

I. Introduction.

Thank you for purchasing the Scotty's Sled Shed Custom Probe Modification Kit for Knight Signal Tracer models 83Y135 and G-690. The units are identical in structure and only the 83Y135 manual is readily available.

This kit was developed to help fellow vintage electronic enthusiasts. The Knight 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 end twisted from RF to Direct function to bypass the demodulator circuit. This twist functioned as 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 bring the RF demodulator circuit and switch inside the Signal Tracer. I have not found a measurable difference in sensitivity as the gain on the Knight Signal tracer is more than significant to overcome the loss of a 40" coaxial lead.

The demodulator circuit is the same as the manual, we have just moved the location of the circuit which provides the use of a more practical test probe.

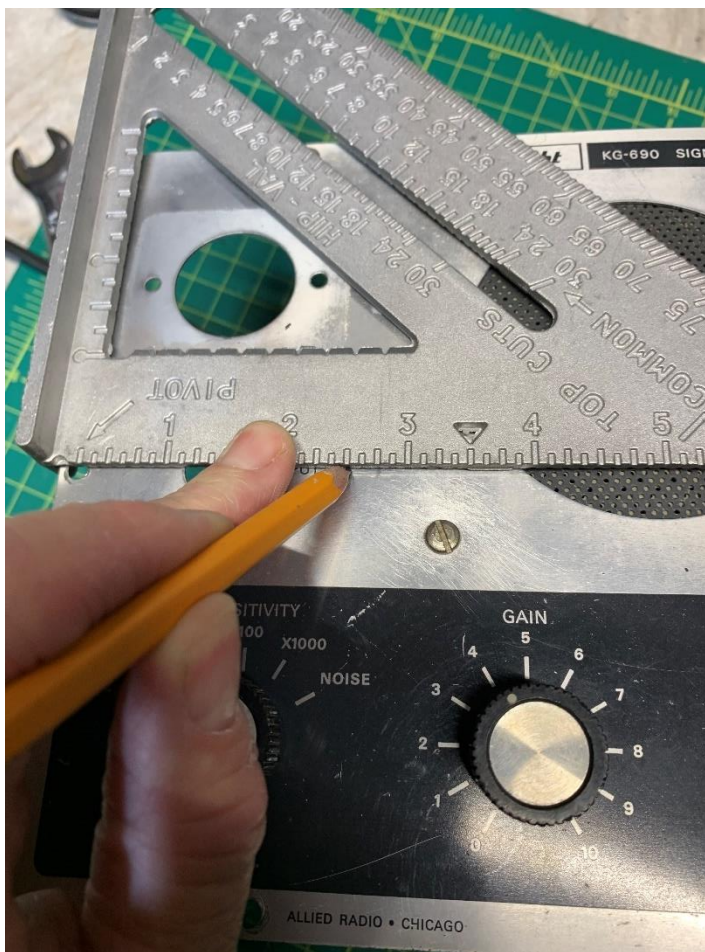
I also offer a complete restoration component kit that provides a replacement for every resistor, diode, and capacitor. Please email me at mysledshed@yahoo.com or visit my eBay store listing at: <https://www.ebay.com/itm/175892511123>

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 were taken over various kits with different capacitor values or manufacturers. Feel free to experiment with different values from 0.1uf to 33pf or even 1pf. The OEM value was 400pF which is difficult to find, so a 390pf has been included in your kit.
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 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.**
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 Knight 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://bama.edebris.com/manuals/knight/83y135>

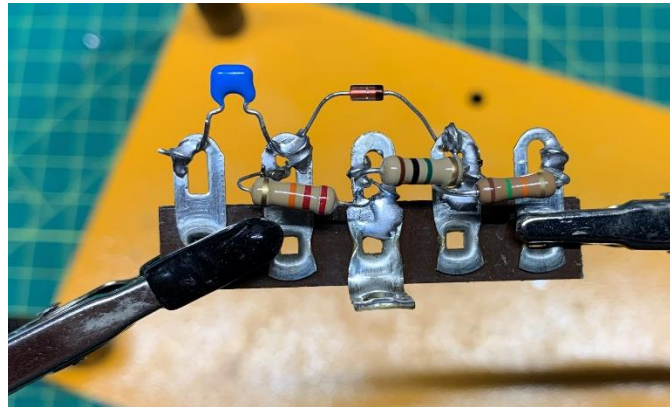
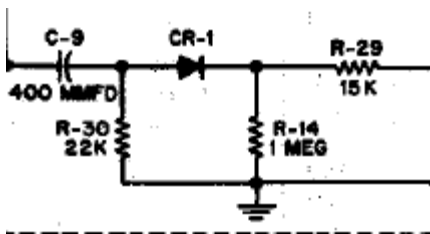
II. Preparation

