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EL-34
Installation Guide

VFO Stabilizer for DRAKE TR-4 Transceiver

Required Reference Manual - ELcon FLL VFO-Stabilizer

Figure 1 – DRAKE TR-4 after Modifications

Installation description

Version 1.0a
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Important! Hints or tips for the correct function of the EL-34.

Watch it! Absolutely observe.

1 Introductory remarks

The Drake TR4 is a 5 band, 19 tube transceiver available factory wired in 1964 for $699. The TR-4C was introduced in 1973 and was similar to the TR-4 except that the dial was updated to make it easier to read. I bought my TR-4 for $15 as it had been stripped of many parts. It was in a brown paper bag, so I now call it the brown paper bag radio. I restored it and it's one of my favorite radios.

I measured my TR-4 PTO drift at about 500 Hz and also a TR-4C at about 400 Hz. Drake used a PTO like the Collins S line instead of a VFO. The Permeability Tuned Oscillator (PTO), where the frequency is set by varying an inductor rather than the traditional variable capacitor VFO. The inductance in these VFOs is usually changed by rotating a ferrite or brass core in the center of the inductor's former.

With the EL-34 installed, the PTO drift is only a few Hz. from cold to on for an hour.

Here are some features of the EL-34.

Available on line at https://shop.elcon.ch/yaesu/universeller-fll-vfo-stabilisierer.htm

I used PayPal to complete my purchase.

All high-quality parts provided included programmed 14 pin PIC microprocessor.

Easy to build thru hole PCB, with plated thru holes and silk screen.

Excellent manual in English.

Easy to install in radio.

Excellent factory support.

This document describes how to install the EL-34 in a DRAKE TR-4 Transceiver. The EL-34 has two connectors required for installation.

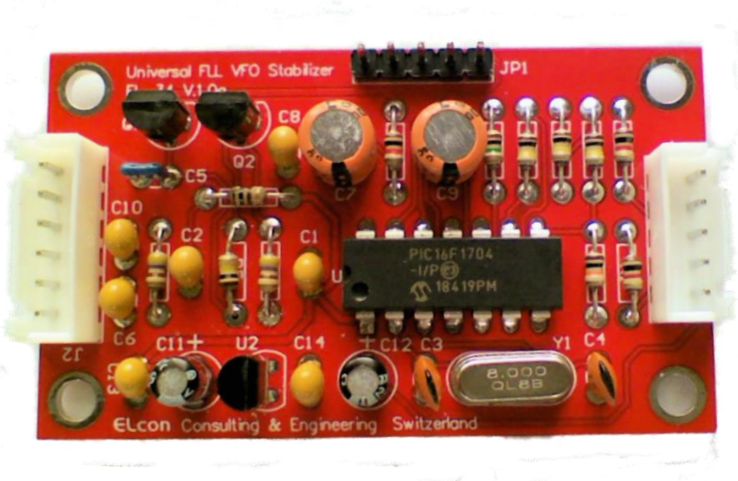


Figure 1 FLL-VFO Stabilizer EL-34

2 Installation Summary

2.1 PTO Connection:

Figure 2 show the under-chassis PTO connection using a 0.001 Uf ceramic disc from the EL-34 VFO input to the junction of C195 and J2 pin 6 of the TR-4.

