

So Many Antennas.... ...So Little Roof



By Stu Goldstein

You often can tally the number of radios in a mobile command post simply by counting the number of antennas on the roof. Most of the time, for every radio, there is a corresponding antenna. That's OK for command posts with only one or two radios; however, for those equipped with several radios, it can present a challenge.

Take the NYPD Technical Assistance Response Unit (TARU) as an example. Its mobile command post houses a Raytheon JPS Communications ACU-1000 unit, which is a transportable intelligent interconnect unit that offers cross-band radio branch exchange. As radio communications coordinator of the TARU, I maintain the unit, which has 10 radios. If I were using all 10 radios, I would need 10 antennas on top of the mobile command post. In reality, however, I only use four: one UHF, one VHF, one 800 MHz, and one low band.

Initially, I set up four antennas on the roof of TARU's mobile command van, and the unit worked fine. To relieve some of the antenna congestion, I followed the rule of antenna separation and spread them out. When using the ACU-1000, it is especially important to spread out antennas when you position them on roofs. Even better, spread them out vertically. That's why antenna towers work so well; they allow for vertical separation of multiple antennas

A Better Solution

At the 2003 APCO International conference in Nashville, Tenn., I ran into a man by the name of Kevin Koch, who works for STI-CO Industries. He showed me a new interoperability tri-band antenna they were testing, which handled UHF, VHF, and 800 MHz. Kevin told me that I could hook up a UHF radio, a VHF radio, and an 800 MHz radio to one antenna and transmit on all three radios at once.

Even better, I could hook up the antenna to three of the radios attached to my ACU-1000 unit and be interoperable using only one antenna. I am not an engineer, so I had a problem believing that one antenna could receive



RF and transmit two RFs at the same time. It was too good to be true.

To convince me, Kevin came to New York City and brought me this antenna. I set it up on the TARU mobile command van, which by the way, I named IRWIN, short for interagency radio-wide information network. IRWIN is a reconverted microwave news truck with a 50-foot antenna mast and generator.

We hooked the STI-CO antenna to the mast via its N-female connector, which we attached to the existing antenna line on top of the truck. Inside the truck where the coaxial lines end, we hooked up a triplexer, which has three ports labeled UHF, VHF, and cellular. We attached the radios to their specific ports, and the testing began.

I believe you need to crawl before you can run, so we started out slowly. First, I went to each radio — a UHF BK brand mobile, a VHF BK brand mobile, and a Motorola

ASTRO Spectra 800 MHz radio — and did separate radio checks. The radio checks were “five-by-five” with good, clear audio.

Then came the real test. Could one antenna simultaneously receive and transmit via the ACU-1000? I interconnected the UHF and VHF radio and performed radio checks. Once again, clear as as bell. I then brought the 800 MHz radio into the net. To my surprise, the audio was crystal clear. The antenna worked!

The bottom line? When you have a lot of radios and a limited amount of roof space, a tri-band antenna can be a good solution. ■

Detective Stuart Goldstein, a member of MissionCritical Communications' editorial advisory board, is assigned to NYPD's Technical Assistance Response Unit (TARU). Contact him at stuart867@aol.com.

RadioResource *MissionCritical Communications* delivers wireless voice and data solutions for mobile and remote mission-critical operations. The magazine covers business, public safety, and regulatory news; case studies; in-depth features; innovative applications; product information and comparisons; emerging technologies; industry reports and trends; and technical tips. In addition, each issue contains *Public Safety Report*, a special section devoted solely to the needs of the public safety community. Editorial content targets organizations in the United States and Canada with mobile and remote communications needs, including public safety, government, transportation, manufacturing, utility/energy, business, and industrial entities.

To request a FREE subscription or get more information, go to www.mccmag.com.

RadioResource *MissionCritical Communications* is published by the RadioResource Media Group. Pandata Corp., 7108 S. Alton Way, Building H, Centennial, CO 80112, Tel: 303-792-2390, Fax: 303-792-2391, www.rrmediagroup.com.