

Honda EU1000i Generator Hash Filter

by

Andrew Cornwall /VE1COR

May 2008

I acquired my Yaesu FT-897D transceiver a couple of years ago to be both a homebody and a traveller. My wife and I are snowbirds, escaping the snowy and cold Canadian winter by spending December through March camping in our travel trailer on the Arizona deserts. Most of the time we 'boondock' on public land without hookups for water, electricity, and sewer. Our trailer is self-contained for 'dry camping' and is equipped with solar electric power. We carry a small, Honda EU1000i electric generator for electricity during the infrequent days when there is a scarcity of sunshine for solar power, or when we need an extra jolt of electricity such as to communicate on ham radio. The Yaesu FT-897D is specified to pull 22 amps at 12 volts when transmitting its full power of 100 watts, and at this amperage the trailer's house batteries would be quickly discharged.

My early intention while camping of plugging the FT-897D's AC power supply, an MFJ-4125, into the Honda's AC outlet to power my amateur radio rig was thwarted by overbearing generator hash picked up when receiving. Although the Honda EU1000i and its larger sibling the EU2000i are supposed to output a pure 60 cycle per second sine wave, it appears that the waveform is made up of a prolific series narrow square waves of gradually differing heights which very closely approximate a true sine wave. For most appliances the noise produced by the narrow square waves is ignored. Though, for a very few amateur radio transceivers, among them my FT-897D, generator hash emanating from the electrical cord plugged into the generator is picked up by the receiver. (The noise is not induced through the power supply.) The level of interference is more on some bands and less on others, but for 20 and 40 meters the hash was so loud to make them unusable.

My Honda EU1000i is a relatively early model, purchased in the year 2001. Later models of this family may not exhibit the hash problem. Nevertheless, my generator is an acoustically quiet, efficient, and reliable member of my Rving equipment. It has, I hope, many more years of service left.

To solve the problem of RF hash I tried a couple of commercial line filters built into power outlets, but they made no difference whatsoever. Also, snap-on common mode ferrite filters on the power line did not work.

Fortunately for me, I am not alone with this problem. Michael Tope, W4EF, described on his website a solution to a hash problem with his Honda EU2000i. The URL to his article is:

http://www.dellroy.com/W4EF's-Ham-Radio-Page/Portable_Operation/EU2000i_Filter.htm

Michael constructed a common mode RF choke using a pair of ferrite toroid cores that he had on-hand. The choke is incorporated in an extension cord plugged into the generator, which then powers the HF rig. With a few changes I copied Michael's design, and the results are excellent. When before there was hash now there is none - not a trace! My experience affirms Michael's design.

Where Michael used a pair of FT-240-43 ferrite toroid cores, I used the FT-140-77 version. The latter is smaller (1.4" diameter versus 2.4") and is meant to work at a lower frequency range which more closely matches the HF amateur radio spectrum. He further used five turns of a pair of #12 awg wires on each core. The winding on my cores consisted of about 8 turns (as many as I could squeeze onto the core) of the three wires (e.g. white, black and green) in an 18 awg extension cord. To make winding the cores easier I cut the extension cord into two pieces and exposed the wires by peeling back the outside

cover of each piece. After winding the cores I connected the corresponding wires of each section with wire nuts.

Below are pictures of my RF filter, built into a couple of plastic junction boxes. I have yet to waterproof it, and, therefore, I take care not to let it get wet.

