

WA3RNC 40 Meter CW Transceiver Quick-Kit

Model 40MXCVR Assembly Instructions



Fig. 1

- Covers approximately 7.017 to 7.047 MHz.
- Dual digit LED Digital Dial with 10 turn tuning potentiometer.
- Output is adjustable from 0 to 5 watts with rear panel control.
- 12 dB Rx attenuator switch on rear panel with front panel indicator.
- Sharp 350Hz bandwidth (-6dB) crystal IF filter for single signal reception.
- Receiver sensitivity (MDS) 0.15 microvolts, image rejection 68dB
- Transmitter harmonics and spurs at -55dBC assures FCC compliance.
- Rx current consumption about 46 ma, Tx 400-800ma at 12V input
- PC Board contains 104 machine installed SMT parts, and 17 additional thru-hole parts to allow for complete factory alignment of the transceiver.
- User installs 24 components, and the board is finished and factory aligned.
- Die cast powder painted enclosure is predrilled for quick final assembly.

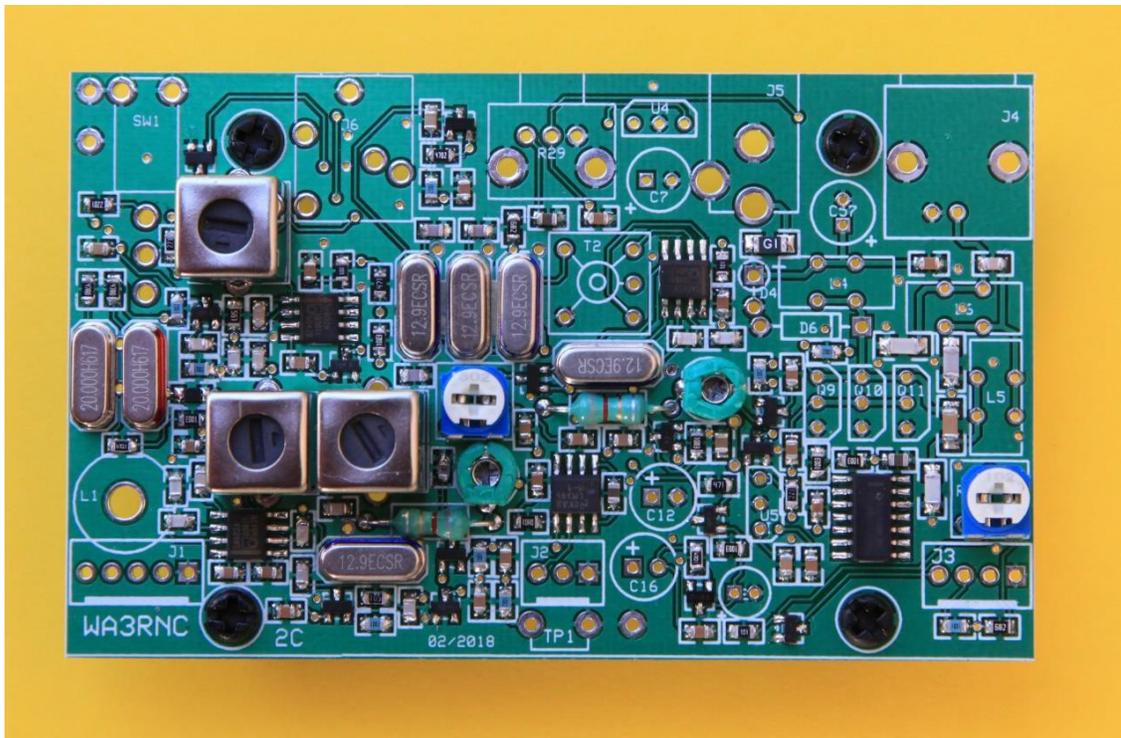


Fig. 2

PC board with factory installed parts. Board is aligned at factory as well. There is no need to tweak any trimmers or coils. Please don't do it.