1. The first thing to prepare is where you would like to install the switch. I installed the switch on the front panel adjacent to the input connector. This was a more practical location for my bench, but you may choose another location that suits you better. The next couple of steps will be a guide for front panel mount.
2. Since you will be removing the old Switch Craft microphone jack now is the time to remove that jack and line up the hole for the DPDT switch. A carpenter square will help you mark a level line across the center if you wish to center up the switch with the RF connector hole.
3. Removing the 6E5 Eye tube and bracket assembly will make your project a bit more efficient.
4. Once you find where you want to install the switch, drill a 15/64" hole. Test fit the switch fits snug in the hole and clean up any burrs, spurs, or shrapnel.



Knight 83Y135 and G-690 Signal Tracers

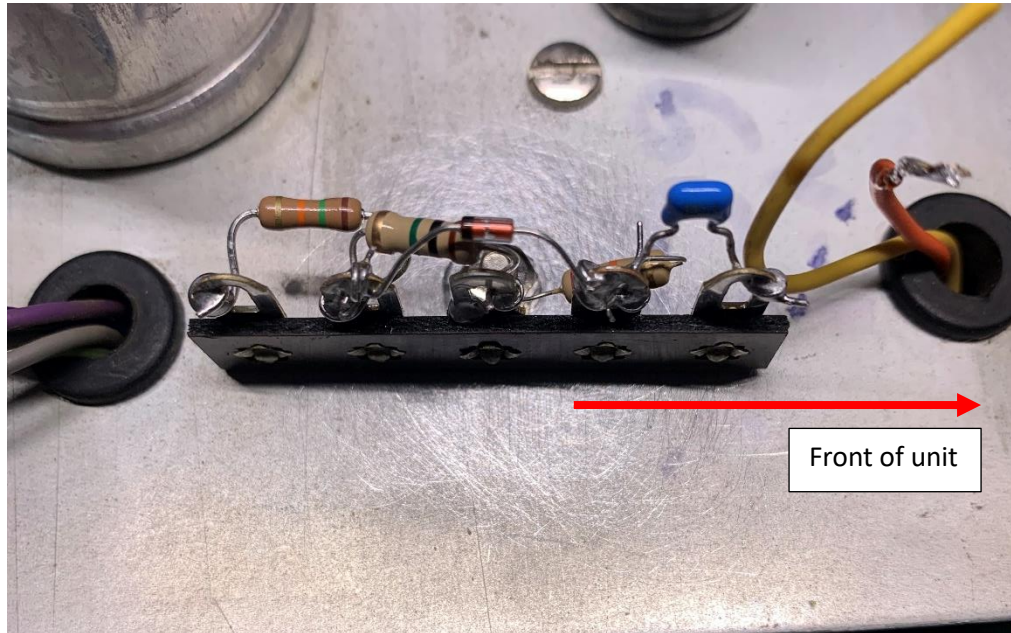
- Next prepare the circuit assembly. It may be easier to assemble in the direction shown left to right in the original schematic. With the L of the center lug facing toward you, install the assembly as shown. The Center tab will be ground. From left to right:
Capacitor Leg 1 to leg 2.
22K ohm resistor Leg 2 to leg 3(ground)
Diode Leg 2 to Leg 4 (Band end on Leg 4)
1M ohm resistor Leg 3(ground) to Leg 4
15K ohm resistor Leg 4 to Leg 5.



- Prepare the mounting area by removing the nut and bolt that holds a terminal strip below and is between the two grommets. Clean around hole with wire brush.

