I. Introduction.

Thank you for purchasing the Scotty's Sled Shed Custom Probe Modification Kit for

This kit is intended for unmodified units, configured in the original OEM configuration.

This kit was developed to help fellow vintage electronic enthusiasts.

You will need the following to install this kit:

1. Hot soldering iron (to remove chassis soldered original twist tab capacitors)
2. Desoldering tool or wick.
3. Solder
4. Painter's tape
5. Basic tools.
6. Eye protection suggested.
7. Fume extractor suggested.
8. Drill
9. 1/8" drill bit.

Before you get started there is a list of items to be aware of.

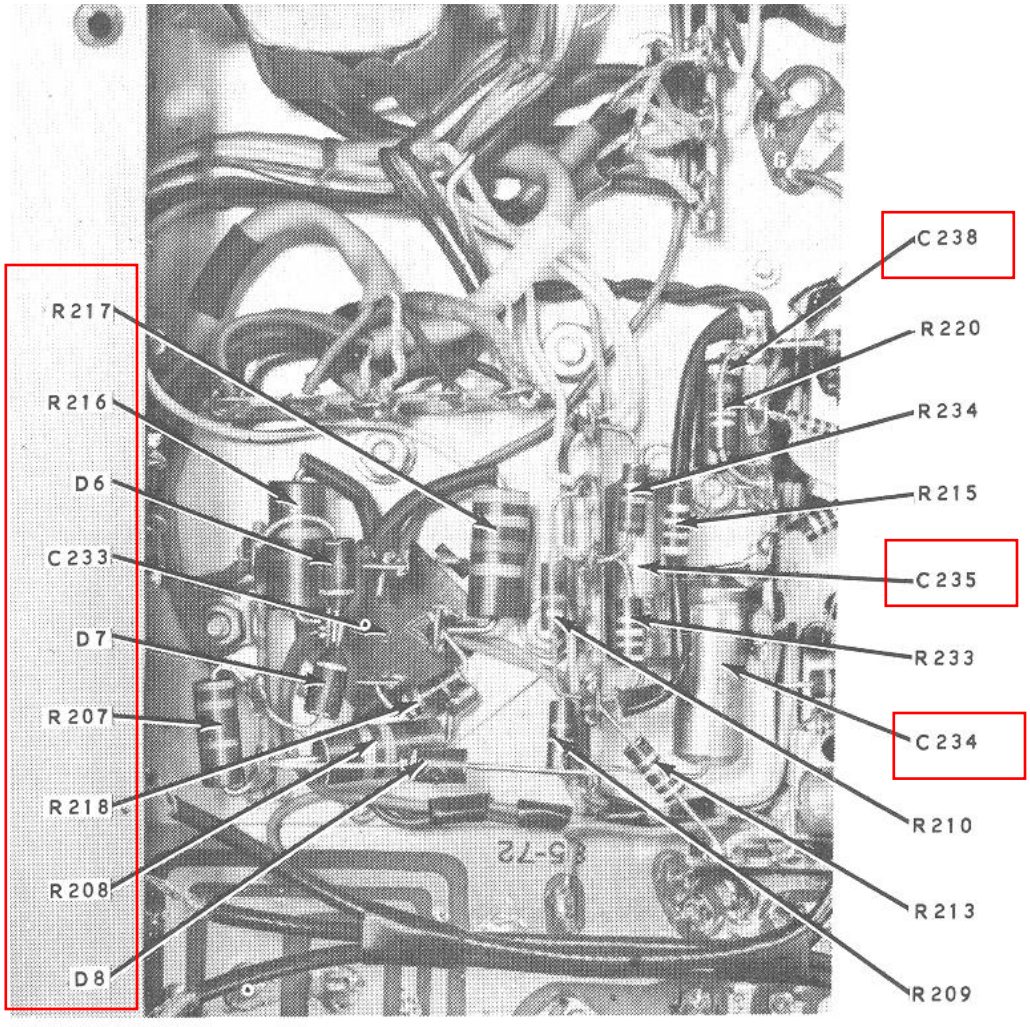
1. Due to constant supply chain challenges, Scotty's Sled Shed reserves the right to substitute component OEMs. If there is an orange bodied resistor in installation guide images and you receive a blue bodied resistor, it is due to component substitutions.
2. You may see a blue capacitor in one pic and a yellow capacitor in another picture. Multiple pictures may have been taken over various kits with different capacitor values or manufacturers.
3. Scotty's Sled Shed LLC is only providing you with components for a DIY installation.
4. The following instructions are only a guide. Experienced users may have a preferred method of installation.
5. **CAUTION: Lethal voltages are present in these devices**. If you are not aware of that by now, you should NOT be performing this upgrade.
6. If you do not feel comfortable working around high voltages, please do not perform the upgrade. Find an experienced technician to perform or assist you.
7. Scotty's Sled Shed LLC is NOT liable for any damage caused to your equipment, bench, house, Power supply or that your spouse is mad at you for working on this 50-year-old piece of equipment. You are ON YOUR OWN.
8. Customer assumes all responsibilities and agrees to check all resistances, capacitance, and voltages before and after installation.
9. Customer assumes all responsibility to know how to read a schematic and perform the task this kit requires.
10. Customer assumes all responsibility to SAFELY perform procedures by following the OEM manual.
11. You get the point; you are responsible for yourself.
12. Please be sure to download the manual if you do not have it. They are readily available online at:
13. Read the original OEM manual. The process for replacing components will be nearly identical to the original installation.
14. References are made in this guide to component numbers associated with the original manufacturer manual. Customers should familiarize themselves with what the components are. IE C4, C5, D7, R8
15. Some original components were pre 1970 (when the EPA was established). DO NOT CUT OPEN THE ORIGINAL CAPACITORS. There may be toxic chemicals inside. Heathkit were sold primarily as DIY kits for Amateurs. There may be variations of how your unit was assembled vs what is seen in the pictures.
16. Protect yourself and remember to wear protective eyewear, use a fume extractor, and have a fire extinguisher nearby.