Parts are separated into 8 packets. The PC board is contained in packet 1. Start assembly with packet 2, which contains the 3 final RF output FETs, the 8 volt and the 6 volt regulators, 1 glass Zener diode, four aluminum standoffs with 4-40 screws, 2 rubber feet with hardware, and a self-adhesive rubber bumper. First install the standoffs on the bottom of the PC board. Next, install the three BS170 FETs at Q9, Q10, and Q11. Make sure that the parts match the silkscreen outline. Install the FETs so that they sit about $\frac{1}{4}$ inch above the PC board. Similarly, install the two regulators U4 (LM78L08) and U5 (LM78L06). Form the leads of the glass diode (D6) so that it will install horizontally on the board. The banded end is closest to the RF output FETs. Place this diode no more than $\frac{1}{4}$ inch above the board. Clip the excess leads and check all solder connections for shorts.

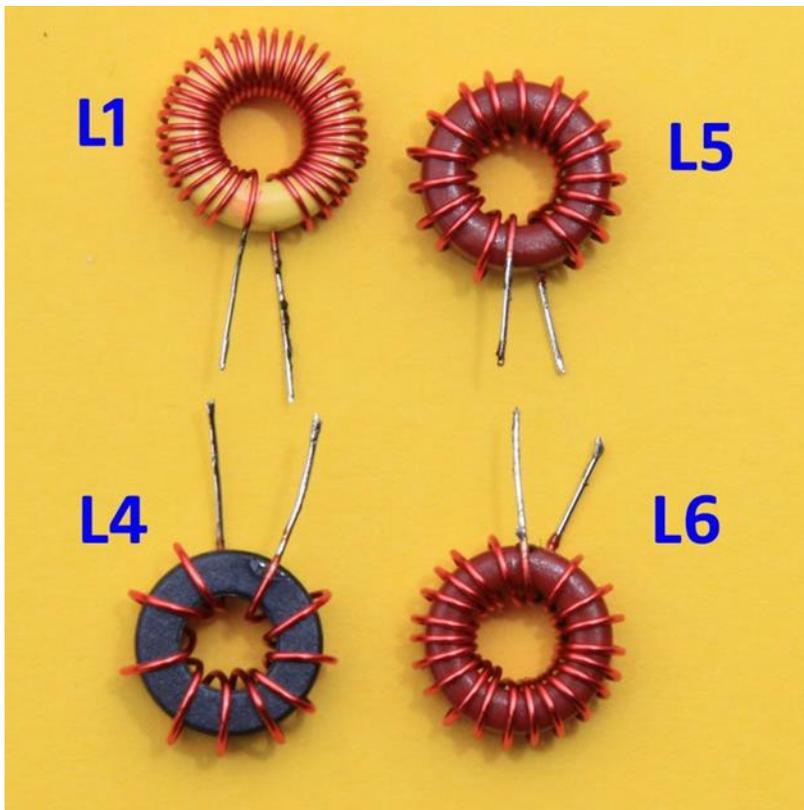
Packet 3 contains five electrolytic capacitors and the transformer T2. The longer lead on the caps is the positive lead. This lead must always attach to the square pad on the PC board. Install 100uF caps at C7, C12, and C12A.

The 47uF cap is installed at C16. The 10 uF cap is placed at C20. Install the transformer at T2. Make sure these parts are down tight against the board. Clip the excess leads and again, double check all solder connections for shorts.

Packet 4 contains the power adjust potentiometer with knob, the three jacks (BNC antenna, DC power, and 3.5mm key), the attenuator switch, and three header pin connectors. Install the BNC connector (J4), the DC power connector (J5), the key jack (J6), the attenuator switch (SW1), and the power adjust pot (R29) making certain that all of these components are down tight against the PC board.

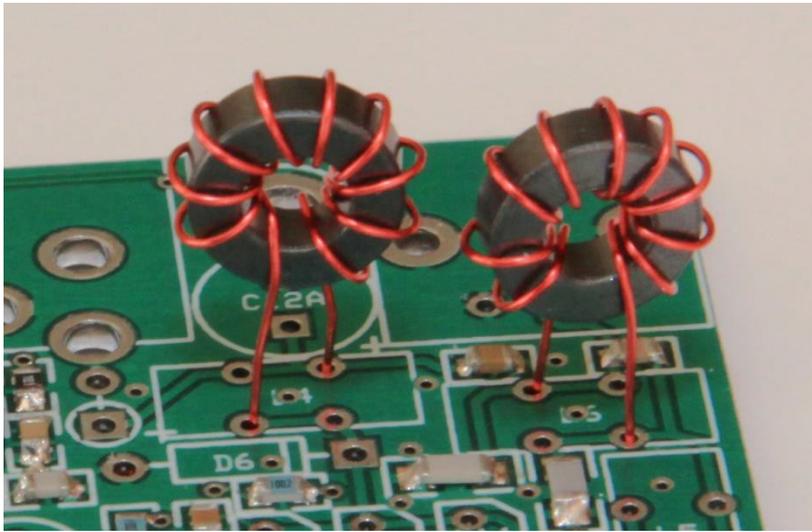
This is very important to ensure that the PC board will fit into the housing.

