DIYMORE XF0075 (Manual Days) 1-30 MHz Manual QRP Antenna Tuner Kit

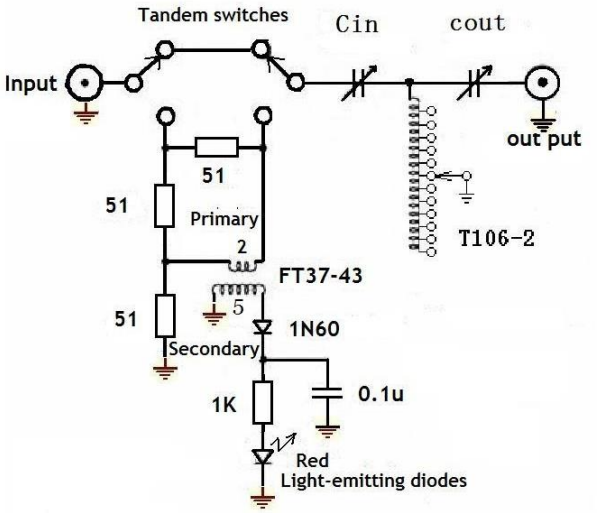
Description:
This kit allows you to construct a T-network based low power HF Antenna Tuner.

Specification:
Continuous power rating: 15W at 50% Duty Cycle
Maximum power input during tuning process using internal dummy load: <3W
Tuning indication: LED display – minimum brightness indicates good match.
Radio Interface: BNC – can be modified to SO239
Operating frequency: 1-30MHz
Antenna Interface: BNC – can be modified to SO239
The antenna impedance matching range: about: 30 - 300 ohms
Box size: Approx. 100mm x 68mm x 50mm

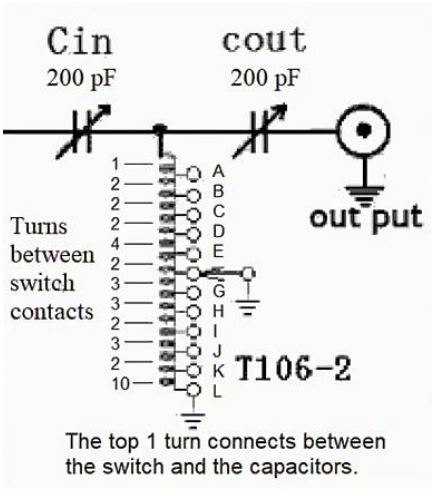
Note:
This kit is not a ready-made product. It needs construction and installation by yourself.

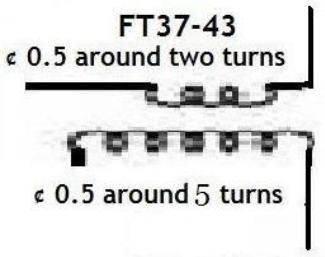
Kit Components:
1 x waterproof sealed box
1 x Stickers (used to determine the position of the mounting holes – refer to translations in this document)
2 x BNC surface mounted Co-axial RF Sockets (can be substituted with surface mount SO239 sockets)
1 x 0.45m 0.3mm dia red insulated wire (ordinary wire segment)
1 x 0.45m 0.3mm dia yellow insulated wire (ordinary wire segment)
2 x Variable capacitors
2 x Small knobs (for variable capacitors)
4 x 2.5mm countersunk head screws (to mount variable capacitors)
2 x 2.5mm round head long screws
1 x 2.5mm round head short screw
4 x 3mm washers
2 x 3mm nuts (these should be M2.5 to match the long screws – include a star washer when mounting tuning knobs)
1 x 12 position rotary switch with a large knob
1 x T106-2 toroid (red)
1 x 2.45m 0.5mm dia enamelled wire for winding the T106-2 toroid and FT37-43 toroid
1 x QS2015012 printed circuit board
1 x DPDT switch (select or bypass built in dummy load and tuning indicator)
1 x red LED
3 x 51 ohm 2W resistors
1 x FT37-43 toroid (Black)
1 x 1K resistor (light-emitting diode current limit)
1 x 1N60 diode
1 x .1uF ceramic capacitor

