This page is to assemble

Assembly for v9 Series PCB's

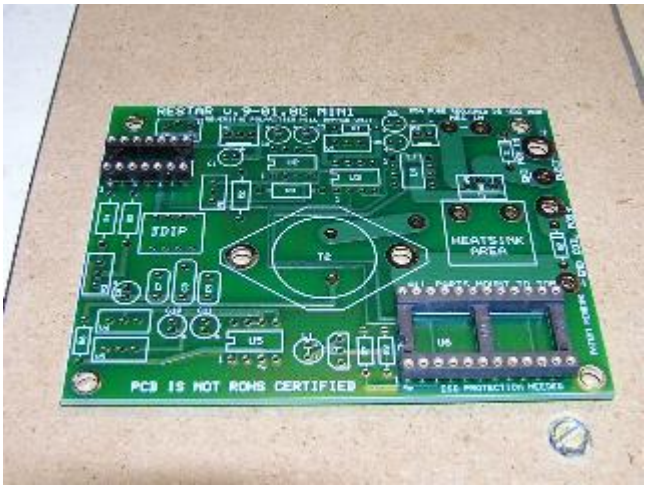
Thank goodness for Modern Day programs that allows us to download this info.

Once you've completed the assembly process, please download the "What Happens Next" PDF

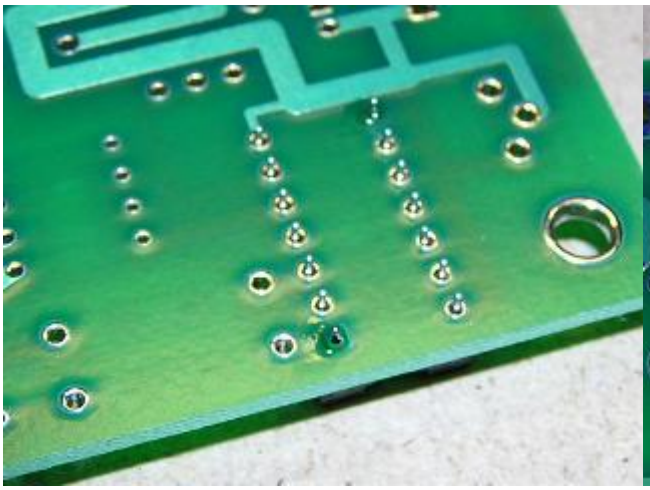
First off we hope this helps those of you who have purchased the v9e and/or v9f. This PDF is replacing the printout that used to come with the boards due to paper, ink and postage costs. If you have any questions or have additional comments please let us know.

To start off, using your blank board draw a template on the aluminum sheet that comes with your hobby box, or comparative mounting area.

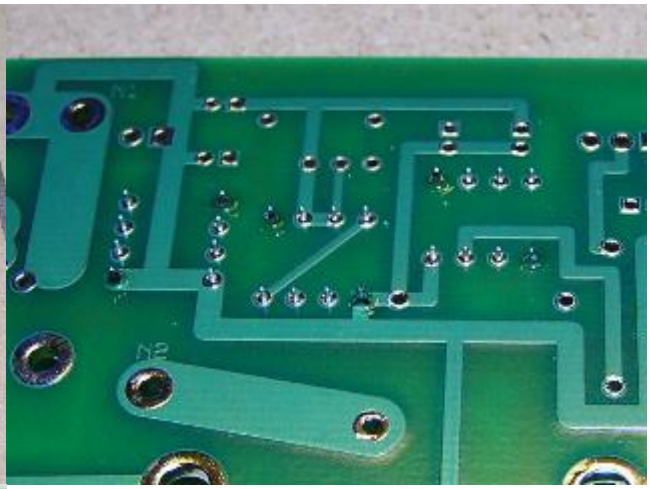
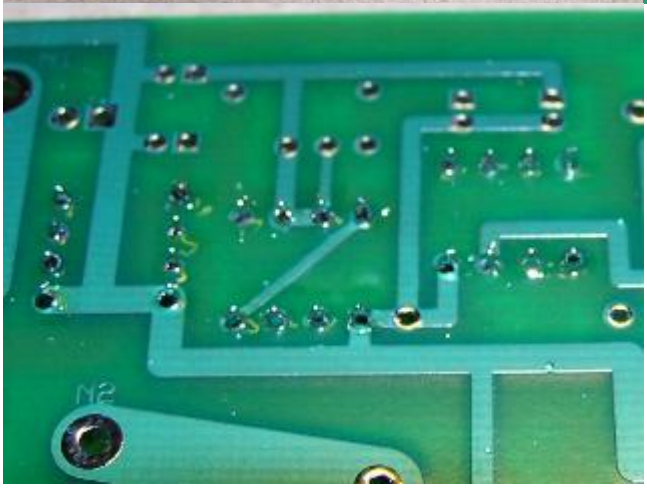
NEW "HOW TO SOLDER" SERIES ON YOUTUBE:
Please see the web site for the video series.



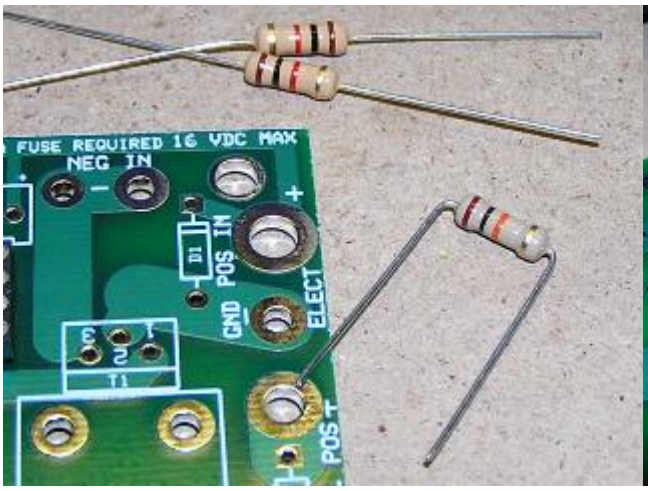
1. Start out with a blank board. Using the 24pin and 14pin DIL's insert the first two dil's (dual inline sockets) into there respective slots. If you are not using DIL's do not insert the microchips at this point, as 90% of microchips are static sensitive.
Solder the 2 DIL's in place using no more than 600-700 Degrees F. Any more may melt the DIL's or Microchips.

