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The Noise Frontier

“Hams can be instrumental in identifying and fighting the advances of this growing threat.”

Earlier this year, something extraordinary took place in Evanston, Illinois. As Rick Lindquist, WW1ME, reported in the “Happenings” column in the October 2016 issue, wireless vehicle key fobs, cell phones, and other wireless electronics stopped working. The problems were localized in the 600 block of Evanston’s Dempster Street, and they were almost exclusively confined to vehicles and cell phones located in that vicinity. Car owners could not open their vehicles or, in certain cases, even start them. To add to the frustration, some cell phones were also inoperable, so victims couldn’t even call for help. But these exotic occurrences with wireless devices were not the extraordinary event.

The Evanston Police Department initially contacted the Federal Communication Commission’s Chicago office for help, which resulted in the FCC referring them to the automobile manufacturers. Based on what the FCC knew about the situation, their response may not, in fairness, seem so unreasonable. For the Evanston Police, however, concerned about matters even more serious than stalled vehicles — namely, nonfunctioning cell phones and potential disruption of police communication systems — their next call was directed to ARRL Headquarters and ARRL Lab EMC specialist Mike Gruber, W1MG. Gruber called on ARRL Central Division Director Kermit Carlson, W9XA, who also volunteers as the ARRL EMC Committee Chairman. Carlson used a noise signature receiver that is part of Gruber’s arsenal of tools at the ARRL Lab, and together they were able to identify a strong interference source — something like a *nail* in a haystack — located near the center of the affected area. Accomplishing this was not quite so easy as a glib retelling would have you believe: Mike is an experienced interference bloodhound, and Kermit is an accomplished Engineering Physicist.

What’s extraordinary about the mystery in Evanston: the police called *us*. They asked for our help, and the League mobilized to assist in analyzing and solving a thorny problem. We should be as flattered by their outreach as we are proud of the results. First responders frequently call for our assistance in times of disaster, and in the case of Evanston, there is a certain man-bites-dog aspect to the story. It emphasizes the point that Amateur Radio serves the community in many, and sometimes unfamiliar, ways.

But there has been pushback from members of our community who assert that this kind of work is not our remit. “We are not in the ‘business’ of solving every interference case that arises in the country,” said one radio amateur in a recent posting. I disagree, and I find the comment frankly astonishing. It is the policy of ARRL to defend our spectrum from all adversaries, deliberate or random, from all consequences, intended or not.

Ed Hare, W1RFI, the head of the ARRL Lab, has been warning

all of us for years about the consequences of a pernicious, pervasive, rising noise floor that, left unchecked, will swallow up our spectrum just as quickly as the common carriers that are eyeing our real estate. At W1AW, the noise floor sometimes rises to S-7 levels during the day.

The cause of the rising noise floor can be, at least in part, attributed to sources like the one identified in Evanston — in that case, an errant neon light power supply. But noise is not limited to neon lights: a wide variety of switching mode power supplies for lighting and other applications are flooding the market. These devices are cheap, powerful, broadband, sometimes non-compliant RF generators. And their harmful effects are cumulative over time: as more and more offending devices are sold and installed, the noise becomes more intense and diffuse while the public’s investment in noise generating equipment becomes larger and therefore more difficult to unseat.

In one respect, we are fortunate. The noise problem is growing so quickly that it is impacting commercial business. When commercial interests are threatened, you can expect a Category 5 response. The broadcast industry, especially AM broadcasters, are taking notice of its impact on their service areas. That is why ARRL, which has long enjoyed a relationship with broadcasters, is working closely with the Society of Broadcast Engineers (SBE) and the National Association of Broadcasters (NAB). We have common interests in beating back the rising tide of noise. And our work with SBE and NAB is predated by Ed Hare’s longstanding relationship with the Institute of Electronic and Electrical Engineers, where they have labored long and hard to establish noise standards and to map noise sources. Noise is a new frontier, and we must take it seriously.

I am hopeful in the future for support from the commercial wireless sector. Perhaps it will take note that in Evanston, not only did cars fail to start, but cell phones didn’t operate, either. While commercial wireless is busy measuring our spectrum for curtains, rugs, and furniture of its own, I trust it will appreciate how quickly the value of spectrum vanishes when immersed in noise.

It’s only fair to note that the FCC did dispatch a field engineer to Evanston to size up the problem. That’s a generous gesture in this age of constrained budgets. We ought to be grateful.

I was told his car wouldn’t start, either.

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