Amateur Power

By Grady E. McCright
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Until digital communications systems are fully implemented, look to an already-available back-up system: ham radios.

A lot of media coverage has been devoted to the poor service offered by the new communication systems being purchased by many departments: 800MHz digital systems, trunking systems and narrow-band FM systems. Some of these troubles come with updating archaic repeaters, obsolete antennae, outmoded feedlines, and other system components that are simply worn out or in ill repair. Granted, we are spending a huge sum of money to bring in the advanced communication systems, but the new technology is not without serious growing pains.

Dead spots that develop where previously there were none can certainly present hazards to firefighters. Other problems that become apparent when any unproven communications system is installed include talk between channels, weird noises on the system and even repeater echoes. I've even heard of firefighters carrying personal cell phones to ensure that they have an adequate communications link with the department. Relying on a cell phone on the fireground is a serious indictment of the existing radio communications system. It's a frustrating problem that may place interior teams or others in perilous circumstances.

Will there ever be a solution to these problems? Certainly, once public works has spent thousands more dollars to continue to modify, enhance and redesign the systems until they hit on the correct configuration that satisfies the needs of local firefighters. But what are we to do in the meantime?

In virtually every community across America, a high-quality radio repeater system already exists and is just awaiting discovery by emergency crews. It may come as a surprise to fire departments that this system is available and can be put to use almost immediately for very little money compared to the costs of a commercial system designed for emergency services. My department is currently using this system as a backup emergency communications system: the amateur radio service.

Immediate solution

Ham radio operators all across this country have installed high-quality 2-meter and higher frequency repeater systems. These transceivers are available and encouraged for emergency communications. Local amateur owners willingly support such use, as it is one of the basic tenets of amateur radio. Emergency services shouldn't use these amateur radio systems for routine, day-to-day fire department traffic, but when an emergency exists, the hams of this nation will relinquish the use of these repeaters for emergency traffic.

As a rural volunteer fire department in the New Mexico mountain country, we experienced poor to non-existent communications on two large wildfires over the past two years. The Lincoln National Forest wildfires resulted in the complete destruction of more than 20,000 acres and scores of homes. As any firefighter who combats forest fires knows, expected fire behavior, weather forecasts, crew location, fire status, and air drop times and location are extremely important. I could not reliably obtain this information.

The first use that the James Canyon Volunteer Fire Department is making of this existing system is to cover the rampant dead spots in this county. The current fire service radio repeaters are outdated, and the antennae and lead-in coaxial cables are in disrepair. Many of the repeaters designed for 100 watts are radiating only 15. There also are many locations, such as deep canyons and outlying areas that are not covered by the county fire repeater system. And while cell phones may provide dependable communications in a large city, cell phone coverage in our district varies, and I doubt if 50% of our district even has coverage.

The department certainly can't afford to replace all the county repeaters, feedlines and antennae, and the county does not seem to be prepared for the task, so we sought other avenues. We found the solution to this dangerous situation in ham radio. Local amateurs heard of our concerns and came to our aid.

The second use of this system is to conduct administrative tasks such as ordering water for firefighter rehab or vehicle replacement parts, or to pass along health and welfare information to firefighter families or the status of the property of those displaced by fire. Almost all the dozen or so county repeaters transmit on the same frequency, and when the conflagration is large and widespread, such as in a wildfire, that frequency becomes bogged down from heavy emergency traffic. We can unload that burden by handling our department's non-emergency traffic on this standby communication system.

Equipment options

The department now has five engines and a command vehicle equipped with 2-meter mobiles. We also have eight handheld radios and one base station. In times of crisis, both the county and amateur base stations are staffed by a staging officer who helps keep up with engine and crew placement, arranges for relief crews, assembles meals and water, obtains vehicle or firefighter equipment or replacement parts, and places telephone calls for those of us in the field to the sheriff's office dispatcher or the National Forest Service.

Speaking of telephone calls, many ham repeaters around the country are equipped with auto patches that allow a one-way or simplex telephone call to be placed. In that way, a licensed amateur can converse with someone via the radio link to a landline. Unfortunately, when you push-to-talk from the radio, the other party can only talk when the radio operator is not pushing the mike key, but it's far better than no link to a phone line.

