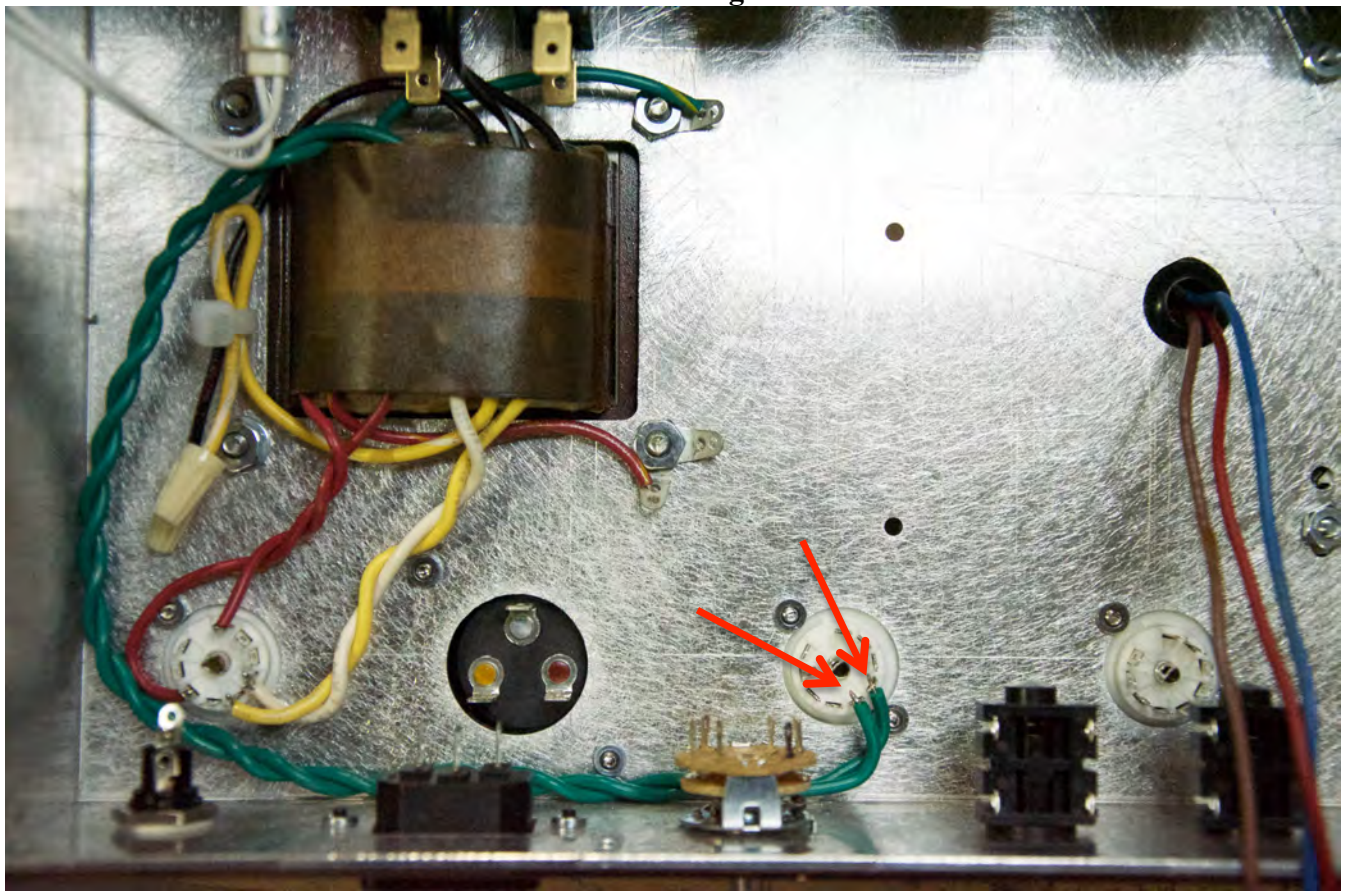
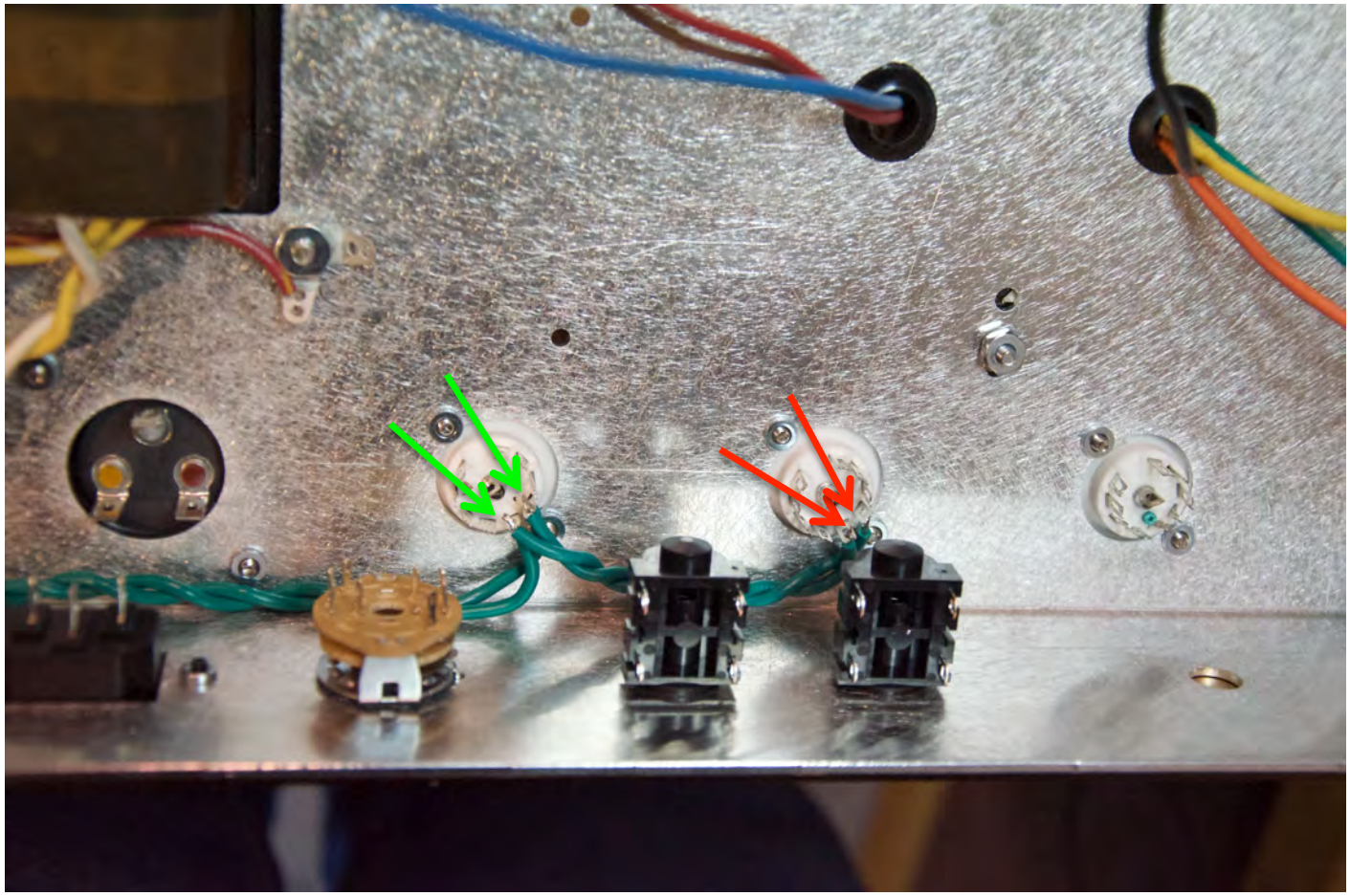
9

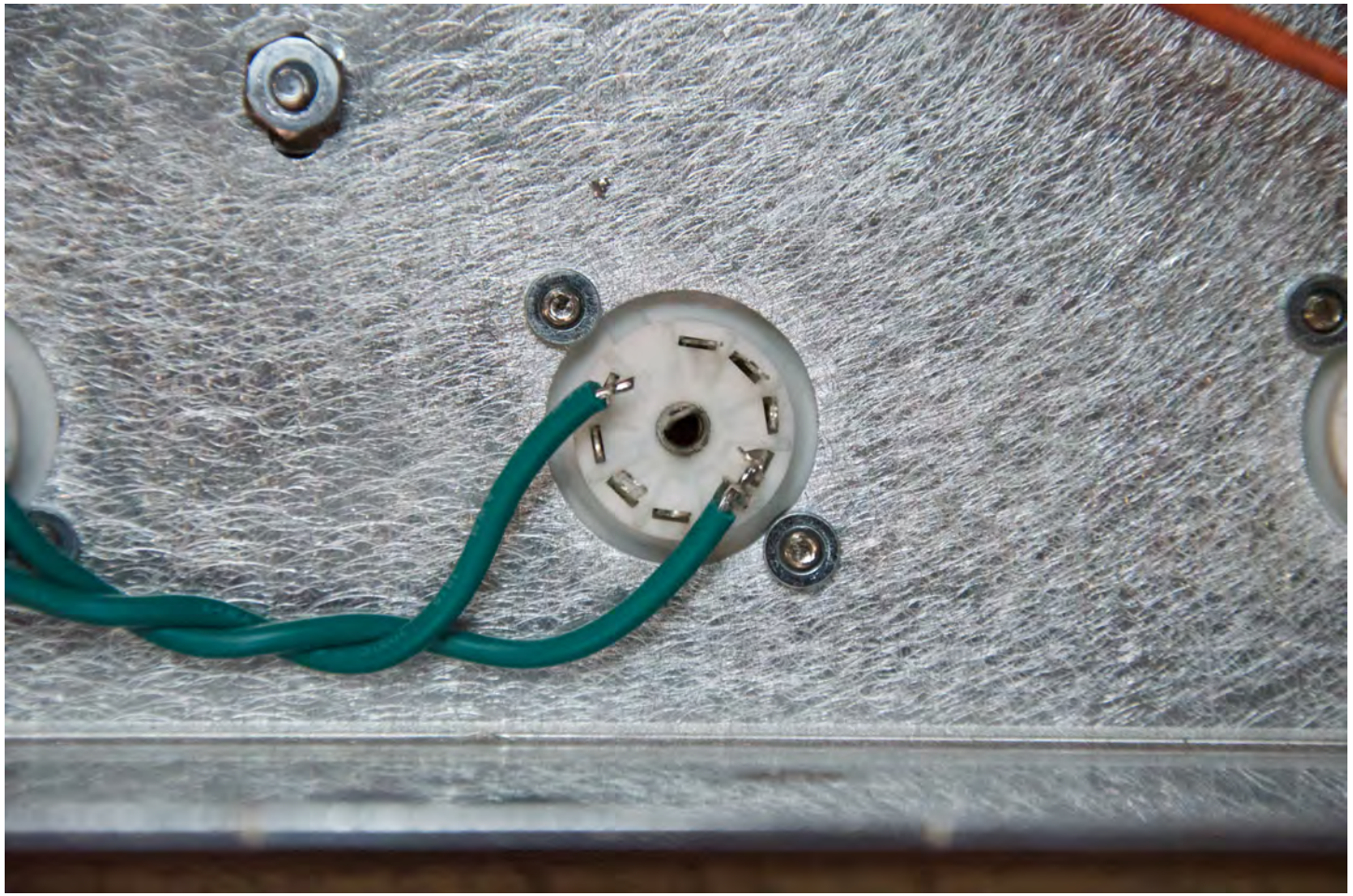
For this section you will need the length green wire included in your kit. You will want to cut them to make pieces that are 3 ½ inches long.



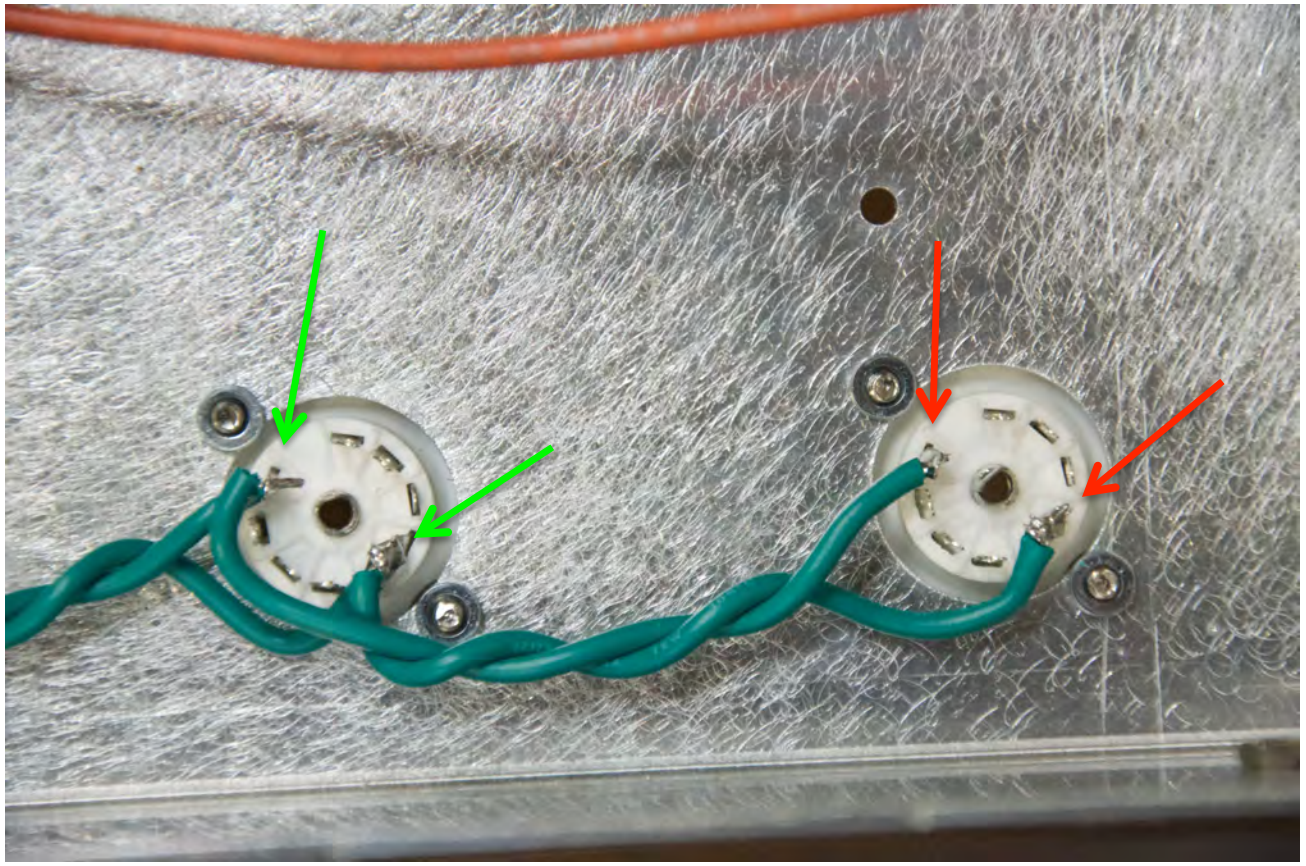
Step 10: Twist the green wires coming off the transformer together and run them to the first EL84 socket. Attach them to pins 4 and 5. Do not solder yet. Note: you will probably need the full length of the green heater wires to make the connection. Keep in mind while doing the heater wiring, it does not matter which wire goes to which pin.



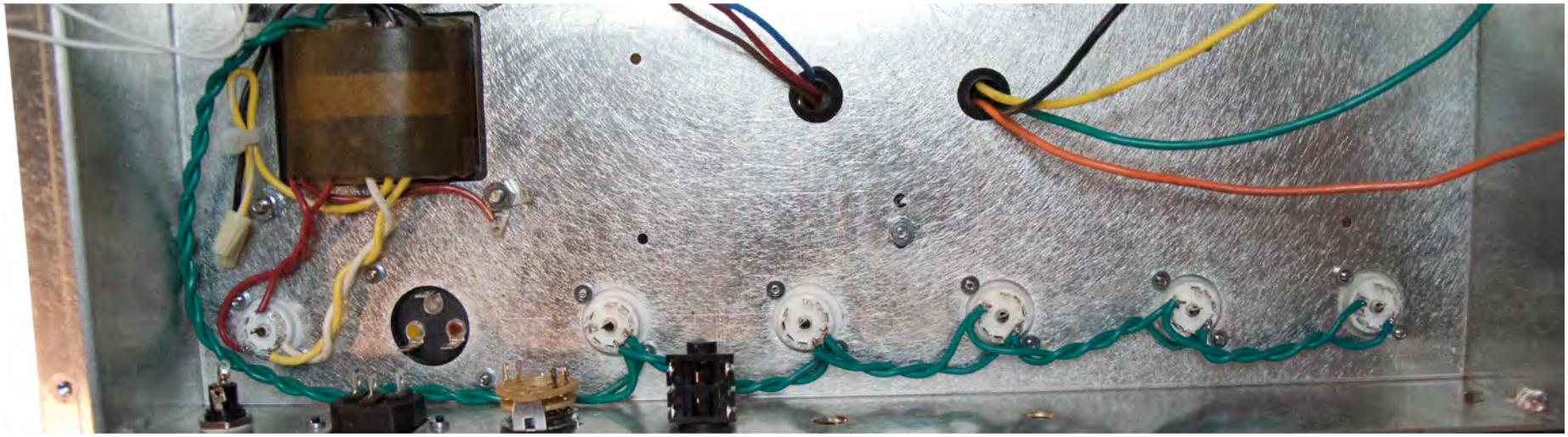
Step 11: Take two 3 ½ inch pieces of green wire and attach them to the first EL84 socket in pins 4 and 5. Solder at the green arrows. Twist the wires and run to the next tube socket. Attach these at the red arrows at pins 4 and 5 of the second EL84 tube socket, but do not solder yet.



Step 12: Repeat the previous step. Place two 3 ½ inch pieces of green wire into pins 4 and 5 of the second EL84 and solder them. Then twist the green wires and run to the next socket. This time **Connect the wires to pins 9 and 4/5 of the first preamp tube socket**. Do not solder these connections yet.

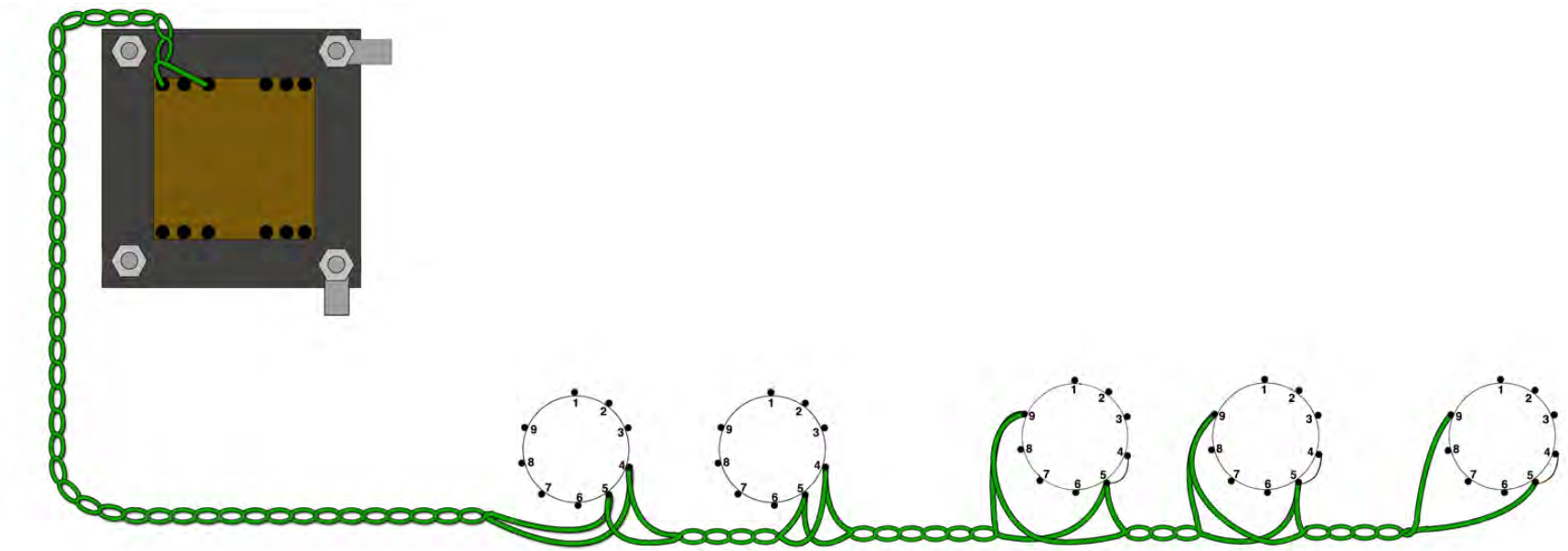


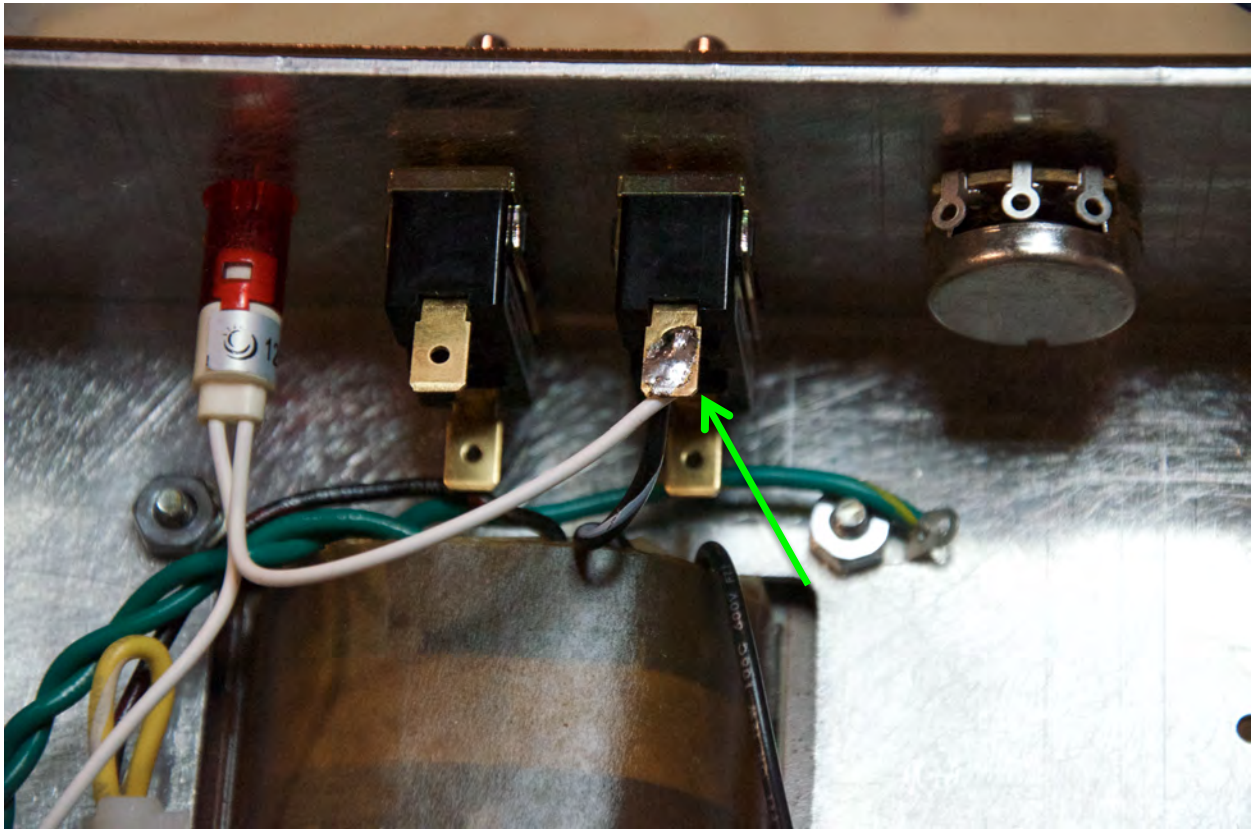
Step 13: Take another pair of 3 ½" green wires and insert them in to pins 9 and 4/5 of the first preamp tube socket. You can solder these points at the green arrows. Twist the green wires and insert them into pins 9 and 4/5 of the next preamp tube socket at the red arrows, but do not solder.



Step 14: Repeat the previous step for the final tube socket. This time you can solder all connections. The picture above shows what your heater wiring should look like.

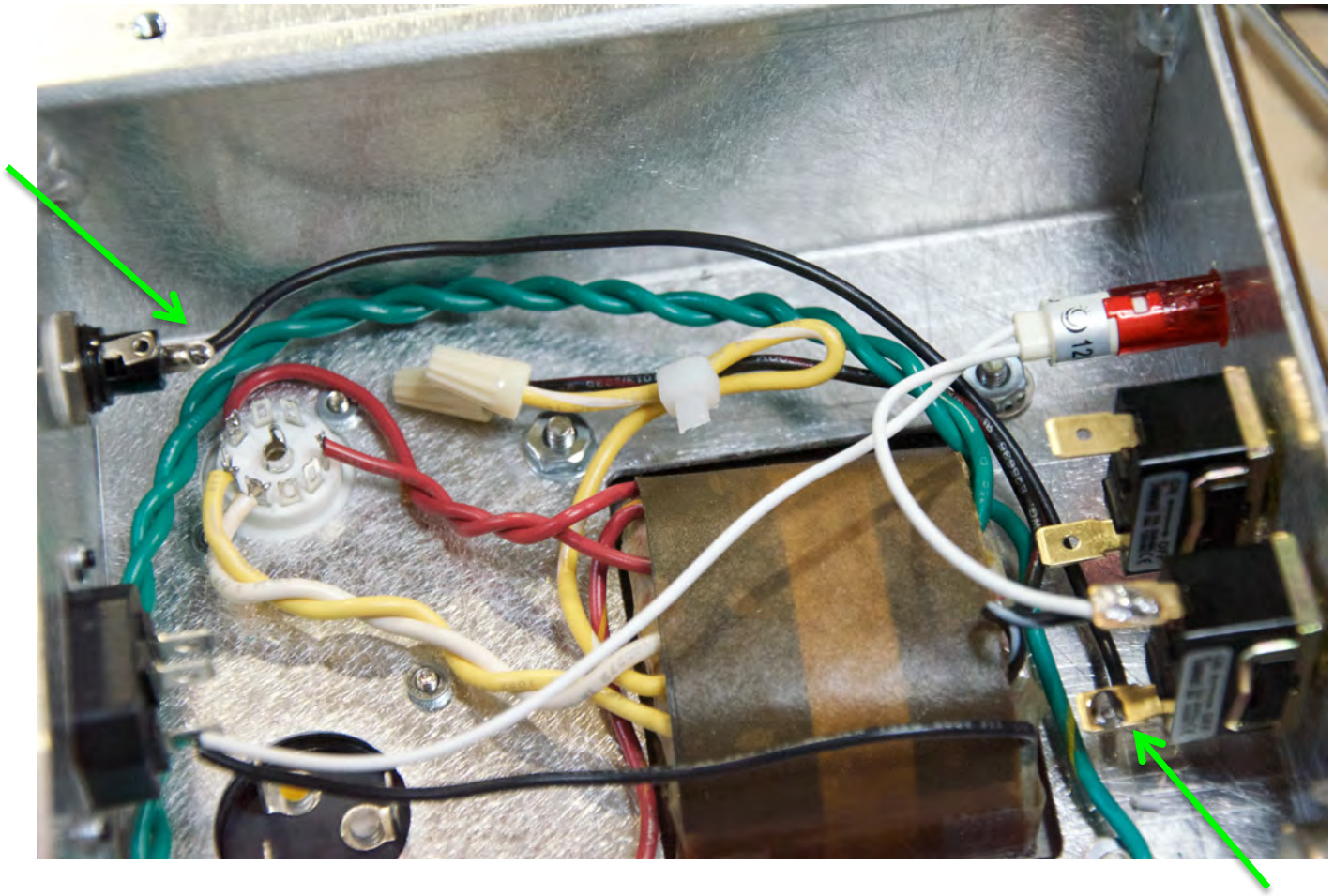
Heater wiring diagram



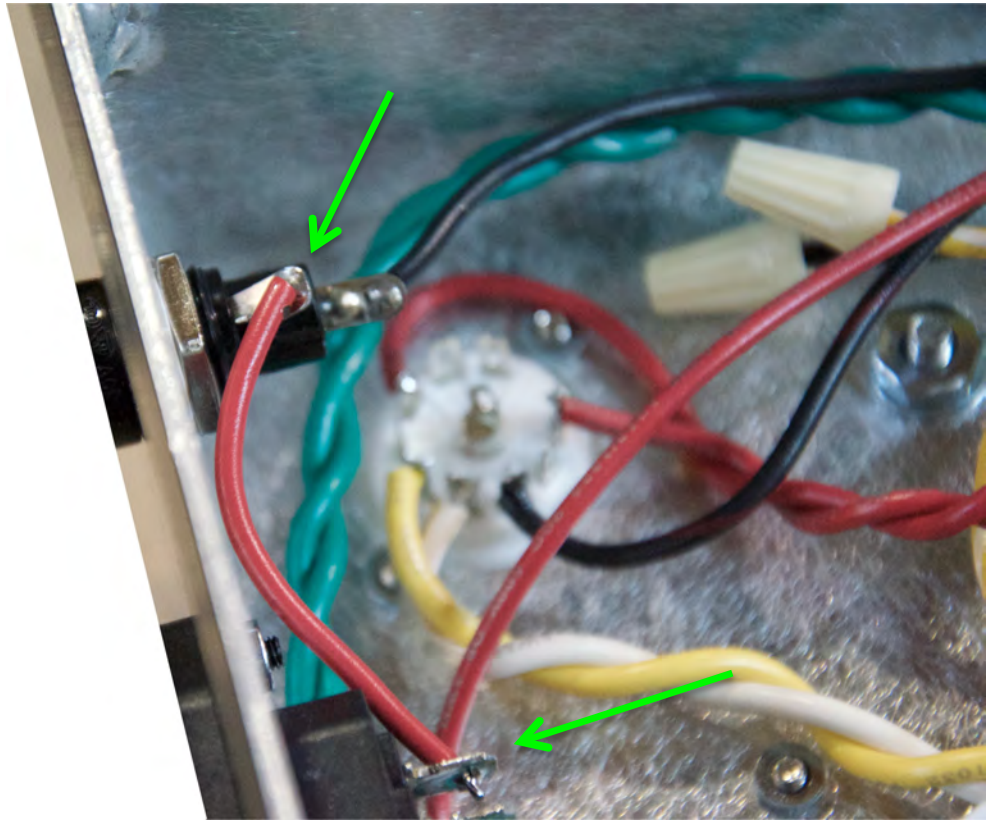


Step 15: Attach the Black/White wire and one of the lamp wires to the “ON” side of the mains switch and solder.
NOTE: It does not matter which lamp wire.

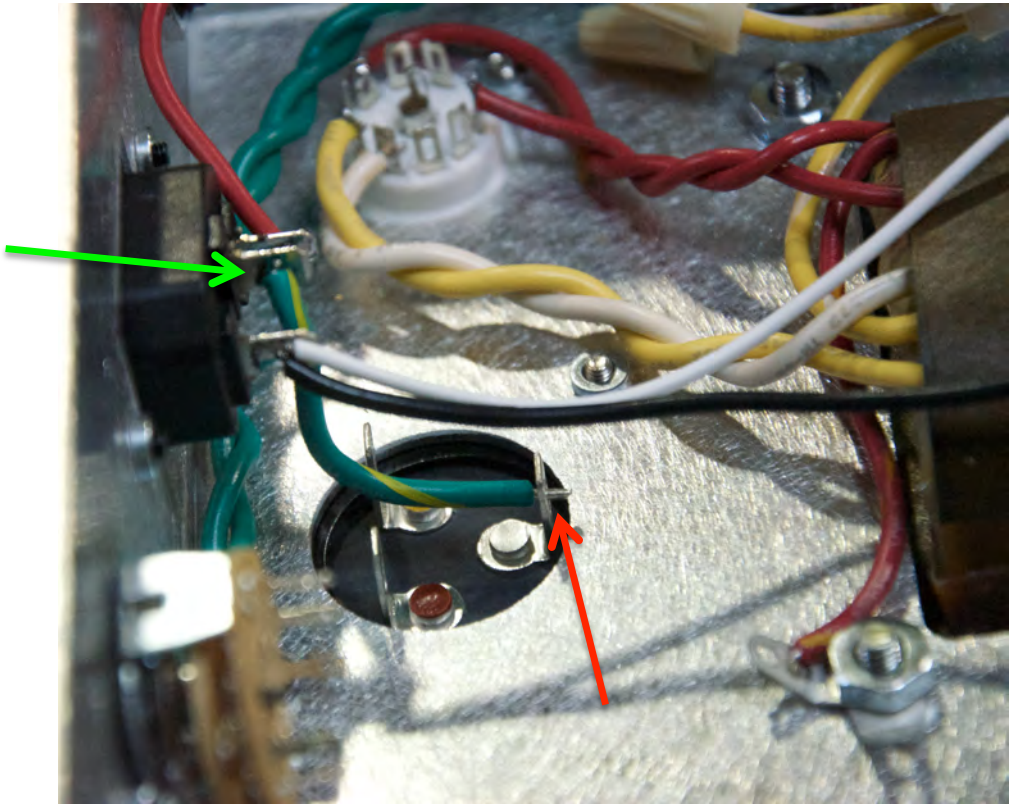
Step 16: Connect the Black wire from the transformer and the remaining lamp wire to the “N” terminal of the power receptacle and solder.



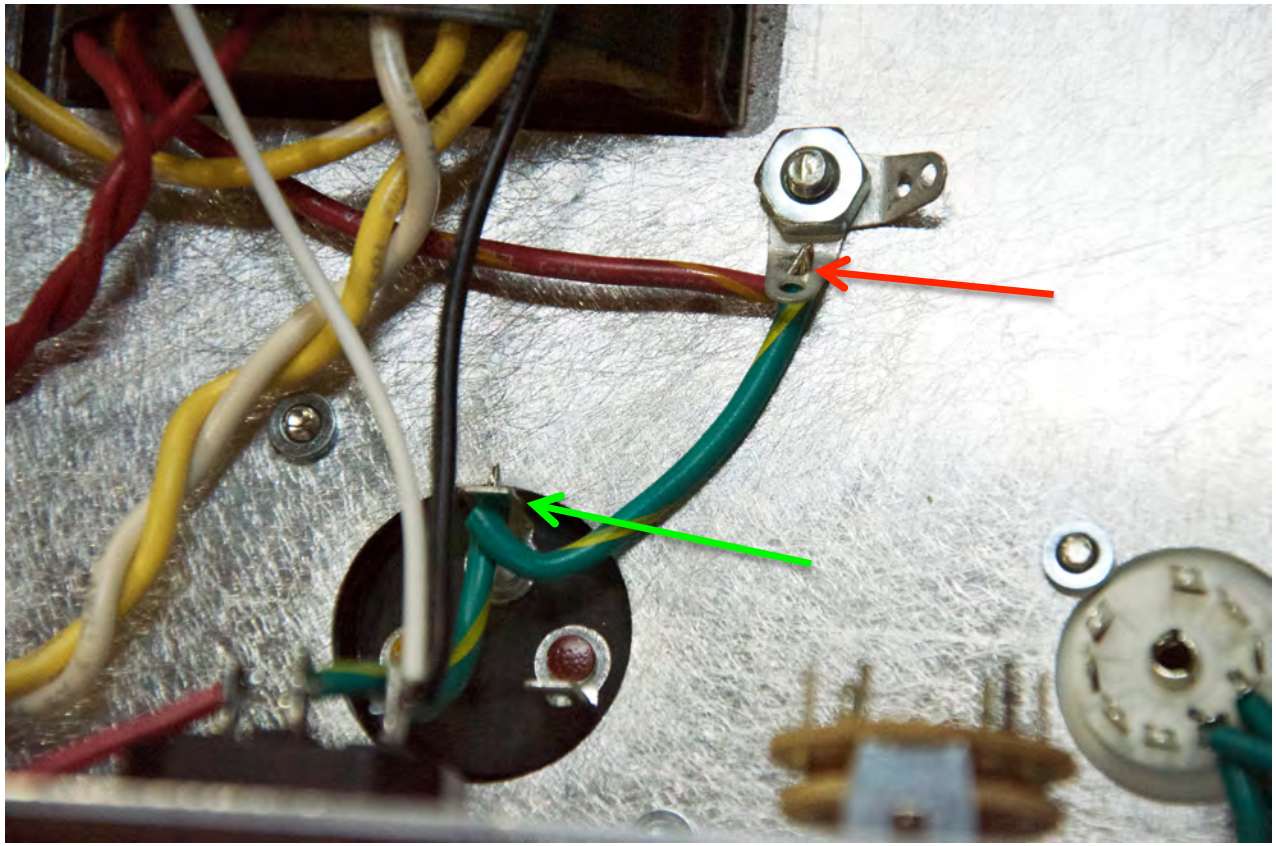
Step 17: Using the clipped black wire from the previous step, connect the center pin of the fuse holder to the "OFF" side of the MAINS switch (green arrows) and solder.



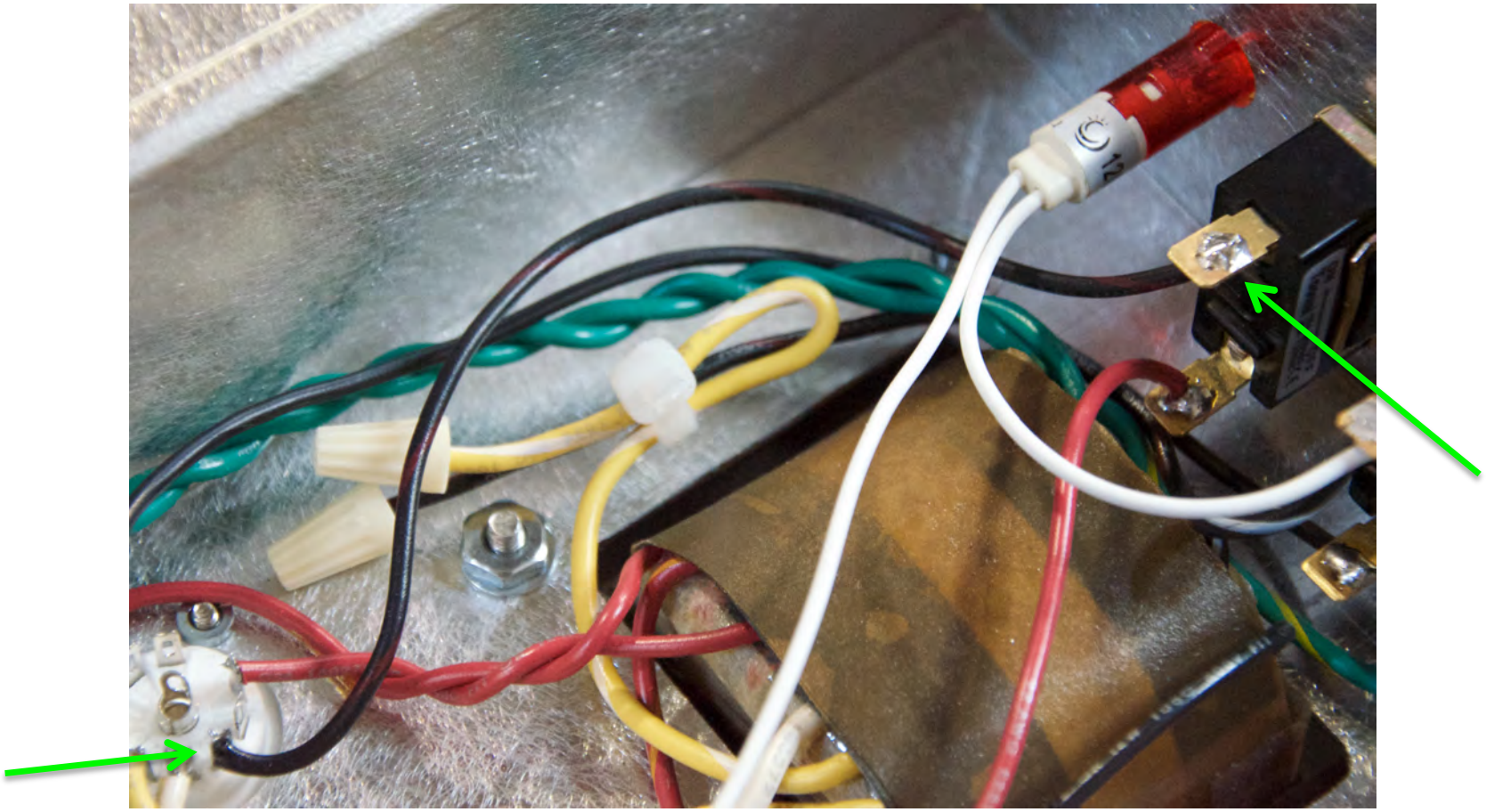
Step 18: Using a piece of red wire, connect the remaining fuse terminal to the “L” lug of the power receptacle and solder.



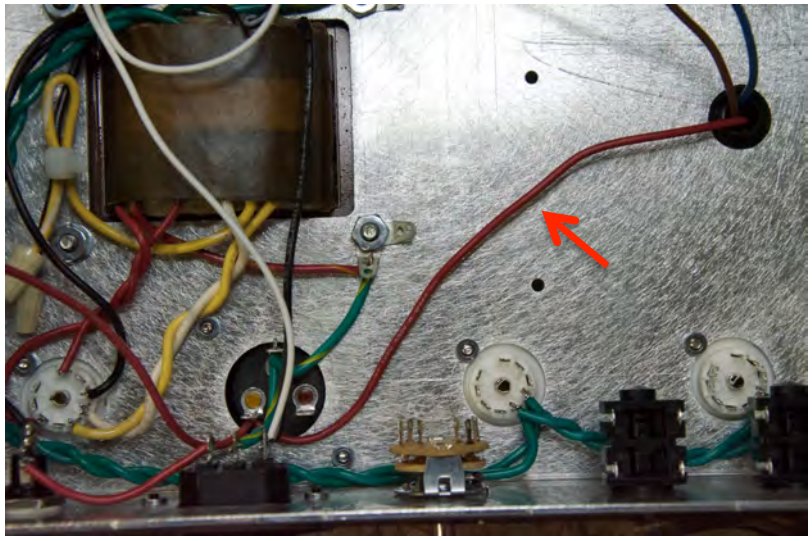
Step 19: Using a piece of the Green/Yellow wire, connect the “E” terminal of the power receptacle to the silver lug of the capacitor. Solder at the power receptacle (green arrow). Do not solder at the cap yet (red arrow).



