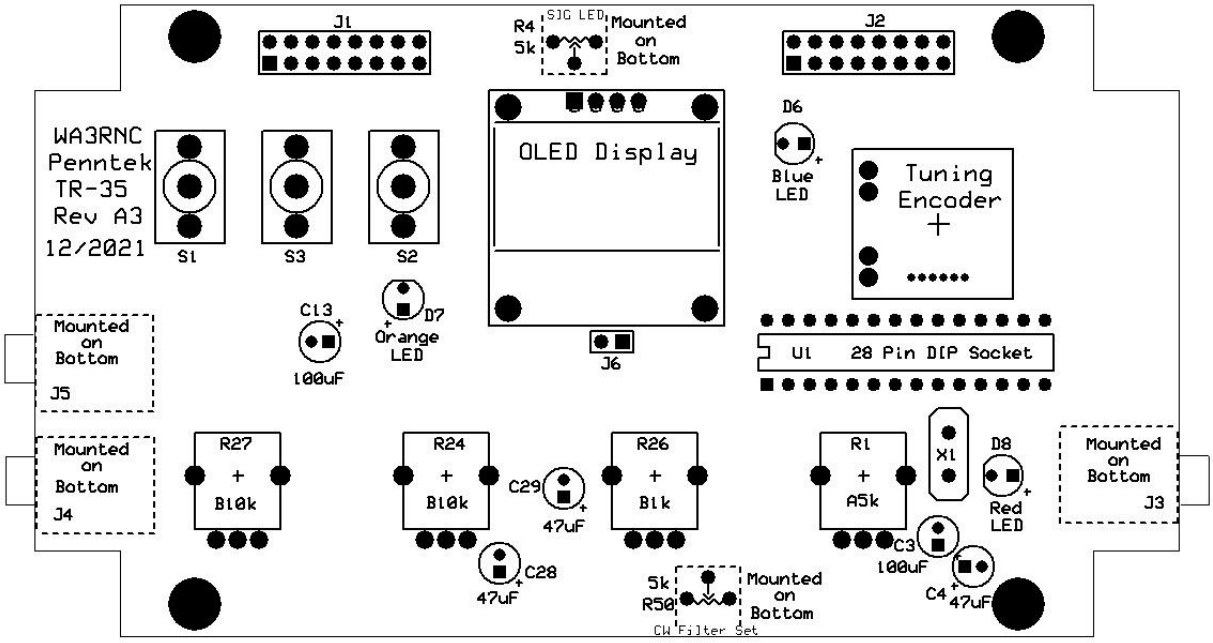
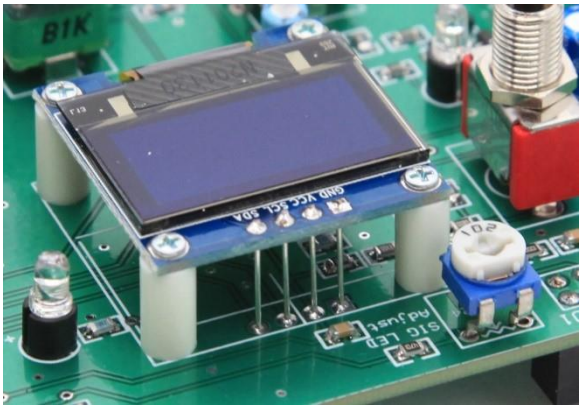
TR-35 Upper Board Assembly Instructions optical encoder 7/5/23



TR-35 Upper Board User Installed Parts

Refer to the above placement diagram while performing the following steps

1) Install and solder X1, 16MHz crystal. Make certain that the crystal is NOT down tight against the PC board. It should be about 1/32 to 1/16 inch above the board surface. Solder and trim 2 leads.
2) Install and solder the 28-pin socket for U1 tight against the board. The notch must be toward the center of the board. Verify that orientation is correct, and that all 28 pins are through the board before soldering. Solder and trim 28 pins. (Untrimmed pins might touch toroids on lower board.)
3) Install the OLED display using the provided white plastic spacers and 4 each miniature screws and nuts. The nuts go on the bottom of the board. Take your time with this, and be very careful not to lose your nuts (always good advice). Do not overtighten this hardware. Once the display is mounted, install 4 wires cut from two included sacrificial resistors, from the display connection points to the PC board. See the photo. Make certain that the wires do not short together. The resistors can be discarded. Solder and trim 8 connections, 4 on the display, and 4 on the PC board. **Important**: Place

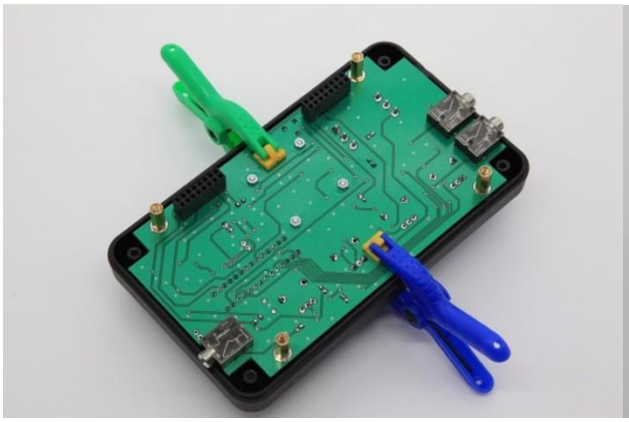


some clear fingernail polish on the screws and nuts on the bottom of the board so that they don't come loose and find trouble later. This has occurred several times on prototype units.
The photo shows a TR-25, but TR-35 display mounts the same way.

