ELcon Consulting & Engineering

Brunnhaldenstrasse 8
3510 Konolfingen
Switzerland

Telefon +41 (0) 31 792 04 61
Fax +41 (0) 31 792 04 62
E-Mail info@elcon.ch
Shop http://shop.elcon.ch

EL-34
Installation Guide

VFO Stabilizer for DRAKE TR-7 Transceiver

Required Reference Manual - ELcon FLL VFO-Stabilizer

Figure 1 – DRAKE TR-7 after Modifications

Installation description

Version 1.0a

tested and written by Marinos Markomanolakis, SV9DRU / KI4GIN

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

Watch it! Absolutely observe.

1 Introductory remarks

The TR-7 remains one of the top choices of classic radio which offers extremely clean Rx performance, robust construction and no infestation by the all too usual nowadays DSP sound “enhancement” gimmicks which manufacturers are using to lure new customers into buying new rigs.

Having an analog PTO gives the TR-7 a low phase noise frequency generating ability, but also its inherent, temperature depended frequency drift. This seems to stabilize quite a bit after 1 hour of operation and can be reduced by installing the optional fan, but cannot be totally eliminated.

The ELcon EL-34 stabilizer kit is offered at a very reasonable price and has several refinements over the original Huff-Puff stabilizer as well as other similar circuits that can be found on the internet. Following a few simple steps, it can be integrated in the TR-7 and provide rock solid frequency stability from a cold start!!

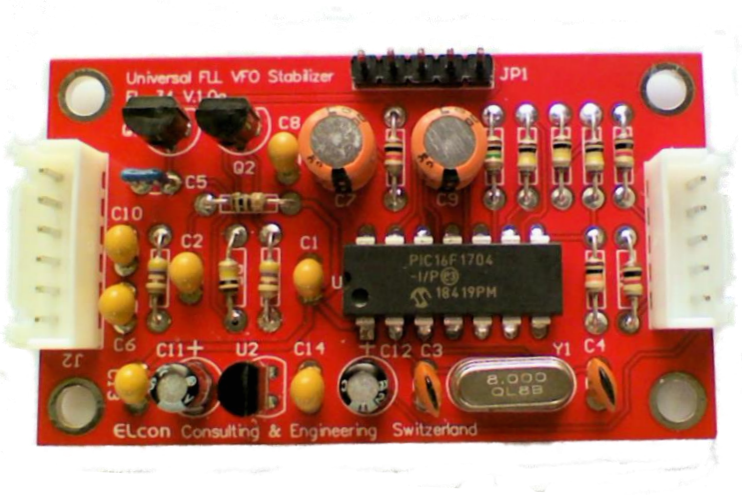


Figure 1 FLL-VFO Stabilizer EL-34

2 Installation

2.1 First step: Where and how to install the EL-34 in the TR-7

As luck would have it, 2 of the 4 corner holes in the kit’s PCB align almost perfectly with 2 of the supporting screws in the back left corner of the TR-7’s underside. (Figure 2).