Schematic Diagram:



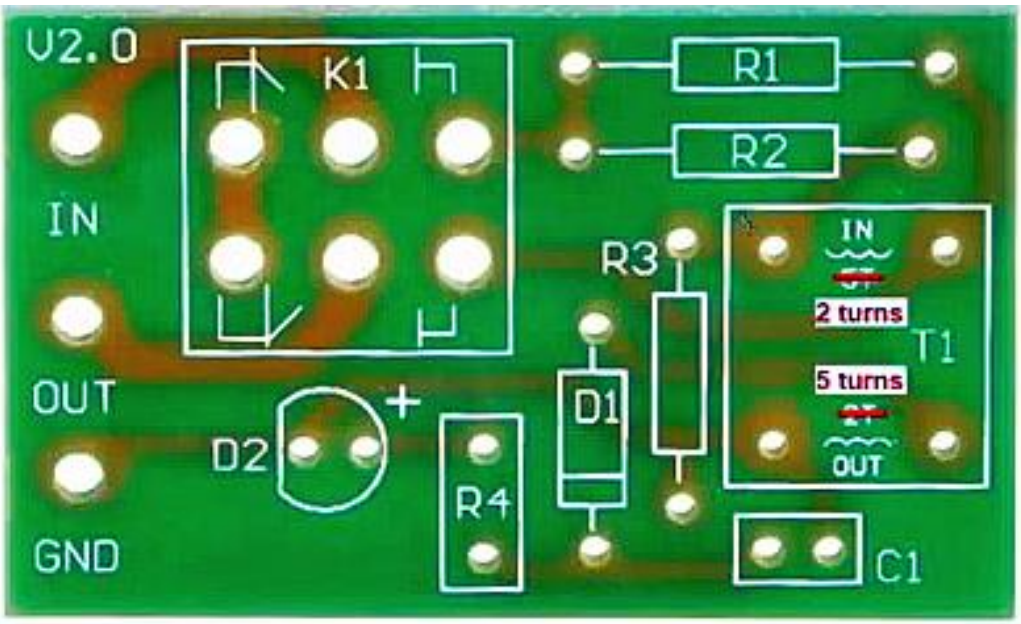
Winding Details: corrected (graphic by KP4MD)



