New Jersey's South Counties Emergency Radio Network

By Bill Cole, N2CSA

Amateur Radio for the 21st Century is a slogan Icom uses to describe their D-Star digital system. That slogan has come to define the effort of a group of Southern New Jersey hams who are building an emergency network based on D-Star technology.

This story begins in the spring of 2005 with the "Operation Atlantic Surge" emergency exercise in Cape May County, NJ. The exercise simulated the helicopter evacuation of critical care patients from the New Jersey shore hospitals due to an impending hurricane. It was a joint effort of the New Jersey Divison of Health and Senior Services (DHSS), the Southern New Jersey Regional Medical Coordination Center (MCC), and the Cape May County Office of Emergency Management.

Members of the Cape May County RACES (Radio Amateur Civil Emergency Service) and ARES (Amateur Radio Emergency Services) groups supported the exercise with backup communication and Amateur Television.

In the latter stages of the exercise, the hospital personnel were told the cell phone system had failed. While the medical personnel were trying to work things out, a senior official from the DHSS noticed RACES and ARES operators communicating by radio. The question was asked, "Who are they?" The reply came, "They're the amateur radio guys." The next question was, "Where can we get some amateur radio guys?"

With that simple exchange a major amateur radio project was born.

A Cooperative Effort

Over the next two years, the DHSS and MCCs (New Jersey has five regional MCCs) worked with the various local RACES and ARES groups to equip New Jersey critical care hospitals with amateur radio capability.

Work session January 31, 2009. Repeaters were distributed.

This consisted of a state grant to the MCCs for purchasing dual band 2 meter/440 transceivers, 220 transceivers, antennas and power supplies. This equipment was distributed by the MCCs to the various county RACES/ARES groups for installation in local hospitals. Tests of the hospital installed equipment became part of regular monthly RACES/ARES test nets.

Coincidental to this effort, the South Counties Mutual Aid Group was formed. It is a consortium of RACES/ARES groups in the seven southern counties of New Jersey: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem. The group ultimately falls under the auspices of the seven County Offices of Emergency Management.

The goal of the South Counties Group is to better coordinate RACES efforts within its geographic area which coincides with the Southern Regions of DHSS and MCC. It espouses a regional approach geared to break the barriers of county lines and maximize communication by the various RACES groups.

D-STAR

In November 2007, a group of Cape May County, New Jersey hams put their heads together and formed the Jersey Cape D-Star User Group (JCDUG) to experiment with D-Star technology. Regular readers of this magazine know that in late winter 2008, the JCDUG received a grant from Grove Enterprises and Monitoring Times consisting of three D-Star repeater modules which form the nucleus of the JCDUG's full stack D-Star repeater.

Three members of the JCDUG formed

Members of the South Counties Mutual Aid Group at the work session December 13, 2008. Inventory was taken, property stickers applied and Go-Kit equipment was issued.

Work session January 31, 2009. Participants braved 20 degree temperatures to distribute repeater equipment.

Cape May County's representation to the South Counties Mutual Aid Group. Not surprisingly, a sizable portion of discussion within the Mutual Aid Group centered on D-Star technology. When in early summer 2008 the Mutual Aid Group learned of the potential for a major grant to expand services to Southern New Jersey hospitals and specialty care centers, the engineering of a D-Star repeater network became the primary item of business at meetings.

The New Jersey Department of Health and Senior Services (DHSS) announced its grant to the Southern New Jersey Regional Medical Coordination Center (MCC) for the backup communications network in late summer 2008. A total of $202,400.00 was provided to facilitate a network to link hospitals, specialty care centers, and long term care facilities. A proposal was submitted, and the MCC made the grant available to the South Counties Mutual Aid Group. Ultimately the network came to be called the South Counties Emergency Radio Network or SCERN.

Up to now this chronicle has been a litany of agencies, acronyms, etc. and is illustrative of the path amateurs can anticipate when participating in a project with governmental and quasi-governmental organizations. However, this project went smoothly. The New Jersey Division of Health and Senior Services, as well as Southern New Jersey Regional Medical Coordination Center, are to be acknowledged for their speed of action and cooperation.