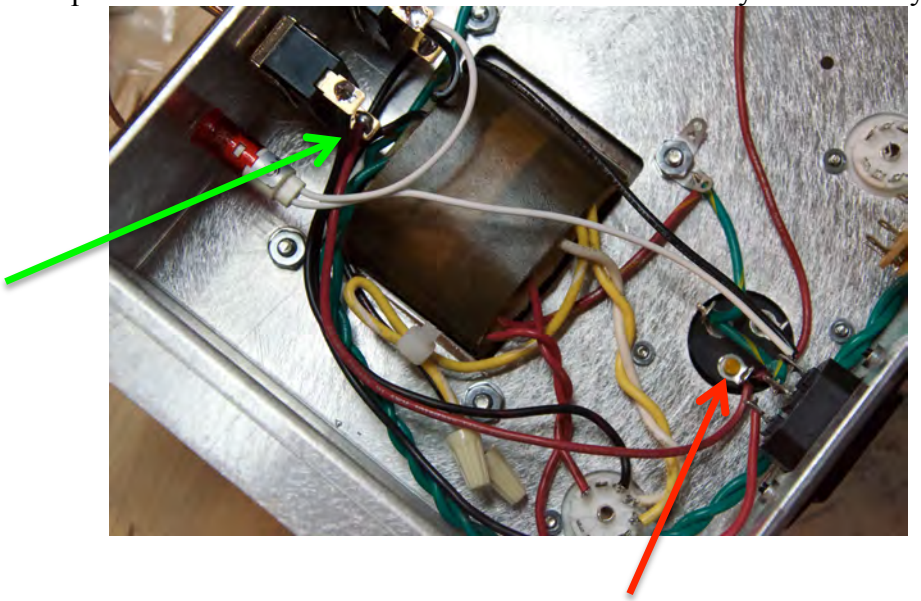
Step 20: Using another piece of Green/Yellow wire, connect the silver lug of the capacitor to the closest ground solder terminal. Solder the capacitor terminal (green arrow). Do not solder the ground terminal yet (red arrow).

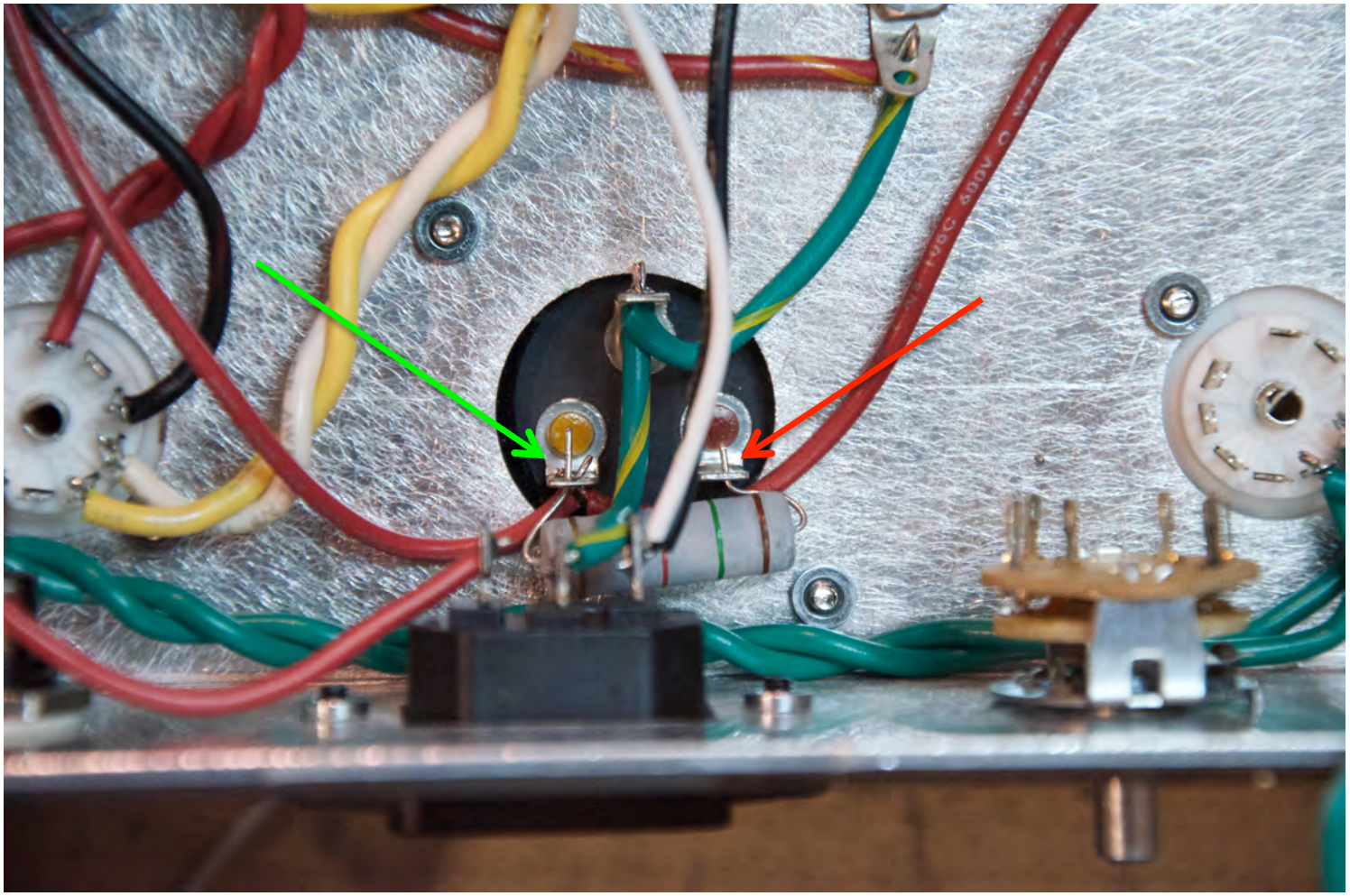


Step 21: Using a piece black wire, connect pin 3 of the rectifier tube to the “ON” side of the standby switch. Solder both spots (green arrows).

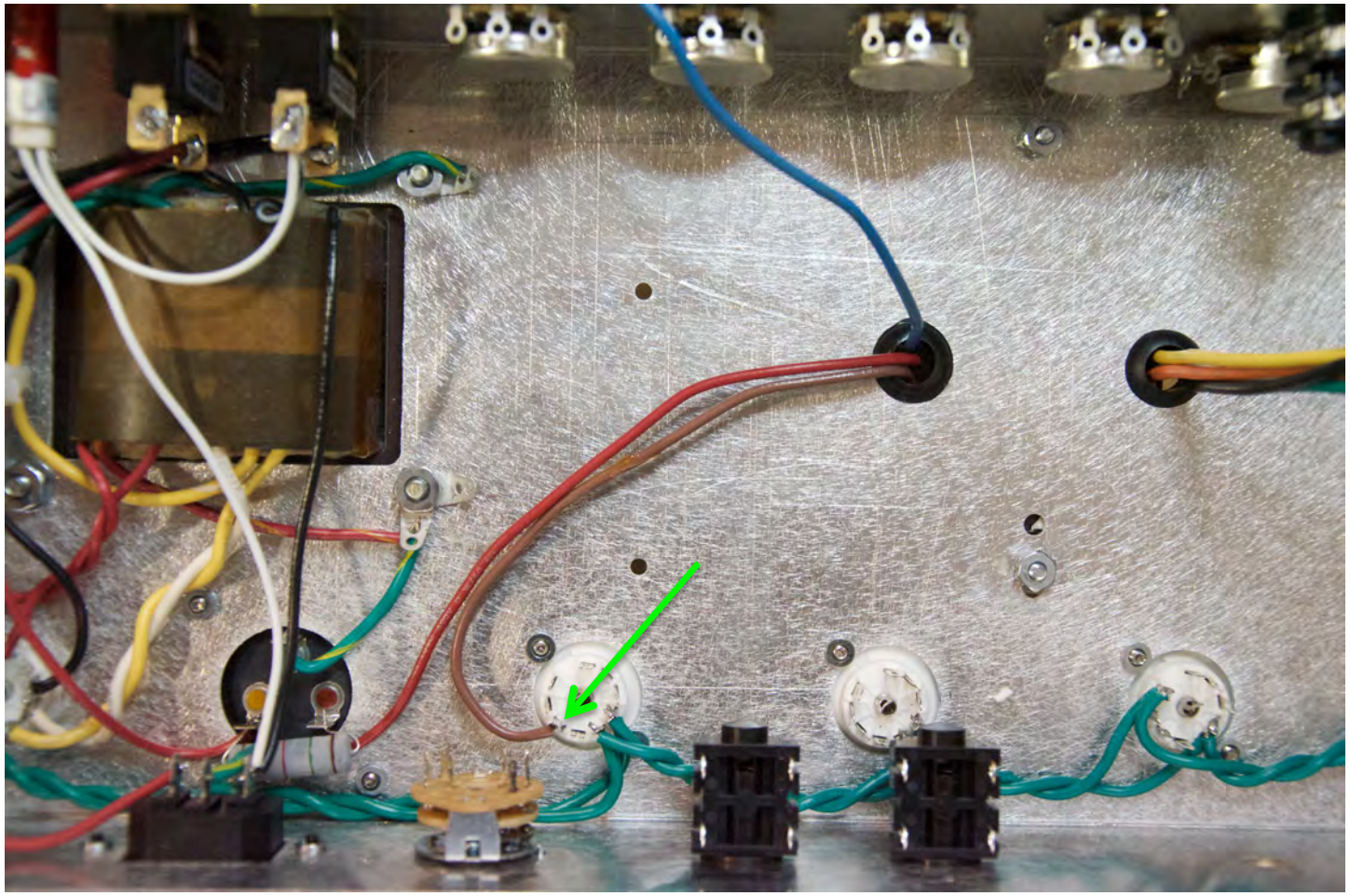


Step 22: Connect the red output transformer wire to the yellow terminal of the multi-capacitor. Use another piece of red wire to connect the yellow multi-capacitor terminal to the "OFF" terminal of the standby switch. Only solder at the switch terminal.

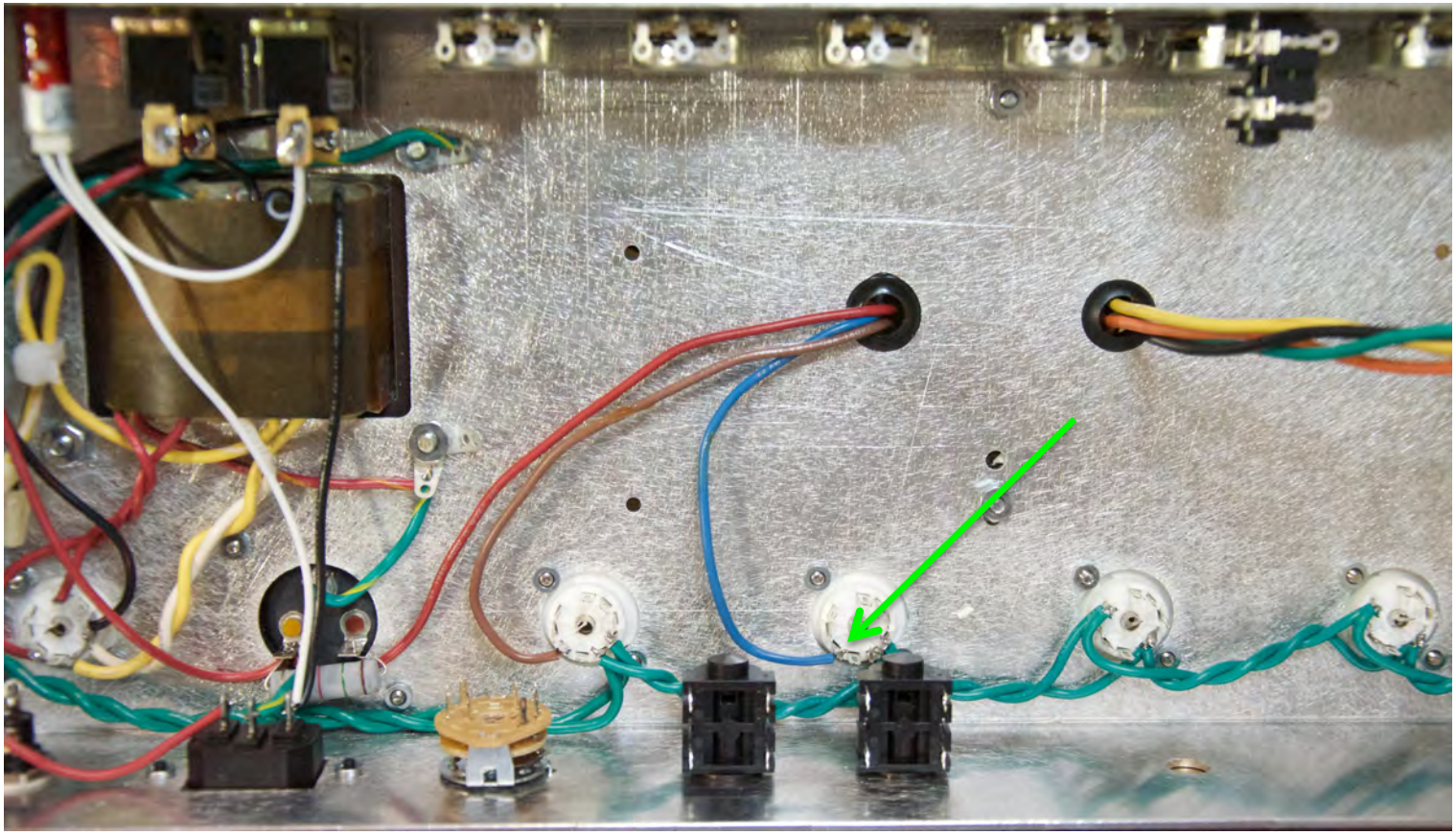




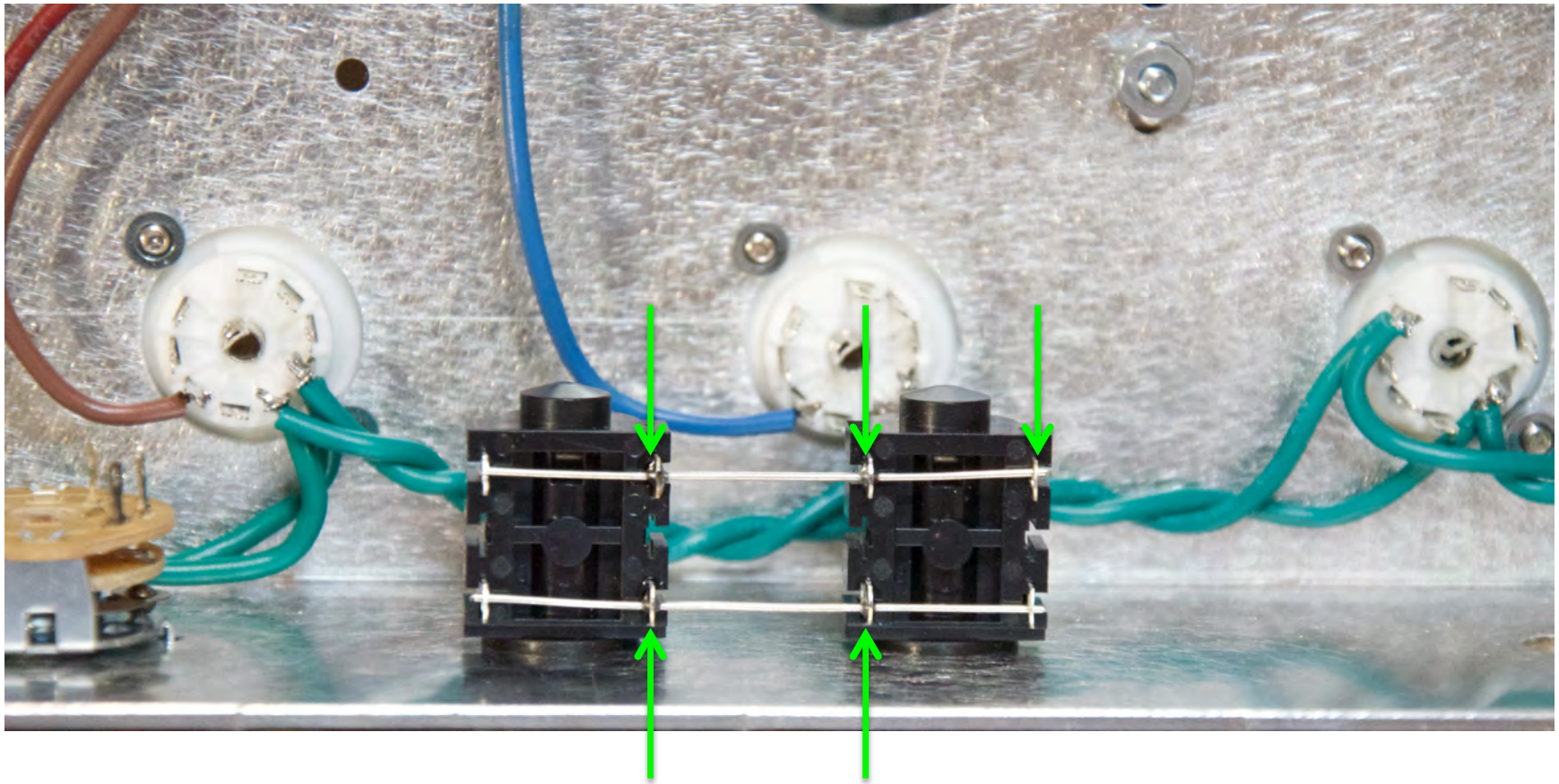
Step23: Insert the 1.5K 5W resistor between the yellow and red lugs of the multi-capacitor. Solder the yellow lug now (green arrow). Do not solder the red lug (red arrow)



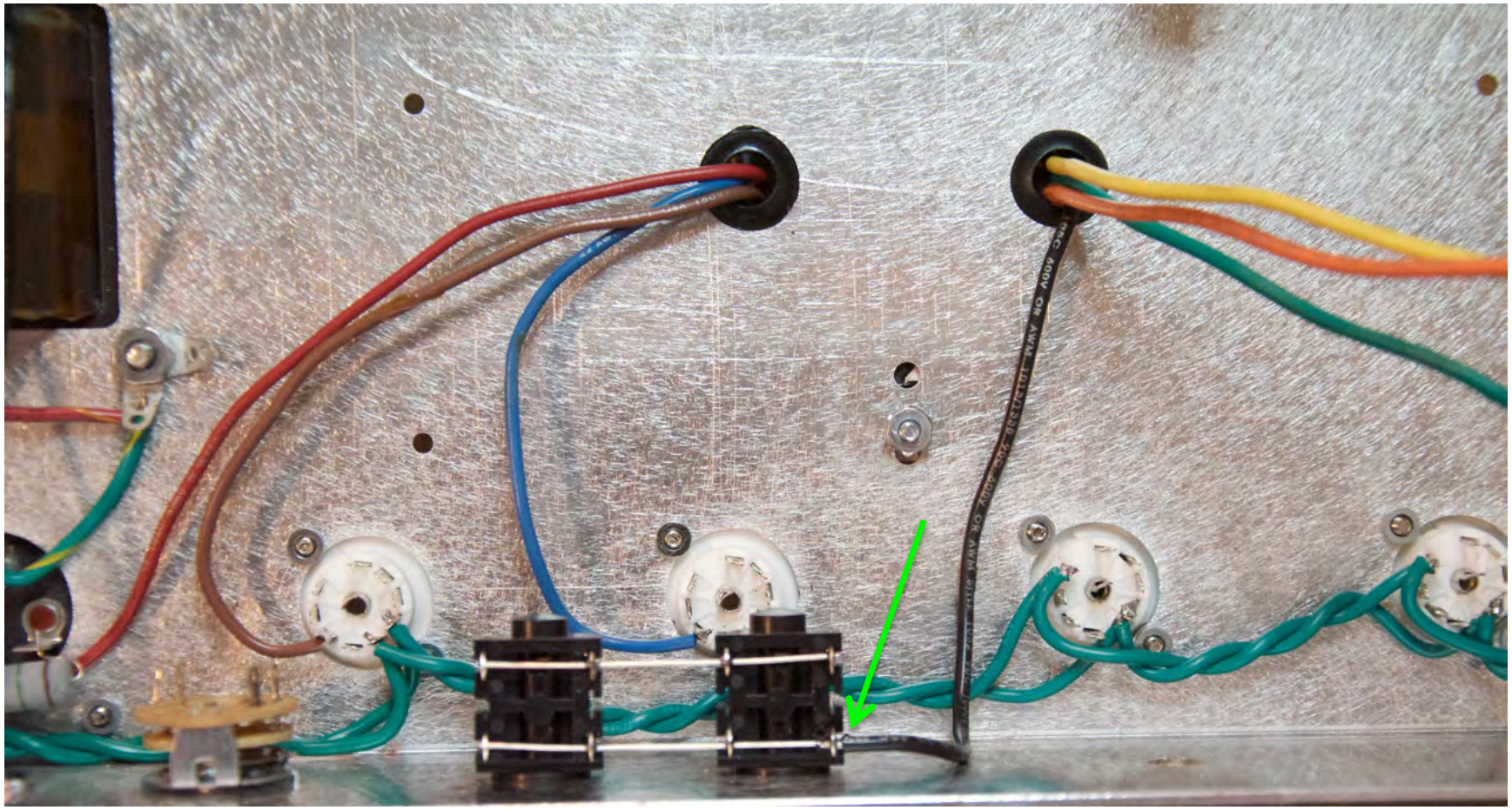
Step 24: Connect the brown OT (output transformer) wire to pin 7 of the first EL84. Solder this connection (green arrow).



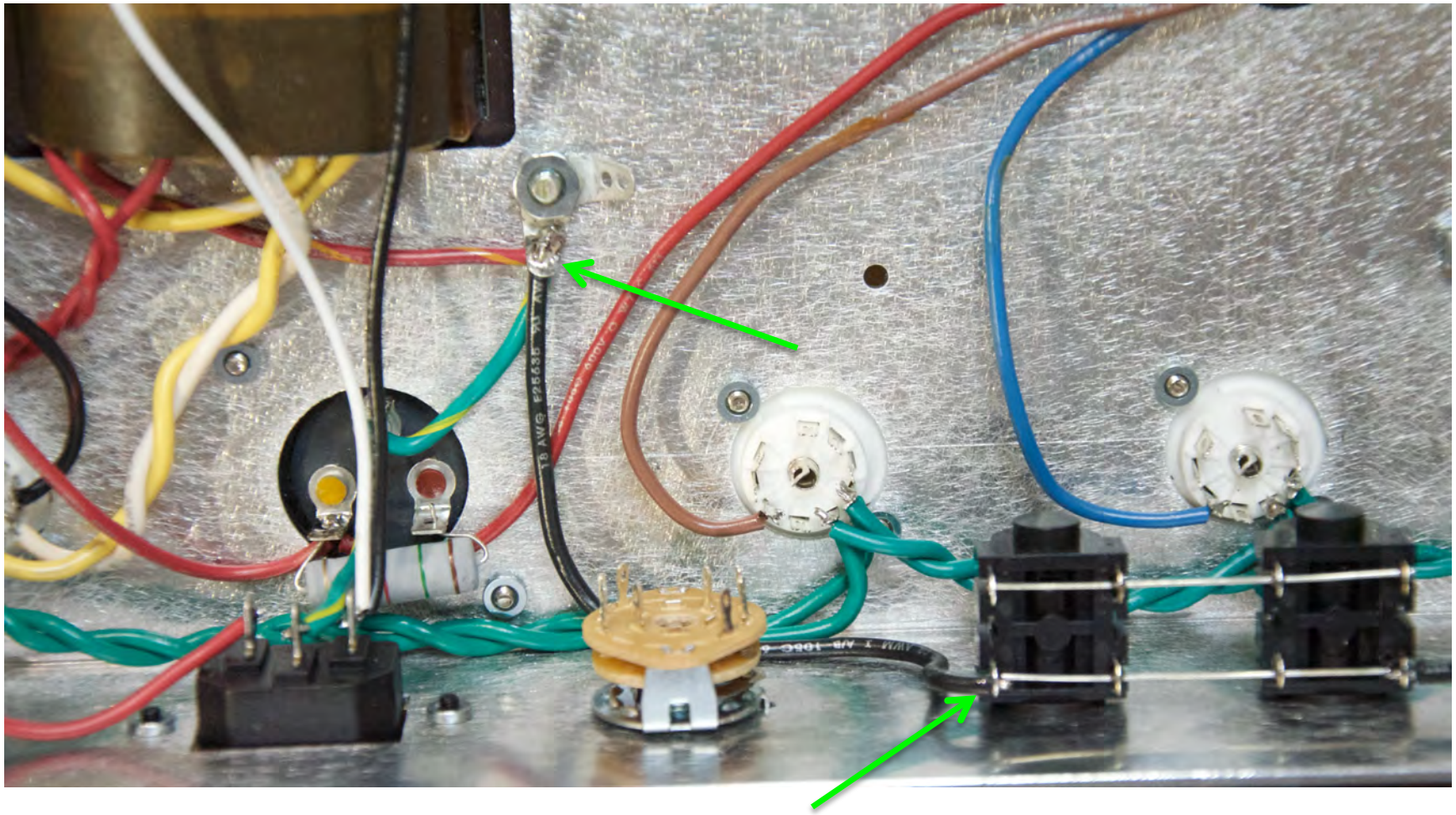
Step 25: Connect the blue OT primary wire to the next EL84 at pin 7. Solder this connection (green arrow).



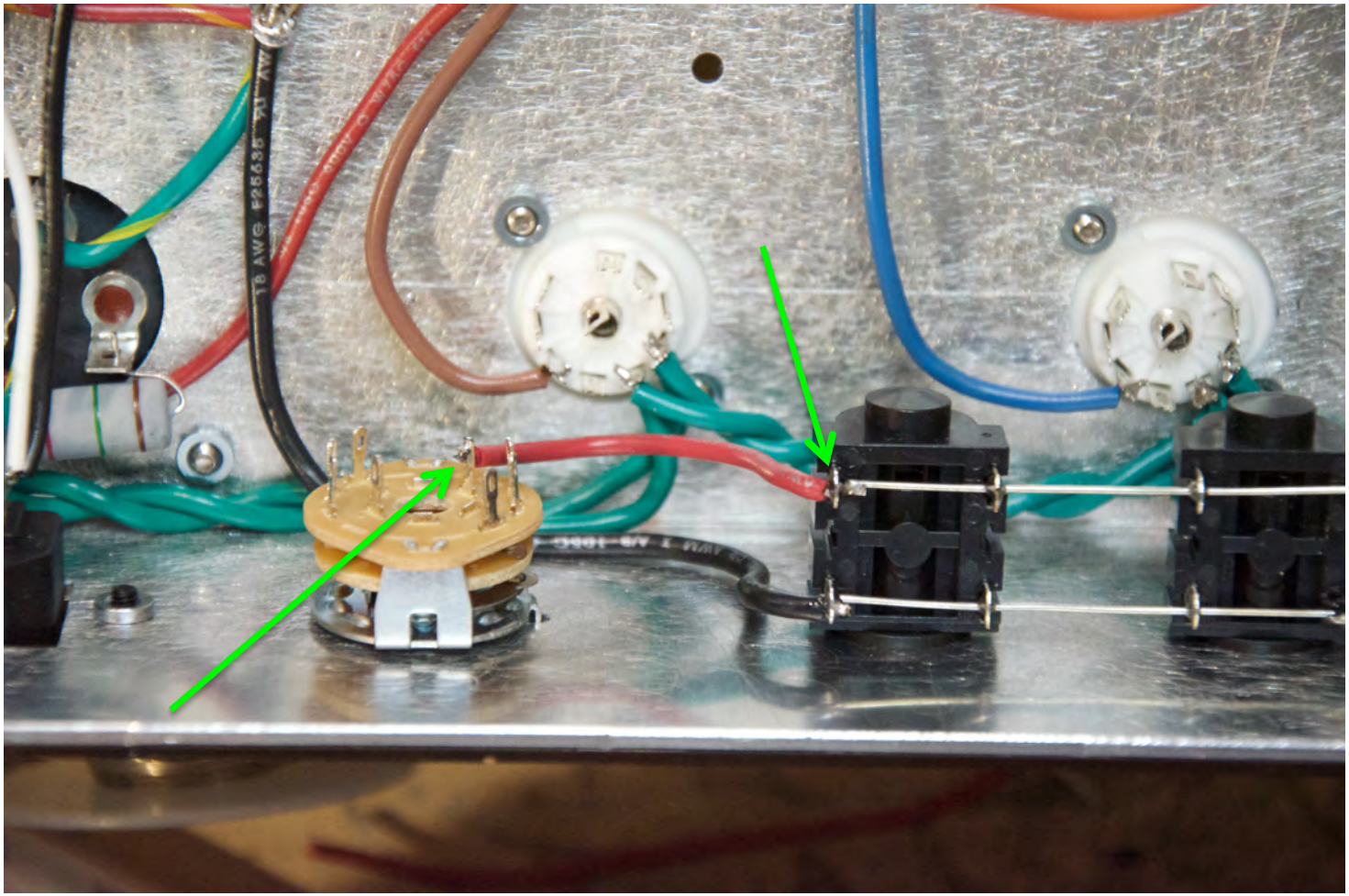
Step 26: Create the output jack bus connections. Using two pieces of bus wire, connect the lugs as shown. Only solder at the green arrows for now.



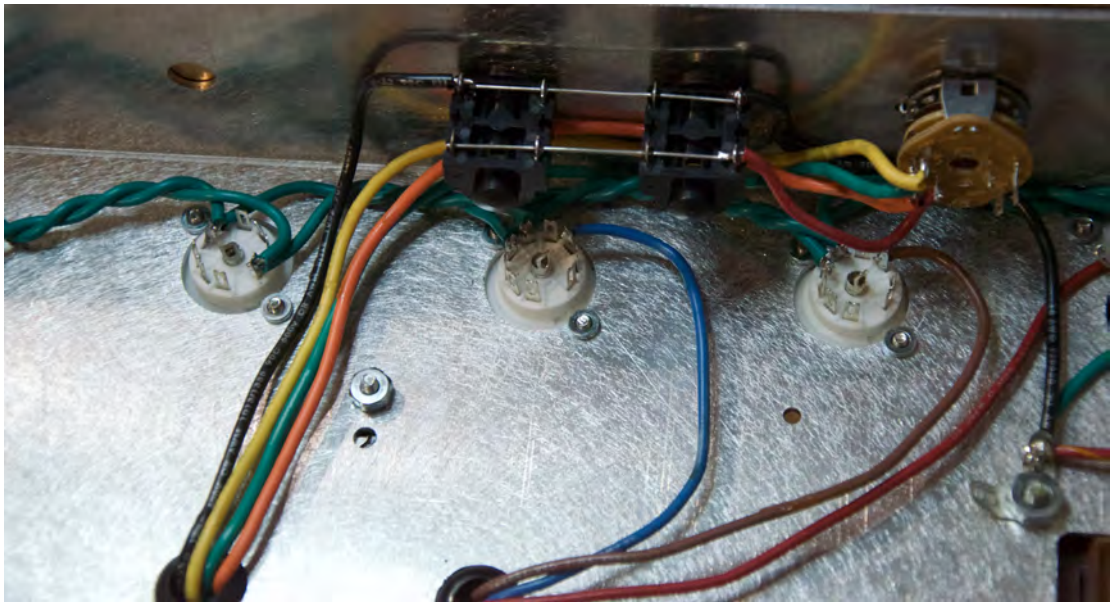
Step 27: Connect the black OT secondary wire to the output jack bus closest to the panel. Solder only at the green arrow for now.



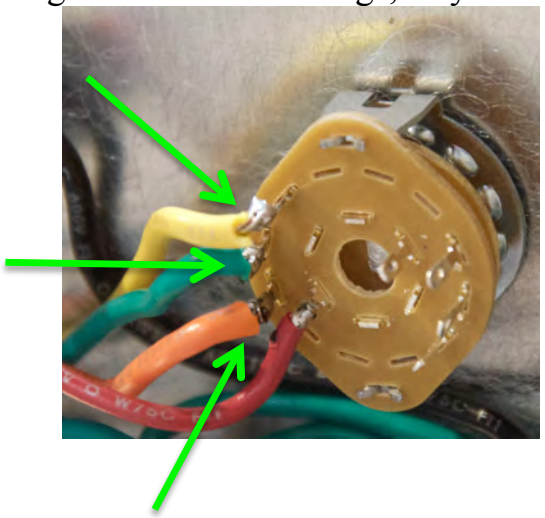
Step 28: Using a piece of the black wire you just cut, make the ground connection for the output jacks by connecting the bus to the ground terminal. Solder at the green arrows.

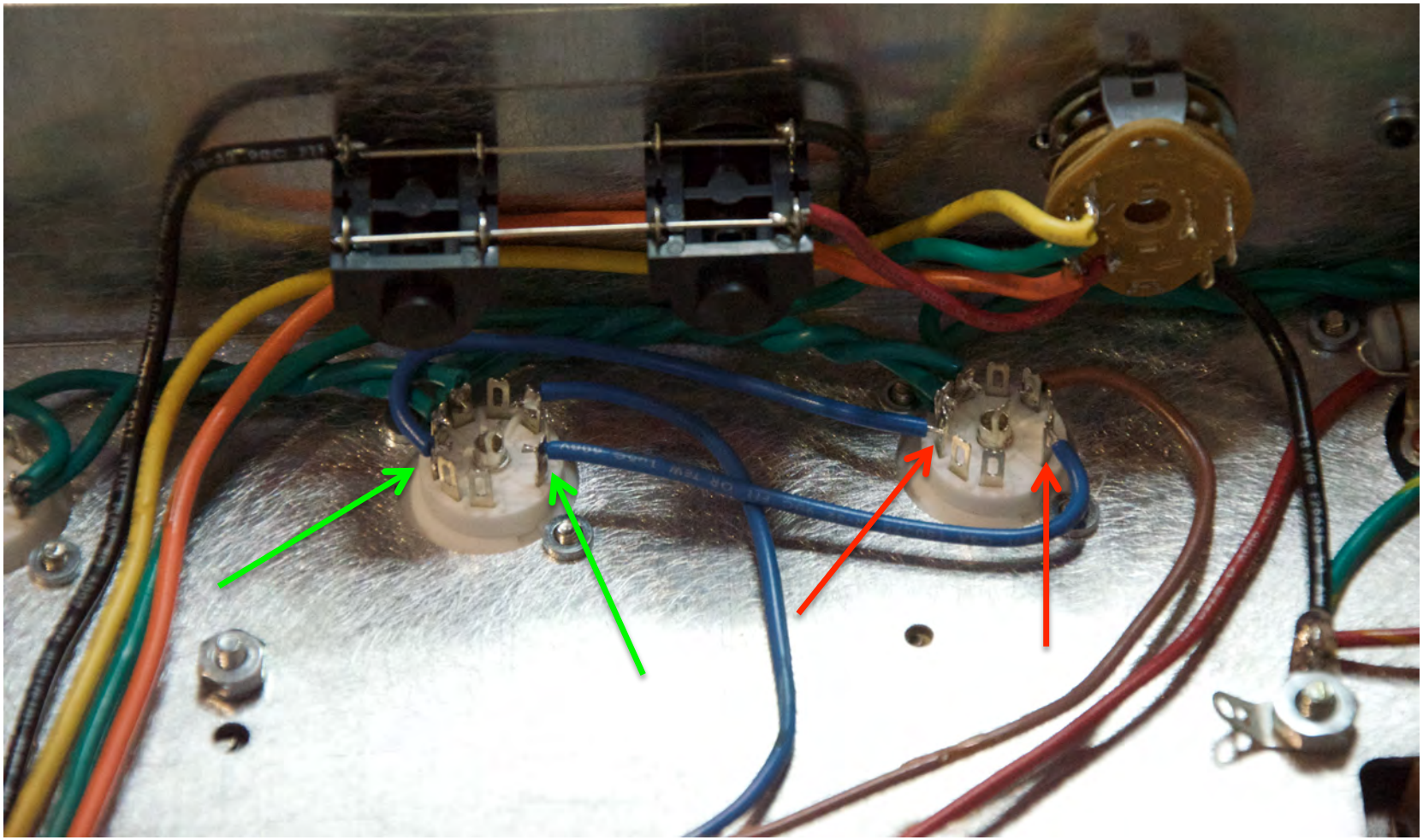


Step 29: Using a piece of red wire, connect the remaining lug of the output bus to the center lug of the rotary switch closest to the output jacks. Solder at the green arrows.



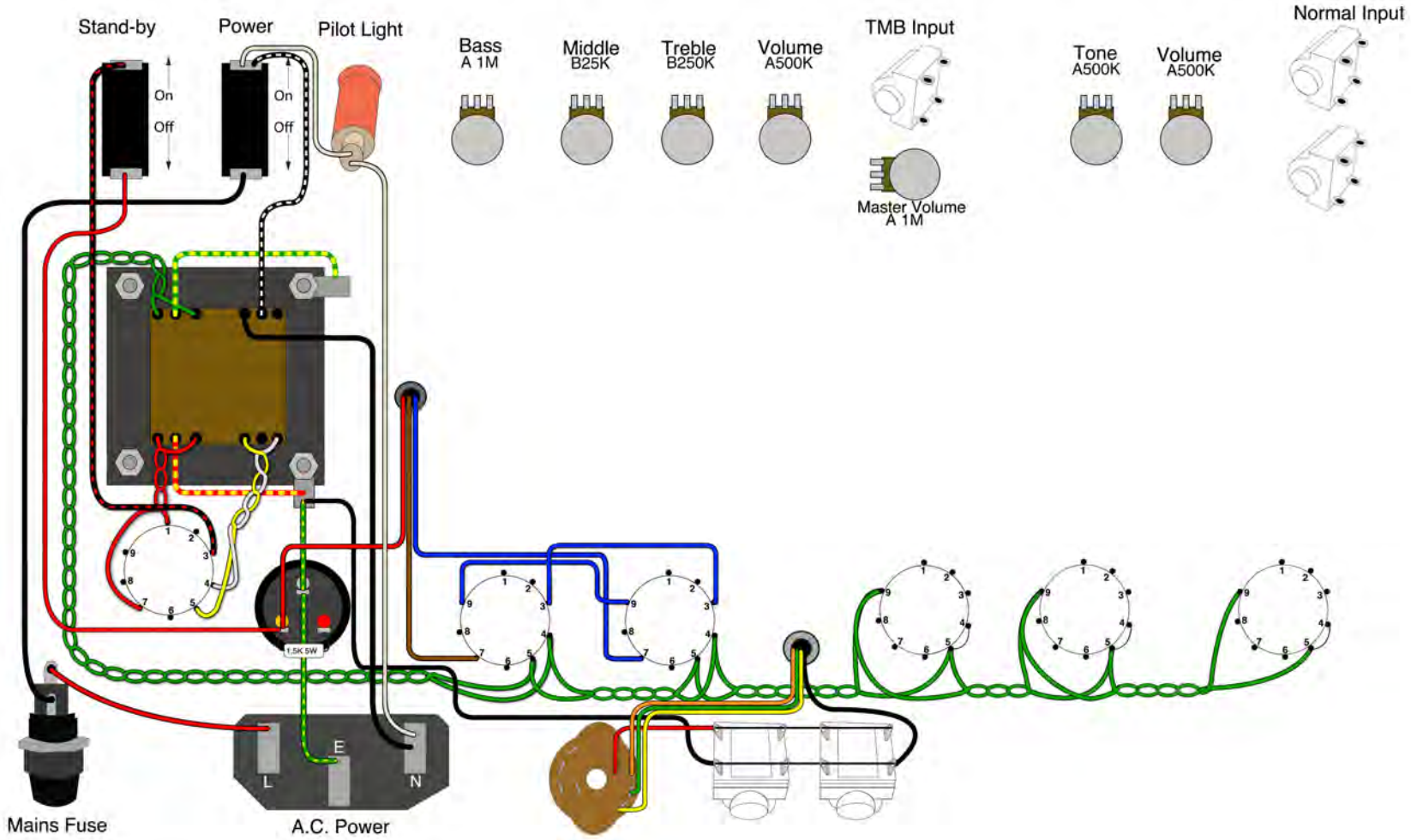
Step 30: Connect the remaining OT secondary wires (orange, yellow, and green) to the rotary switch. Solder them to the lugs as shown. The wires might not fit into the lugs, so you can 'tack solder' them if you need to.



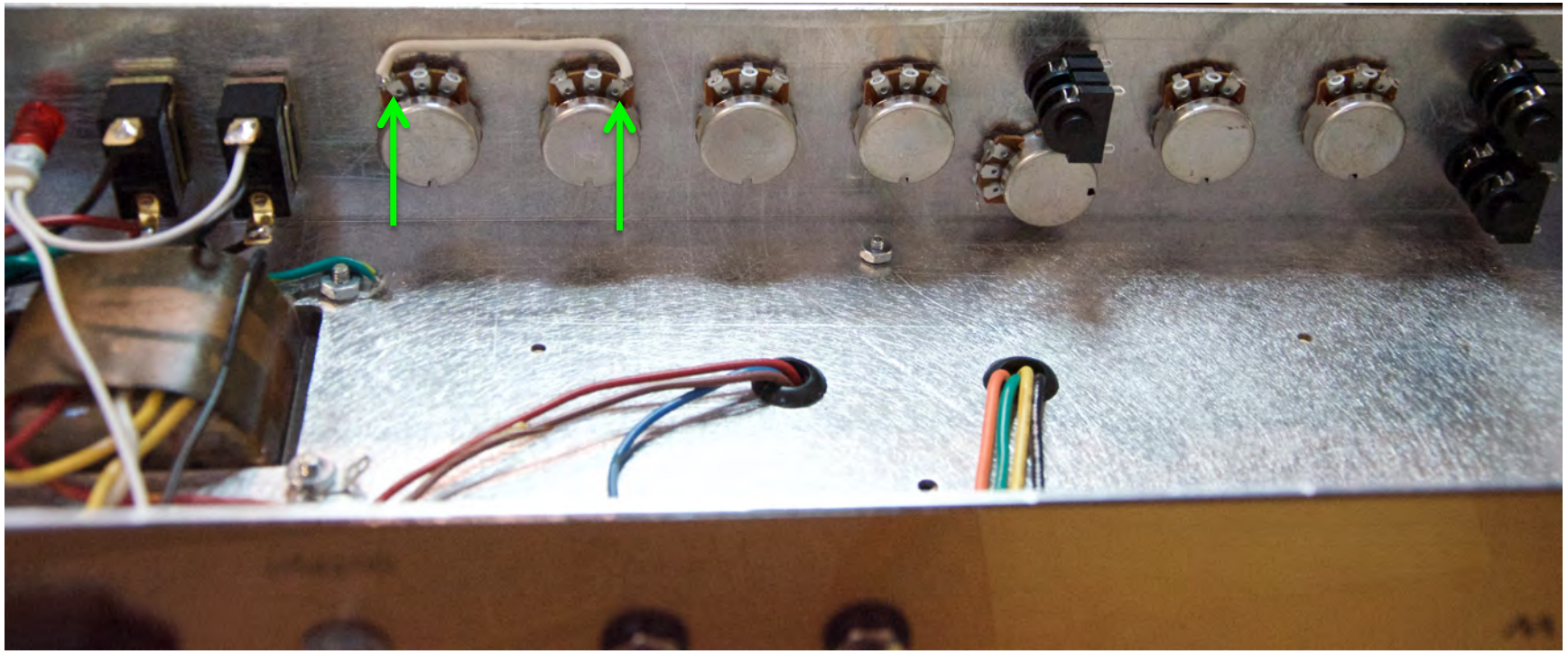


Step 31: Take two pieces of blue wire from step 25 and make two connections on the EL84 sockets. One is between pins 9 of each socket, the other between pins 3 of both sockets. Solder only at the green arrows. Do not solder at the red arrows yet.

