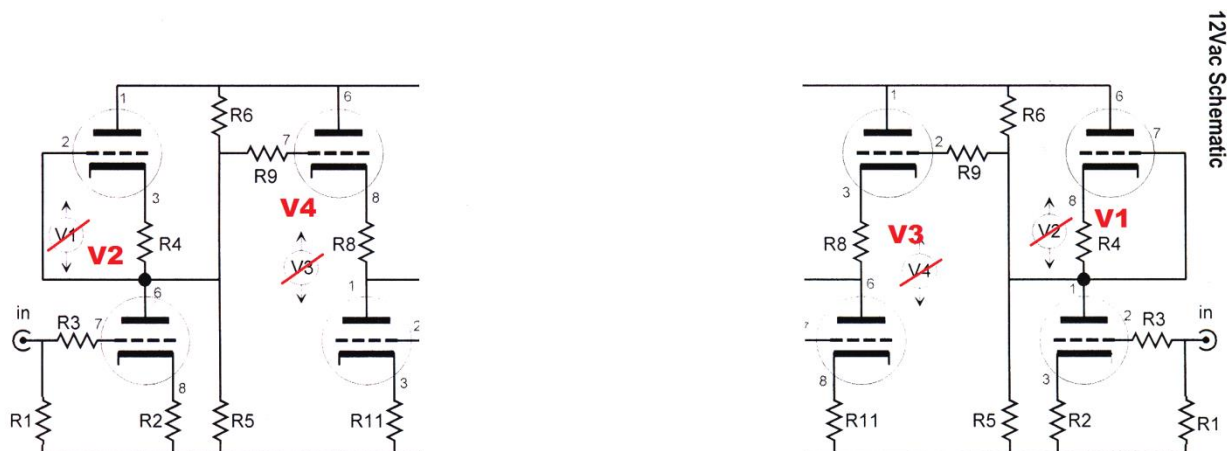


Board Assembly:

There is a minor error on the schematic on page 6 of the manual. It won't affect assembly or operation but it will have you scratching your head and muttering if you look at the schematic and try to trace it out on the board. Reverse the V1 and V2 designations on the schematic. Reverse the V3 and V4 designations on the schematic. See below.



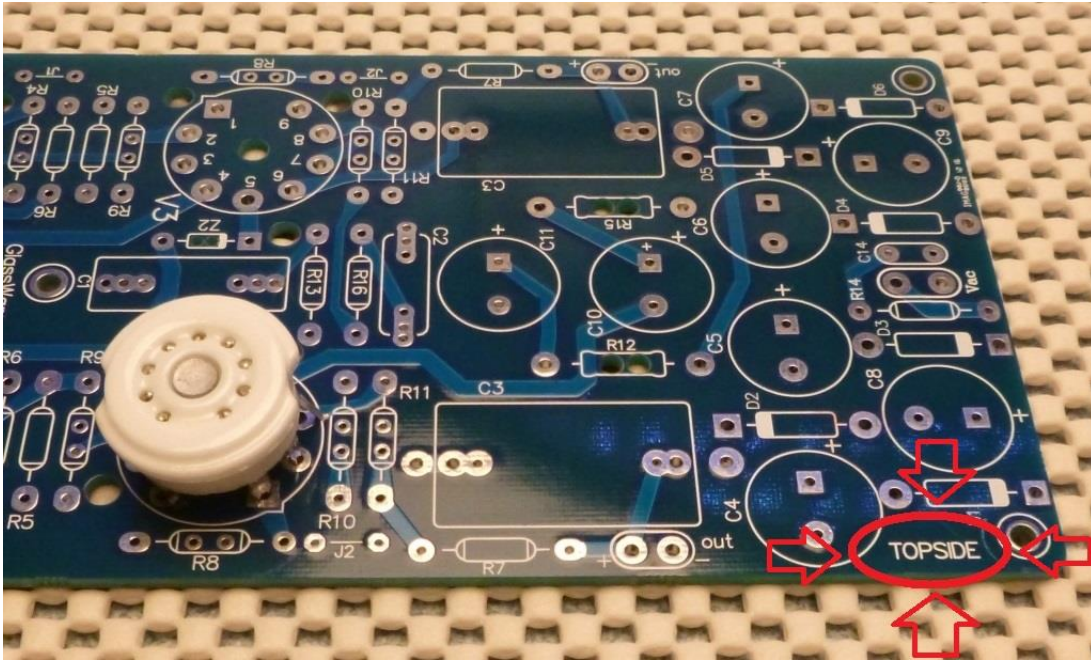
I can't emphasise enough: Take your time and follow the assembly instructions outlined below. As I mentioned in part one the Aikido board is thick, which is a good thing, but if you install a component in the wrong orientation, E.G. diode or capacitor polarity flipped, it is especially difficult to correct.

