Hints and Kinks

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ADDING TRANSMIT OFFSET TUNING TO THE UNIDEN HR-2600 TRANSCEIVER

◊ The Uniden HR-2600 is one of the finest 10-meter mobile radios I've ever used. It can transmit CW, SSB, AM and FM, and can even do repeater splits. As nice as the HR-2600 is, it doesn't include a means of exactly tuning in incoming signals. It's therefore possible to be as much as 50 Hz off another station's frequency because of the radio's 100-Hz tuning steps. Of course, you can tune the HR-2600's *receiver* exactly to the other station by using the radio's **RIT** (receiver incremental tuning) control, but this corrects only your receiver tuning and not your transmitter. What the radio needs is a transmit incremental tuning (XIT) control to allow you to move its transmit frequency independently of its receiver. Better yet, modifying the existing RIT circuitry to move the transmit frequency along with the receive frequency would make a simultaneous RIT/XIT control—a powerful feature. Here's how to do it.

To perform this modification, you'll need a soldering iron, solder, electrical tape, pliers, a screwdriver, and a wire cutter/stripper. You'll also need two 8-inch pieces of small-gauge hookup wire, which I'll refer to as Wire 1 and Wire 2. (Regular hook-up wire or speaker wire will work fine.) Finally, you'll need a 10-kΩ potentiometer to calibrate the new RIT/XIT control. Either a thumbwheel style or PC-mount pot would be a good choice.[1] Refer to Figure 1 as you move through the steps to follow.

1. Start by placing the HR-2600 with its speaker side down. Disconnect the antenna coax and power, remove the top four cover screws, and place the top cover to the side. Turn the radio around so its back faces you. There are two small, square, green PC boards mounted vertically to the radio's inside front, one on each side. Locate the one on your left first. Notice that there are three vertical soldered pins on the top right corner of this board. Solder one end of Wire 1 to the third pin down from the top. This point is common to the radio's original transmit and receive control voltages.

2. Locate the vertical, square, green board on the right. There are seven vertical soldered points on the left side of this board. Pins 6 and 7 are actually connected together on the board. Also, one of the two white leads from the radio's panel lamp is attached here. Solder one end of Wire 2 to this lamp-attachment point. This will supply the voltage for our new RIT/XIT control.

3. Turn the HR-2600 so its front is toward you, and locate VR11. It's in the radio's front right section (the end closest to you). It's also the rightmost one of three variable resistors (white, with crosses on their tops). VR11 allows you to adjust the voltage that sets the radio's transmit frequency. Notice diode 43 (D43) just in front of VR11. Cut this diode's cathode wire close to the circuit board. (The cathode end is the one closest to you and is marked with a yellow band.) Gently straighten the diode so it stands vertically. This keeps it away from the cut you just made.

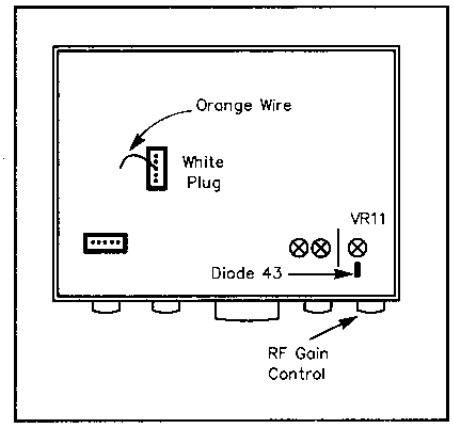

Figure 1—Service-bench view of the Uniden HR-2600 transceiver, showing connection points for AC3L's XIT/RIT modification.

4. Find the white, five-wire jumper plug located just to the left of center on the radio's large circuit board. Cut the plug's center wire (orange) about 1 inch above the white plug. (This wire provided voltage that determined the receiver frequency.) Tape the top wire of your cut (the end not attached to the plug) to insulate it from other wires.

5. Solder the remaining free ends of Wire 1 and Wire 2 as follows: Solder Wire 2 to the 10-kΩ pot's center terminal. Solder Wire 1 to either of the pot's two end terminals. Position and tape the pot to any convenient spot (I taped mine to another wire) that you can access with the cover removed, making sure that it can't short circuit to another component.

6. Reconnect the HR-2600 to its antenna and power supply, but do not replace its cover yet. Now you must recalibrate the radio's frequency display—that is, you must make its operating (transmit/receive) frequencies agree with its frequency display. Since a single voltage source now controls the radio's transmit and receive frequencies, you can make its operating and display frequencies agree with the help of a local ham transmitting on a known frequency. That is, with the other station transmitting on a known frequency that's a multiple of 100 Hz (displayed as, say, 28.400.10 on a transceiver with 10-Hz tuning and display), tune the HR-2600 to display the same frequency (28.400.1). (The other station will probably sound strange because your modified HR-2600's operating and display frequencies don't agree yet. When you start to calibrate the display, don't tune in the other station so it sounds right; tune your *radio* so it *displays* right.) Then, with the HR-2600's **RIT** (now **RIT/XIT**) control to set to its center **OFF** position, adjust the new 10-kΩ pot so the other station sounds exactly right.

If you want to get fancy, you may want to consider adding an external switch to allow you to toggle between RIT/XIT and the original RIT function. (I haven't had a need for this, so I'll leave this mod to you.)

That's it! With the new RIT/XIT turned on, you should be able to vary your HR-2600's operating frequency 1½ to 2 kHz on either side of its displayed frequency. Remember: The display doesn't change as you adjust the **RIT/XIT** control, so watch those band edges!—*Edward Oros, AC3L, Allison Park, Pennsylvania*

[1]Radio Shack lists two candidates for this 10-kΩ part in its 1995 catalog: a "horizontal style" (271-282) and "15-turn" (271-343)—*Ed.*

FEEDING A QUAD WITH OPEN-WIRE LINE INSTEAD OF COAX

◊ After purchasing a GEM quad antenna, I determined that the best place for the antenna on my property was 325 feet from my operating position. Adding the height of the 40-foot tower out to the antenna feed point yielded a total required transmission-line length of of approximately 375 feet. Feeding the quad even with low-loss coax could easily result in a 3-dB loss at 28 MHz. In other words, *half* of my transmitted power would be lost in the coax and never get to the antenna!

At the encouragement of Jay Kolinsky, NE2Q, I looked at using open-wire transmission line. Using readily available 450-Ω line, the losses would be low and the line cost went down to only 10 cents per foot. As we learned later, there were even bigger benefits.

Feeding the Antenna

I've talked to a lot of people using quads, and the most common feed method seems to be to feed each driven element via its own coaxial feed line. They use a remote antenna switch to select the desired driven element. I couldn't find anyone who had fed their quad with open-wire line. A call to the antenna manufacturer produced some suggestions, but not firm guidance on how to do the job.

The antenna was set up for for four bands: 20, 17, 15 and 10 meters. Jay and I decided to take the easy way out and tie all of its driven elements together, spacing their terminals with a 1½-inch porcelain insulator, and feed the all four driven elements with the open-wire line as shown in Figure 2. We ignored the driven elements' sum feed-point impedance, since using open-wire line meant using an antenna tuner between the transmitter and the line, anyway. We did not attempt to tune the antenna's driven elements, deciding instead to carefully adjust the quad's front-to-back ratio on each band and let the tuner take care of the rest.

Unexpected Results

Careful front-to-back ratio adjustments