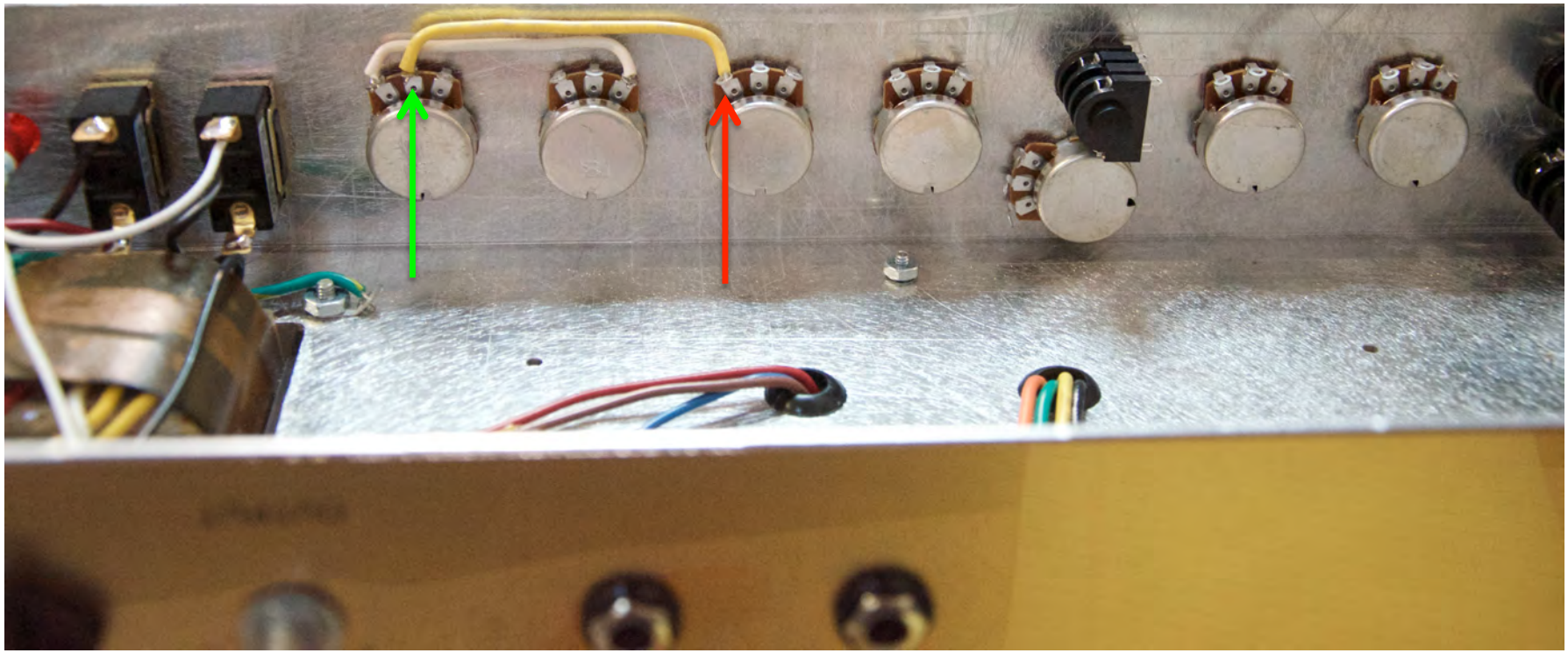
Wiring diagram of what you've done so far



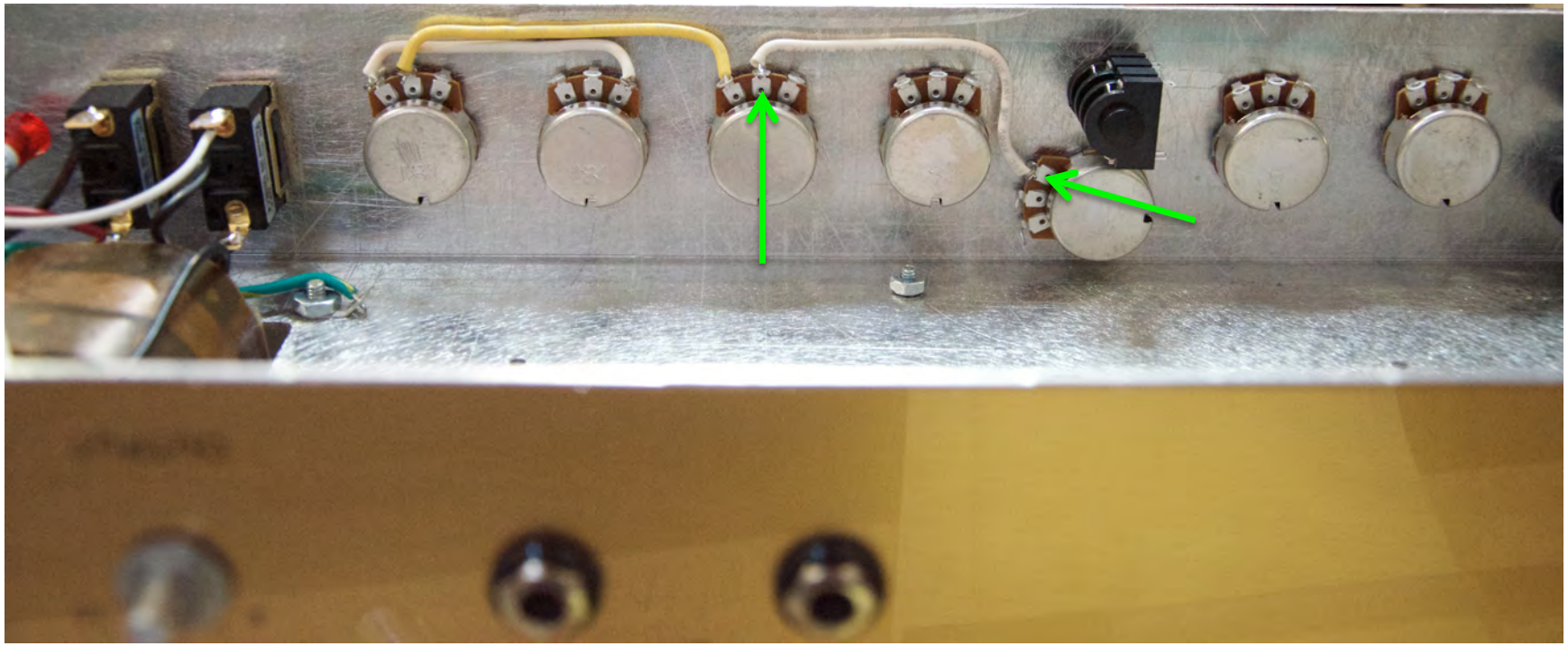
Potentiometer wiring



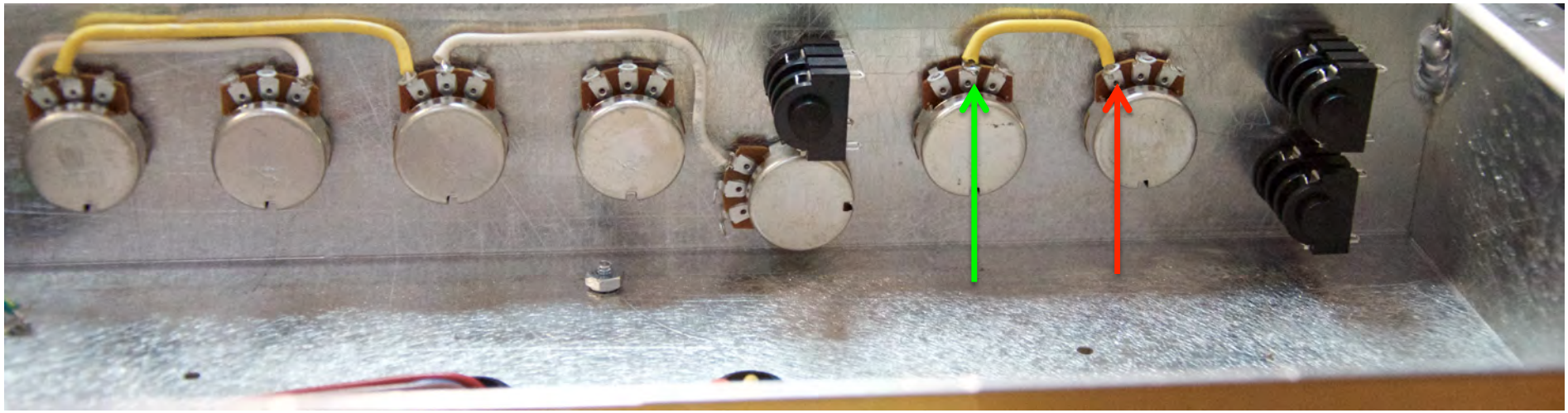
Step 1: Take a piece of white wire and connect lug 1 of the BASS pot to lug 3 of the MID pot. Solder both connections (green arrows)



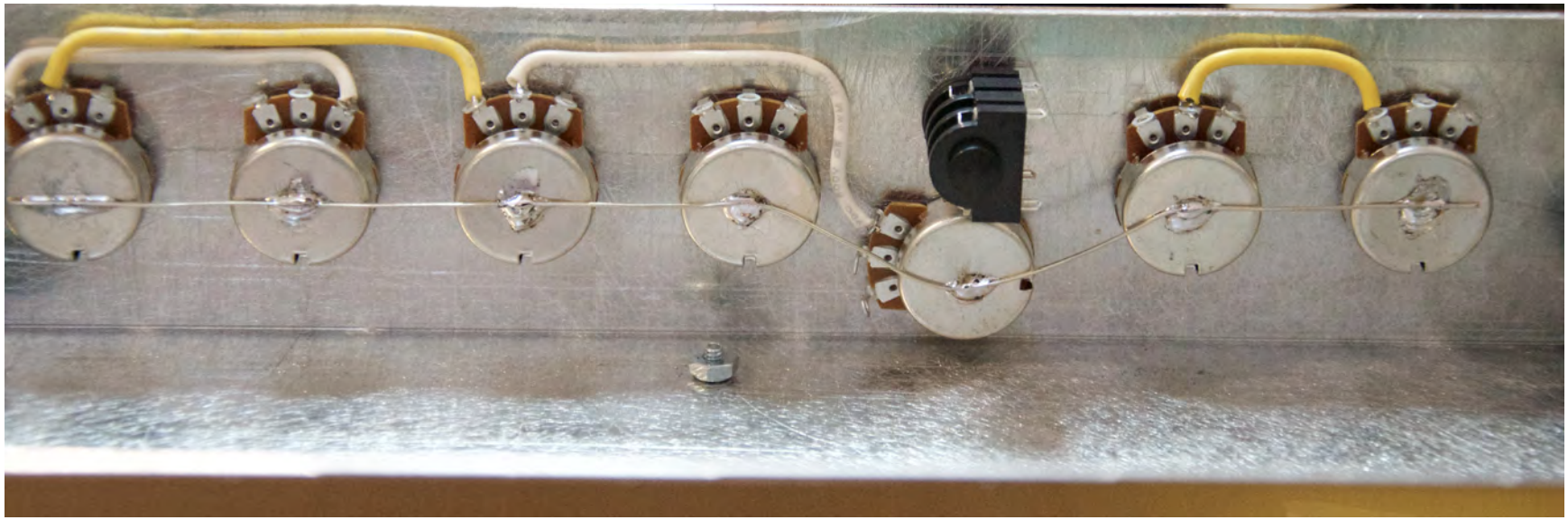
Step 2: Using a piece of yellow wire, make a connection between lug 2 of the BASS pot to lug 1 of the TREBLE pot. Only solder on lug 2 of the BASS pot (green arrow). Do not solder on the TREBLE pot (red arrow) yet.



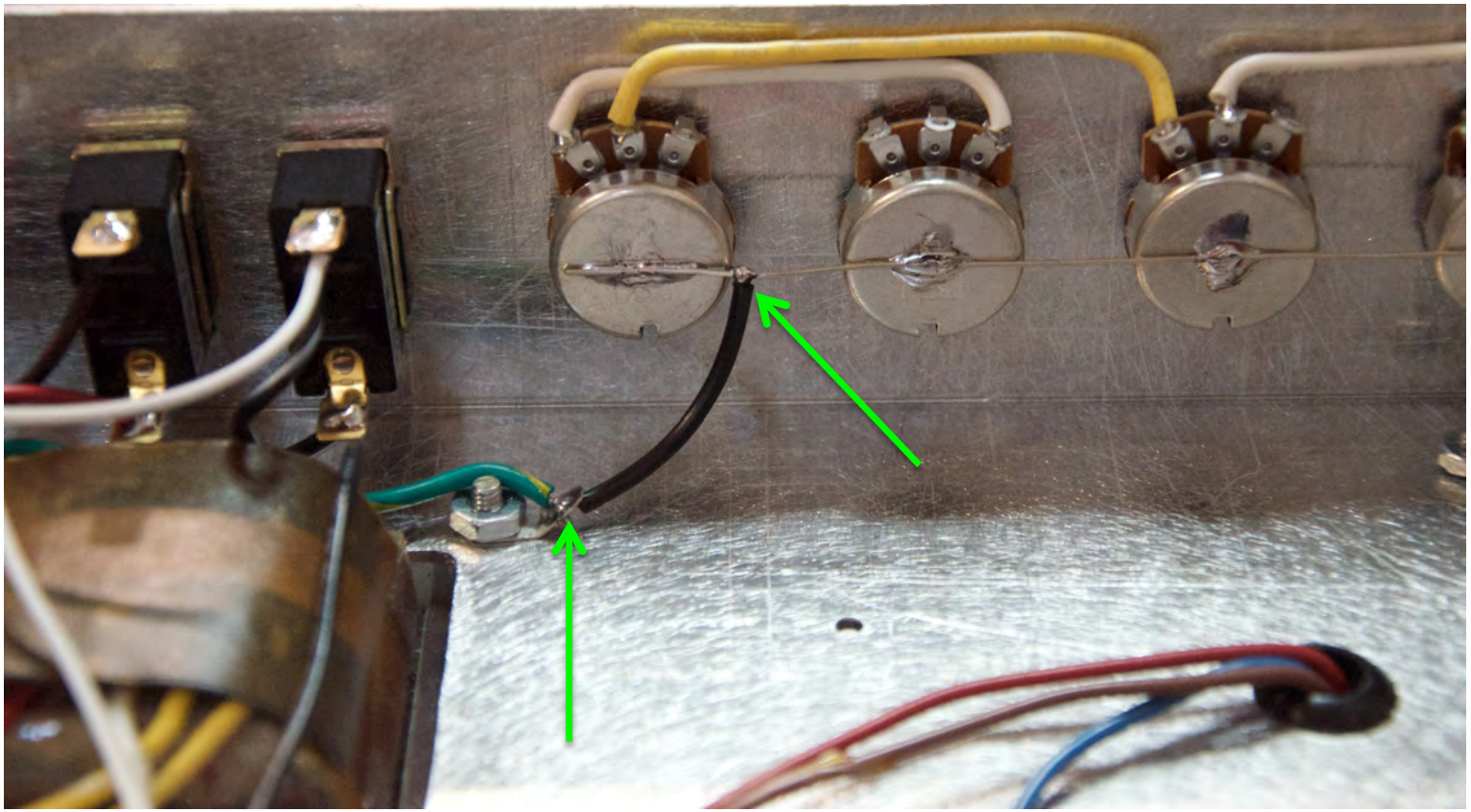
Step 3: Using a piece of white wire, connect lug 2 of the TREBLE pot to lug 3 of the MASTER VOLUME pot. Solder both connections (green arrows).



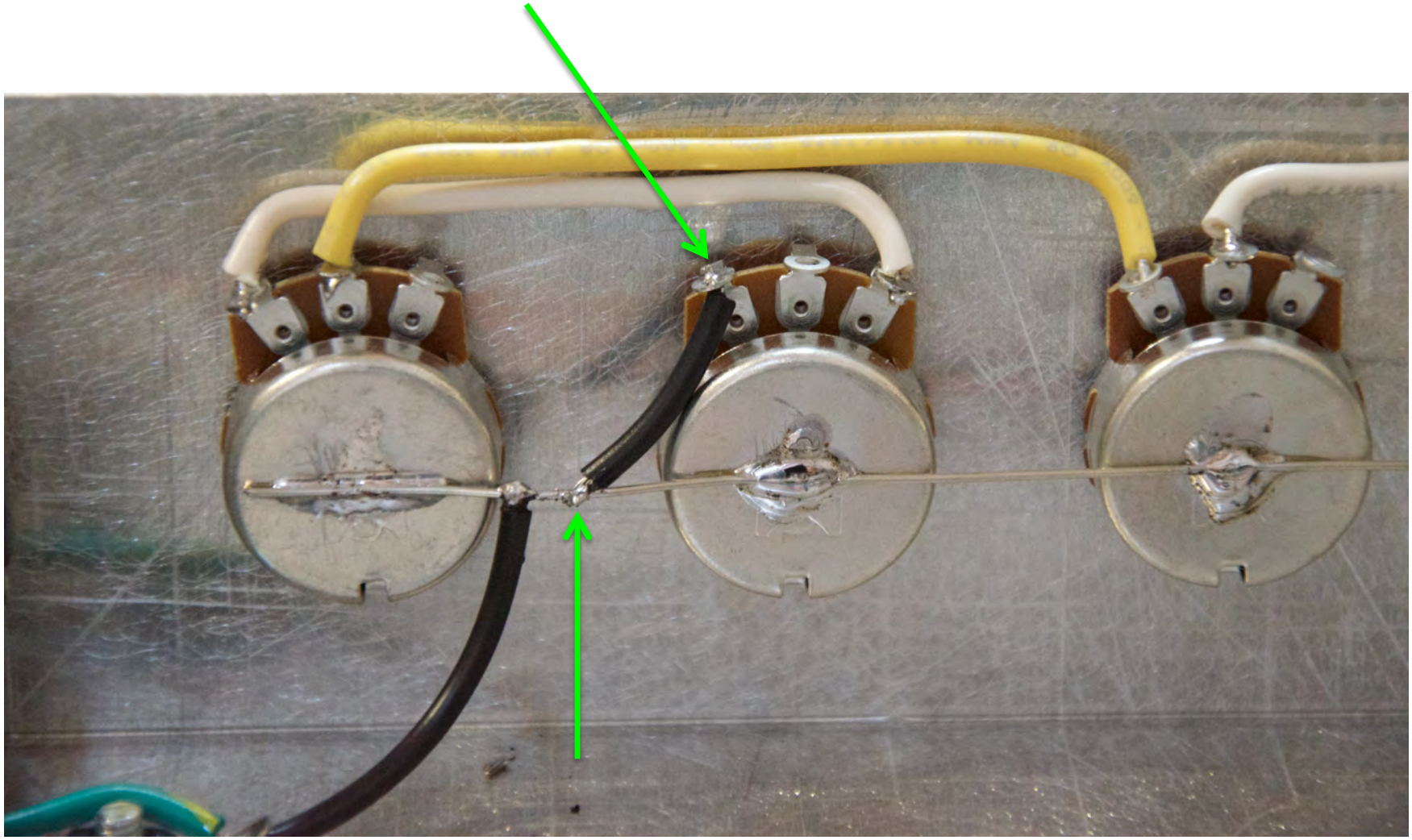
Step 4: Using a piece of yellow wire, make a connection between lug 2 of the TONE pot to lug 1 of the VOLUME1 pot. Only solder lug 2 of the TONE pot (green arrow). Do not solder lug 1 of the VOLUME1 pot (red arrow)



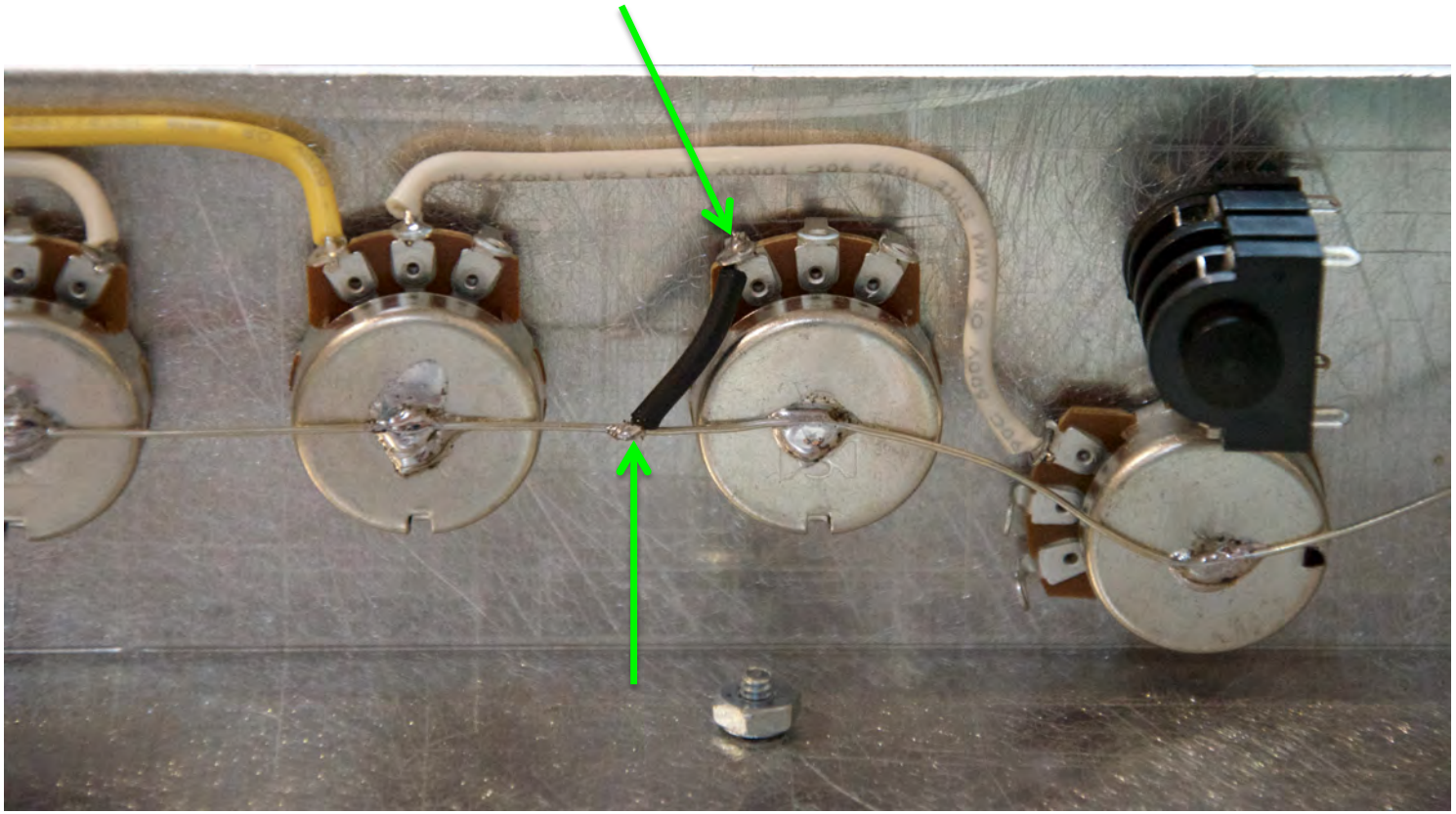
Step 5: Make the ground bus for the potentiometers. Take a long piece of bus wire, and bend it to connect to each pot as shown. You will solder directly to the back of the pots. If you have problem with solder adhesion, you can scratch the back of the pots with emery cloth or a file.



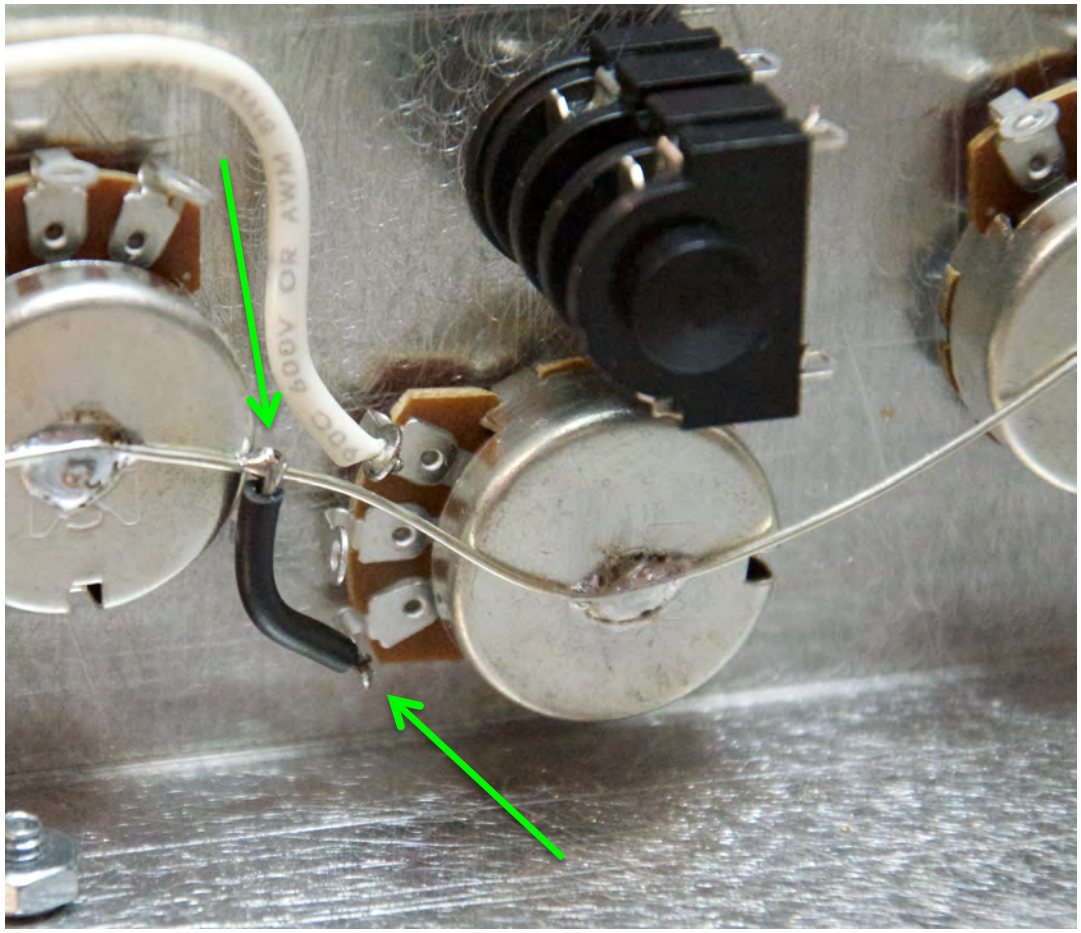
Step 6: Take a 2 inch piece of black wire and connect the ground bus to the chassis ground solder terminal. You want to wrap the wire around the bus wire. Solder both connections at green arrows.



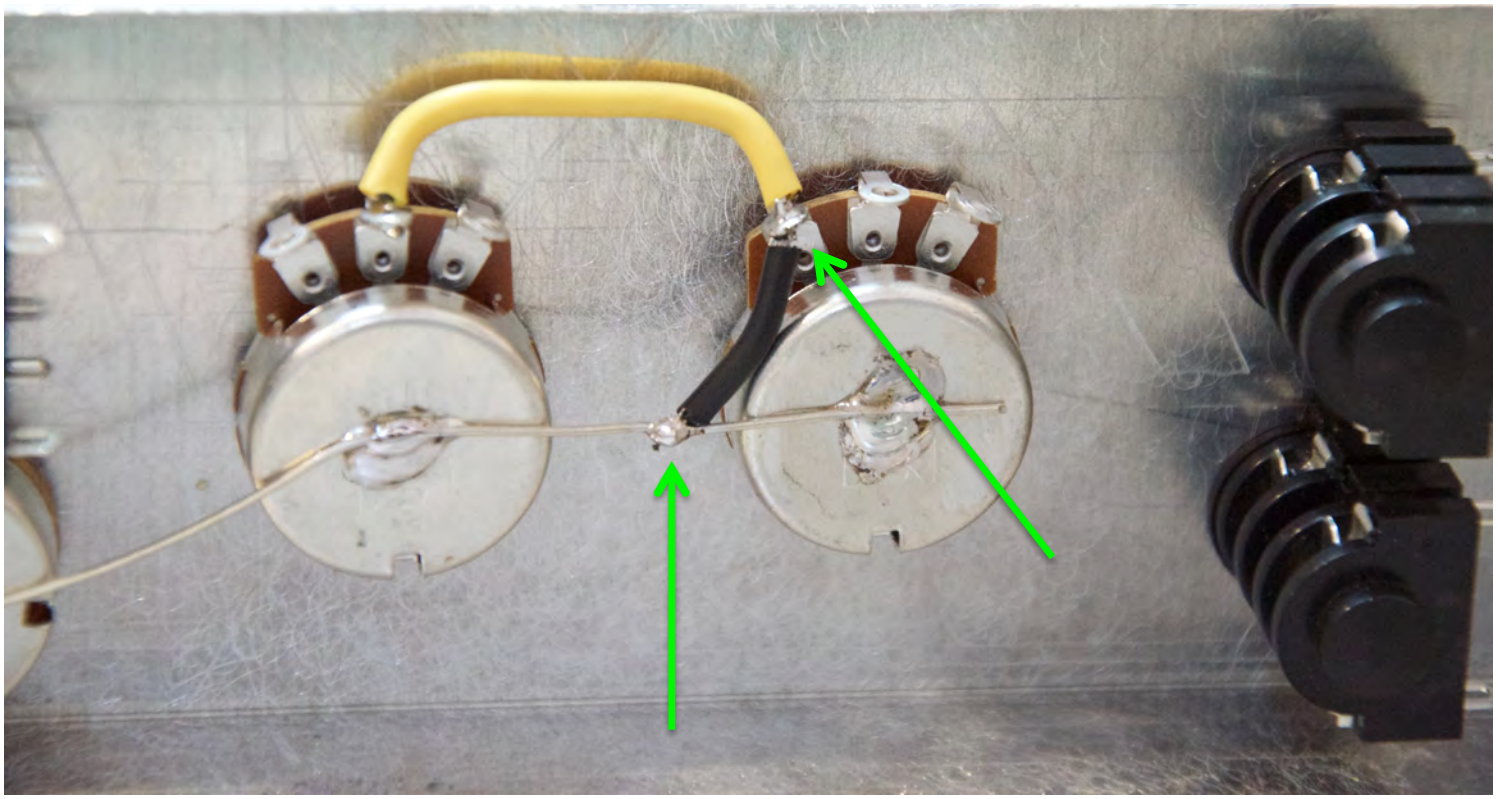
Step 7: Take a 1 inch piece of black wire and connect lug 1 of the MID pot to the ground bus as shown. Solder both connections at green arrows.



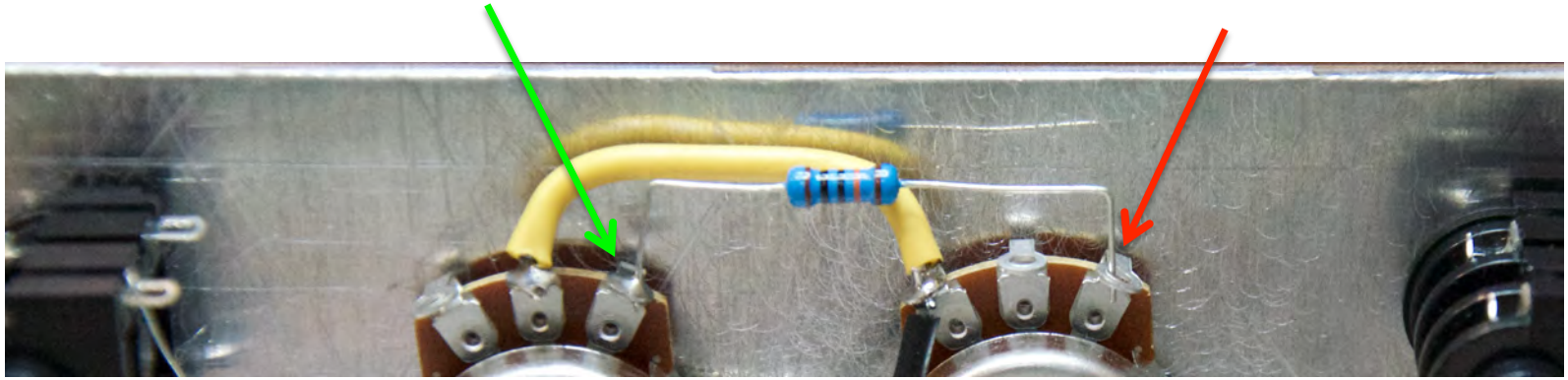
Step 8: take a 1 inch piece of black wire and make a connection from lug 1 of the VOLUME2 pot to the ground bus. Solder both connections (green arrows).



Step 9: Using a 1 inch piece of black wire, connect lug 1 of the MASTER VOLUME pot to the ground bus. Solder both connections.

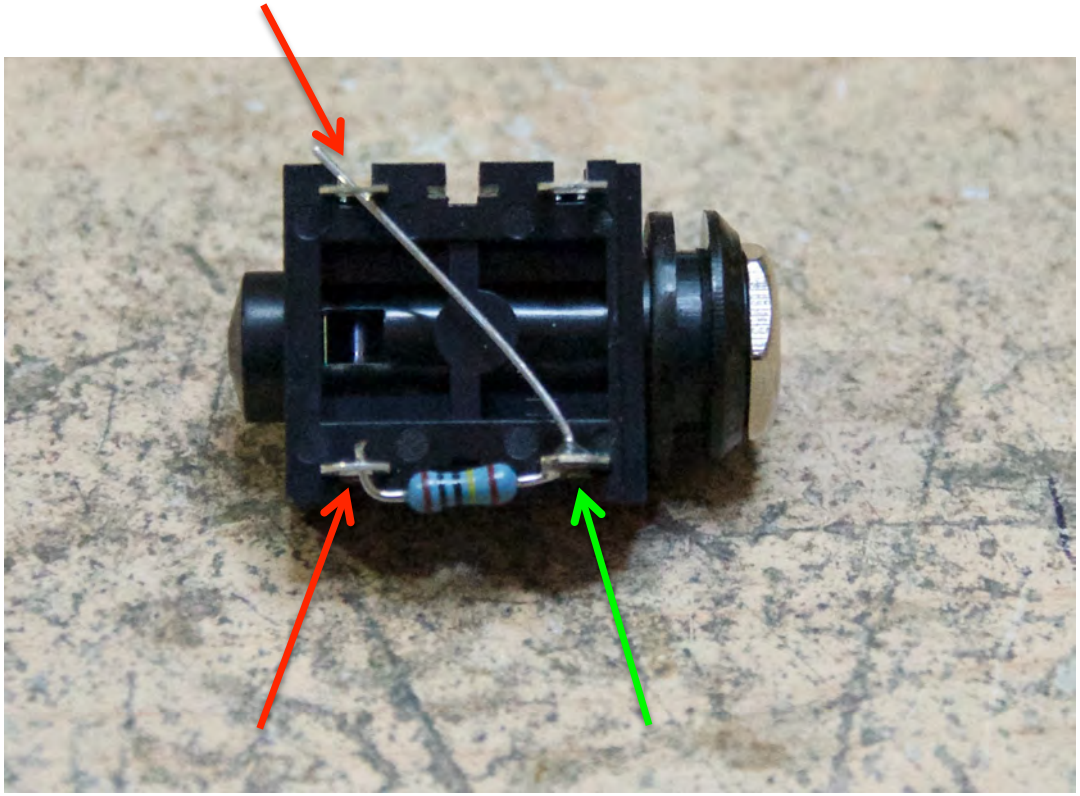


Step 10: Take a 1 inch piece of black wire and connect lug 1 of the VOLUME1 pot to the ground bus. Solder both connections now (green arrows).

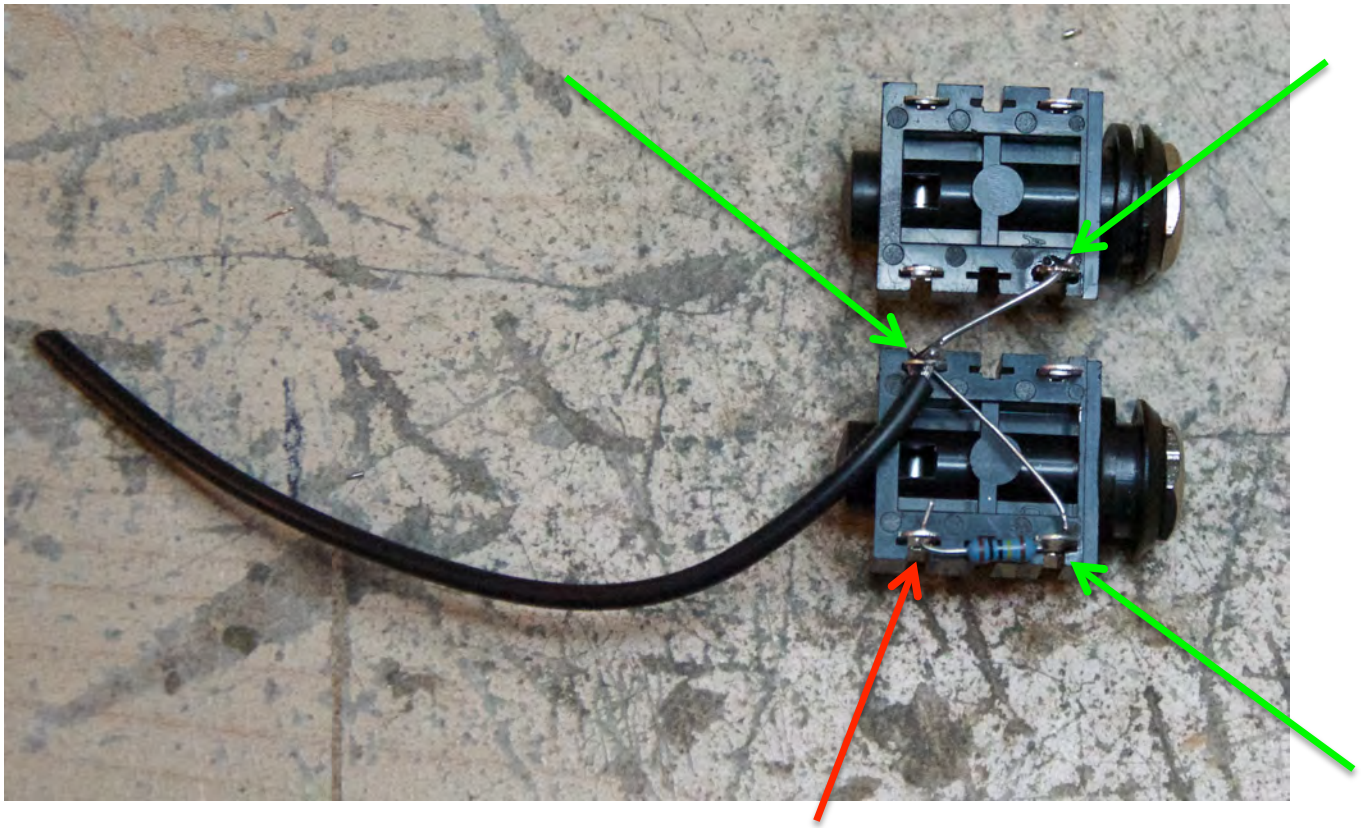


Step 11: Attach a 100K resistor between lug 3 of the TONE pot and lug 3 of the VOLUME1 pot. Only solder at lug 3 of the TONE pot for now (Green arrow). Do not solder lug 3 of the VOLUME1 pot (red arrow).

