The Hospital Antenna & Radio Testing Program

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*Revision 2 (August 2015): General update and added ICS-214 Form*

Introduction

The Hospital Antenna & Radio Testing Program is one of the core public service functions of Central Ohio Amateur Radio Emergency Service. The program began in 2001 after the concept was presented to Central Ohio Trauma System (COTS). COTS obtained funding for installing amateur radio dual band antennas at area hospitals and the program was on its way. The program was known as the Hospital Antenna Testing Program. Bill Carpenter - AA8EY spearheaded the introduction of the program, and Mary Carpenter - N8AOM (SK) served as the coordinator until 2002 when Mark Griggs - KB8YMN became the coordinator. Until 2009, amateur radio operators brought their own personal equipment into the hospitals to test the antennas and to operate during emergency exercises. A history of the Hospital Antenna Program can be found on the COARES website.

COTS Hospital Radios

In 2008, COTS proposed that each hospital in their system be equipped with a complete, self-contained amateur radio station. COARES was invited to specify and purchase the equipment, and assemble the equipment into portable cases, program and test the radios and to transfer the equipment to the hospitals and to COTS. By April 2009, twenty-two hospitals and COTS were equipped with amateur radio stations for 2 meters and 70 cm. Approximately half of the radios went to hospitals outside of Franklin County, which had also been provided with antennas (and were to be supported by their local ham groups, not COARES). The heart of each station is an Icom ID-800H VHF/UHF transceiver that is D-STAR capable on both 144 and 440 MHz. Output power is 55 watts on 2 meters and 50 watts on 70 cm. The transceiver is mounted on a removable platform that also has an ICOM IC-SP10 remote speaker mounted at the rear. A door in the platform provides access to a storage area for a Heil Dual Side Traveler Headset, microphone, coax jumper cable, AC extension cord and accessories. Built-in pockets are provided within the case lid, for forms, manuals, etc.

A notebook is included with a "mini-operating guide" to the ID-800H radio, and log sheets for recording test data. The Astron SS25 power supply is mounted under the platform. Spare 20 amp radio fuses also are stored in the case.
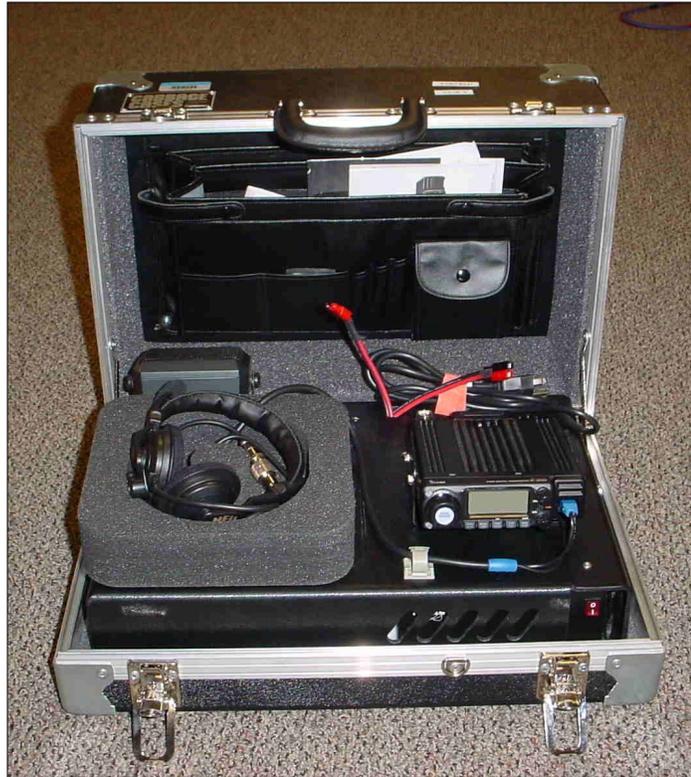
One of the 23 COTS hospital radios. Note the two accessory Anderson PowerPoles for running/recharging HTs, cell phones, etc. In situations where there is not sufficient space for the entire case at the operating position, the platform with radio, power supply and speaker can be removed from the case. The radios at the five ADAMH agencies are similar but not identical.

When COTS Radio testing was incorporated into the testing process, the program was renamed the COARES Hospital Antenna & Radio Testing Program. In late 2009 and early 2010, COTS added similar radio equipment to five locations in Franklin County. The new locations are agencies in the ADAMH network, and would operate as shelters for their clientele in an emergency. Port Columbus International Airport also had a dual band amateur radio antenna and it was added to our tests.