4) Install and solder R4, 5k signal LED sensitivity, and R50, 5k AF filter trimmer pots <u>on the underside of the board</u>. Solder 6 leads on the board top side.
5) Install and solder D6, the blue Signal Quality LED, mounted on a plastic spacer. The longer lead connects to the square hole. Make sure the LED is straight and tight against the board. Solder and trim 2 leads.
6) Install and solder D7, the orange RIT warning LED, using the same procedure as for D6. The longer lead goes to the square hole. Solder and trim 2 leads.
7) Install and solder D8, the red low battery warning LED, using the same procedure as for D6 and D7 above. The longer lead goes to the square hole. Solder and trim 2 leads.
8) Install and solder (2) electrolytic capacitors C3 and C13, 100uF, tight against the board. The longer lead (+) goes to the square hole. Solder and trim 4 leads.
9) Install and solder (3) electrolytic capacitors C4, C28, and C29, 47uF, tight against the board with the longer lead to the square hole. Solder and trim 6 leads.
10) Install and solder jacks J3, J4, and J5 <u>TIGHT AGAINST THE BOTTOM</u> of the PC board. Straighten any bent pins before installing. Solder 15 pins.
11) On each of the toggle switches S1, S2, and S3, install a single nut (used as a spacer) onto the bushing. Tighten the nuts for a snug fit. Save the 3 remaining nuts for later. Set the switches aside for now.
12) The 4 potentiometers (R1, R24, R26 and R27) are fitted with a nut and a washer (used as spacers) on the bushings. Tighten the nuts if

necessary. Set the potentiometers aside with the switches previously prepared with nuts.

13) In this step, the tuning encoder, switches, and potentiometers will be soldered to the PC board using the top case half as an alignment fixture. Take your time with this effort. It is important for a good fit within the housing. Do not solder any of these components until instructed to do so. To start, position the PC board with the display side up and with the jacks closest to you. Place the on-off toggle switch S1 onto the board with the slot in the bushing toward the board center. Place the 2 remaining 3-position spring return switches in the S2 and S3 positions with the slot in the bushings to the center of the board. Do not solder the switches yet. The pots will now be placed. Pot R1 (volume control) must read “A5K” or “A10K” on the rear side of the part (either one will work fine). R26 (RF Gain Control) must read “A1K” or “B1K”, R24 (TX Power Control) and R27 (Keyer Speed Control) must read “B10K”. Please check this carefully as these parts are difficult to remove if you make a mistake! Straighten any bent pins. Install the potentiometers into the board but do not solder yet. The precision optical tuning encoder is supplied with a plastic spacer and a nut. Remove the nut. <u>The spacer must remain on the encoder shaft</u>. Carefully place the 6 encoder pins into matching holes in the PC board to the right of the display (do not solder yet). Now carefully fit the top case half down over the switches and control shafts. You might need to gently nudge some of the controls, tuning encoder and switch bushings to allow the top inside of the case half to make contact with the 12mm spacers and/or the switch and potentiometer nuts. Once contact is made, clamp the board to the top case half with small plastic clamps as shown in the photos. The small clamps in the photos came from Harbor Freight (6 pieces for 2 bucks). Anything similar should work. You might be able to improvise by using rubber bands and an additional object to keep pressure on the backside of the PC board. The idea is to maintain pressure of the board components against the inside of the top case half while soldering the switches, encoder, and the controls.



These photos depict a TR-25, but the concept is the same with the TR-35. (Do this if you don't have suitable clamps)

Attach the switches temporarily to the panel with their three remaining nuts and snug them up. Be careful not to scratch the panel. Attach the tuning encoder to the panel with the nut that was previously removed as well. The nut must pull the encoder spacer tight against the inside of the front panel but be careful not to overtighten it. Carefully turn the assembly over and verify that the PC board is level with and centered in the case half. If one end of the board seems higher than the other, or if the board seems crooked, investigate and find the cause. Once you are satisfied with the alignment, the switches, potentiometers, and tuning encoder can be soldered. There will be a total of 35 soldered connections in this step. After soldering, remove the clamps and four nuts holding the board to the panel. Don't lose the nuts, you will need them later. Separate the board from the case top, Set both aside for later. The upper board is finished. Proceed to the Lower board assembly procedure.