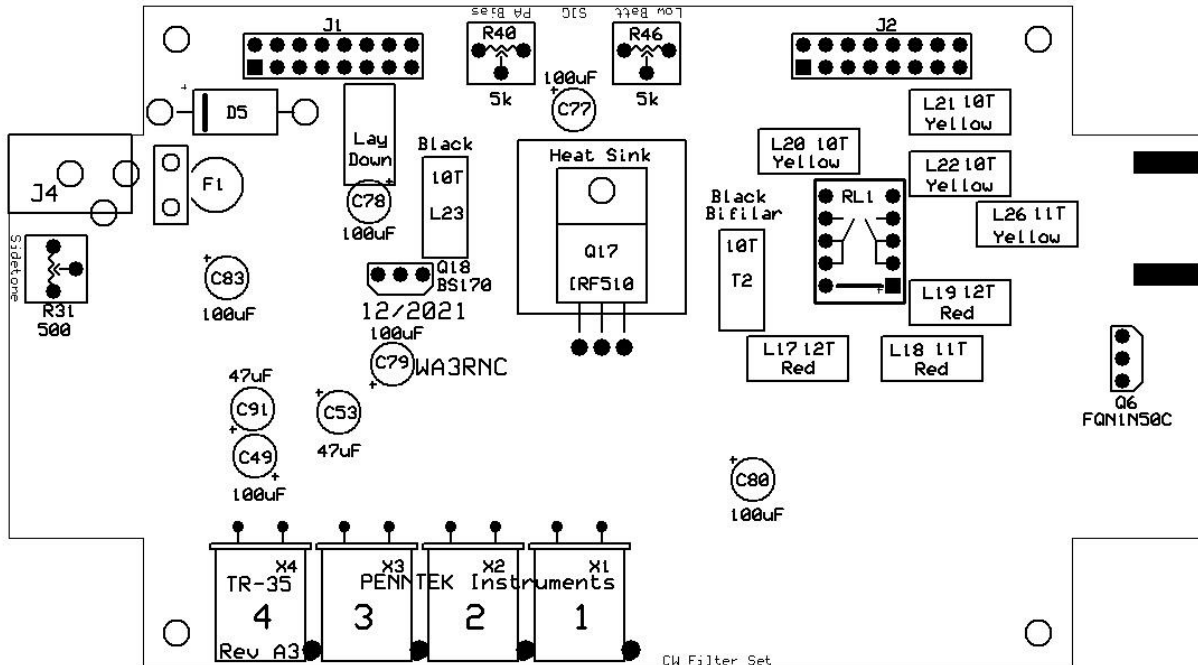


TR-35 Lower Board Assembly Instructions 01/10/22

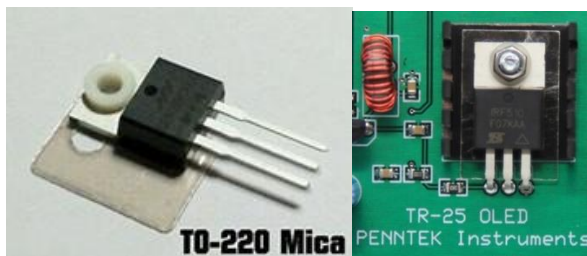


TR-35 Lower Board User Installed Parts

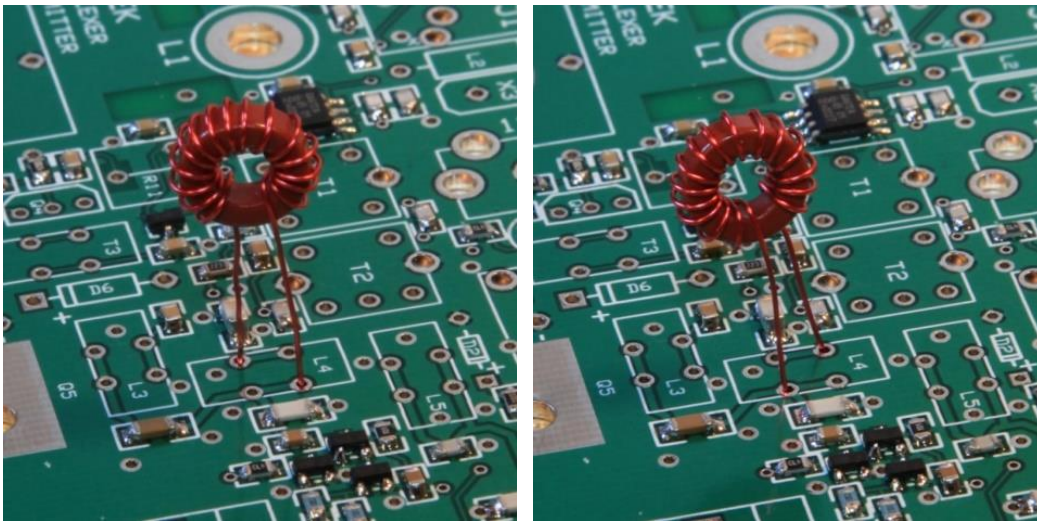
Refer to the above diagram while performing the following steps