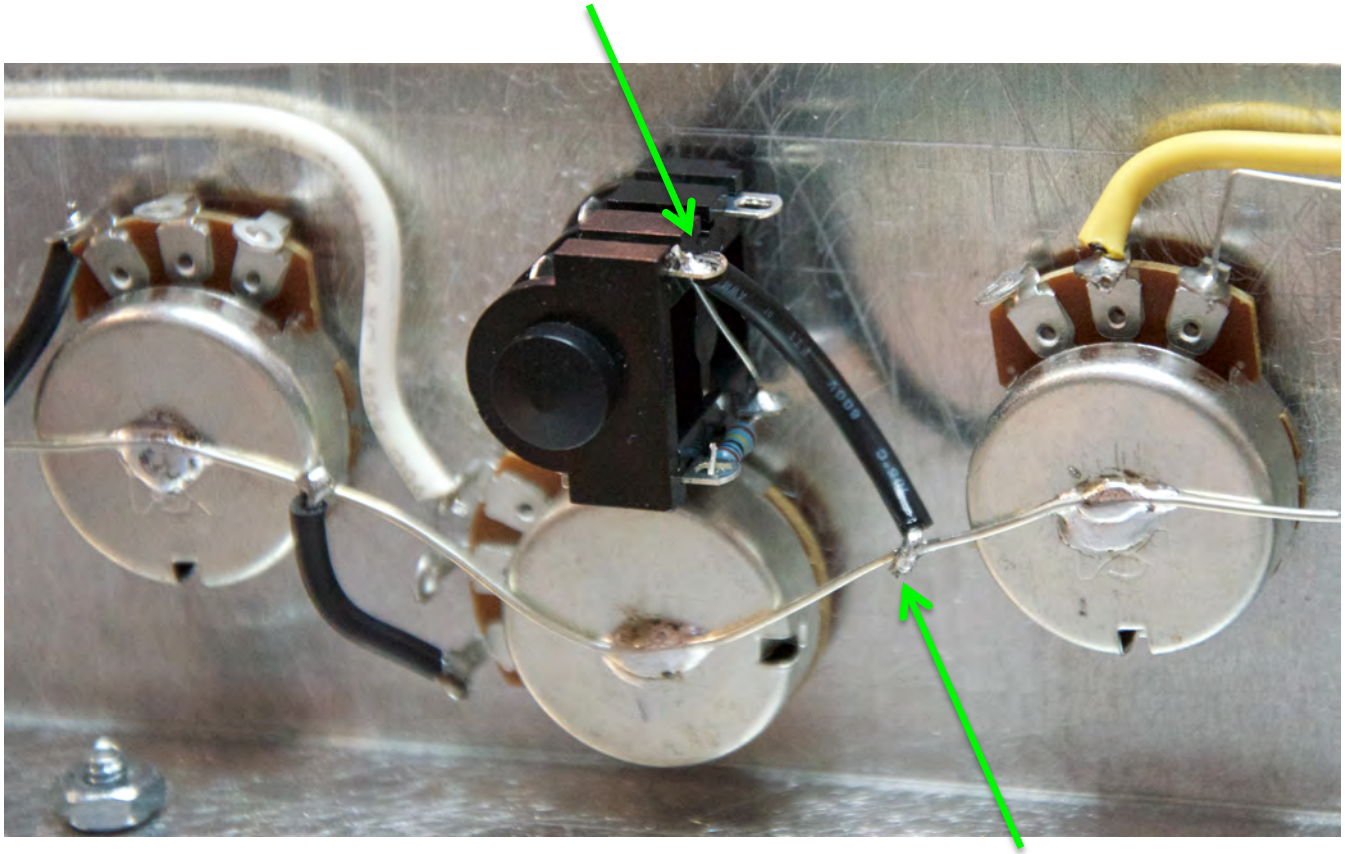
Input Jack Wiring



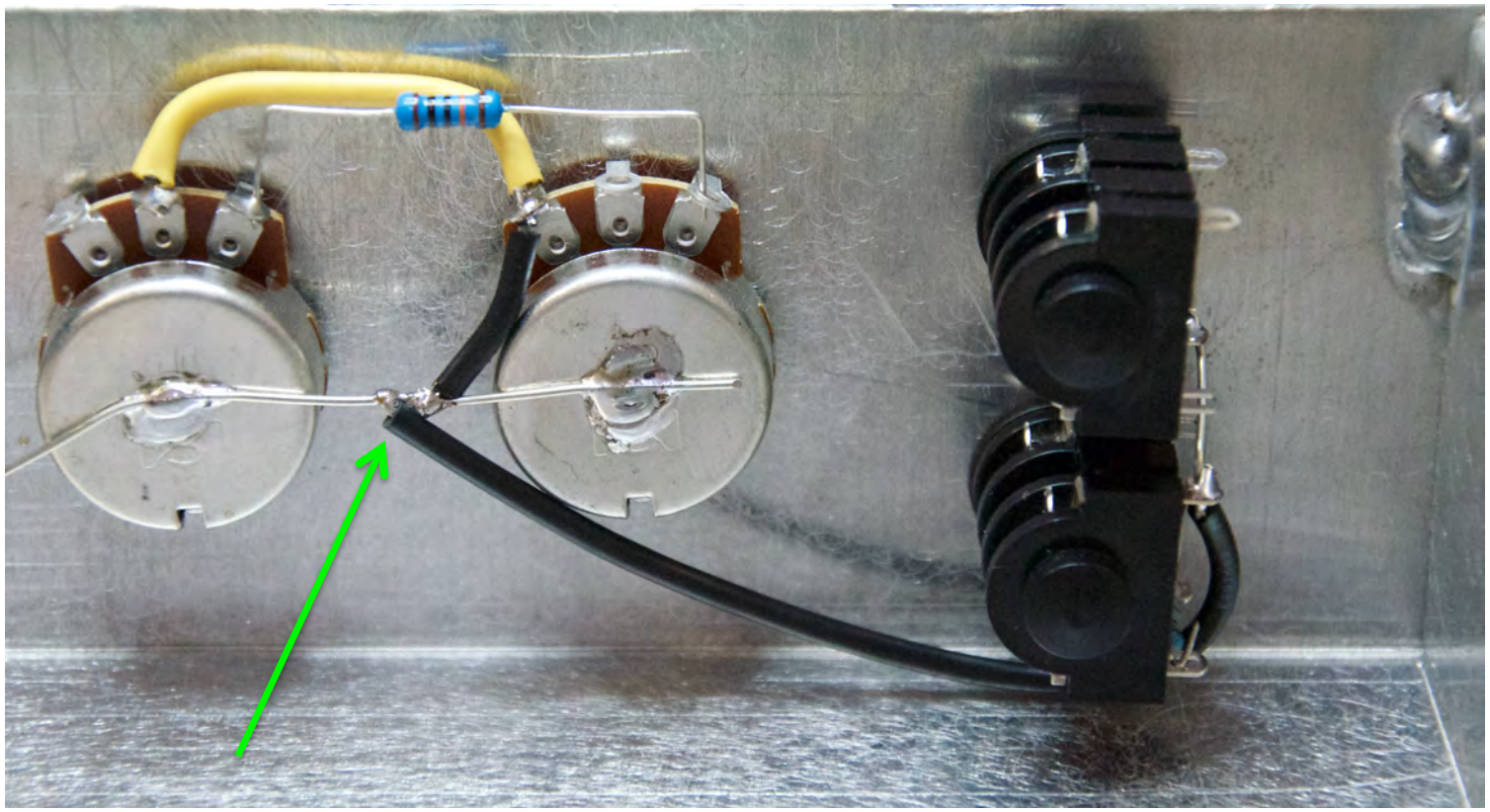
Step 1: Prepare the ‘TMB’ channel input jack by bending a 1M resistor as shown. Only solder at the green arrow for now. Do not solder on the red arrows.



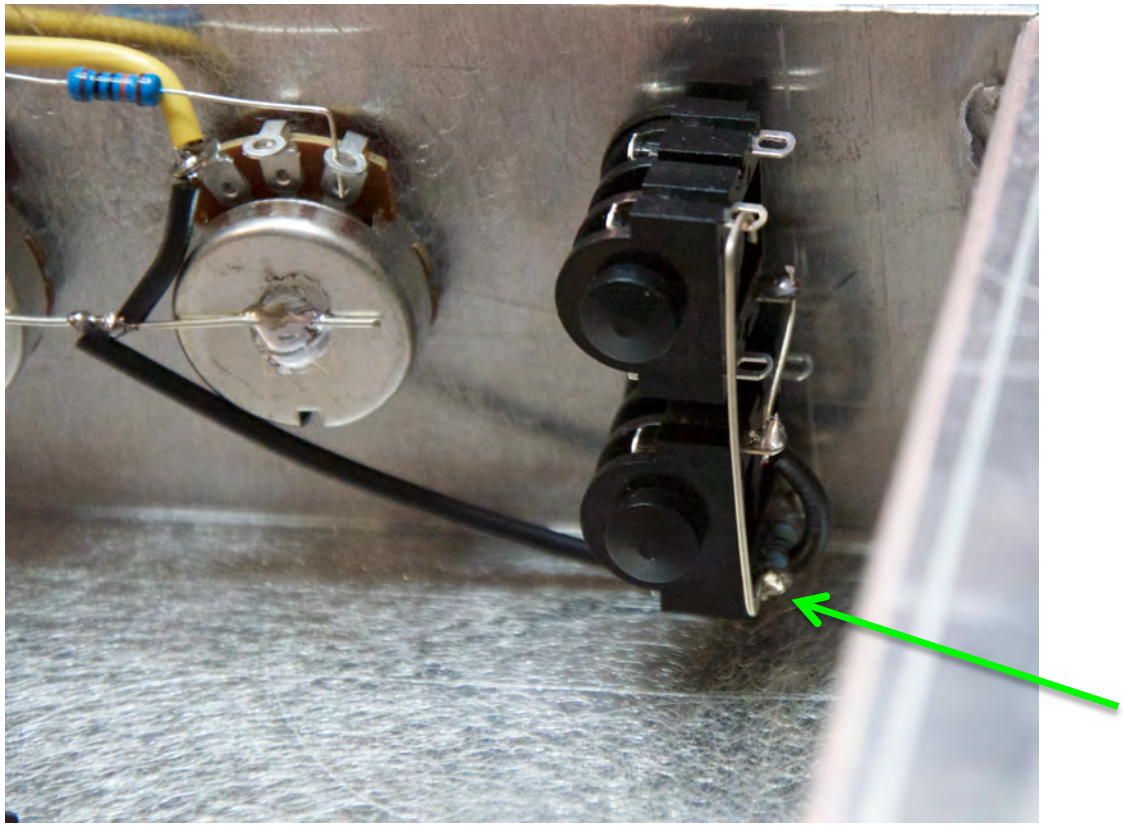
Step 2: Prepare the ‘Normal’ channel input jacks. Repeat the previous step for the bottom jack. Also add a jumper between the ground lugs as shown using a piece of bus wire. Connect a 4 inch piece of black wire to the junction as shown. Only solder at the green arrows for now. Do not solder at the red arrow.



Step 3: Mount the TMB input as shown. Using a 1 ½ inch piece of black wire, connect the tip disconnect terminal to the ground bus. Solder at the green arrows.



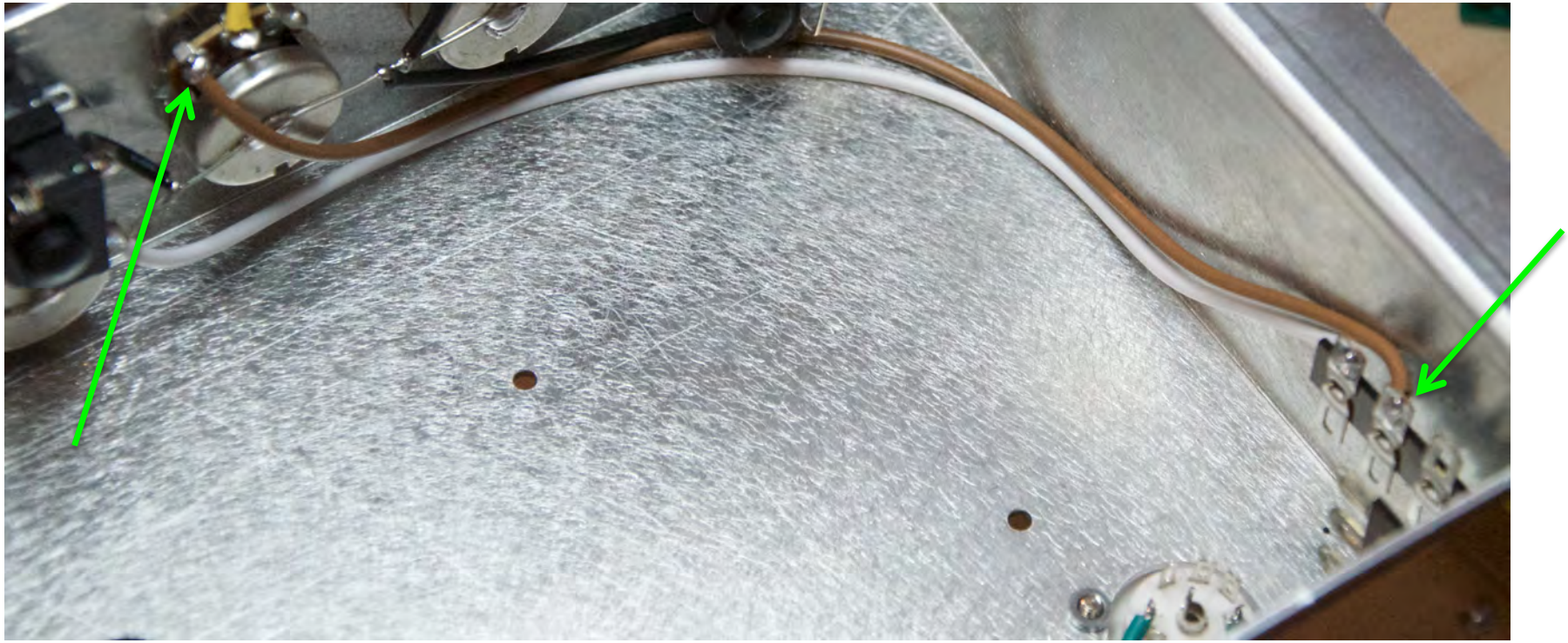
Step 4: Mount the normal input jacks as shown. Connect the black wire to the ground bus. Solder at the green arrow.



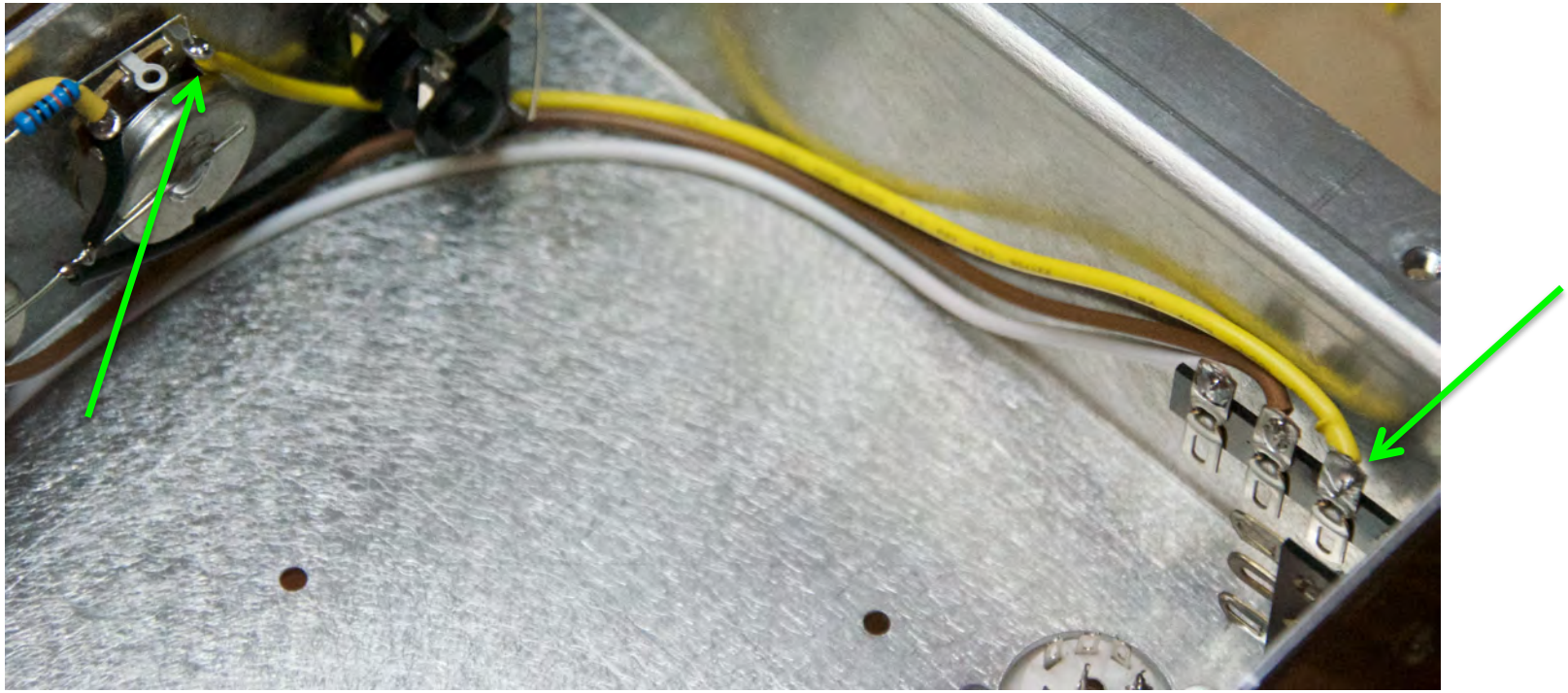
Step 5: Connect the tip terminal of the lower jack to the tip disconnect terminal of the upper jack using a piece of bus wire as shown. Only solder at the green arrow for now.

Terminal Strip Wiring

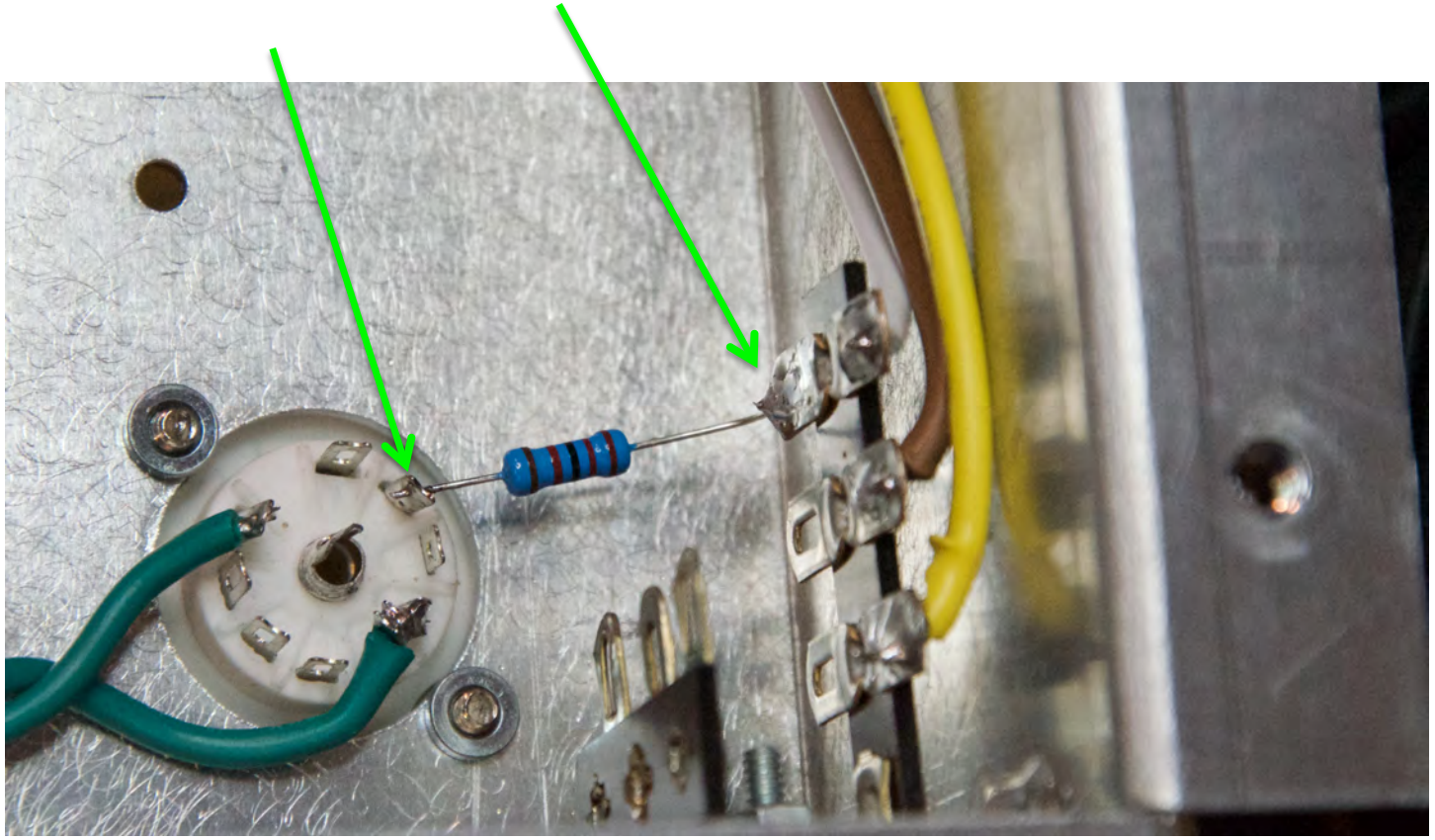
Step 1: Using a 10 inch piece of white wire, connect the TMB input from the unsoldered end of the 1M resistor to the first lug of the 6-lug terminal strip. Solder both connections (green arrows).



Step 2: Using a 10 inch piece of brown wire, connect lug 1 of the TONE pot to the second lug of the 6-lug terminal strip. Solder at the green arrows.

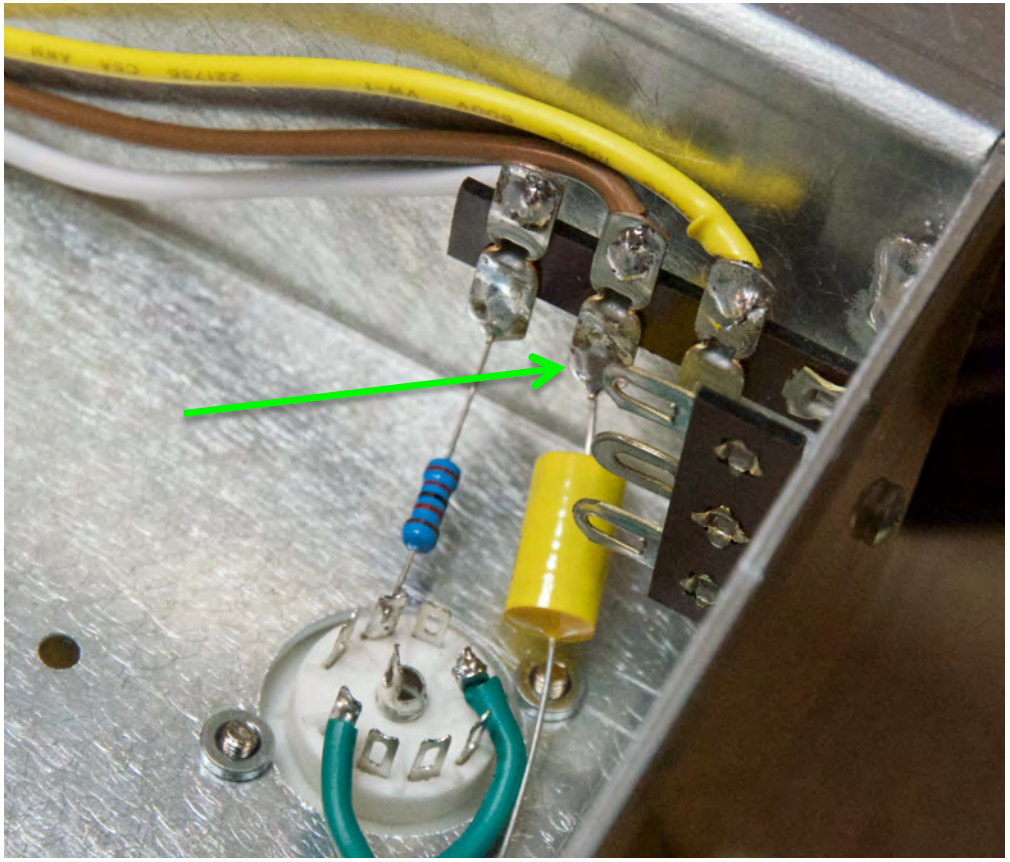


Step 3: Connect 8 ½ inch piece of yellow wire from lug 3 of the VOLUME1 pot to the third lug of the 6-lug terminal strip. Solder both connections at the green arrows.

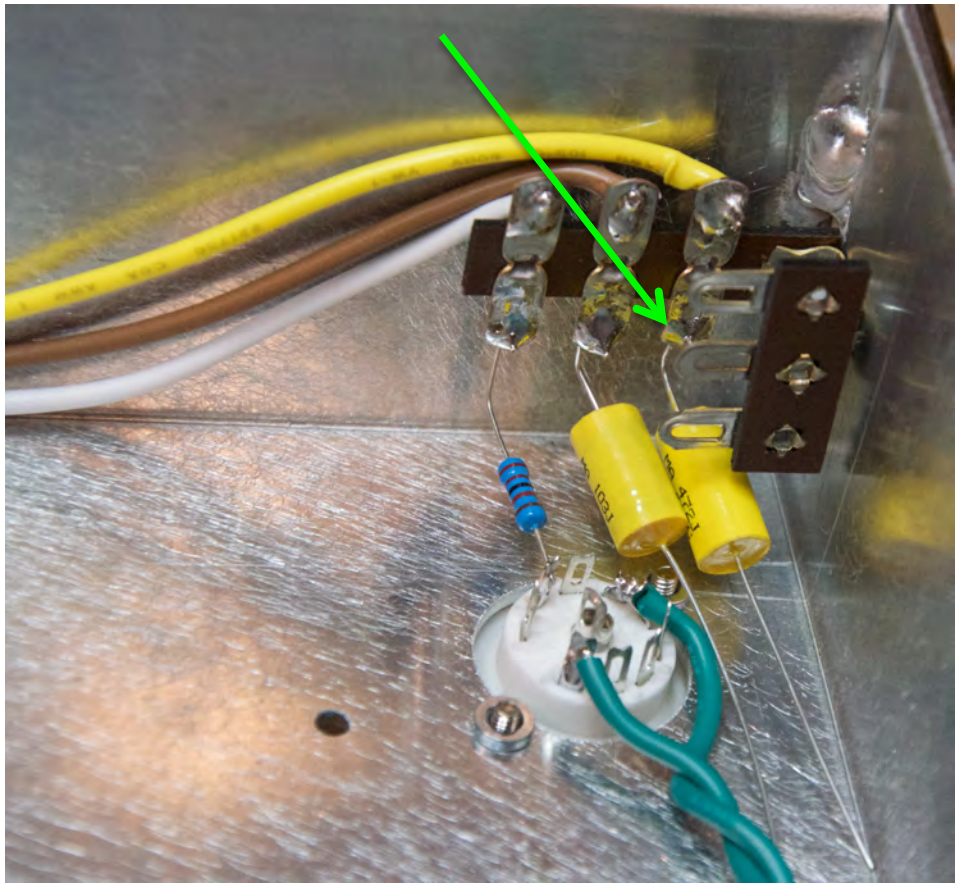


Step 4: Connect the lug of the 6-lug terminal strip that is also connected to the white wire to pin 2 of the first tube socket using a 22K resistor as show. Solder both ends.

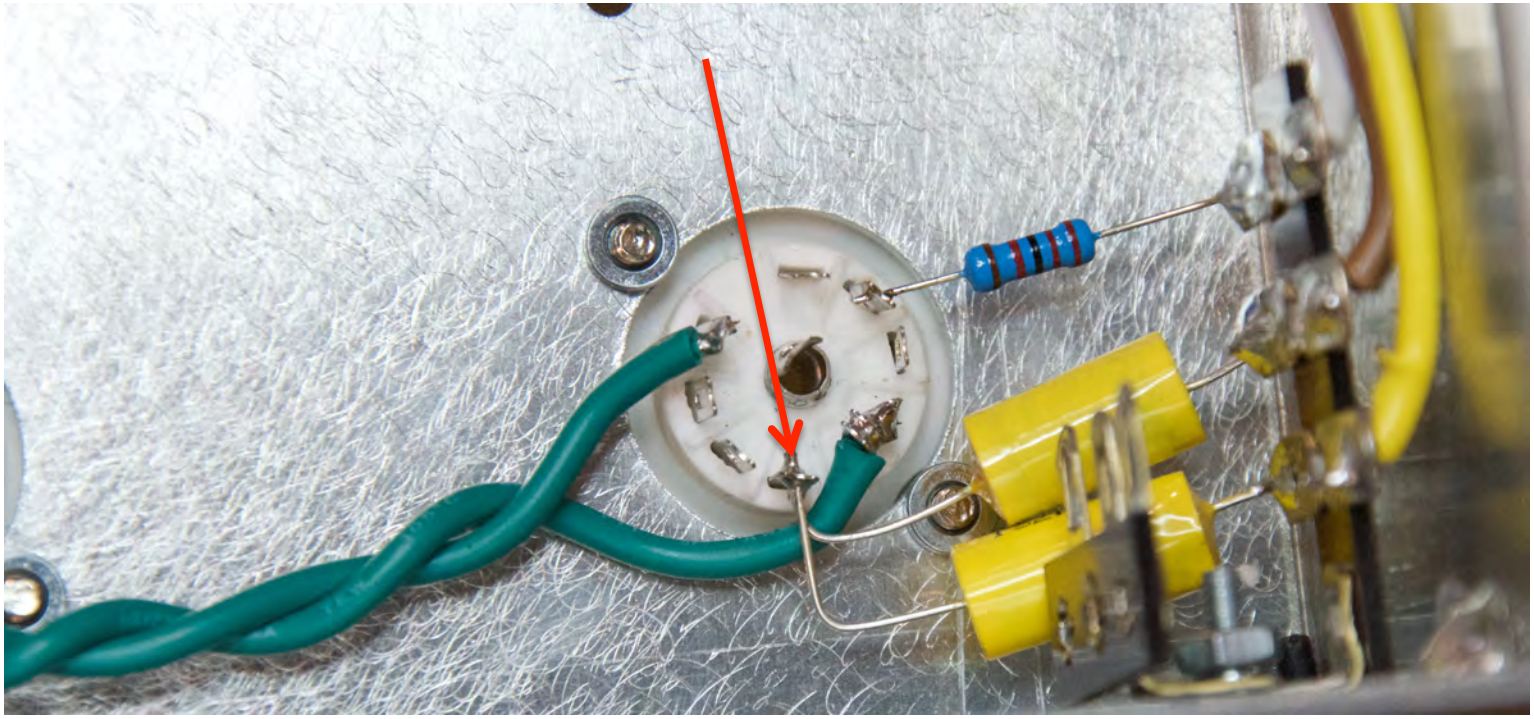
NOTE: Be careful to not short the leads of the resistor against the chassis or any other pins.



Step 5: Connect one end of a .01uF capacitor to the lug of the 6-lug terminal strip that is also connected to the brown wire. Solder one end of the capacitor, leaving the other end unsoldered and not connected to anything for now.

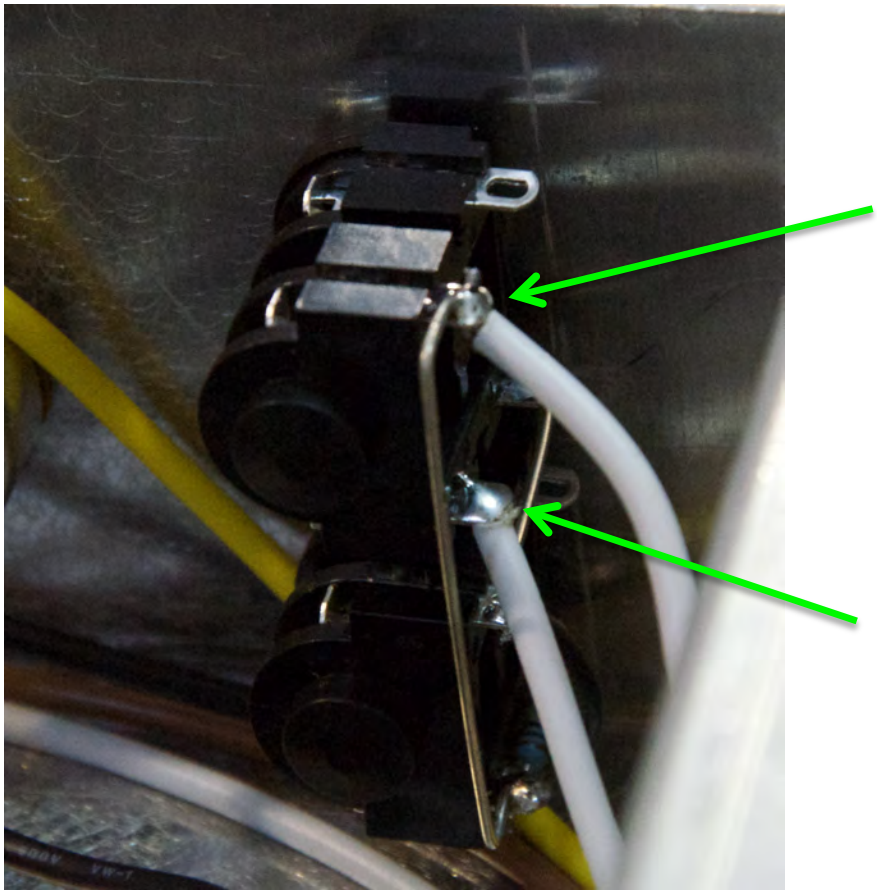


Step 6: Connect one end of the .0047uF capacitor to the lug of the 6-lug terminal strip that is also connected to the yellow wire. Once again, leave one end open.

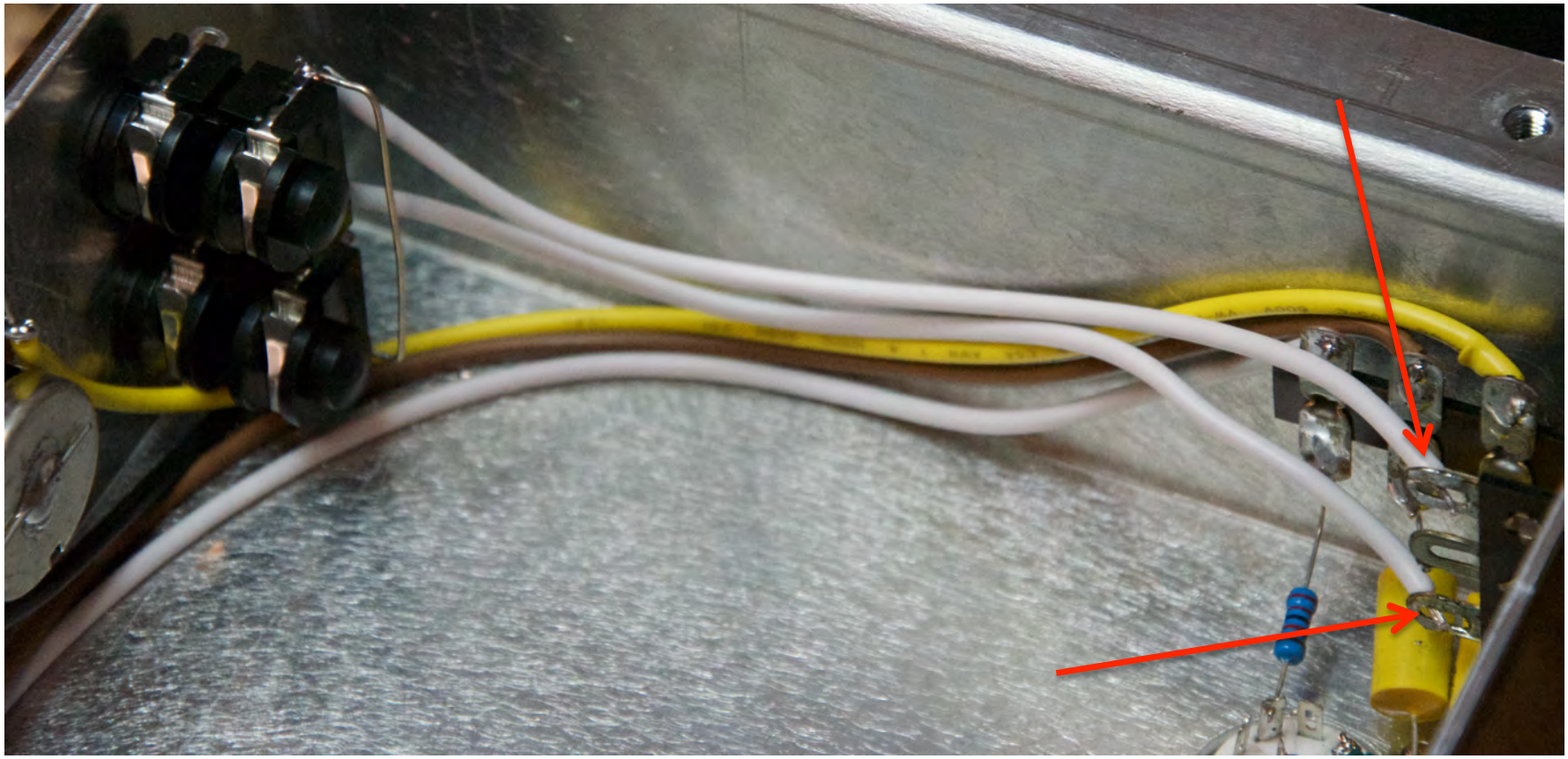


Step 7: Take both of the unsoldered ends of the capacitors and insert them into lug 6 of the first tube socket as shown. Do not solder pin 6 of the tube socket yet.

Note: Be careful to not short any of the leads against the chassis or any other tube socket pins.

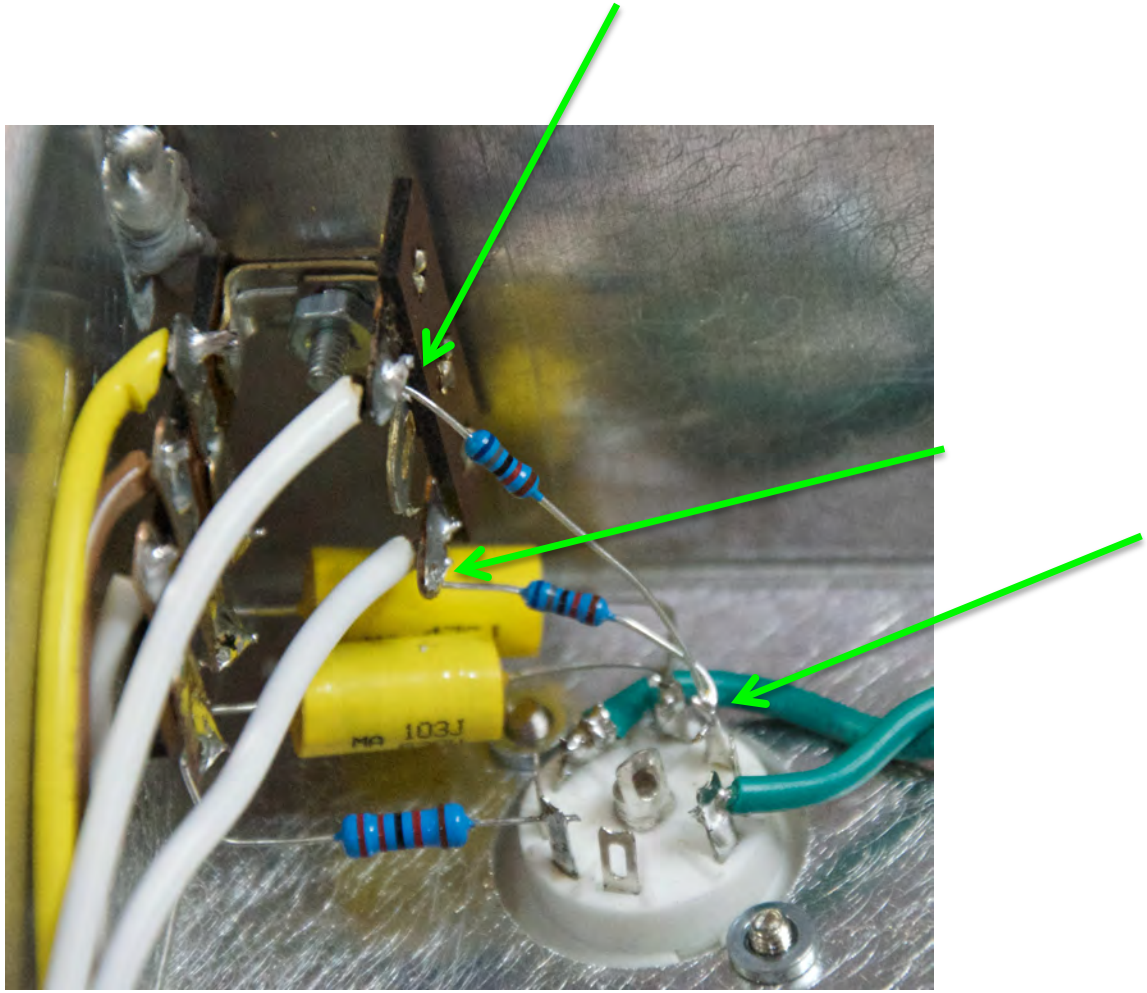


Step 8: Cut and strip two pieces of 6 inch white wire. Connect the end of one wire to the tip terminal of the top normal jack and the end of the other wire to the tip disconnect terminal of the top normal jack



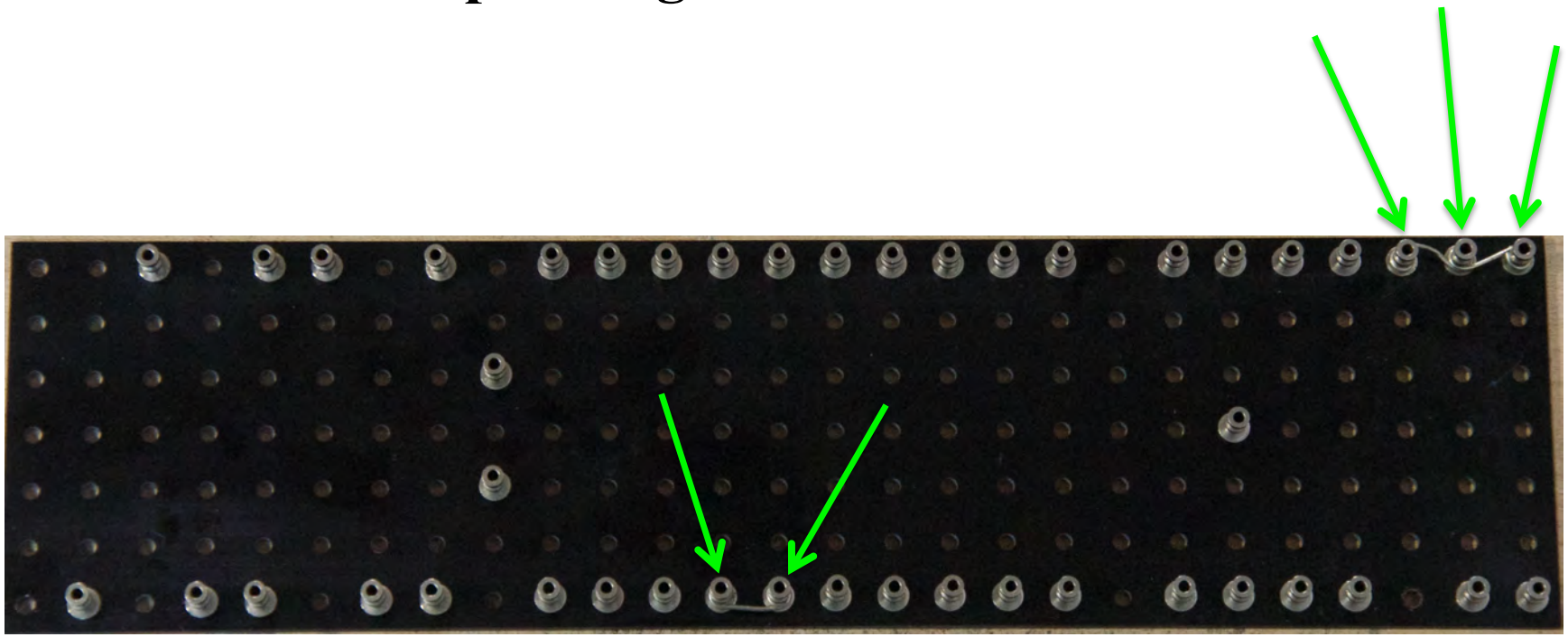
Step 9: Insert the other ends of the white wires into the 3-lug terminal strip. Insert the wire from the tip terminal into the lower lug. Insert the wire from the tip disconnect terminal to the upper lug. Do not solder yet.

NOTE: The middle lug of the 3-lug terminal strip is connected to the chassis. Make sure you do not connect anything to this lug.