Install the 3 pin header at J2, the 4 pin header at J3, and the 5 pin header at J1. **Make certain that the plastic polarity bar of the headers is closest to the board edge.**



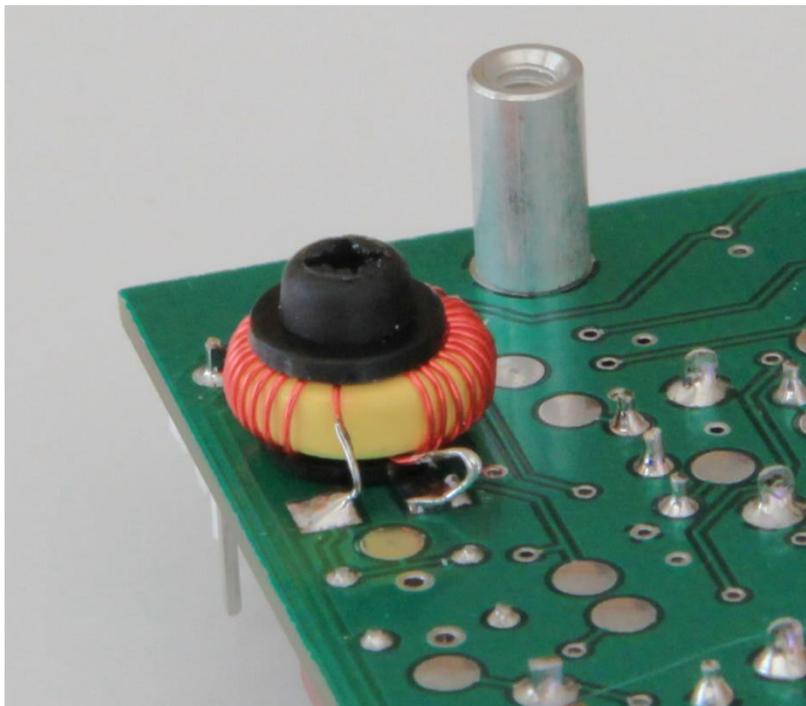
Packet 5 contains the four toroid coils, so conveniently pre-wound for you! Remember that toroid coil turns are counted on the inside of the core. Install L4 (all black core with 10 turns) using the holes that better match the coil leads. See the photo below. One toroid is wound clockwise, the other

counterclockwise. Either will work just fine. Use the mounting holes that



best match the toroids in your kit. Install L5 (red core with 18 turns) and L6 (red core with 21 turns). Keep these toroids tight against the board. L1 (yellow core with 37 turns) is installed on the

board bottom and is held in place with the included nylon hardware. Installation will be easier if the leads are soldered to the square pads before securing the toroid with the hardware. Use a plastic washer on both the top and bottom of the core. See the photo.



This concludes the construction of your PC board. The board has been carefully and completely aligned at the factory, and you are cautioned against trying to adjust or tweek any transformer cores or trimmers. You will not be able to

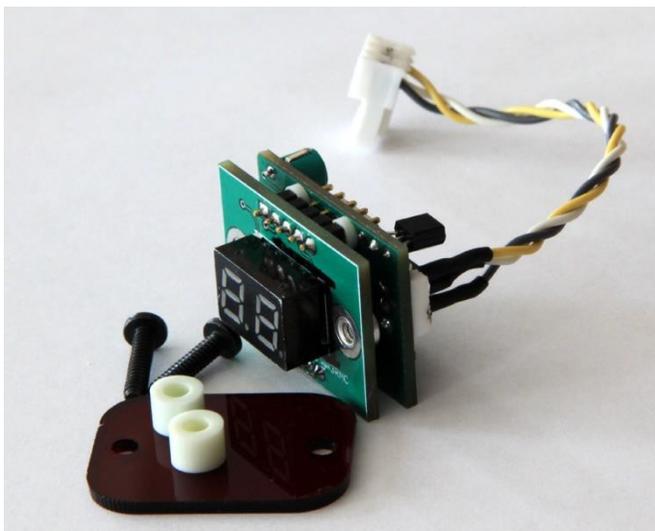
increase power output by attempting these adjustments!

