

## Help for the HW-2036 — hum mods for Heath-equipped hams

**A**lmost immediately after I put my Heathkit® HW-2036 on the air, two problems cropped up. First, there was a terrible hum on the transmit audio whenever I tried to work

through a repeater, and second, the phono plug coax connector kept coming loose. Daunted but not defeated, I put the thing back on the bench and proceeded to dig into the problems

with great exuberance.

If you live in an area that doesn't require a Private Line® (PL) for repeater access you may never have noticed the hum. But if you use PL you undoubtedly

have been told that you have a noticeable—if not objectionable—hum on your signal. It's not humming because it doesn't know the words, it's humming because the injection level is simply too high. Unfortunately, Heath did not see fit to include a level adjustment. Enter modification #1.

The square-wave output from the tone generator is fed through several stages of RC filtering to R134, a 470k resistor. (See Fig. 1.) Although R134 is part of the waveshaping network, its actual value does not appear to be critical. Replace it with a pot and you'll have a tone level adjustment.

In my first attempt at this mod, I used a 750k pot—and promptly ran out of adjustment range! A second trip to the junk box produced a 2.5-meg linear PC board pot that worked very well. Actually, any value from 1 to 5 meg will work. The lower the value, the easier it is to adjust—but the more you risk running out of adjustment room.

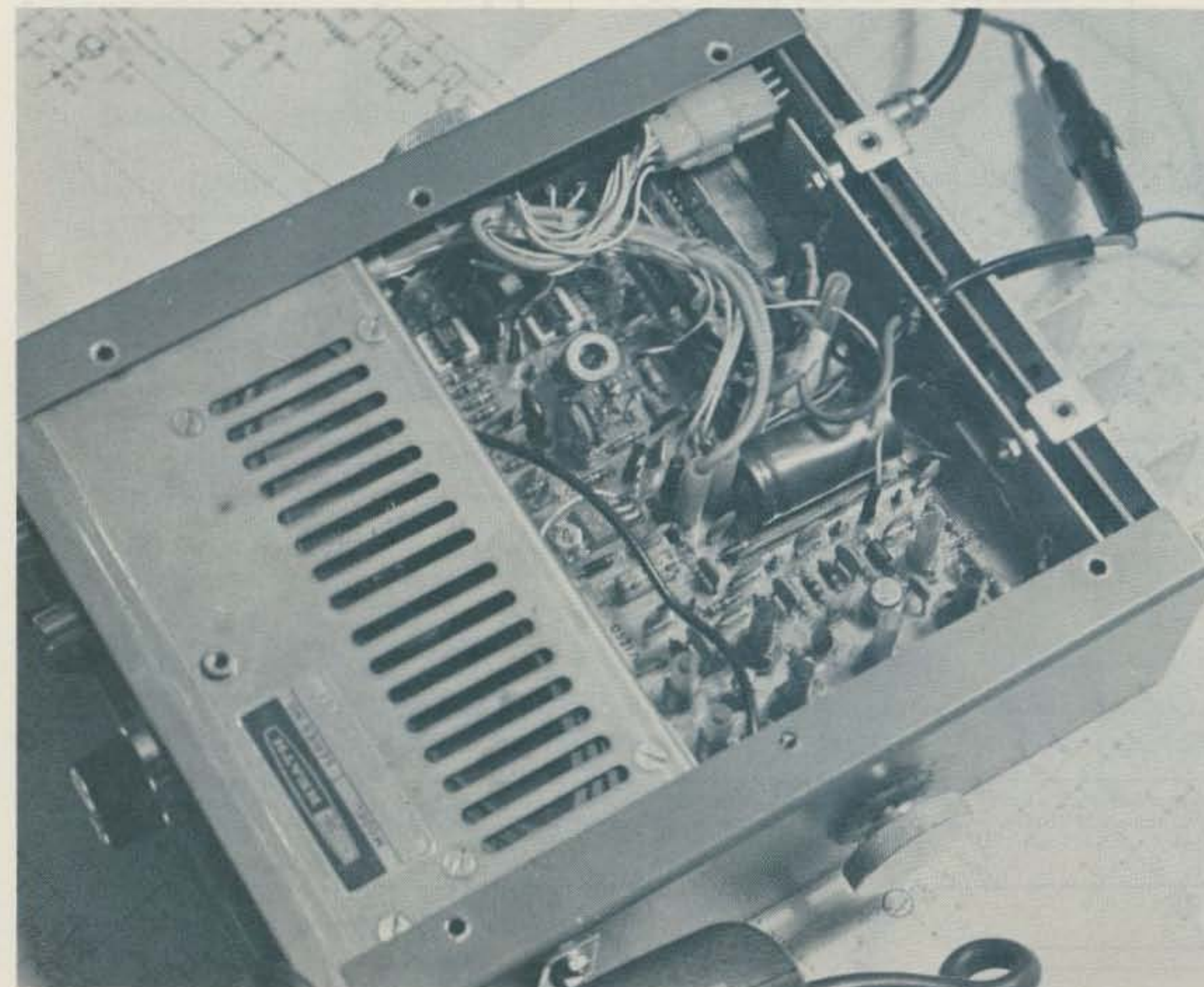


Photo A. This shows the completed modification. The PL adjustment pot is mounted horizontally behind the deviation pot. Note the coax pigtail at the antenna jack.

