

Template

I. Introduction.

Thank you for purchasing the Scotty's Sled Shed Custom power supply restoration Kit for Heathkit DX-60. This covers only the models without a suffix after the DX-60. Does not cover DX-60A, or DX-60B.

This kit is intended for unmodified power supplies, 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.

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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, with some minor changes.
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. The power supply you have may have been modified.
16. Protect yourself and remember to wear protective eye wear, use a fume extractor, and have a fire extinguisher nearby.

Template**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.
8. For axial Film capacitors, there are multiple tutorials online for how to find the foil end of the capacitor with an oscilloscope, signal tracer or audio amplifier.

III. Identify components.

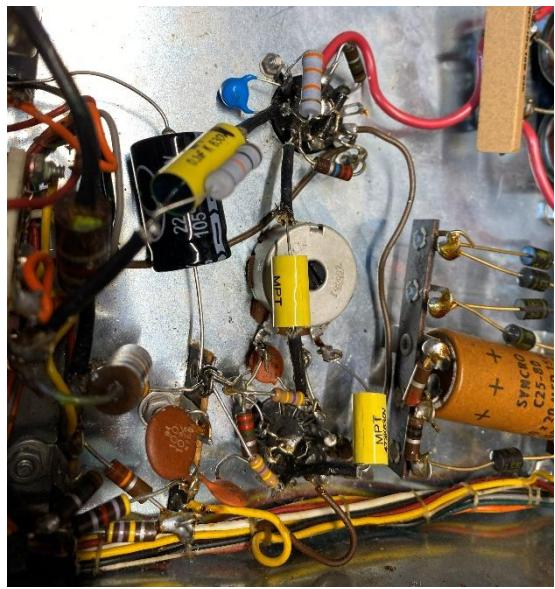
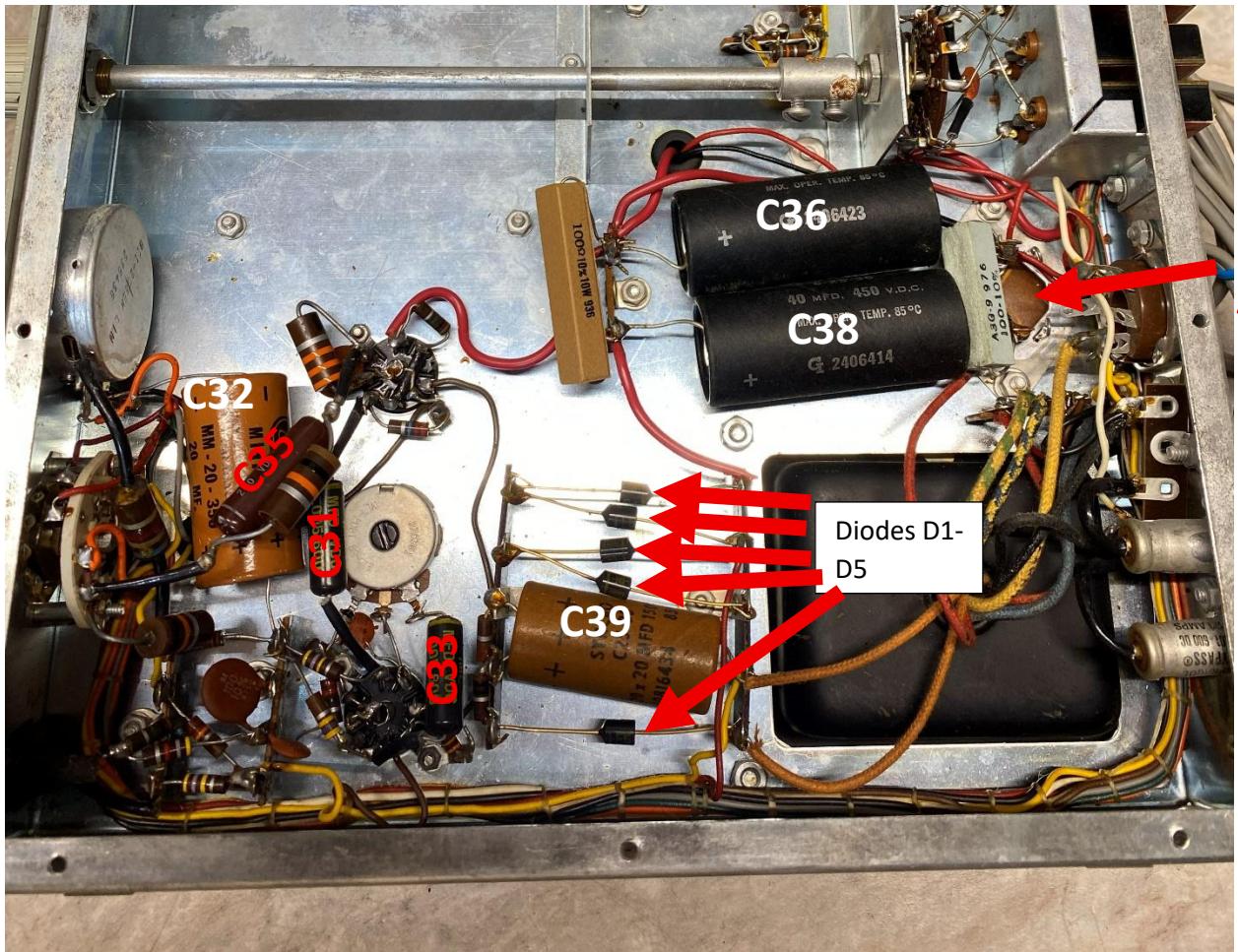
The kit focuses mostly on the power supply section of the DX60. This kit is intended for the first Version that does not have any suffix. This is not intended for DX60A or DX60B versions. They are all similar but there are a couple of capacitance values difference in the B version. The labeling will also be different. DX60 the multi section twist tab capacitor is 37A/B with 40uf each. In the DX60A and B, this is labeled as C37 and C38 separately but is still a multi-section twist tab capacitor 20uf each section.