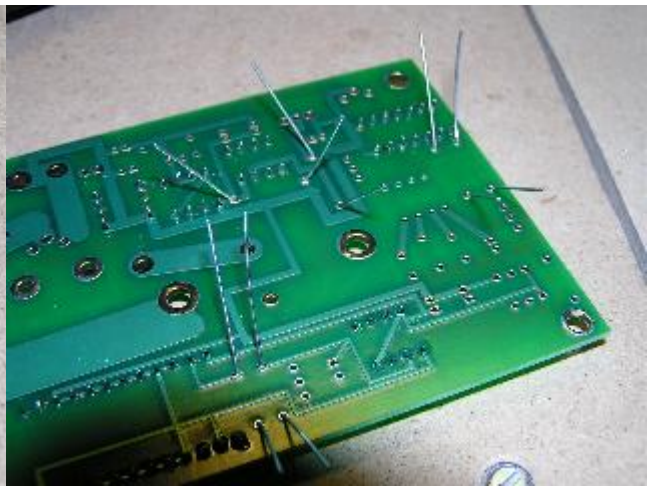



2. Tack as show here first. Then when all DIL's are tacked, use this method to get an even alignment of the DIL's. Once you have straighten them, continue soldering all DIL's into place.

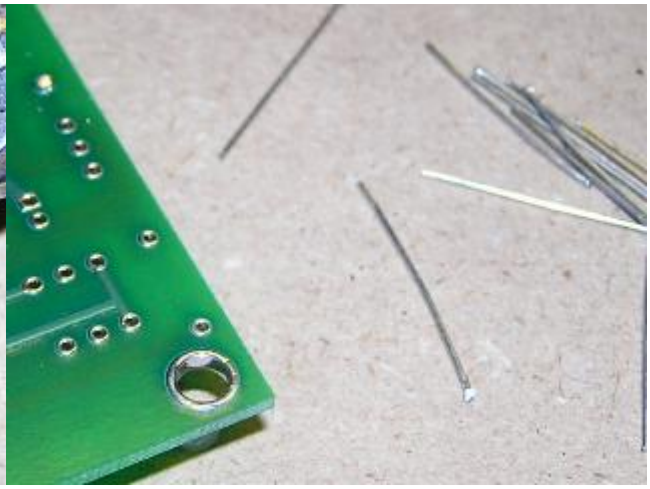
3. Continue to solder the remaining DIL's into place.



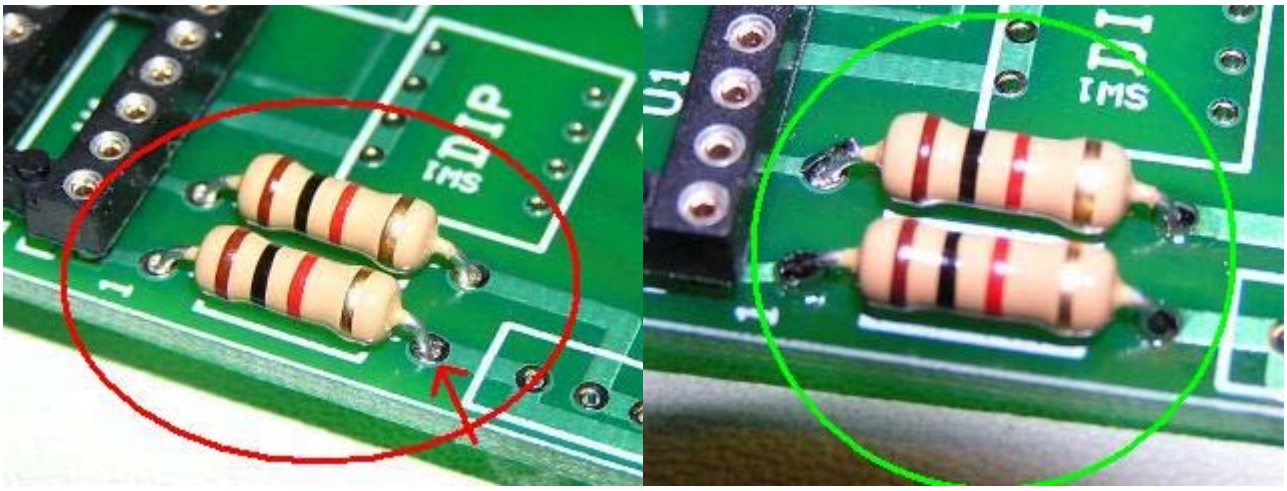


4. Next bend the resistor leads as shown and insert them into their respective areas on the board and bend out the wires as shown. This will not damage the resistors, this will hold them in place for soldering.

