

I. Introduction.

Thank you for purchasing the Scotty's Sled Shed Custom Probe Modification Kit for Heathkit IT-12 and T-4 Visual/Aural Signal Tracers.

The units are identical in structure behind the faceplate.

This kit was developed to help fellow vintage electronic enthusiasts. The Heathkit Signal Tracers are a well-built unit but are often found missing the probe or the probe is beyond repair.

The original Probe had the RF demodulator circuit built into the probe. The probe switched from RF to Direct function to bypass the demodulator circuit via a switch.

Multiple online forums of building probes with pill bottles, copper tubes or other apparatus with a switch just makes for a cumbersome probe.

What this kit does is provide the customer with the components to build a set of test probes. One for Audio/Noise (direct) and one for RF (demodulator diode/capacitor). Or you can just build one probe if you want.

I also offer a complete restoration component kit that provides a replacement for every resistor, diode, and capacitor. Please email me at mysledshed@yahoo.com or visit my eBay store listing at: <https://www.ebay.com/itm/355121857506>

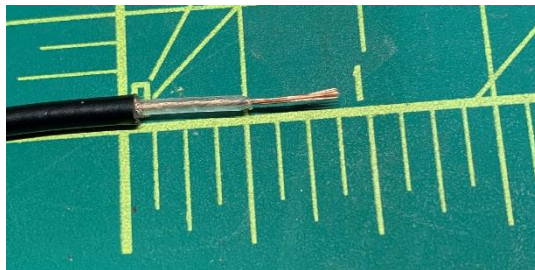
Before you get started there is a list of items to be aware of.

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. The Audio/Noise probe will have ~110VDC present at "Noise setting". **You have been warned. DON'T TOUCH THE AUDIO PROBE END when switch is in the "Noise" mode. The RF Probe will block the DC with the capacitor from reaching the probe end.**
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 Heathkit 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: <https://www.vintage-radio.info/heathkit>

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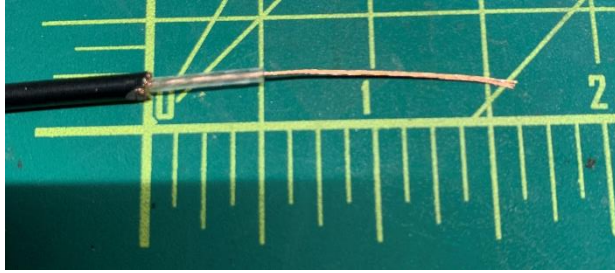
II. Preparation

1. The first thing is to prepare the probes. Use of solder paste will improve the quality of the installation and reduce dwell time with the iron.
2. OPTIONAL. Drill an 1/8" hole at the bottom of each probe. You will use these holes to hot glue probe lead, so it doesn't pull out. This is completely up to you if you want to do that.
3. Choose if you want to have a single ground lead from the microphone jack or a ground lead at each probe (recommended). The latter will require you to cut the 30" 18AWG wire into two 15" sections. Strip back one end of the ground lead and solder or crimp to the alligator clip(s).
4. Prepare one 3ft section of RG174 coax for RF Probe.
 - a. Strip back 3/4" of outer cover and cut off all the braid.
 - b. Strip back 3/8" of center dielectric. Tin center strand.
 - c. Solder the capacitor and diode in series with the RG 174 coax end. Capacitor is on the coax end. Diode can be installed anode or cathode end out, doesn't matter.
 - d. Remove the probe end nut and fish the assembly through the probe end until about 1.5" of the diode lead is sticking out.
 - e. Wrap lead around base of probe clockwise. Tighten probe end nut.



5. Next prepare the other 3ft RG-174 coax for the Audio/Noise probe. There will not be any components soldered to the end. This is a direction connection.
 - a. Strip back 1 1/2" of outer casing. Cut off all ground braid.
 - b. Strip back 1" of the center dielectric. Tin center conductors.
 - c. Insert lead into the probe, through the hole to the tip, wrap and tighten down same as with the RF Probe lead.

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6. **Single Ground lead option:** (dual ground lead- skip to step 12). Insert both RG-174 and the open end of the 18AWG (30" piece) through the male microphone jack housing.
7. Separate Ground lead option: Insert both RG-174 open lead ends through the male microphone jack housing.
8. Strip back ½" of outer casing on each RG-174, pull shield braid back.
9. Strip back 1/8" of the center conductor dielectric. Tin center strands
10. Insert center strands of both RG-174 into the center lug and solder in place.
11. Solder or crimp the outer section of the jack to the coax shielded braid (include ground lead if using single ground). Slide the plastic cover over the assembly and the outer shell and snug outer casing.



12. For separate ground leads, slide a 3/16 heat shrink tube over the open end of each RG-174 coax up to the base of the probe.'
13. Follow steps 8,9,10 above minus the 18AWG ground wire at the phone jack. Just the two RG-174 leads will connect to male phono jack.
14. Pick a comfortable spot about 2-3" below the probe and carefully strip back about ¼" of outer casing of the RG-174.
15. Strip ½" of other end of each 18AWG ground jumper (which is now 15" each).
16. Wrap 18AWG around the exposed braid of each RG-174 lead. Carefully solder. Solder paste will help solder flow and reduce dwell time. Too much dwell time will damage the dielectric and create a short.
17. Slide heat shrink tubing over the soldered joint.



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18. Optional-If you drilled the hole in the probe end, use a hot glue gun to squeeze hot glue in the hole until it starts to push out the bottom end of each probe. Allow it to cool.
19. On the probe with the diode and capacitor (RF Probe) install the RF Probe decal, and the AUDIO/NOISE decal on the other probe.
20. Slide the clear heat shrink tubing over the probe end to at least cover the decal to protect. It may take some patience to work that tubing down as it may want to stick.
21. With hair dryer or heat gun (low heat) shrink all the heat shrink tubing at probes, ground leads and alligator clips. Set assembly aside.



22. remove cover of the Signal Tracer.
23. If no probe is installed, remove the rubber grommet on the face or existing connector.
24. Remove the eye tube and its holder. This will make it easier to solder the leads to the new ¼" phono jack.
25. If probe is installed, or the coax is there, unsolder the coax to the 3 lug solder lug and remove coax. Note where the coax was installed.
26. Install the female ¼" phono jack in opening where the O-ring was on the face plate.
27. Solder in either the two 4" 18 AWG jumpers to the jack or use the 4" RG174 jumper to make the jumper to the phono jack.
28. Reinstall the Eye Tube bracket and Eye tube, and outer case of Signal Tracer.



III. Completion and tests.

1. To test functions, follow the owner's manual for the RF, Audio and Noise tests. For RF test, with the RF probe connected to an outdoor antenna center and ground, you should be able to pick up audio from an AM broadcast station.
2. To use as an audio amplifier, plug a microphone, speaker out jack (IE computer, IPOD) or electric guitar to the phone jack (do not use NOISE setting).



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 communicate.

Thank you, and good luck!

73's

Scott

W8AOR