

KIT BUILDING

BY JOE EISENBERG,* K0NEB

Look Ma, Two Bands!

The Penntek TR-25 CW Transceiver

As things slowly return to near normal, I can only hope this trend continues. Hamfests are starting up again, and more new kits are appearing. I truly look forward to seeing everybody in person again as events are allowed to resume. This month, I am looking at a new kit that offers QRP operators a nice portable dual-band CW transceiver for both 40 and 20 meters. The Penntek TR-25 kit is designed by John Dillon, WA3RNC, who has made a few previous QRP kits as well.

The Penntek TR-25 is a reasonably compact QRP CW transceiver kit that features an OLED digital display and lots of perks for a small transceiver. There is a very stable synthesizer for frequency generation, along with a 4-pole crystal filter centered on 700 Hz and having about 300 Hz of bandwidth, which is great for operating CW. The front panel has controls for keyer speed, RF output power, receiver RF gain, and headphone volume. There is also a switch for changing the band and enabling the RIT. Unusual for a kit radio are dual keying input jacks. You can have both a straight key and a paddle plugged in and choose which one you use by simply using it, with no menus to select the key type. The OLED display is readable in sunlight and reads down to 10 Hz, more than adequate for CW. The tuning steps are selected by varying presses of the tuning knob. The TR-25 tunes in three selectable steps from 1 kHz to 100 Hz and down to 10 Hz.

Building the Kit

Building this kit isn't as difficult as the boards first appear. All the surface-mount components as well as the trimmer capacitors are pre-installed. The trimmer capacitors are pre-tuned at the factory, so having precision alignment equipment is not necessary. This type of hybrid kit where the surface-mount parts are pre-installed is becoming more common as the number of practi-

cal through-hole components that are available diminishes. There are about 200 surface-mount parts already installed and 55 user-installed parts in the TR-25 kit.

The assembly procedures involve first assembling the upper board, followed by the lower board. The two boards end up being attached to each other like a sandwich, and then placed into the case. The case is pre-drilled, marked, and set up for very easy final installation. I found the instructions to be very complete and easy to follow. A

task I normally perform at the beginning of assembly is sorting the parts either by stage or by component type. This kit is innovative in that the parts are supplied in clear plastic strips that are heat sealed into tiny pouches containing the parts needed to perform each step. So, when beginning the next step, you simply cut open the next little pouch to get the parts to complete that step. As long as you complete that step, there are no loose parts to get misplaced as they are all contained in sealed pouches on one of the three strips. One parts strip is



The Penntek TR-25 case along with the three sealed parts strips ready to begin assembly with no parts sorting needed!