5. Solder one side, and then straighten the resistors before making the second and final solder.

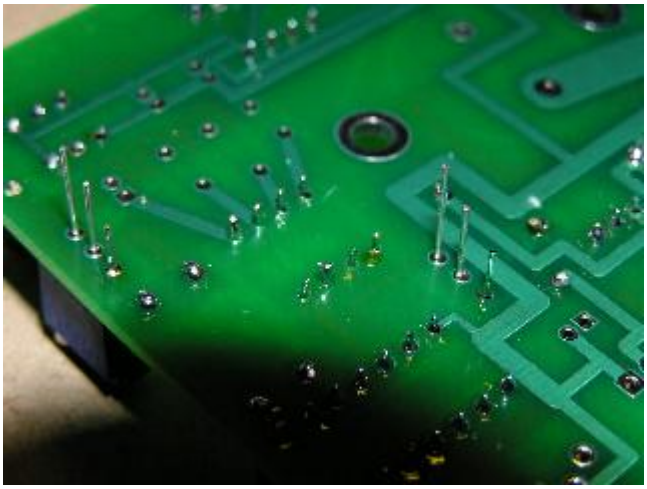



6. Trim the excess as shown here.

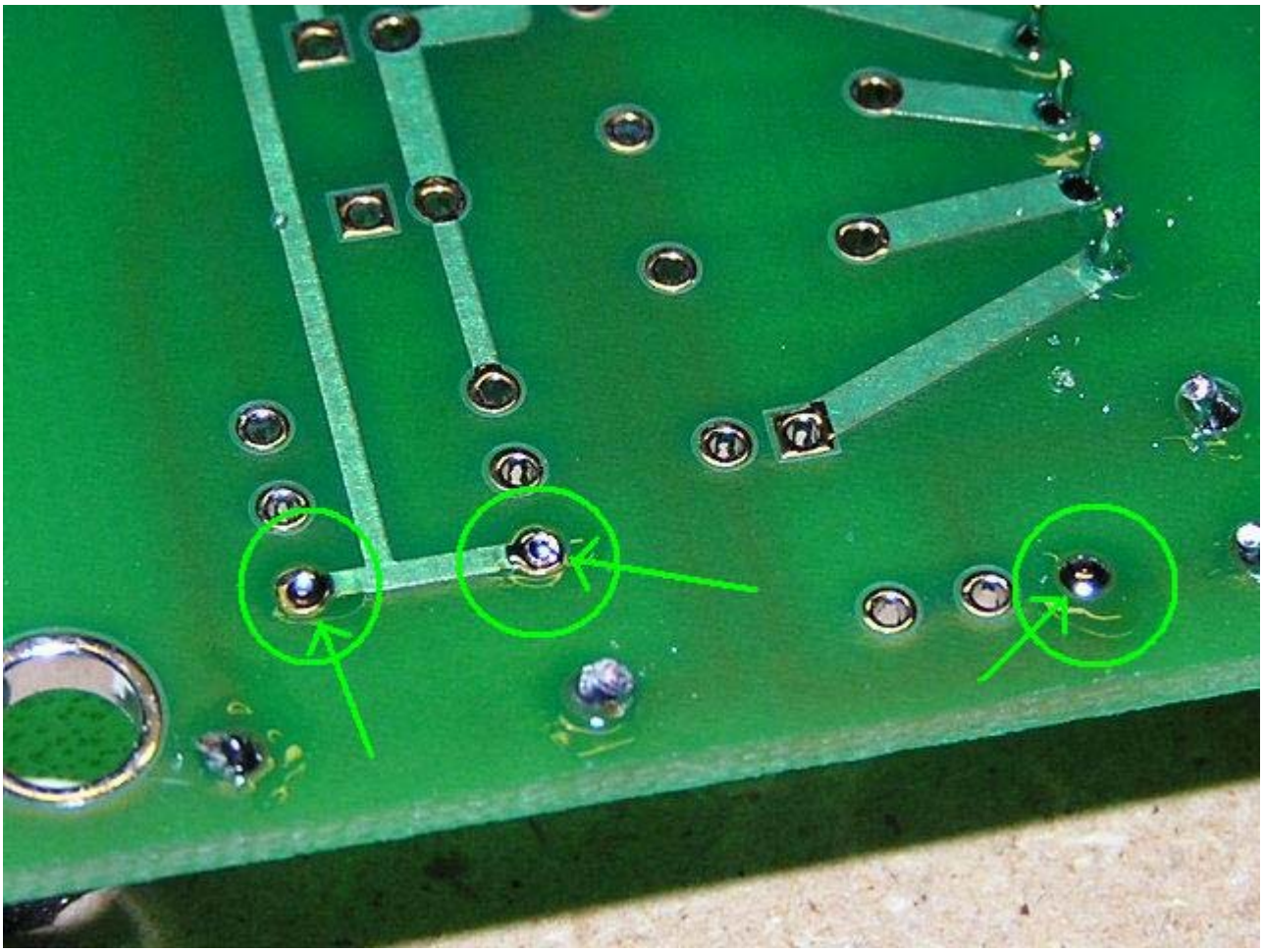


7. Make sure the let the solder flow to the other side of the board, making connections on both front and back sides. If the solder doesn't flow, manually apply additional solder to the unsoldered areas.

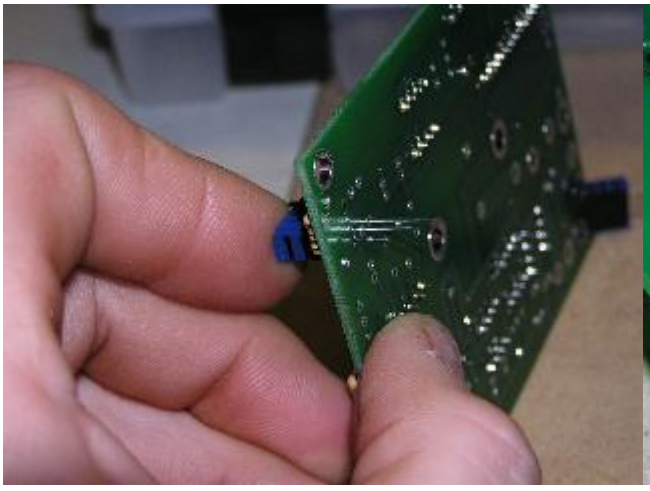
8. Next push the dip switch block into place, using firm pressure. Make sure not to bend the pins while pushing the block into place.

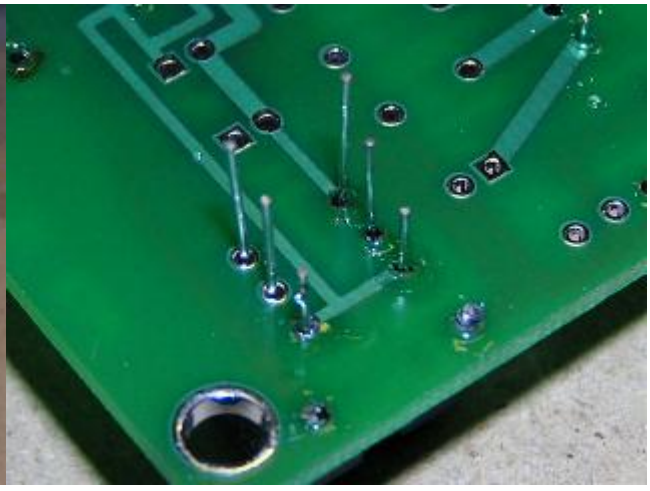


9. Solder the block into place.

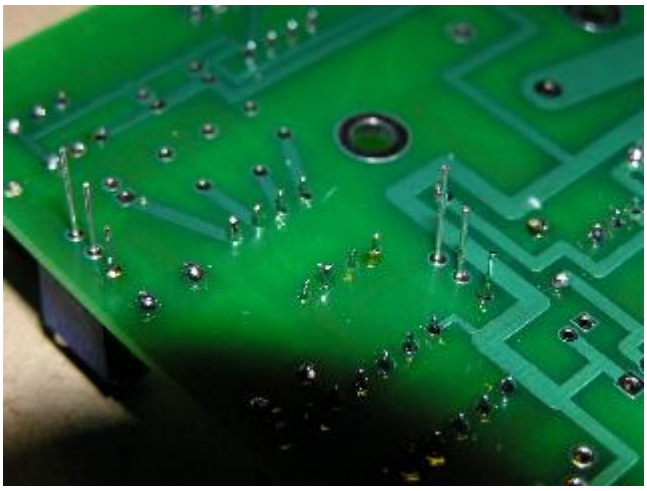


10. Next locate the areas where the Variable Resistors (or POT's = Potentiometers) will be. On the POT's there are three leads longest to shortest. Please note that is does not matter which direction the POT's are inserted, you can choose either way. Find which hole on the board is going to the shortest lead and apply a small amount of solder (enough to cover the hole, but not make a bead) to the one hole. Questions on #10? HELP

