Section 2: The Networks for Messages

Topic 6c

Net Operating Guidelines

Objectives

Welcome to Topic 6c.

This topic will help you understand how to operate efficiently and effectively in a net environment under emergency conditions.

Student Preparation required:

None.

Introduction

Every organization needs an executive-level manager to oversee the entire operation and ensure that everything runs smoothly. Depending on the type of net, the Net Manager (NM) will be responsible for recruiting and training Net Control Station (NCS) operators, liaison stations, and other net members.

The Net Manager sets up the net's schedule and makes sure that one or more qualified NCS operators will be available for each session of the net. In a long-term emergency net, the Net Manager may also arrange for relief operators and support services. Some Net Managers may be responsible for more than one net.

The NCS

Think of the NCS as a ringmaster or traffic cop. The NCS decides what happens in the net and when it happens. If the Emergency Operations Center (EOC) has a priority message for Red Cross Shelter 1, and Medical Station 4 has an emergency message for Mercy Hospital, it is the NCS's job to make sure that the emergency message is sent first. He or she decides when stations will check in, with or without traffic, and whether messages will be passed on the net's frequency or a different one. The NCS needs to be aware of everything going on around him or her and handle the needs of the net, its members, and partners as quickly and efficiently as possible. It can be a daunting task in a busy and challenging net.

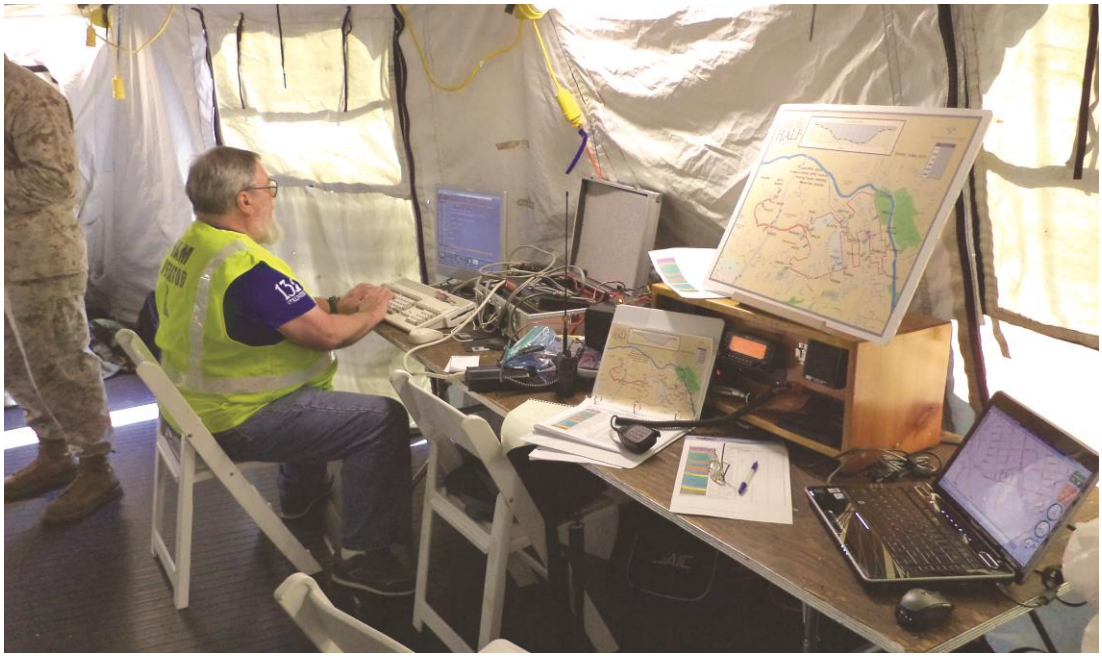
The NCS can be located anywhere but should be able to hear most, if not all, stations in the net. This helps avoid time-consuming "relays." Some groups place their NCS at the EOC or command post; others like to keep the NCS away from the noise and confusion.

