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Topic 8

**Net Control Station (NCS)
Operator Practices**

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Objectives

Welcome to Topic 8.

Following completion of this topic, you will have gained knowledge of the basic steps of serving as Net Control operator for a net.

Student Preparation required:

Ongoing observation of local, regional, or national nets.

The following is a list of questions the NCS operator should answer before opening the net.

- **Can the NCS hear all the stations in the net from his or her location?**

  The NCS should be able to hear all the stations in the net whenever possible. Relays may be used, but they slow the operation of the net significantly. For best results, some area testing should be conducted via simplex well in advance, to see which stations can communicate with which others, so that stations can properly be put in place to ensure good communications during an emergency relay.

- **Is the NCS location sufficiently separated from the partners' operations?**

  It is good practice to assign net control duty to a station in a low-traffic location. The noise and commotion in an Emergency Operations Center (EOC) can greatly degrade the ability to run a net well. Establishing net control at another location permits the EOC station to concentrate on passing traffic and working with the partners. Of course, the NCS and the EOC station need to work together as a team. It is common for the overall incident to be managed from the EOC, while the off-site NCS assumes responsibility for managing check-ins and net traffic. In practice, it's not hard to work out a productive division of labor.

- **Do you have the best-performing antenna for the conditions?**

  A "rubber duck" (short, flexible, helically wound) antenna is not adequate unless you can see the repeater antenna — and if the repeater fails, you are out of business. A higher gain flexible or telescopic antenna would extend the range of the handhelds over that of the rubber duck antenna. On HF, an Near Vertical Incidence Skywave (NVIS) antenna is essential for skip-zone communication. For long-range nets, conventional vertical, beam, or dipole antennas (or a combination of these) will work best.

- **If you are running your radio with battery power, do you have at least 1 hour of battery capacity available?**

  Ideally, you will have a fully charged battery and access to backup batteries. If you are the only choice for NCS, make sure that you can run the net long enough to have someone else prepare to assume the duty, so you can recharge your batteries when needed.

- **Are you using a headset with a noise-canceling microphone?**

  Even from home, background noise can affect how well you can hear and be heard.

- **Do you have a sufficient supply of pencils/pens and paper to run the net for your shift?**

  You will not be able to remember enough about the traffic or participants to be effective unless you write down the information. Also keep on hand a sheet of paper for tracking net participants and their requests, as well as a good supply of any required forms.

- **For VHF/UHF repeater operations, are you familiar with the characteristics and control commands of the repeater system hosting your net?**

  Your effectiveness as NCS may be adversely affected if you are unfamiliar, with linked systems in particular.

- **Do you have a runner, liaison, or logging person to support you?**

  For large emergency events, all three are required. It is nearly impossible to handle the net, keep accurate and complete logs, and handle messages at the same time.

- **Do you have a designated backup net control station?**

  In case you go off the air, another station should be ready to take control of the net.

- **Do you have a designated relief operator?**

  Everyone gets tired, and the NCS must be the most alert operator on the net.

Opening and Closing the Net

Nets may be opened or closed on a specific schedule, or when the situation dictates. For instance, training and regular traffic nets may open at specific times, and may run for a specified period, or as long as it takes to complete the net's business. Emergency nets are often opened and closed as needs dictate.

Each net session should begin with the reading of a standard script that describes the purpose of the net and its basic procedures and protocols. Here is a sample script:

> This is W1HQ calling the Newington Emergency Net. This is a directed net, and all stations must call Net Control only. This net is handling only Emergency and Priority Traffic at this time. Only ARES stations assigned to this net should participate. Once checked in, please check out with Net Control before leaving the frequency. Stations with emergency traffic may check in or break the net at any time.

At the end of each net session, you can read a similar script, also briefly thanking members for participating and reminding them of any future nets or other obligations. All scripts should be kept short and to the point.

The Importance of Message Precedence

In a communications emergency, one of the NCS operator's primary concerns is "information overload." Without a system in place for regulating the flow of information, a message requesting "more bedpans for a shelter" may end up being sent before one requesting "a trauma team for a train wreck." Failure to organize the information flow could result in critical messages

being delayed or lost.