Note: Some of the components included with the kit may look different than the ones shown in the photos.

1. Clean both sides of the board using a cloth or paper towel dampened with isopropyl alcohol or acetone.
Clean the tube socket pins with a cotton swab dampened with isopropyl alcohol or acetone.

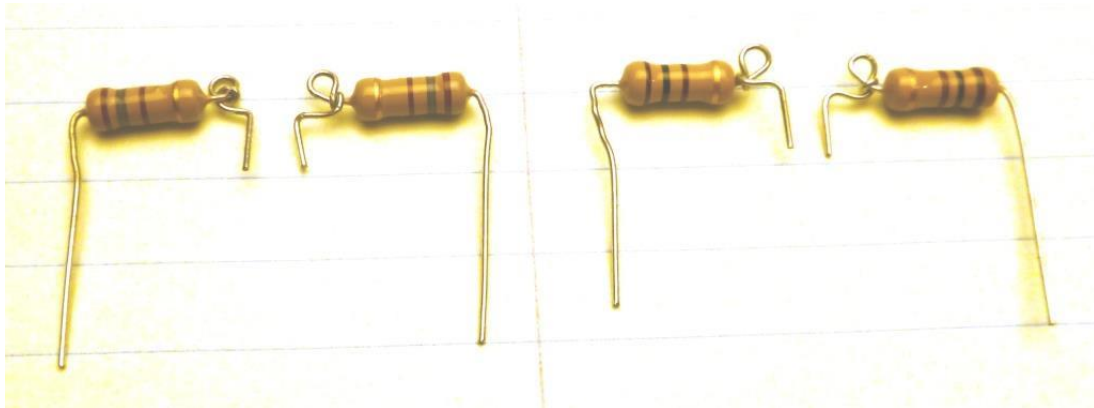
VERY IMPORTANT: If you assemble the tube sockets and solder them to the wrong side of the board you'll hate yourself. Just about the only way to remove them is to break the porcelain then remove the pins one by one. Pay close attention to the indication on the board in the next step.

2. Note the indication on the board (see picture below) that states TOP SIDE. Insert one of the tube sockets through the board on the TOP SIDE and solder in place. Make sure you solder the pins on BOTH sides for optimum conductivity and maximum strength. Assemble and solder the other three sockets as well.

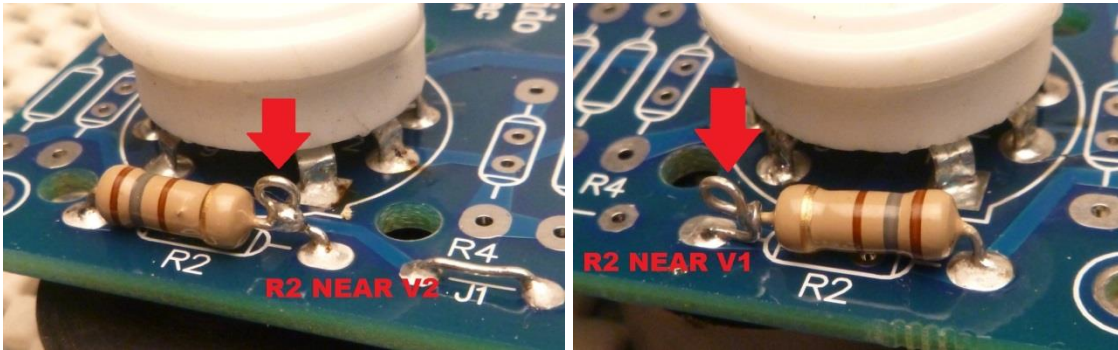


With reference to pages 4, 5 and 6 of the manual install the following parts (all components are assembled to the TOP SIDE of the board. Where possible flow solder around component leads on both sides of the board.

3. Prepare two 180 Ω and two 100 Ω resistors with leads looped at one end as shown in the picture below. This is to make voltage measurements easier later on. If you don't know the resistor colour code verify values with a multimeter before assembly. Don't get bent out of shape if the resistors don't measure exactly on the nominal value. Even 5% carbon film resistors usually measure within 3%, which is fine. Tubes and tube circuits are, generally speaking, very forgiving.