- 1) Install and solder relay RL1 to the board with the polarity bar toward the board center. See the photo. Solder 10 pins.
- 2) Carefully form the leads of diode D5, if necessary, to fit on the board. The banded end goes to the square pad. Position the diode fairly close to the board, about $\frac{1}{4}$ ". Solder and trim 2 leads.
- 3) Install and solder Polyfuse F1 to the board. Bend this part over as shown on the overlay before soldering. Solder and trim 2 leads.
- 4) Install and solder the DC power jack J4. Make certain this jack is tight against the board and is straight. Solder and trim 3 pins. These pins must be trimmed after soldering to allow for proper fit into the case.
- 5) Install and solder the side-tone level 500-ohm pot R31. Solder and trim 3 pins.

- 6) Install and solder PA bias pot R40 and low battery warning adjustment pot R46. Both are 5k (marked 502). Solder and trim 6 pins.
- 7) Install Q18 BS170 TO-92 FET with the flat side as shown on the parts overlay. Position the part with about ¼" lead length above the board. Solder and trim 3 leads.
- 8) Install Q6 TO-92 FET FQN1N50C with the flat side as shown on the parts overlay. Position the part with about ¼" lead length above the board. Solder and trim 3 leads.
- 9) Install and solder 100uF electrolytic capacitors C49, C77, C78, C79, C80, and C83. The longer positive leads goes to the square pad. All the capacitors except C78 must be installed tight against the board. Note that C78 must be installed lying down on the board. Bend the leads BEFORE soldering. Solder and trim 12 leads.
- 10) Install and solder 47uF electrolytic capacitors C53 and C91 tight against the board. The longer lead goes to the square pad. Solder and trim 4 leads.
- 11) Form the leads of Q17, the final RF amplifier FET IRF510 so that the 3 leads mate with the mounting holes while the tab hole mates with the FET mounting hole through the heatsink. See the photo. Place the heatsink against the board, with the clear mica washer between the heatsink and the FET. Fit the FET leads into the mounting holes, and then insert the mounting screw from the bottom through the board, heatsink, mica washer, FET tab, and plastic insulator. Place the nut on top of the plastic insulator. Make sure the plastic insulator fits inside the FET mounting hole. Align the FET and heatsink with the mica washer between them. Tighten the screw fairly tightly. Don't deform or damage the plastic insulator. Use an ohmmeter to check for shorts from the FET metal tab to ground. Solder and trim 3 pins. Secure the nut to the screw with clear fingernail polish.



12) This step involves installation of 2 black ferrite toroidal inductors. The 3-leaded toroid is installed at T2. The twisted 2-wire center lead goes to the center hole, while the single wires go to the outside holes. The single red and green wires can go into either outside hole (1 in each hole). The 2-leaded 10-turn toroid is installed at L23. Mount the toroids vertically against the board. Solder and trim 5 leads. Note that there are two sets of holes for L17 through L23, and L26. Depending on how the coils were wound, left hand or right hand, one pair of holes will make for a better fit. Use either diagonal pair of holes, but be sure not to connect both coil leads to pads that are connected together! See the Photo for examples of left- and right-hand wound toroids. Neither is wrong, and either will work fine. Note that turns on a toroidal core are always counted on the inside of the core. Each time the wire goes through the center hole, it counts as a turn.

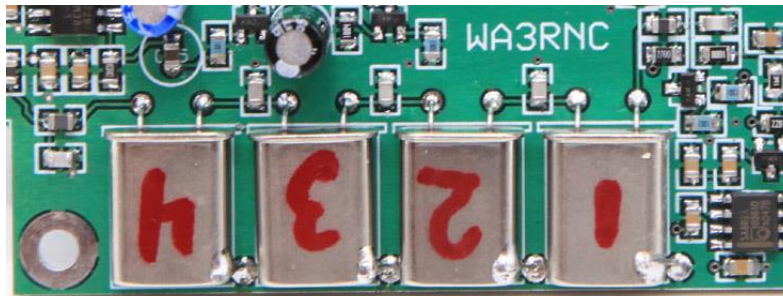


13) This step installs 3 yellow 10-turn toroids at L20, L21, and L22. Solder and trim 6 leads.