Addition of Signalink interface devices for digital communications
Digital communications provides a significant enhancement to the existing voice communications capabilities of the COTS Radios. COARES has opted to utilize the widely accepted digital communications suite known as fldigi, and in particular the MT63-2000L mode. Flmsg, a subset of fldigi, facilitates sending formal messages using the ICS mandated ICS-213 General Message Form. Flmsg is ideal for sending lists of items such as pharmaceuticals, supply lists and other detailed information which needs to be transmitted quickly and accurately.

Beginning in 2014, several COTS Radios have been equipped with Signalink interfaces and when used with a laptop computer or PC (to run the fldigi software) they are ready for digital communications. Additional information regarding the usage of COTS Radios with fldigi can be found elsewhere, as it is beyond the scope of this document.

Why test the antenna and radio?
When tests are performed, problems are sometimes found with the antennas, coaxial cable runs, or the radios. Lightning strikes have damaged antennas, antenna connectors have become corroded, antennas have become waterlogged, and problems can occur with the radios and power supplies. Monthly testing finds these problems and repairs then can be made to restore the system to full functionality, to ensure that everything is working properly and ready to perform in case of an emergency.

So why is it so important to ensure that everything is ready in case of emergency?
Our purpose is to provide communications support to the community in the event of a communications emergency, which exists when a critical communication system failure puts the public at risk. A variety of circumstances can overload or damage critical day-to-day communications systems. It could be a storm that knocks down telephone lines or radio towers, or the failure of a key component in a system that has widespread consequences. Violent storms, tornados and earthquakes knock down communications facilities, underground cables are dug up, hospital phone systems fail.

Examples are easily found. In 2011, the St. Johns Regional Medical Center in Joplin, MO was demolished by an EF5 tornado. All the systems failed, and ham radio was the only means of communication as patients were transferred to other hospitals. During Hurricane Sandy, the emergency generators failed at NYU Hospital in New York, and all 215 patients had to be evacuated to nearby hospitals. Local disasters can result in multiple casualties which can overload hospitals and require special measures to track the victims are they are transported to area hospitals.

Emergency exercises are frequently held to test the emergency preparedness plans of hospitals and agencies such as airport authorities. COARES is written into these plans, and ham operators may be dispatched to the incident scene, COTS, Port Columbus, FCEM&HS, Coroners and area hospitals, etc. It is essential that the antennas and radios are in complete readiness during these drills.

Conducting the hospital antenna & radio test
In order to ensure that the antennas and amateur radio equipment are always available and fully operable when needed in an emergency, it is necessary to test the system on a regular basis. Central Ohio ARES members test the Franklin County Emergency Management & Homeland Security (FCEM&HS), COTS, Franklin County Coroners Office, and each Franklin County hospital's antenna and radio once every month, and report the findings to the hospital antenna & radio testing coordinator. The coordinator files a monthly testing summary with COTS. (The ADAMH agencies are

tested quarterly). Several hospitals outside Franklin County have COTS radios and antennas, and some are tested by radio amateurs from other organizations in those counties. Their testing protocols and reporting mechanisms are maintained by their organizations.

You sign up for a hospital antenna & radio test by entering your name and call sign on the signup sheet that is circulated at each COARES monthly meeting. You will then be contacted via email by the COARES Hospital Antenna & Radio Testing Coordinator. You will receive a reminder of what hospitals and/or other locations you volunteered for. Attached to the email will be a hospital datasheet for each location you requested. The datasheet includes a map showing how to get to the hospital, and instructions regarding where to park, where to enter the facility, who to contact, where the COTS Radio is located, and where the antenna drop is located. In short, everything you need to know will be in the datasheet. You will also receive, by separate email, a report form to complete when you have completed the test. Your report, when submitted, will populate a spreadsheet which will be used to complete the monthly report which is sent to Central Ohio Trauma System.

When an amateur goes to the hospital to perform a monthly check, he or she should have a pencil or pen to fill in the test information in the log book. If the amateur owns a VHF SWR meter, it should be taken along to check the antenna SWR. The SWR measurements over time can provide an indication of antenna degradation. The checks should be performed and reported by the end of the third week of the month. This provides time to remind those who are late completing the test and/or report, so the results can be reported to COTS in time for their monthly meeting. COTS shares the information with the hospital administrators at their regular meetings. You should also get in the habit of always taking your own HT and adapters with you in case there is a problem accessing the COTS Radio.

