

QRP Special:

KIT BUILDING

BY JOE EISENBERG,* KONEB

Creating Some Sawdust

With the antenna project mostly completed (see last month's column and cover), I found time for building again now that the cold weather season is at hand. I have received great signal reports from all over, including lots of DX, so the antenna improvement project was a great success. At both QRP and QRO power levels, everything is performing well, with a greatly reduced local noise floor and many more contacts. I was active in the 2020 ARRL November Phone Sweepstakes and am anxiously awaiting the results.

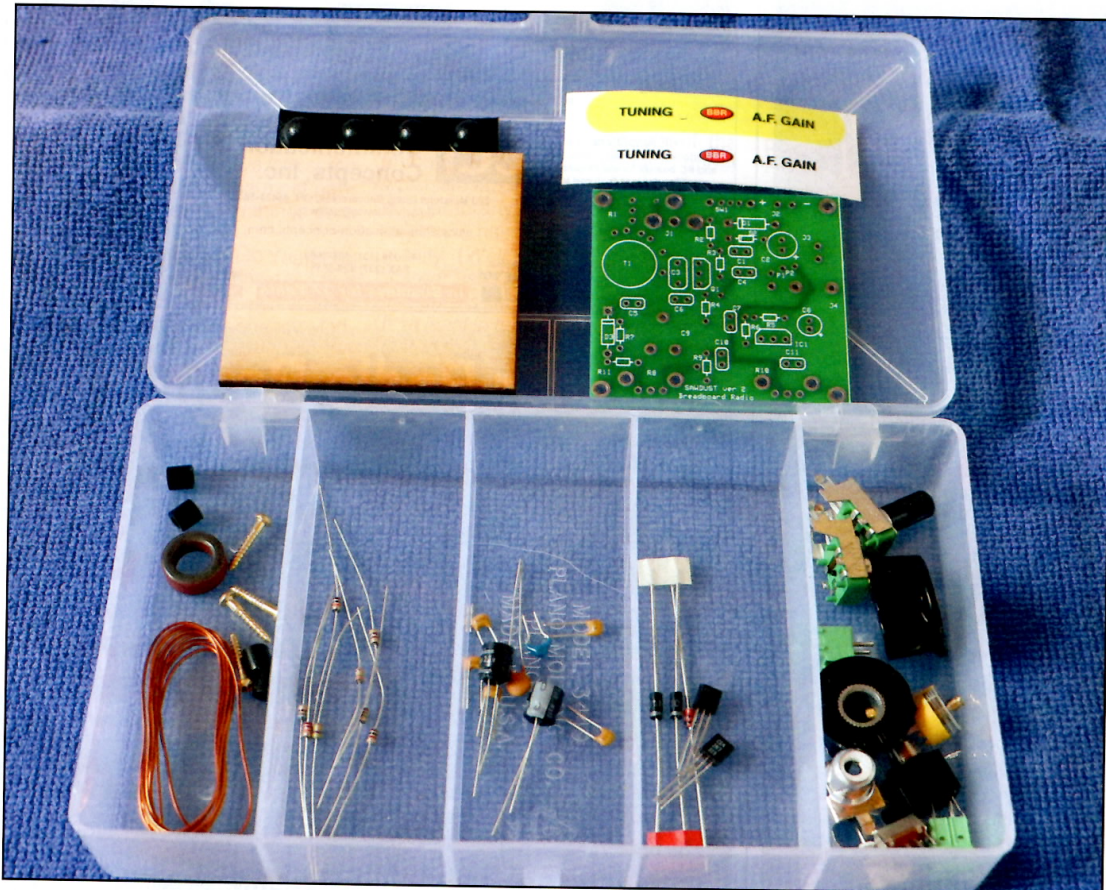
The kit I began this month is simple and functions well, either on its own or with a matching transmitter and T/R switch kit. Breadboard Radio, the brainchild of Bill Minikiewicz, W4FSV, has a variety of affordable and simple kits to keep you busy during these long winter months. Grouped together,

they can form a QRP CW station or using the Splinter II kit, a complete QRP CW transceiver on one board, including the straight key.

This month, I decided to assemble the Sawdust, a simple regenerative receiver for the 40-meter band. I'll follow up with some of the other Breadboard Radio kits in subsequent columns. This kit has assembly procedures that I found to be kind of the reverse order of many other kits I have built in the past. Instead of resistors first, etc., this kit begins with the assembly of the toroid. It is probably a good thing, because this toroid has three segments and needs to be assembled very carefully to ensure the rest of the kit assembly goes smoothly. In the past, I have advocated for some builders to pre-assemble any toroids and carefully mark them, so they go in quickly when that area of the kit is assembled.