II. Preparation

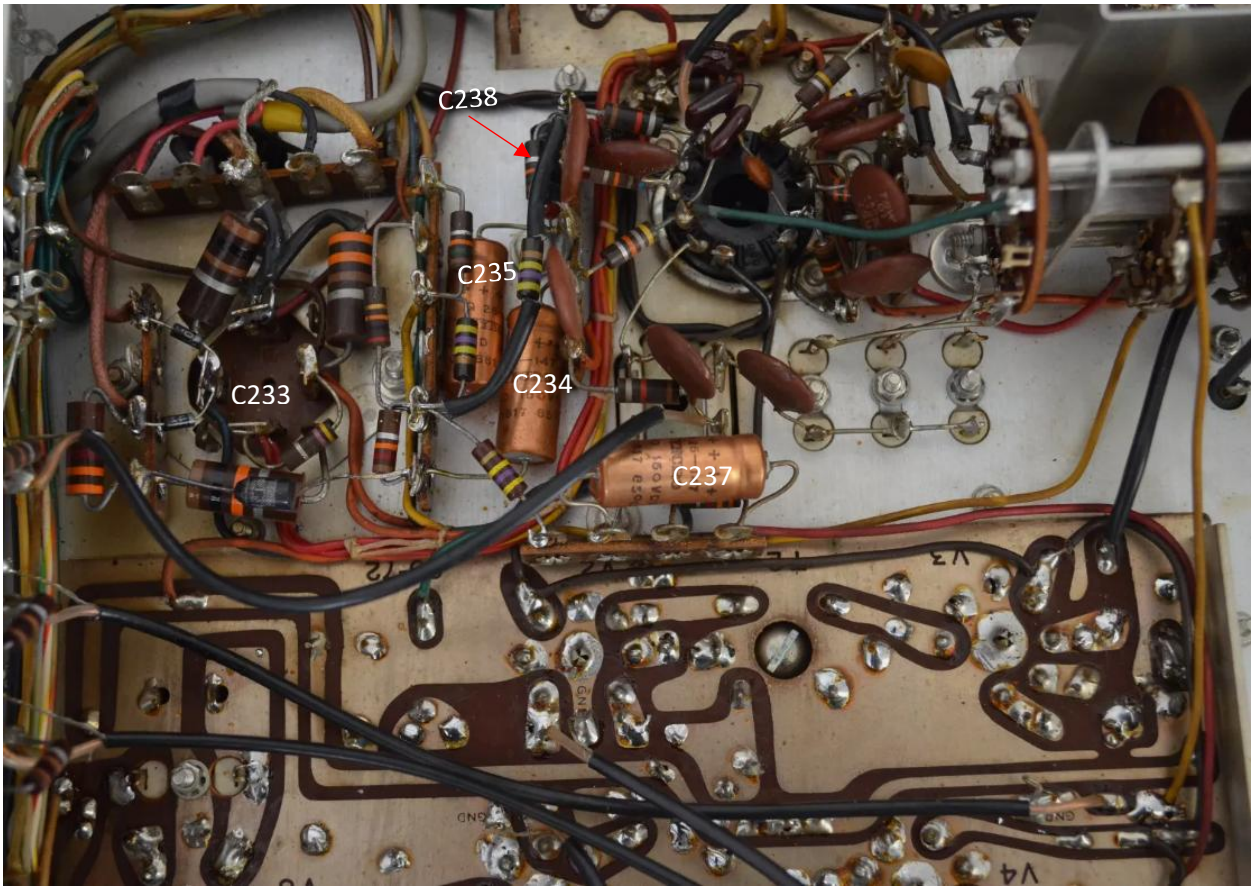
1. Take lots of pictures and video if you need to, of the original assembly for future reference.
2. Print out/copy an additional copy of the schematic.
3. Ability to label wires/components as needed-tape, label maker, etc.
4. On the extra schematic, it may help to write down where each lead of (Example) Capacitors C5, C6, C7 and associated resistors are connected to the terminal strips. Example C5 **(+)** to lug 1, **(-)** to chassis ground.
5. Be sure that all capacitors are discharged.
6. READ THE OEM OWNER/INSTALLATION MANUAL!
7. Solder paste will improve the efficiency of soldering and de-soldering.

III. Identify components

Locate the main components on the underside of the unit. This kit primarily replaces the high voltage capacitors and some related components. See the list of main components you

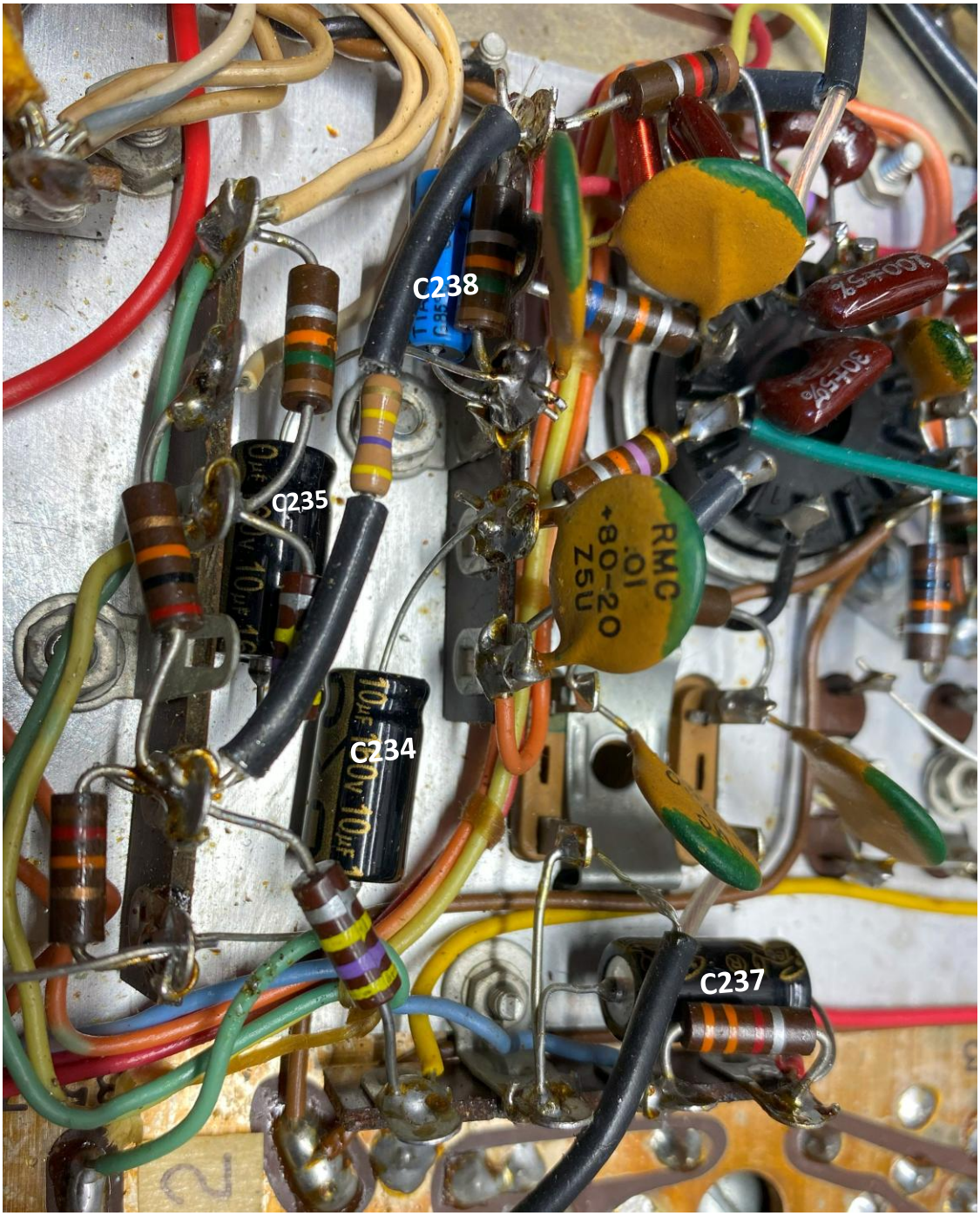


will be replacing.