Six of our transceivers are dual-band — capable, meaning that if we are in a deep canyon and unable to pick up a repeater with a handheld unit, we can set up one of these dual-band mobiles as a cross-band repeater. When activated, this 50-watt unit will repeat on another band whatever transmissions we make with 5-watt handheld units. The reverse also happens, so we will hear distant transmissions on the band we are working. It is like having a mobile repeater in your vehicle.

The audio quality far surpasses that of the county radio system, and the cost of these amateur radios is 20- to 50% (depending on options and single band versus dual band) of what we spend for county radios. The repeaters in populated areas are already installed, and local hams graciously installed two additional repeaters in the area and plan on installing a couple more repeaters to provide continuous coverage in our district as well as in our contiguous areas of mutual aid. Even in our remote area, there were about five existing repeaters that we could activate from different locations before any expansion.

Licensing, other successes

Operating these amateur radio service radios requires that each control operator hold a Federal Communications Commission station license, but don't let that requirement scare you off. A no-code technician class amateur operator permit can be obtained by passing a 35-question exam with no Morse code requirement. The questions are taken from a pool of 250 questions covering the salient aspects of operating a radio station. It is surprisingly easy to pass and allows one to operate on the VHF/UHF amateur bands, which are located very near where we are already.

After only three classes and three examination sessions, our department of approximately 35 active firefighters and EMS personnel had 14 licensed firefighters and 10 licensed staging officers. Luckily 2005 has been a wet year and the fires have been minimal, but the dry and windy springs will come again and we will be ready with adequate communications.

Last year, we had one Type-6 brush truck and crew deployed to the county north of our district for five days. The crew was sleeping in tents about 60 miles north of our main station. My only way to communicate with them was via 146.610MHz ham radio repeater located on Capitan Peak. County radios wouldn't reach their location and cell phones were out of the question, but I was able to communicate with them at will. They requested spare parts and supplies for the truck and clean clothes for the crew, and I relayed welfare messages to and from their families each day. We arranged for a crew change-out, all by ham radio.

Had it not been for the amateur radio repeater system in the area, I wouldn't have been able to communicate with the crew at all unless they drove a number of miles to a public service telephone and, maybe more importantly, neither would their families. This investment in firefighter time to prepare for the license testing and the monetary investment in radios has been well worth the costs. Even those were defrayed by the generous donations of communication equipment from a local supporter and ham. Another local amateur and former fire chief provided the training to firefighters necessary for them to pass the exam. Several other amateur operators in the area provided equipment, encouragement, repeaters and support. One even climbed the towers and installed repeater equipment.

Open options

The key to success in such an endeavor is to obtain the assistance and support of the local amateurs in your area. From my experience, they will be willing to make existing repeaters available for emergency transmissions; help with the training; administer the examinations; provide technical advice; install additional repeaters, if required; and assist in the acquisition of the necessary base stations, handhelds and mobiles.

Even if your existing government-provided radio communication system works well, who's to say when the repeater you need desperately might fail. If it's the only one you can activate from that location, the amateur repeaters are standing by for use in any emergency. Is your department equipped with licensed operators, training and amateur equipment to take advantage of this blessing? Mine is and I'm proud of that fact.

Grady McCright is chief of the James Canyon Volunteer Fire Department, Cloudcroft, N.M. He is the author of the non-fiction book Jessie Evans: Lincoln County Badman and of five fiction books.

Where to Go

Once you decide to investigate an emergency backup communication system, the first step is to contact local amateurs. How do you find them?

Chances are high that someone in your department either is a licensed ham or knows someone who is an active amateur radio operator. If not, contact the **NYC Amateur Radio Emergency Communications Service (www.nyc-arecs.org)** and ask them for help in training and planning. Most active hams will gladly steer you in the right direction for training, testing and equipment. They also will be glad to answer any questions you might have about the amateur service.

The **NYC Amateur Radio Emergency Communications Service** consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service when disaster strikes. The NYC Radio Amateur Civil Emergency Service is a similar collection of licensed hams who are in the business of providing emergency communications services in time of national or local need. These organizations would be most happy to assist your department in developing an emergency backup communications system.

Radio equipment can be purchased from various manufactures such as ICOM, Kenwood, Alinco and Yaesu. Ham radio vendors include Ham Radio Outlet (www.hamradio.com), Amateur Equipment Supply (www.aesham.com) or Gigaparts (www.gigaparts.com). These distributors also supply all the necessary accessories.