1. Identify each capacitor location.
2. Remove each capacitor one at a time. The suggestion is to replace the components in suggested order in this guide.
3. Please see the image for identification.

IV. Replace Capacitors C32, C33, C34, C35, C39, Diodes D1-D5

1. C39 is a dual 20uf 150v Axial Electrolytic Capacitor. Replace this capacitor with the two supplied 22uf 160V axial capacitors.
2. C32 is a 20uf 350v axial capacitor. Replace with supplied 22uf 450V axial capacitor.
3. C33 and C34 are axial .05uf 600v film capacitors. Replace with supplied .047uf (.05uf are supplied when available) 630V axial film capacitors.
4. C35 is a .1uf 200v axial film capacitor that has a 10k ohm 2W resistor across it (parallel). Replace this capacitor/resistor with supplied 0.1uf axial film capacitor and 10k ohm 2w resistor.
5. Replace Diodes D1-D5. If the leads will not reach the terminal strip, you can flip the orientation of the 5 lug terminal strip(s) to make distance narrower. Or do J-hooks if that is easier for you.

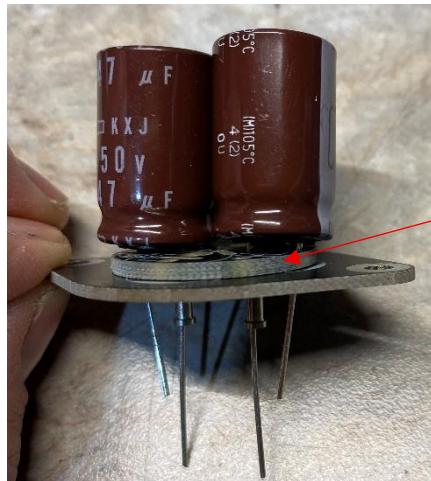
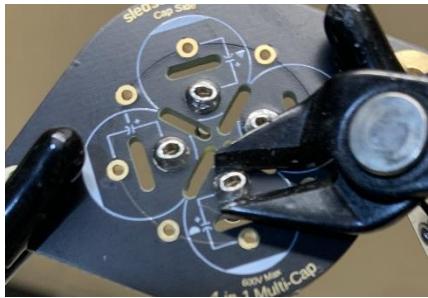
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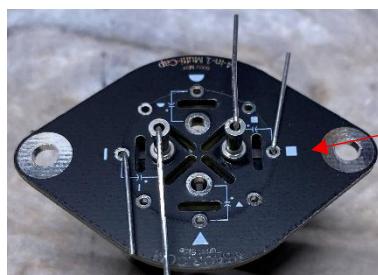
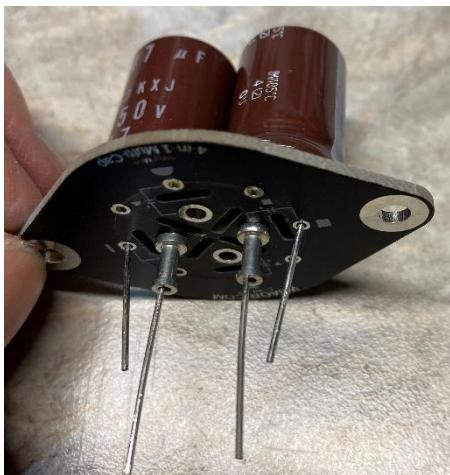
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V. Replacing Capacitors C37A/B, C36, and C38.