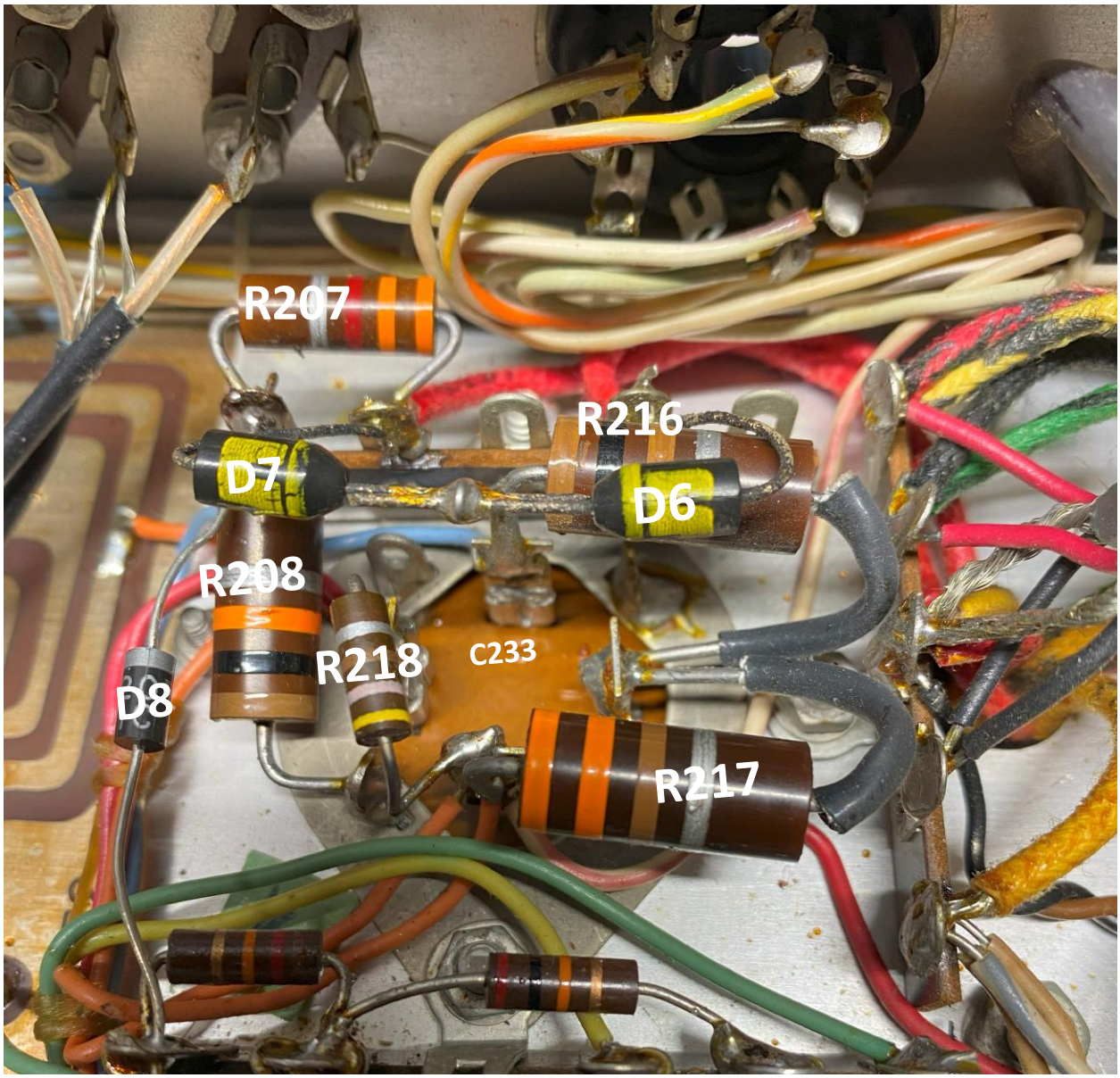
IV. Component replacement C234, C235, C237.

1. C234, C235, C237 are 10uf 150v axial Electrolytics. Replace each of those with the supplied 10uf 160v Axial Electrolytic capacitors.
2. C238 is a 10uf 15v Axial Electrolytic capacitor. Replace with supplied 10uf 50v Axial Electrolytic Capacitor.



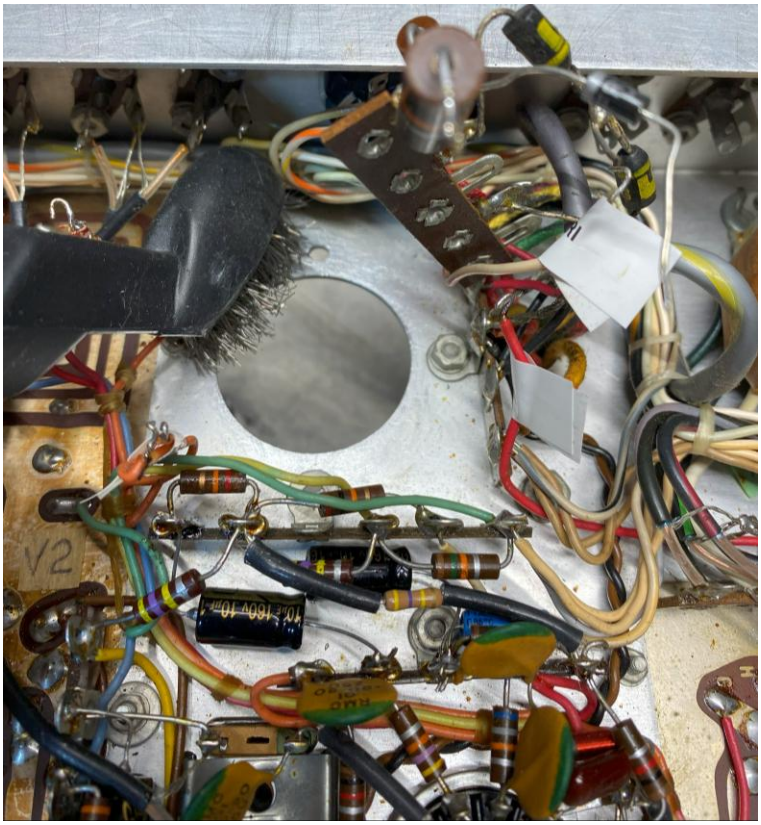
V. Capacitor C233 (Twist Tab Mult-Section) Removal.

The large twist tab multi-section can capacitor looks ominous due to the size of resistors from the 1960's but we will try to make it less complex. Take lots of pictures.



1. Start with either clipping or unsoldering D6 and D7 rectifier diodes from twist tab cab C233 Half-moon/circle terminal lug.
2. There should be a light blue hookup wire (maybe another color) also going to C233 Half-moon. Unsolder and mark it with label.
3. Unsolder the 2w 10k ohm resistor that is going to the C233 twist lug and the terminal strip where cathode of D8 is install. A replacement diode and resistor are included in the kit.
4. Unsolder the two red hookup leads at C233 terminal lug (no marking or may be marked (-). Label the two leads as Dash.