To prepare the pot, first

solder one end terminal and the arm together. Then solder about 3/4-inch lengths of wire to each end terminal. Bend the leads straight back from the front of the pot and set it aside for a few moments.

Pull the bottom cover off the rig to expose the transmitter circuit board. R134 is located behind the deviation pot. (See Fig. 2.) Snip the resistor in half, crush the carbon and composition from the leads, and bend the leads straight up. Now solder the leads from the pot to the leads protruding from the circuit board. Be careful—not too much heat—you don't want the solder to flow on the foil side of the board.

To adjust the pot, set it for about 500k and get into a QSO on a PL-controlled repeater. Slightly increase the resistance on each transmission. When the other stations report that they can no longer hear the tone, note the position, but continue increasing the resistance until you can no longer hold the machine. Then set the pot midway between those two points. If you find that you can no longer hold the machine while the tone is still audible, check the frequency of the tone.

As long as you have the rig on the bench, you may as well consider one other simple mod. My rig is in and out of the car several times a day. At that rate, it didn't take long for the phono plug coax connector to become loose and intermittent. After taking the rig apart several times to

tighten up the connector, it finally dawned on me that there must be a better way.

One way would be to replace the phono jack with a chassis-mount BNC connector. That would require some (slight) mechanical rework of the box, however. Since my mechanical ability is zero—I can't even put the cap on a peanut butter jar without getting it cross-threaded—I began considering alternative solutions. I decided that a short piece of coax and a few connectors could do the trick.

For most practical purposes, the input and output characteristics of a half-wave section of coax are the same. If you were to solder a half-wave section of coax to the output of the rig, you would effectively move the output point to the end of the coax. That is the theory.

To put theory into practice, solder a UG-89/U BNC connector to one end of a piece of solid-dielectric RG-58. On the other end, solder a phono plug. The distance from the open end of the UG-89 to the tip of the phono plug should be 24-1/2 inches.

Now, tack solder the phono plug to the antenna connector on the rig. I emphasize *tack solder*, because you may eventually have to take the rig apart for maintenance, and a completely soldered connection would be a bear to get apart.

Replace the phone plugs in your car or shack, or wherever else you operate, with UG-88/U connectors; you'll be back in business

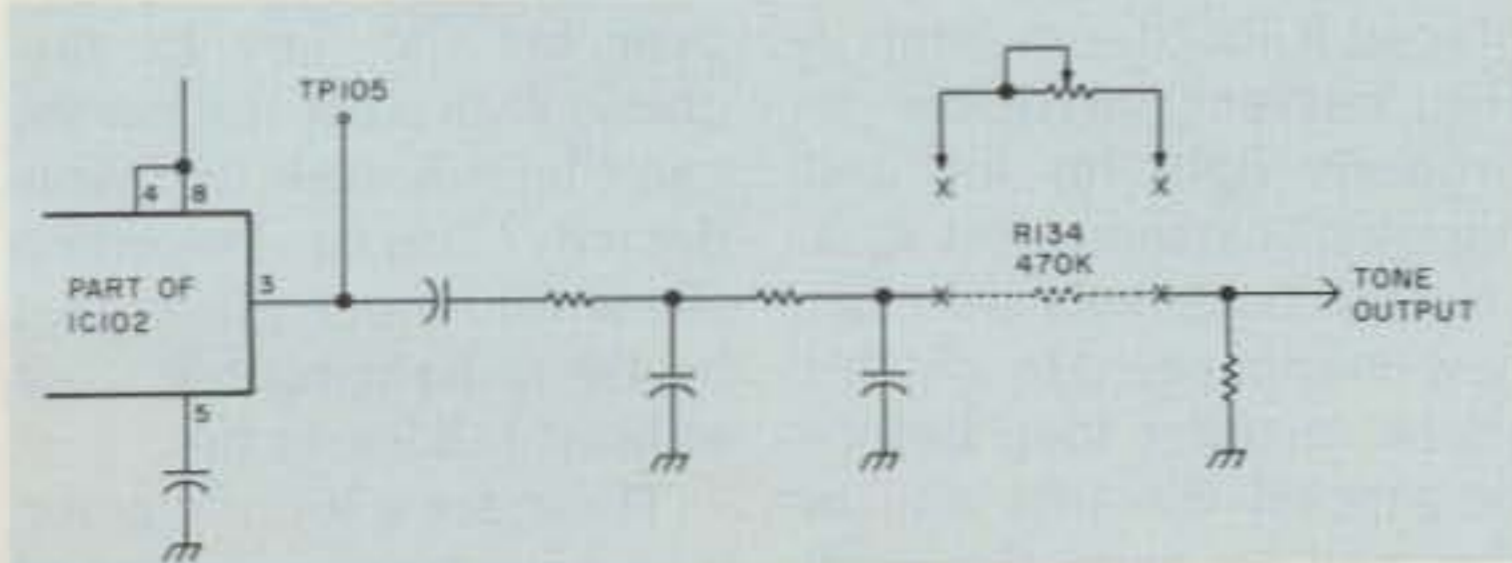



Fig. 1. The tone generator, IC102, and the electrical location of R134 in the output circuit.