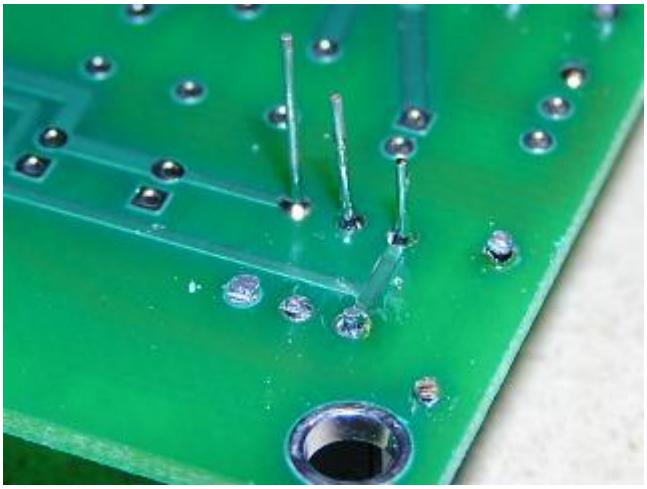




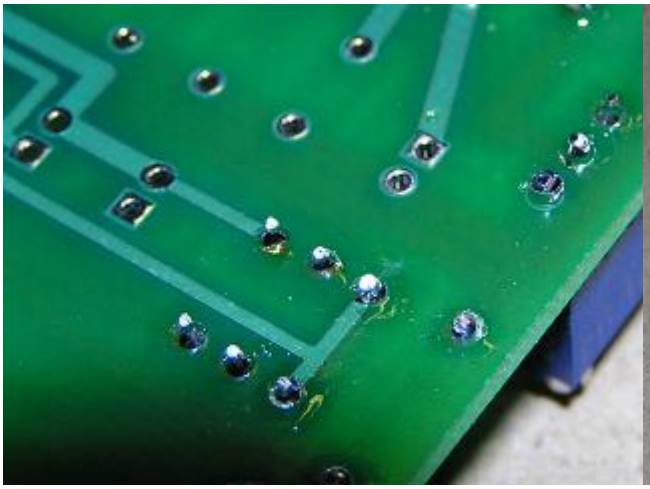
11. Next apply heat (solder gun) to the backside of the hole while using your hand to push the POT through the melted solder and other holes.



12. Repeat this process for the rest of the POT's.

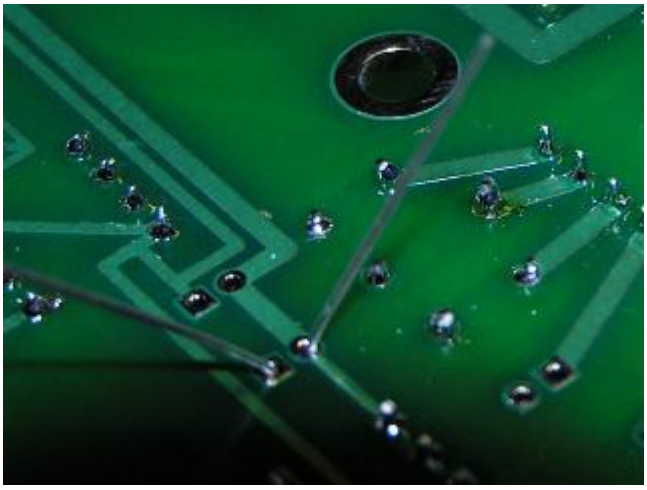


13. Solder the rest of the POT leads sticking through the board, and trim them like you trimmed the resistor leads.

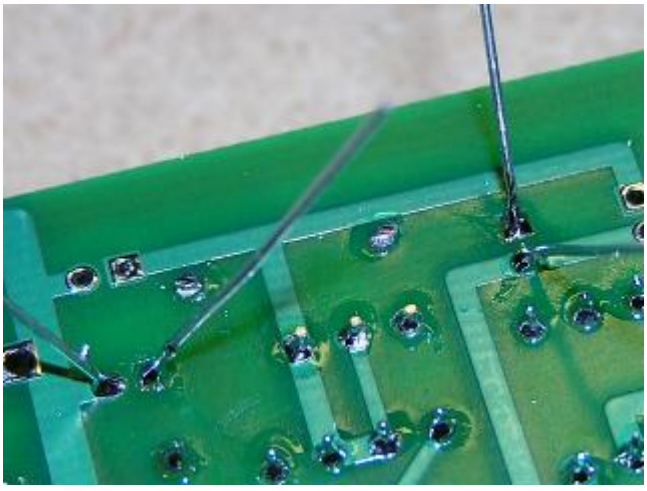


14. They should look something like this.

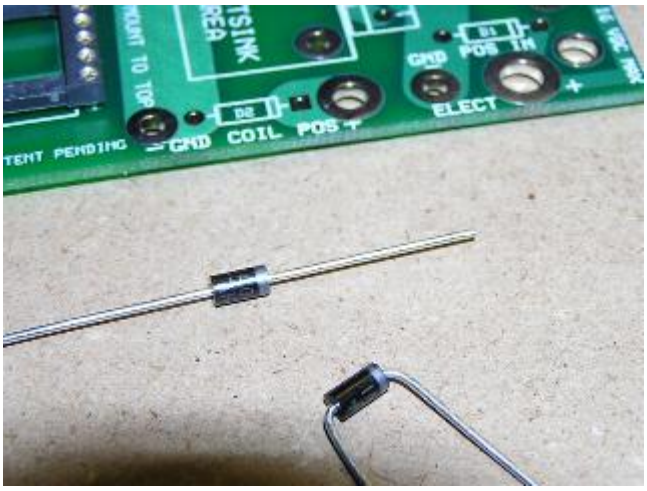
15. Next we'll work on the Radial Electrolytic Capacitors.



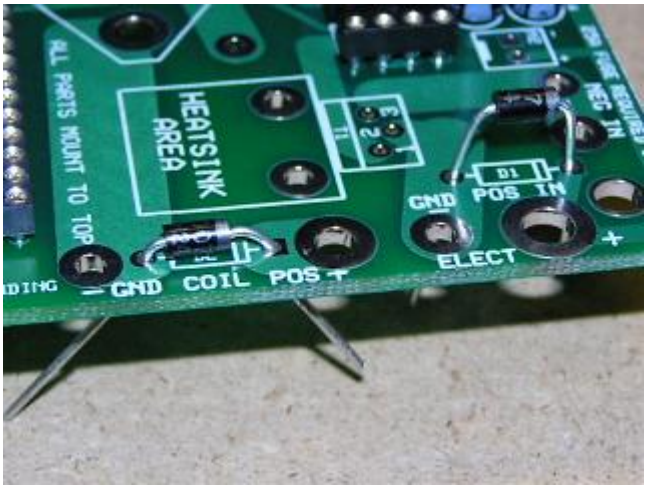
16. Push the leads for the Capacitors (CAP's) through the holes on the board, putting each respective size in it's place on the board. Make sure the + on the board matches up with the longest leads on the CAP's.



