

## I. Introduction.

Thank you for purchasing the Scotty's Sled Shed Component Kit for Heathkit Signal Tracers models IT-12 and T4. If you would like to download this manual, it is available at <https://w8aor.com/downloads>.

This kit was developed to reduce the frustration of trying to source replacement components that sometimes are not available from one location. Often the customer must purchase a single component from a source where the shipping costs more than the component.

The 29mm style multi-section capacitors are obsolete. I had this board developed for the sole purpose of restoring one of the most quintessential pieces of test equipment for vintage equipment: The Signal Tracer!

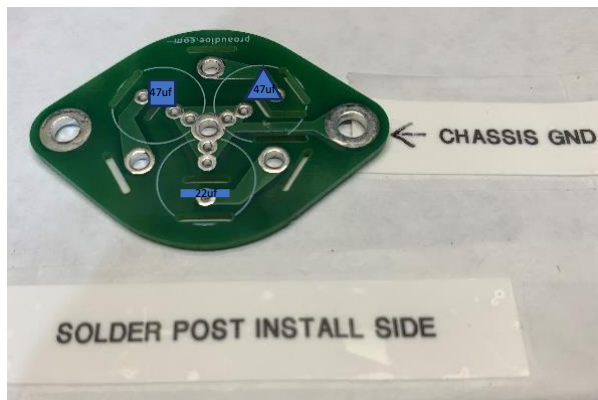
Before you get started there is a list of items to be aware of.

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. The OEM component list is 1/2watt for all resistors. There may be a mix of ½ and 1watt resistors in your kit depending on supply chain. If the price was same or less for 1 watt, then we will supply a 1watt resistor.
2. Scotty's Sled Shed LLC is only providing you with components for a DIY installation.
3. The following instructions are only a guide. Experienced users may have a preferred method of installation.
4. **CAUTION: Lethal voltages are present in these devices.** If you are not aware of that by now, you should NOT be performing this upgrade.
5. The probe will have B+ voltage present at "Noise setting". **You have been warned. DON'T TOUCH THE PROBE END WHEN THE SWITCH IS IN THE NOISE SELECTION and Probe Switch is set to AUDIO.**
6. Scotty's Sled Shed LLC is NOT liable for any damage caused to your equipment, bench, house, Power supply or that your wife is mad at you for working on this 50-year-old piece of equipment. You are ON YOUR OWN.
7. Customer assumes all responsibilities and agrees to check all resistances, capacitance, and voltages before and after installation.
8. Customer assumes all responsibility to know how to read a schematic and perform the task this kit requires.
9. Customer assumes all responsibility to SAFELY perform procedures following the Heathkit OEM manual.
10. You get the point; you are responsible for yourself.
11. Please be sure to download the manual if you do not have it. They are readily available online at: [http://www.rsp-italy.it/Electronics/Kits/\\_contents/Heathkit/Kits/Heathkit%20IT-12%20signal%20tracer.pdf](http://www.rsp-italy.it/Electronics/Kits/_contents/Heathkit/Kits/Heathkit%20IT-12%20signal%20tracer.pdf).
12. Please note you may receive a board with "sledseats.com" on it. The SledSeats URL will be phased out as supplies last and be replaced by [WWW.W8AOR.COM](http://WWW.W8AOR.COM).

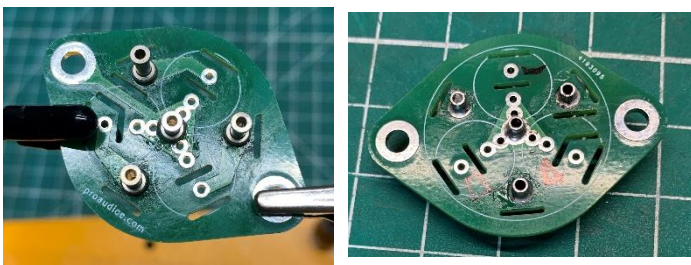
## II. Installation.

Assembly and Installation guide for the Heathkit IT-12 and T-4 multi-sectional capacitor circuit board.

1. Open the bag and check all components listed on the bag cover are included.
2. Identify the different sides of the circuit board.
  - a. The side of the board with the trace showing to the mounting lug from center (ground) is the soldering side for resistors, solder terminal posts and wires.
  - b. The other side is the capacitor mounting side.