The general procedures for hospital checks are as follows:
1. Park in the emergency room parking lot, not where the squads pull in.
2. Enter through the Emergency Room patient walk-in entrance.
3. Use our COARES-approved procedure to gain access, which includes a hospital-issued photo ID for locations requiring a background check.
4. Obtain the self-contained COTS ham radio station and take it to the antenna drop area.
5. Connect to the hospital antenna drop and activate the equipment.
6. Test the antenna by keying 147.06+ or 147.09+ and 444.275+ (all use a tone of 94.8). If someone is listening, request a signal report. If no one is listening, confirm that the repeater is activated. An echo test can also be performed, and it may be useful when no one is on frequency to provide a signal report, and yet there may be some question about how well you are being received by the repeater.
7. Check for the presence of the log book. Normally, the log book will be placed within the COTS Radio case. Fill in the log sheet in this book with the results of your test.
8. Check the SWR if a meter is available.
9. Check for, and note in the report you will file, if the following are not available: log book, writing surface to work on, chair or stool for operator to use at writing surface, emergency power outlet (colored red) within reach of antenna drop, coax jumper cable to connect COTS Radio to antenna connector, AC extension cord to reach the nearest emergency outlet (if required), and report forms.

Procedures for checking radios and antennas at non-hospital locations are slightly different. Written procedures are available for each of these locations, and will be provided only to COARES members who are performing the antenna/radio tests. If recent changes have been made at the operating site, location of radio or log book, best place to park your car, etc., provide that information so the datasheet can be updated.

Problems found with hospital antennas and transmission lines must be repaired either by hospital personnel or with permission, by designated COARES personnel. If a problem is found with a COTS Radio, the hospital antenna & radio testing coordinator will deal with any problems found.

COARES amateur radio operators are encouraged to participate in the hospital testing program. By

visiting different hospitals over time, amateurs will be able to respond more quickly in the event of an emergency.

In an actual emergency

If COARES is requested to assist in an actual emergency, our Emergency Coordinator or designated members will be contacted. He in turn will notify the membership by activation of the One Call Now system or by direct phone calls. A net will be quickly established and the net control operator will take check-ins and direct amateurs to assignments. In most cases, a resource net will be established and check-ins will be directed to the resource net for assignments. Amateurs may be directed to the incident scene, to area hospitals, COTS, FCEM&HS, Coroners, Port Columbus International Airport, or to an ADAMH agency. Hospital teams have been established to enable net control operators to assign amateurs to their predetermined hospitals, when possible. It is vital that each COARES ham responding to an emergency callout, have his or her own radio and accessories as well as their go-kit. A coax jumper cable, and adapters should be included to insure connection capability. Do not assume that you will be assigned to a hospital, and that therefore you would not need your own radio. It is possible that the COTS Radio would not be available in a timely manner, or that the radio cannot be located.

If you are activated for a hospital emergency assignment, it is very important for you to view, and take with you, the document "**Hospital Emergency Amateur Radio Operator**". This document can be found on the home page of the COARES website, www.coares.org. This document describes actions to take when activated for a hospital emergency assignment. It has sections regarding what to take with you to your assigned location, what to do upon arrival, what activities you are expected to perform, etc. The document is aligned with the Incident Command System and it describes your expected actions to conform to the ICS.

The following description applies to emergency drills, which typically deal with a disaster such as a plane crash, resulting in multiple victims. It is important to remember that a real emergency may have nothing to do with an external disaster, but instead may result from a failure of hospital internal communications systems. For example, hams may be needed to provide internal communications between a hospital EOC and various departments. These types of situations may require creative solutions that are not described in a "playbook". Some of these scenarios are covered in the "Hospital Emergency Amateur Radio Operator" document.

In a drill, hams assigned to hospitals will normally meet with the charge nurse in the emergency room. Hospital personnel will provide information regarding the number of victims they can accommodate, and the number of emergency room beds and hospital beds available, depending upon the medical needs. This information will be relayed to COTS, both by telephone (normally) and by amateur radio. COTS will coordinate the dispatching of medics to appropriate hospitals. Amateur radio communication will serve as a backup to the hospital communications.

Amateur operators at the scene of a disaster will report the number of victims being routed to which hospitals, the time the victims left the incident scene, the method of transport, the estimated time of arrival, along with information regarding the number of various triage tags on the victims.