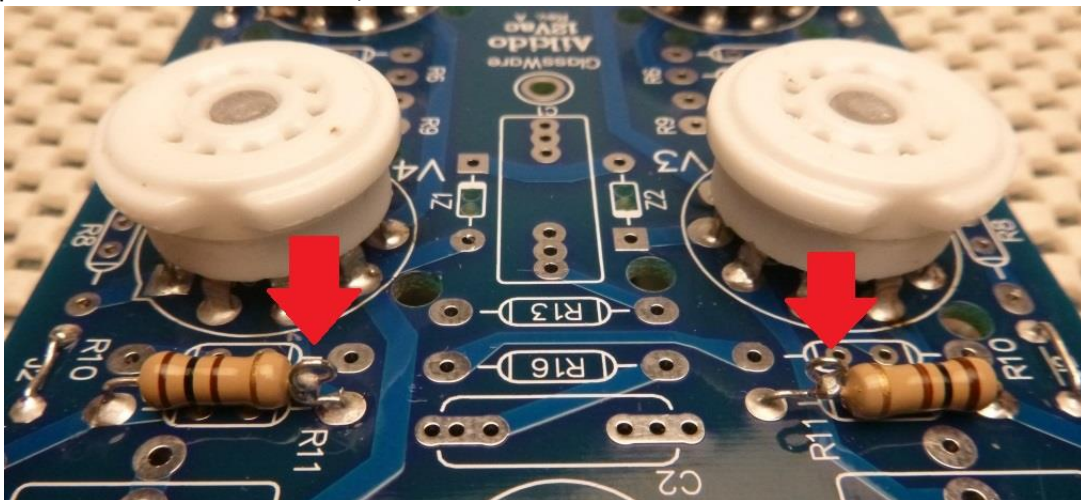


4. Insert the 180Ω resistors in positions R2 (two places) with the looped ends positioned as shown below, solder and trim the leads.

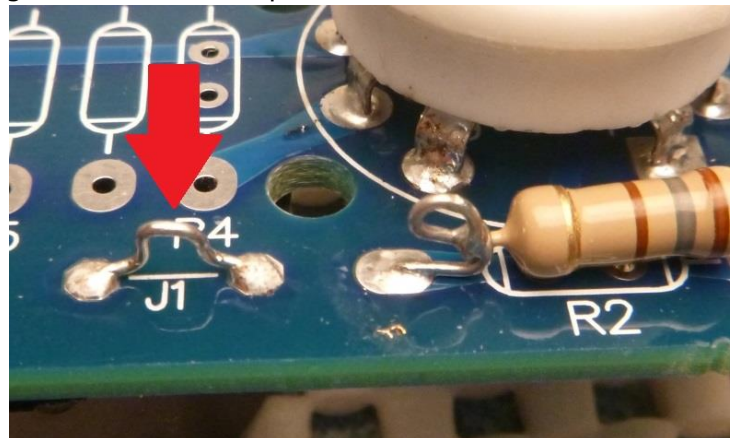


Note: All leads passing through the board should be trimmed for a maximum protrusion of 2mm to prevent contact with the bottom plate of the chassis.

5. Insert the 100Ω resistors in positions R11 (two places) with the looped ends positioned as shown below, solder and trim the leads.



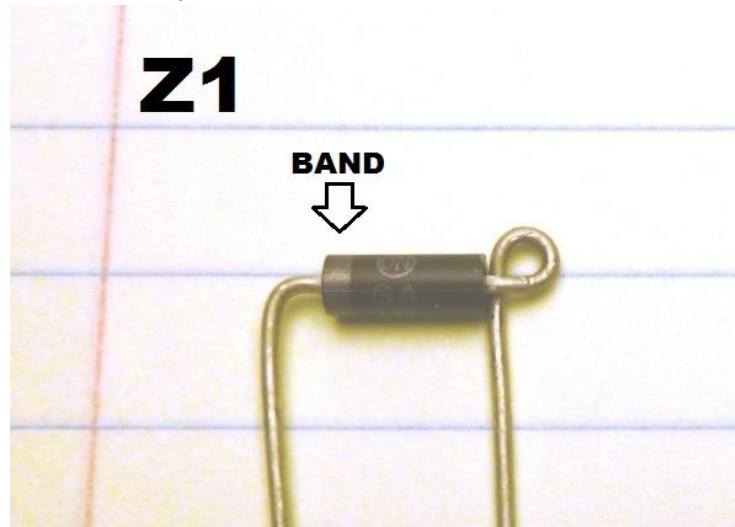
6. Using cut off resistor leads assemble jumpers J1 and J2 (two places each) to the board making one of them a loop as shown below. Solder and trim the leads.