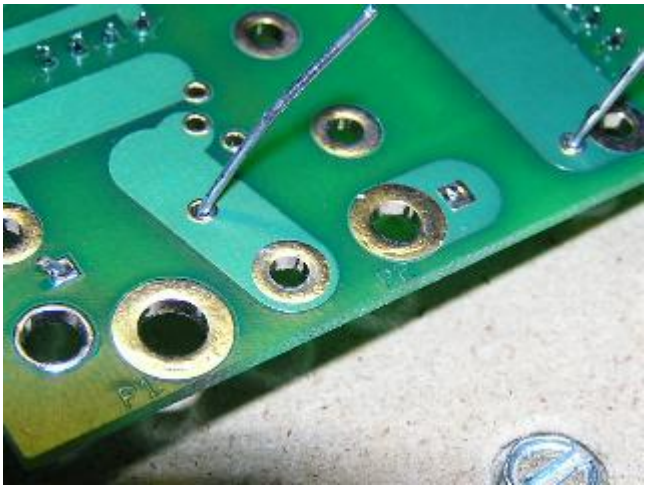
17. Solder into place making sure to push the CAP's, as even as possible, to the board.



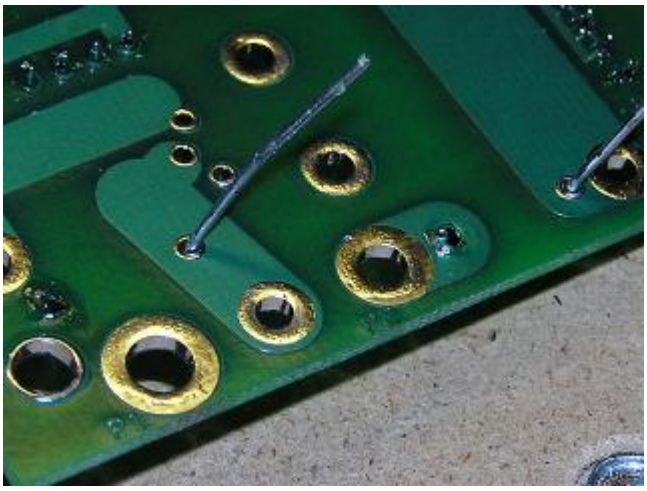
18. Next bend the Diodes like the resistors.



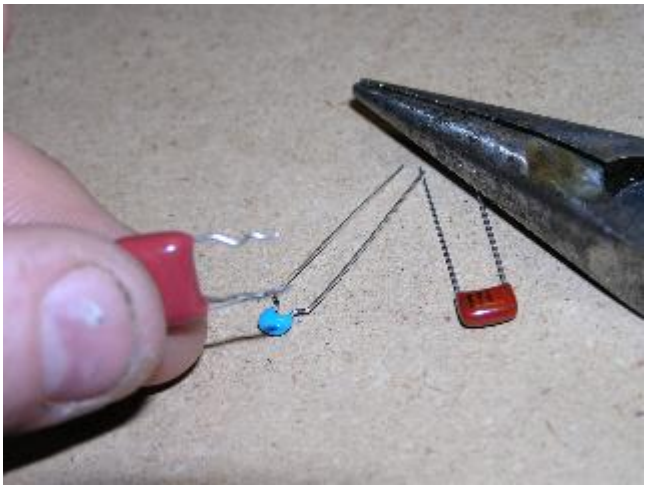
19. Insert the diodes into place. If you have to use a pair of pliers to pull them through, this can be done. Careful not to damage the board or the leads on the board. The diode is sensitive to which way they are mounted. Align the line on the Diodes with the lines on the board.



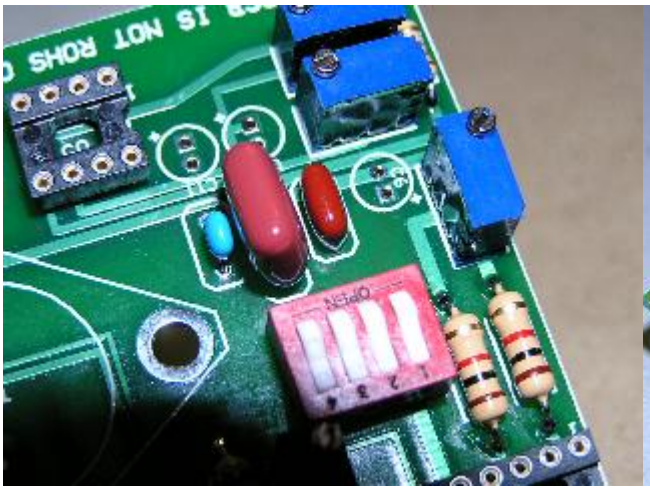
20. Once they are up to your standards of being straight and even with the board, cut off the leads one at a time as shown here.



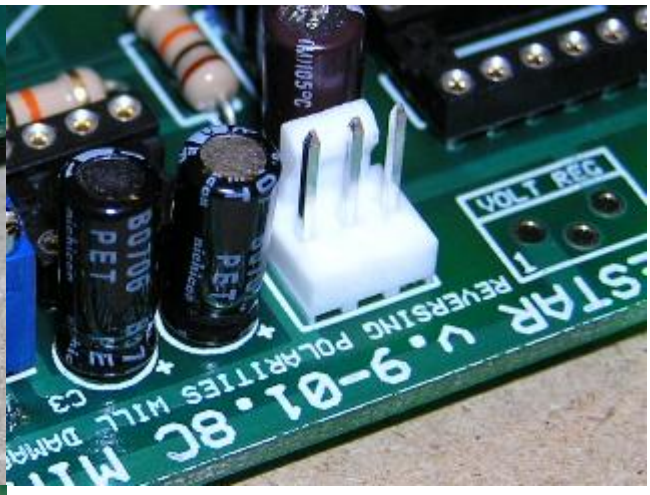
21. Solder the cut leads into place. The shorter leads provide less area to dissipate the heat, thus providing a hotter surface for the solder to melt into place. Repeat for the other leads



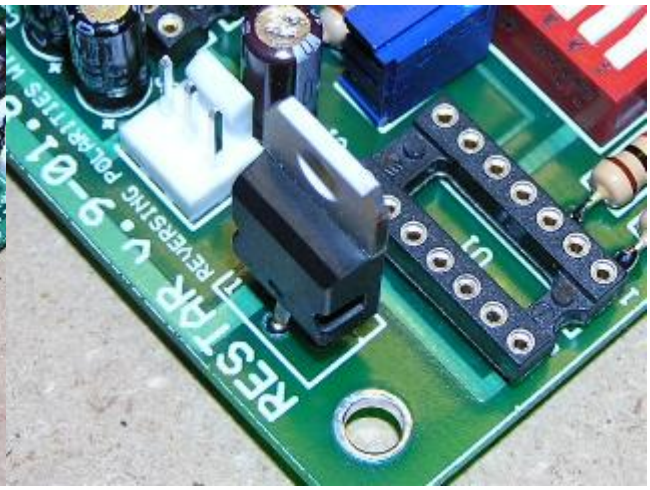
22. Next I will show you how to straighten the leads on the .03 film type CAP. Using a pair of needle nose pliers, feed ONE of the leads into the pliers about half way in. Applying pressure, straighten the lead. Repeat for the other side.