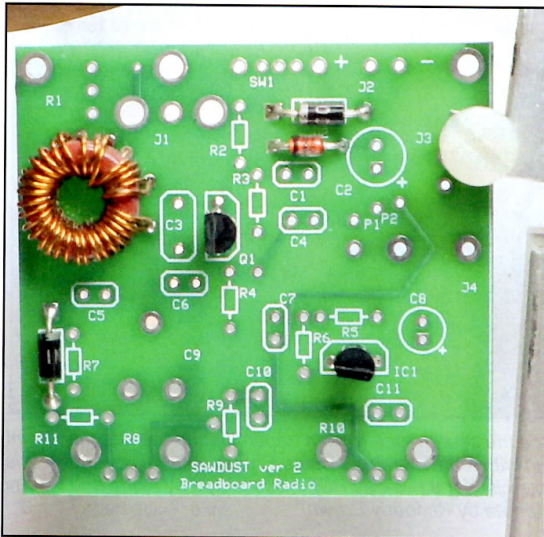
The reason for this toroid having three sections is that it is not only a transformer with a primary and secondary, but also has a "tickler coil" on it to enable regeneration for receiving

*7133 Yosemite Drive, Lincoln, NE 68507
email: <k0neb@cq-amateur-radio.com>

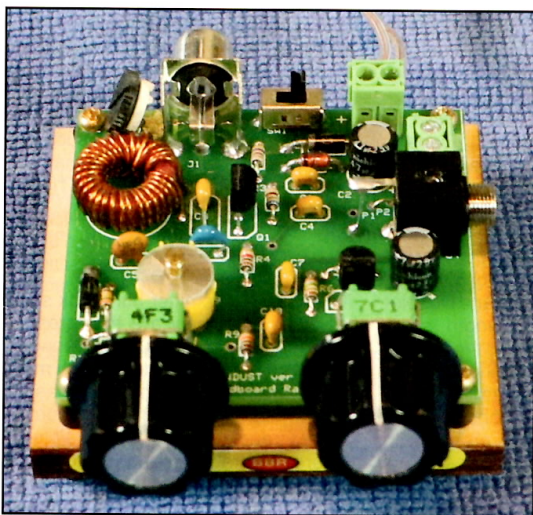


The parts for the Breadboard Radio Sawdust receiver sorted out and ready for assembly.

CW signals. The instructions are quite thorough, but I want to emphasize something that is mentioned in the toroid procedures. Some of the windings are done clockwise, and others counterclockwise. *If this procedure is not followed, it simply will not work.* Looking at the color photos of the finished toroid as well as the diagram farther back in the instructions, the direction of winding is very clear and must be followed as each of the three segments of the toroid are wound separately. I found the insulation on the enameled wire to be thicker and unable to be melted off with the hot solder blob method, so I burned it off and then used an emery board to clean it before I tinned each lead.



The toroid and the semiconductors mounted on the board.



The Sawdust is completed and ready to receive. The wires connected in the back go to the power supply. The terminal strip on the right connects to the matching transmitter and T/R switch, performing sidetone injection and muting.

You will find that if you follow all the directions carefully, each pre-tinned lead will line up correctly with the proper holes on the PC board. Be sure to perform the continuity test mentioned in the instructions before proceeding. Getting the toroid right simplifies the rest of the kit's construction. The transistor and the IC (which looks like another transistor) come next, followed by the diodes and capacitors. The resistors follow along with the jacks and connectors. I found the capacitors and the 1/8-watt resistors to be difficult to read, so I used a component tester to ensure the values of each of the parts before mounting them. The method I used for mounting the board to the supplied wood base was to use a pencil poked through the four corner holes in the PC board to mark the square wood base. I then used a Dremel® tool to drill four tiny pilot holes, so the supplied brass screws would go into the wood. There are four spacers supplied to be used as standoffs below the PC board.

Alignment is easy using either a signal generator or a portable general coverage shortwave receiver. I used the method described in the directions that involves a receiver. A characteristic of any regenerative receiver is a strong local oscillator signal on the desired frequency. It is this feedback that acts both to detect the signal and act as a BFO to be able to hear not just AM, but also CW or SSB signals. I used a small pocket-sized SW receiver that has a digital frequency display and tuned it to 7.040 MHz. I set the tuning pot to its midpoint and adjusted the trimmer capacitor with an insulated tuning tool until I heard the very strong signal in the general coverage receiver. There is a small pot in the back corner that needs to be adjusted for maximum signal or background noise as that is the input attenuator. I leave it turned to minimum signal reduction unless there are strong adjacent signals.

Since it was evening, the band was alive with lots of 40-meter CW signals as well as readily discernable digital signals. After mounting the PC board to the wooden base and applying the front panel sticker, I added the rubber feet, completing this nice little receiver kit. This kit can be powered by 9- to 12-volts DC, making it possible to use a 9-volt transistor battery for portable use. An interesting design feature is the ability to place a jumper on the board to allow using this kit as a code practice oscillator. Choosing another jumper option enables it to be connected to a transmitter kit and pass the transmitter sidetone to the audio amp stage of this receiver kit.

Give yourself about two hours to enjoy building the Sawdust receiver and think about using it to introduce a new ham into building kits and hearing the sounds of the 40-meter band. If you don't have a 40-meter antenna, a simple piece of wire, maybe 20- to 30-feet long, placed outdoors makes a good antenna for hearing this fun band. You can order the Sawdust for \$24.95 plus shipping at <<https://breadboardradio.com/index.html>>. Bill often throws in a bag of random extra parts with your order, which is a great touch. You can never have too many extra parts. I sorted mine into my parts bins to be sure to have them on hand for future building projects.

Hamshack Hotline

I have become a recent participant in Hamshack Hotline, an independent VOIP telephone network for hams. Hamshack Hotline is on the web at <<https://hamshackhotline.com>>. My HH# is 5855, so be sure to say hello if you are on HH. My fingers, toes, and everything else are crossed, hoping we get to see everyone in Xenia in May for "The Gathering" at Hamvention.® I hope to see everyone there.

– Until next time, 73 de KØNEB, HH#5855