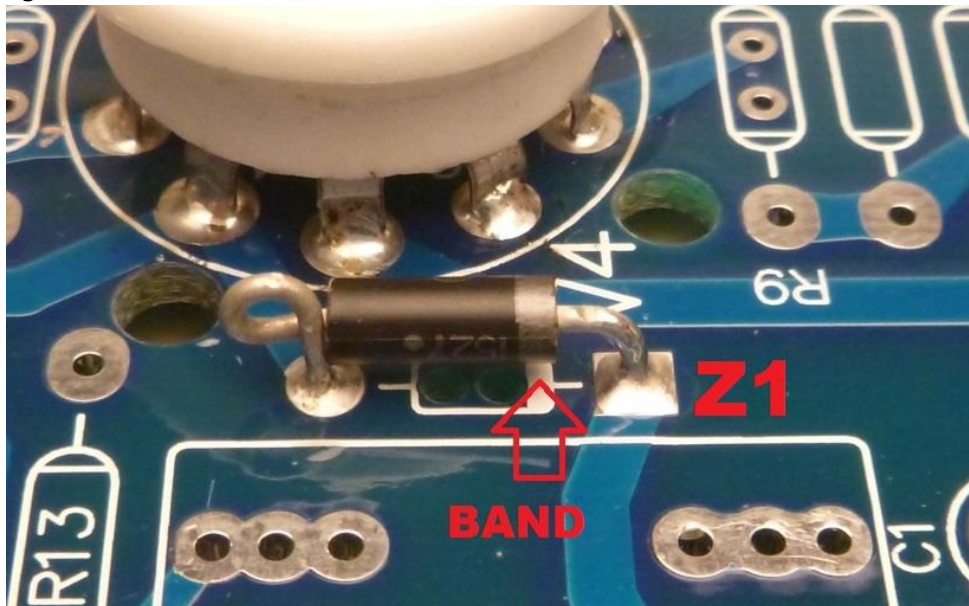
7. Insert the two remaining 180Ω resistors in positions R4 (two places) solder and trim the leads.
8. Insert the two remaining 100Ω resistors in positions R8 (two places) solder and trim the leads.
9. Insert eight $1\text{Meg}\Omega$ resistors in positions R1, R5, R6 & R7 (two places each) solder and trim the leads.
10. Insert six 300Ω resistors in positions R3, R9 & R10 (two places each) solder and trim the leads.
11. Insert one $88.7\text{K}\Omega$ resistor in position R13 solder and trim the leads.
12. Insert one $100\text{K}\Omega$ resistor in position R16 solder and trim the leads.

With reference to pages 4 and 11 of the manual install the following parts:

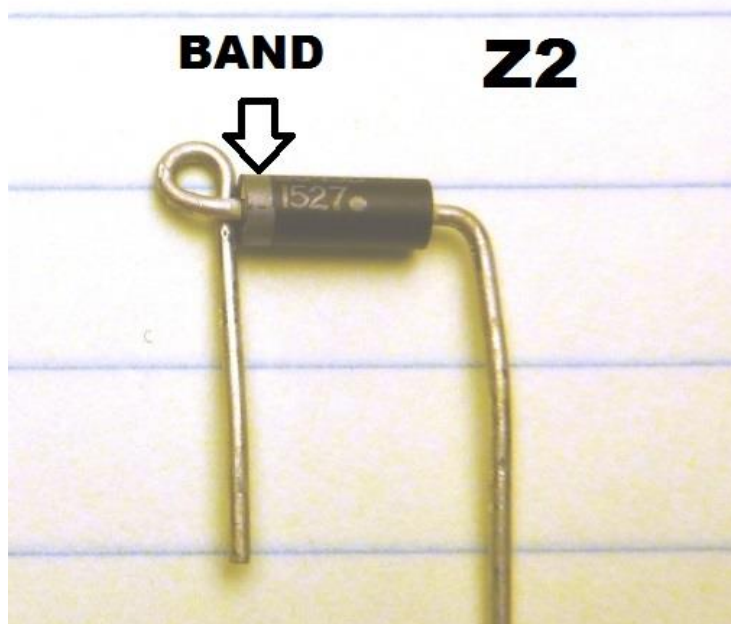
13. Prep diode Z1 with a loop on the **non banded** end as shown in the picture below.



14. Insert Z1 on the board at position Z1 (near V4) with the banded end as shown, spacing it 2 to 4 mm above the board. Solder and trim the leads.



15. Prep diode Z2 with a loop on the **banded** end as shown in the picture below.



16. Insert Z2 on the board at position Z2 (near V3) with banded end as shown, spacing it 2 to 4 mm above the board. Solder and trim the leads.