1. Start by building the new C37A/B capacitor with the supplied Multi-Cap PCB board, spacer, turrets and the two 47uf 450v Radial capacitors.
2. Note on the board there are 4 symbols: Square, Half Moon, Triangle and Line (Dash). These align with the original Twist Tab Multi-Section capacitor. There are four circular tinned holes near the center that line up with each symbol. These are where the turrets will install and the positive (+) leg of the radial capacitors will install.
3. From the "Turret Side" of the capacitor board, insert a solder turret into the holes by **Square** and **Line**. From the "Cap Side" of the board, use snips to slightly bend the end of the turret, just enough that it is oblong and will not fall out. DO NOT CLOSE the end of the turret. The Capacitor leg needs to go through the center.
4. Solder the turret in place on the Capacitor Side. Do not fill the center with solder.
5. Align the supplied spacer with the markings on the board from the "Cap Side". This is necessary to provide the required clearance for voltage creepage. The spacer goes between the capacitor and the board.
6. Install each 47uf 450v capacitor with the Positive leg of the capacitor going through the turret. The negative leg goes through the smaller hole next to the symbol. There are also markings on the board for where the + and – leads go. Bend the legs over to keep them in place. Solder only the negative leads and trim the excessive length. See below images.



Install spacer between caps and board



Capacitors install on Square and Line.

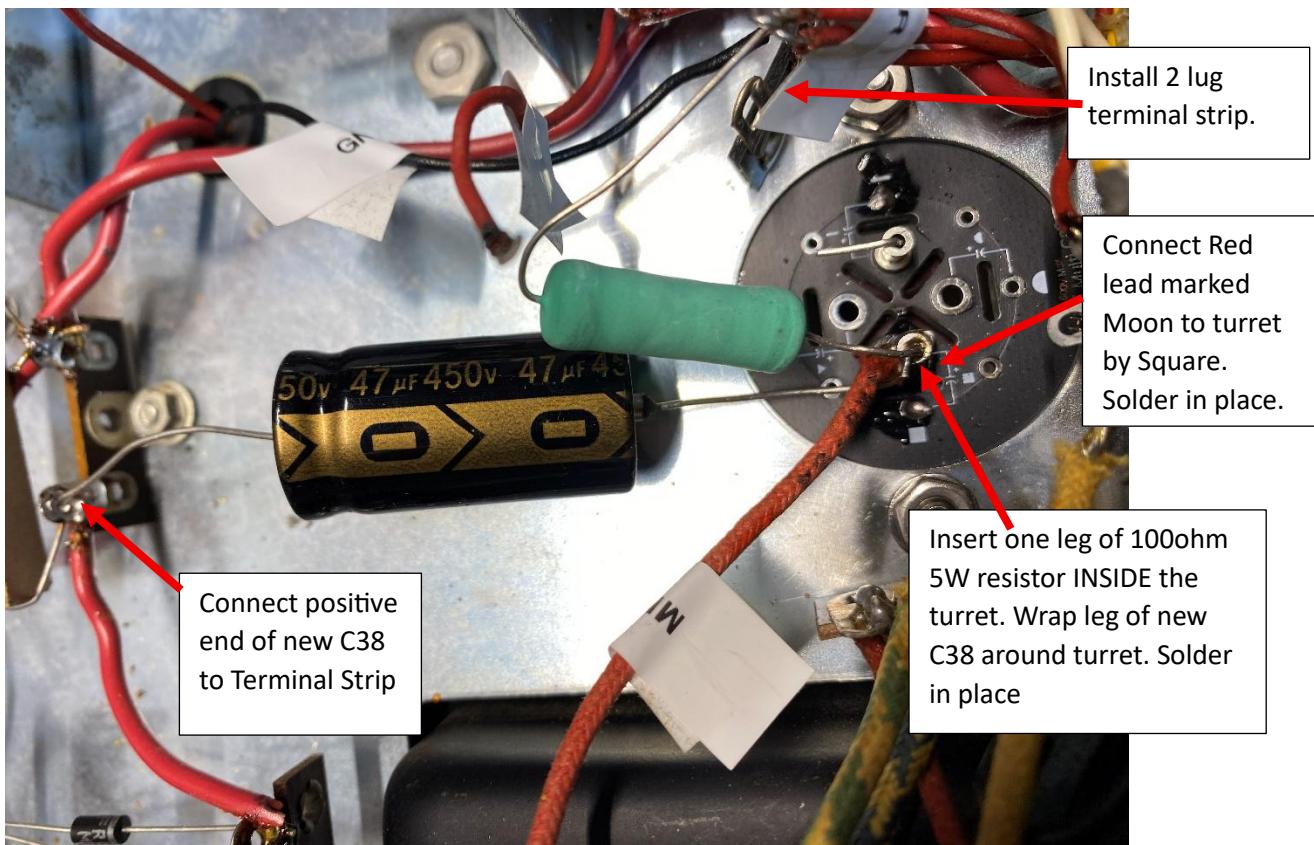
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7. Remove the 100ohm 7w resistor across the two leads of the Twist Tab Capacitor C37.
8. Lift the legs of the two 40uf 450v axial capacitors C36 and C37 from their connections at C37.
9. Note the orientation of the original twist tab capacitor. There are three markings, square, half moon and triangle. This is only a 2 section capacitor so there is not solder lug at the Square symbol. If you want to mark the chassis or take pics now is the time. The new Multi-Cap board will be installed with **Square** and **Line** orientated toward the mounting holes vs the Triangle and Half Moon like the original.
10. Mark each wire lead going to the capacitor. Painters tap or a label maker will help replacing the leads easier.
 - a. Mark and remove transformer lead from Half Moon tab.
 - b. Mark and remove the black lead going to the ground of the twist tab capacitor.
 - c. Mark and remove all 4 red leads from the Triangle mounting tab.
11. Remove the twist tab capacitor. You may need to break the tabs off the old capacitor to get it out of the mounting flange. Discard the old capacitor.
12. Remove C36 and C38.
13. Use a wire brush and clean the chassis surface around the old twist tab capacitor. Top side and underside.