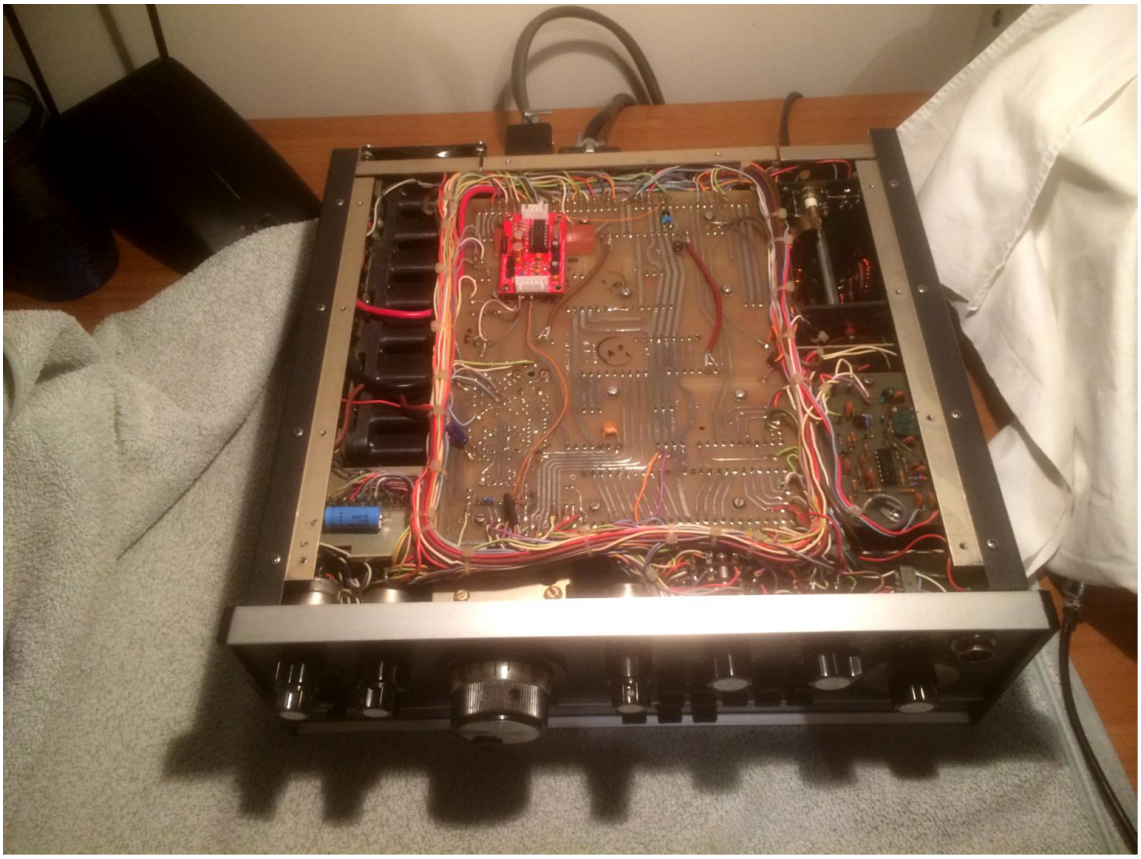


Figure 2 EL-34 mounted on the underside of the TR-7

Figure 3 Small pole terminals

Electrical wire small binding posts were obtained from a local electronics store. After removing their plastic insulation, I bent them 90 Deg (Figure 3) Their cylindrical ends fit snugly into the PCB mounting holes. After installing them on the Tr-7 with the original hardware, I fitted the EL-34 on them, using a spacer to keep a safe distance between the under-surface of the motherboard and that of the stabilizer, and soldered them.

The EL-34 mounting holes are grounded and through plated which makes for a very secure and mechanically stable connection. (Figure 4)

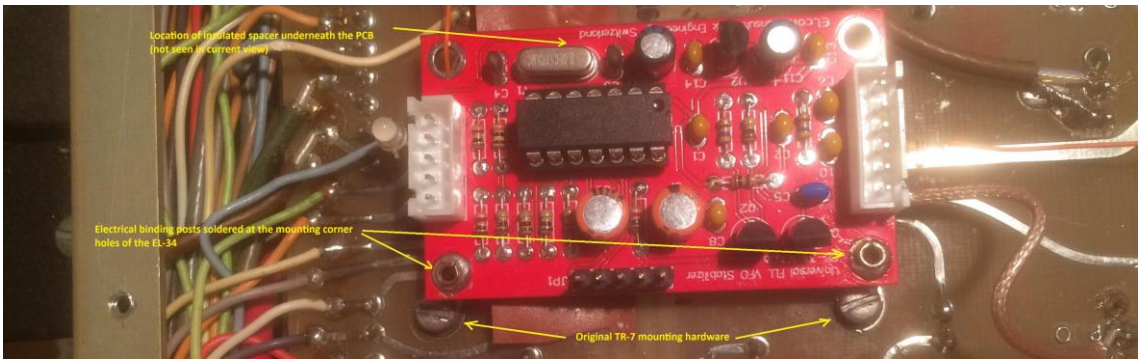


Figure 4 Mounting the circuit board

The stabilizer PCB is rather small size and supporting it by its 2 side holes with a plastic spacer mounted at the midpoint of the PCB, gives perfect stability and obviates the need for a 3rd support structure at the opposite end.

2.2 Step #2: How to interface the EL-34 to the TR-7 circuit

Since this stabilizer includes its own reference crystal, the only connections that need to be made to the TR-7 are the PTO sampling frequency (RF input), the power supply (+10 V) and the correcting voltage to the already existent RIT circuit built in the TR-7 (DC output). This makes for an easy and straight forward step #2.