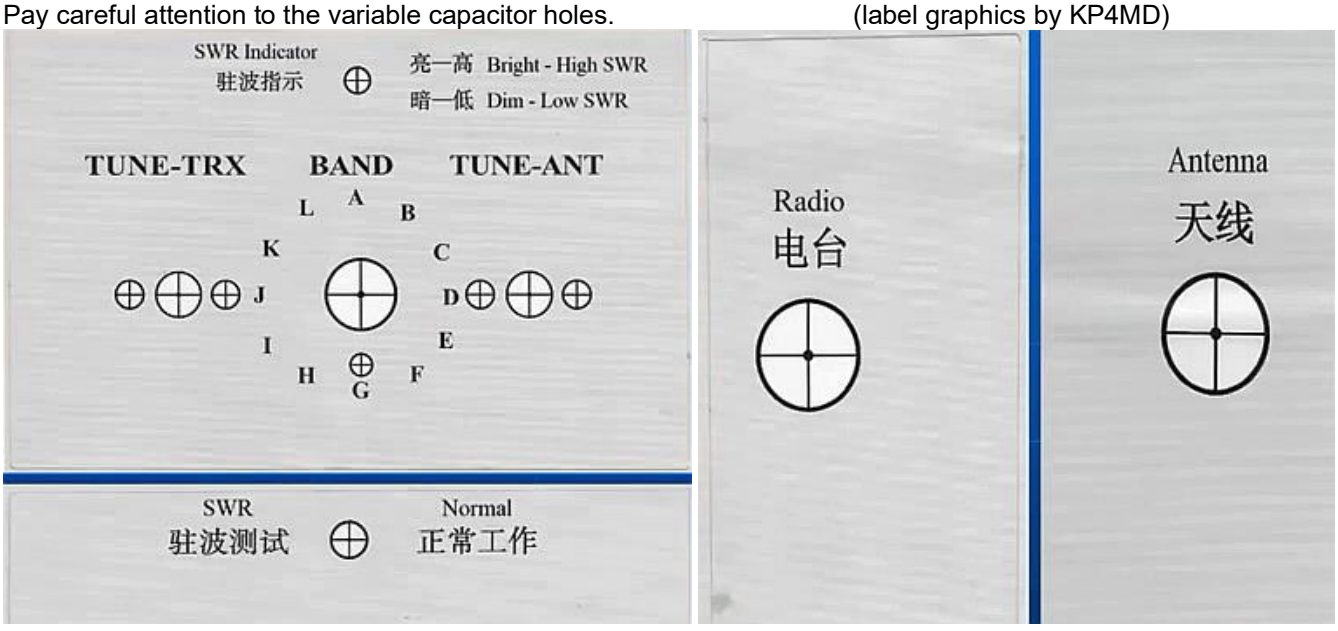


Operating:
Set your transmitter to less than 3W (the built in dummy load has a maximum rating of 5W), set the metering switch to SWR and transmit for short intervals while selecting positions on the rotary switch and variable capacitors until the tuning LED brightness is at a minimum level. Set the metering switch to Normal and check final power reading and SWR reading with internal metering of the transmitter. Set the transmitter output to less than 15W and enjoy operating with a tuned antenna system.

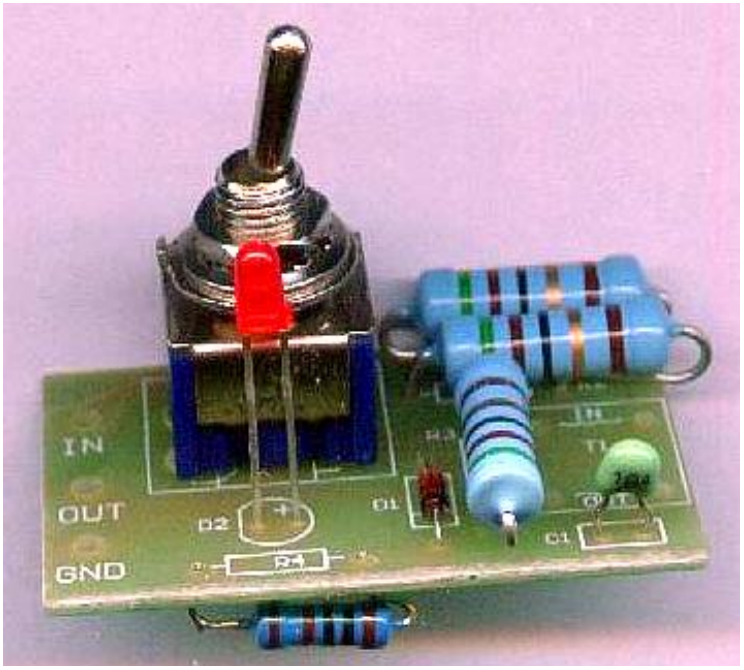
Assembly:
Tools required are soldering iron, solder wire, scissors, knives, drills, wires. Component Count & PCB -

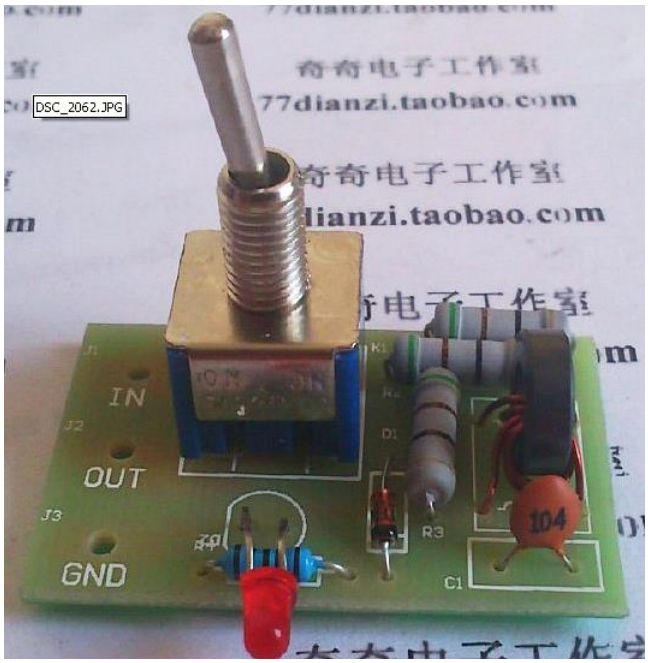


The labels show the position of drilled holes (and some translations).
Pay careful attention to the variable capacitor holes. (label graphics by KP4MD)