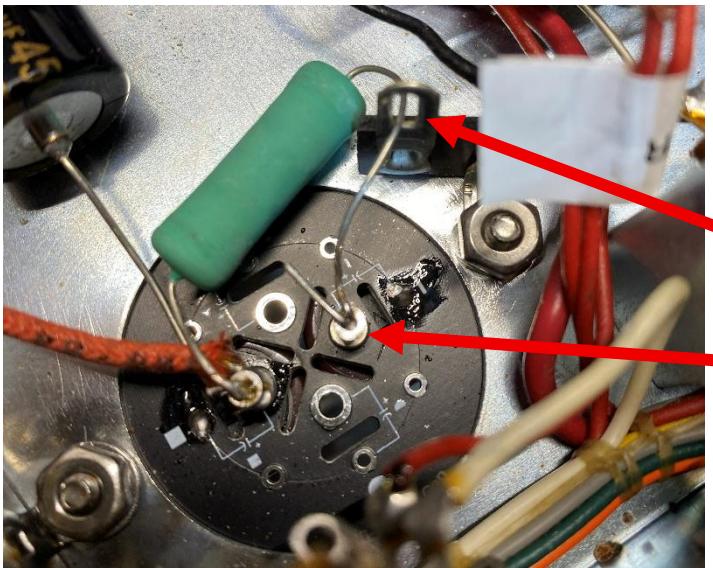
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14. Position the new C37 capacitor assembly so that it sits from the top side of the chassis. Use the supplied #6-32 hardware with a toothed washer between the board and head of the bolt. This will bite into the trace of the board which is Can Common Negative.
15. Before you flip the unit over, you may find it helpful to use painters tap to hold the board and bolts in place while you get the nuts started on other side.
16. Flip the chassis over and install tooth washer on bolt on the left side (**Square**) and install the supplied 2-lug terminal strip with bolt and tooth washer on the right side (**Line**). The terminal strip has teeth on it to bite into the chassis.
17. Check continuity from chassis to the negative terminals of the capacitors at the solder points on the board. Should be zero ohms.
18. Install supplied 100ohm 5W resistor, red transformer lead marked **Moon**, and one 47uf 450v axial electrolytic capacitor (negative lead-new C38) to the turret of the new C37 marked **Square**.
19. The positive leg of new C38 47uf 450v axial capacitor to the left side of the terminal board where the ceramic 100ohm 10w resistor is.