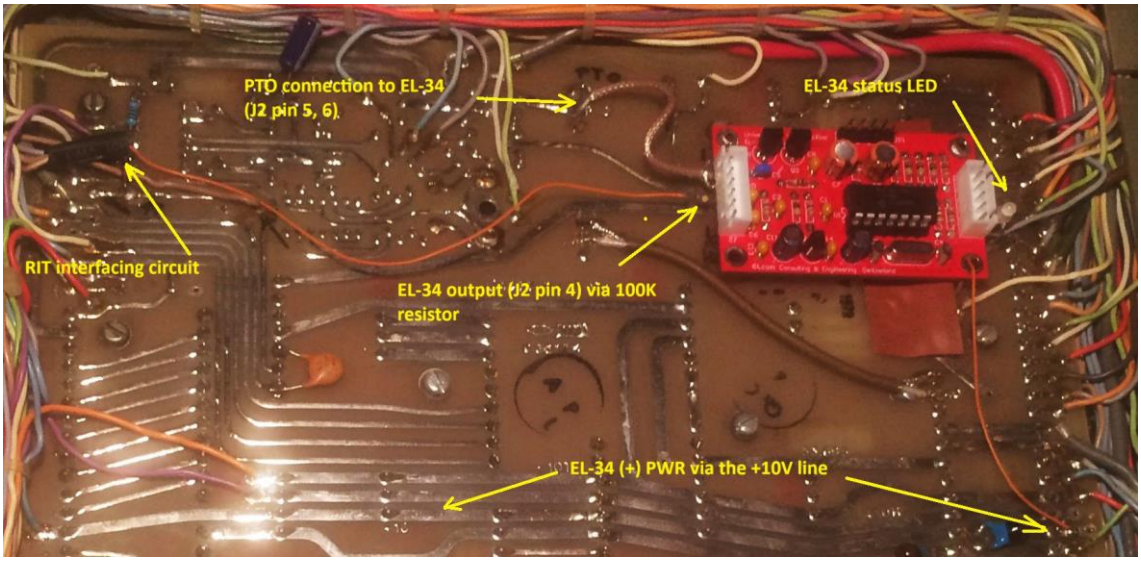


Figure 5 Installation overview

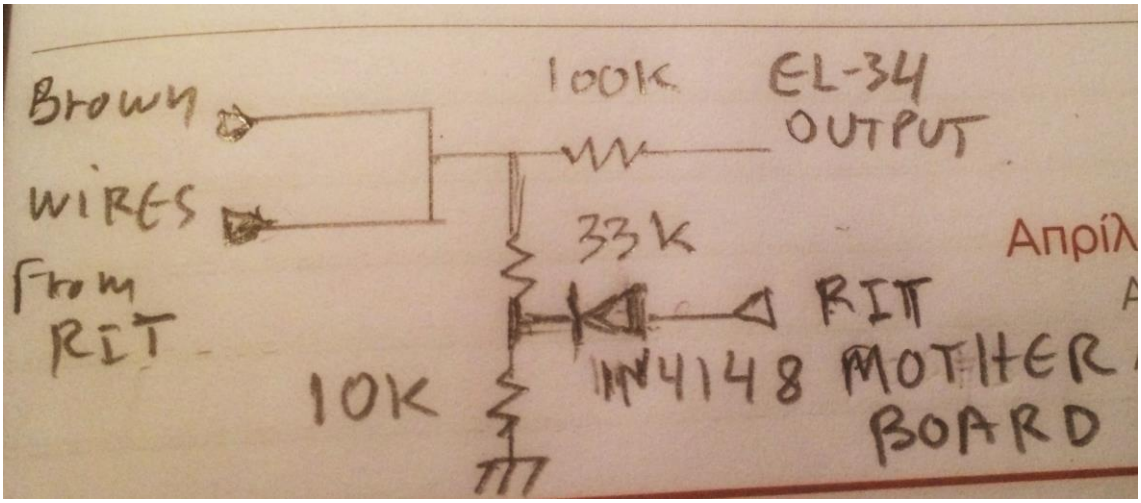


Figure 6 Interface connections schematic

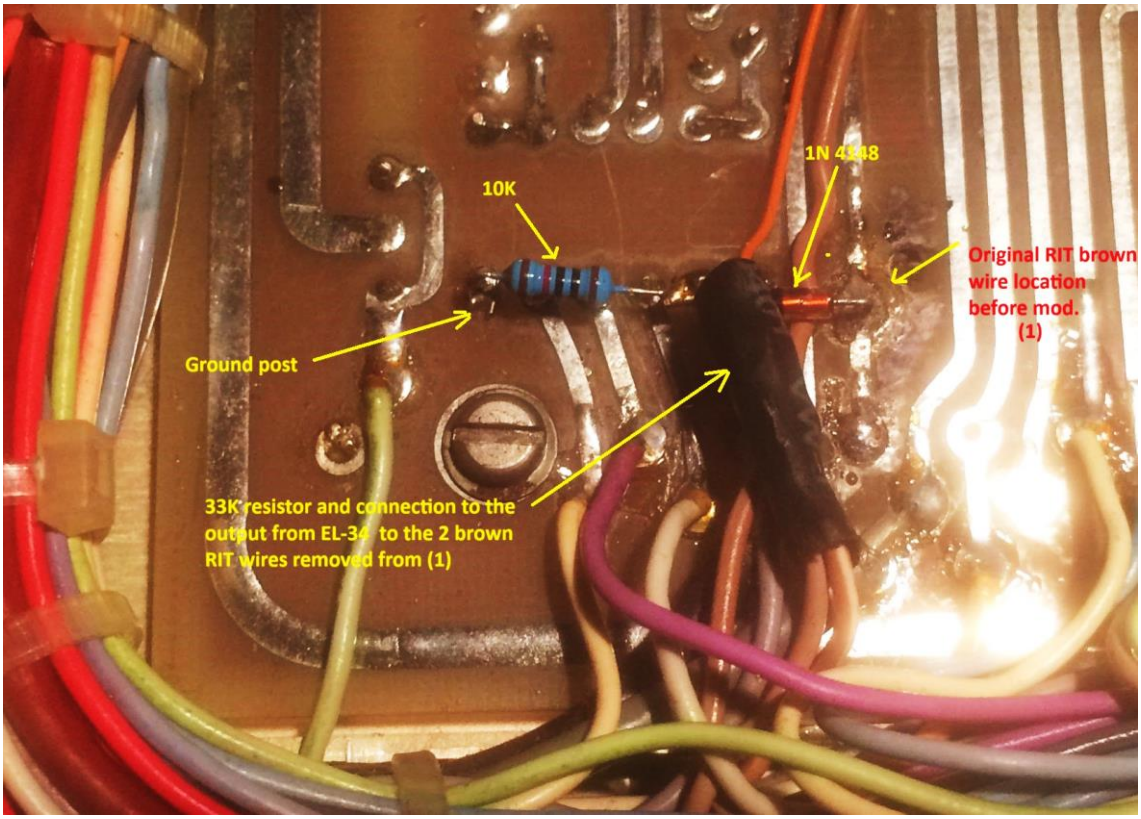


Figure 7 RIT connection

The PTO connection is via a small caliber 50 Ohm coaxial cable RG-316 from the posts with the PTO sign of the motherboard to the RF in of the EL-34. The +10V power supply comes from the respective motherboard PCB assembly of the TR-7.

You essentially are going to desolder the 2 RIT cables (brown wires) from the motherboard and connect them to the EL-34 DC output voltage via a simple resistor and diode circuit as seen in the following schematic and Figure 6. This circuit has already been used by Urs HB9ABO[1] in order to achieve a better frequency stability with the TR-7.

[1] HR Magazine, August 1987 "better frequency stability for the Drake TR7"

For simplicity, I elected to put the status indicator LED of the EL-34 besides its J1 connector. It could also be installed at the front panel in place of the “FIXED” indicator as described in my original x-lock installation article.

⚠ All connections of the EL-34 were soldered underneath the PCB, avoiding to use the J1, J2 female connectors provided with the kit, in order to save on the total height of the installation.

