Section 2: The Networks for Messages

Topic 6b

Introduction to Emergency Nets

Objectives

Welcome to Topic 6b.

This topic will provide you with an overview of operations in a radio network, or "net" environment. It sets the stage for the following topic lessons, which present various aspects of net operation and message handling in greater detail. After reading the topic's content, you will identify information that is appropriate for net operations in a variety of settings and is representative of nets around the country. Local procedures may vary slightly.

Student Preparation Required

Review the sections "Net Types" and "Net Missions" in Topic 6a.

Learn the following definitions:

Formal Messages:	Written messages that are sent in a standardized format.
Informal or "Tactical" Messages:	Brief oral or informal written messages, intended for direct and immediate delivery.
Traffic:	Messages sent over Amateur Radio, usually formal, written messages; more generally, any messages or activity on a particular frequency.
Pass:	To send messages from one station to another.
Third-Party Traffic:	Messages transmitted on behalf of a person or organization other than a licensed Amateur Radio operator. This term also applies when a person other than a licensed operator is allowed to use the microphone.
Liaison Station:	A station responsible for passing messages between different nets.

What an Emergency Net Is

The purpose of any net is to provide a means for orderly communication within a group of stations. An "emergency" net is a group of stations that provide communication to one or more partner agencies, or to the public, in a communications emergency. An emergency net may be formal or informal, depending on the number of participants and volume of messages.

Checking into an Emergency Net

There are two situations when you will need to "check in" to a net.

1. When you first join the net.

2. When you have messages, questions, or information to send.

If you are part of the organization operating the net, simply follow the instructions for checking into directed and open nets as discussed below.

To become part of a directed net, listen for the NCS to ask for "check-ins" and listen to any specific instructions, such as "check-ins with emergency traffic only." At the appropriate time, give only your call sign. If you have a message to pass, you can add, "with traffic." If it is an emergency message, say "with emergency traffic." The same is true for stations with priority traffic. Wait for a response before offering more information. Checking into a directed net when the NCS has not asked for check-ins is usually considered a bad practice. However, if a long period passes with no request, you might wait for a pause in the net's activity and briefly call the NCS like this: "Net control, W1FN, with traffic."

To check in to an open net for the first time, briefly call the net control station, as above. If there appears to be no NCS, call anyone on the net to find out if anyone is "in charge," and then contact them. If you are already part of the net and have a message to send, simply wait for the frequency to be clear before calling another station.

If you are *not* part of the organization operating the net, do not just check in and offer to assist. Listen for a while. Be sure you have something specific to offer before checking in (such as the ability to deliver a message close to your location when none of the regular net members can). If the net really does seem to need help that you feel you can provide, you might check in briefly to ask if they have a resource net in operation, then switch to that frequency. If not, make a brief offer of assistance to the NCS.

Do not be surprised if you receive a cool reception to your offer of help. It is usually nothing personal. Emergency nets are serious business. Most emergency communications managers prefer to deal with people with known training and capabilities, and with whom they have worked before. You may not have the experience, skills, or official credentials they require — and they have no way of knowing what your true capabilities are. Some emergency communications managers will assign you as an apprentice, logger, or "runner." If you are given

such an opportunity, take it! It is all good experience, and a great way to introduce yourself to the group. Better yet, become involved with your local emergency communications group now — do not wait for the next disaster.

Passing Messages

If you told the NCS you have traffic to send when you checked in, he or she will probably ask you to "list your traffic" with its destination and priority. After you send your list, the NCS will direct you to pass each message to the appropriate station in the net, either on the net frequency or on another frequency to avoid tying up the net. When moving to another frequency to pass the message, always check to see if the frequency is in use before beginning.

When the NCS asks you to send your message, the standard procedure is for the NCS to tell the receiving station to call the sending station.

The entire exchange might sound like this:

> ***NCS*:** W1AW, list your traffic.
>
> ***You*:** W1AW, two priority for Springfield EOC, one welfare for the Section net.
>
> ***NCS*:** Springfield EOC, call W1AW for your traffic.
>
> ***Springfield EOC:*** W1AW, Springfield EOC, go ahead.
>
> ***You*:** Number 25, Priority…

(After you have sent your messages to the Springfield EOC, the NCS will next direct the section net liaison station to call you for their message.)

When you have finished, simply sign with any tactical call sign and your FCC call. (You will learn more about messages and message handling, as well as emergency, priority, and other types of precedence later.)

"Breaking" the Net

If the net is in progress, and you have emergency traffic to send, you may need to "break" into the net. Procedures for doing this vary from net to net, but the most common method is to wait for a pause between transmissions and simply say, "Break," and your call sign. The NCS will say, "Go ahead, [call sign]," and you respond, "[call sign] with emergency traffic."

Checking Out of an Emergency Net

Always let the NCS know when you are leaving the net, even if it is only for a few minutes. If the NCS believes you are still in the net, he or she may become concerned about your unexplained absence. This could result in someone being unnecessarily dispatched to check on your well-being.