Before you begin the mechanical assembly procedure it is a good idea to verify that your assembled PC board will fit into the aluminum housing. Do this by first mounting the PC board assembly to the housing base as shown in the photo. The four required 4-40 x ¼ inch screws were included in packet 2 with the screws that attach the standoffs to the PC board bottom. Mount the board to the bottom piece with the BNC, switch, and pot shaft overhanging the plate, but do not fully tighten the screws at this time so as to allow some movement of the board. The bottom plate with the board

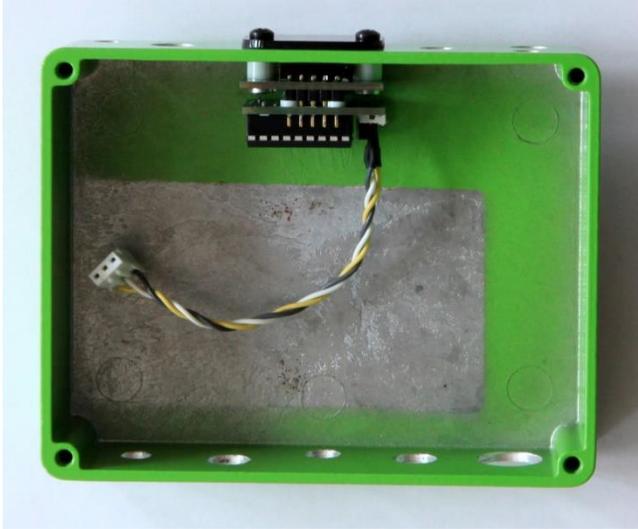


attached should be fitted to the top piece by carefully inserting the BNC connector, pot shaft, and switch through the holes in the rear panel of the top piece. If things don't

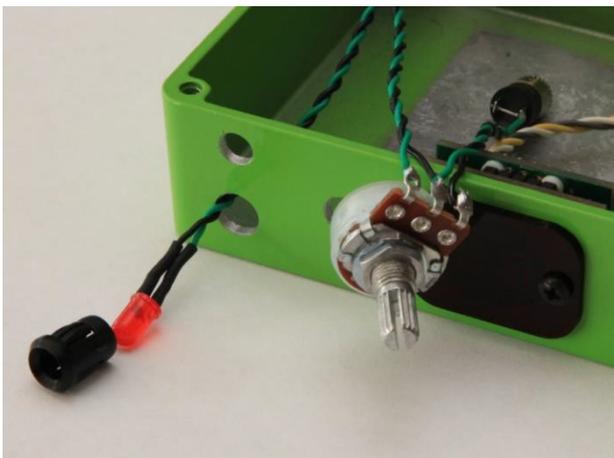
seem to fit well, it's an indication that those parts that fit through the top rear panel have not been installed tight against the board. This must be remedied before continuing. Once the PC board fit has been confirmed, tighten the mounting screws and install the rubber feet from packet 2 at the front of the bottom panel with the hardware provided. Place the small adhesive backed rubber bumper (also from packet 2) at the center rear of the bottom plate. Set the bottom plate with the PC board aside.