17. Inset capacitor C1 solder and trim the leads.

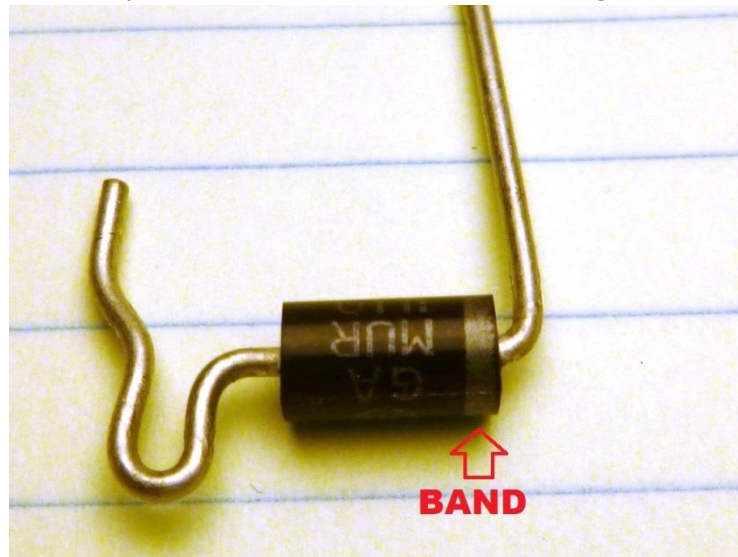
18. Inset capacitor C2 solder and trim the leads.

Optional: Prep a 100K ohm 1 watt resistor (Mouser part no. 294-100K-RC) with some insulating sleeving or stripped-off insulation as shown below. Solder it in over top of C2 as shown. This is known as a bleeder resistor. It draws very little current but will discharge the filter capacitors more quickly when the power is turned off. This will shorten the time between tube changes or other work.

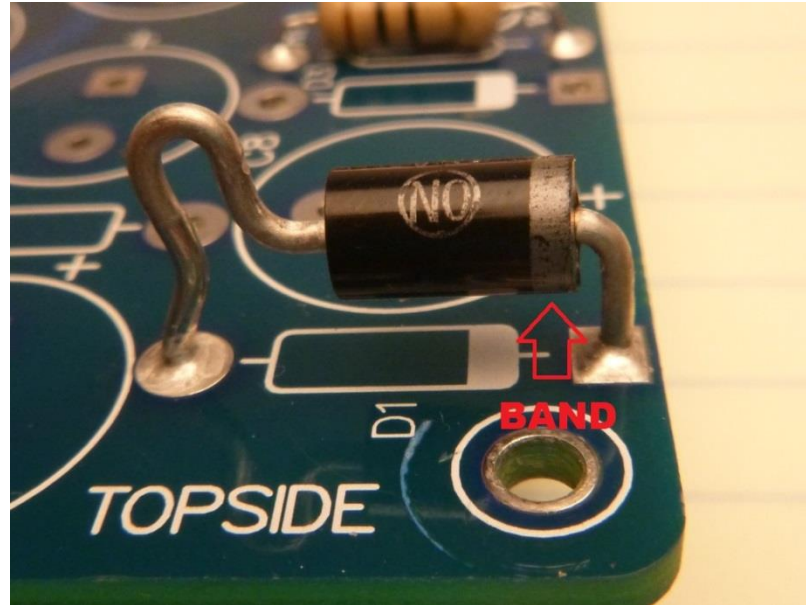


19. Insert resistor R14 and capacitor C14 solder and trim the leads.

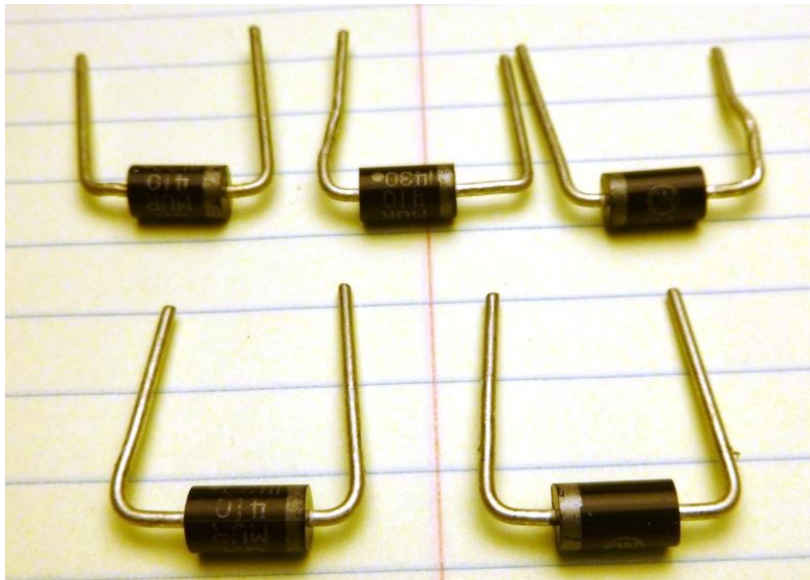
20. Prep one of the MUR410 diodes as shown in the picture with the loop on the **non** banded end. The loop is for later connection to chassis ground.