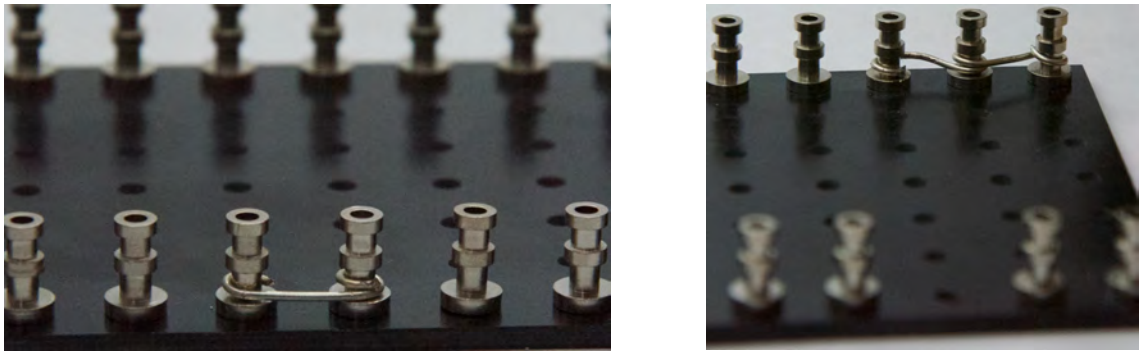


Step 10: Insert one end of a 68K resistor to each of the outer lugs of the 3-lug terminal strip and solder. Then insert the unsoldered ends of both 68K resistors into pin 7 of the tube socket. Solder pin 7 of the tube socket. Be very careful to not short against the middle turret lug, the chassis, or any other tube socket pins.

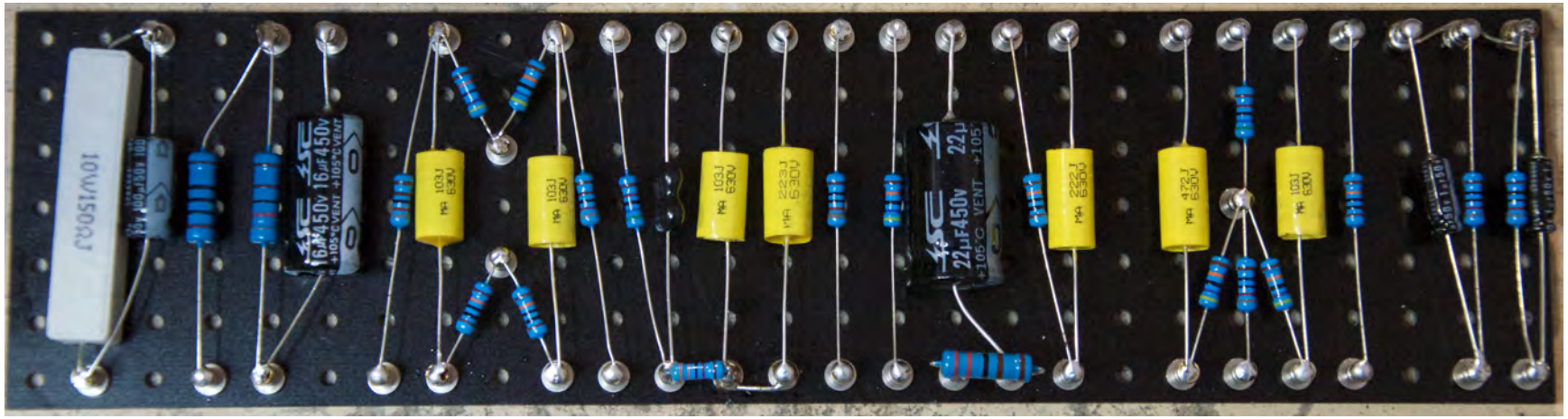
Populating the Circuit Board



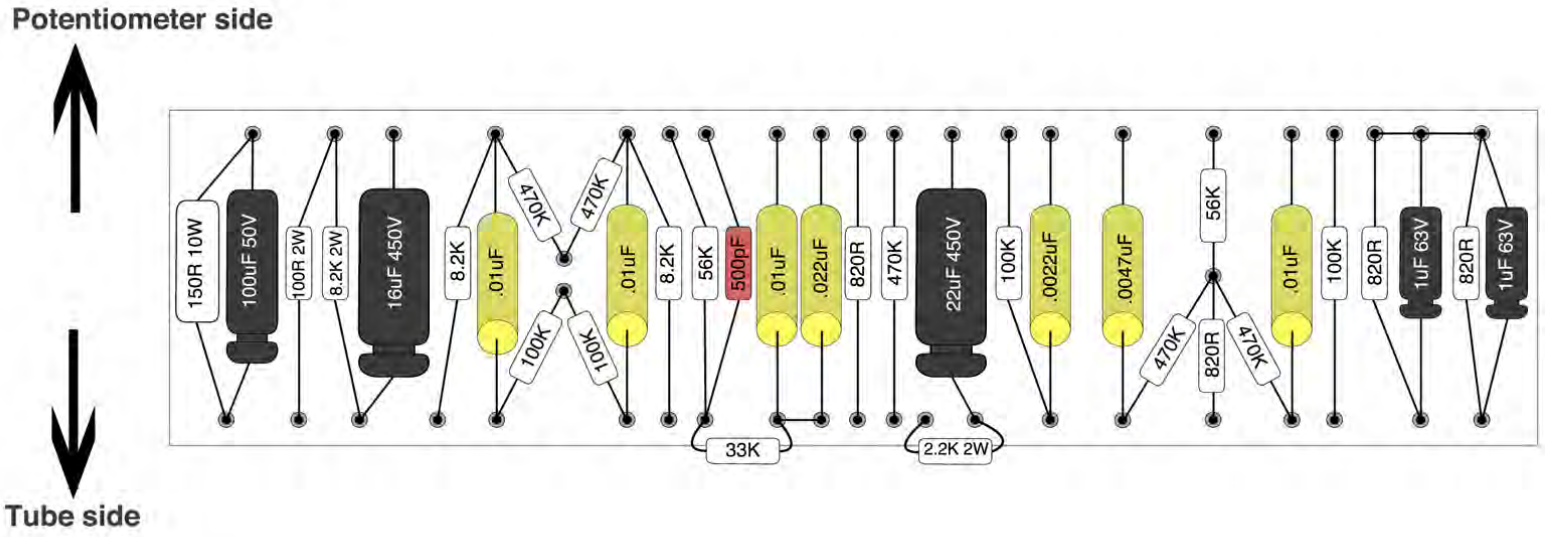
Step 1: Start by creating two jumper spots by wrapping bus wire around the lower tier of the lugs. The lower jump connection is between two lugs, the upper right is between three. Solder all the connections.



Close-up of wrapped jumps

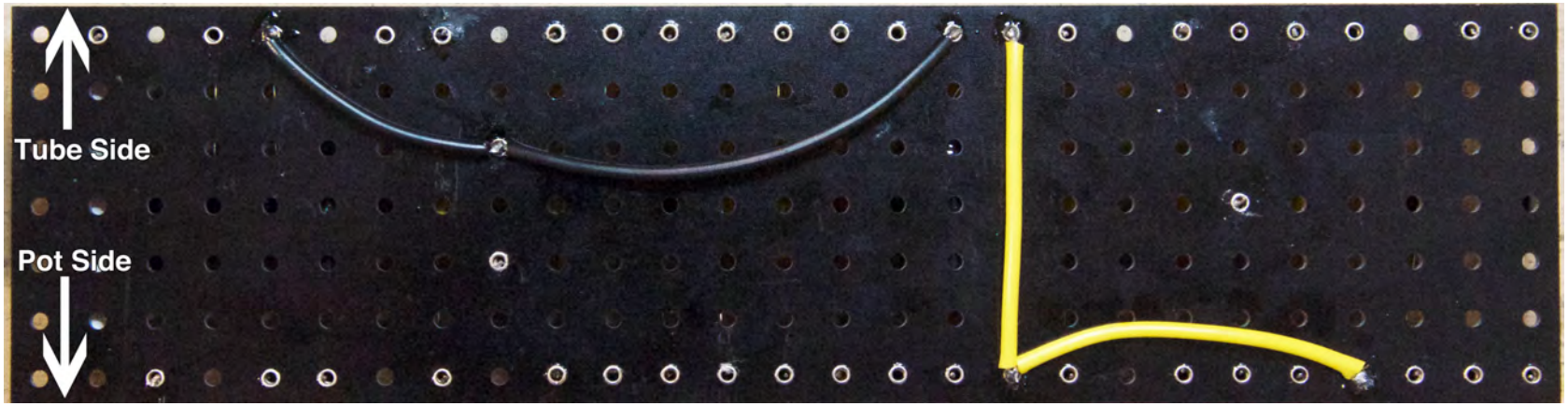


Step 2: Insert all components into circuit board. Insert leads into openings on the tops of turret lugs. Solder the tops of all turret lugs. TIP: Don't use too much solder. It will pour out the other side of the turret lug. If you find that you can't get a nice solder joint on the top of the turret lug, stop fighting gravity. Hold the circuit on its side or even upside down (if you have "helping hands") and use gravity to your advantage.

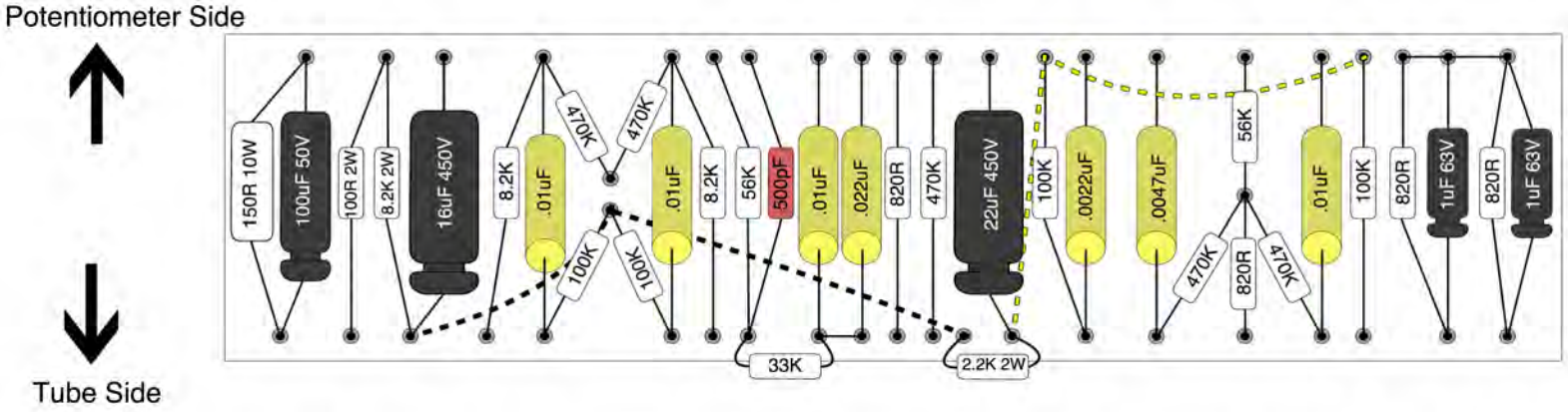


Drawing of component placement.

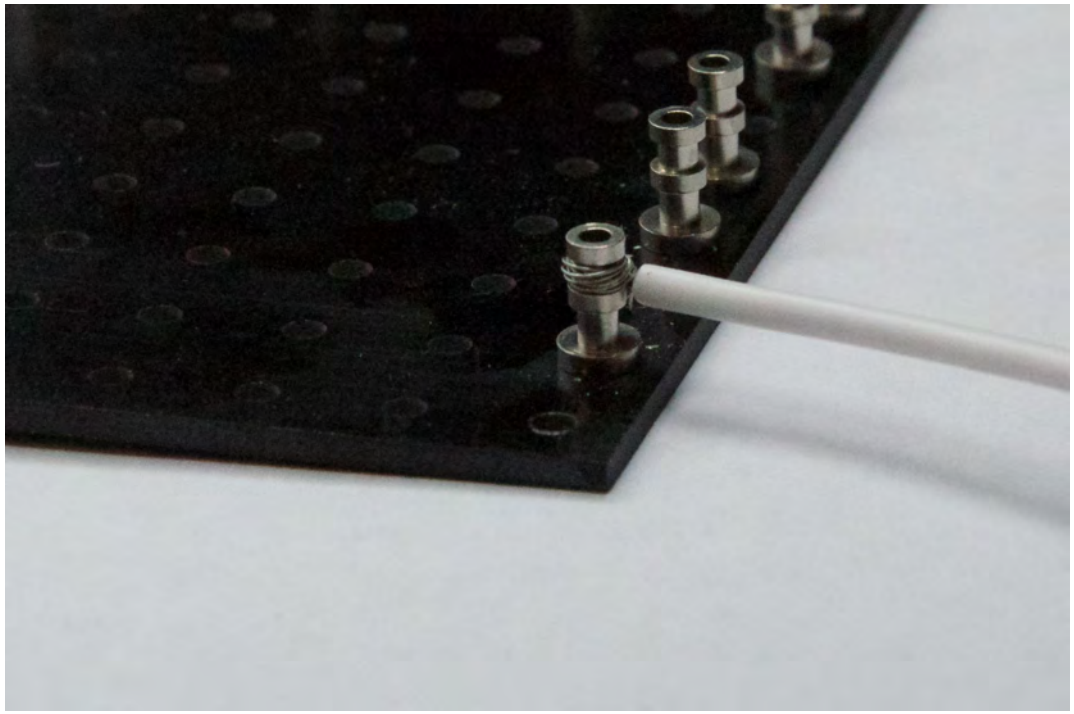
Be very careful to orient your electrolytic capacitors correctly! Don't mix up your 8k2 and 820 resistors!



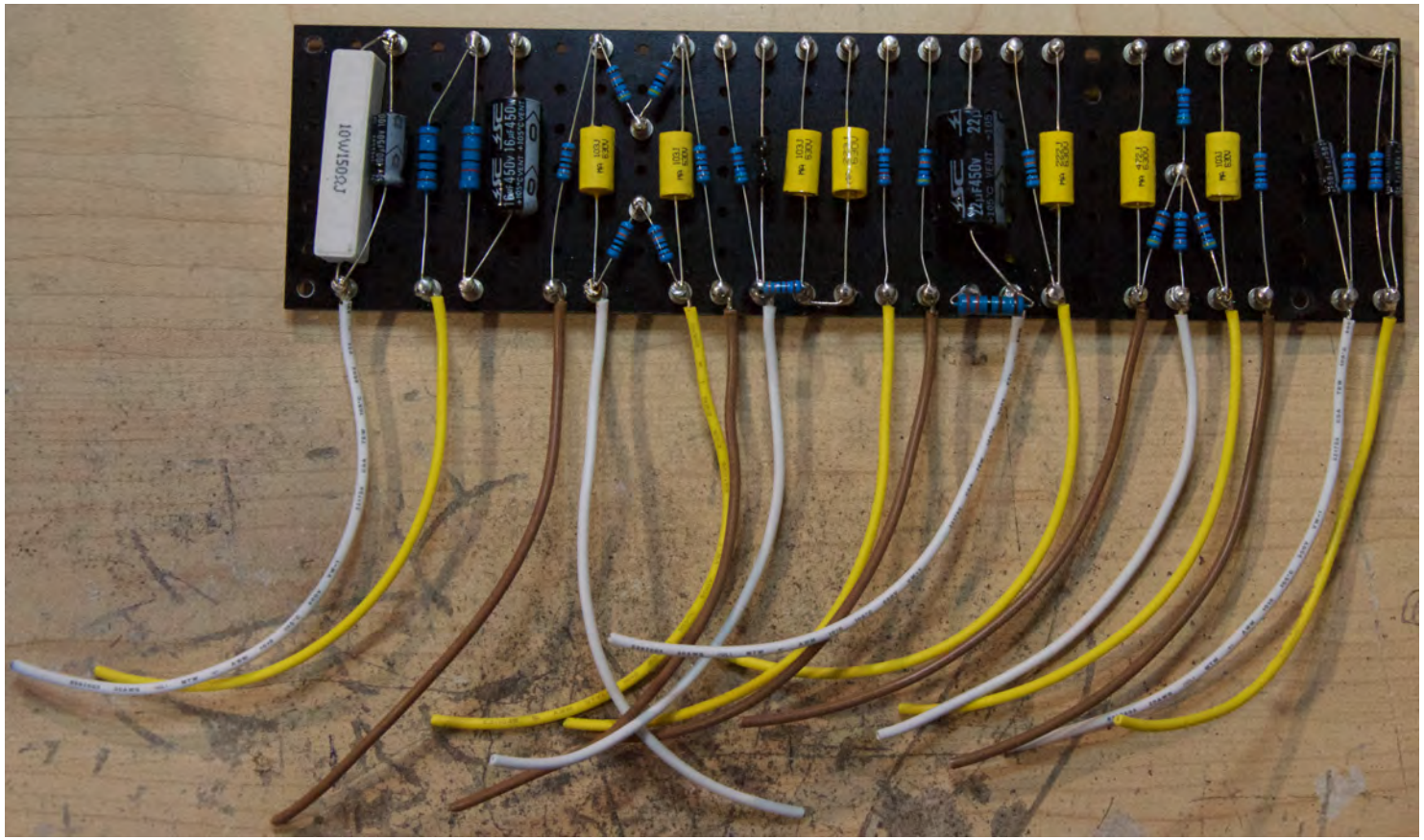
Step 3: Make the underside wire connections. The connections are between the tube side of the 8.2K 2W/16uF 450V junction to the 100K/100K junction. From the 100K/100K junction to one side of the 2.2K 2W resistor. From the 2.2K 2W/22uF 450V junction to the pot side of the 100K. Then from that same 100K to the pot side of the other 100K.



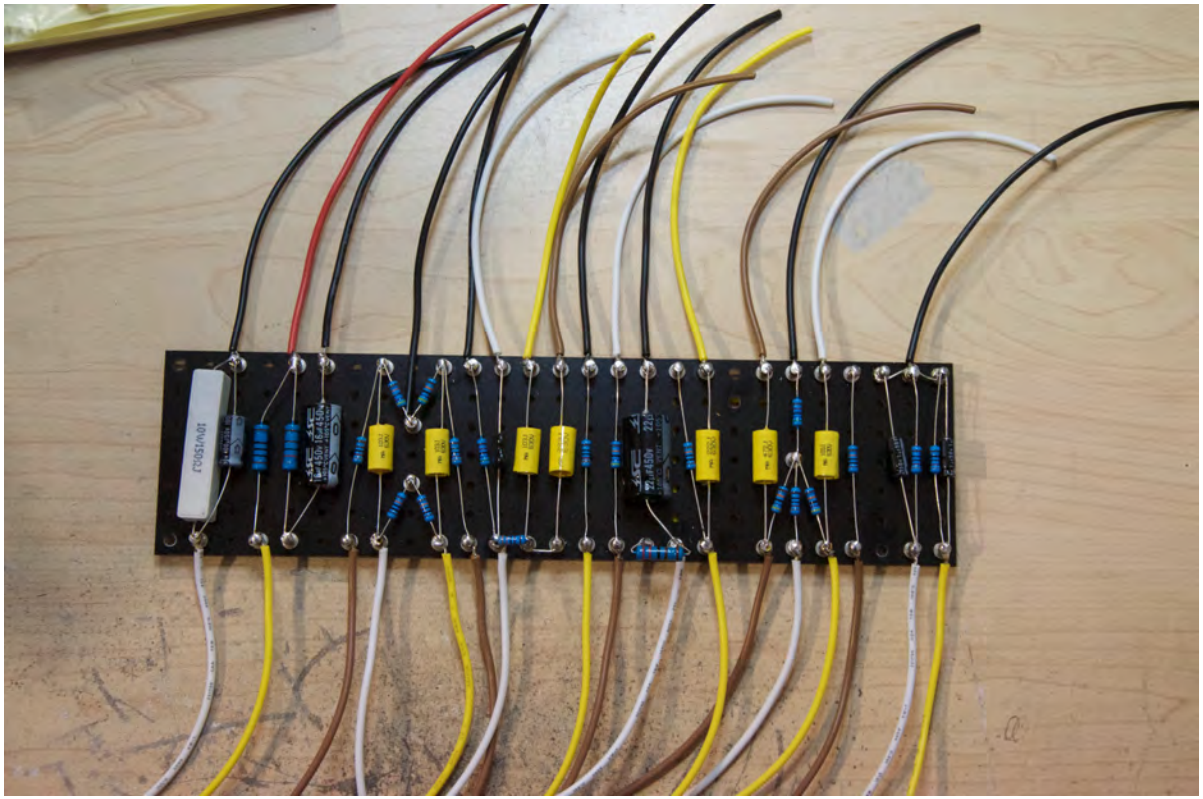
Top-side picture with component values and the underside wires.



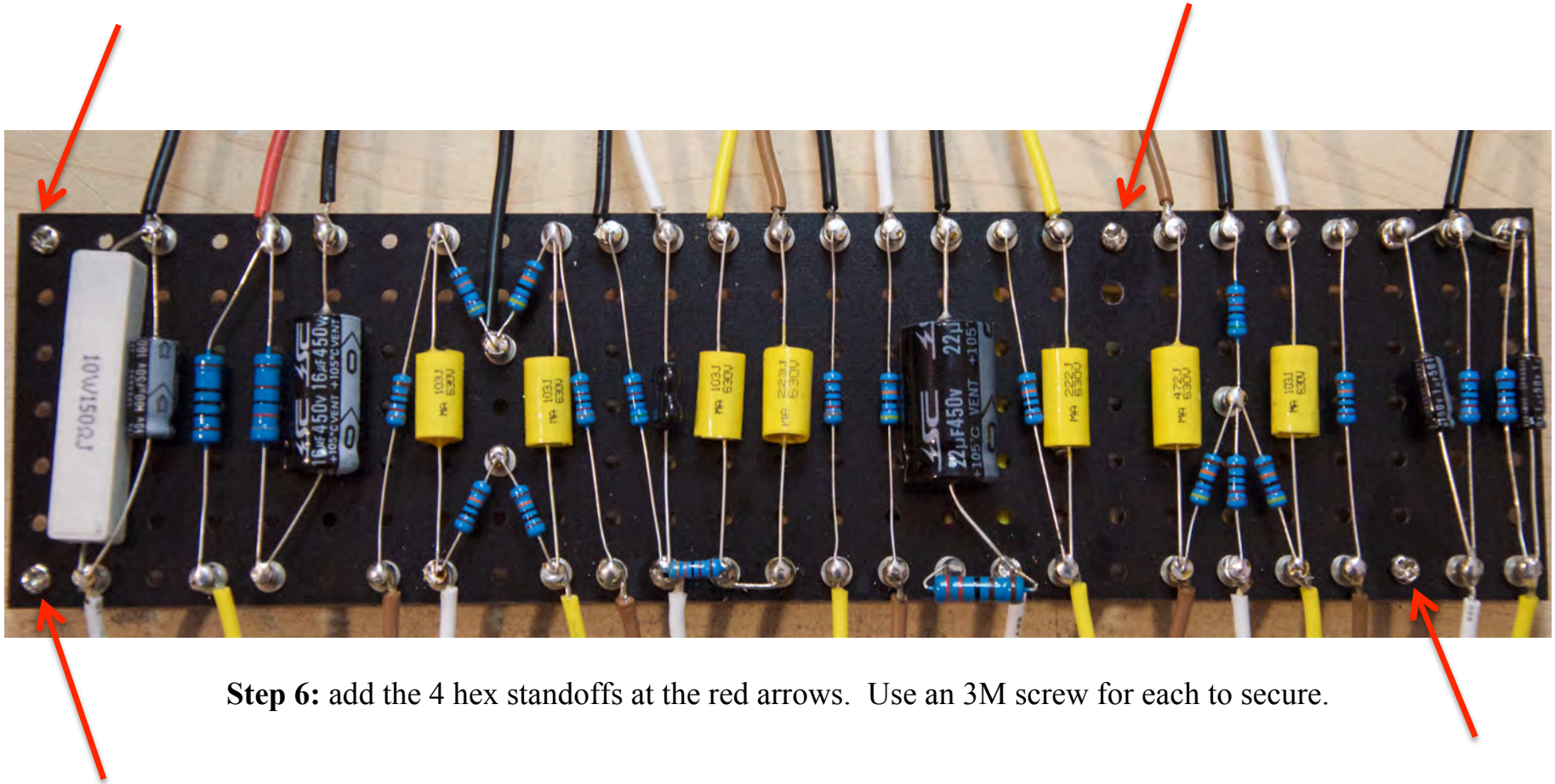
Example of wire connections to top tier of turrets. Strip about ¾” off the end of each wire, wrap it around the top tier of its respective turret lug, then twist and solder.



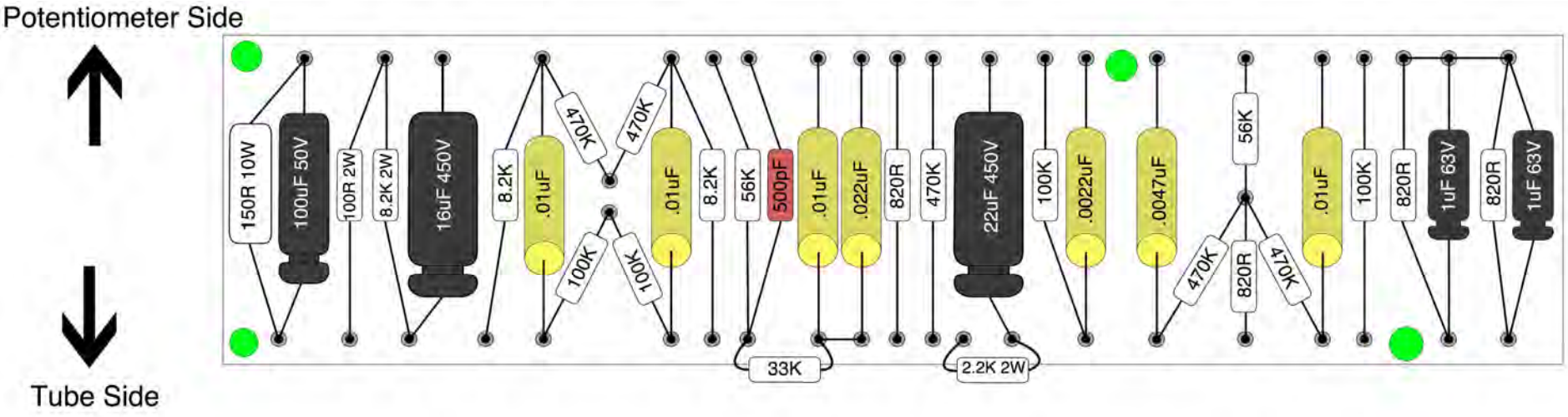
Step 4: Connect off-board wires to top tier of turret lugs on tube side of the board. Use 6” of wire.



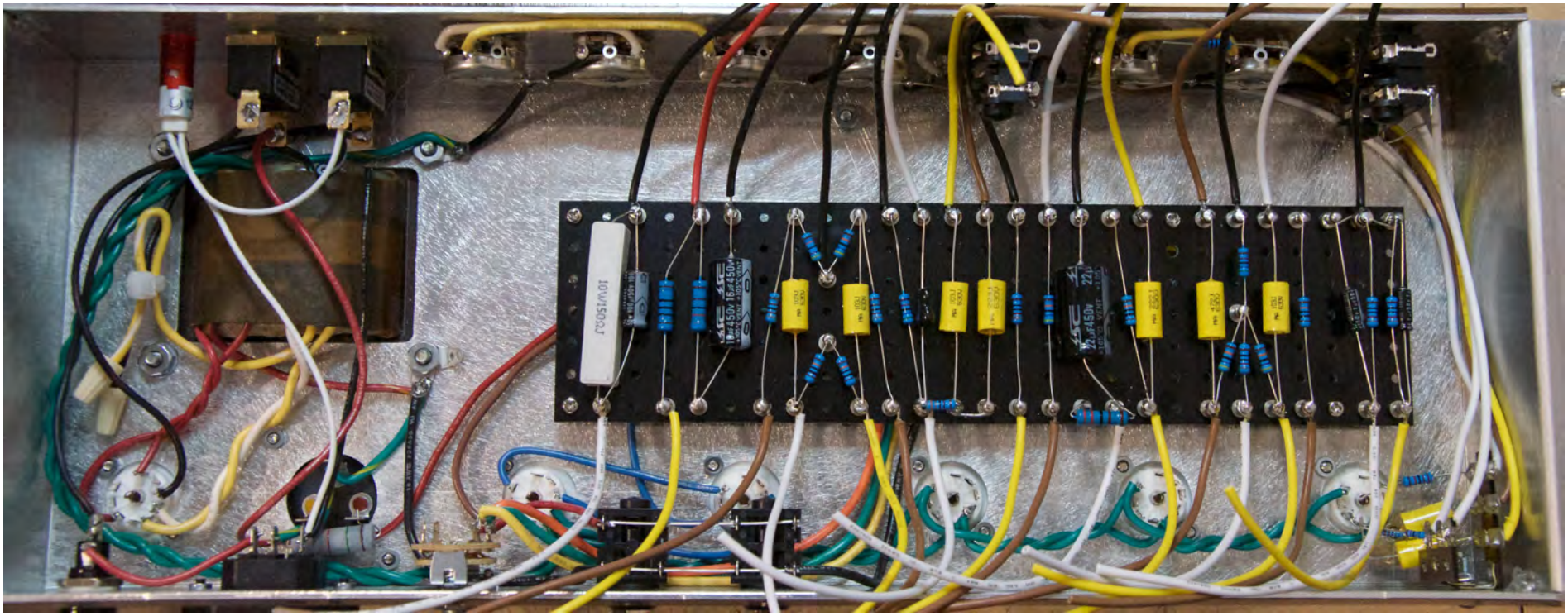
Step 5: Connect off board wires to the potentiometer side. Use a piece of 8 inch red wire at the 100R 2W/8.2K 2W junction.



Step 6: add the 4 hex standoffs at the red arrows. Use an 3M screw for each to secure.

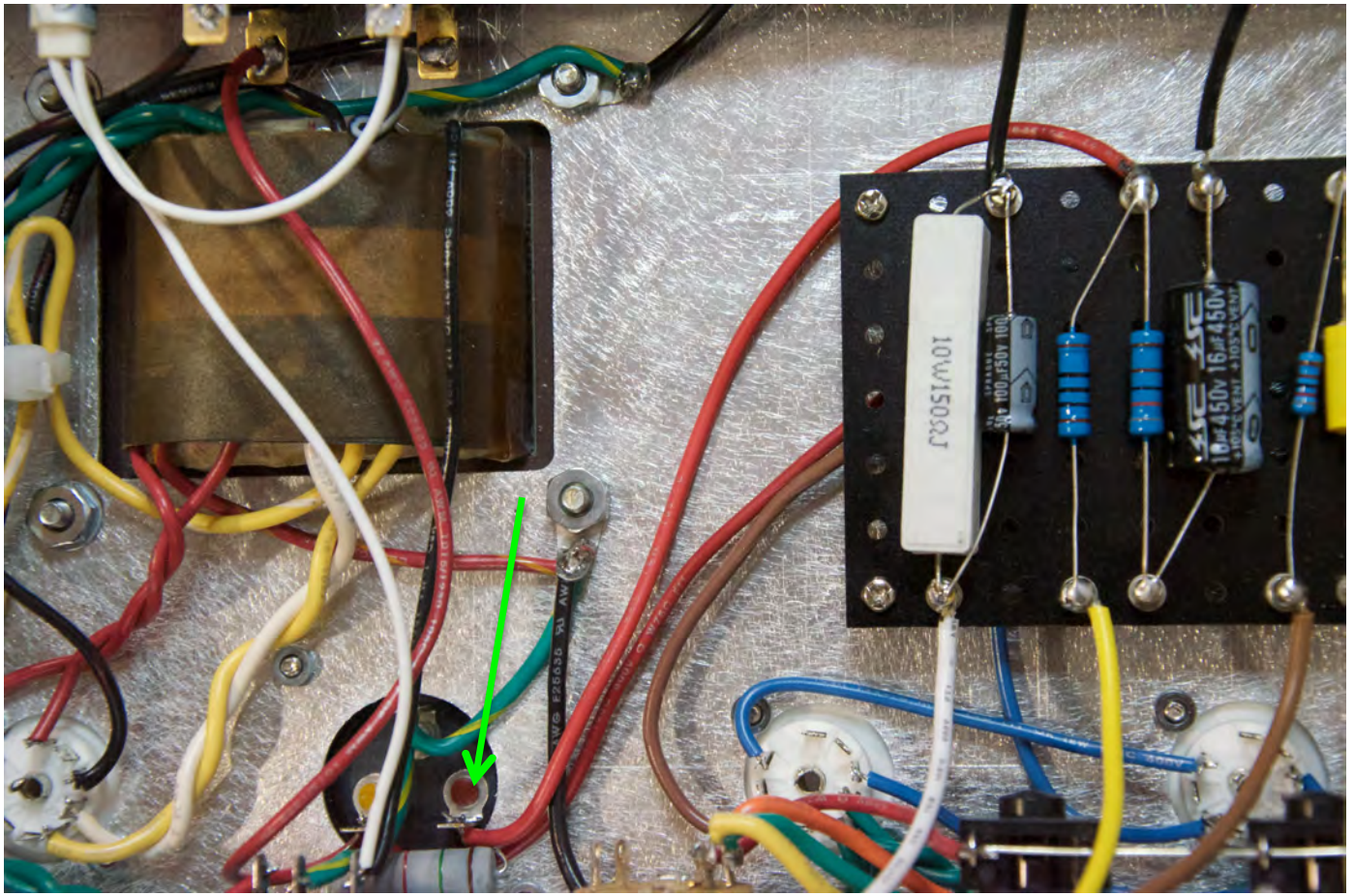


Top-side component picture showing the locations of the standoffs in green.

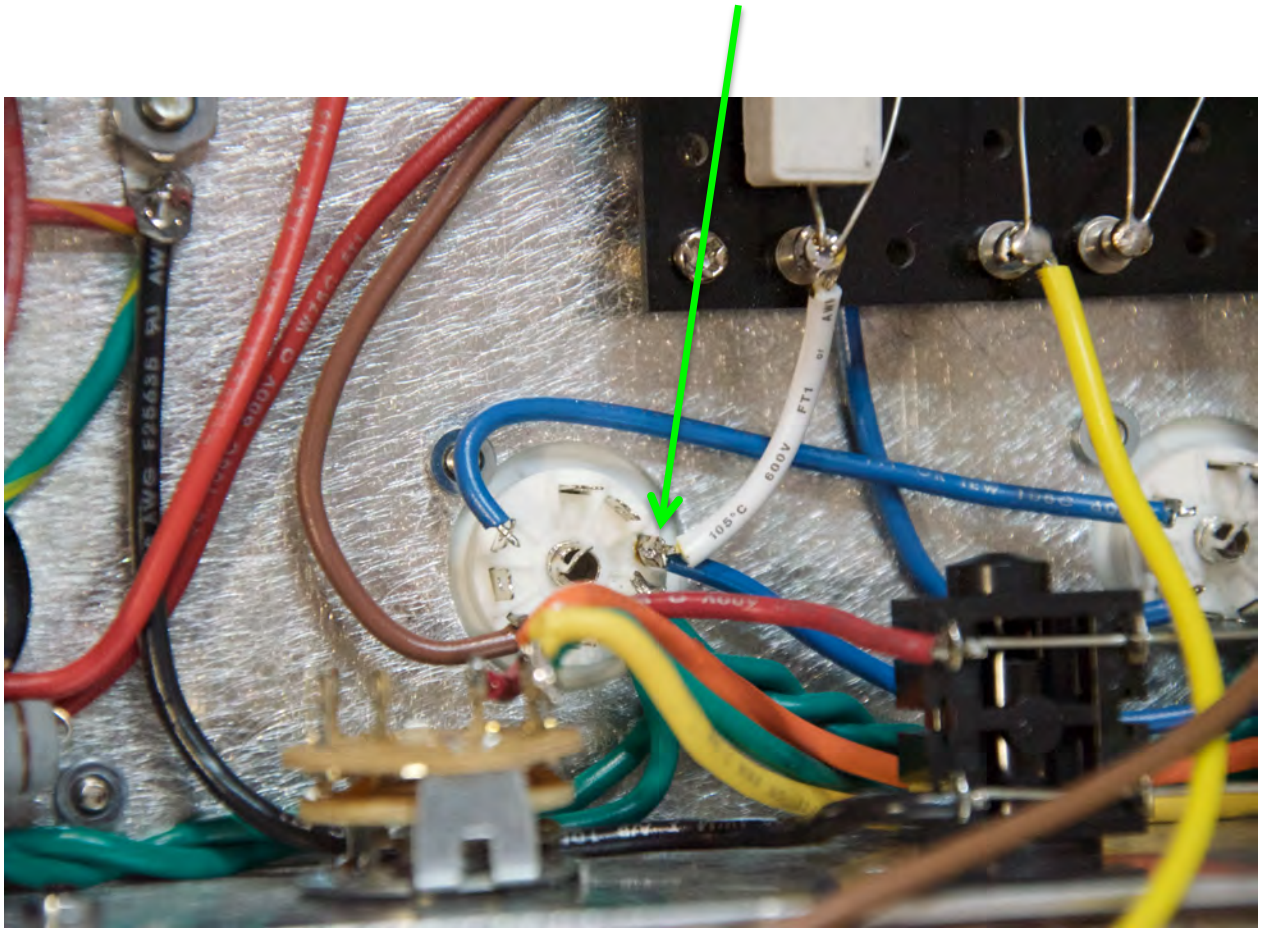


Step 7: Mount the circuit board to the chassis. Use M3 screws to secure.

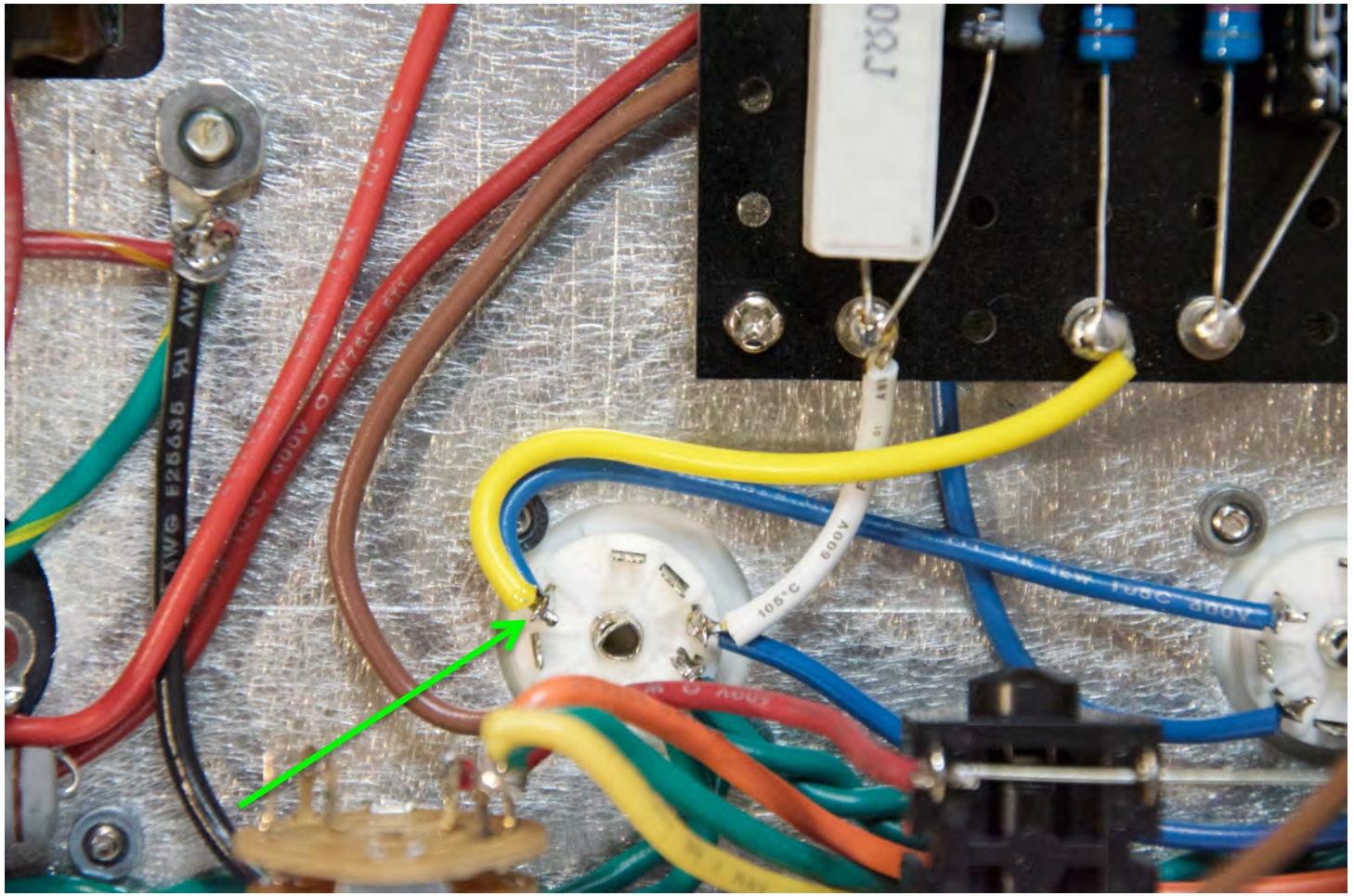
Wiring (Tube Side)



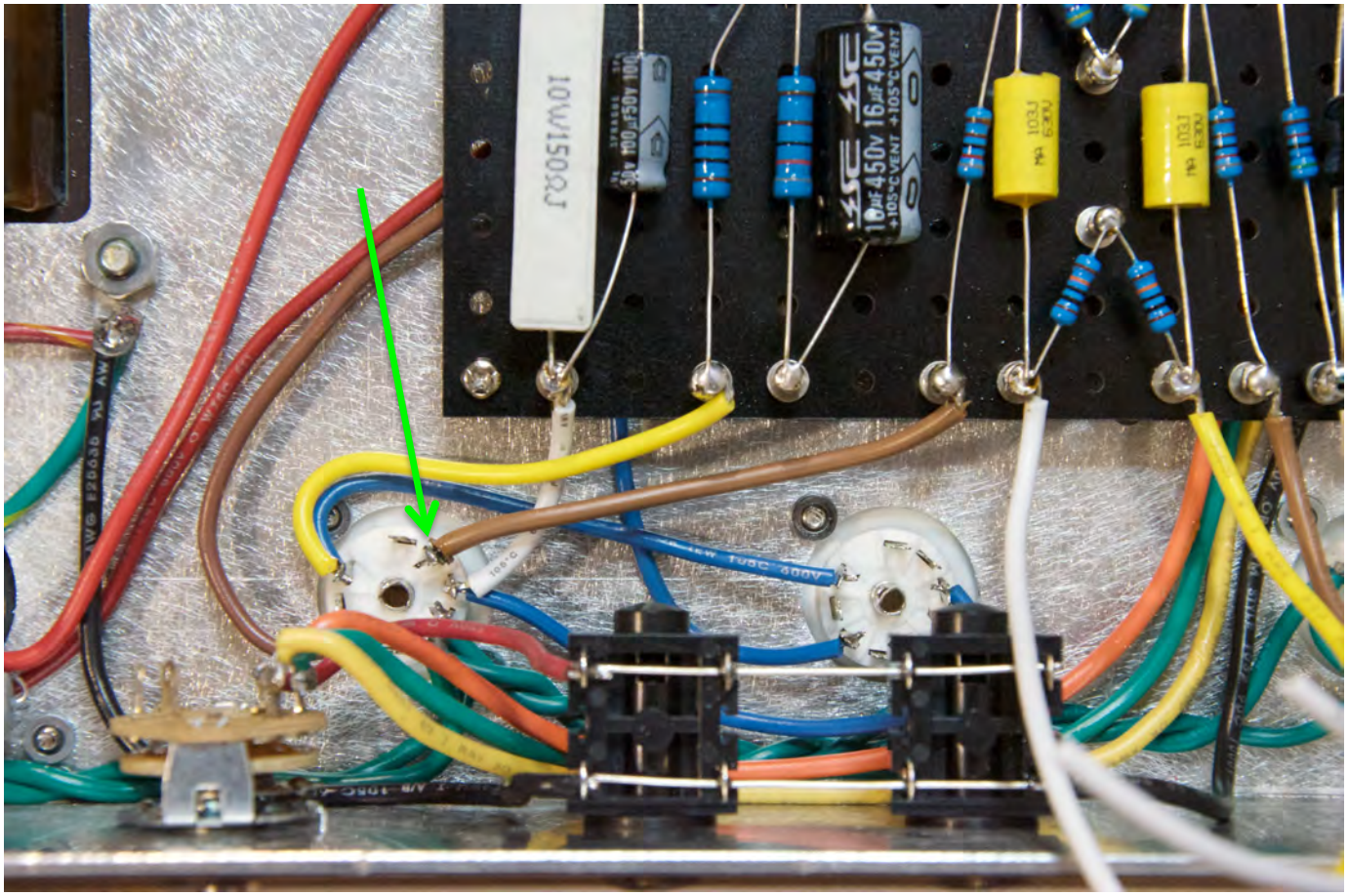
Step 1: Connect the Red wire from the 100ohm/8k2 junction of the board to the red terminal lug of the 32uF + 32uF as shown and solder.