There are three reasons for checking out of (leaving) a net.

1. The location of your station is closing.

   If the NCS has given you directions to close the location, simply acknowledge the request, and sign with your tactical call sign, if you are using one, and your FCC call sign. If the order to close has come from a local official, state that your location has been closed, along with the name and title of the official who ordered it, and sign off as above. Long "goodbyes" only tie up the net needlessly and do not sound very professional.

2. You need a break and there is no relief operator.

   Tell the NCS that you will be away from the radio for a certain length of time and the reason, and sign off with your tactical call sign, if you are using one, as well as your FCC call sign.

3. You have turned the location over to another operator.

   Tell the NCS that you have turned the station over to (give the new operator's name and FCC call sign), and that you are leaving. Sign off with your tactical call sign, if you are using one, as well as your FCC call sign.

There are two special situations to be aware of: First, if someone in authority, such as a law enforcement officer, asks you to move your station, then move immediately and without argument. Notify the NCS of the situation at the first appropriate opportunity. Second, if you are requested by someone in authority to turn off your radio, or to refrain from transmitting, do so immediately and without question. Do not notify Net Control until you have permission to transmit again and can do so safely. There is usually a good reason for such a request. It may be an issue of security, or it may be a potential hazard, such as an explosive device that could be triggered by radiofrequency (RF) energy.

Levels of Nets

Network systems are often "layered" for greater operating efficiency. Some networks are designed to handle messages within specific areas, and others to handle messages between areas. Think of this much like you would the Interstate Highway System. Local messages (cars) travel between destinations directly on local nets (local roads). When a message has to go to a distant city, it is passed to a regional net (state highway), and if it is really distant, to a long-distance net (interstate highway). At the other end, it is returned to regional, then local nets for delivery. What

has been just described is the extensive National Traffic System (NTS), discussed further below.

ARES or RACES can use a similar structure on a smaller scale. For instance, each city might have a local FM net. A county net would handle messages going from city to city. A section HF net would handle messages from county to county. Any net in such a system could have "liaison" stations to pass into the NTS any messages that need to travel out of the section.

Non-Voice Nets

Emergency nets may also use other modes of communication besides voice (phone). Traffic nets have used CW (Morse code) since the beginning of Amateur Radio, and it is still a viable option for long-distance formal traffic. High-speed CW nets can handle more messages per hour than most voice nets. Packet communication on VHF and UHF is often used for local communication when accuracy and a record of the message are required. HF digital modes such as AMTOR, PACTOR, or sound card modes are used on long-distance circuits. Many groups are now using emergency communication applications for modes such as PSK31 on HF and VHF/UHF bands.

Most CW nets are directed nets. Packet nets are not generally directed by a human, due to the automatic "store and forward" nature of the mode, and they are usually operated as open nets with no NCS.

Two systems have received significant attention from many emergency communications groups and offer digital message handling capabilities:

- "Winlink 2000," an automatic system that blends radio and internet transmission paths to permit rapid and seamless email message transfer to stations anywhere on Earth. For most emergencies, it will be possible for stations in the affected area to link to a Winlink HF gateway station outside the affected area, allowing contact with the outside world.

- The D-STAR digital voice and data protocol specification, developed as the result of research by the Japan Amateur Radio League (JARL), is an on-air and packet-based standard that is now widely deployed and sold by a major radio manufacturer. D-STAR compatible radios are available on VHF, UHF, and microwave Amateur Radio bands. In addition to the over-the-air protocol, D-STAR also has network connectivity, enabling D-STAR radios to be connected to the internet or other networks. It also has provisions for routing data streams of voice or packet data directly to specific call signs.

More on these later, but one additional point needs to be made:

Practice and train using digital as you would any other mode.

How do you hold a training net on D-STAR or Winlink? Digital modes are often not keyboard-to-keyboard in real time, and messages might take a while to get to their intended destination. Therefore, any attempt at a "conventional" net must be truly in slow motion. But without taking this time, net members will not know who else is up and operating, that equipment is working properly, and there are no "bugs" in the system. An emergency is not the time to see if your

digital planning works — try it out in a drill or net before you really need it.

Reference Links

To learn about NTS in your area, contact your Section Manager (SM), or Section Traffic Manager (STM). To locate your Section Manager (SM), see the ARRL Section Manager List at http://www.arrl.org/sections

For a list of ARES and NTS nets in your area
http://www.arrl.org/arrl-net-directory

D-STAR
http://en.wikipedia.org/wiki/D-STAR

Winlink 2000
https://www.winlink.org/

Review

Large nets are usually directed (formal) nets with a NCS in charge. Smaller nets may be “open” (informal), and an NCS is optional. Nets can serve many purposes, including passing formal messages, handling logistics, or passing informal tactical messages. Large emergencies may require more than one of each type of net; small emergencies may have one combined net. Medium- and long-distance messages are often handled by the National Traffic System (NTS).