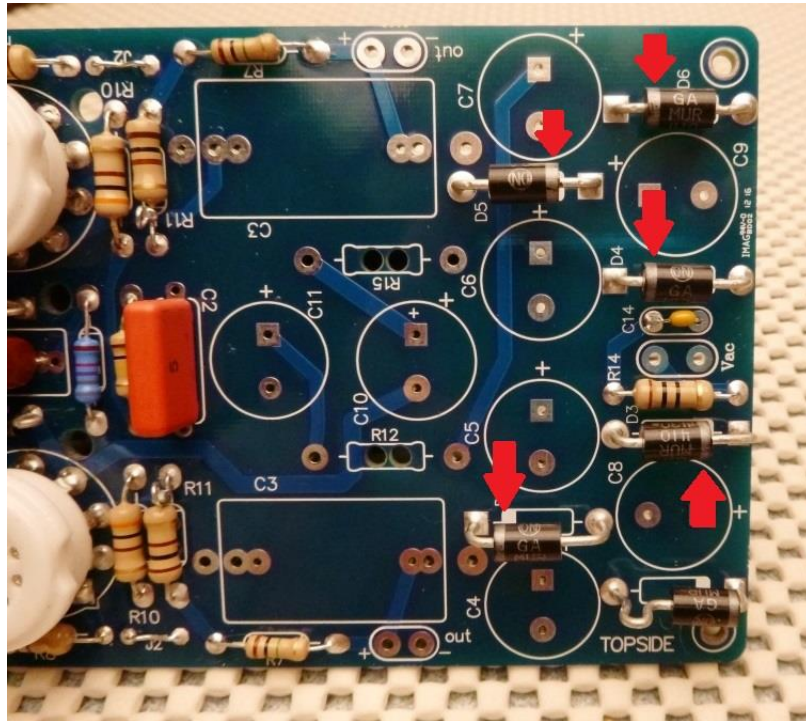
21. Assemble to board at position D1 with the banded end oriented as shown in the picture below, spaced 2 to 5 mm above the board. Solder to board and trim excess lead length.



22. Prep all 5 remaining MUR 410 Diodes as shown in the picture below.



23. Assemble to the board with the white banded ends orientated as marked by the arrows in the picture below. Space the diodes 2 to 5 mm above the board.



24. Solder and trim excess lead length.

In the next section you will assemble capacitors C4, C5, C6, C7, C8, C9, C10 & C11. Capacitor manufactures typically mark the negative (-) lead of their caps. Circuit board designers often (as is the case here) mark the positive (+) connection on the board. This can be confusing but follow the next section to avoid errors.

25. Using a Sharpie marker, mark capacitors C5 & C6 (4700uf 25 volt). Put a black spot on the top of the can closest to the negative (-) terminal. In the blank space leftover write it the capacitor designations (5 or 6) as shown in picture below.



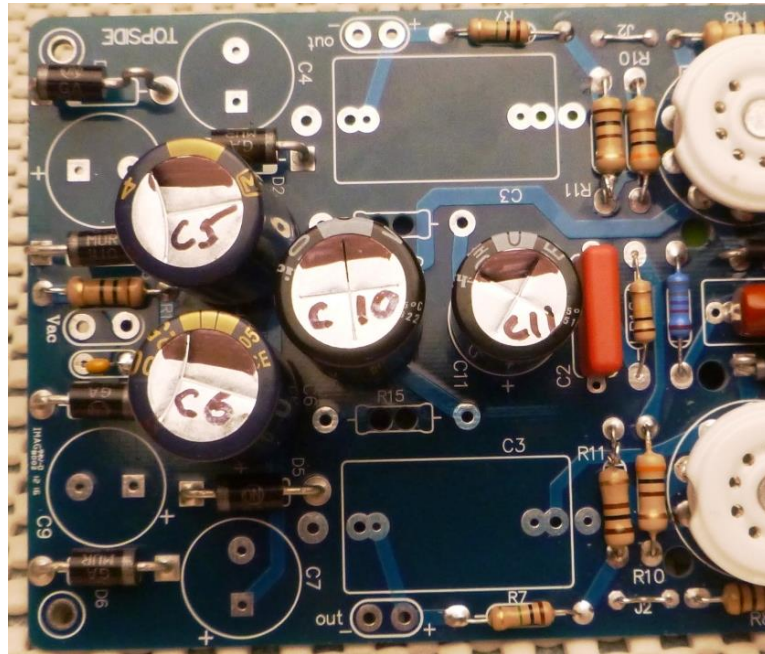
26. Do the same with the five 4700uf 35volt capacitors C4, C7, C8, C9 and C10.



