

My Old Shaky Hands and Failing Eyesight

7-10-2000

I suppose that the following rambling is a story of devoted love for an inanimate object: My trusty **Yaesu FT-890 AT HF** ham radio transceiver.



I purchased my little transceiver in about 1988 from Ham Radio Outlet. It has been a real workhorse going from a fixed base to a mobile unit and back to fixed on many occasions. It has never failed until April 2000. I truly love my little 890 AT - the one with the auto antenna tuner built-in. I can hardly understand why Yaesu quit making this all-in-one package. It is one of the finest HF radios I ever owned and I grew up with MultiElmacs, Hallicrafters, Hammurlund, Heath and Collins S-Line gear. Arguably, this is old tube junk but it was state-of-the-good-stuff in its time. What sold me on the Yaesu transceiver is its incredibly small size and the inboard antenna tuner. This rascal gives better than 1.5:1 on a cheap, G5RV from 160 to 10 meters. That's not too shabby.

PROBLEM

The problem began as a loud static that appeared over the receive audio. Before going any further let me say that the transmitter portion of the transceiver has never hiccupped or failed. An additional dilemma of the noise problem's cause (facing any repair person) was that the static only appeared sporadically and there seemed to be no way we could cause the problem to rear its ugly head. We thought that we had to wait for the problem to occur. I sent the radio to Yaesu (California) for repair and they said they could not find any problem in the radio. To be fair, it didn't act up for them so they had nothing to trace and repair.

About \$189.00 later (after UPS shipping back and forth from Houston to California and adding the Yaesu technician's estimate charges) I just decided to try to trust the rig to last for a week or two before having a complete hernia. I was ignoring the problem hoping that it would hold off for a while - maybe a week or so. I went ahead and put the radio in our Dodge van for a vacation trip, turned it on for a quick test and the radio immediately began doing its nasty thing. I was hoping the problem was my imagination. I bee-lined it over to **Houston Amateur Radio Supply** listening to the awful static and noise all the way to the store. I finally bought a new Yaesu **FT-100** from George for the trip. Betty and I were leaving (the next day) on a long-planned, extended drive through Texas and I didn't want to be without a mobile rig. Also, I'd been eyeballing the ads for this rig for a long time because I knew that it would replace all 3 of the radios in my current mobile installation and I would no longer need to haul my FT 890 out to the van every time we took a little trip. Since George has a good reputation as a repair technician, he convinced me to leave the radio with him to evaluate while I was traveling. I could hardly wait to call him when we got home - hoping that he had solved the riddle. But, as luck would have it, the radio didn't act up during the entire 2 weeks it was in his shop. I really was starting to feel paranoid. Why was this little radio - which I truly loved - causing me so much grief?

GUESS I'M NOT TOO OLD AFTER ALL

After our vacation, I brought the radio home (another \$25 checkout charge for George) and made a beautiful 5/9 contact on 15 meters with Bob in the UK. The radio didn't act up at all for over an hour. But, the next morning I turned on the radio and **BEHOLD!** - it started acting up immediately. Now I was getting mad.

Years ago, I used to be a pretty decent bench technician, repairing anything electronic from TV's to fish finders and I've homebrewed all my life and built a ton of Heathkit gear. So, brazenly, I decided to tackle the repair problem myself even though my middle-aged eyesight requires me to use magnification eyeglasses and my hands are a little more shaky these days. I really felt that I was probably too old to tear into my beloved HF rig. I figured I would do more damage than good. **SMT** haunts me.

I am certain that all of the guys who looked at my radio and heard my tale of woe had the same thoughts - "...either this guy has transmission line noise at his QTH or he is a purist or he is just plain nuts..." They had no idea how many "tests" I had already run to eliminate interference causes and they never got the chance to hear the noise for themselves. I'm certain that any technician could have solved this problem if they could have had the radio act up in their presence. The static would completely drown out reception and would stay in the audio even turning the **RF ANT** gain fully down. That kinda told me that the problem was likely to be in the audio stream somewhere and hopefully not in the receiver front end.

My bride Betty came up with the idea that she could get the schematics enlarged at Kinko's. It turned out that it was the best suggestion since the invention of the wheel. The originals that came with my user manual were tiny little doohickeys that even taxed my magnifying glasses. The blowups are wonderful.

Now that I could look over the schematics with ease, I got a little bolder. I opened up the transceiver and started looking at some **TP** waveforms on my rarely used oscilloscope...just to get a preliminary feel for the board(s) layout and locate where stuff was. I prayed, "Lord please help me...don't let these feeble, shaky hands ruin all those tiny wiring harnesses." I felt like the proverbial bull in the china factory. I just planned each move very carefully and found that I could actually move around inside the rig. I kept reminding myself to be careful.

COAXING THE PROBLEM TO OCCUR

Cooling and heating components has always yielded good troubleshooting results for me so I started cooling components one at a time. I use a straw to isolate the component I am trying to cool. Coolant spray can diffuse in many different directions and cause other components to react. I press the straw over the small transistors, caps and diodes and isolate the coolant to the individual components I'm blasting. Nothing on the **RF** board seemed to do anything. I finally got to the **LOCAL UNIT** board and also did some "tapping" of components to see if I could discover something loose or cracked - a circuit board trace cracked - anything.

Then I tried some coolant spray and **BEHOLD!** - I hit pay dirt. A little **IC (Q1049 M5201L - ACT FIL)** started acting microphonic (like an old tube). I could scratch it with my fingernail, even blow on it, and it would almost act like a microphone. As the device warmed it would begin a little motor-boating sound and finally the static - the main problem - would show up. I found that I could create the problem with short bursts of coolant to the IC nearest pin 1. At least I now had a real **PROBLEM** that I could identify, create and observe. I still wasn't convinced that it was the IC that was failing. I've had mica capacitors become microphonic on me in the old tube days so I carefully checked several caps in and around Q1049. Nothing. So, I ordered a new **IC** from Yaesu and asked for overnight delivery: \$1.36 for the IC and \$24.00 for overnight. Go figure.

HAPPY DAYS

Well, the IC arrived today and I soldered it in. Now the **FT890** runs like new. The problem has been solved and my little puppy is, once again, firing on all four - just like new.

I remember the days when some friend had an intermittent problem with their TV and they would ask me to fix it for them. I would "cook" the sets for days before the problem reared its head. Sometimes I went searching for a faulty part based on what they described as the symptom and used my trusty freeze spray like I did on the 890. These kinds of quirks, that don't show up at the most opportune time, often have to be coaxed into misbehaving. I guess if someone all of a sudden froze my nose I might get a little fretful, too.