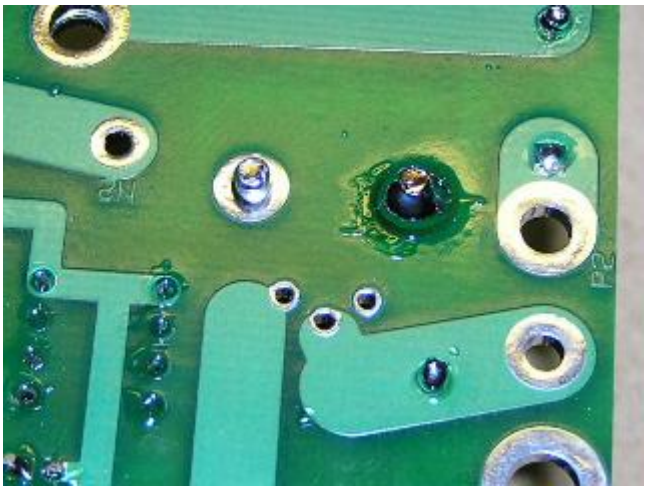
23. Next feed all the remaining film type CAPS into their areas on the board. Making sure to pull the leads through as much as possible.

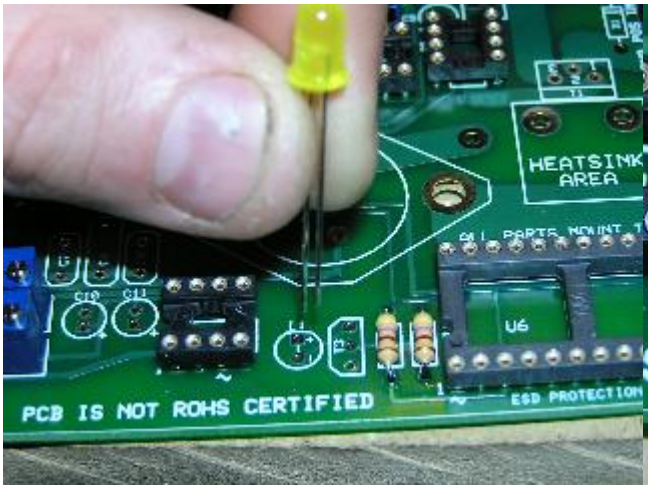
24. Next we will work on the molex connectors, for the FAN and the THROTTLE wires. As with the POT's solder over ONE hole where the connectors go on the board. With the three holes, I use the middle, you may use a different hole if you like. The two holes, I use either one, neither is wrong nor right. BE CAREFUL NOT TO BURN YOU FINGERS, you may want to use pliers for this. Melt the area you applied solder and insert the correct side into the hole. Allow the solder to cool. Then repeat with the remaining leads.

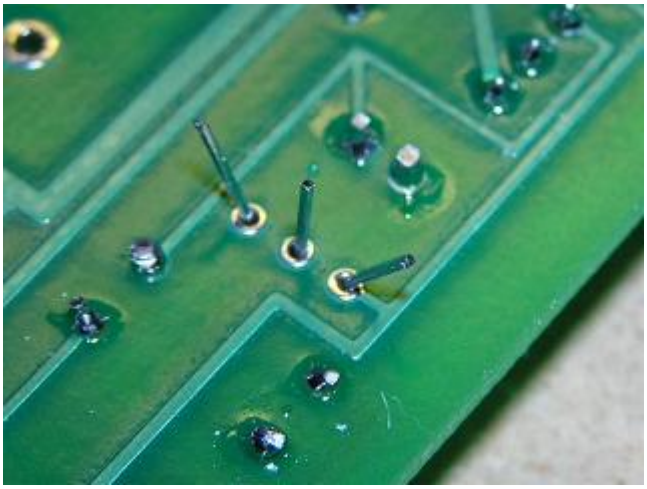
25. Next insert the mountable side of the heat sink to the board. BE CAREFUL NOT TO BREAK THE BOARD as some of the heat sinks are tight fitting. This step MUST BE DONE BEFORE soldering the mosfet to the board!!! Also the MOSFET is extremely ESD or Electro-Static Discharge Sensitive, so mounting will be done last. You can however mount the Voltage Regulator into its respective hole. No ESD is needed for the Volt Reg.



26. Solder both of the mounts on the heat sink to the boards. This will require a lot of heat and solder to complete. If you do not use the heat sink that is here, you may break the mosfet off from age and vibration. This is why we use this mountable heat sink. Also if using a smaller box, you may want to purchase the next smaller size heat sink.



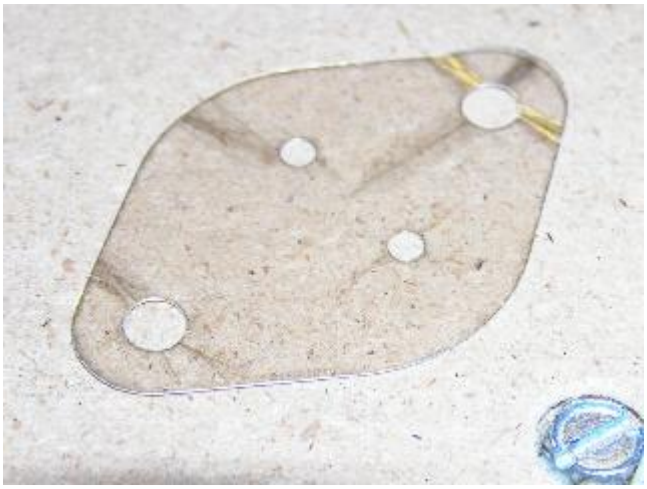
27. Next mount the LED and T3 Transistor. The flat side of the transistor aligns with the flat side of the layout on the board. The round side of the Transistor to the rounded end of the mounting label. The long lead on the LED (as with the CAP's) will go to the + on the board. If you do not want to use an LED, you can short out the + and other hole where the LED would insert with a spare wire or cut leads from the above items. Any color T1 3/4 LED can be used, this is to show the timing circuit.



28. Bend the outer leads of the transistor out as shown here, for mounting. Next solder to the board.

29. Now for the mounting of the 2n3055 transistor (T2). In the picture, the kit is REQUIRED for this board. It resists temps upto 1200F. You must use this kit or damage may occur to the board and wires leads running under the transistor.

30. Spread the pieces of the kit out as shown. The low left corner of the picture shows what pieces will not be used and can be discarded.