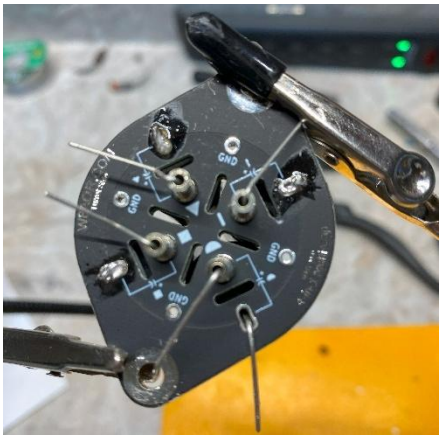
5. There are two resistors (470ohm 1/2w and 330ohm 2w) and three wires going to Triangle Lug of C33. Suggest cutting or unsoldering the two resistors to get at the hookup leads. Replacement resistors for C233 are supplied in the kit. It may be easier to cut the lug end off so it's easier to remove the hookup wire.
6. For Square of C233, remove the 100ohm 2w and 330ohm 2w resistors out of your way. Then remove the hookup lead going to Square of C233 and label it.
7. One or more twist tabs will be soldered to the metal flange. For the others, just use pliers and twist them off so they break at the flange. Then remove the nut bolt at the two terminal strips holding flange in. Unsolder twist tab flanges and remove. You may need to just break the tab by twisting from the top.
8. A replacement 5 lug terminal strip is included in case you break it during install/removal.
9. Once removed, clean chassis areas around the mounting holes with wire brush both sides, for a clean ground.

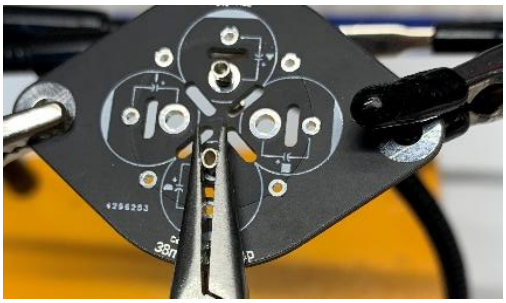


VI. Replacement of C233

Assemble the Multi-Cap Wide Body PCB (printed circuit board) assembly as follows.

1. The Multi-Cap board has two sides, one labeled "Cap Side" the other is labeled "Turret Side". It is also marked with symbols Half-Moon, Square, Triangle and Dash.
2. From the Turret Side, install at turret in each one of the holes by each symbol. The turrets will only go into one spot.
3. From the "Cap Side" slightly squeeze each turret end sticking out. Just enough to make it oblong so it does not fall out. It does not take much pressure.
4. Align the spacer board so the symbols match with the Multi-Cap board on the Cap Side. Set spacer over the Multi-Cap board and insert the following capacitors.
    a. 100uf 250v goes into Half-moon,
    b. the three 47uf go in the other three slots.
    c. For the SB-300, there are only three caps, 100uf Half-moon, 47uf Square and Triangle.
5. Pull leads through and solder ground on Half-moon, Square, triangle and Dash only. Trim. Do not solder the leads going through the turrets yet.



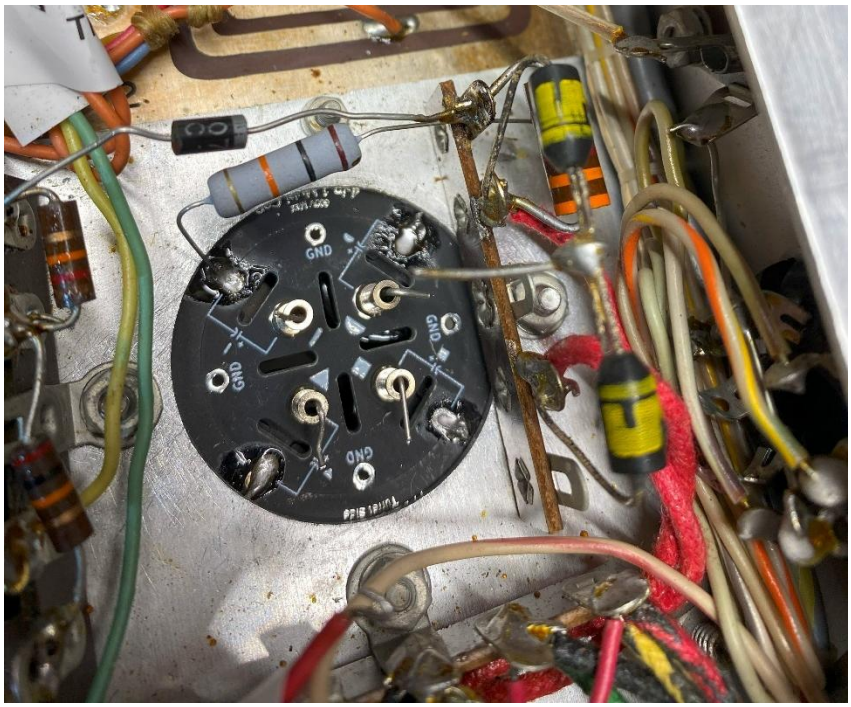


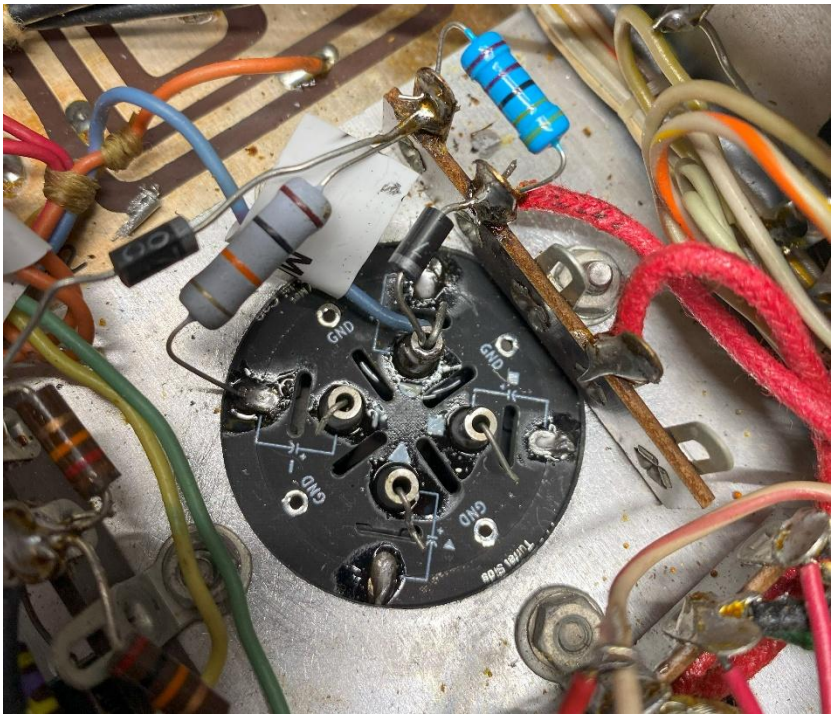
6. Flip Multi-Cap PCB assembly over and insert 6-32 bolt with tooth washer on both holes. The washer needs to go between the board and bolt head to bite into the printed solder on the board (ground).
7. From the top side of the chassis, set the Multi-Cap assembly into the slot with the 100uf (Half-moon) and 47uf (Square) toward the backside of chassis. Hold in place across the 6-32 bolts with painter's tape.