Packet 6 contains the digital dial and its associated parts. See the photo. Attach the digital dial to the enclosure top with the 4-40 X ½ inch plastic screws. The screws first go through the red plastic filter piece (remove the protective paper), then through the aluminum case, and then through the white plastic

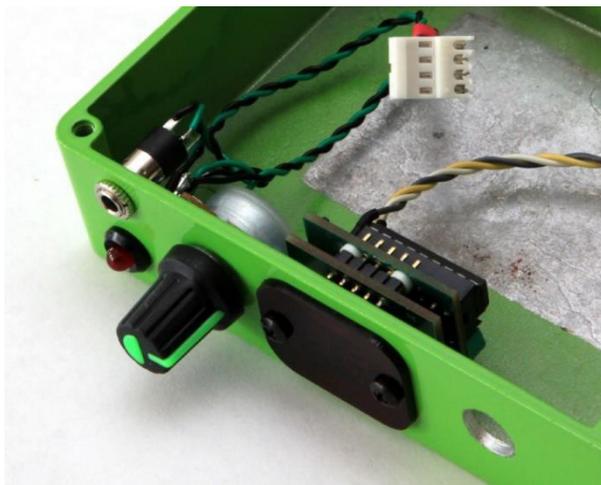


spacers and into the threaded captive nuts in the digital dial. Do not overtighten the screws. Be careful not to install the assembly upside down. Compare your unit with the photo. If your wiring harness wires exit the module on the left side, you are upside down...Flip it over!



Packet 7 contains the volume control wiring harness, and an LED lens.

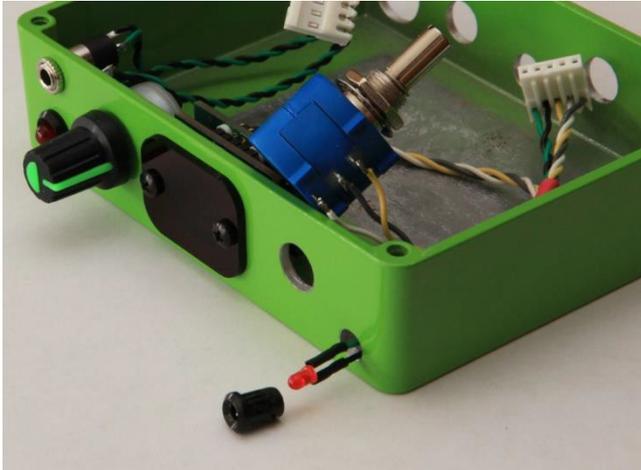
Start by putting the LED through the upper right front panel hole as shown in the photo. Install the LED in the holder, and then carefully push the holder with the LED back into the front panel. Be careful not to push on the LED lest it pop out of the holder.



Once the LED and holder are installed, be careful not to apply too much stress on the LED wire. Install the volume control and the headphone jack.

Orientate the volume control as shown in the photo. Be careful not to scratch the front panel when tightening the mounting

nuts. Align the knob on the control shaft and push it on.



Packet 8 contains the tuning potentiometer with knob and a small LED. Start by putting the LED through the upper left front panel hole. Install the LED into the LED holder, and then carefully push the holder with the LED back through the hole taking care not to push on the LED.



Install the 10-turn tuning pot to the panel, orientated with the terminals toward the case side to prevent shorts to the bottom panel. Install the knob onto the shaft.