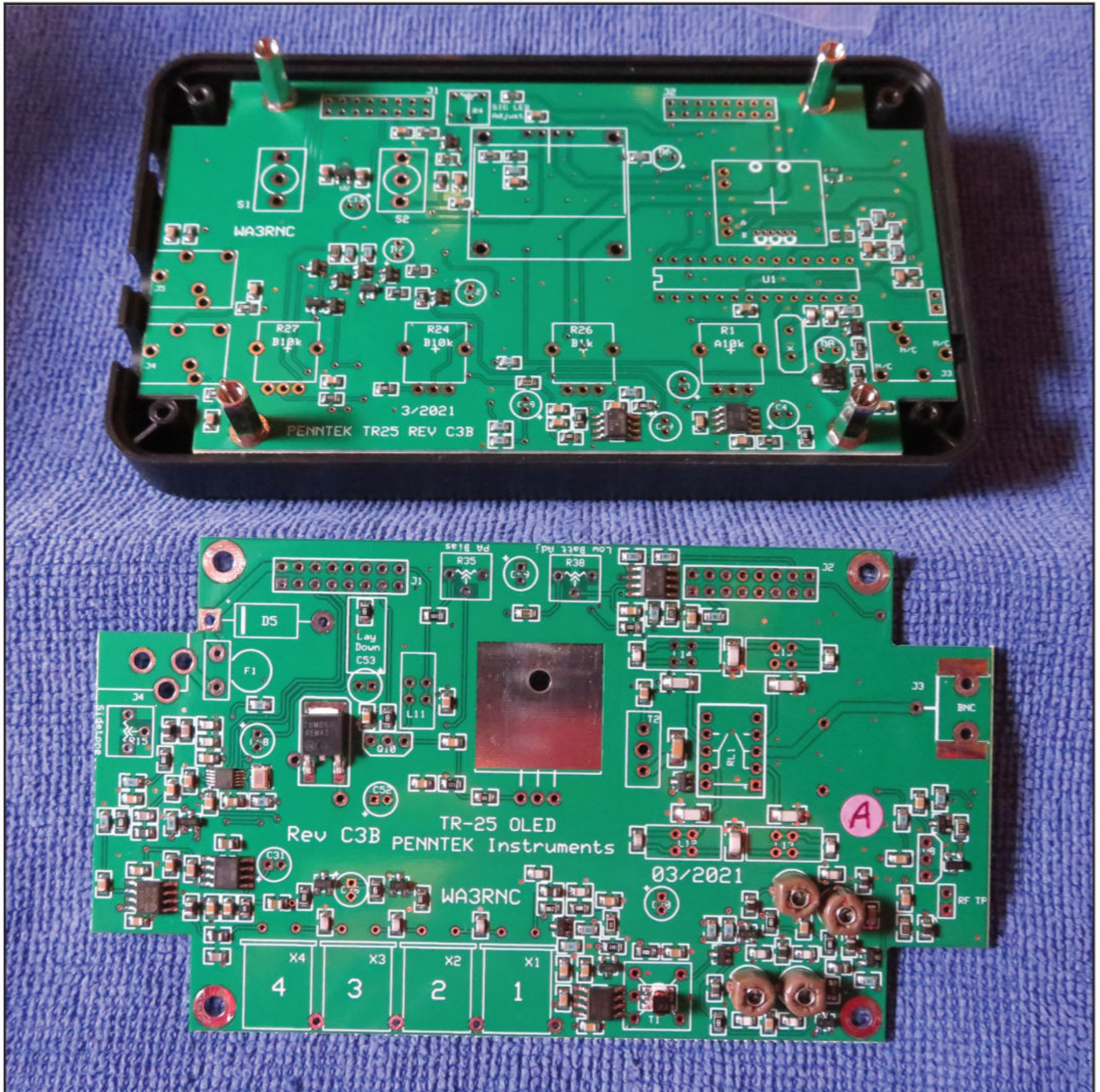
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dedicated to the upper board, one is for the lower board, and the last one is for final assembly. The final assembly parts strip also includes a set of plugs for headphones or speaker output, a key, a paddle, and the DC power input.

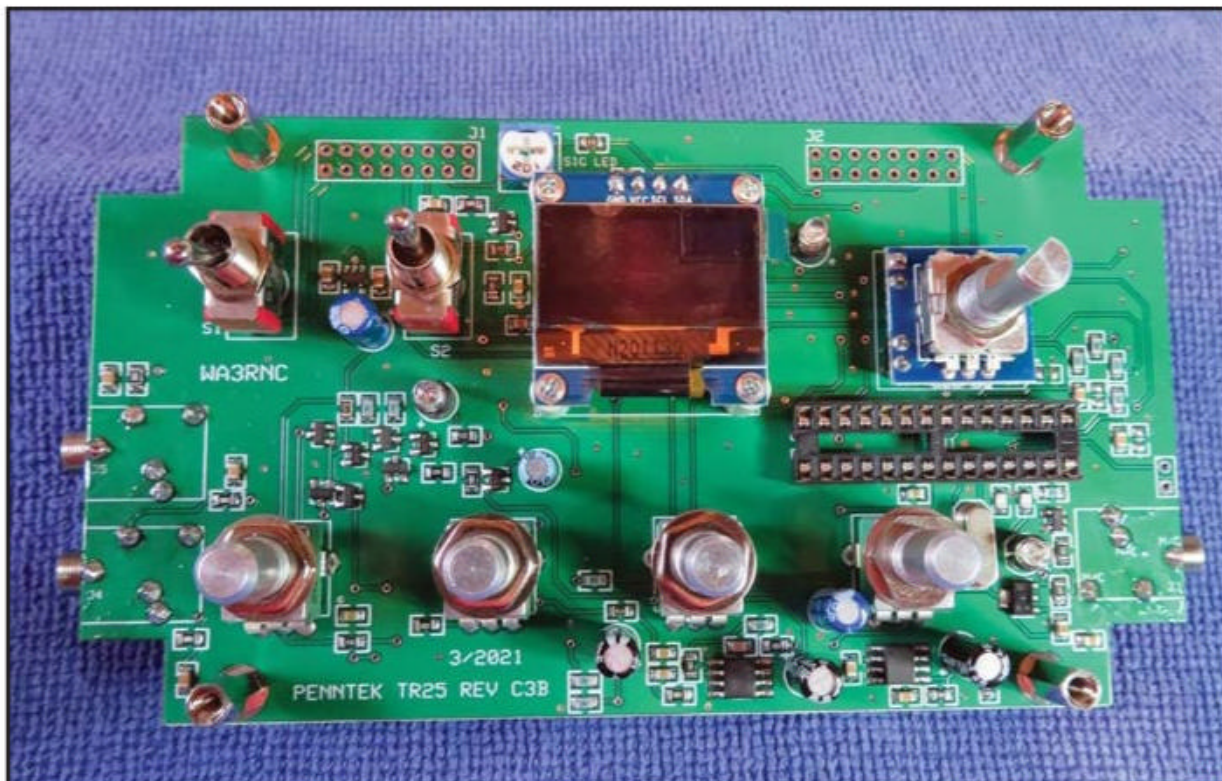
There are six toroids to wind, one of which is a bifilar transformer. The good news is that if you really do not like winding toroids, you can order an optional pre-wound set of toroids. I didn't find winding the toroids to be especially difficult, and the bifilar one has the red / green wires already twisted together to make winding that one even easier. The instructions call out the lengths of wire to be used for each toroid, which is something I find very helpful, so I am not winding from an excessively long piece of wire. There is enough spare enameled wire supplied to be able to rewind a toroid