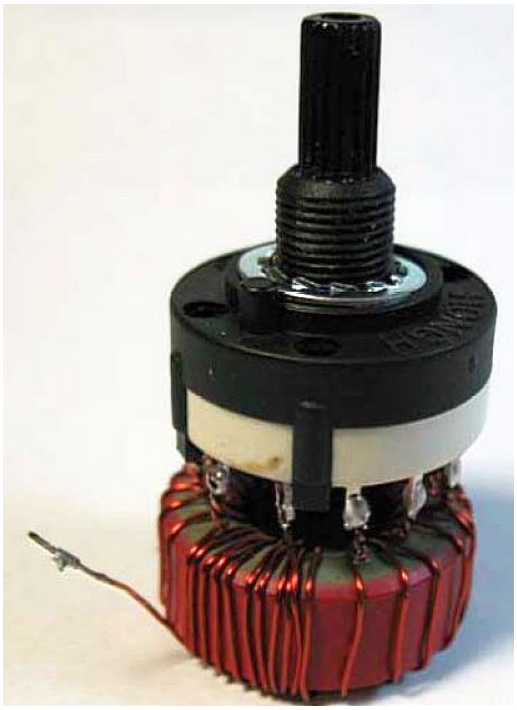


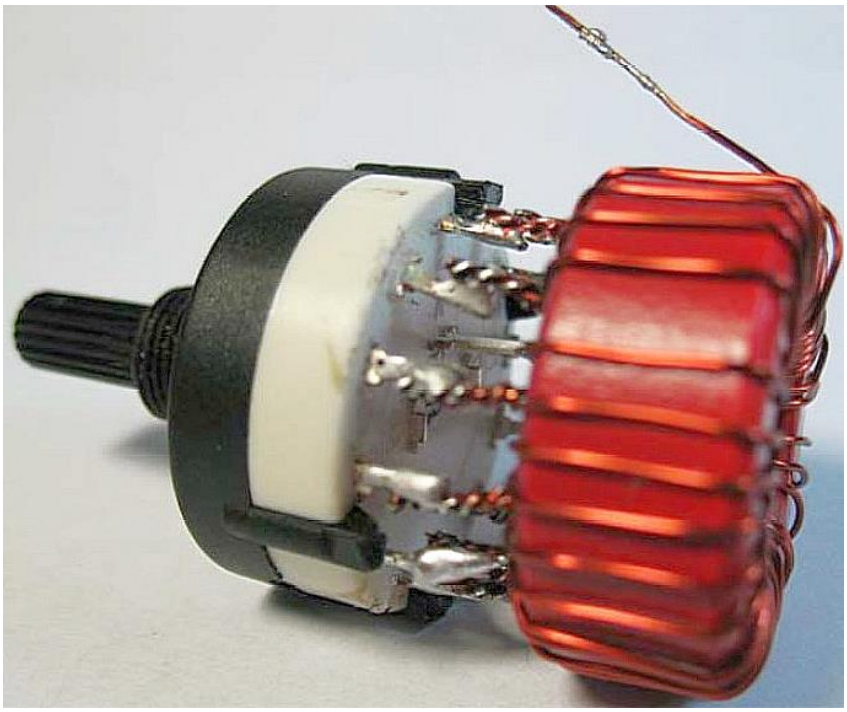
Solder in the standing wave detection circuit and light-emitting diode components and toggle switch.
This includes the finished F37-43 transformer. Be tidy with your soldering and refer to the photos and schematic diagram frequently to avoid errors.





