

Annihilating Interference in a Sea of Signals

How industry collaboration helps meet the challenge of in-building interference detection and mitigation across jurisdictional and corporate boundaries

The Situation

During large sporting events, stadium security communications fail intermittently, making it impossible for security staff to call for back up or emergency response. The culprit might be the new point-of-sale system recently installed. But, with over 100 vendors and a dozen other RF systems throughout the venue, finding interference is like looking for a needle in a haystack.

Challenge

Public safety communications professionals struggle with the fact that RF communications obey the Laws of Physics, and pretty much ignore jurisdictional boundaries. This is a particular challenge in South Florida.

South Florida, which includes Miami-Dade, Broward and Palm Beach counties, is the 8th largest metroplex in the United States within one RF envelope. The area faces aging infrastructure and, in many cases, support that has been discontinued. In addition, the area is host to many large public events and venues that involve numerous public and private entities. This often results in brutal wireless conditions, which can adversely affect public safety.

Finding and eliminating interference in a sea of signals is as important to life-safety as it is challenging. It's not uncommon for several adjacent agencies to be hunting the same offending signal at the same time, without realizing it. Historically, these agencies had few opportunities to meet and discuss matters of common importance even though the scope of their common problems often intersected.



“Finding and eliminating interference is critical to public safety RF communications, but the reality is that South Florida agencies just don't have a million dollars or more for a high-end system.”

**COOPER
GENERAL**



“Starting with the Anritsu S412E System Analyzer and other smart and affordable tools, we were able to build a system that helps customers find and abate interference in just minutes, even in the presence of thousands of signals.”

Solution

A regional group of RF professionals formed the South Florida Wireless Engineering Council (www.soflawireless.com) to discuss and collaborate on how best to address problems of common interest, particularly in the area of public safety RF spectrum matters.

At one of the Council's seminars, an impressive, top-of-the-line interference hunting solution amazed attendees. There was just one problem; the system's seven figure price tag. RF engineers from Cooper General (www.coopergeneral.net) left the seminar inspired to create a similar, more affordable solution. Their goal was to build the capability to annihilate interference using proven resources that were readily available and that had a price tag attractive to budget strapped local jurisdictions.

The result of their innovation and hard work is The Retaliator (www.coopergeneral.net/the-retaliator) and more recently The Retaliator 2! The prototype solution combined the following components:

- Cooper General mobile engineering talent
- Anritsu S412E (www.anritsu.com/en-US/Products-Solutions/Products/S412E.aspx)
- Collection of directional antennas, cable, connectors, and the like
- Nice collection of filters
- Spare BDA, a spool of wire, a DAS antenna, and a tripod
- Painfully unattractive Chevy van worth about \$800
- Duct tape

“We knew the solution would start with the Anritsu S412E,” says Dan Deveson, Cooper General's lead engineer. “No other single piece of equipment is more vital to our business. Because it so easily switches between RF technologies and testing systems, it is the most effective and efficient way to find and abate interference fast. Something that can be truly life saving in a public safety application.”

Cooper General added a generous power system, a Public Safety grade bi-directional amplifier (BDA), and deployable DAS antenna on a tripod, with spooled RF cable. This allows them to deploy in-building enhancement radio coverage within minutes, rather than weeks.



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For more information on
The Retaliator, go to
[www.coopergeneral.net/
the-retaliator](http://www.coopergeneral.net/the-retaliator)

To view Cooper General's
Portfolio visit
[www.coopergeneral.net/
our-portfolio](http://www.coopergeneral.net/our-portfolio)

Result

What The Retaliator lacks in surface beauty, it makes up for in sheer power. It can find and abate a tough interference emitter further, faster, and better than most any other solution. What could take days and multiple technicians can literally be accomplished in just minutes.

"If a customer is having an in-building problem, we roll out The Retaliator. In less than five minutes, we can light up an area of challenged coverage in any building," says Dan Deveson. *"Plus, because it's a simple, fast demo, we can show customers how powerful it is. It's really shortening the sales cycle because customers know it will meet their specific needs before they cut the P.O."*

"Our Anritsu S412E supports these two vastly different RF work-environments [in-building and outdoor] better, faster and cheaper than any other solution on the market, and we've looked at them all," says Deveson.

More important to Cooper General's bottom line is that the S412E didn't just pay for itself, it helped secure Cooper General's position as South Florida's leading RF systems house.

"I've yet to find a commercial RF challenge I couldn't beat with my Anritsu LMR Master," says Dan. *"Whether it's coverage testing, interference tracking, cable testing, decoding funky P25 operations, you won't find a better, more flexible instrument for any amount of money."*

Anybody who knows Dan knows he's not shy with his opinions on RF. Nor is he shy about his Anritsu S412E.

"When we started down this path some years ago we were a typical radio dealership too dependant on our fax machine for orders. The S412E changed all that, and a quick look at our portfolio will tell you how."



“Now, thanks to our Anritsu LMR Master, when somebody in South Florida thinks about Public Safety communications, they usually think of Cooper General. We can work better, faster and cheaper, but more importantly, we can do stuff that our competitors don't even know about. With a little duct tape, a hundred lines of Python, and our S412E we are capable and equipped to solve any RF problem.”

Interference Essentials for Public Safety Applications

Flexible, Powerful & Portable System Analyzer

- Easy to set up and works in just minutes.
- Quickly uploads site maps and instantly map signals to find interference fast.
- Easily switch between technologies (P25, DMR, NXDN, TETRA, etc.) to quickly see which systems are affected in order to prioritize appropriate response based on the threat to public safety communications.
- Effortlessly switch between testing systems (antenna, over the air, wired, etc.) to locate interference, make an adjustment, and then test to make sure the interference is truly gone — ***all in one site visit.***