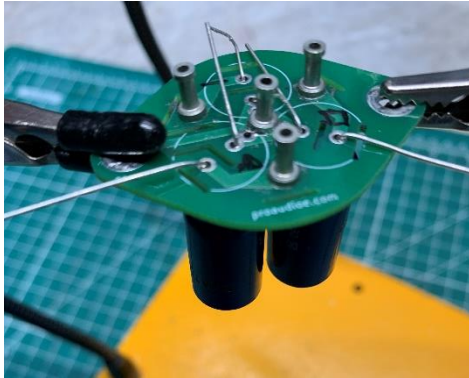
3. The new version boards are marked Square, Triangle and Line (Blank or Dash), as shown above on both sides.
  - a. Keep the orientation but just flipping over the board vertically, not horizontally.
  - b. Note the values shown above for each section of the capacitor board.
  - c. The *uf* value is for reference only, it does not need to be written in the space.
4. Install the 4 solder terminal posts in the holes (optional) as shown below on the soldering side of the board. Slightly squeeze the post on the "Cap side" to make the turret oblong, but not closed. Solder paste on both sides will help the solder flux through the board. Solder each post.



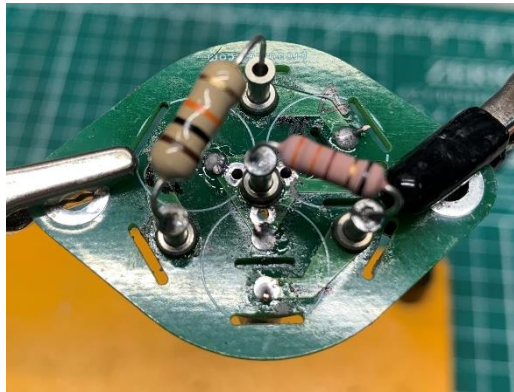
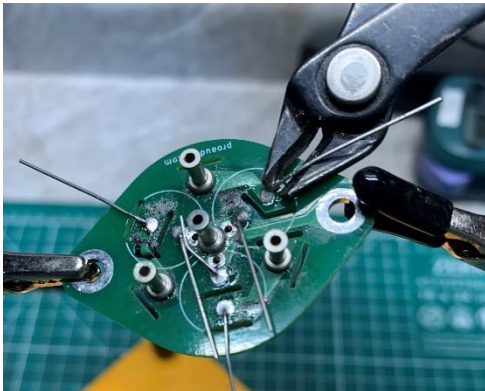
5. If using the supplied spacer board, set over the alignment marks (square triangle line) on the capacitor side of the boards.
  - a. Install each capacitor one at a time bending the legs over on the underside to prevent them from falling out.
  - b. The ground side goes toward the center pin. Positive is the outer pin.
  - c. The 47uf 250V capacitors mount on the Square and the Triangle.
  - d. The 22uF 25v capacitor mounts on the Line.

## Heathkit IT-12 and T-4 Signal Tracers

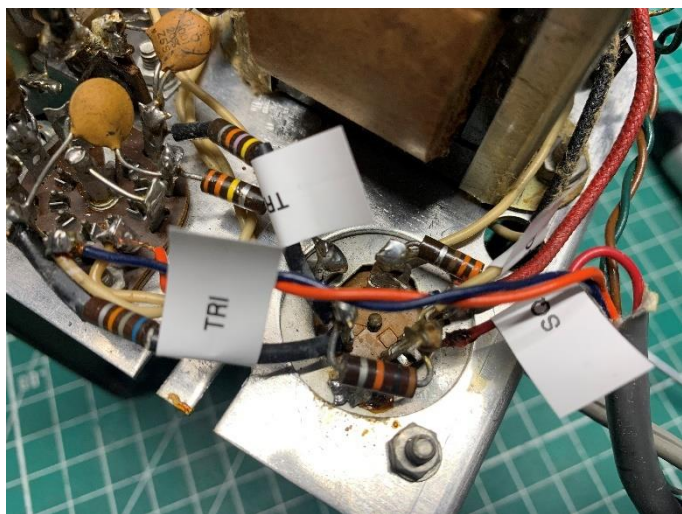
6. The spacer mounts between the capacitors and the board. The spacer is not necessary on this unit but is supplied in case you want to use it.



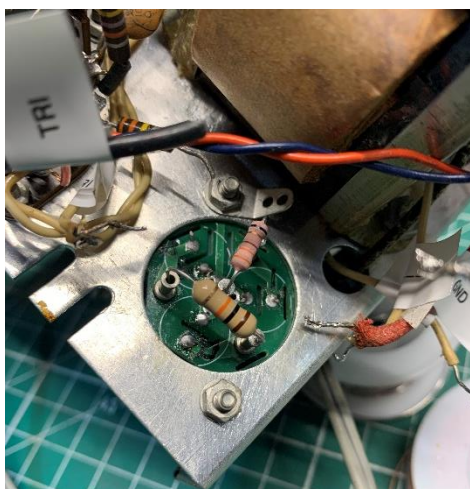
7. Trim off the leads (note if you do not want to use the soldering post turrets, you do not need to cut the capacitor legs off at this time).