Figure 8 insulating metal undercover

1 strip of insulating tape was installed underneath of the EL-34 PCB and masking tape at the area of the metal undercover overlying the EL-34, (though not necessary since there is enough clearance). (Figure 8).

Finally, while the default delay time for the EL-34 to “grab” and stabilize the PTO once any movement of the tuning knob has stopped is 2 seconds, I found it more convenient to increase it to 5 seconds, using the process described in its manual. I like to try and bring the incoming station as close to its correct frequency as possible by small precise fine-tuning movements of the PTO knob, which may take longer than 2 seconds.

The final result is excellent. Crystal – like frequency stability form a cold start, regardless of the fan action in the rig. Both the construction of the EL-34 kit and its installation went together perfectly, and the project worked on the first try!

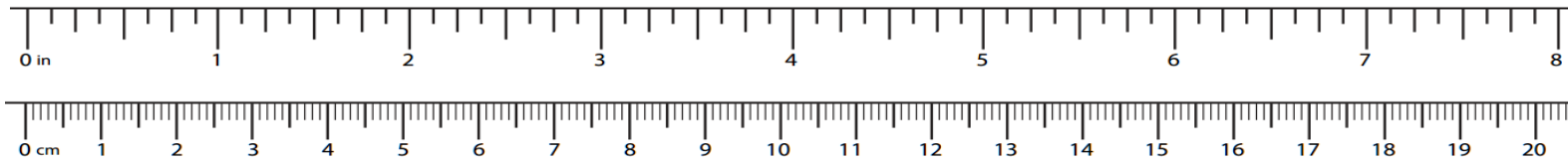
I do believe the EL-34 is a perfect addition to any analog VFO rig, including the legendary TR-7, which seems to be very “happy” with it.

Any comments or questions are welcomed marinosmm707@gmail.com

73 to all,
Marinos sv9dru / ki4gin

3 Appendix

3.1 Ruler



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