As EMS squads arrive at a hospital, the amateur will report the arrival as well as the number of patients. If there is any breakdown in normal communications, amateur radio will provide communication continuity between the hospitals, COTS, the incident scene, and EMS departures and arrivals, via the net control operator. Accurate tracking of victims is of vital importance.

Here are some guidelines for all ham radio operators involved in disaster communications:
- Relay critical information that has been verified, to net control.
- Report facts, not speculation or assumptions.
- Report source and information: "The Fire Chief reports that….."
- Deliver messages verbatim. Don't put your interpretive spin on the message.
- If you hear something questionable and report it, state "This is unconfirmed information" or   "This is an estimated number of…"
False rumors can impede rescues and may put people in danger. Others (police, fire, media or any-

one with a scanner) may be listening and act on it or report it as fact.

Required Forms
The Incident Command Systems and NIMS require the use of certain forms for use by radio communicators during an incident. The forms are ICS-213 General Message Form and ICS-214 Activity Log. Copies of these forms may be found in a yellow folder which is placed within each COTS Radio case. Copies can be downloaded from the www.coares.org website and each amateur should carry a supply of both forms in his go kit. A description of these two forms, and their proper usage, is on the homepage of www.coares.org under the heading "ICS Forms Information".

The ICS-214 Activity Logs and ICS-213 Message Forms must be turned in at the end of the incident, to your supervisor or to the Documentation Unit. If there is no one to take the forms, then keep them in your possession, as the forms likely will be requested later.

Ham Radio Emergency Information Template
This template (included following the text in this article) will assist the ham by indicating the type of information that needs to be collected. The template is not an actual form to be used, but serves to organize and illustrate the type of information that is usually required.

Integration with the Incident Command System
Amateur radio operators involved with emergency communications are expected to receive training in the following specific FEMA courses:
IS-100 - Introduction to Incident Command System
IS-200 - ICS for Single Resources and Initial Action Incidents
IS-700 - National Incident Management System (NIMS)
IS-800 - National Response Framework, An Introduction
(These are all available, online, from FEMA: http://training.fema.gov/IS/crslist.asp)

"Smart " Triage Tags

Triage tags
Triage tags will be placed by emergency personnel, on each individual who is transported to a hospital. The triage tags have been standardized as follows:

Red – priority 1: immediate; life threatening but treatable injuries needing first priority.

Triage Tape—plastic stretch tape that can be torn and tied to wrist, arm, leg or ankle.

Yellow – priority 2: delayed; potentially serious but stable enough to wait for a short while for treatment.

Green – priority 3: minor: injuries that can wait longer. Walking wounded.

Red – with Blue Tab* Expectant: not expected to survive (report this as Red—Priority 1 on the air!) A corner of the Red triage tag is folded over exposing a blue colored tab.

Black – dead.

In the event that triage tags are expended, triage tape may be used instead. This colored, plastic sticky tape may be wrapped around a victim's wrist, arm, leg or ankle.

For each transport of victims, the ham operator at the incident scene should obtain a count of the number of victims falling into each triage category, and provide this information to net control. Net control will provide this information to COTS and it will be relayed to the receiving hospital by normal communications and by amateur radio. Note: this information should be provided by an official at the incident scene, and, ideally, documented in an ICS-213 General Message Form.

Conclusion
The Hospital Antenna & Radio Testing Program is an important service of COARES, and requires the support of many dedicated amateur radio operators. Our efforts are much appreciated by COTS, the hospitals and the agencies. In the event of a true emergency, amateur radio again will step up to serve the public as well as provide justification for the frequencies with which we have been entrusted.

Ham Radio Emergency Information Template
This is an example of information needed in an emergency
(Not an actual form)

Date _____   Time_____   Ham Operator Call Sign_____

Hospital_____

Message Received from:
Net Control Call Sign_____   On Scene Ham Call Sign_____

Other_____

Incident_____

Location_____

Hazmat   Agent_____
               Decon on scene   Yes   No

Estimated number of patients_____

Adult_____   Child_____

Injuries
         Type   Burns   Trauma   Respiratory

Red   – priority 1: Immediate _____

Yellow   – priority 2: Delayed _____

Green   – Priority 3: Minor Walking _____

Red   **-with Blue tab** – Expectant : not expected to survive_____

Black   - Dead

Transportation: Squad #_____   COTA #_____   School Bus #_____

Med Flight_____   Private Service_____   Self Other_____