The NCS oversees one specific net but should not be responsible for the entire emergency communications operation. That is the job of the Emergency Coordinator (EC) or similar emergency communications manager. It is not possible to be in command of all aspects of an emergency response and still run a net effectively since each job requires 100 percent of an individual's attention.

Net Scripts

Many groups open and close their nets with a standard script. The text of the script lets listeners know the purpose and format of the net. Using a standard script also ensures that the net will be run in a similar format each time it operates, regardless of who is acting as the NCS.

A backup NCS needs to be readily available should there be an equipment failure at the primary NCS location, or if the primary NCS operator needs to take a break. There are two types of backup NCS; the first is collocated with the primary NCS; the second is a backup NCS located off site. Off-site backup NCS should maintain a duplicate log, or if cloud sharing is available, have access to the primary NCS log, so they can seamlessly take control of the net when called upon. An off-site NCS also allows for station redundancy so that the net may continue to function should something happen at the primary net control location. Depending on the situation, either the Net Manager or the primary NCS appoints both types of backup NCS. All members of the net should be made aware of the backup NCS assignment early in the net's operation.



Acting as a "Fill-in" NCS

Even before you have had a chance to be trained by your group to act as a NCS operator, an opportunity might arise for you to handle the job temporarily. During an emergency, anyone and everyone can be asked to take on new and unfamiliar tasks in order to deal with a rapidly changing situation. Fortunately, basic NCS skills are not difficult to teach or learn. Here are some basic guidelines:

- Treat members with respect and accept suggestions from other experienced members.
- If you are taking over an existing net, try to run it much as the previous NCS did.
- Always follow a script if one is provided.
- Write your own script if necessary but keep it short and to the point.
  Handle messages in order of precedence: Emergency — Priority — Welfare — Routine.
- Speak clearly and in a normal tone of voice. Use good mic technique.
- Make all instructions clear and concise, using as few words as possible.
- Keep notes as you go along; do not let your log fall behind.
- Write down which operators are at which locations. When one leaves or is replaced, update your notes.
- Ask stations to pass messages off the main net frequency whenever possible.
- All the reading and study in the world will not replace actual experience. You should look for opportunities to practice being an NCS operator well before an emergency occurs.

Net Members

Operators at various sites are responsible for messages going to and from their locations. They must listen to everything that happens on the net and maintain contact with the partners' people at the site. They assist the partners with the creation of messages, put them into the appropriate format, and contact the NCS when they are ready to be sent.

Whenever possible, two operators should be at each site. When the station is busy, one can handle logging and message origination and work with the partners' staff while the other monitors the net, sends messages, and copies incoming traffic. During slower periods, one member can be "off-duty" for rest, meals, or personal needs.

Bulletin Stations

In some nets, the NCS does not send out bulletins and other incident-related information. That is the role of the "bulletin station." This station relays ARRL bulletins, or those authorized by the partners, to all stations in the net. They may also be transmitted on a preset schedule, such as at

the top and bottom of each hour. The bulletin station must be located with the partners or have a reliable communication link to them.

Liaison Stations

Liaison stations pass messages between two different nets. Depending on the type of organization, the NCS or Net Manager usually assigns these stations. Messages may be passed as needed or on a preset schedule. In some cases, a liaison station will monitor one net full time. When a message must be passed to another net, they leave the net temporarily to pass it, and then return. The other net has a liaison station that does exactly the same thing, but in reverse.

In other situations, a single liaison station may need to handle messages going both ways between two nets. There are two ways to do this. You can use two radios to monitor both nets at the same time, a difficult task if either or both nets are busy. The radios antennas must be separated sufficiently to prevent interference between radios when one is used to transmit. In the second method, one radio is used, and the liaison station switches between the two nets on a regular schedule.

Relay Stations

While it's not a regular net position, a relay station passes messages between two stations in the net that cannot hear each other. Relay stations are generally designated by the NCS on an "as needed" basis. If you can hear a station or stations that the NCS cannot, it is okay to volunteer to act as a relay station.

