

1) Here is a photo showing the connections to the power transformer. R4 has been removed and an external choke is connected in its place. (blue and purple wires). The white wire in the center of the front of the board goes to the GROUND terminal on the power cord receptacle. **THIS IS VERY IMPORTANT!** If your power transformer has a ground wire connect it to the power receptacle also. The output transformer connections are made in a similar manner although they are not visible in this photo.

2) Connect a voltmeter across R30 (the red and black mini grabbers in the foreground). Set this meter to its highest DC voltage range. This meter reads the B+ voltage. It may be useful to label it B+. During All subsequent tests leave this meter in place. Use this meter to check for presence of B+ voltage, but do not rely on it as the only means to verify that a board is safe to touch.

3) Connect another voltmeter across R7. Set this meter to its highest DC voltage range. This meter reads the B- voltage. It may be useful to label it B-.
Put another voltmeter across the filament supply for the output tubes. This is usually easiest at the tube socket itself. It may be useful to label it Filament.
Power the board up with no tubes in it. Verify that the filament voltages are correct. Then check the negative voltage supply. The B+ voltage may be slightly negative at this point. This is normal. Power OFF the board. Do NOT touch the board for 5 minutes after the power is disconnected. The negative voltage should decrease to a low value within a minute or so.

4) Next, put in a rectifier tube. Power up the board. After the rectifier tube warms up you should have B+. Power OFF the board. Do NOT touch the board for 5 minutes after the power is disconnected. The negative voltage should decrease to a low value within a minute or so, however the positive (B+) voltage will decay at a slower rate since there is a light load on it with no tubes in the board.

You will need to measure the voltages at various points on the board in the following steps. If you only have 3 meters, leave one on the B+ voltage and use the other 2 for the individual tests. The meter on B+ is a quick indicator of circuit health.

5) Put a meter from the grid of the output tubes to ground. One meter for each tube. Power up the board. Each meter should read a negative voltage. With ONE HAND BEHIND YOUR BACK carefully adjust one of the **bias pots (R12 or R23)**. The "*negative voltage*" for the corresponding output tube should change. Set it to the most negative voltage, and then adjust the bias pot for the other channel. Set them both to the most negative voltage. Power OFF the board. Do NOT touch the board for 5 minutes after the power is disconnected.

6) Next, put in the 5842's. Put a meter from the plate of each 5842 to ground. *The plate is easiest to access by clipping the positive meter lead on to the coupling cap lead closest to the 5842.* The cathode pots should adjust the plate voltage on the 5842's. *Set them to about 175 volts (not critical).* The pots were added because of the wide variation in 5842's that I saw. Power OFF the board. Do NOT touch the board for 5 minutes after the power is disconnected.

7) **Connect a load to the amp**, speakers or resistor. It is wise not to use your good speakers during initial testing. **Finally, clip voltmeter leads across the 10 ohm resistors in the plate supply of each output tube (R18 and R29), put in the output tubes, and power the amp on.** **The tubes should draw no (or very little) current.** After the amp has been on for a few minutes, slowly **adjust the bias pots to raise the output tube current to the desired value.** There will be some interaction, since the supply voltage drops under load. Let the amp run for a few minutes and watch the output tube current. Some tubes will creep upwards for a while,

especially new ones. Power OFF the board. Do NOT touch the board for 5 minutes after the power is disconnected.

8) Connect a signal source up to the amp. I have used clip leads to connect the amp up to a CD player for temporary connections. These are visible in the photos above.

Power the amp ON. Now you can apply a signal and listen. Leave the meters in place for at least the first hour of operation. Watch the tube current and the B+ voltage carefully during the first few hours of operation since some tubes will creep upwards over time. Reset the tube current if it changes by more than 1 or 2 mA in the first hour. If it has increased, set it on the low side, since it is likely to increase further. Power OFF the board. Do NOT touch the board for 5 minutes after the power is disconnected.

Complete the assembly into the chassis or cabinet. Reconnect the 3 meters (B+ and tube current) before powering up. Power the amp ON and test for proper operation.

Recheck the tube current after about 10 hours of operation.