31. The film pad can look cracked or bent as long as it is not separated or in multiple pieces.

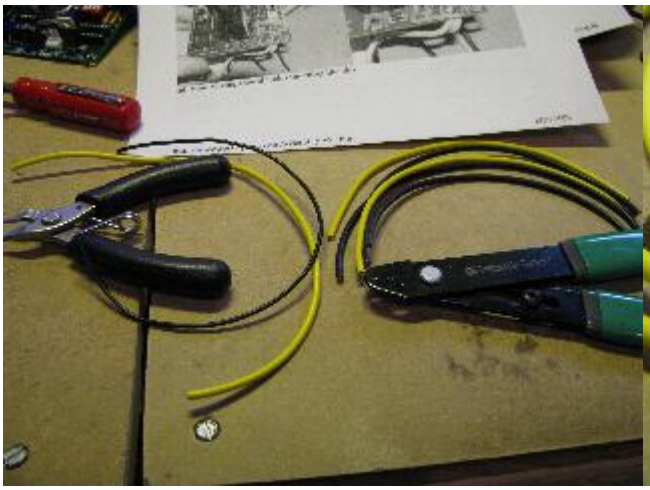
32. Put pad on the board.

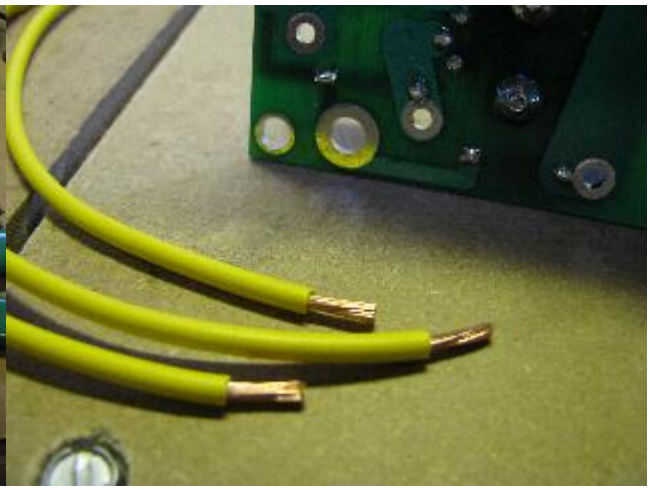
33. Next instert the two screws into the 3055 Transistor.

34. Insert the Transistor into place using the screws and leads to align it as straight as possible. And as with the diodes, cut ONE lead. Tighten the screw to help hold this in to position while you are soldering.

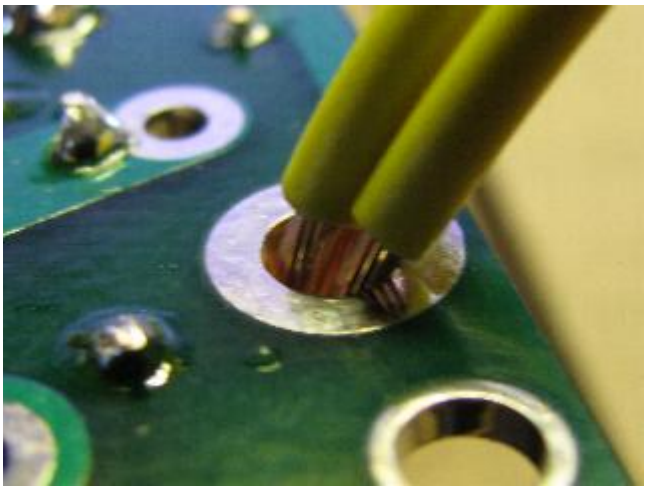
35. Solder into place and repeat with the other lead.

36. Remove the screws and save as they will be needed in the final assembly with the heat sink.

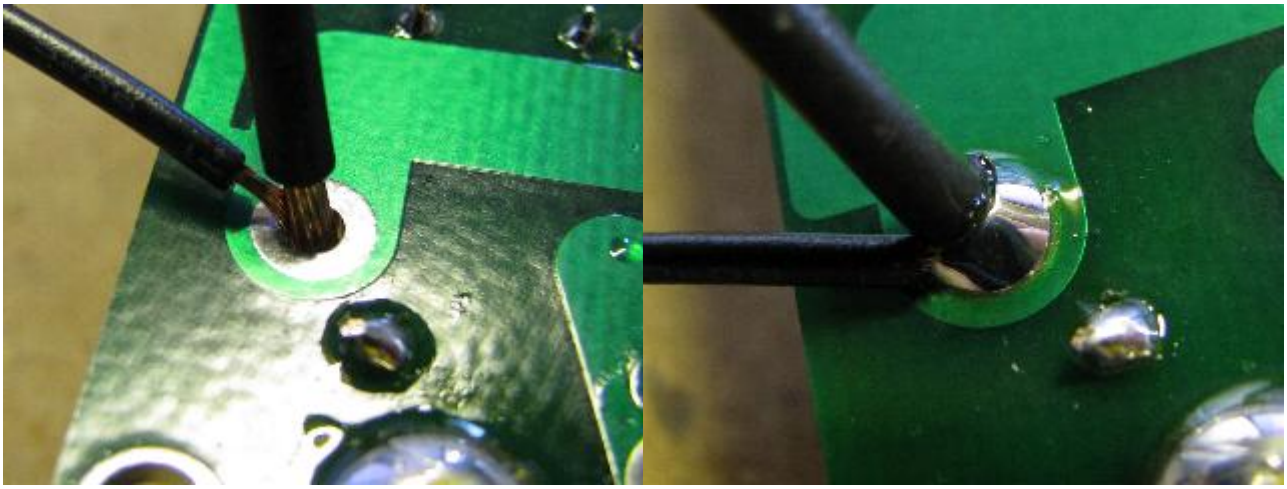




37. Now for wire mounting to the board. As seen here, strip about 1/8" - 1/4" of the shielding off of one side of the wire. The wires being used here are purchased from Home Dep*t. They are 16awg (gauge wire). Due to the Amper Demand, this wire is plenty large for this unit. We cannot guarantee that a larger wire to fit in the holes provided. Color doesn't really matter either. As seen here you can use Red, Blue, Yellow as Positive. We would recommend only using black for negative.