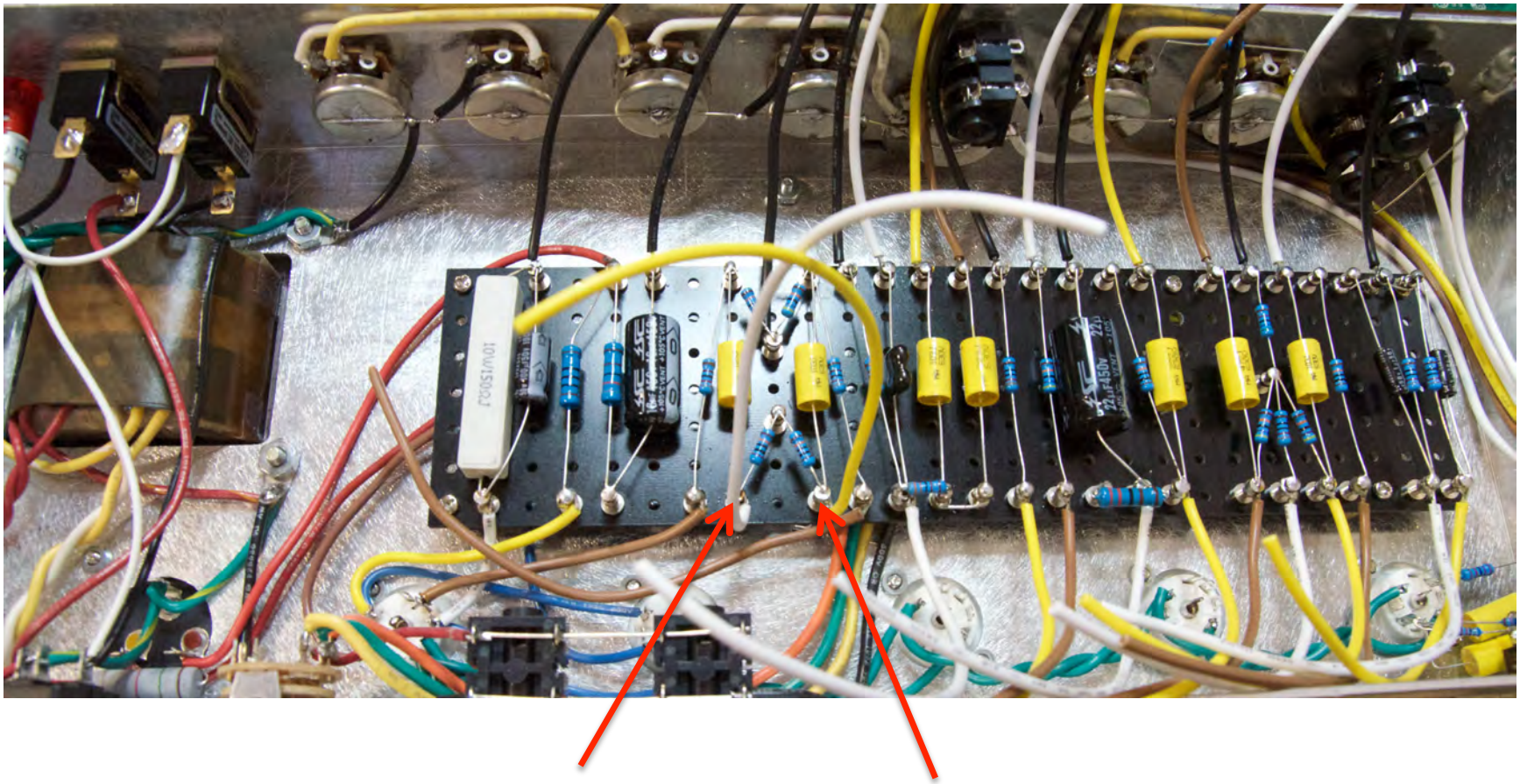
Step 2: Connect the white wire from the tube side 180R 10W/100uF junction to pin 3 of the first EL84 tube socket. Solder pin 3 of the tube socket now.



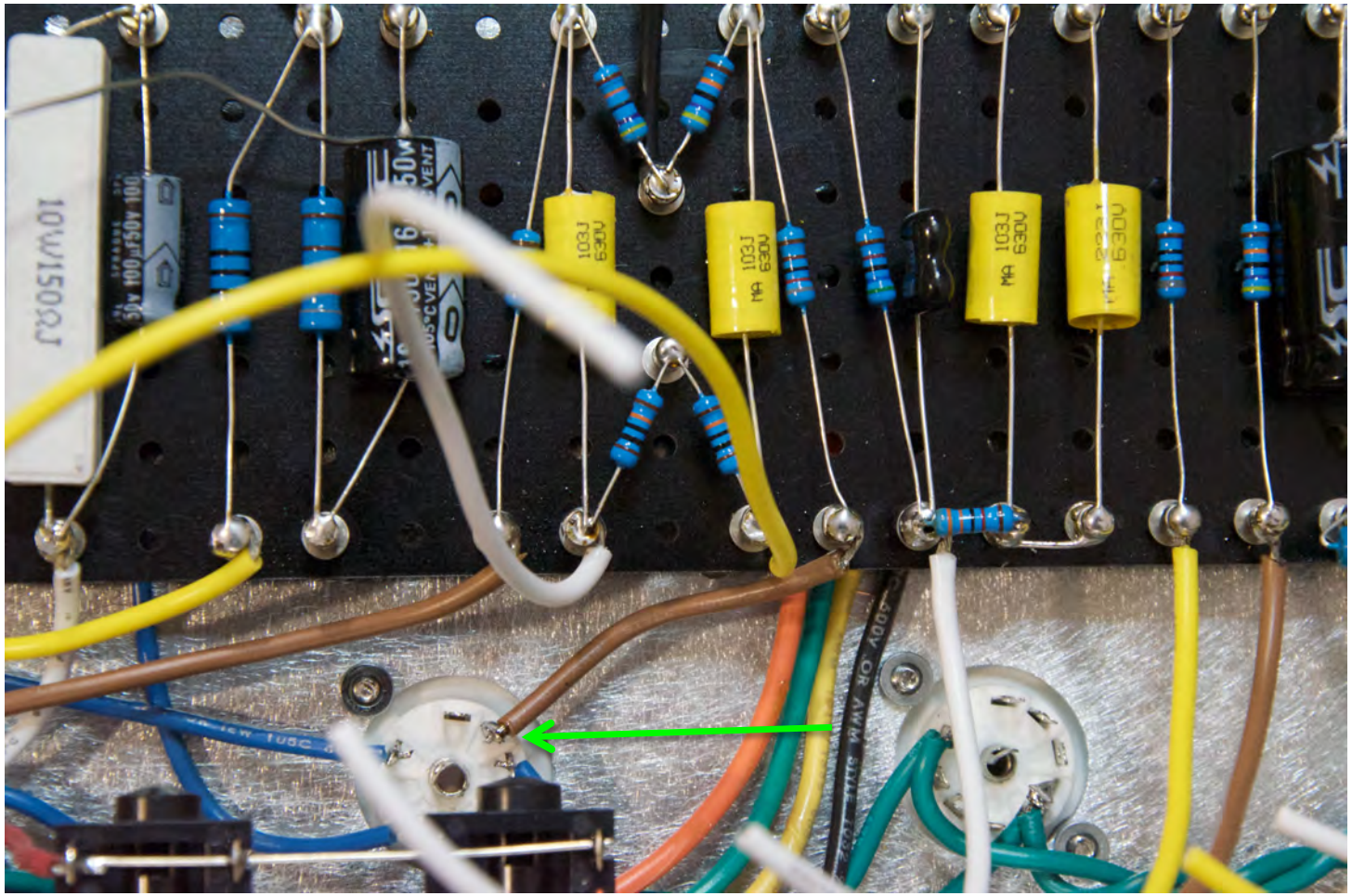
Step 3: Connect the yellow wire from the tube side of the 100ohm resistor to pin 9 of the first EL84 tube socket and solder.



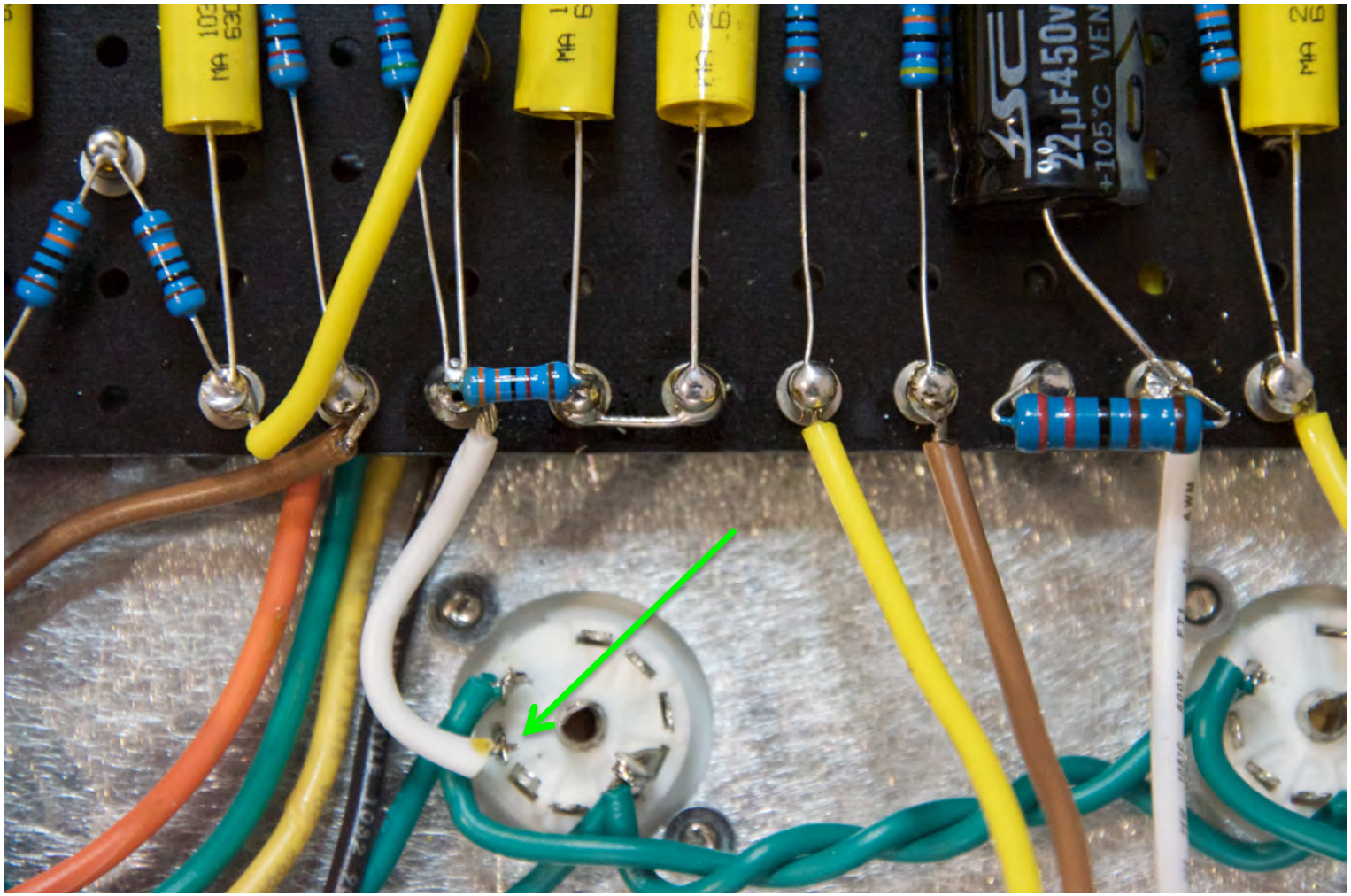
Step 4: Connect the brown wire from the 1/2watt 8k2 resistor to pin 2 of the first EL84 tube socket and solder.



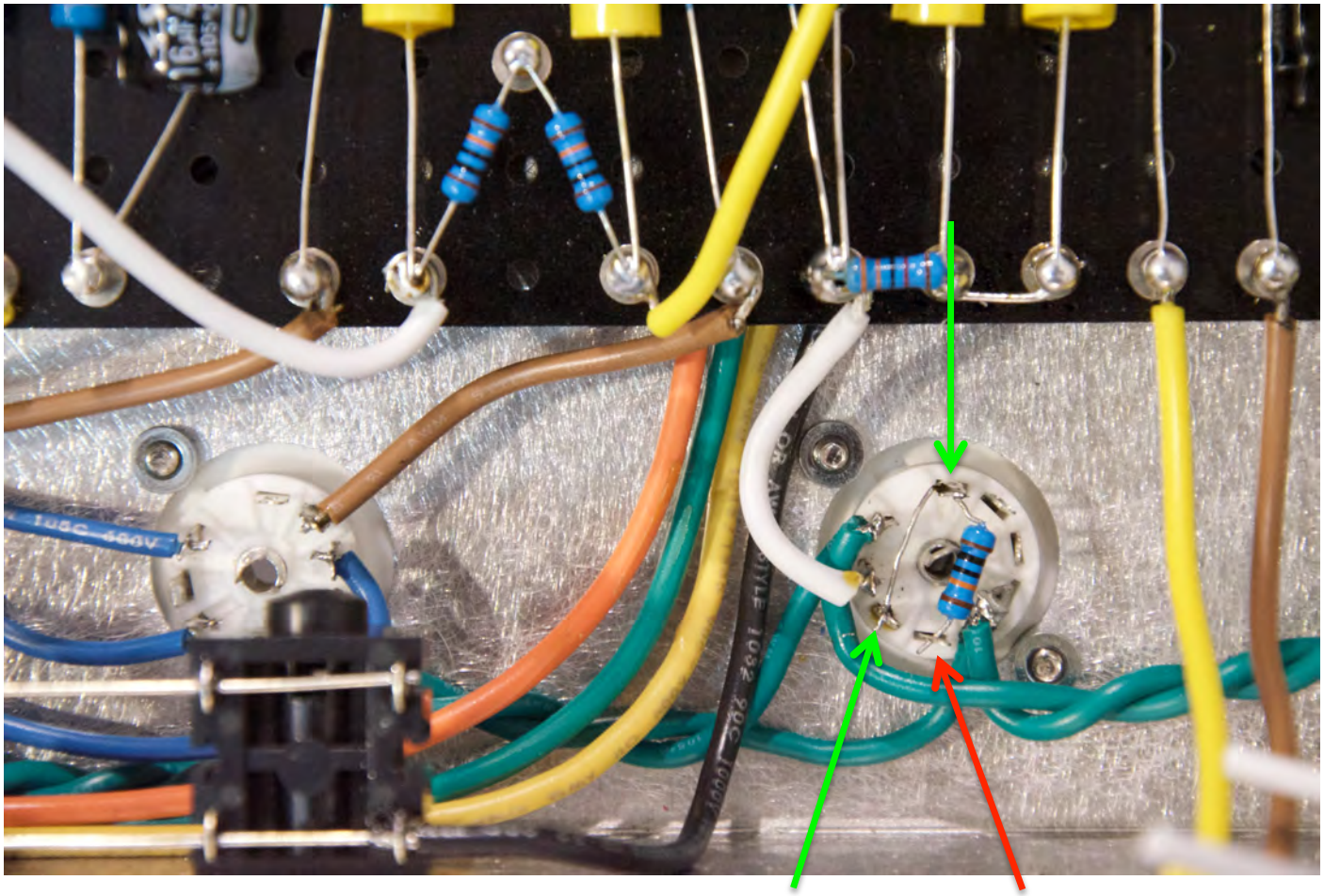
Step 5: Move the next white and yellow wires at the 100k/.01uF junctions out of the way for now. We will come back to those later.



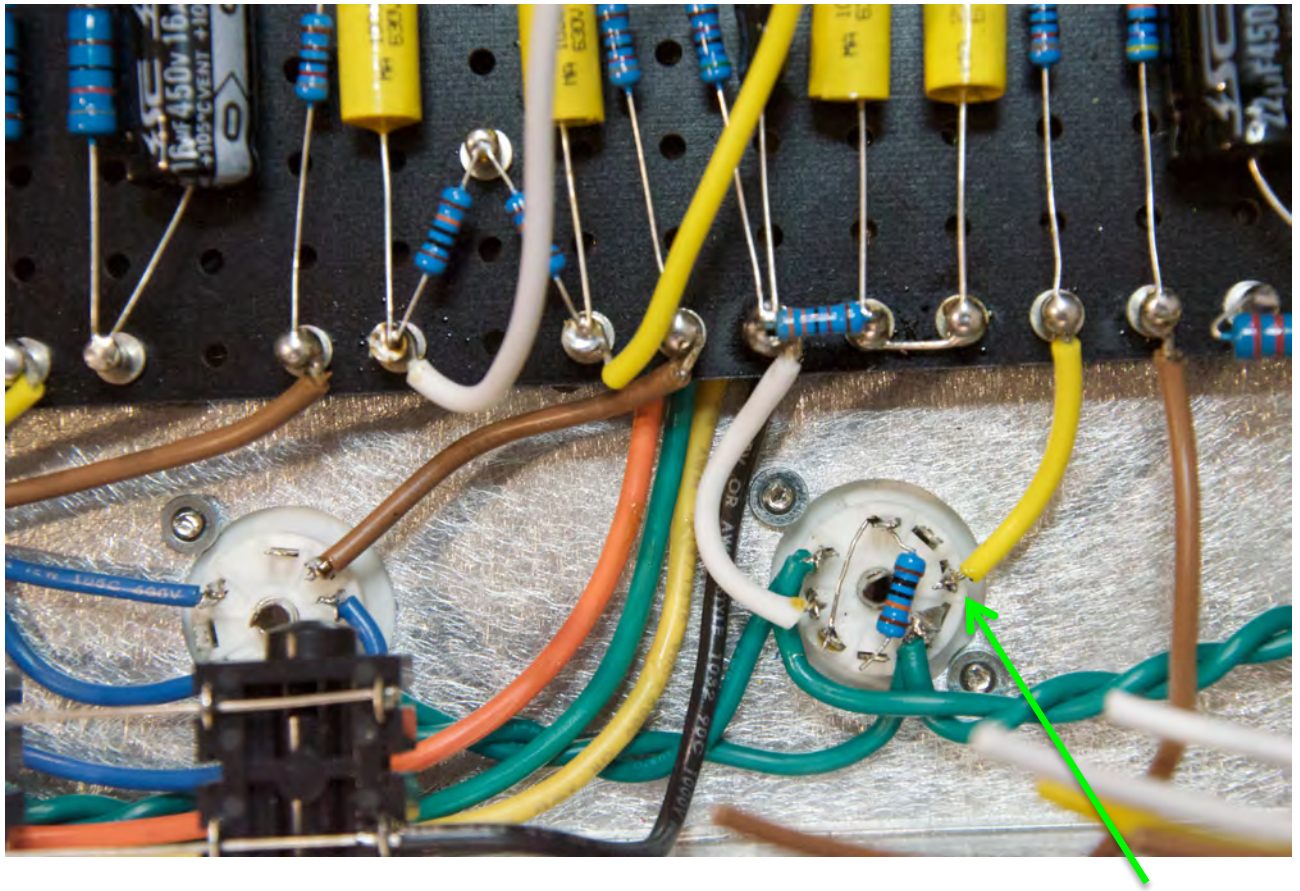
Step 6: Connect the brown wire from the other 8k2 resistor to pin 2 of the second EL84 tube socket and solder.



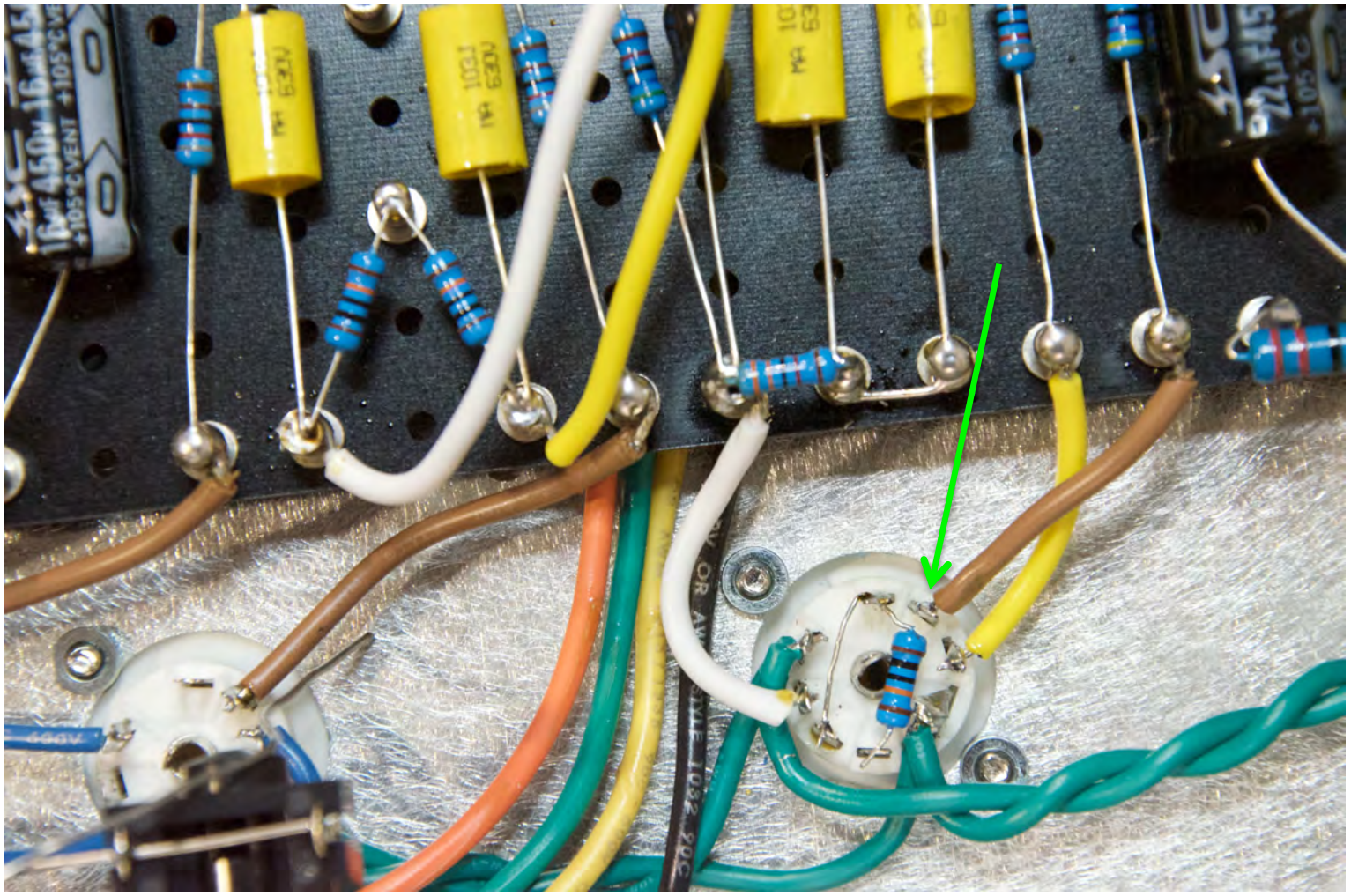
Step 7: Connect the white wire from the 56k/33k/500p junction to pin 8 of the first ECC83 tube socket and solder.



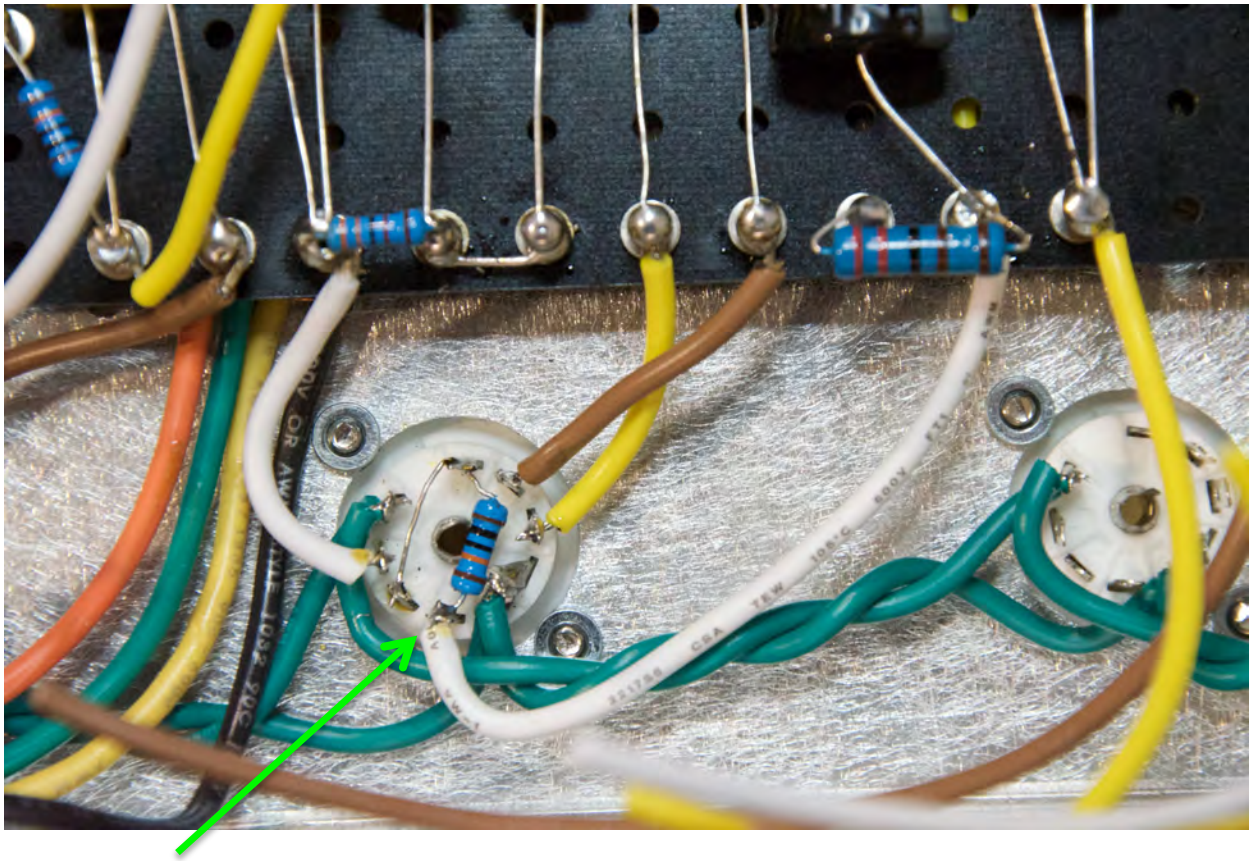
Step 8: Take a 100K ½W resistor and make a connection on the first ECC83 tube socket between lugs 1 and 6. At the same time, use the lead from lug 1 to jump to lug 7 as shown in the picture. Only Solder at lugs 1 and 7 (green arrows). Do not solder at lug 6 yet (red arrow)



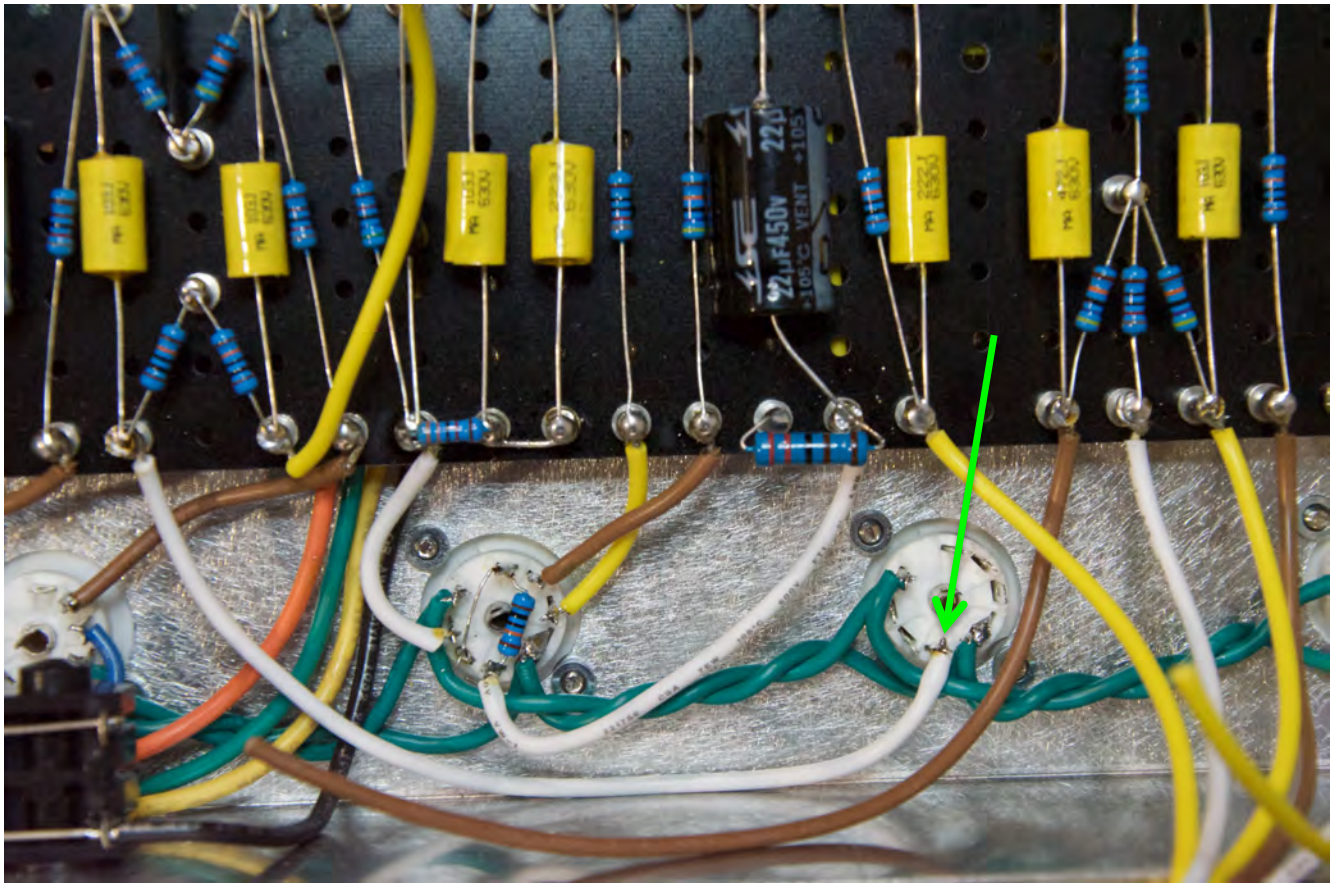
Step 9: Connect the yellow wire 820ohm resistor to pin 3 of the first ECC83 tube socket and solder.



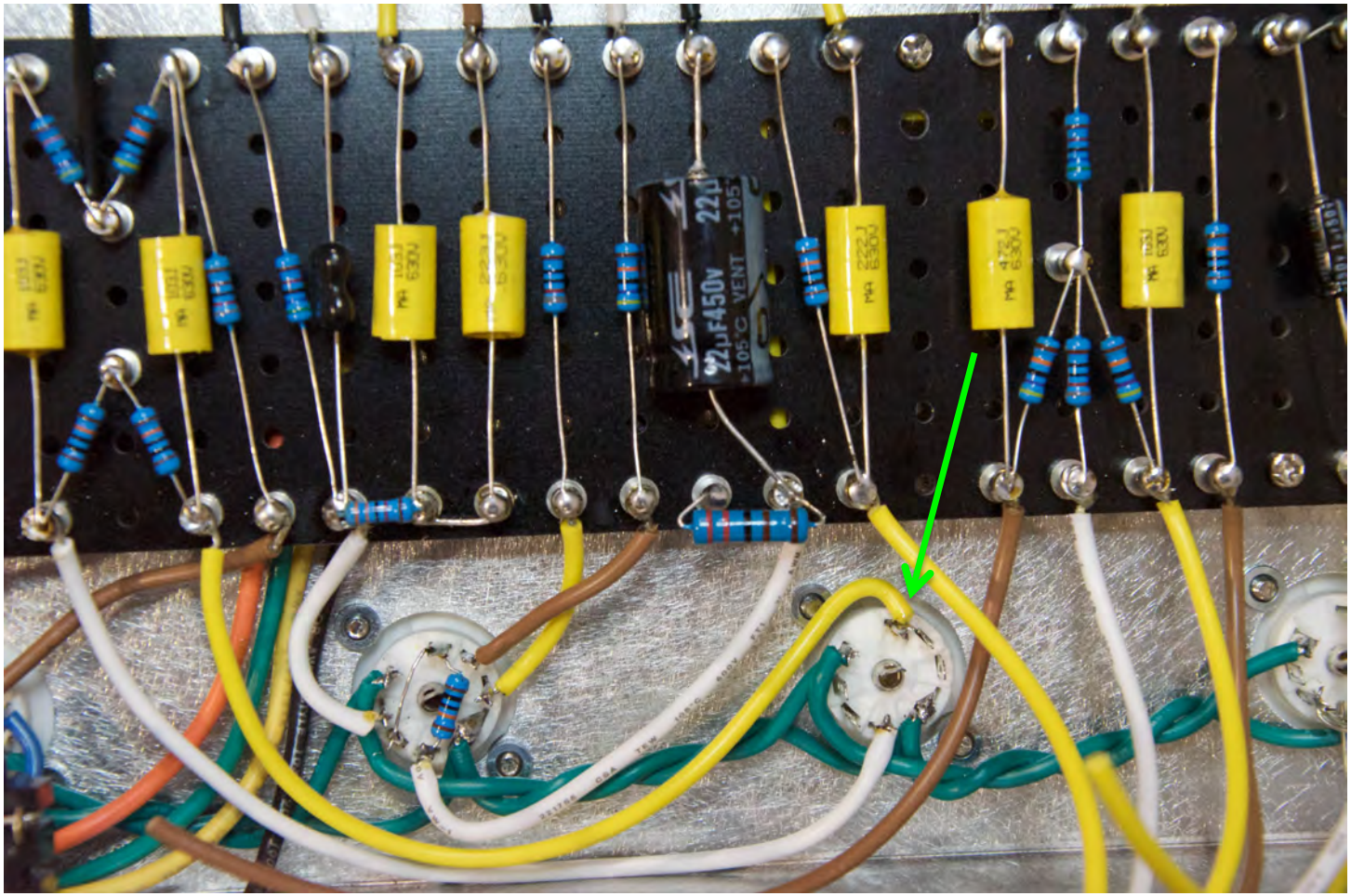
Step 10: Connect the brown wire from the 470k resistor to pin 2 of the first ECC83 tube socket and solder.



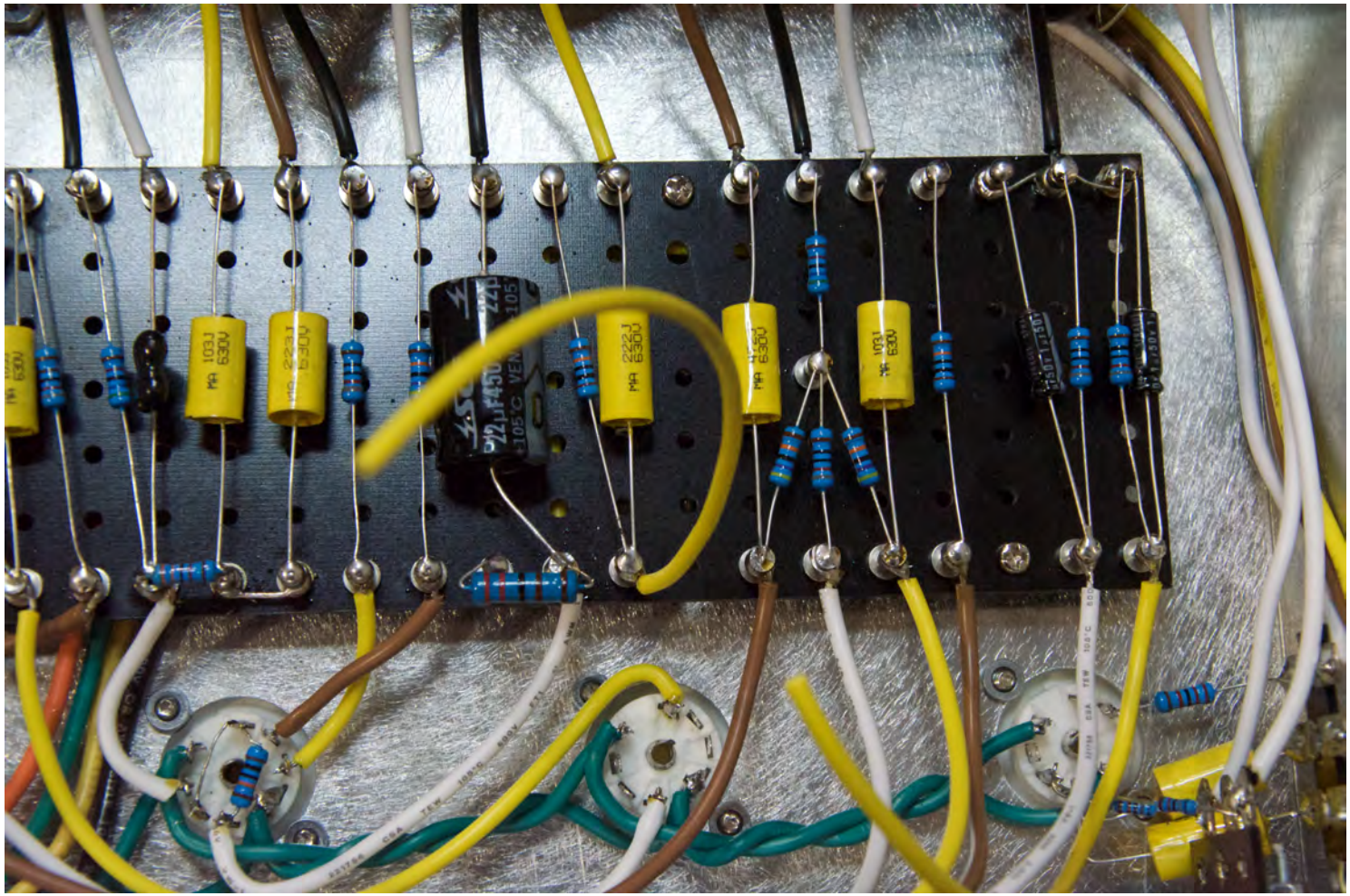
Step 11: Connect the white wire from the 2k2/22uF junction to pin 6 of the first ECC83 tube socket and solder.



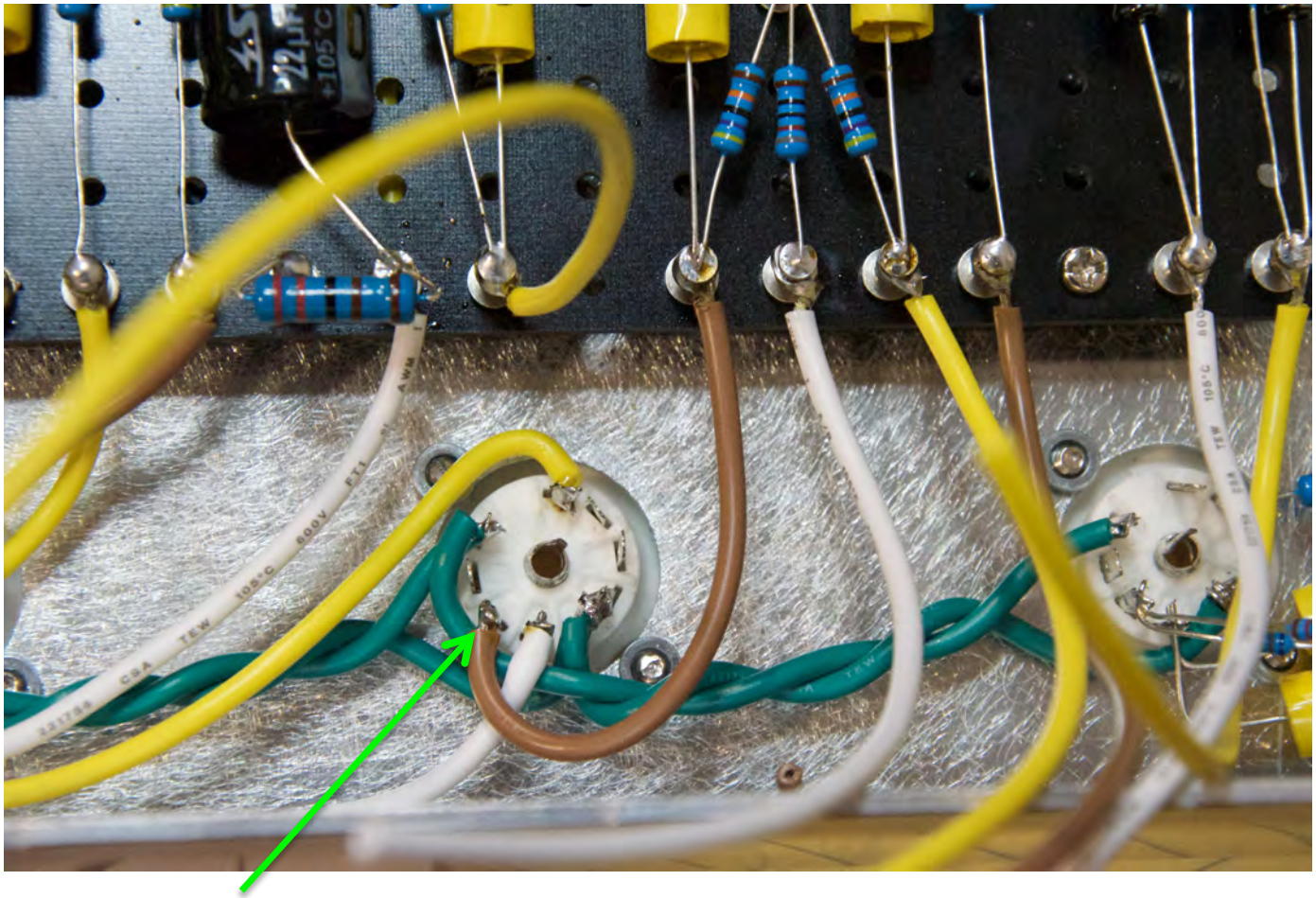
Step 12: Take the white wire you bent out of the way in step 5 and connect it to pin 6 of the second ECC83 tube socket and solder.