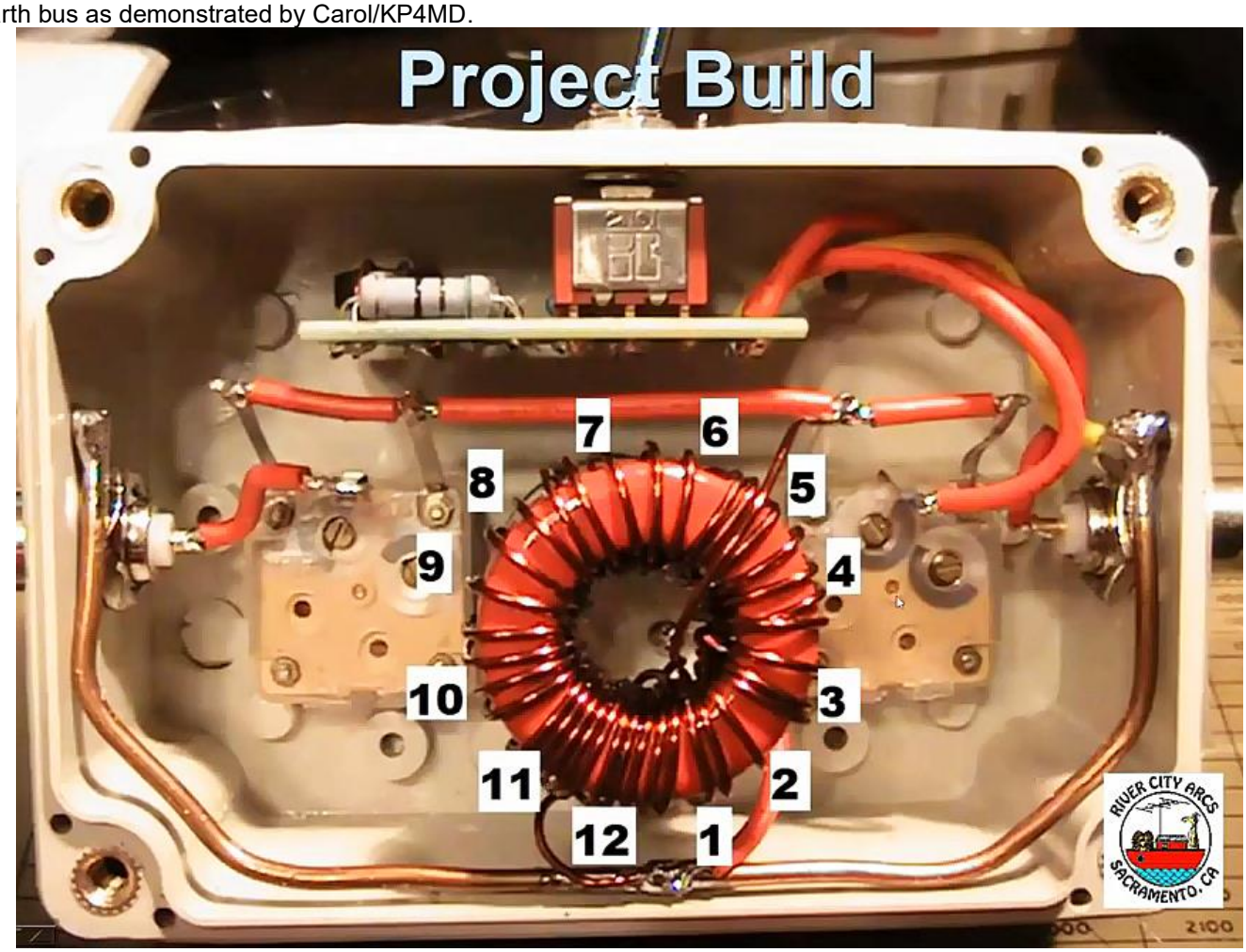
Construction details of the T106-2 switchable inductor