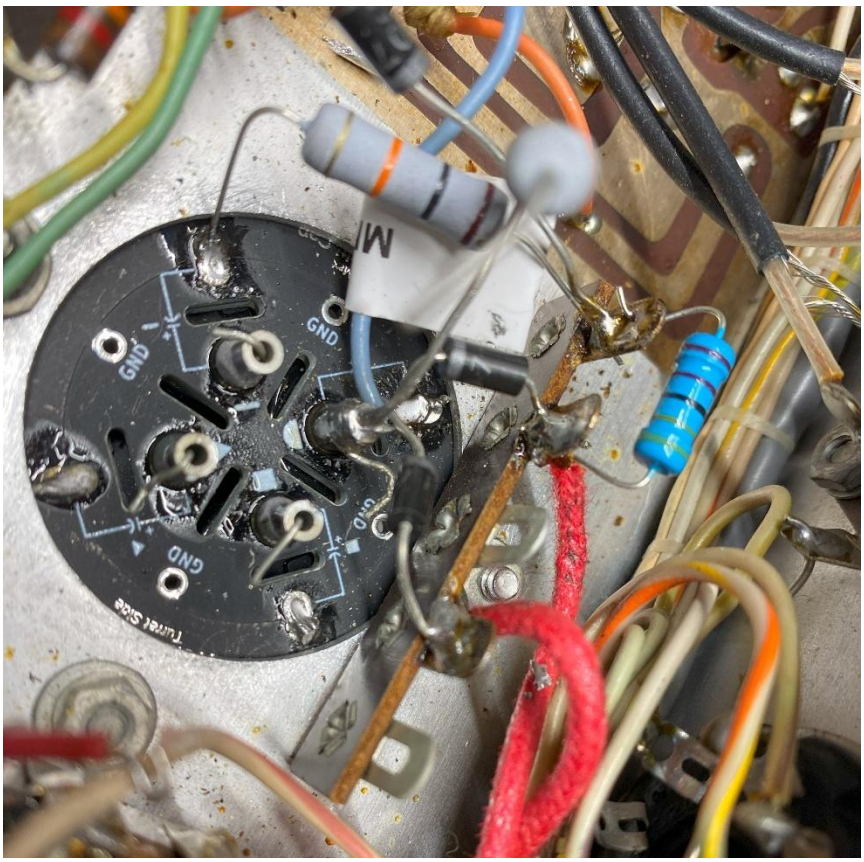
8. Turn chassis over and put an internal tooth washer over each #6 bolt so it will be placed between the chassis the 5 lug term strips. If replacing the term strips, the new ones have teeth that will bite into the chassis, so washers are not needed.
9. Put the term strips down over the bolts, secure with nuts.
10. If you want to reuse the original 10k 2w resistors, you can solder the leg that went to the ground twist tab of C23 to one of the grounds on the C233, or to the center lug of the terminal strip.
11. Replace D8 (Cathode goes to back terminal strip lug 1 where the 100k and the 3.3k resistors are connected.
12. Replace R207 with supplied 3.3k 1w if needed.
13. Wrap the lead marked half-moon to the turret with half-moon symbol. Solder, but do not enclose the hollow turret with solder.
14. Remove the two rectifier diodes D6 and D7 (optional) from term strip. Trim the lead of one of the FR07 rectifier diodes on the cathode end to about half its length and insert into the hollow turret of Half-Moon. Do not solder yet but do solder the Anode end into the 2nd lug of term strip where R207 (3.3k) and transformer wire are connected.
15. Cut one lead about 2/3's on the 100ohm 2watt resistor. Insert long leg into hollow turret of Half-moon where the diode is. It may be a tight fit. The other leg of the resistor will go into the hollow end of Square. Resistor will be in a vertical position. Solder the diode and resistor to the Half-moon turret, but not the square turret.
16. Add the other rectifier diode with Anode to terminal lug strip lug #4 and the cathode to the turret of Half-moon. May want to J hook around the other Diode and resistor. Solder the leads.
17. Solder the hookup wire marked square around the turret at C233 Square. If the original is not long enough, an extra piece of hook up wire is provided in your kit.

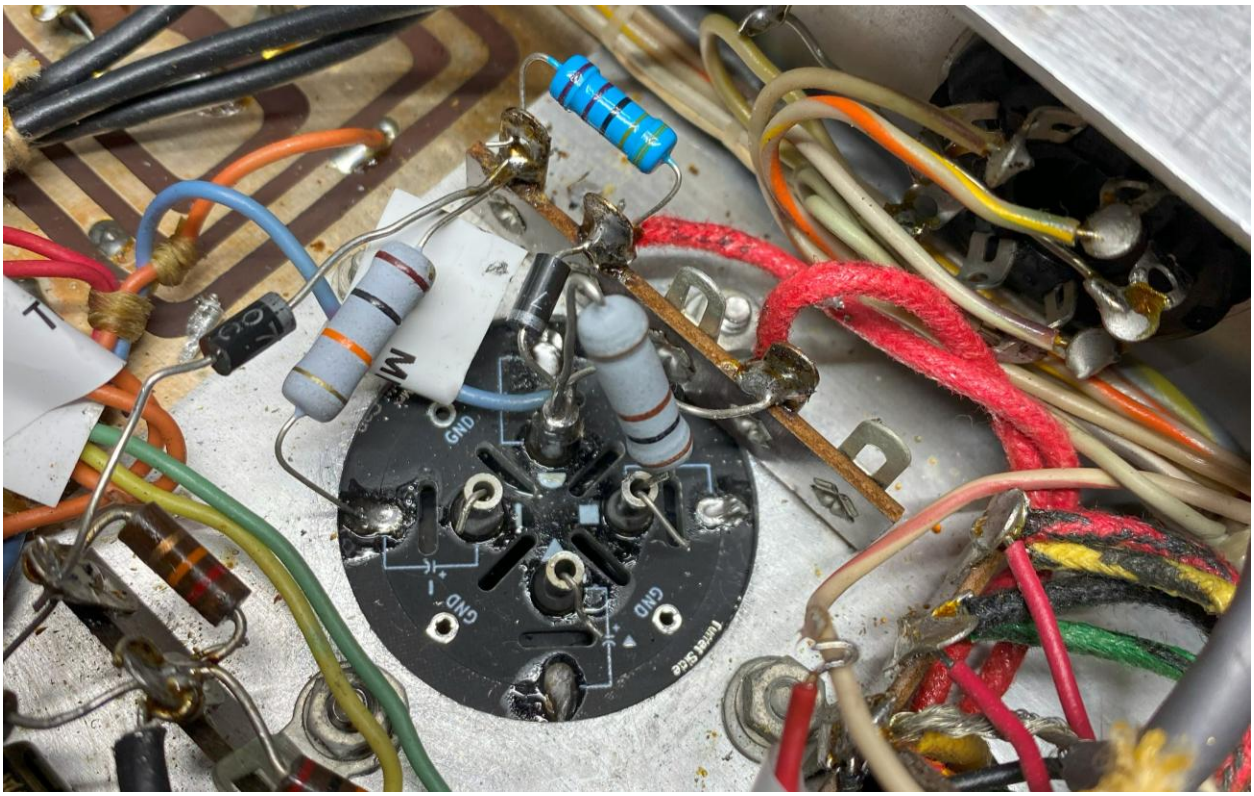
Solder the three (3) hookup lead marked triangle to the triangle turret.