if needed. A nice touch is the inclusion of a flexible piece of fine sandpaper in the toroids pouch, making cleaning of the toroid leads much easier. I not only used the sandpaper, but also the hot solder blob method to totally remove any remaining insulation as well as tinning the leads for better connection to the PC board.

When soldering the BNC jack to the board, it is advisable to use either the highest heat setting on your soldering station or an even hotter iron as the BNC jack sinks away a lot of the heat. Be careful to let it cool thoroughly before touching it after soldering as it retains heat. There are some components where it is noted that you must ensure the part is mounted as close to the board as possible. These taller components are mostly the electrolytic capacitors. I mount them



The upper board is resting inside the top part of the case with the lower board below it ready to begin.



The upper board without the interface connectors but with everything except the CPU IC installed. The OLED display board is in the top center of the upper board.



The six toroid cores and wire along with the supplied sandpaper ready to wind and prepare for mounting.

as close as possible and solder them, then I reheat each leg while pressing down on the top of the electrolytic capacitor to be sure it is as low as possible. Once the two boards are sandwiched together in the final assembly, it becomes apparent how close this tolerance is and why being extra sure to mount them tightly is important.

On the Air

I would estimate assembly of this kit to be an afternoon project and definitely a fun experience. I tested it on the air by

using the Reverse Beacon Network to see where I was being heard. I followed that by answering the CQ of an SKCC member. Donna, WB9TFF, was calling CQ on 20 meters when I plugged in a homemade 3-D printed straight key and answered. With solid 599 signals both ways, it was a very easy QSO. The TR-25's AGC circuit helped a lot when dealing with the stronger signals that evening.

You can order the Penntek TR-25 kit at <www.wa3rnc.com> for \$250 plus any options such as the pre-wound