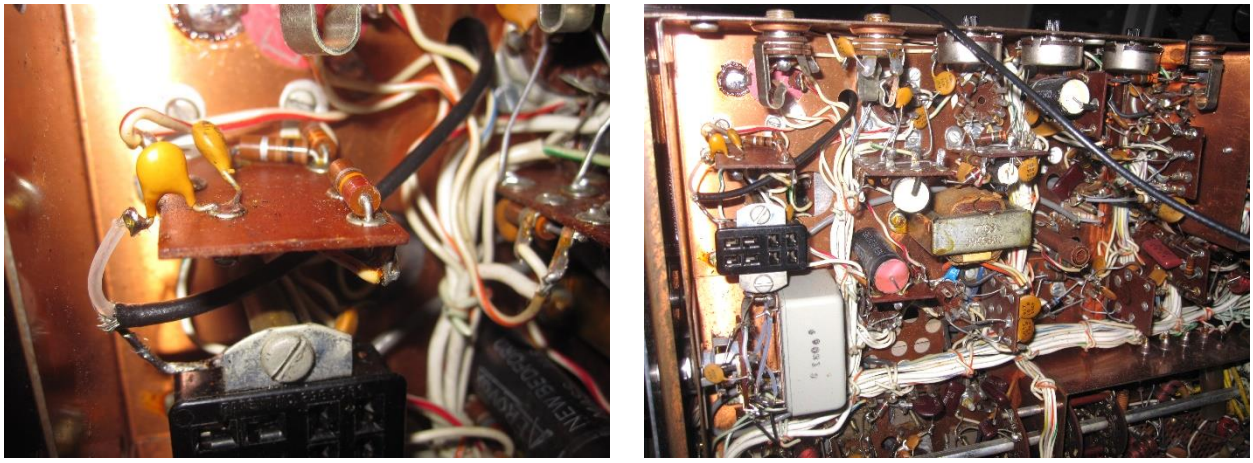


Figure 2 VFO-Connection

It is not necessary to remove the PTO to make this modification. Figure 3 shows one of the 2 tabs that are pressed to remove the PTO cover. Before removing the cover, disconnect the side of the spring that goes to the hole in the PTO can. With both tabs squeezed, the can can be slid backwards.

Figure 3 tabs

Figure 4 shows the connector used to connect the parts shown in the schematic. Ground is on the PCB just below this connector. I used a piece of #24 Teflon wire to connect the 100K resistor to the EL-34. The can can now be replaced, making sure the tabs snap in to secure the can. Replace the end of the spring in the PTO can.

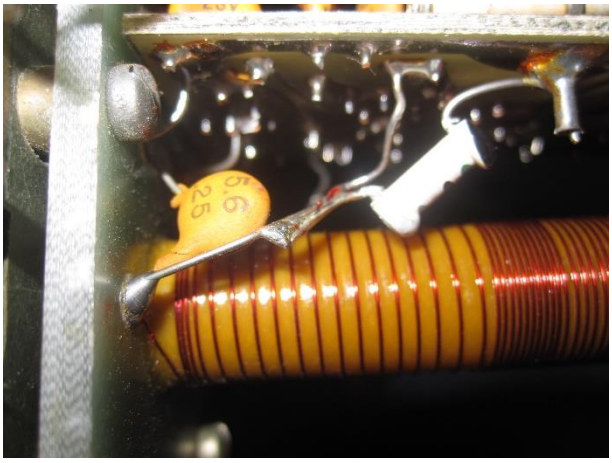


Figure 4 PTO-Connector

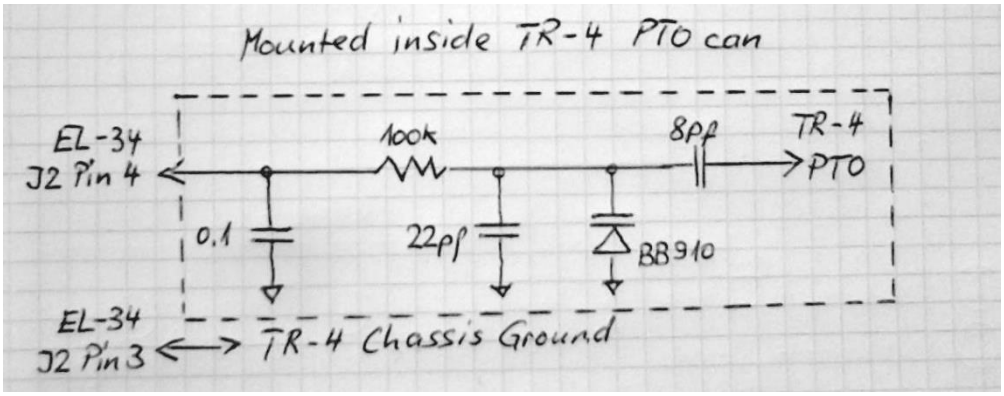


Figure 5 Tuning circuit with varactor diode

2.2 Mounting the EL-34:

I used ¼" 4-40 holes under the spacers used to mount the EL-34 to the Vector board power supply to attach to a sheet metal shield mounted under the power supply. Figure 6 shows the box on top of the chassis that I used to mount the EL-34.