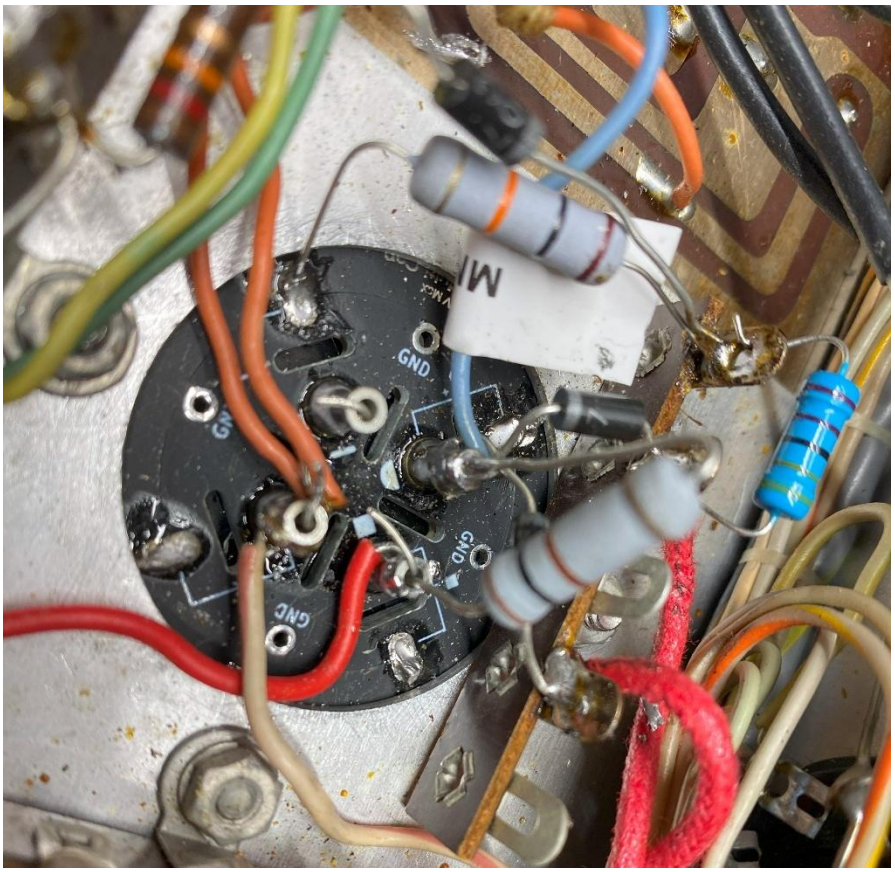
18. Insert supplied 330ohm 2w resistor into the center of turrets for triangle and square. Solder turret at Square only.
19. Solder the two hookup wires marked Dashed to the final turret with the Dash (-) symbol.
20. Trim leads of the supplied 470ohm 1w resistor and insert each leg, one into the center of Dash turret, the other into the hollow end of Triangle where the 330ohm 2w resistor is.
21. Solder both turrets.
22. C233 is now complete. Double check all your connections.