There are four levels of message precedence:

1. **Emergency** (Relating to the immediate protection of life or property)

2. **Priority** (Partners and ARES® messages directly related to the emergency, but not as time-sensitive as an emergency precedence message)

3. **Health and Welfare** (Inquiries or information about the whereabouts or condition of persons in the affected area)

4. **Routine** (Messages unrelated to any emergency: birthday greetings, net activity reports, etc.)

Highest Precedence

The primary job of the NCS operator is to ensure that messages with the highest precedence are sent first — *emergency*, then *priority*, then *health and welfare*, then *routine*.

Most emergency nets refuse to handle any *routine* messages at all, because they usually have little or no bearing on the emergency itself or the partners' needs. Other nets may handle only *emergency and priority* messages, or primarily *health and welfare* messages.

Asking for Check-ins

Ask for check-ins immediately after reading the opening script, and then periodically during the net's operation.

If the net is handling only *emergency and priority* messages, and not *welfare* or *routine* messages, it is important to state this in the opening script and when asking for "check-ins with messages."

If *emergency* precedence messages are likely, it is a good idea to ask for them first, then move on to *priority*, and finally *welfare*. Try to ask for "check-ins with traffic only" as often as possible and ask for "check-ins with or without traffic" at least every 15 minutes, so that new stations may join the net.

In a busy net, it can be difficult to balance the need to handle the current message backlog and still take check-ins on a regular basis. It is important to ask for check-ins with traffic frequently to ensure that priority or emergency messages get through expeditiously.

When taking check-ins, the NCS should read back the calls it received, and then ask if anyone was missed. This method can cut the time required for check-ins.

Time-Tested Techniques

Listen! When asking for reports or soliciting traffic, *listen carefully*! This might seem obvious, but it is easy to miss critical information when operating under the stress of an emergency. Wear headphones and reduce any distractions around you.

Log check-ins first. After asking for check-ins, note on your net worksheet or log as many calls as you can *before* you acknowledge anyone. Acknowledge all stations heard by call, ask for fills on any partial calls heard, and then ask if you've missed anyone.

Pair up stations to pass traffic on a different frequency whenever possible. This practice results in net "multi-tasking" and a higher rate of traffic handling. This is true especially when longer formal messages are being passed, or when a protracted discussion or exchange of information is required.

Every net has a style of operating, suited to the needs of the net. Most participants will catch on to the methods used, but if they do not, take time to explain. Things get done much more quickly if everyone uses the same techniques.

Be as concise as possible. Use the fewest words that will completely say what you mean. This will minimize the need for repeating instructions and messages.

Take regular breaks. While you may not recognize the stress that being NCS produces, it is constant, and it will become evident in your voice. If you find yourself asking when your last break was, you know it is time to take one. Turn over the net to your backup at least every 2 hours and rest. Do not listen to the net while you're resting — just rest. Once you have rested, listen to the net for a few minutes before resuming as NCS.

Control the tone of your voice. Be as calm as possible. Tension tends to cause voices to increase in pitch, and net members will detect this change. When you use a calm tone, other members of the net will tend to remain calm as well. Remember to speak with confidence and authority. A weak or indecisive demeanor undermines your effectiveness as NCS, and consequently the productivity of the net.

Legally identify yourself. In the heat of things, especially using tactical call signs, it is easy to forget the requirement to identify. A good NCS will identify at least every 10 minutes as required by FCC rules and regulations.

When conducting a net using a repeater with a PL tone, don't forget to announce the PL tone. Valuable time can be lost trying to find it, and emergency messages could be waiting.

Net Disciplines

You can reasonably expect trained net members to:

- Report to the NCS promptly as they become available
- Ask the NCS operator for permission to call another station
- Answer promptly when called by the NCS operator
- Use tactical call signs
- Identify legally at the end of each exchange
- Follow established net protocol

One method to enlist the cooperation of the net is to explain what you are doing in a calm and straightforward manner. This may involve supplying a small amount of real-time training. The one thing you must *never* do is to criticize someone on the air. It is better to lead by example — it produces better results. If a problem persists, try to resolve it on the telephone or in person afterward.

Microphone Technique

Know how to use your microphone. An NCS operator that cannot be understood due to poor microphone technique will be ineffective.

Articulate; don't slur. If your natural speech is rapid-fire, you may want to train yourself to slow down on the air.