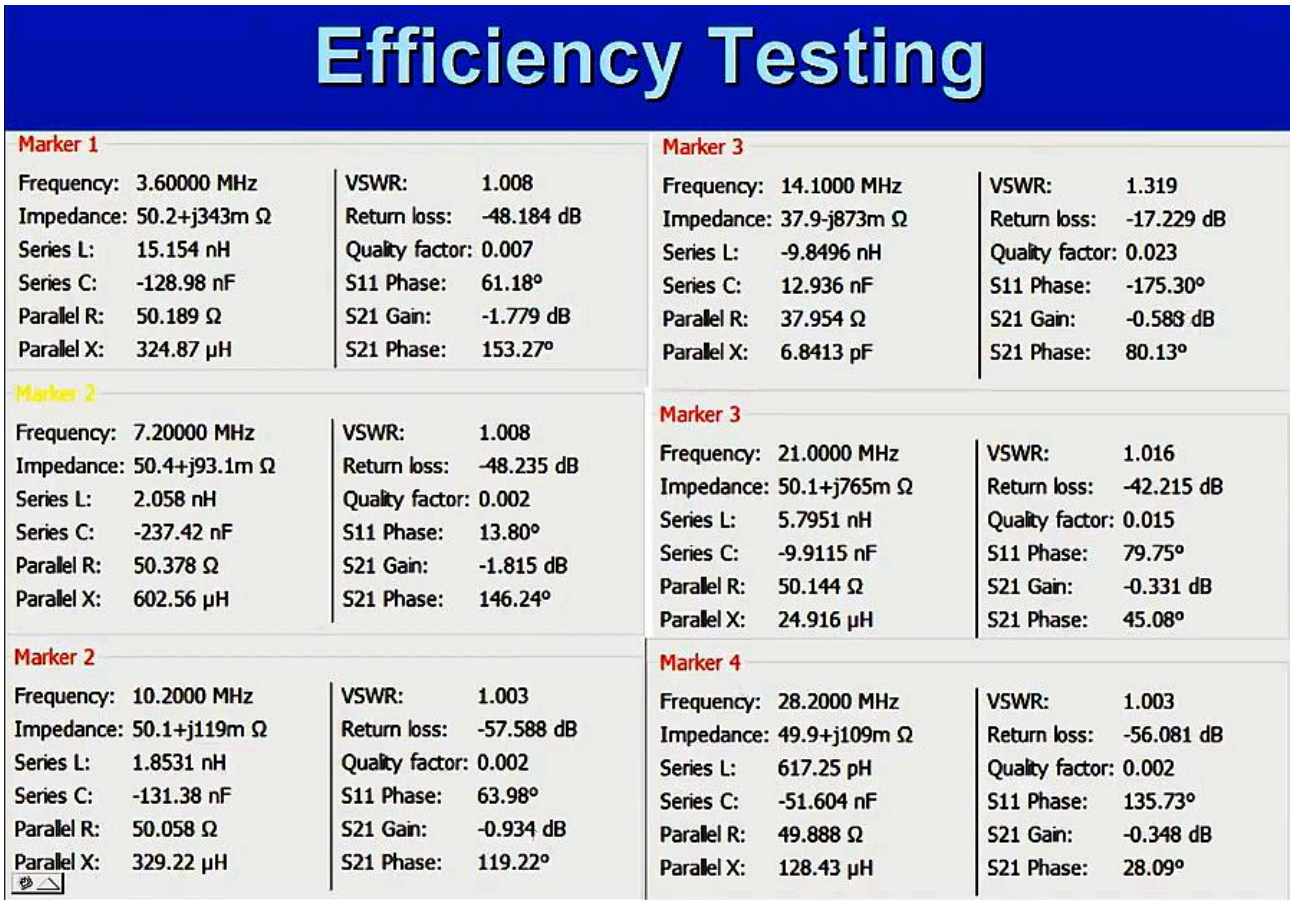


Pay attention to the winding direction and turns of the inductor.

Below is the final layout of the main assembled components including the interwiring suggestion and inclusion of an earth bus as demonstrated by Carol/KP4MD.



Some errors were evident in the original instructions supplied – many thanks to Carol/KP4MD and her YouTube presentation on pointing out these errors. This document includes Carol's corrections and assembly suggestions.



Results of testing by Carol/KP4MD utilising a Tiny-VNA properly calibrated.