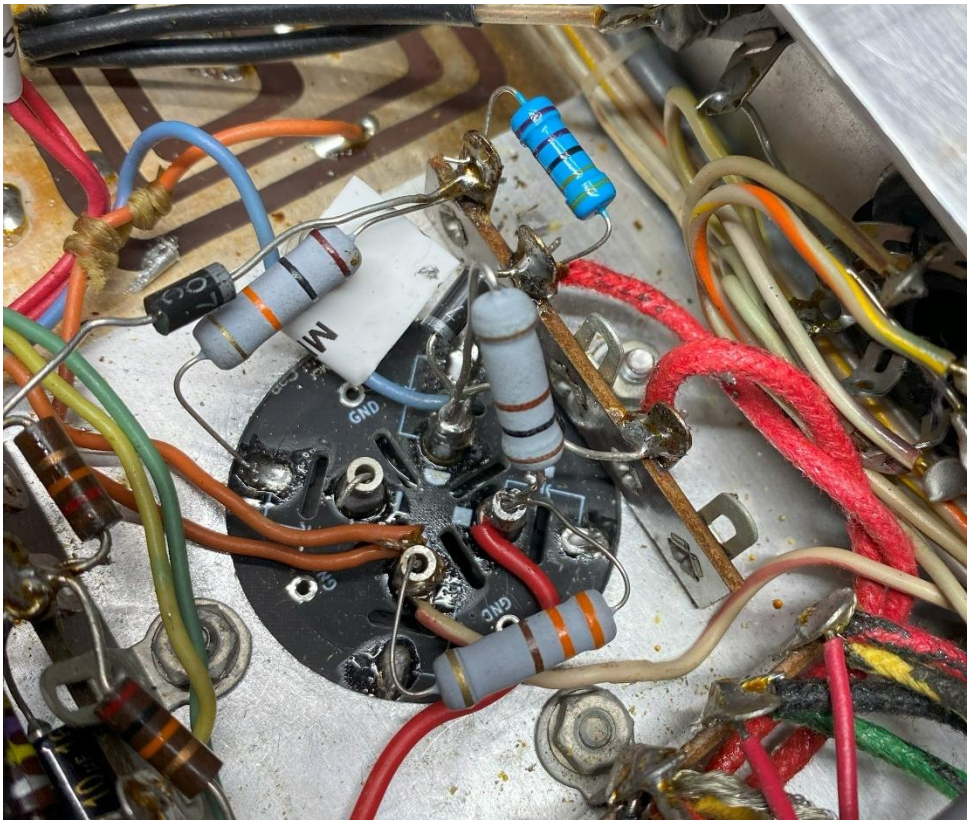


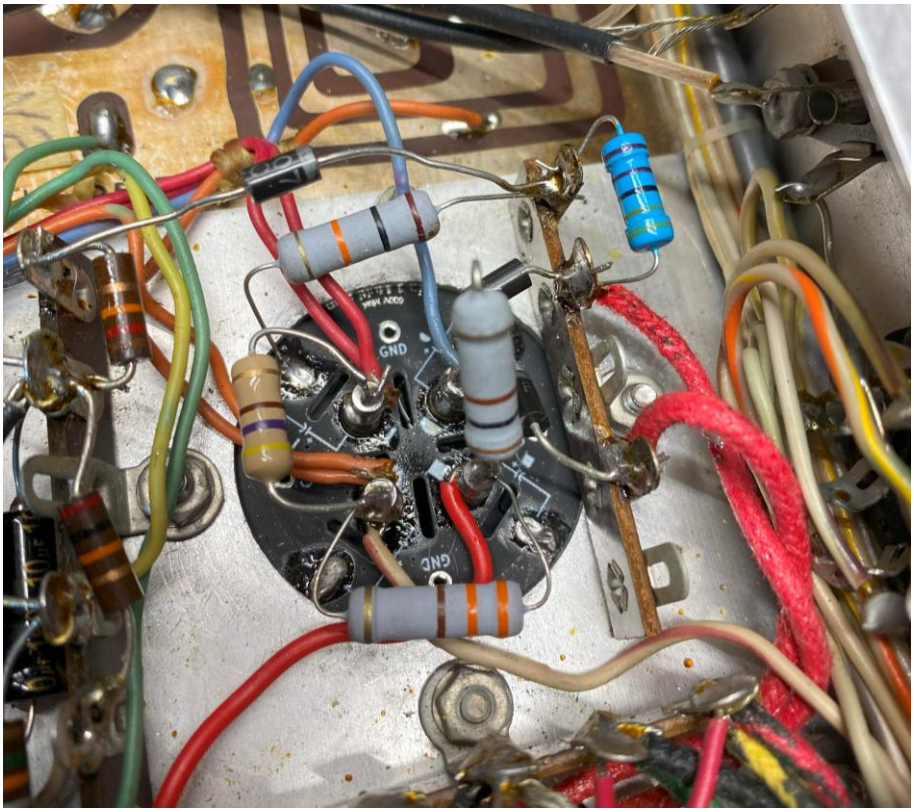


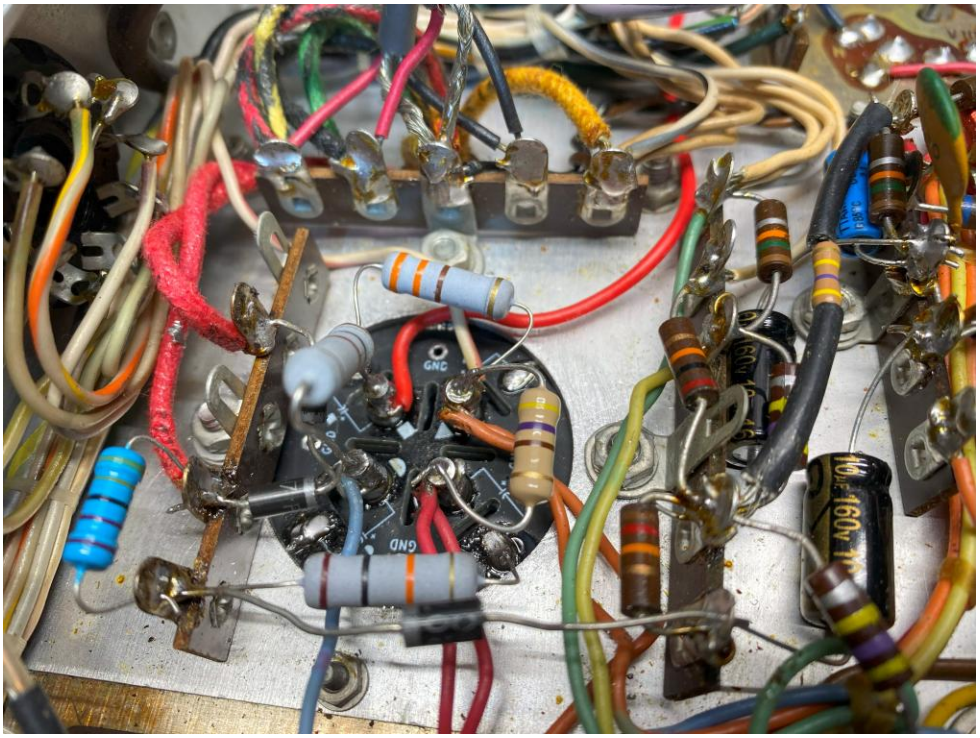


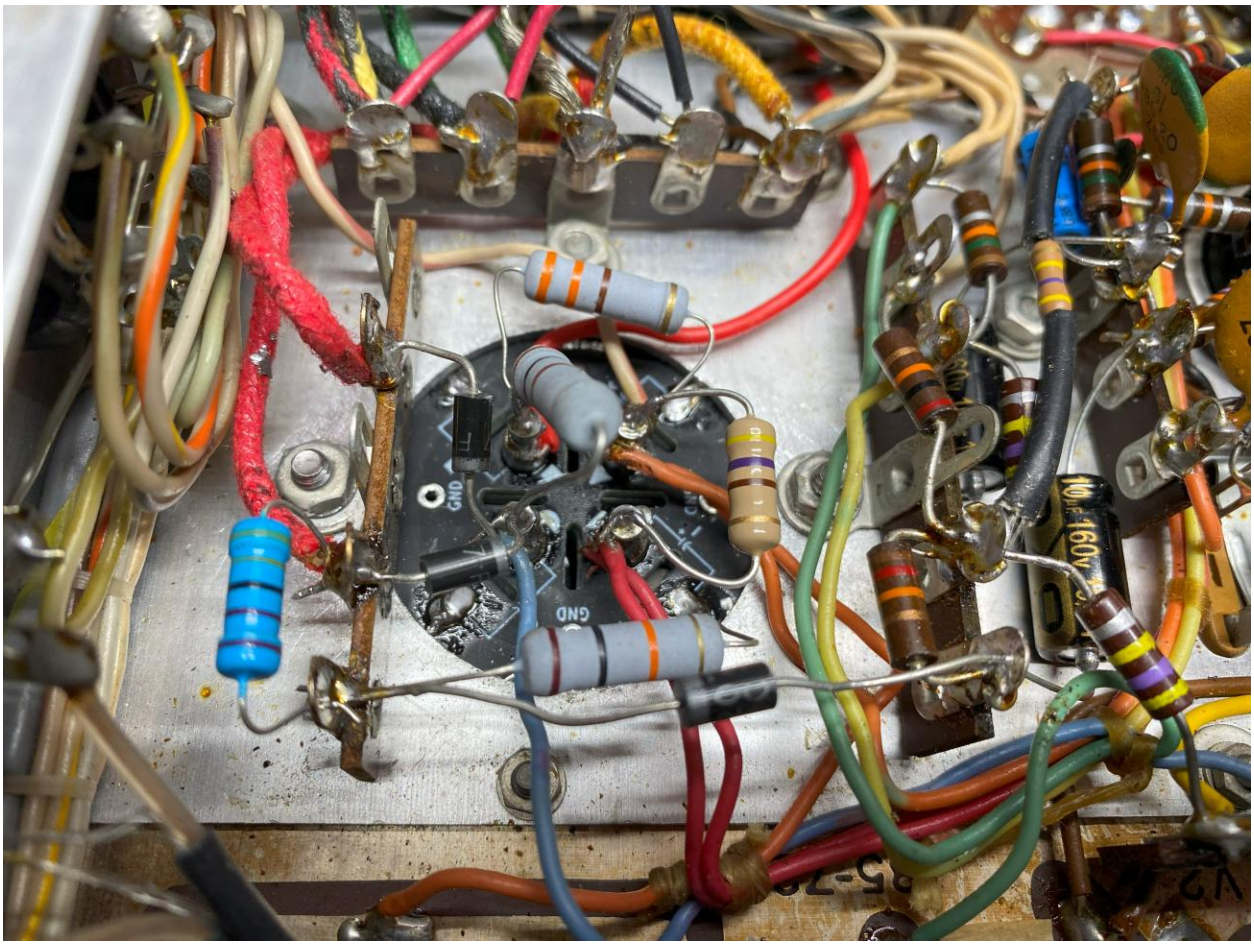




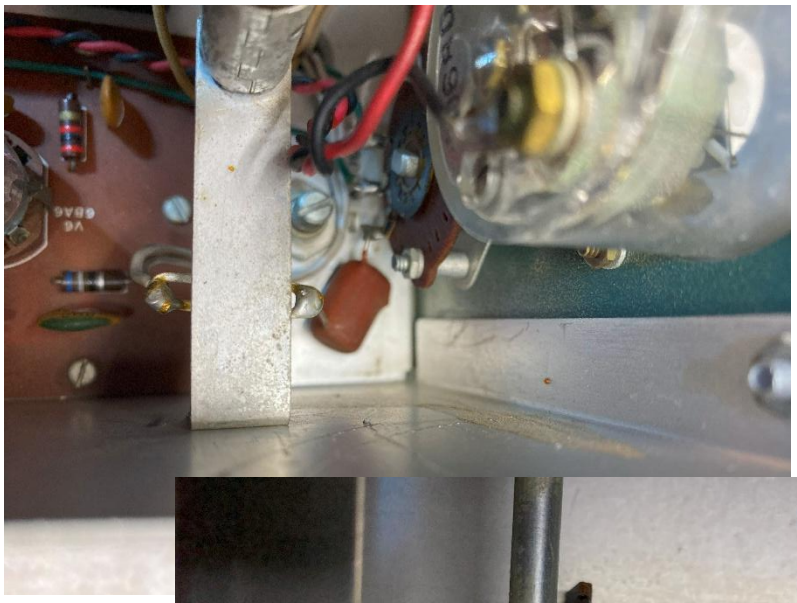


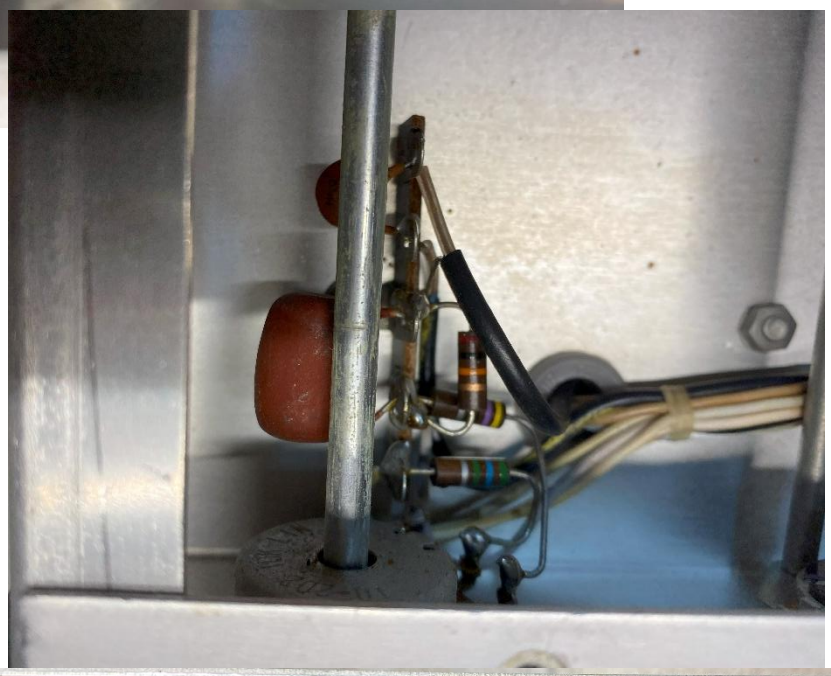


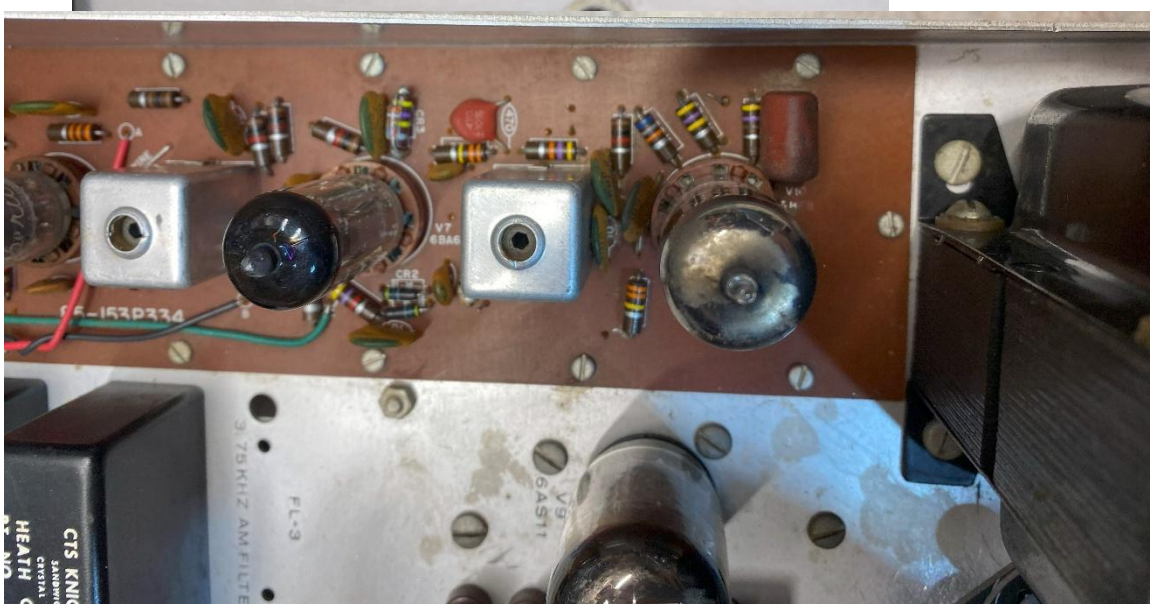




VII. **Replace the three 0.22uf 400v radial film capacitors**
C109 (IF/Audio Board near V10), C216 (terminal strip behind the converter/rf switch), and behind the AGC switch top side.







VIII. Summary.

1. Suggest bringing the radio up slowly on a Variac the first time.
2. Be sure to follow the original Heathkit Owner's Manual for the alignment procedure.

I welcome feedback on any tips or tricks you find to make the project go faster.

I would like to see customer pics of final installations.

If you find an error in this document, please kindly let me know at mysledshed@yahoo.com

Please be professional in your communique.

Thank you, and good luck!

73's

Scott

W8AOR