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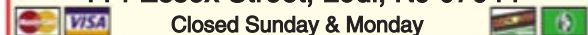
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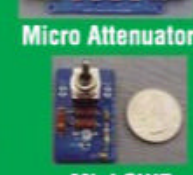
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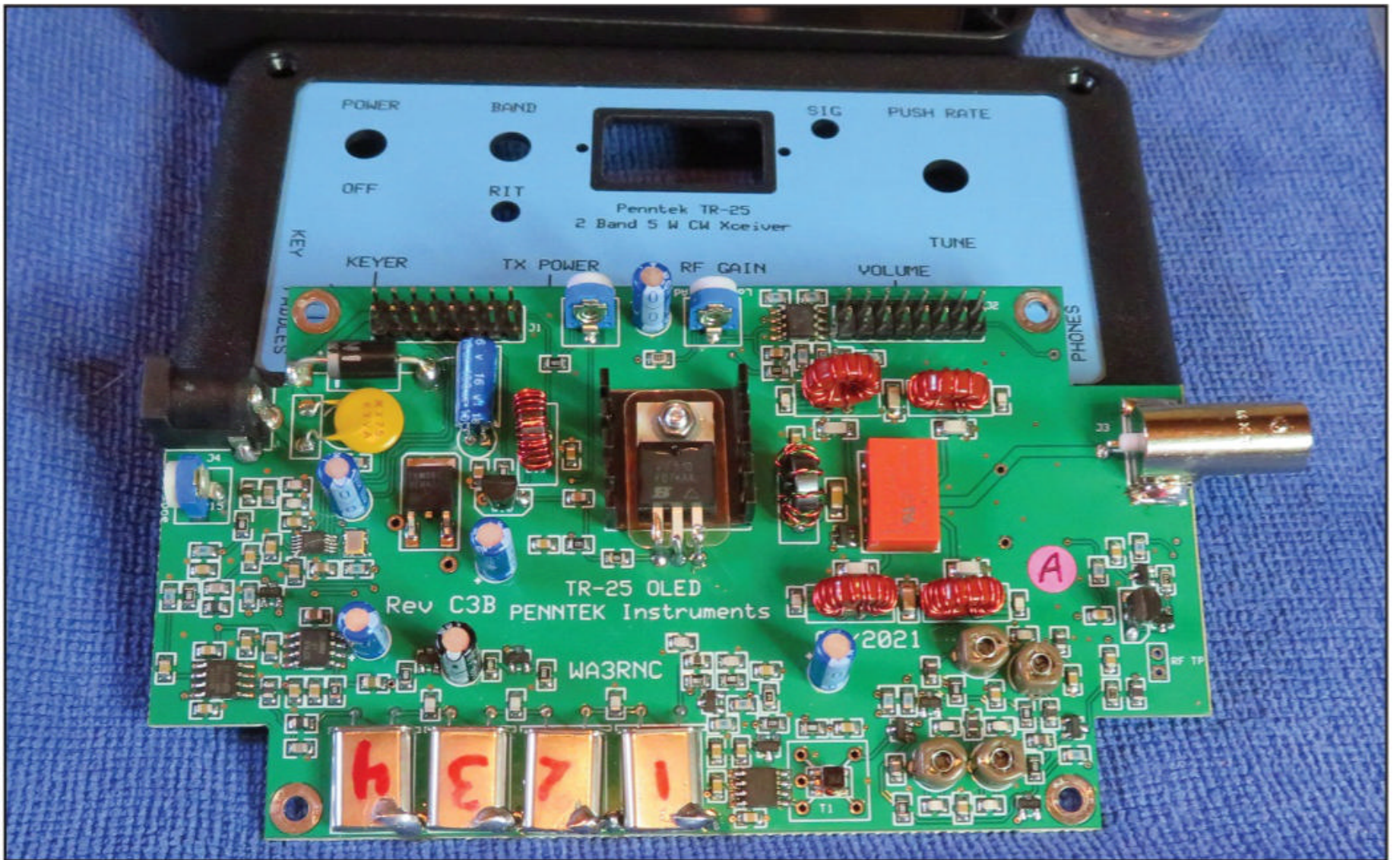
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The lower board with all six toroids is ready to be joined by the upper board for initial testing.

what's new



bhi Dual In-Line DSP Module

bhi has lowered the price on its Dual In-Line amplified DSP noise-cancelling module to \$262.99. Featuring a powerful dual-channel digital signal processor with a latency of 32 mS, the Dual In-Line offers eight noise filter levels of 8-40 dB of noise cancellation.

The Dual In-Line module caters for both mono / stereo speaker level and stereo line level audio input signals. Powered speakers can be connected to the stereo "Line Out" socket, and a passive speaker can be connected to the 7-watt amplified mono "Audio Out" socket. You can listen with headphones and a mono speaker at the same time, making the unit ideal for DXing, club stations, special event stations and Field Day events.

Operation of the noise cancelling is straightforward with rotary controls and a filter on/off switch and an 8-position rotary switch to set the noise filter level. There is also a switch that allows you to separate or combine the input signals. There is an input level control with LED indicators and separate output level controls for adjusting the line level and speaker output levels.

bhi Dual In-Line is available now and can be purchased at DX Engineering <www.dxengineering.com> or GigaParts <www.gigaparts.com>.



The completed Penntek TR-25 is ready to go on 20 and 40 meters!

toroids, if needed. You will find John, WA3RNC, very responsive in answering questions and providing technical assistance.

Headin' to Huntsville

The Huntsville Hamfest is coming this month, and I really look forward to seeing familiar faces in person again! I'll also be at the Peoria Superfest in September and possibly the Halloween Hamfest in St. Louis, as well as others as they restart.

– Until next time, 73 de KØNEB