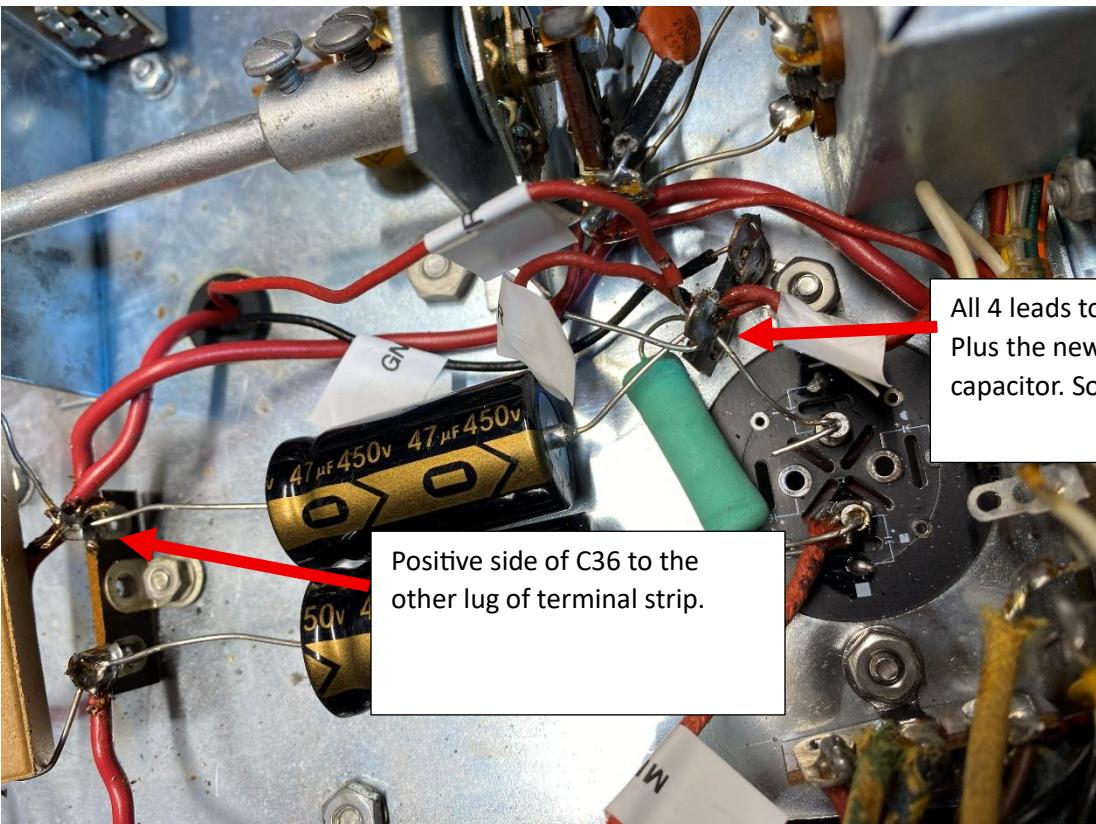
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20. Wrap the other leg of the 100ohm 5W resistor through the open lug (not the ground lug) of the added two terminal lug strip. Then bring that lead through to the turret of the Line side of the new C37 to the inside of the turret. See next image.



Loop 100ohm 5w resistor through the open terminal of added terminal strip (make sure it is NOT the one connected to ground). And insert the other end into the turret and solder. Trim excessive leads.

21. Bring all 4 Red leads marked Triangle to the solder tab of the 2 lug Terminal Strip.
 22. Bring the negative lead of the other 47uf 450v axial capacitor also to the lug of terminal strip.
 Solder in place.



All 4 leads to terminal strip.
 Plus the new C36 47uf 450v capacitor. Solder in place.

Positive side of C36 to the other lug of terminal strip.

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23. Solder the black ground lead you removed from C37 earlier to the grounded lug of the added 2 lug terminal strip.



24. This completes the installation of the rebuild kit.
 25. Double check all your connections carefully.
 26. Check all solder joints, look for cold solder joints and solder blobs.
 27. Ensure the capacitors are oriented to the correct polarization.
 28. The kit includes all the high powered resistors except the 100ohm 10W ceramic. You can replace it as needed.
 29. The kit also includes two spare T-47 bulbs.

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