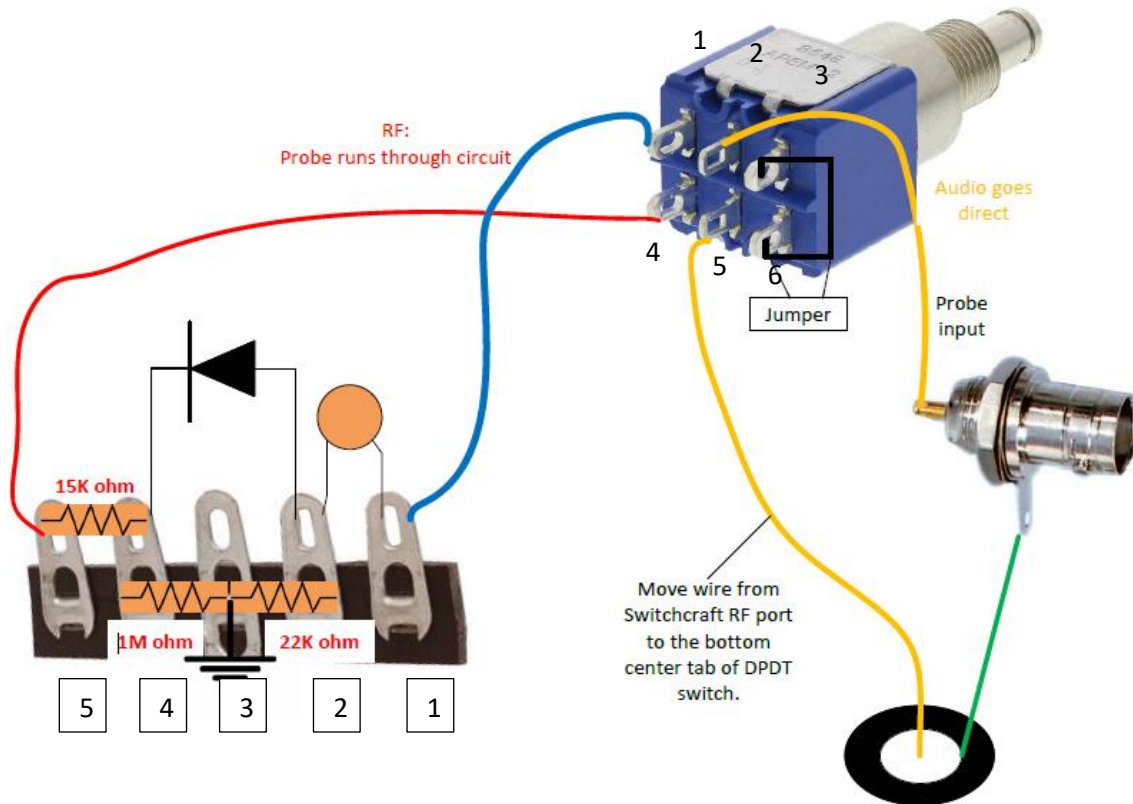


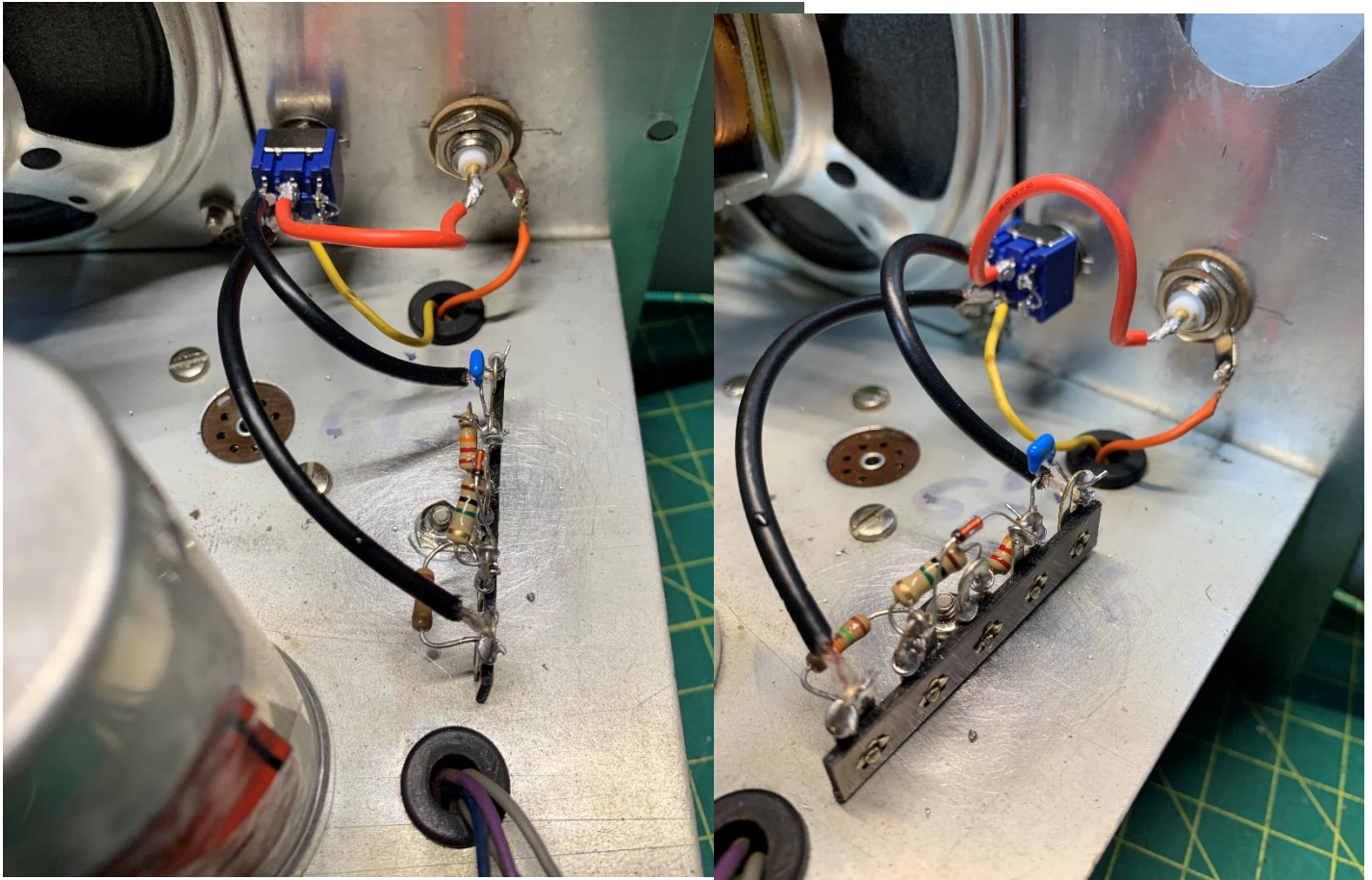
7. Turn the assembly around 180 degrees and install the assembly into the same hole you removed the nut and bolt and reinstall the nut and bolt. There is another solder lug board on the other side of chassis. The capacitor should now be facing the front face plate.



