

The Capacitive Coaxial Ground Wire

— could this be the end of TVI?

Have you been awarded the WAS or the WAC awards? Now, don't confuse these awards with the Worked All States or Worked All Continents awards. I'm referring to the Worked All Stereos and Worked All Consoles awards. Well, the two awards I am referring to are not the most popular awards being issued these days, especially with your neighbors. I was the unhappy recipient of both of them not too long ago.

An amateur friend of mine found the problem, made a simple modification, and I am happy to say that these two awards will adorn my shack no longer. Want to know what the modification was? Well, I'm about to tell you, and as I do, I'm going to tell

you a little bit about my problems.

I recently had the fantastic experience of setting up my very own shack. Being an American GI stationed in Germany, it took me about two months to get my German call after passing the US General Class test a year ago April. During this two month period, I ordered and received all my equipment and was ready to set up my shack. With the help of some friends, I put up my beam, ran the coax, and was ready to plug in the transceiver.

When we got ready to hook up the ground wire for the transceiver, we discovered that this would necessitate running about 30 feet of wire out the window and down the side of the building to the ground rod. You see, I live on the second floor of a four story apartment building. No problem, though; we had plenty of good copper wire. With the ground wire hooked up, we were all ready to put the station in operation. I plugged in the rig, tuned it up, and started

making contacts.

Boy, this amateur radio has got to be the greatest hobby in the world! As fate would have it, however, there came a menacing knock on the door. It was a couple of very irate neighbors who in no uncertain terms informed me that I was completely wiping out their TVs and stereos, including a gunshot scene from "Starsky and Hutch" and the cannon shots at the beginning of the *1812 Overture*.

I was completely shocked and, to say the least, a little discouraged. I pacified the neighbors and went to work immediately to find out the source of the interference. I was using a match box and a low-pass filter, and all the equipment was connected and operating correctly, so what could be causing the problem? I had used up all my electronics expertise just passing the test and setting up my shack, so I shut the rig off and decided I had better get some additional help.

I called my good friend Bill Pardue AA4AG/DA1KV, who holds an Extra Class license, and ex-

plained my problem. If anyone could find the source of the interference, he could. He came right over and checked out the entire station. Everything looked good until he came to my ground wire. At about 30 feet, the ground wire was resonant at 10, 15, 20, and 40 meters. He suggested we check it with a field-strength meter. As Bill operated the rig, I went outside with my field-strength meter. I set the sensitivity about half-way as I rounded the corner of the building. I got to about four feet from the ground wire and the needle of the meter was already pegged out. I yelled the results to Bill, who was listening through the window.

"Disconnect the ground wire," he shouted back.

I knew we couldn't run the rig without a ground wire, and I didn't have the slightest idea what Bill had in mind, but I disconnected the ground wire and Bill threw the other end out the window. About five minutes later, I saw some coax coming out of the window. Bill

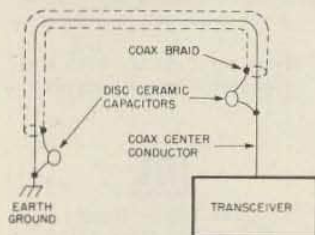


Fig. 1.

yelled to hook the center conductor of the coax to the ground rod. As the end of the coax came within reach, I noticed a capacitor had been soldered between the center conductor and the braid. I hooked the center conductor to the ground rod and stood back while Bill started transmitting again. With the sensitivity set where I had had it before, I checked the field strength

again. Nothing. I moved closer and closer and still no reading. Finally, with the sensitivity set at full and the antenna of the field-strength meter touching the ground wire, I was able to get the needle to move a little.

Back in the shack, Bill explained the operating principles. The center conductor acts as the ground, but in case some rf is radiated, it is absorbed by

the braid and bled back to the center conductor (ground) through the capacitors. Because the path of the least resistance is through the center conductor, no rf will be induced through the capacitor to the braid. Only the rf that is radiated from the center conductor will reach the braid, and thus the braid acts as an extremely effective shield.

The type of coax used is

not important, but the capacitors must be 1000-pF disc ceramic rated at 1.4 kV. The illustration will show you exactly how to install the capacitors.

If this story sounds familiar and you have been awarded the WAS and WAC by your neighbors, your ground wire might very well be the culprit. This ground wire worked for me, and it might work for you. ■