Workload and Shift Changes

Although it happens frequently, an operator should not try to work excessively long hours. When you become tired, your efficiency and effectiveness decline, and your partner is not getting the best possible service. Net managers and NCS operators should work with the EC or other emergency communications manager to ensure that all net members get some rest on a regular basis. It is a good practice for any replacement NCS, liaison, or net member to monitor the net for at least 15 minutes and review the logs with the present operator before taking over. This ensures continuity in the net's operation.

Operating Considerations for Non-Voice Modes

Packet modes include FM packet, HF packet, and PACTOR. Because packet modes can provide an automatic connection between two stations, it is not proper to speak of a "packet net." Although messages can be transmitted between two stations "keyboard to keyboard" as with Radioteletype (RTTY) or PSK31, it is usually better to transmit them as "traffic," using the bulletin board or mailbox facility of the terminal node controller (TNC). Packet messages are automatically routed and stored without any action by the receiving station's operator or an NCS.

Non-packet digital modes are not automatic and may require an NCS operator to manage the net in much the same way as a phone or CW net. These include RTTY, PSK31, AMTOR, and Olivia.

CW Procedures: Clean and accurate code sent at 10 words per minute is better than sloppy code sent at 30 words per minute. Sending speed is not a true measure of effectiveness, but accuracy is.

When propagation or interference makes communication difficult, or when the receiving operator cannot keep up, it is time to reduce the sending speed. Always send at a speed that the receiving station can copy comfortably.

There are variations used when passing traffic via CW, especially when both stations are operating in "full break-in" mode (both stations can receive signals between each Morse character sent). The receiving station can "break" (stop) the sending station at any point for needed fills, instead of waiting for the entire message to be sent. There are additional special prosigns used, and interested amateurs should be familiar with ARRL Publication FSD-218 (http://www.arrl.org/public-service-field-services-forms). This publication is sometimes referred to as the "pink card," and contains CW net procedures as well as a description of the Amateur Message Form, message precedence, and Handling Instruction abbreviations.

Interference Problems

If your net experiences interference, the NCS has several options. If the interference is coming from adjacent or co-channel stations that may be unaware of the emergency net, the NCS should politely inform them of the net and ask for their cooperation. Alternatively, the NCS might ask an HF net to move over a few kHz. If the problem cannot be resolved in this manner, each net should have one or more alternative frequencies that it can move to as required. If possible, the frequencies themselves should not be published or mentioned on the air.

Never discuss, acknowledge, or try to speak with an intentionally interfering station. Many years of experience have proven that this only encourages the offender. If the interference is making communication difficult, simply announce to the net that everyone should move to the alternate frequency and sign off. Better yet, put a plan in place so that when interference occurs, all net members know to move to the alternate frequency without being told to do so on the air. If intentional interference persists, the Net Manager or NCS can contact an elected ARRL official or a Volunteer Mentor and ask that the FCC be notified of the interference. In some cases, the FCC may be able to track down and contact the responsible station.

Reference Links

ARES Manual
http://www.arrl.org/files/file/Public%20Service/ARES/ARESmanual2015.pdf

ARES Field Resources Manual
http://www.arrl.org/files/file/Public%20Service/ARES/ARESFieldResourcesManual-2019.pdf

ARRL Publication FSD-218
http://www.arrl.org/public-service-field-services-forms

Review

As the net's "ringmaster," the NCS operator is responsible for keeping the net operating smoothly and ensuring that messages are sent in order of priority. An off-site backup or alternate NCS operator is essential for long-running nets in the event of equipment failure or operator fatigue. Net member stations should monitor the net continuously whenever possible, as well as maintaining contact with the partner's staff at that location. Liaison stations pass traffic between two different nets, sometimes only in one direction, and sometimes in both directions. Bulletin stations transmit bulletin messages from the partners to the net. CW nets can move messages very quickly and accurately, but slightly different procedures are used than with phone. Packet radio doesn't use a conventional net format due to its automatic nature and is well suited to handling large volumes of traffic or highly detailed and lengthy messages.