Gearing Up

At the October meeting of the South Counties Mutual Aid Group, the initial specification for the South Counties Emergency Radio Network (SCERN) was formulated. The network initially would consist of seven main D-Star repeaters. Each main repeater includes an ID-RPT4000V 440 slow speed data module, ID-RPT2D high speed data module, an ID-RP2C controller, 60 amp power supply, a 440 duplexer, server, server UPS, a repeater cabinet, and a tri-band antenna (1.2 gig., 440, 2 meter).

One of these repeaters would be deployed in each of New Jersey's seven southern counties. In addition, each county would receive two go-kits, consisting of an ID-800H transceiver, ID-1 transceiver, 30 amp power supply, laptop computer, antenna and triplexer, with a Pelican case for storage.

Because the D-Star high speed data repeaters are lower power, it was decided to obtain ten additional data repeaters consisting of a cabinet, ID-RP2D data module, ID-RP2C controller, power supply, server and server UPS to be placed as fill-in units where there were signal issues. Each county would receive one, with the other three held in reserve to plug gaps in the system. The plan was approved.

The equipment specification was developed because of the anticipated message traffic. Its purpose is not only to handle voice traffic, but to send data in the form of email, files, spreadsheets, NTS style messages, graphics, photos, and tracking data similar to APRS. The voice traffic and tracking data is transmitted via 440 UHF, and data, files, photos, etc. at 1.2 gigahertz.

Glaringly absent is the use of the 2 meter band, which has long held sway in emergency communication. It is absent for entirely practical purposes. The local coordinating council doesn't have seven 2 meter repeater frequency pairs available in the coverage area. The D-Star system is sufficiently flexible to enable the addition of 2 meter repeaters if circumstances should change.

Work Begins

The grant was made by DHSS to the Southern Regional MCC and the equipment was ordered. Throughout November and the first week of December 2008 equipment was received and warehoused at a secure facility. With the arrival of all the equipment, a work party was held December 13, 2008. Representatives of the South Counties Mutual Aid Group met at the storage facility to inventory, property tag, and begin distribution of equipment. Go Kits were distributed to the representatives of each county in attendance.

A second work party was held January 31, 2009, at which the representatives of each county were issued a 440 voice/high speed data repeater and a high speed data fill-in repeater. Members of the Gloucester County, NJ, contingent were most energetic and placed their 440 voice/high speed data repeater on the air in voice mode for testing purposes, becoming the first county to put a SCERN repeater on line. At the time this article is being prepared (February 2009), the remaining six counties are awaiting installation of antennas, etc. prior to bringing their voice/high speed data repeaters on line.

The target for these repeaters to be activated is May. The date for having the repeaters linked via internet has not been established, but will probably be late summer or early fall.

Too Soon to Judge...

The work of establishing the system has just begun. So the work yet to be done includes: Go Kit laptops must have software installed, fill-in data repeaters sited, training must be scheduled, and so much more. As this project is charting new areas for amateur radio, there will be obstacles yet undiscovered to overcome. One thing is certain: the network is being built by amateurs at a bargain price.

The development of the SCERN is still in its early stages, and must be viewed as such. However, at some point its utility must be evaluated. That point is at least eighteen to twenty-four months away.

Digital communication is becoming the standard for the 21st century, not only for amateur radio, but also public service, television, cell phones and other communications. At this time D-Star is the major player in amateur digital. Currently, there are nearly 400 D-Star repeaters connected via the gateway world wide. These repeaters are being used by over 7200 registered users.

If your interest in D-Star has been piqued, there is much to learn about the system. The best single source we recommend for developing this knowledge is the **ARRL's VHF Digital Handbook** by Steve Ford, WB8IMY.

This article has chronicled the development of the SCERN amateur network from concept to the first D-Star repeater being tested. There is much yet to do in turning the equipment into a fully functioning emergency network. We hope to make a further report in *Monitoring Times* when the system is fully operational. **MT**

Work session January 31, 2009. South Counties Mutual Aid Group representatives from Gloucester County, NJ programming an ID-RPT4000V repeater module.