8. If you have a variable temperature iron, you will need to use lower heat to solder the connections to the DPDT switch. A 15watt iron should be sufficient. Watch your dwell time as these newer switches are not built to handle the heat like they were in the 1950's.
9. With the DPDT terminal side facing you, three slots on top, three on the bottom; solder a jumper across the two far right posts that sit above each other.
10. Install the switch into the hole you drill to mount it.
11. You will need to use the fiber washers from the original Switch Craft connector due to the side of the holes to install the BNC bulkhead connector. The shouldered fiber washer goes on the outside of the chassis. The other fiber washer on the inside.
12. Install the BNC connector. Solder the ground lead that was removed from the ground ring of the Switch Craft to the ground ring of the new BNC connector.
13. Solder the original lead that went to the center of the Switch Craft connector to the bottom center terminal of the DPDT switch.
14. The next steps will vary depending on where you mounted the switch. There is a 12" piece of 18ga flexible wire and 12" piece of RG 174 included to make jumpers with from the board to the switch and to connector. The following diagram below shows the routing. Feel free to solder the shielded braid of the coax to the center ground lug. Try to keep your jumpers as short as possible. The wiring diagram is as shown below.

- Lug 1 of board to Lug 1 of switch.
- Lug 5 of board to Lug 4 of Switch (do not jumper to lug 5 of switch. The arrow is just showing signal path).
- Lug 2 of switch to BNC center.





III. Completion and tests.

Congrats you have completed the modification. Now you will attach the probe and test your installation.

1. Attach the included label above or below your DPDT switch.
2. Attach the probe to the BNC connector.
3. Set the DPDT switch to RF.
4. Set Sensitivity to X1, Gain to 2, Speaker to ON, and turn on the unit. Allow tubes to warm up.
5. You should begin to hear the speaker hum. Touch the probe end with your finger and you should hear some buzzing. Turn the gain up slowly until you do if not at setting of 2. Increase sensitivity to X100 and it should be louder.
6. Optional- If you have a wire antenna outside (Shortwave, ham radio) you may be able to pick up the audio of a nearby AM broadcasting station. Ground of probe to shield of coax, center of probe to center of coax feeding the antenna. This is how I test my probes and signal tracers when I build them.
7. Set the DPDT switch to Audio and touch the probe, should hear buzzing. If you have a DMM or DSO nearby you can use the probe to pick up the hum or other noise.
8. Caution next step has hazardous voltage, do not touch probe end with hand.
9. Lay probe on clear surface where it cannot touch metal. Turn the Sensitivity switch to Noise.
10. Measure with DMM, VTVM, Analog VM across probe center and the ground lead for ~100-125VDC.
11. This completes the testing of the assembly. Please follow the user manual for use of Signal Tracer.
12. Have fun!!

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