27. Mark capacitor C11, 390uf 100volt, as well.

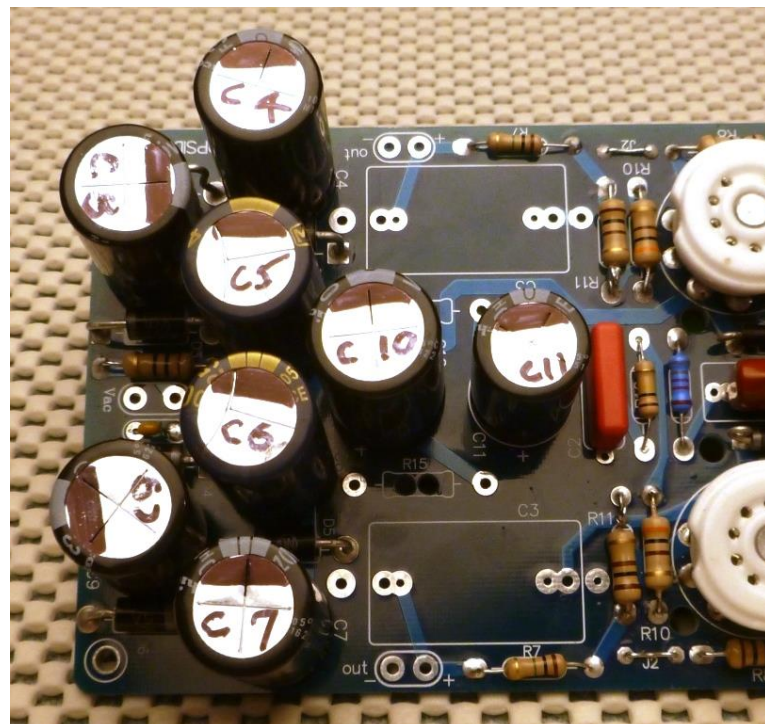


28. Assemble caps C10 and C11 to their respective places on the board, ensure they resemble the picture below, solder and trim the leads.



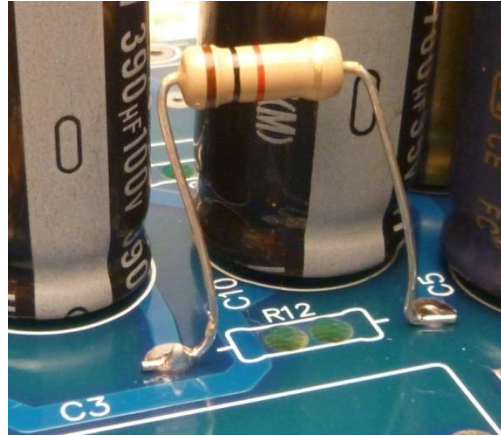
29. Assemble caps C5 and C6 to their respective places on the board, ensure they resemble the picture above, solder and trim the leads.

30. Assemble caps C4, C7, C8 and C9 to their respective places on the board (note C8 and C9 'point' in opposite directions), ensure they resemble the picture below, solder and trim the leads.



31. **IF** you are using the transformer specified in my parts list the following resistors for R12 and R15 should be correct. I have specified them for a maximum line voltage of 125 Vac. Measure your AC line voltage. Even if your line voltage is as low as 110 the voltage to the tubes should be adequate. If your line voltage is consistently over 125 volts you might consider using slightly higher resistor values to reduce the likelihood of premature tube failure.

If you are experimenting with various resistors to set the correct voltages leave the leads long to start with. Don't insert the leads through the holes. Bend the bottoms over 3 to 4 mm and solder to the pad surrounding the holes. See example below.