Different microphones perform differently. Experiment to find the best microphone placement. Have another station listen while you make adjustments. There are no general rules that apply to all situations. If your mic came with a manual, following its guidance is a good starting point, but you'll still want to experiment to find what works best for you.

Three major categories of microphones are commonly used in amateur stations.

Noise canceling — A noise-canceling microphone is designed to filter ambient noise from the desired sound, which is especially useful in noisy environments. If you are using this type of microphone, you must speak close to the microphone element for the best effect.

Unidirectional — This type of microphone picks up sound primarily from one direction. If you are using a unidirectional microphone, speak directly into it (on axis) for best performance. However, these mics tend to produce more bass tones as you get closer; this is called "proximity

effect." You can sometimes compensate for too much bass by backing off or speaking slightly off-axis. Consistent technique is critical with these microphones because small changes in angle and distance can have a pronounced effect on volume and frequency response, making it hard for others to understand you.

Omnidirectional — This type of microphone picks up sounds from multiple directions. The common electret mics that are supplied with most rigs are omnidirectional — equally sensitive in all directions. These mics tend not to suffer from proximity effect, but they often do a great job of picking up unwanted background noise in addition to your voice. If you are using an omni in a noisy environment, get up close to the mic and reduce the mic gain on the rig to make the mic less sensitive to the background noise.

Some microphones are prone to sibilance (a hissing sound when "s," "f," or "ch" sounds are spoken) or "popping" (during "p" or "b" sounds). Much of this extraneous noise is caused by turbulence produced when air flowing from your mouth strikes some part of the microphone. The trick is to aim the mic so that it responds to the pressure wave produced by your voice while avoiding the high-velocity airflow. For example, you can sometimes improve things by changing the angle of the mic slightly (i.e., speaking "across" the mic instead of directly into it) or pointing the mic at the corner of your mouth. In the most severe cases, try placing a foam windscreen over the microphone. You can use a rubber band to hold it in place. The best microphones are relatively impervious to wind noise and speaking directly into the mic may yield the best sound.

On HF, it is critical to adjust the mic gain and compression to achieve a good signal. Over-modulation and distortion should be avoided at all costs. The goal is maximum intelligibility. Even on VHF and UHF FM rigs, it is a mistake to assume that mic gain, and deviation controls are adjusted to optimum levels for your voice and operating style. All-band radios have speech compression that can be turned on and off. It is meant to be used with SSB, and should never be used with FM. It can cause over-deviation, or at least distorted transmit audio. Sometimes a small adjustment makes a big difference in the quality of your audio.

Road noise can be a huge problem when operating mobile. It is human nature to speak louder as the vehicle's speed increases, simply because we have trouble hearing ourselves over the noise. The problem is, the louder we holler, the more strained and distorted we sound. The solution is to get close to the mic, turn down the mic gain, and force yourself to speak at a constant volume and uniform speed regardless of background noise. With a little practice, you can train yourself to do this.

For good microphone technique, use the "Monitor" function that is available on most modern transceivers to monitor your audio quality through your headphones. Then you can hear what you sound like and make corrections yourself.

Finally, when you find a technique that works, *use it consistently*.

More Hints for Successful Operation

- Keep transmissions as short as possible without losing message clarity.

- For voice nets, use only plain English and standard "prowords" (procedure words). "Q" signals are only for Morse code operation, and 10-codes are passé even in the CB community — most served agencies have abandoned codes in favor of plain English. Keep the net formal and professional but friendly. An informal or casual style during an emergency net promotes sloppiness and does little to impress served agencies.

- If the net is a scheduled net, start on time! Tardiness indicates poor management and doesn't inspire confidence in the NCS.

- Use a script to promote clear and concise communication. Scripts can be used to open and close the net, and for periodic "housekeeping" announcements. If you don't have a preprinted script, take a moment to write one.

- Frequently identify the name and purpose of the net. Advise listeners of the sub-audible squelch tone (CTCSS or DCS) required, if applicable. This can be part of your periodic "housekeeping" script.

- If the net is an emergency operation, use your scripts to tell listeners where to find other nets, such as resource or specialized nets. In some cases, this may help prevent un-needed but well-meaning stations from checking in just to offer their services, which distracts the net from its mission.

