

## An External Mic for the Radio Shack HTX-202/404

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After purchasing a used Radio Shack HTX-202 two-meter HT, I found that I really liked the audio from the radio's built-in speaker. However, in some situations it was inconvenient to pick up the radio to use the internal mic; for example, when using the rig as a mobile on an external antenna. Since this radio has separate jacks for an external speaker and external mic, I decided to build a little microphone for it.

Actually, I already had an AT&T external mic that worked quite well. It was originally designed for some ancient cellphone auto setup and its PTT button didn't seem very rugged. Since I got this mic from a discount electronics distributor several years ago, the likelihood of finding a replacement was nil. Thus my desire for building another mic with a more rugged PTT button.

For this style of HT, the external mic circuit carries both the mic audio and a DC component to activate the rig's PTT circuitry. The PTT is activated by the voltage drop across a resistor which is in parallel with the mic element. The accompanying diagram shows the circuit. All HTs EXCEPT those from Kenwood use a circuit like this, but the resistor values are different for different makes. For the HTX-202 a value of 2.2 Kohms is good. For the Icom IC-T2H a value of 33 Kohms is needed. Yaesu and Alinco use something else. (Start somewhere in the vicinity of 2.7 Kohms and go up and down from there.)

The resistor value that works best may be different for different electret mic elements and the value of the resistor has an effect on the audio drive from the mic. Thus, expect to do some experimentation!

Use a rugged, long-life PTT button, since it gets pushed a lot. Some inexpensive pushbuttons are not made for heavy-duty use. I found some nice discount pushbuttons from All Electronics ([www.allelectronics.com](http://www.allelectronics.com)), but their inventory changes constantly so I won't bother with a part number.

What about the electret element? You can find these many places. What I did was take an el-cheapo cellphone headset and remove the whole mic boom from it. I then friction fit

the boom in a hole on the side of a small plastic box which supports the PTT button and contains the resistor. I used the headset cord for the rig connection. Generic cellphone headsets use a 2.5mm stereo connection, but for my mic only the tip and sleeve connections are used. I found that the mic sounded better if I put a small piece of open-cell foam in front of the mic element. This kept it from rattling in its case and reduced popping.

I also built a second mic with a bare electret element inside the plastic box, with holes drilled in the box's side. This mic worked, but it had somewhat more bassy, hollow sound to it. One ham liked it more than the other, while another ham had the reverse preference! The element was also obtained from All Electronics, and it even came in a small rubber shock mount which just fit in my enclosure. The number and placement of the holes in the box can make a difference, and it also helped somewhat to put a baffle inside the box cutting down the size of the chamber containing the element.

Besides generic cellphone headsets, you can also use those cheap microphones sold for use with a PC. You can hack up the mic or maybe add an external PTT box containing the pushbutton and resistor. I have used generic cellphone headsets as rig headsets for my FT-817 and FT-8800R by building a box with the PTT button and circuitry that goes between the headset and the rig. But for non-HT rigs you need different circuitry as the rig does not put DC on the mic line. The same can be done with a PC headset--only the connectors are different.

These are fun, low cost projects you can try. They use inexpensive parts and are quick to put together. Be sure to look in your rig's manual, as some do show connections for external mics. If there's no info in the manual, go to the Internet and look for guidelines for hooking up packet TNCs to HTs. These can be helpful, although you must change the circuit a bit for the PTT button.