8. (Optional) Install the 330 ohm resistor from the Line (---) to the center ground post and solder in place. Note if you use too much heat you can loosen the solder posts. Be sure they seat well so not to create a cold solder joint.
9. (Optional) Install the new 10k ohm resistor between the Square and the Triangle soldering posts.
  - a. You may want to only solder the Square side as there are two more resistors and a wire that need to be soldered to the Triangle post after you install the board.
10. Mark all wires and resistors of what post of the original multisector capacitor are mounting to.
  - a. Some wires or resistors may not be accessible until another wire or resistor is moved. Mark one, remove one, repeat.
  - b. For the 68K ohm and 47k ohm resistors, these can be replaced after installation. Just cutting the lead at the capacitor end is usually more efficient than trying to desolder each component.

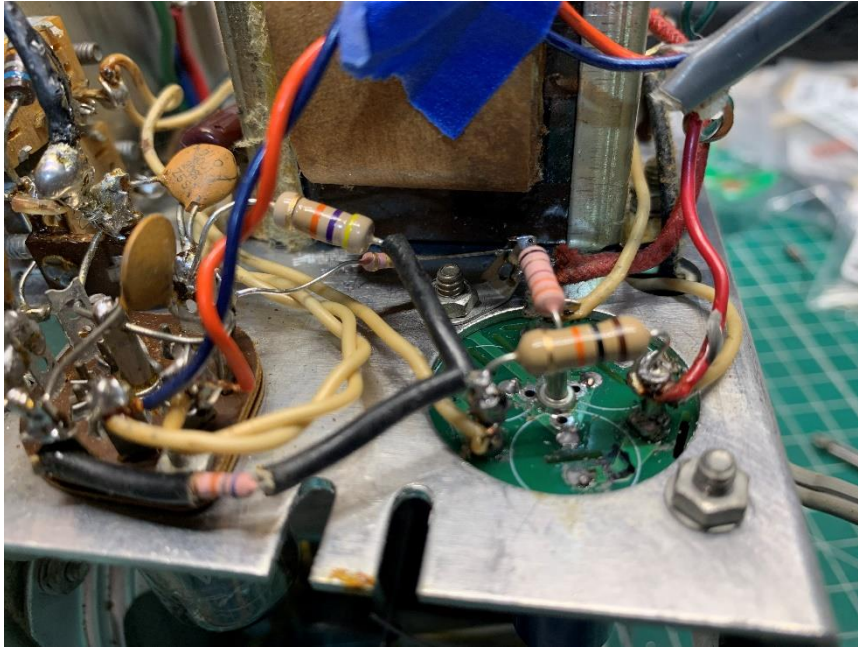


11. Remove the original capacitor. Save the bolts, locking washers and nuts. You will re-use those pieces.
12. Clean the surfaces around the mounting holes top and bottom with wire brush, sandpaper or Mr. Clean Magic Eraser works well too.
13. Install the capacitor board with the board on the top side so the capacitors and top of the board are on the same side as the Vacuum Tubes.
  - a. Loosely install the outer bolt first.
  - b. For the inner bolt, put the tooth washer on the board side and the provided #6 grounding lug on the nut side. Oriente the lug so that both the 300k ohm resistor and the ground center tap of transformer (IT-12) can reach the lug.



## Heathkit IT-12 and T-4 Signal Tracers

14. Connect the associated cables and resistors to the proper locations. I usually start with the Transformer Center Tap to Ground lead first with the 330k ohm resistor (replace with new-optional) that goes to pin 2 of V1 (12AX7).



15. Please refer to the OEM manual to complete the installation.
16. Double and triple check your connections are going to the right spot.
17. A common mistake is swapping the 330ohm resistor across C7-20uf with the 330k ohm resistor for V1 Pin 2. If you have none or very low audio gain, odds are you swapped these two resistors.
18. There are enough components here to replace every capacitor, resistor (excluding variable resistors) and diode, including the original probe.
19. Included is also a new label if the original RF $\leftrightarrow$  Audio label is damaged or missing.

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

Also like to see customer pics of final installs.

If you find an error in this document, please kindly let me know at [mysledshed@yahoo.com](mailto:mysledshed@yahoo.com)

Please be professional in your communicate.

Thank you, and good luck!

73's

Scotty

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