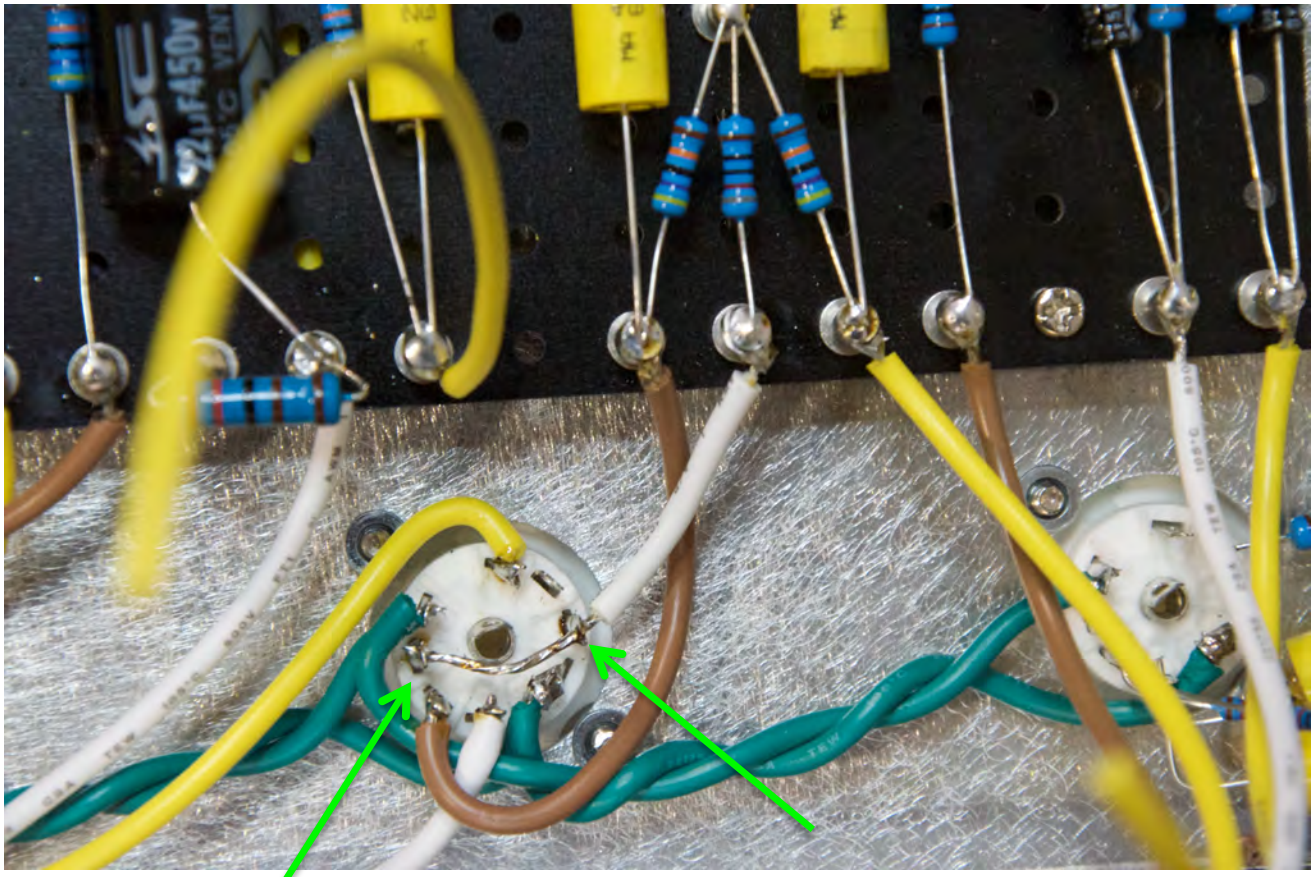
Step 13: Connect the yellow wire you bent out of the way in step 5 and connect it to pin 1 of the second ECC83 tube socket and solder



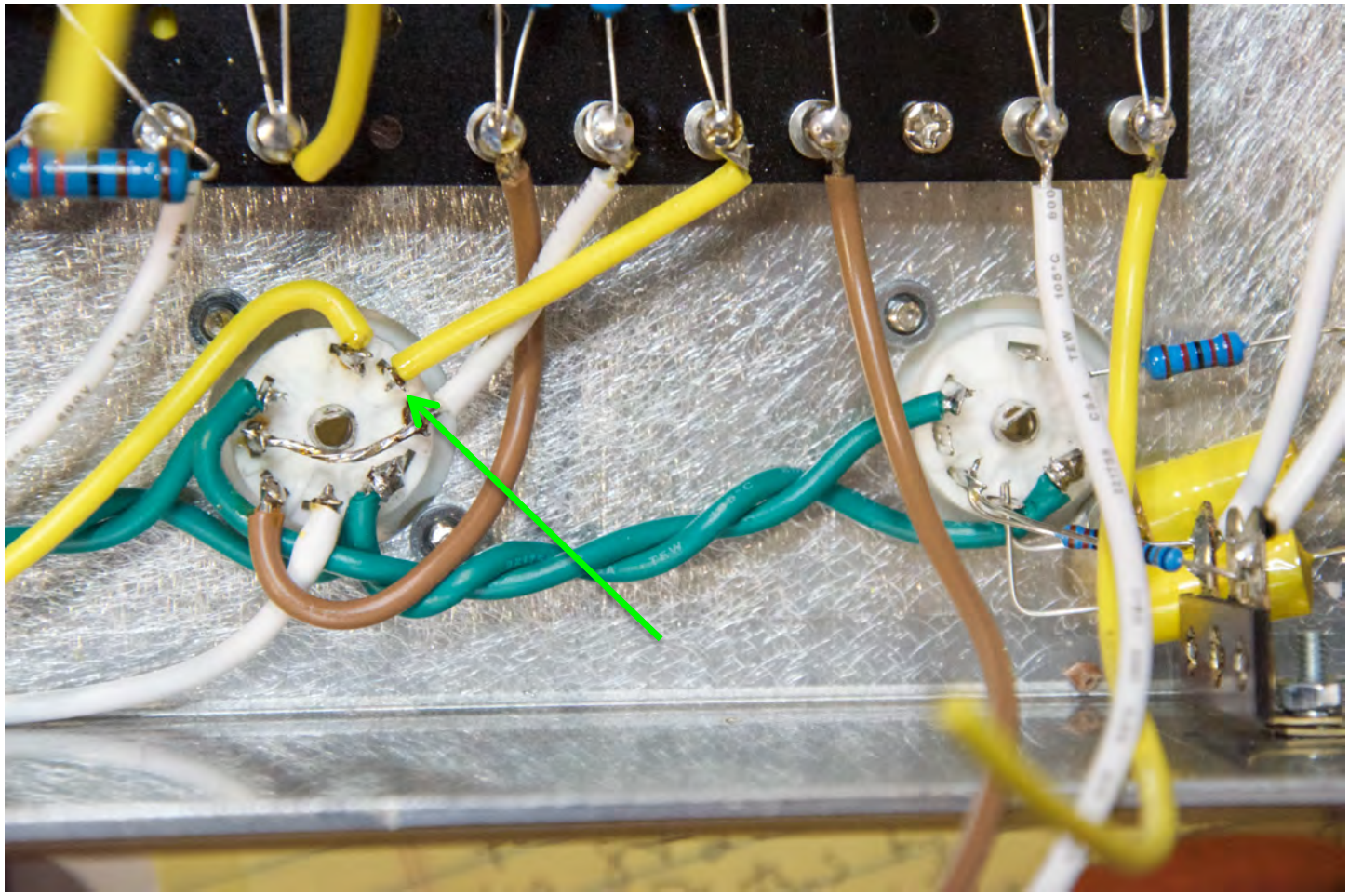
Step 14: Move the next yellow wire at the 100k/.0022uF junction out of the way for now. We will come back to it later.



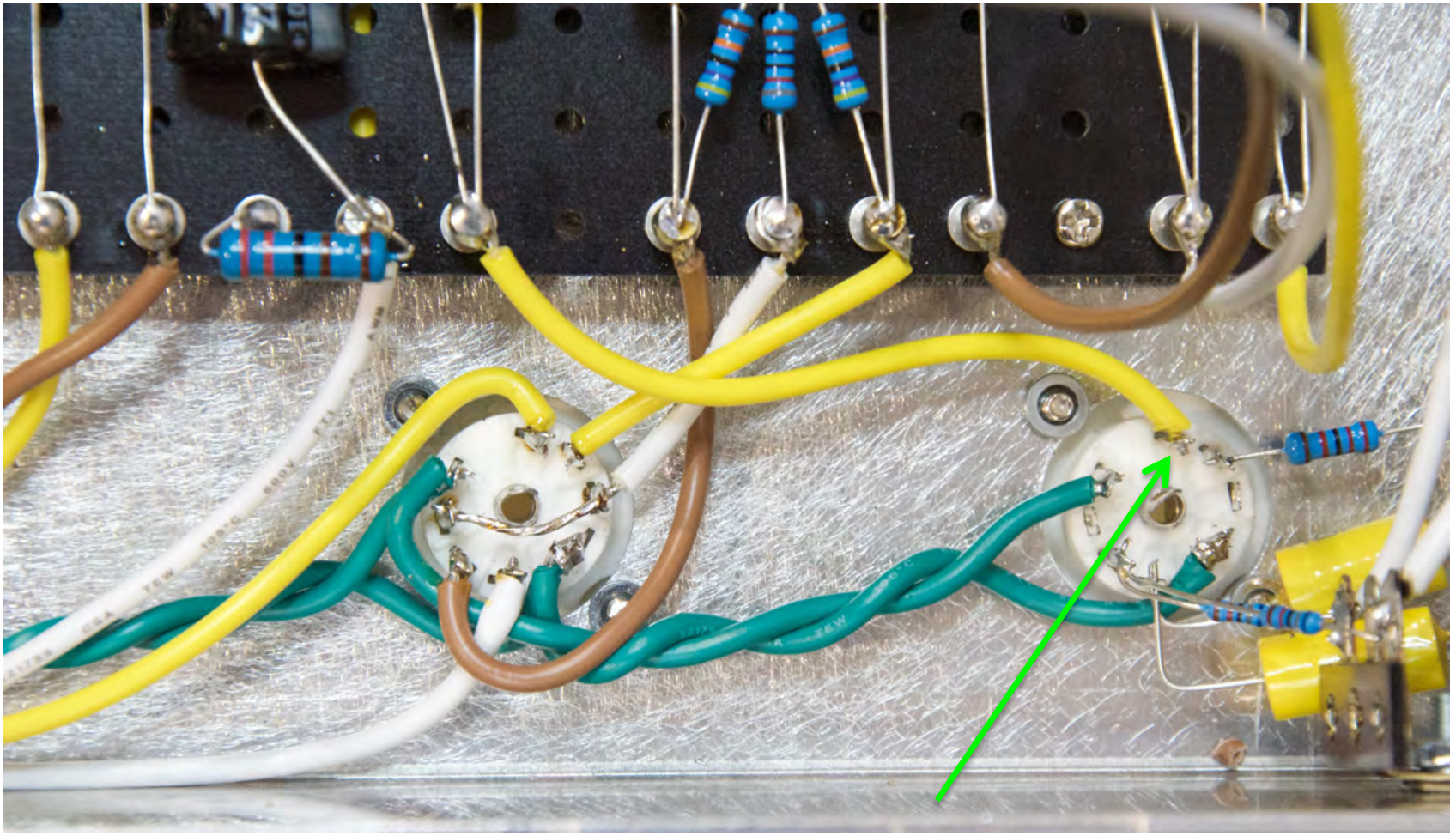
Step 15: Connect the brown wire from the 470k/.0047uF junction to pin 7 of the second ECC83 tube socket and solder.



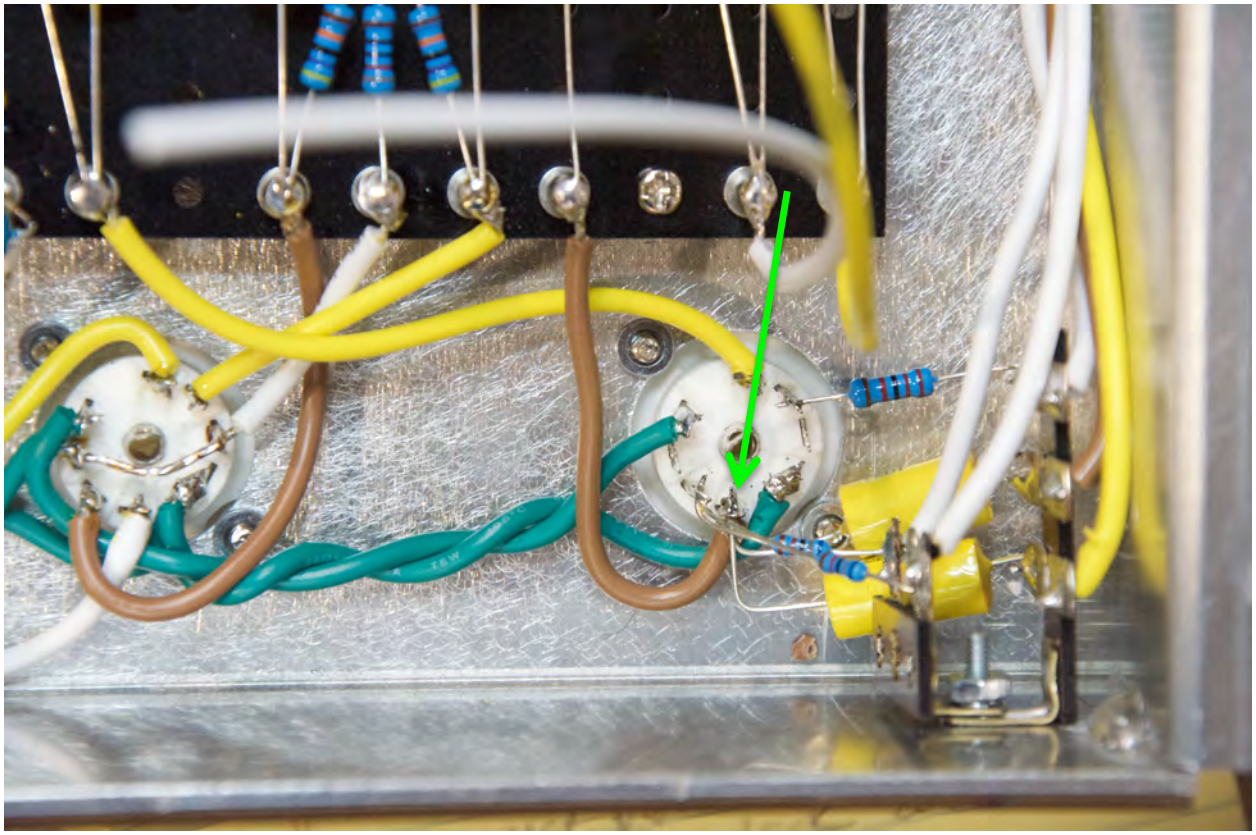
Step 16: Take the next white wire from the 820ohm resistor and connect it to pin 3 and pin 8 of the second ECC83 tube socket. Do this by measuring your total wire cut to pin 8, and stripping enough wire to contact pin 3 as well. It might be helpful to tin the wire so there are no stray strands to deal with. That center pin of the tube socket is insulated from everything, so if your jumper between 3 and 8 touches it, it's OK.



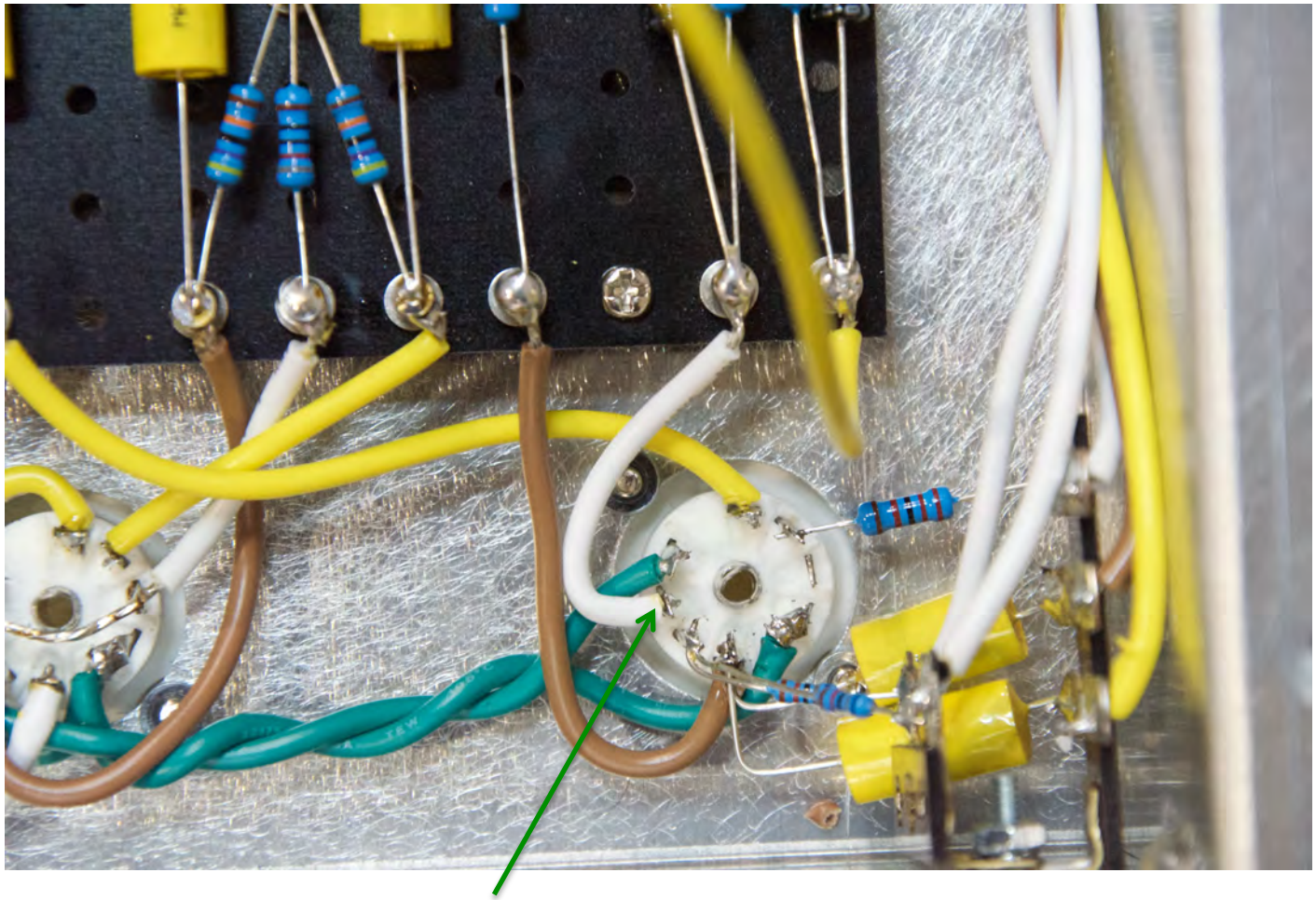
Step 17: Connect the yellow wire from the 470k/.01uF junction to pin 2 of the second ECC83 tube socket and solder.



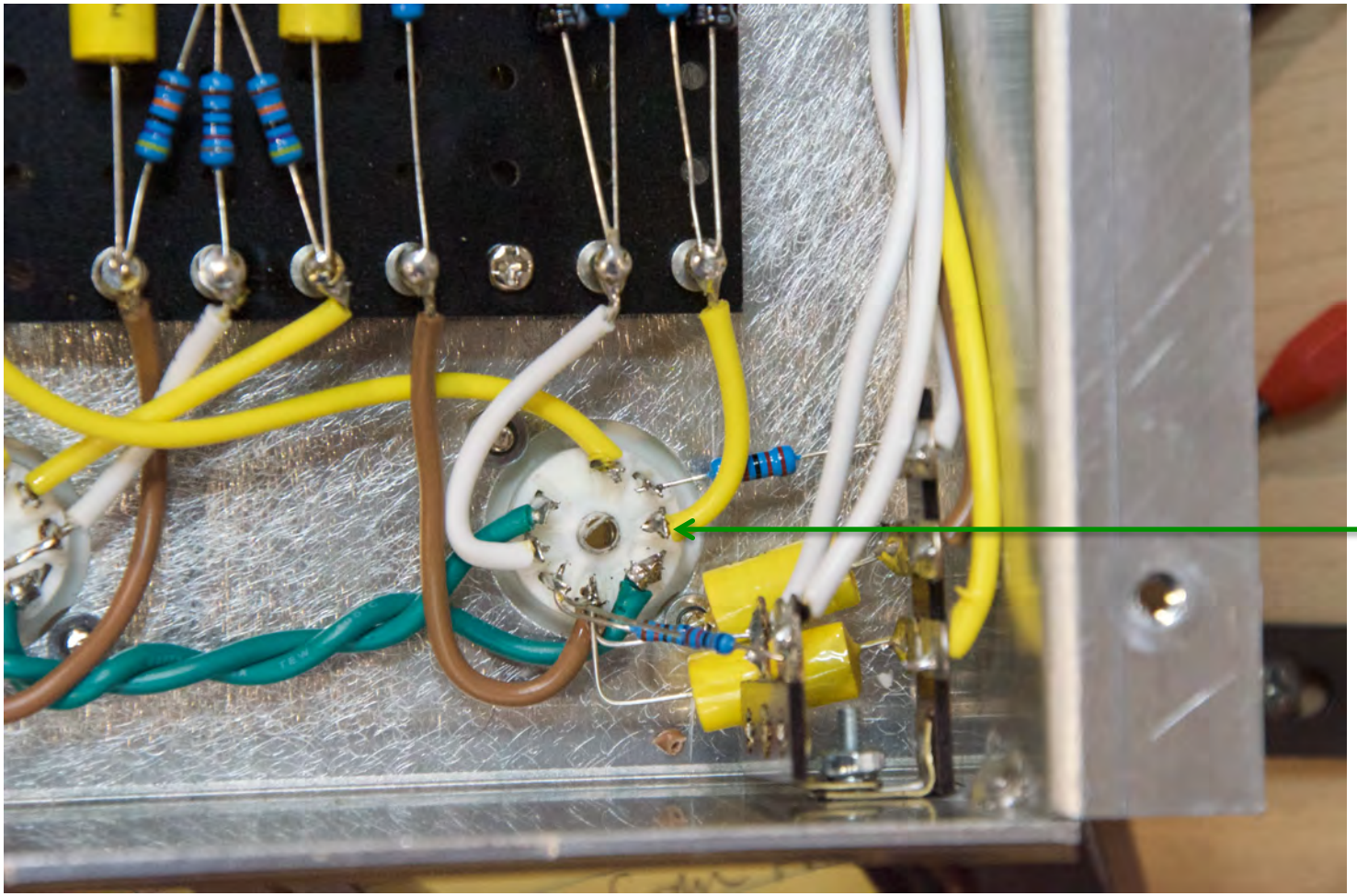
Step 18: Take the yellow wire you moved out of the way in step 14 and connect it to pin 1 of the last ECC83 tube socket and solder



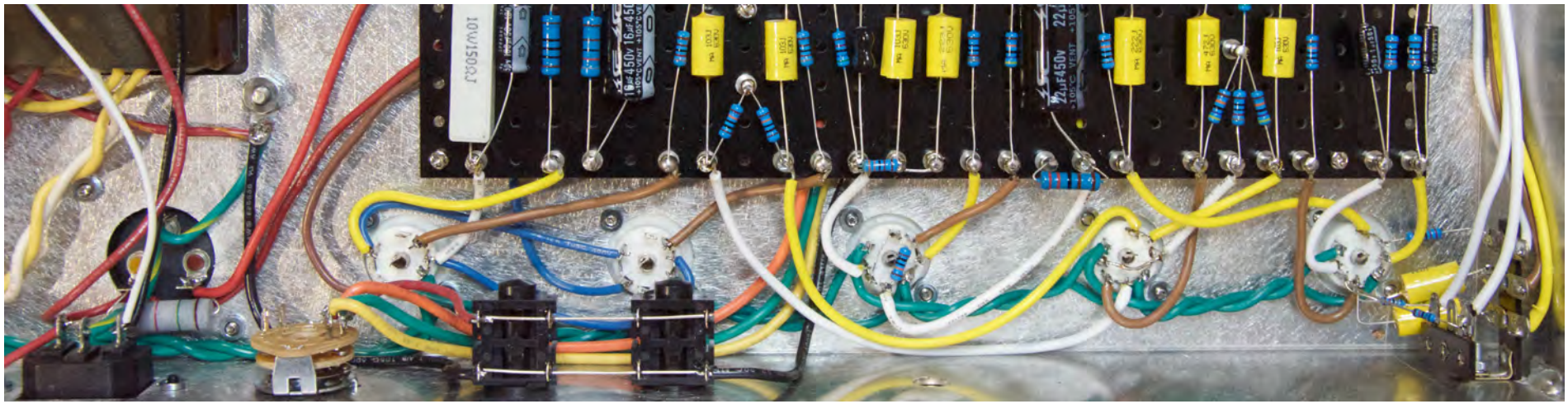
Step 19: Connect the brown wire from the 100k resistor to pin 6 of the last ECC83 tube socket. The two capacitors from the terminal strip will be sharing this lug. Solder now.



Step 20: Connect the white wire from the first 1uF/820ohm junction to pin 8 of the last ECC83 tube socket and solder.

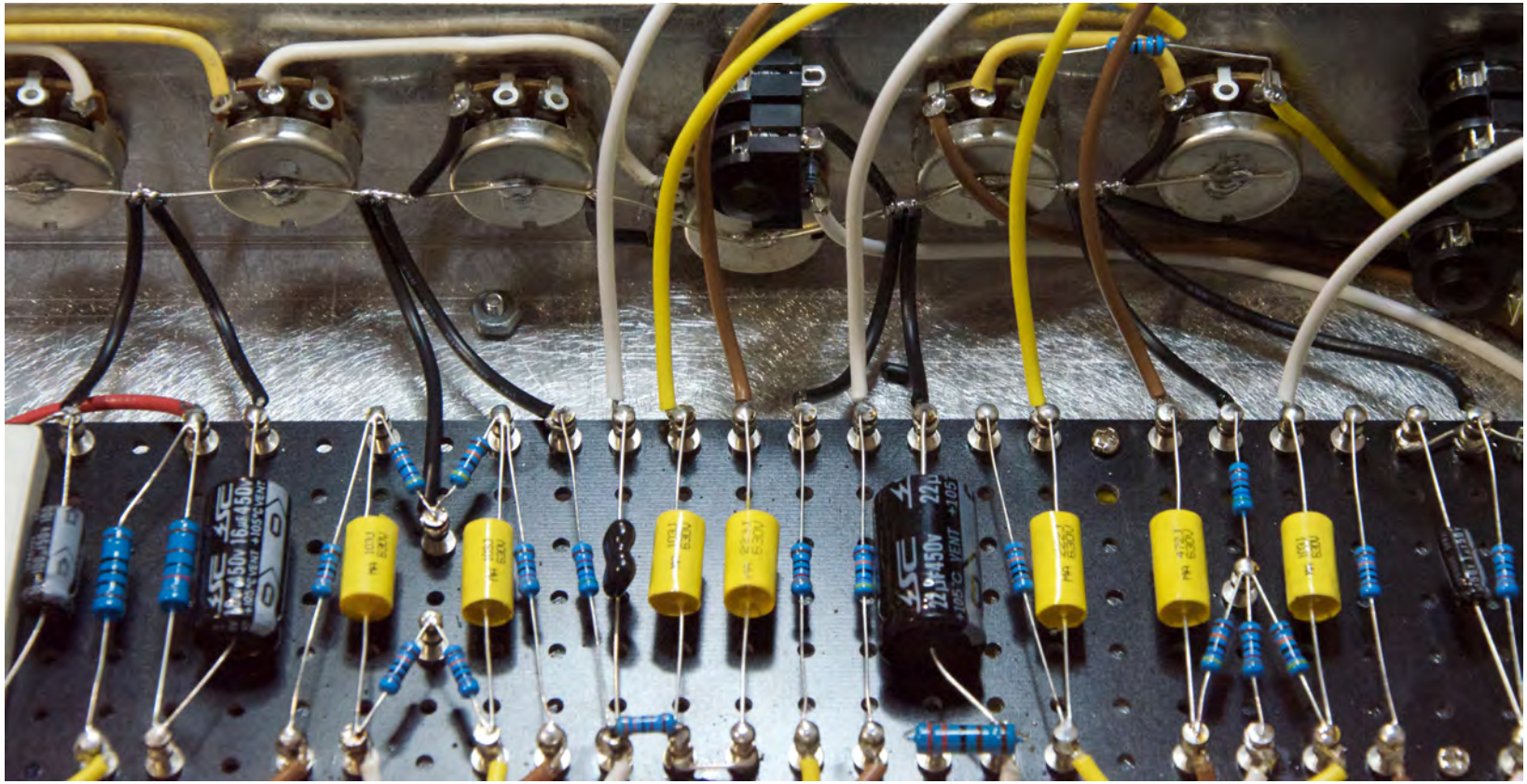


Step 21: Connect the final yellow wire from the second 1uF/820ohm junction to pin 3 of the last ECC83 tube socket and solder.

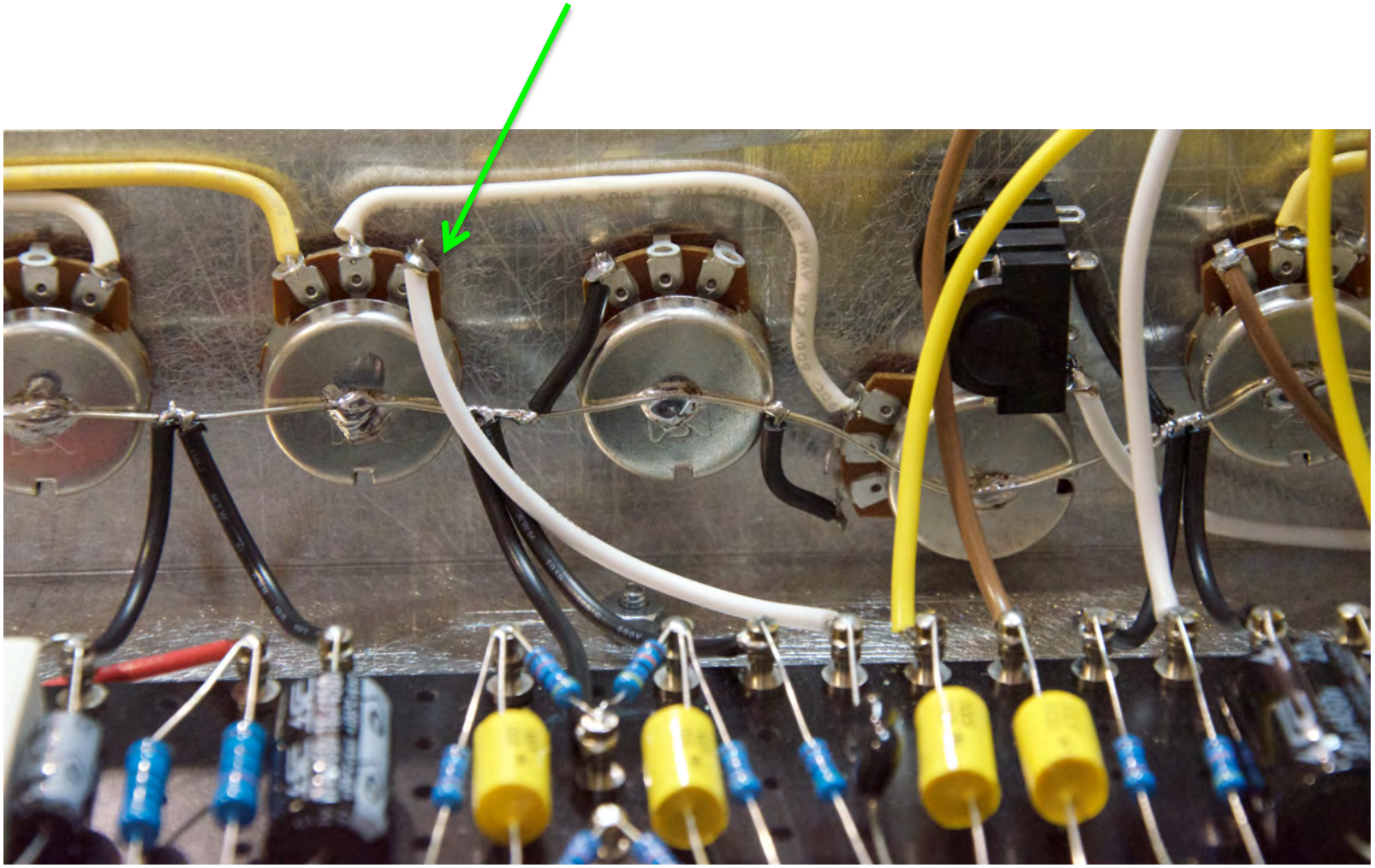


This is how your tube side wiring should look

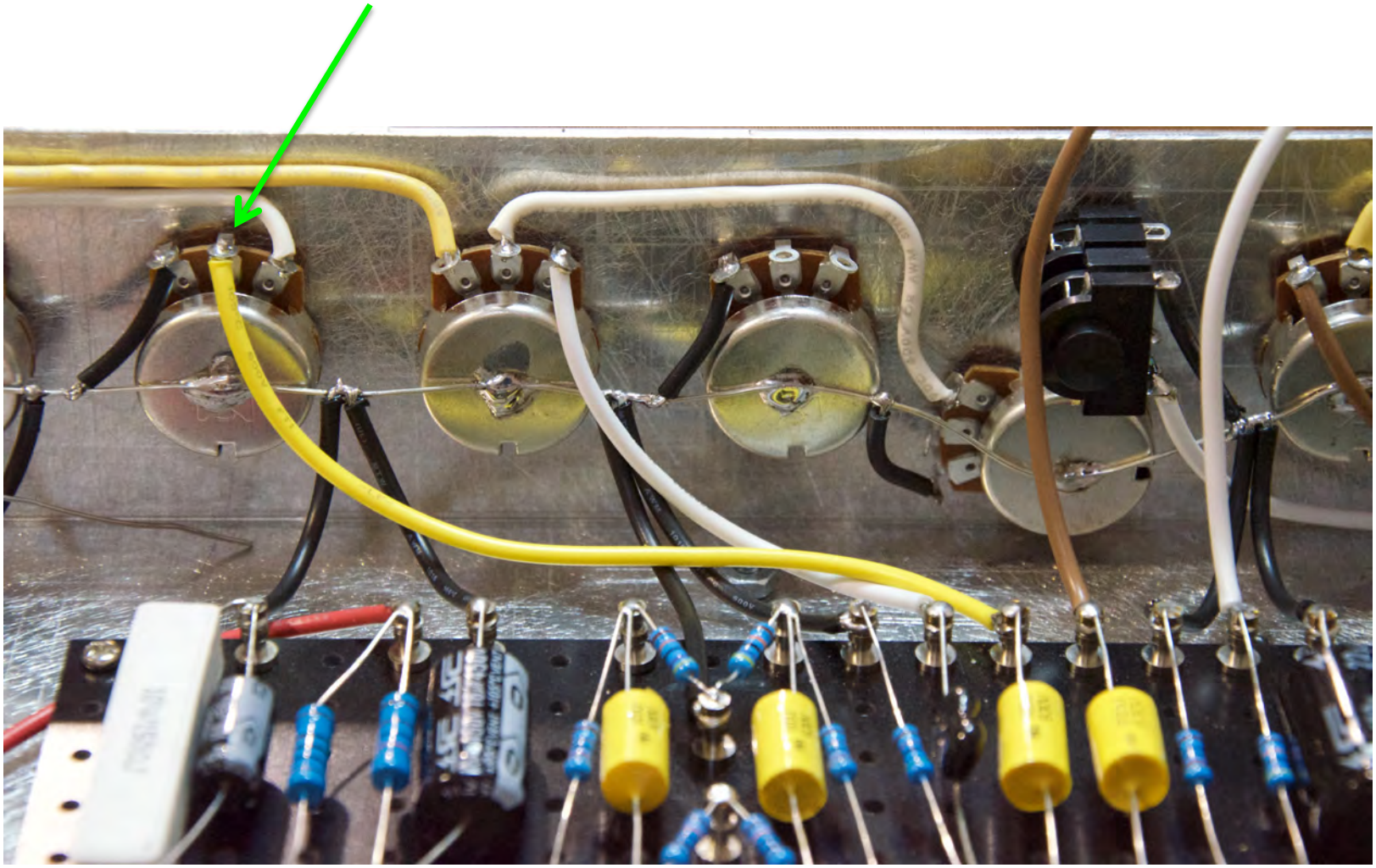
Wiring (Potentiometer side)



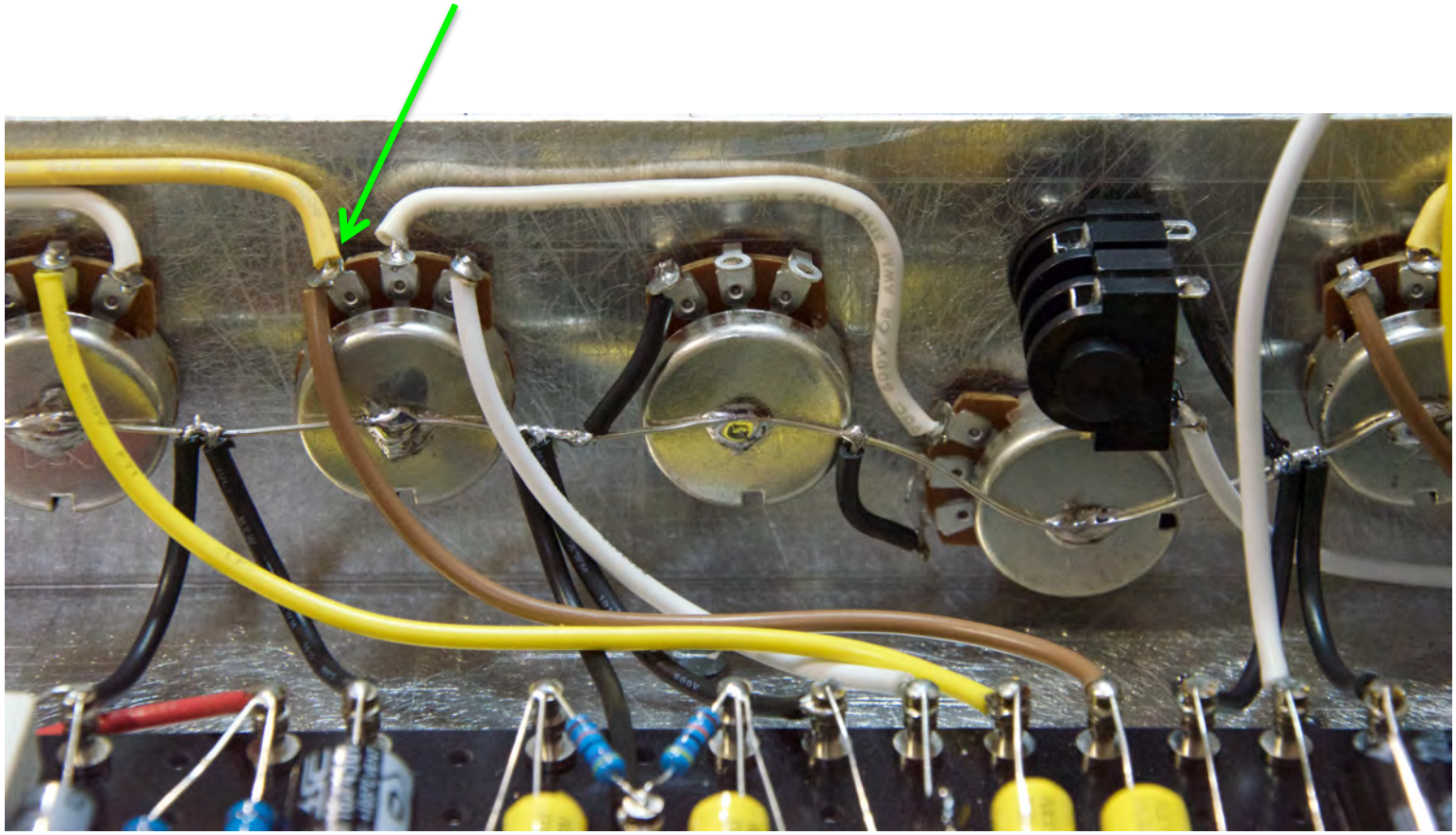
Step 1: Connect all the black wires from the circuit board to the ground bus running along the backs of all the potentiometers and solder.