14) Install the 2 red 12-turn toroids at L17 and L19. Solder and trim 4 leads.

15) This step installs 1 red and 1 yellow toroid, each with 11 turns. Install the red one at L18, and the yellow one at L26. Solder and trim 4 leads.

16) Install the IF filter crystals X1 through X4. The crystals have been measured and sorted, so they must be installed properly for maximum IF filter effectiveness. The crystals are numbered according to the reference designator where they will be installed. The crystal marked “1” will be mounted at X1, and so on. The crystal leads need to be formed by carefully bending them 90 degrees. See the photo.

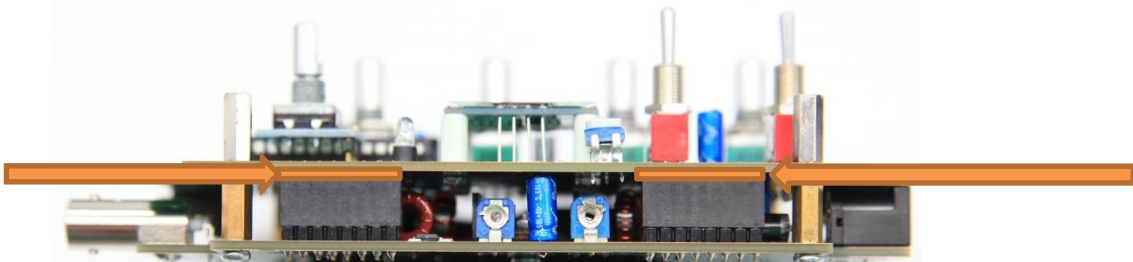


Mount the crystals down tight against the board. Solder and trim 8 leads. Ground the crystal cans with wires cut from the included sacrificial resistors. Do not overheat the crystal cans! Be quick when soldering to the cans. Trim the grounding wires. The resistors may be discarded.

17) The 16 pin connectors J1 and J2 will be installed together on both the upper and lower boards. This step requires some attention. The male connectors (.025" square pins) will be installed on the lower board (the one with the heatsink), and the female connectors on the upper board (the one with the OLED display). To allow for maximum pin engagement for these connectors, the female connectors will not be assembled tight against the upper board. There will be a small gap between the female connector body and the bottom of the upper board. Start this step by installing the male header pins into the top side of the board with the heat sink (lower board). Make certain that these connectors are tight against the board. Solder one pin on each connector and examine them for straightness before soldering the rest of the pins. Once all 32 pins are soldered, locate the assembled top board with the 12mm spacers attached, and place the board upside down in front of you, with the spots for the upper board connectors J1 and J2 closest to you. Place the female 16 pin connectors into the bottom of the upper board. Do not solder these connectors. Now carefully place the lower

board upside down over the upper board, carefully aligning the 4 connectors. The lower board mounting holes should line up with the spacers mounted on the upper board. Once everything is lined up, carefully press the boards together. Stop and investigate if something doesn't seem right, or if the board mounting holes do not line up. With the boards tight together, locate the four 3mm x 6mm screws and use them to secure the boards together. Turn the board set assembly right side up with the display and controls facing up. Now, the object is to fully engage the female connectors onto the lower board pins by pushing the female connectors down onto the male pins as far as they will go. This may require the use a flat surfaced object to gently push on the connector pins to fully seat them onto the pins.

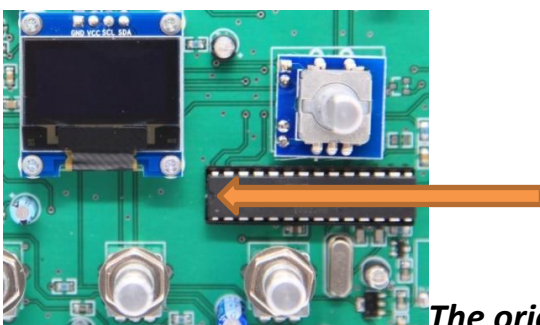
Note that this will let a small gap between the upper board surface and the female connector. See the picture.



Note the gaps between the female connectors and the upper pc board

The upper board female connectors can now be soldered. Solder 32 pins.

- 18) Locate the 28-pin microcontroller IC U1. Observing antistatic measures, carefully install U1 into the 28 pin socket. Be sure to place the pin 1 end toward the center of the board. Be careful not to bend any pins!



The orientation notch indicates pin 1 end.

This completes assembly of the upper and lower pc boards. Proceed to the "Preliminary Checks and Tests" document.