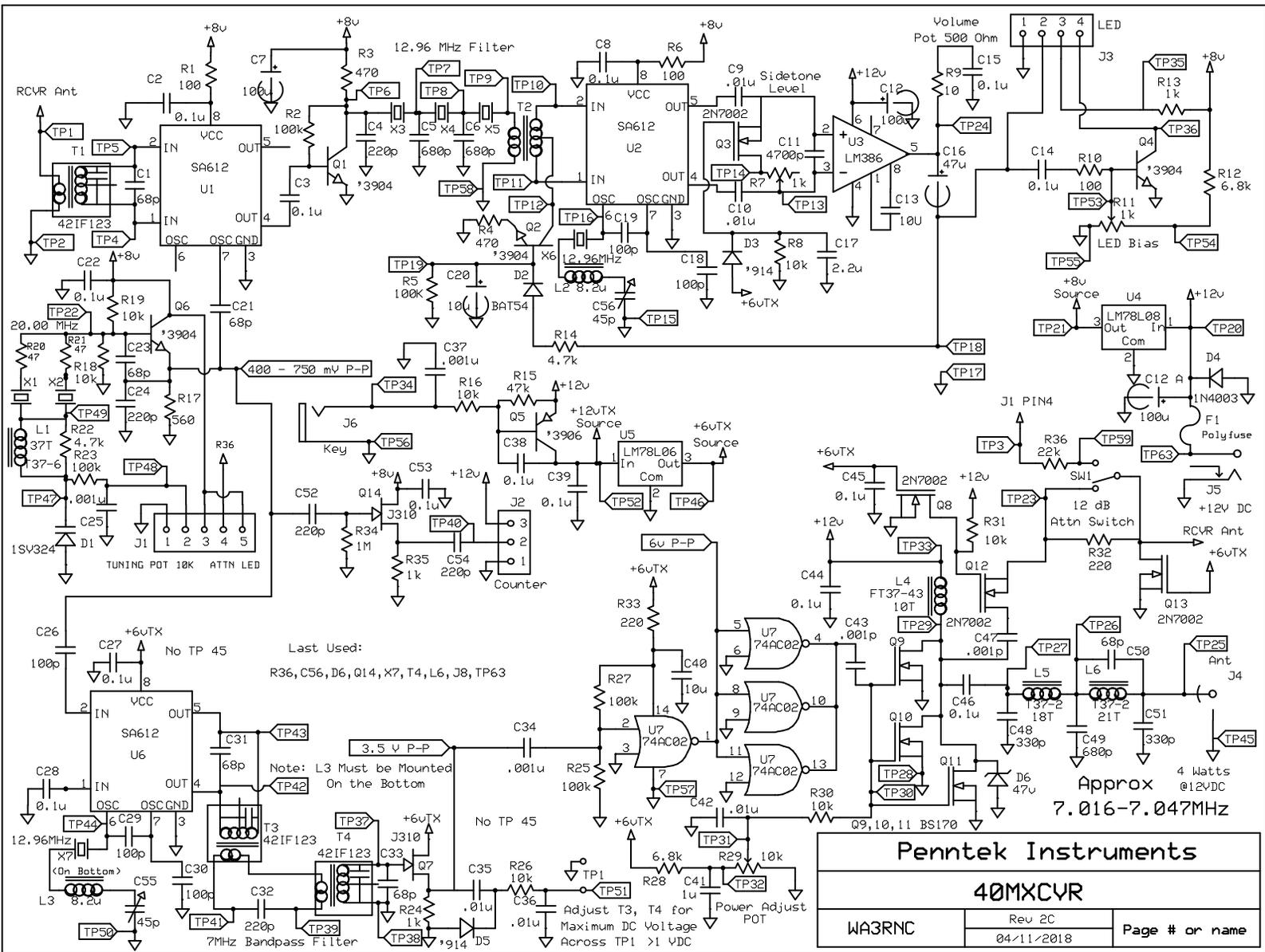


All that remains to do is the final assembly. Carefully connect the three wiring harness connectors to the pin headers. Orient the connectors so that the wires extend back over the PC board as shown. The connectors won't fit if they are reversed. Insert the board connector and the attenuator switch through the holes in the rear of the upper case. Carefully close the clamshell.

Be careful not to pinch the wires. Install the 4 flathead screws to affix the bottom plate to the top piece. Install the knob on the rear panel power level control. You're finished!