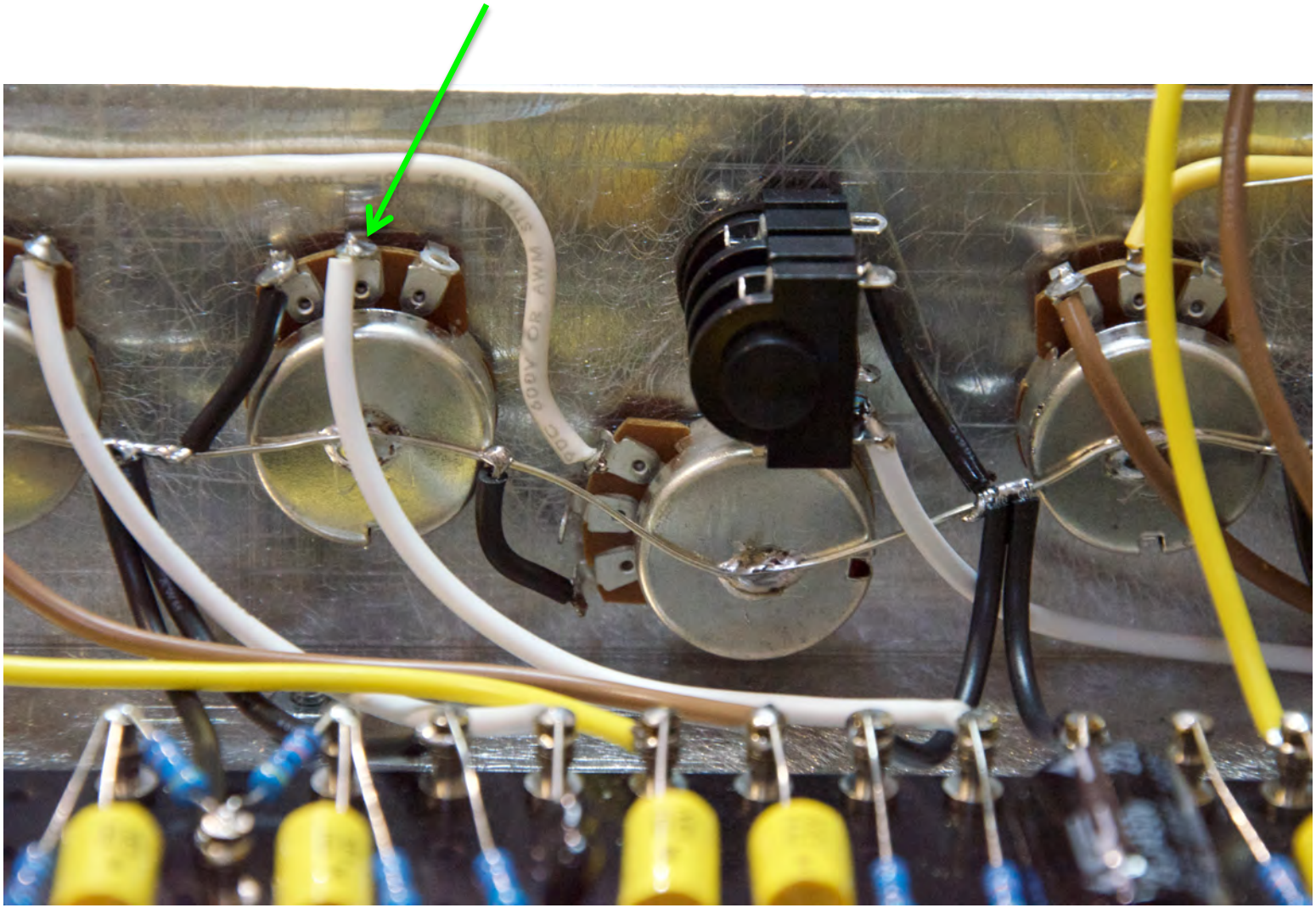
Step 2: Connect the white wire from the 500pF capacitor to lug 3 of the TREBLE potentiometer and solder.



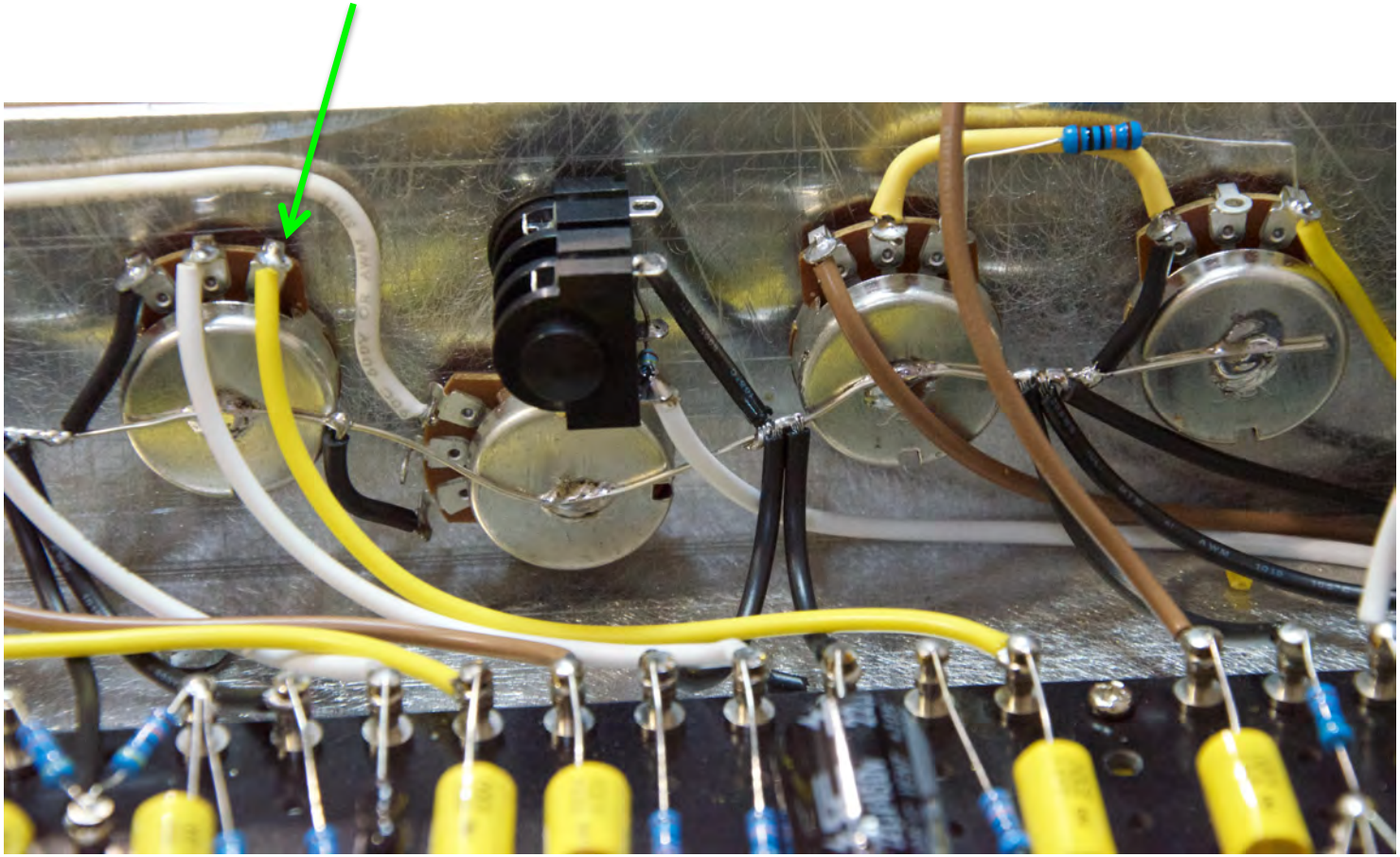
Step 3: Connect the yellow wire from the .01uF capacitor to lug 2 of the MIDS potentiometer and solder.



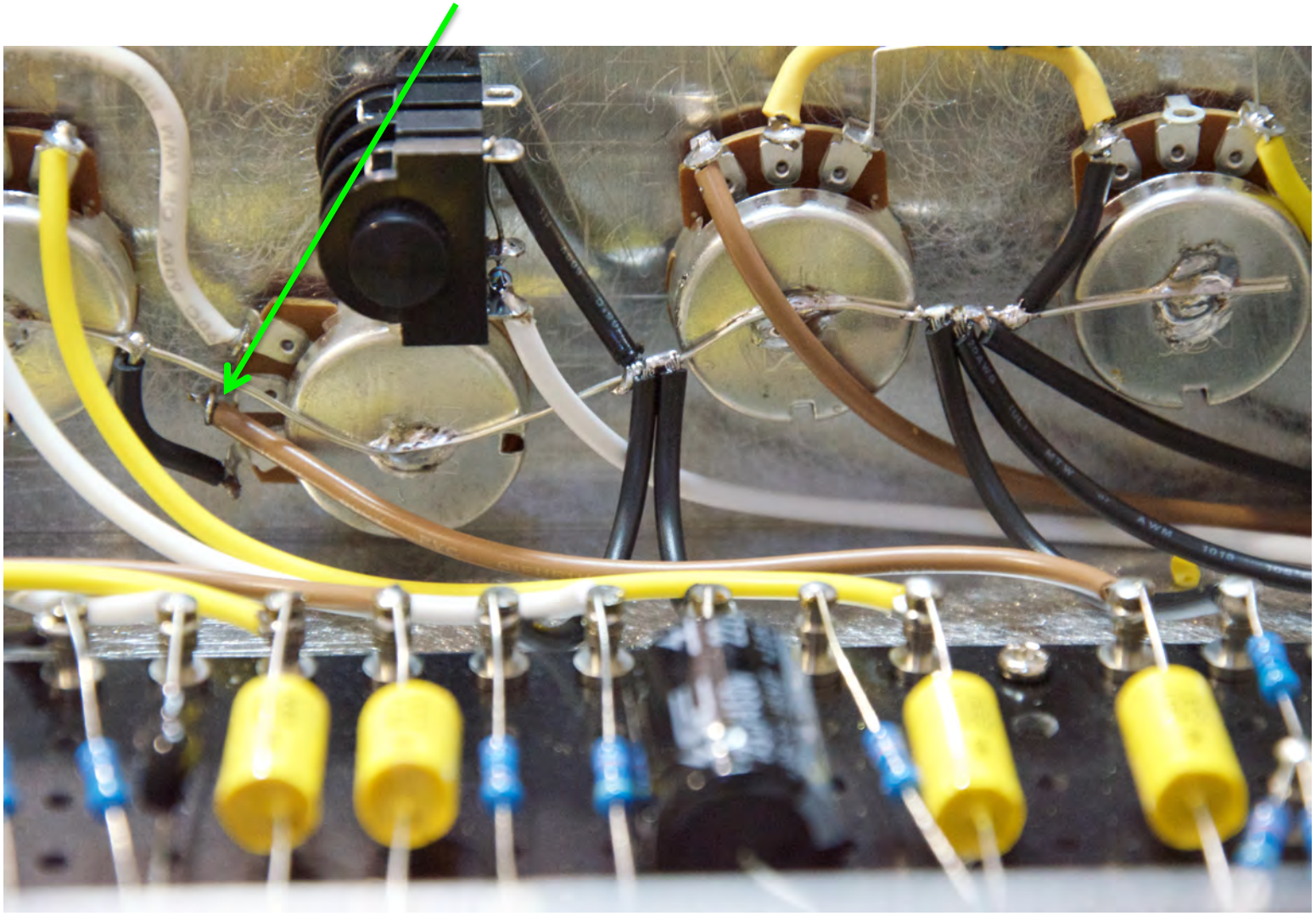
Step 4: Connect the brown wire from the .022uF capacitor to lug 1 of the TREBLE pot and solder.



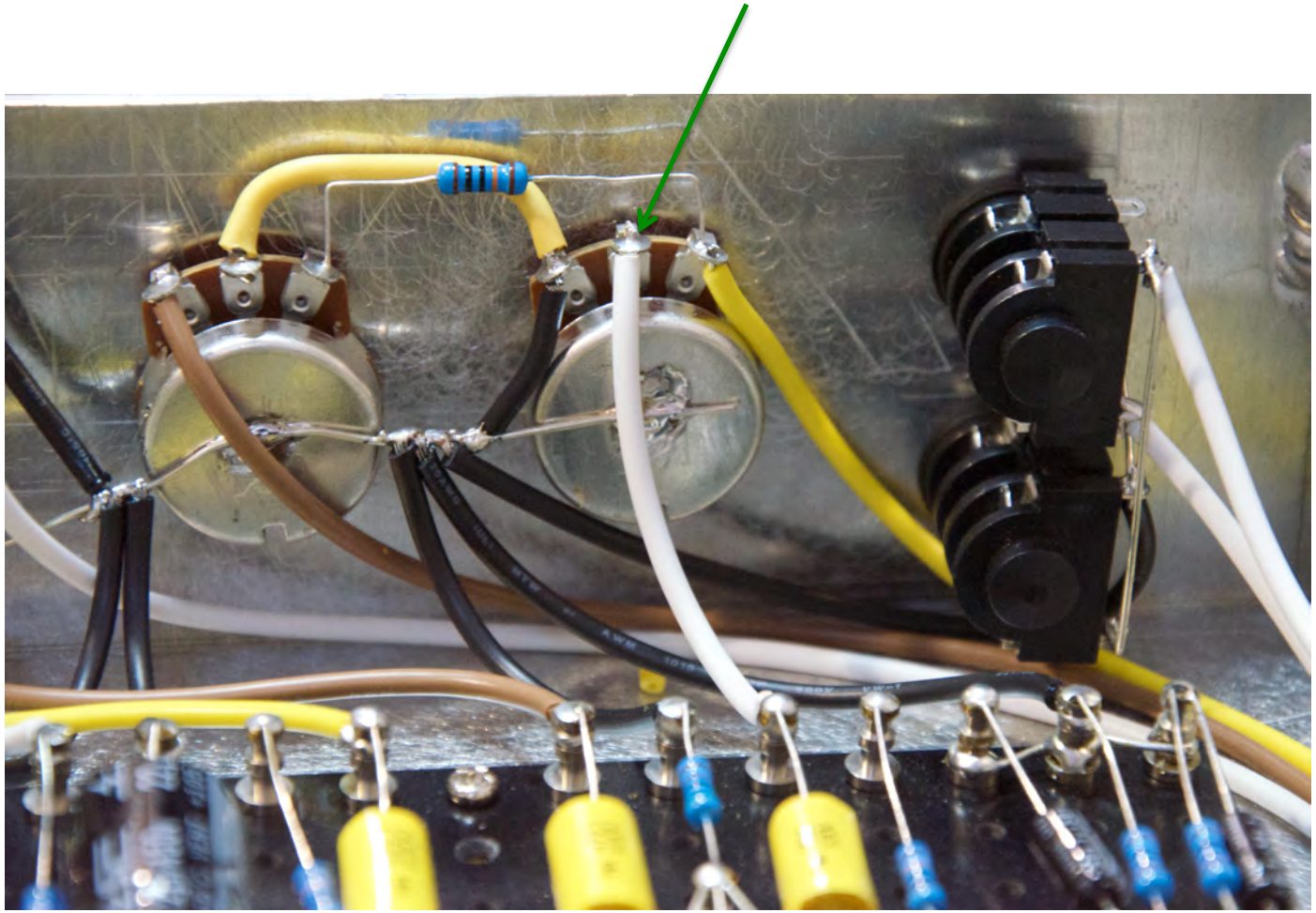
Step 5: Connect the white wire from the 470K resistor to lug 2 of the VOLUME2 pot and solder.



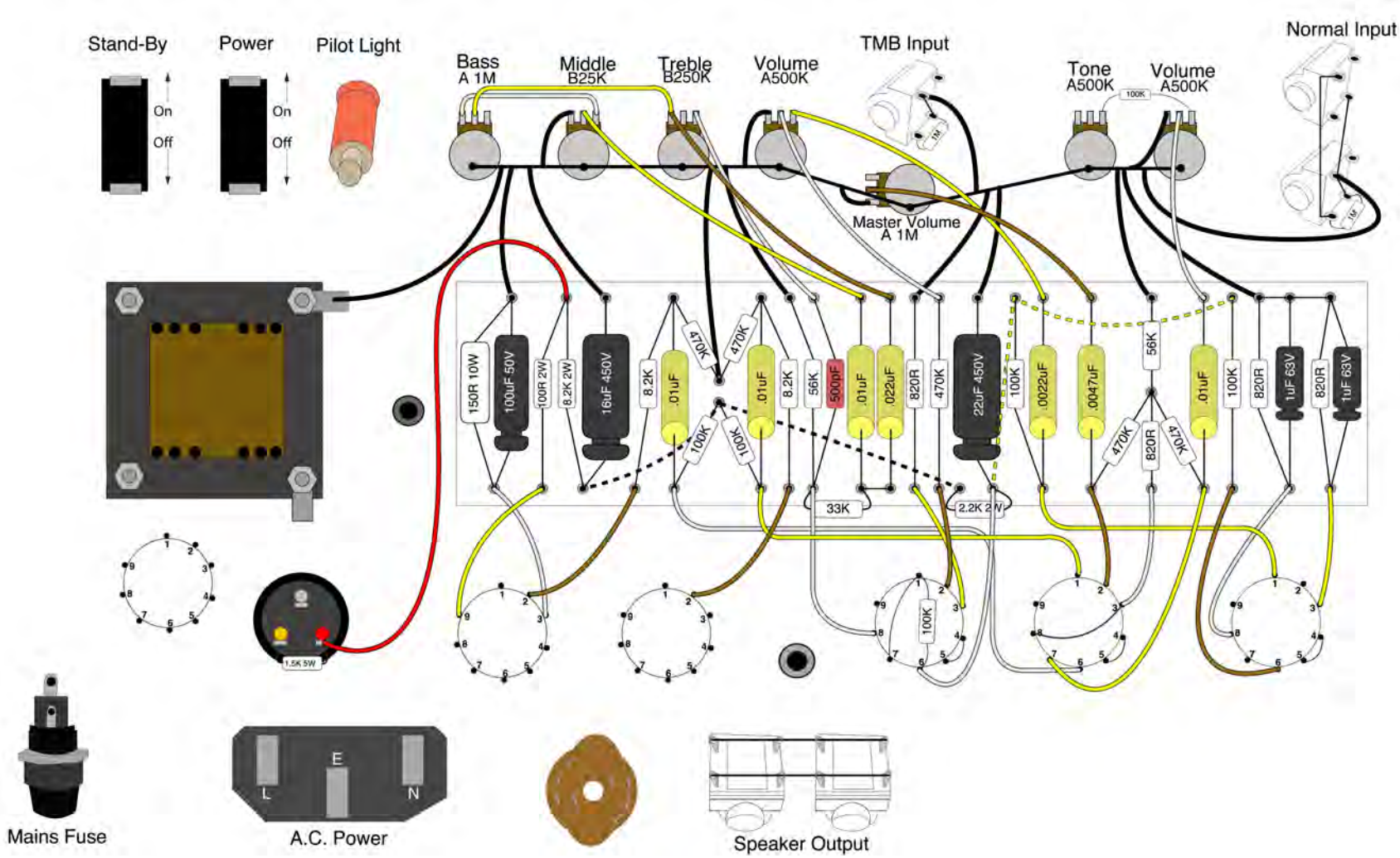
Step 6: Connect the yellow wire from the .0022uF capacitor to lug 3 of the VOLUME2 pot and solder.



Step 7: Connect the brown wire from the .0047uF capacitor to lug 2 of the MASTER VOLUME pot and solder.

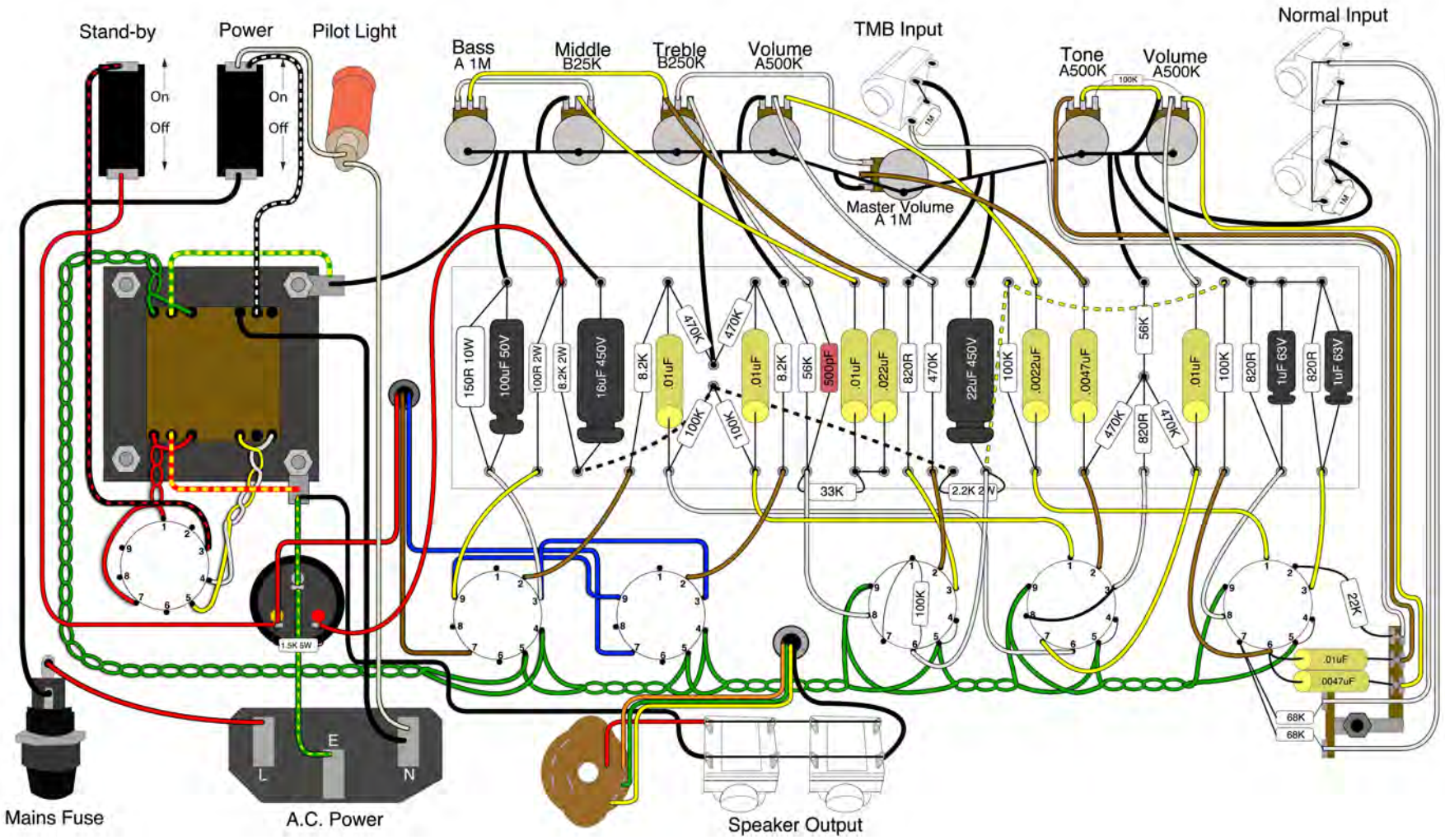


Step 8: Connect the final white wire from the .01uF capacitor to lug 2 of the VOLUME1 pot and solder.

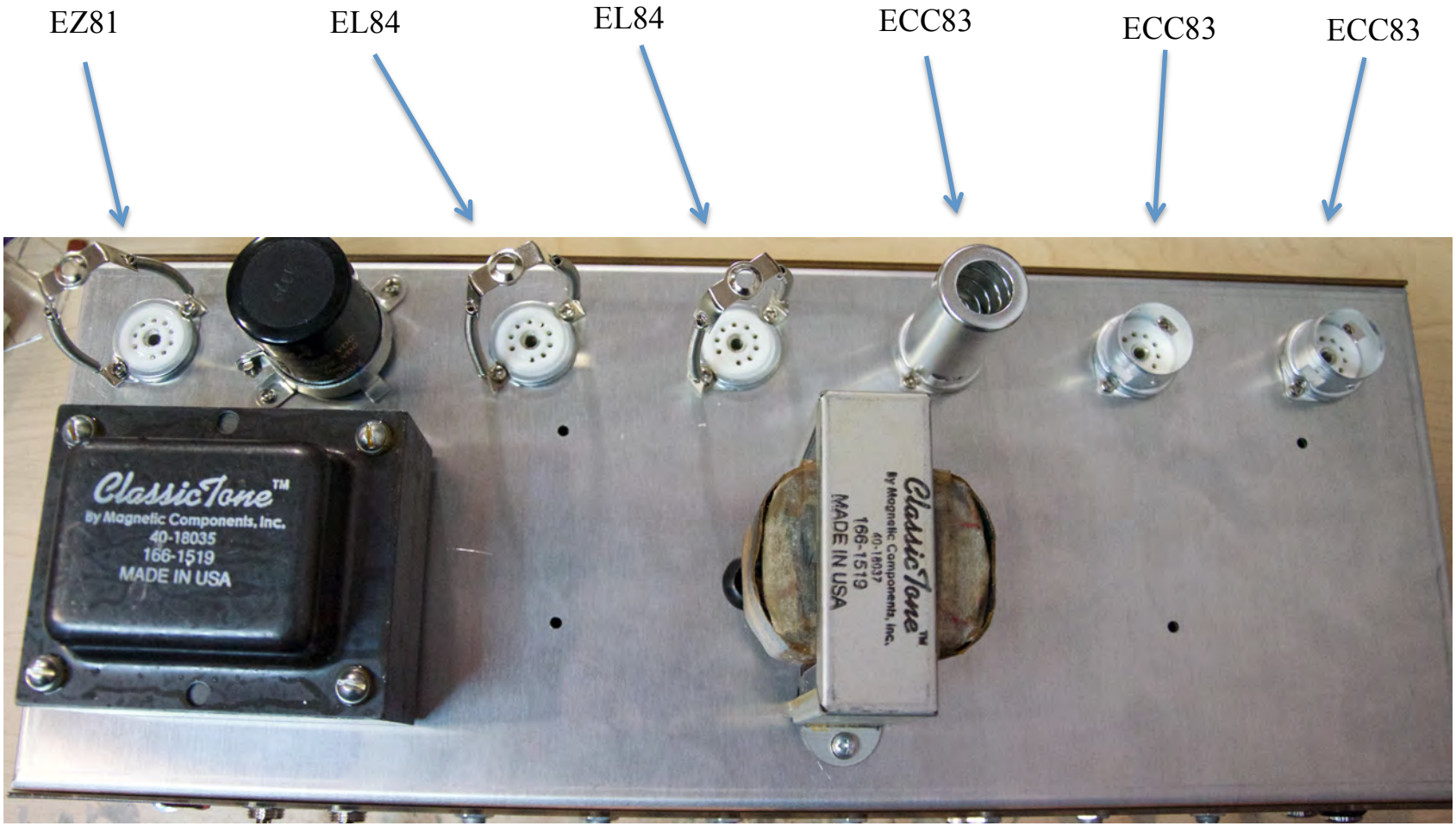


Drawing of the wiring coming from the circuit board

Finished Layout



Turning your amp on for the first time



Step 1: Make sure your AC power cord is NOT plugged in. Do NOT install any of the tubes yet. Do not plug a speaker into the speaker jack. Do not plug any instruments into the input jacks. If at any point in this process, you smell smoke, see sparks, or hear any loud electrical hum noises, immediately pull the AC power cord from the wall socket. **If you blow a fuse, do NOT forget to unplug the AC power cord before attempting to replace the fuse.**

Step 2: Do not test your amp on a metal table or any surface that can conduct electricity. Situate yourself and your amp so that the AC power outlet you will be using is within arm's length.

Step 3: Install the 2A slo blow fuse into the panel mounted fuse holder on the back of the chassis.

Step 4: Turn the amplifier's power switch on, but still do not plug the power cord in yet.

Step 5: Orient the amp so that you can see the indicator light. When you plug the power cord into the AC power supply, you should be able to see the indicator light come on immediately. This means, at the very least, AC power is getting to the power transformer and that the power transformer is working. Now plug the power cord into the amp first and then into the wall socket.

Step 6: Hopefully your pilot light came on and your fuse did not blow. Now turn the mains switch off and unplug the power cord from the wall socket.

Step 7: Install the EZ81 rectifier tube.

When testing your amp voltages, always keep one hand in your pocket if possible and wear shoes with rubber soles. This doesn't reduce the risk of electrocution, but it will reduce the amount of damage that will be done if you get do electrocuted. It won't make you impervious to electrocution, but the less "grounded" you are, the less the amount of current that will be able to flow through your body. Doing things like going barefoot or holding onto a metal drain pipe with your free hand while working with electricity won't increase the risk of electrocution, but they will increase how well you conduct current to ground, and that increases the amount of damage you can do to yourself if you are electrocuted.

Step 8: Plug the AC cord into the wall socket. Make sure the standby switch is in the "standby" position. Turn the Mains switch on. The rectifier tube should start to warm up and glow. Hopefully you know that vacuum tubes (especially the rectifier tube) get very hot once they are warmed up. You must allow adequate time to pass for them to cool off before you attempt to touch them. If you

measure the voltage at the solder terminal of the of the ON side of the standby toggle switch, you should read approximately 340VDC. To test the rectified DC voltage, first set your meter to test DC voltage 500V or greater. Then connect the black probe to chassis ground. Then touch the red probe to the various test points.

Step 9: Now, one by one, add the tubes to their respective sockets and make sure that they are warming up. The amp should still be in standby, so no power is going to the circuit just yet. We're only testing the heater wiring at this point. If your rectifier and tubes heat up, and your rectified DC voltage checks out, we can assume that you've wired the power section correctly and it's time to see if the amp works.

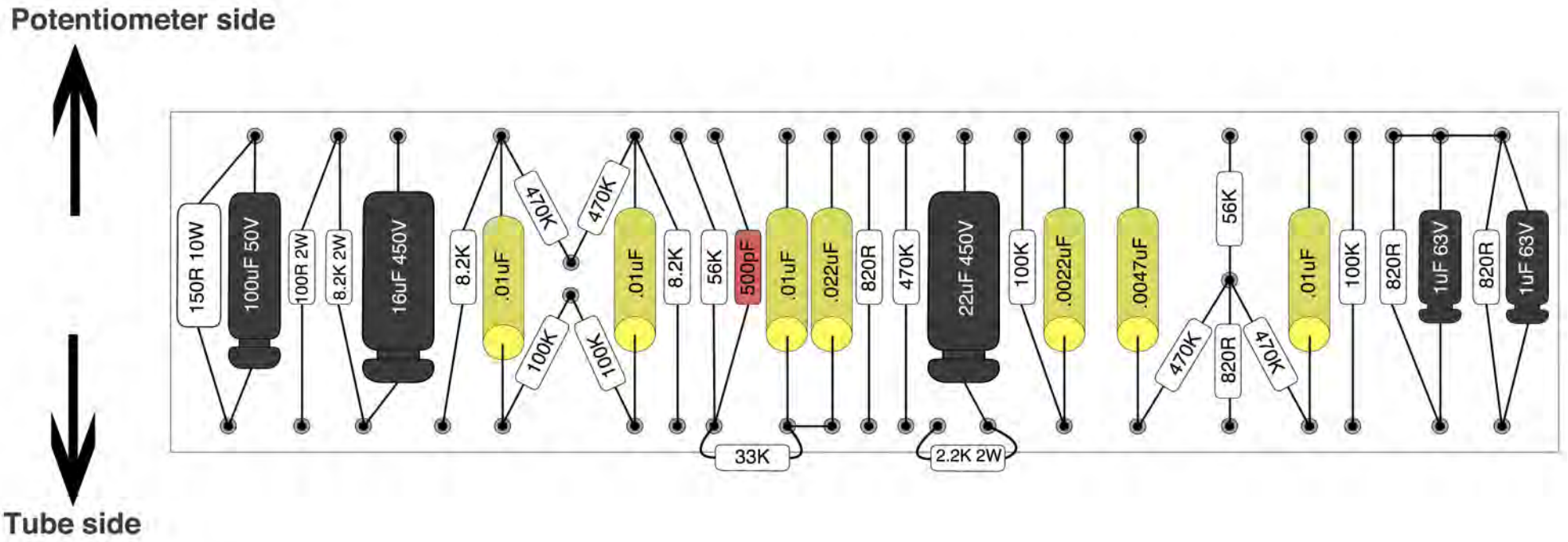
Step 10: Turn the MAINS toggle switch off.

Step 11: VERY IMPORTANT BEFORE YOU TAKE THE AMP OUT OF STANDBY!!! Be sure to plug a speaker into the speaker jack. You should never turn your amp on without the proper speaker load. Doing so will damage your output transformer. Plug a speaker into the speaker jack. Make sure the impedance rotary switch is set to the correct impedance for the speaker(s) you are using. The speaker should be able to handle at least 20watts.

Step 12: Turn both volume knobs down all the way. Turn the mains toggle switch on. Wait for the tubes to warm up. Now is the moment of truth….take the amp out of standby. If your fuse doesn't blow and you don't smell anything burning, slowly turn up both volume knobs. Do you hear the pleasant hiss of an idle amp coming through the speaker? Congratulations! Your amp works. Now it's time to rock out!

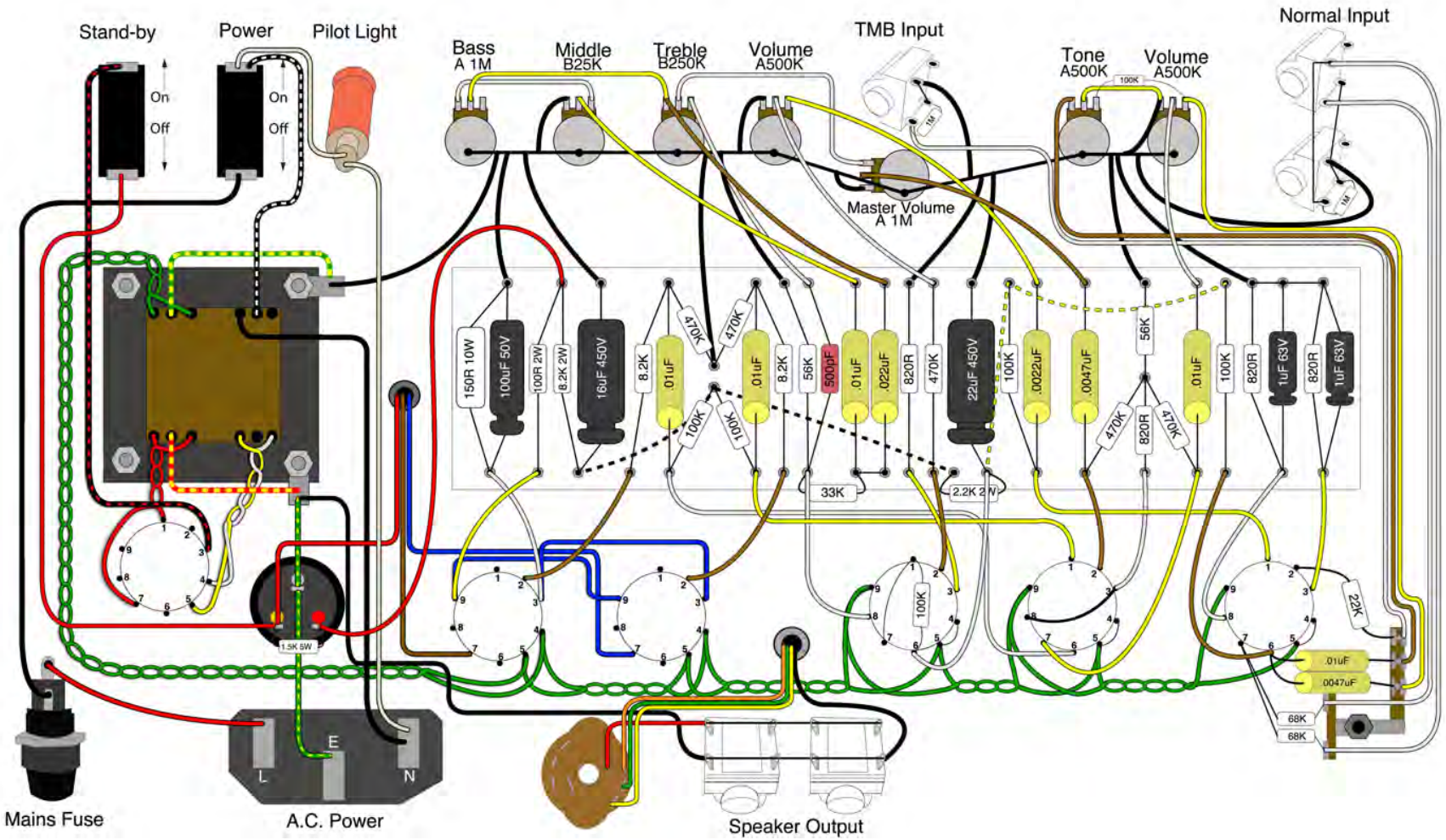
Diagrams and Schematic

Circuit board (top side)

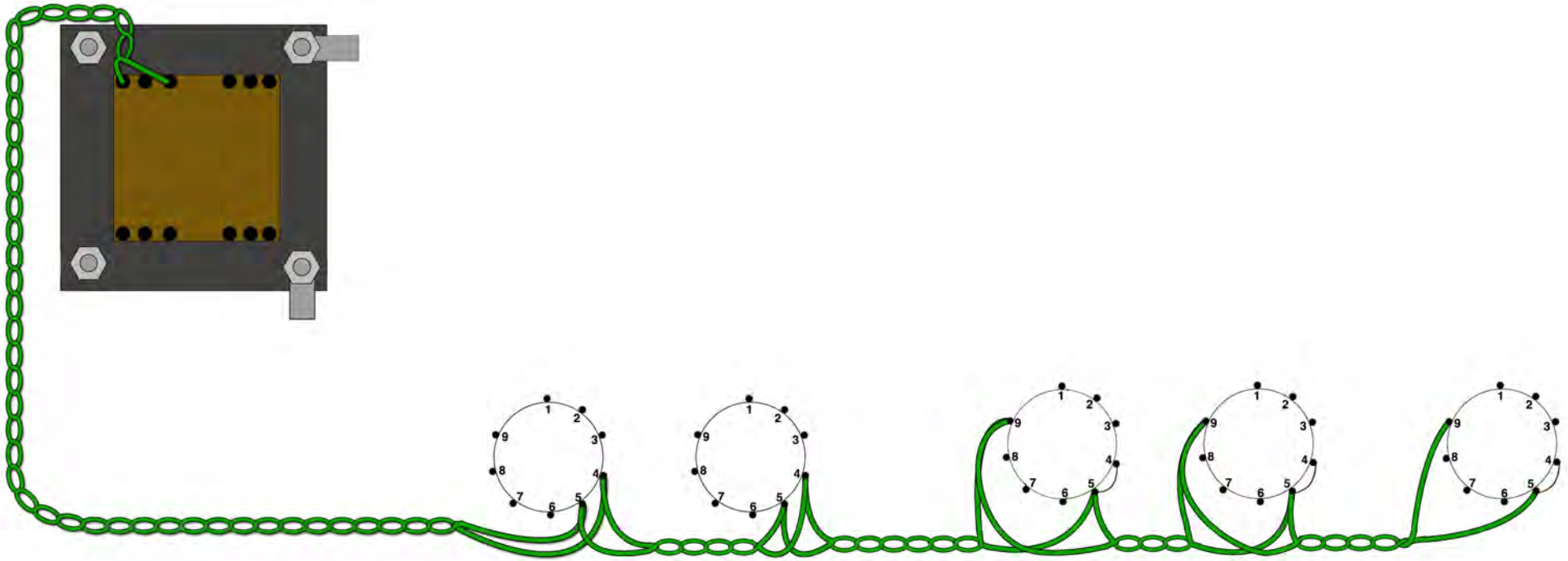


Wiring Diagram

for hi res pdf version go to http://www.byocelectronics.com/brit18layout.pdf

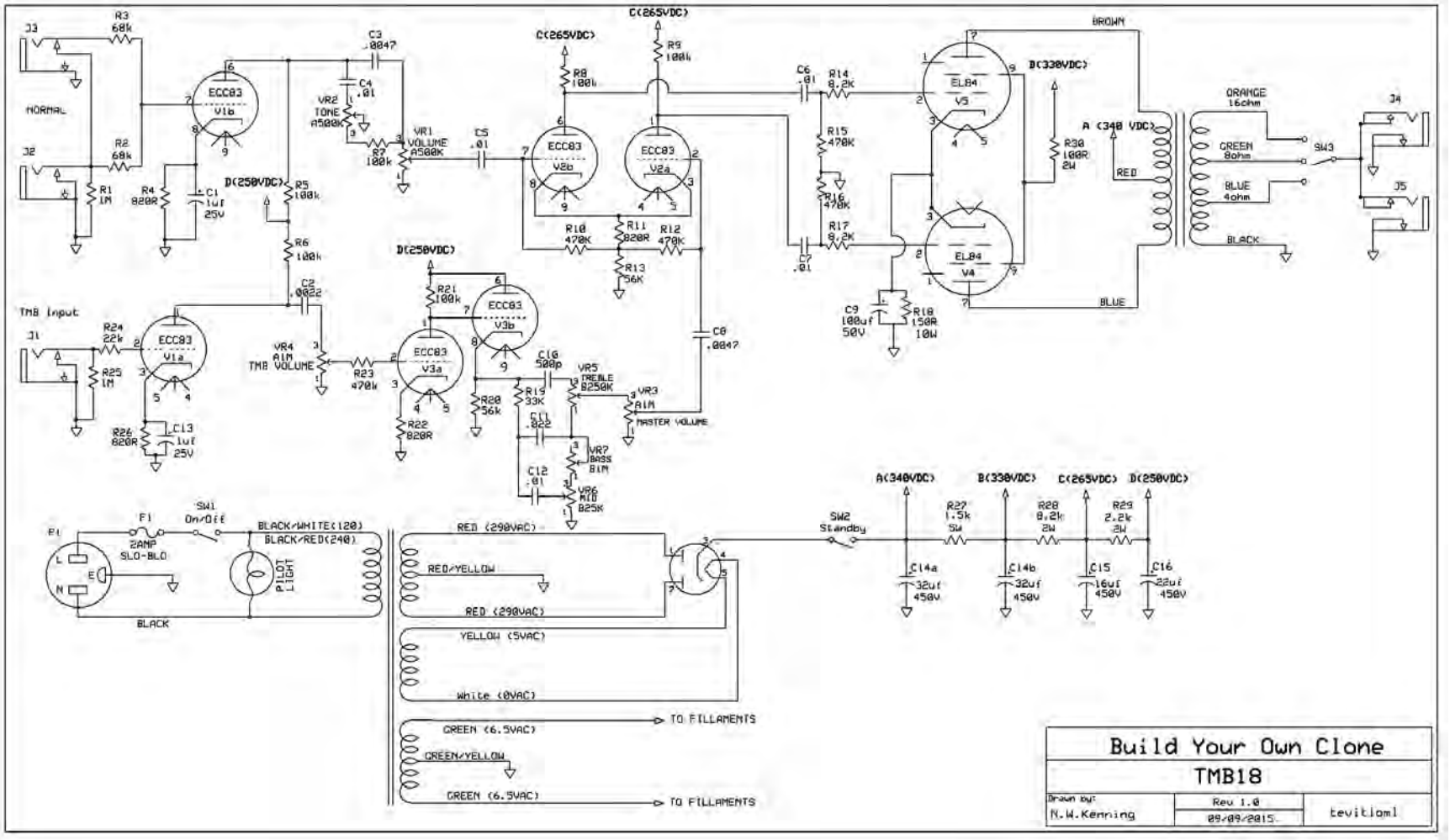


Heater Wiring



Schematic

For hi res pdf go to http://www.buildyourownclone.com/tmb18schematic.pdf



For technical support, visit www.byocelectronics.com/board

Written by:
N.W. Kenning & K. Vonderhulls

Artwork & Photography by:
N.W. Kenning & K. Vonderhulls