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UPDATE: THE INTERFERENCE REPORT CARD

By RON HRANAC

During the past 10 years, I've penned a handful of columns on the subject of cable interference to and from over-the-air amateur (ham) radio communications. My last Communications Technology column to use the title "Interference Report Card" appeared in the April 2003 issue (www.cable360.net/ct/operations/bestpractices/14955.html). At the time, I noted we were doing pretty well, although everything wasn't roses.

Longtime readers know I'm a member of the American Radio Relay League's EMC Committee, and I serve as the liaison between ARRL and the cable industry to help sort out cable-interference cases that, for whatever reason, are unable to be resolved at the local system level.

The vast majority of the time when what is believed to be cable interference does happen, the affected ham operator is able to work with system personnel to get it fixed. Every now and then, an interference complaint is escalated to ARRL headquarters or even to the FCC. Either of the latter usually triggers my involvement, initially by making contact with the cable operator's corporate-engineering folks to request assistance and then tracking the case through resolution.

How are we doing today? Given that there have been only five total complaints this year, and only of which had to be brought to my attention by ARRL required follow-up with the cable company's corporate office, I'd say things have been even better than my 2003 "pretty good" comment.

Cable-related complaints have been far fewer than even two or three years ago, which suggests to me that most cable operators are keeping their plants tighter and are working to resolve local interference complaints when they do come up. I attribute this to additional emphasis being placed on managing leakage and ingress, which helps ensure more reliable operation of various digital services carried on cable networks.

In the last couple of years, there have been some interesting interference cases that initially were believed to be signal-leakage problems. They turned out to have nothing to do with cable except that the interference was radiating from the cable plant.

In nearly all of those cases, the affected ham operators complained of noise-like interference radiating from an amplifier or power supply location, pedestal, overhead cables or some other outside-plant device. The noise generally affected the upper end of the medium-frequency (MF) and the lower end of the high-frequency (HF) bands—frequencies from about 1 MHz to perhaps 10 MHz or 15 MHz.

Because the interference was radiating from the cable plant and was noise-like, and that cable companies carry set-top and cable modem upstream signals in the HF range, the interference naturally was assumed to be leaking upstream digital signals.

The culprit? Powerline noise or interference from Part 15 devices and other sources, all coupled to the cable network's strand and outer surface of the coax shield as common mode currents via code-required distribution plant and subscriber drop neutral bonds. Portions of the cable plants then behaved somewhat

like long wire antennas, radiating the common-mode signals into the over-the-air environment. This kind of interference is not signal leakage, nor is the cable company responsible for fixing it.

Some examples of sources seen in those cases include a defective ground-fault-circuit-interrupter (GFCI) outlet in a nearby home, the aforementioned powerline noise (broken insulators, loose pole hardware, etc.), a defective street light, switch mode power supplies used with certain in-home devices, and what was thought to be a telco digital subscriber line (DSL) installation.

“When any OTA interference case crops up, it’s critical that system personnel work with the affected ham operator. Don’t dismiss the complaint.”
Does this mean that all noise-like over-the-air interference in the MF and HF bands is from something other than cable? Not necessarily. I recall one case several years ago involving a standby power supply that radiated noise-like interference in the AM broadcast band and slightly higher frequencies. This was a legitimate equipment problem and, fortunately, the power supply manufacturer had a fix available.

When any over-the-air interference case crops up, it’s critical that system personnel work with the affected ham operator. Don’t dismiss the complaint as “some ham or CBer whining about cable.” Check the affected area for signal leakage and fix all leaks that do exist — including low-level ones less than the FCC’s 20 microvolts per meter (µV/m) limit. (Quick side note: A leak that causes harmful interference must be fixed regardless of its level—even if it’s well-below 20 µV/m—per §76.613.)

In some instances, system techs have temporarily and very briefly turned off a downstream channel or the portion of the outside plant where the interference existed to confirm whether or not it was signal leakage. This is clearly a service-disruptive measure and a last resort that simply may not be possible to do in most instances.

Cable Channel 18 (144 MHz-150 MHz) overlaps the 2-meter ham band (144 MHz-148 MHz), and the most common interference in that frequency range is caused by Channel 18’s 145.25 MHz visual carrier leaking out of either the plant or subscribers’ poorly shielded cable-ready TV sets connected directly to drops. For the former, the plant leakage must be repaired. The latter may indicate the TV set should be evaluated by a competent service shop. Alternatively, installing a set-top usually will take care of on-channel leakage by a cable-ready TV.

One rather unusual 2-meter ham band interference case involved intermodulation of a 162 MHz NOAA Weather Radio (www.weather.gov/nwr/) signal appearing on or near 145.25 MHz. The intermod was found to be coming from an emergency operations center, and it had nothing to do with the cableco’s or NOAA’s transmitters. This was an oddball situation in which the interfering signal initially was believed to be leaking from the cable network, but the presence of NOAA Weather Radio audio on 145.25 MHz was a strong clue that it probably wasn’t signal leakage. A little detective work by the cable company found the source. This was an excellent example of a cable operator going beyond the call of duty to help locate a noncable problem.

I want to wrap up with something from my April 2003 column because it definitely bears repeating: What happens if you get a call from a ham operator complaining about possible signal leakage interference to his or her radio communication? How should you handle it? Here are two checklists for you and your system staff:

What not to do

Tell the ham operator your system complies with the FCC’s 20 µV/m signal leakage rules and your plant’s perfectly legal

Ignore him or her, hoping he or she will go away

Don’t return phone calls

Get confrontational

What to do

Take the complaint seriously

Respond in a timely manner

Work with the ham to resolve the interference complaint

Educate your customer-service reps, installers and technicians about the seriousness of interference complaints

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