Figure 6 box on top of the chassis

2.3 Power Supply

The EL-34 has an on board 5-volt regulator. Power to this regulator is obtained by a half wave rectifier and a 1000uF capacitor obtained from the TR-4 12.6 VAC used in the tube filaments. This provided 16 volts DC for the EL-34.

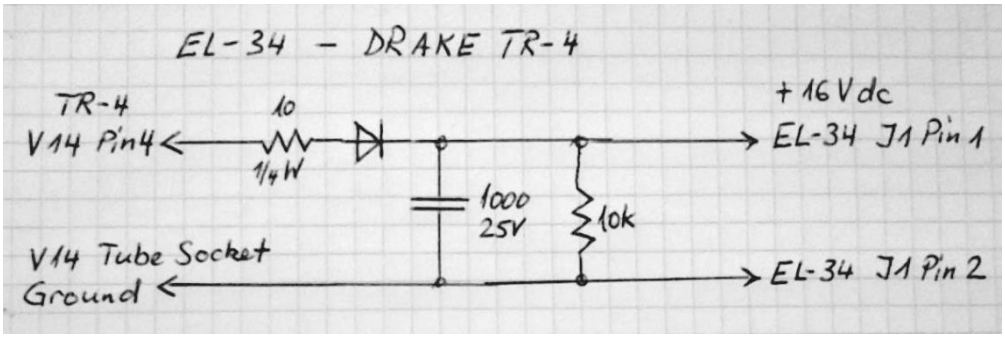


Figure 7 Power Supply for EL-34

I used a piece of double-sided foam tape between the can and the metal shield. It fits perfectly and doesn't touch the 2 shafts on the sides. Figure 8 shows the EL34 mounted on the can.

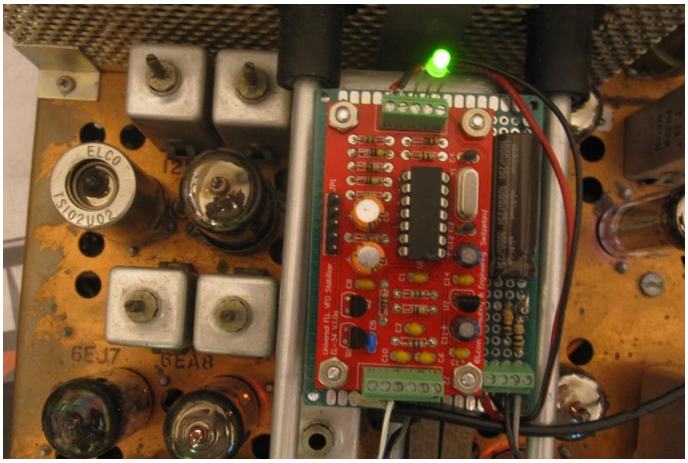


Figure 8 Power Supply and EL-34 in place

I bent the wires of the Bi LED so that I can see it through the top cover of the TR-4.

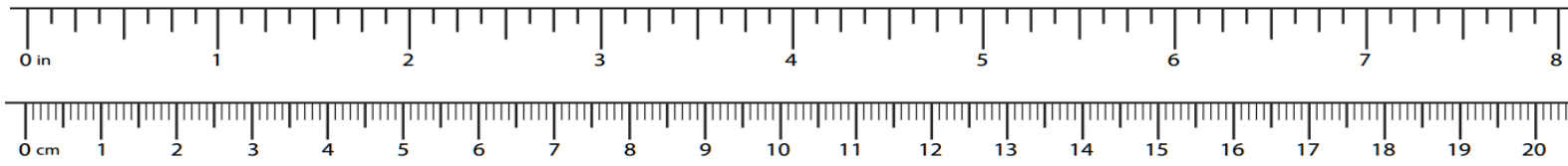
The dial needs to be recalibrated. This is easy to do. There is a lever that can be used to move the PTO disc so that it is in the correct position to show the displayed frequency.

I removed one of the 6-32 screws holding the TR-4 tuning can in place and placed a #6 ground lug under the screw before replacing it. I soldered a short wire from the ground lug to the EL-34 J2 pin 1 ground.

If you have questions or comments, I can be reached at blessed_duck@yahoo.com

3 Appendix

3.1 Ruler



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