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without intermittent coax connectors.

There are several other mods which I would like to describe in future articles.

In the meantime, you can enjoy operation without intermittent coax connectors and without the hum. ■

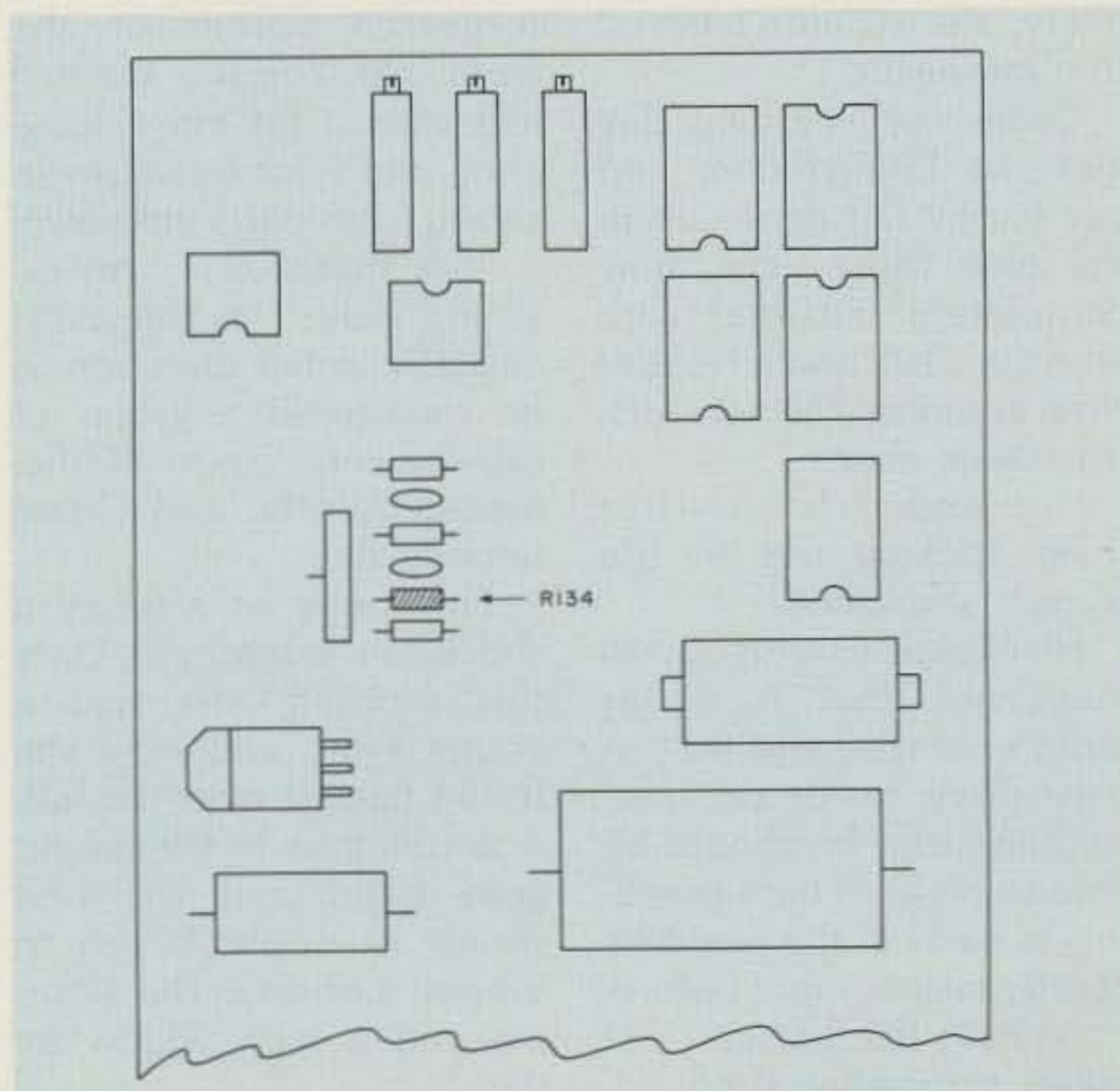


Fig. 2. The physical location of R134 behind the transmitter deviation pot. Most minor components have been omitted for clarity.