Notes on Operation

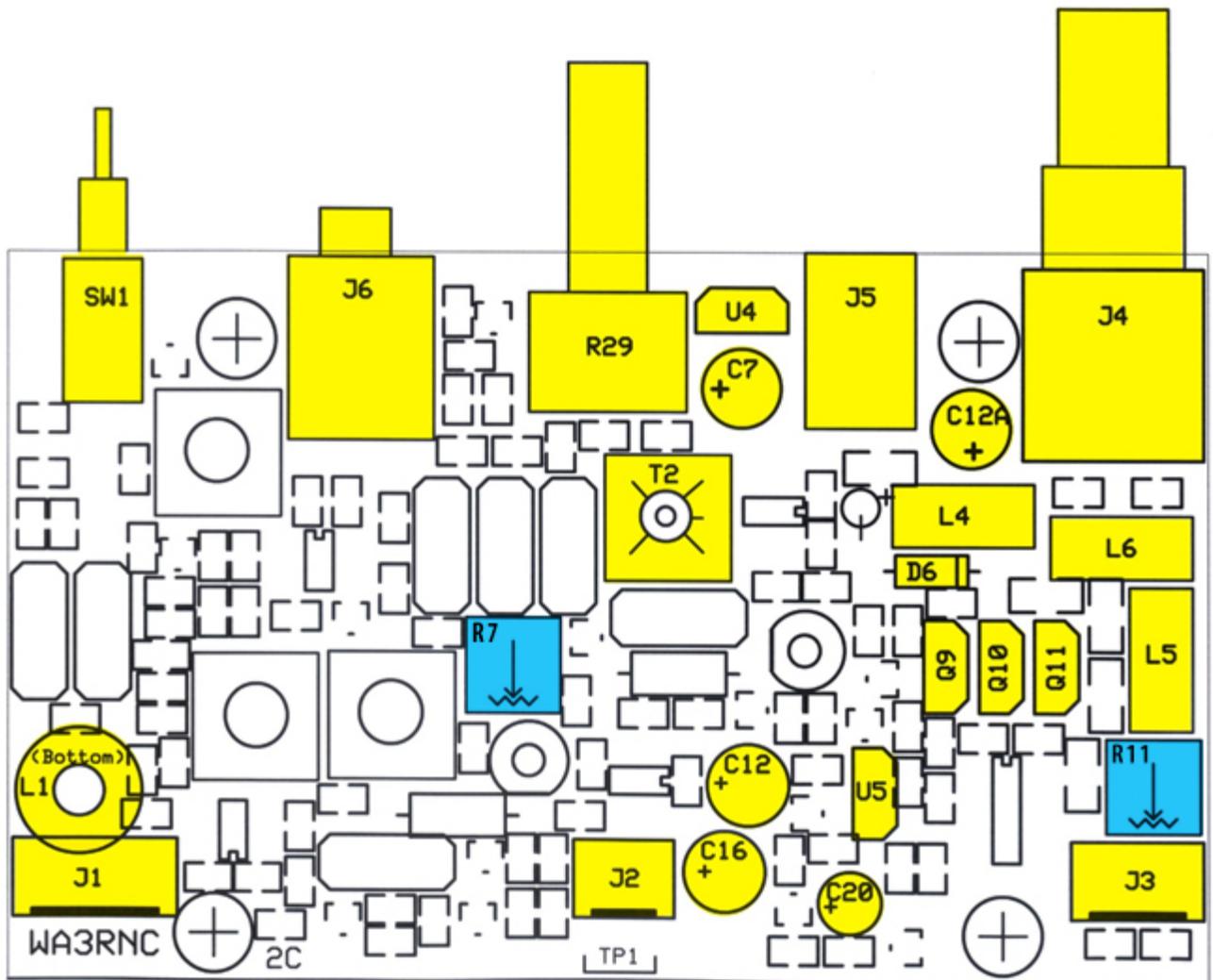
- 1) The transceiver operates on 12 to 14 volts DC. The power connector center pin is positive. Receive current consumption is about 46 ma. Transmitter power consumption is 400 to 800 ma.
- 2) Transmitter power output is adjustable with the rear panel knob from near 0 to 5 watts. The output impedance is 50 ohms. The final RF output FETs are intended for CW duty cycles. Do not hold the key down for more than a few seconds at high output levels. Turn the power level down when adjusting an antenna tuner
- 3) The switch on the rear panel is a receiver 12 dB attenuator. When engaged, a small LED is illuminated on the left side of the front panel as an indicator. This switch has no effect on the transmitter.
- 4) The LED above the headphone jack indicates the relative strength of the signal. The LED sensitivity can be adjusted with trimmer potentiometer R11. If you wish to disable this LED, turn R11 fully counterclockwise.
- 5) The sidetone level will vary as the power is adjusted. The level can be adjusted with trimmer potentiometer R7 if desired. The sidetone you hear is the actual transmitted signal heard by the receiver.
- 6) The digital dial reads kilohertz above 7 MHz. "7.0" to the left of the 2 digits is implied. The accuracy is +/- 1 kHz.
- 7) Do not use "mono" plugs for the audio out. Use only "stereo" connectors. Mono plugs will short the audio output and may cause damage to the unit. You may use either type of plug for the key jack.
- 8) There is no power on-off switch provided. Remember to disconnect the battery or power supply when use is discontinued.



Penntek Instruments

40MXCUR

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Builder installed parts are shown in yellow

R7 = Sidetone level adjust pot (shown in Blue)

R11 = LED Bias adjust pot (shown in Blue)