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IC-970H 9600 Modifications

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Icom IC-970H/A MODIFICATION For 9600 bps Operation

WARNING - READ ALL OF THIS BEFORE STARTING ANY MODS!!

In case you didn't read the above warning, read all of these instructions before starting. Once you begin to make this modification it will be more work to un-do it. While reviewing the instructions, familiarize yourself with the locations and adjacent parts by reviewing the schematics for the IC-970 that were delivered with your user manual or in the service manual.

If you aren't confident, don't proceed with the following steps:

1. Prepare three lengths of small coax, each in series with a 10mfd tantalum capacitor (Radio Shack 272-1436 suitable). The capacitors can be made an integral part of the coax using shrink tubing such that the braid of the coax and the one free lead of the capacitor extend from the end of the shrink tubing. The capacitor lead and the braid lead should be brought out of the shrink tubing, each inside of its own insulated sleeving. The capacitors provide DC blocking and the shrink tubing arrangement provides as small a package as possible at the Main circuit board end of the coax lead (space is a bit tight).
2. If you have the IC-970-H model, remove the power supply from the top and lay it over the side of the IC-970. This will reveal a metal tray beneath the supply. Don't drop the screws!!! It will be a real troublesome job trying to find them again down in the guts of the radio. Use a screwdriver with a screw holding attachment. It will be a real help.
3. Remove the metal tray from the top of the radio. Don't drop the screws. This will reveal the MAIN circuit board where all wiring will be done.
4. Remove all screws around the circuit board holding it to the radio. Again, watch the screws!!! By now you can guess that I dropped one.
5. Locate IC-11, IC-5 and D16. The Main Band receive FM audio is on pin 9 of IC-5. The Sub Band receive FM audio is on pin 9 of IC-11. The transmit audio is sent to the anode of D16.
6. You must turn the circuit board over to reach the foil side to make connections. This may require unplugging one or two of the inter board connectors.
7. Solder the capacitor leads of the prepared coax to pin 9 of IC-11, pin 9 of IC-5 and anode of D16. The connections may be made to any convenient spot on the foil that leads to the proper connection spot. The coax braid lead is soldered to nearby chassis ground foil. You will have to trace the ground foil from the nearest mounting screw hole out to where it comes near to the connection points. Check carefully for solder bridges, shorts, etc. Be sure to label the free ends of the coax NOW!! If you don't, you will kick yourself around the block when you get the board back in and then try to figure out which coax lead is which. Replace the board, routing the free ends of the coax to the right rear of the radio near the accessory socket. Don't drop the screws!!
8. Remove the blank metal cover plate from the spare accessory plug holes in the back of the radio. Fabricate another cover (easy to do) so you can retain the original for replacement sometime when you sell the radio. Mount a small DPDT Radio Shack type switch on this metal plate so it protrudes from the rear through one of the two blank accessory holes. This switch will switch the 9600 audio output from either the Main Band (for terrestrial packet) or from the Sub Band (for satellite packet) .
9. Wire the two receive audio leads and another short length of small coax to the switch so you can switch either of the receive audio leads to the short length of small coax. Solder the coax braids to the unused switch terminals. It is not required, but it is a nice place to terminate these leads. Replace the new cover plate with the switch protruding from the back of the radio. It is easy to remember the switch positions if you mount the switch such that toggle up is MAIN

band and down is SUB band receive.

10. The D16 lead and the now, single receive audio lead from the switch will now be terminated on two unused pins on the DATA socket on the rear of the radio. Connections will be made on the small circuit board attached to the data socket. This whole assembly can be removed by removing a couple of screws and one cable plug.
11. On the small circuit board find the pads that go to DATA socket pin 6 and pin 11 (currently not used). Solder the D16 lead to one lead of a 2200 ohm resistor and the other lead of the resistor to the pad going to pin 6 (resistor prevents loading down the regular mic audio). You can put this resistor in series with the capacitor at the D16 end if you wish and are neat about it. I personally feel it should be installed at the DATA socket as described so that if you ever want to change its value to help the transmit audio level on a stubborn 9600 modem, you won't have to worry about dropping screws again. Solder the receive audio lead to the pad going to DATA socket pin 11. Solder both the coax braids to a nearby chassis ground pad.
12. **CAUTION:** Data socket pin 13 has 13.8 volts DC on it. It is a good idea to cut the solder side of this pin or otherwise insulate it on any plug you plug into the DATA socket. The spacing is close and soldering to the 13 pin "DIN" plug is rather trying. You DO NOT want 13.8 volts DC getting shorted to something and vaporizing a foil trace in your radio or otherwise going into your 9600 modem by accident.

We used this arrangement at the Soviet Space Exhibit and it worked fine. I have made mods to both the H and A models of the IC-970. Good luck and have fun (You will if you don't drop any screws).

- AMSAT.ORG would like to thank Roy W0SL for this article