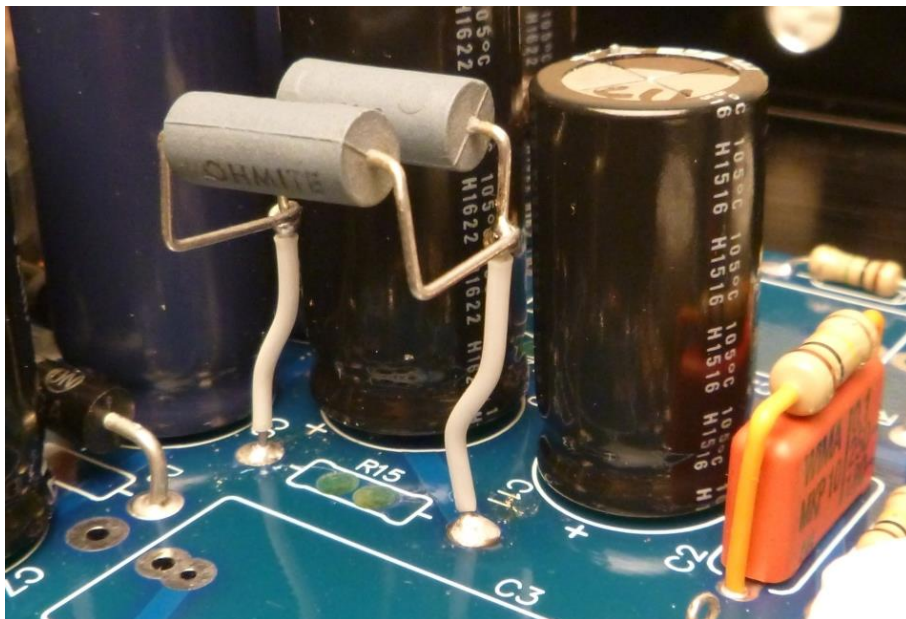
32. Assemble the 1000 Ω 2watt resistor (Mouser part no. 71-CCF2-J-1K) to the R12 location on the board as shown below. I've spaced the resistor above the board to aid in heat dissipation and covered the leads with some stripped-off insulation. Note: The lead closest to the tube sockets is left partially bare to facilitate voltage measurements.



33. Connect the two 51 ohm 3 watt resistors (Mouser part no. 660-MOS3CT631R510J) in parallel as shown below. Use some stripped-off insulation to cover the leads as these resistors will sit quite high above the board, again for heat dissipation. Note: Once installed the resistors are not to rise above the level of the tallest filter capacitors or they will interfere with the lid of the chassis.

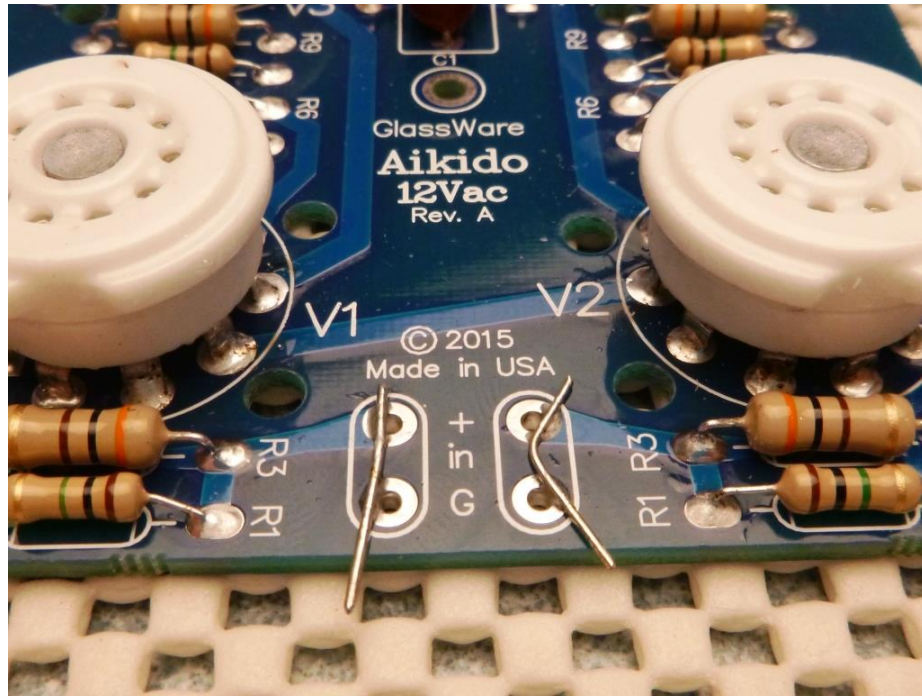


34. Assemble the resistor combination to the R15 location on the board as shown below.



35. NOTE: C3, two places, (the output caps) will be assembled to the board after the initial voltage tests.

36. To prepare for testing solder two short leads (cut off resistor or capacitor leads) across the two inputs. Don't put the leads through the holes as they will be removed after testing.



Proceed to the next set of instructions:

Chassis Pre-assembly, Transformer Wiring & Preliminary Testing