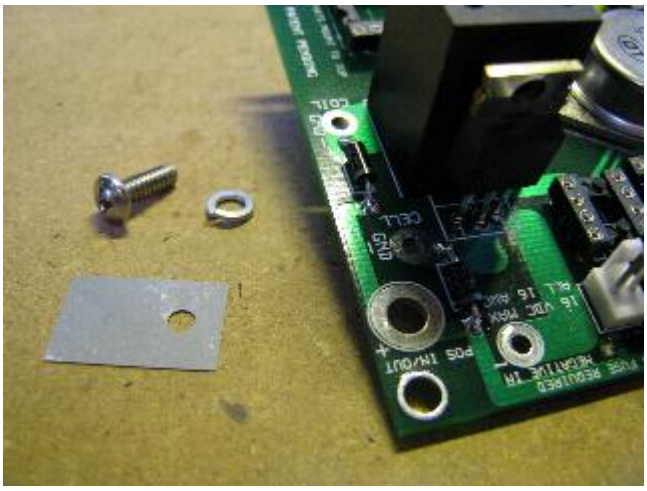


38. Solder the Positive wires, any color will suffice.

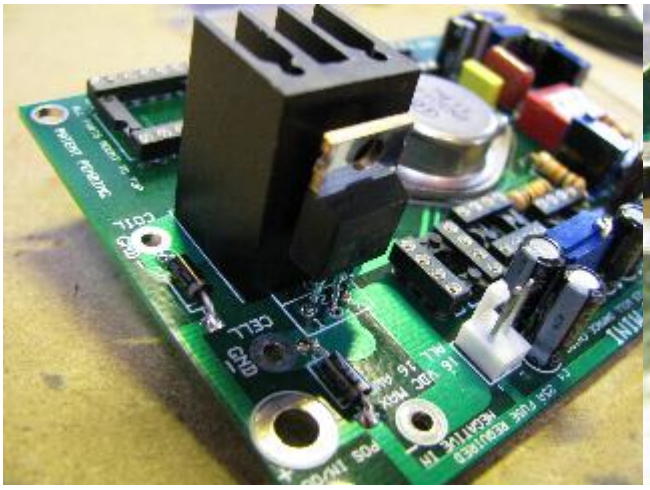
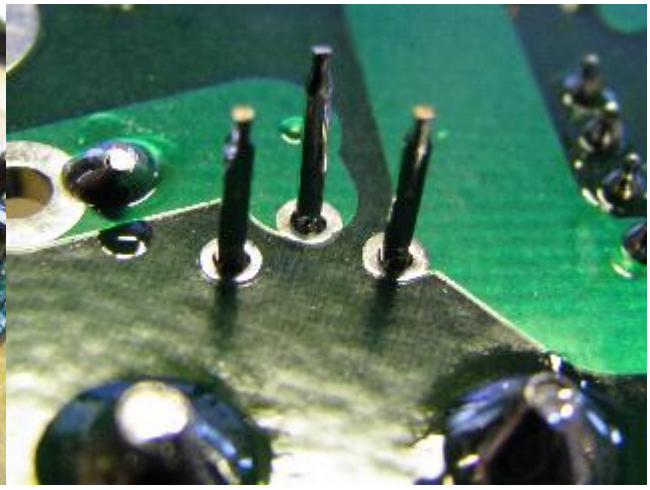


39. Then solder the Black/Neg wires to the board.

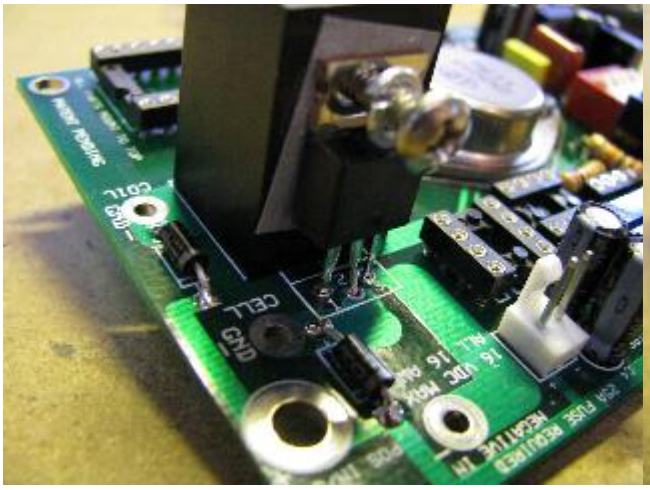
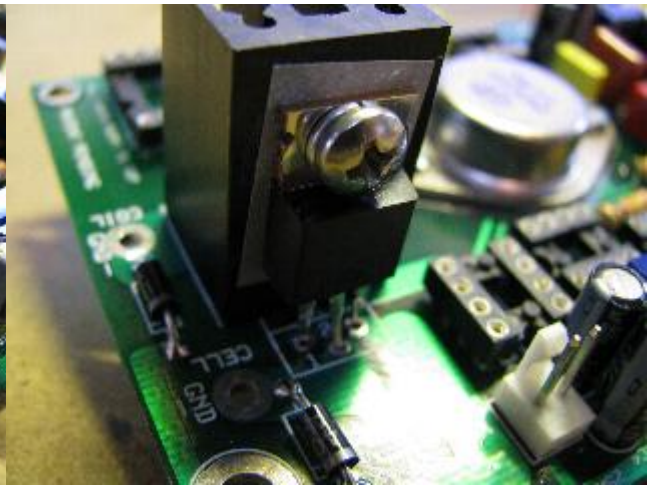
40. Your wiring should look something like this



41. Last (you can do this sooner) we're going to assemble the MOSFET. We hope you have an ESD mat, grounding bracelet and electrical ESD monitor. If you do not, we do not recommend assembling this yourself. You can make a makeshift ESD area. The internet can provide you with this as we have the correct setup. we bought ours on Eb*y for about $100.

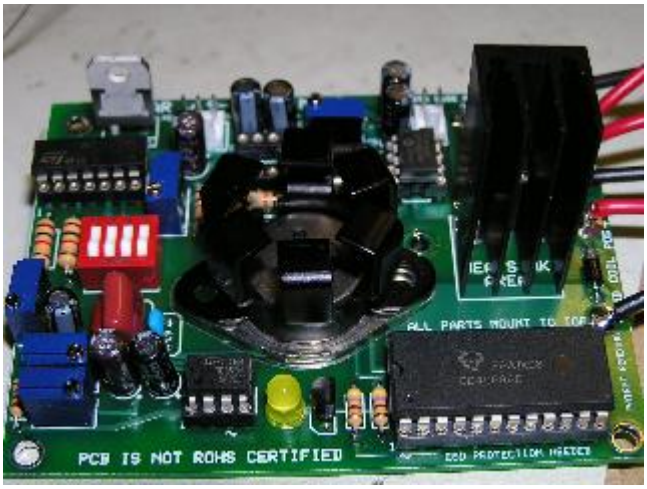



42. Insert the MOSFET into its hole, next to the heat sink and align the mount hole. DO NOT SOLDER AT THIS POINT.

43. Using a 6-32x3/8 pan head screw, and using a thermal heat pad OR Heat Grease, mount the MOSFET to the Heat sink. Screw until tight, but not overly tight. NOW solder Mosfet into place. Each lead can withstand 300C for 10 seconds (reference only, you should print out or find the manufactures data sheet on this subject.)

44. Your mostly complete board should look something like this.



45. With all the chips and heat sinks in place, your unit should look comparative to this. Remember to re-insert the screws; lock washers and nuts for the transistor and heat sink tighten them down.

For help, please email: HELP@restarpwm.com