- Be friendly, yet in control. Speak slowly and clearly with a calm, even, tone — not a monotone. Speak with confidence, even if you are nervous.

- Acknowledge requests promptly and specifically so that net participants are not left wondering if they were heard, or which one of several callers was recognized.

- Ask specific questions and give specific instructions. This reduces the need for "repeats" and prevents confusion.

- Have pencil and paper ready — write down *all* calls and tactical call signs. Practice writing down everyone's calls when you are not the NCS.

- Read your radio's owner's manual and know your radio before an emergency occurs. Random fumbling with knobs wastes valuable time and is very unprofessional.

- Know how to use your microphone. Have another station advise you on the best distance and angle from your mouth to the microphone and the proper mic gain setting. You may have to adjust your mic technique to compensate for increased background noise — talking louder will likely cause over-modulation or distortion. Articulate, don't slur.

- When there is a "double" (i.e., when two or more stations transmit on the same frequency at the same time), listen to see if you can identify either station by call sign or by text. Then, ask all stations to stand by while you solicit clarification or repeats from each

station involved, as needed.

- During check-ins, recognize participants by their tactical call sign whenever possible — it helps to let everyone else know which stations are on the air and become familiar with what the tactical call signs are.

- Don't be afraid to ask for assistance if you need it. The Net Manager should be able to assist you or locate additional help. That is part of their job.

- You will make mistakes. Acknowledging them will earn the respect and support of net members, but don't dwell on them.

- Avoid thinking out loud. If you need a moment to consider what to do next, say something like "stand by" or "please wait" and un-key your microphone while you think.

- Transmit only facts. If there is a *real* need to make an educated guess or to speculate, make it clear to others that it is *only* speculation and not fact.

- Avoid becoming the source for general information about the event. If it is an emergency, refer event status questions to the proper public information net or Public Information Officer (PIO). Avoid casual discussions about the partners' response efforts on the air because the press or the general public might be listening and take information out of context.

- When necessary, use standard ITU phonetics. Assume that there is no such thing as "common spelling." Send all numbers as individual numbers, e.g., 334 is "three three four," not "three hundred thirty-four."

Reference Links

For more information on the NCS operators function, please see the chapter on emergency communications in The ARRL Operating Manual
http://www.arrl.org/shop/ARRL-Operating-Manual-11th-Edition/

See also the ARES Field Resources Manual
www.arrl.org/files/file/ARES_FR_Manual.pdf

ARRL Net Directory
www.arrl.org/arrl-net-directory

To learn more about local and Section-wide ARES and NTS net operation, contact your Section Manager (SM), your Section Emergency Coordinator (SEC), or District Emergency Coordinator (DEC). To locate your Section Manager, see
www.arrl.org/sections

NVIS
www.arrl.org/nvis

Review

The NCS operator has many skills, some of which are transferable, and some specific to the NCS's job. He or she must not only control the flow of messages, but also keep the net moving quickly and professionally. The NCS operator must effectively handle any problems with net members, interference, special situations, and urgent messages.

Activities

1. Develop your own set of guidelines for operating the ideal net. These guidelines should show what you imagine to be the best way to operate. Monitor two or more nets if you can and compare each net's performance with your guidelines. Alternatively, describe efficient and effective communications techniques that you observe being used in a well-run DX operation or a contest.

2. Formal nets have both opening and closing scripts. Develop outlines for both an opening and closing script.

3. Develop a method that works for you so that you can have immediate access to critical phone numbers, e-mail addresses, and other contact information for local served agencies, police, fire, section officials, and others who you might need to contact in a hurry while still working a net.

Welcome to Topic 8 Knowledge Review

Please review the following questions to improve your understanding of this topic:

Question 1:

Which of the following statements is *true*?

a) The NCS should ask for check-ins immediately before reading the opening script.
b) The NCS should ask for check-ins just before reading the closing script.
c) The NCS should ask for check-ins immediately after reading the opening script and periodically thereafter.
d) The NCS should ask for check-ins every 10 minutes during the operation of the net.

Question 2:

In which order should messages be handled during an emergency?

a) Priority, Emergency, Health and Welfare, Routine.
b) Emergency, Priority, Health and Welfare, Routine.
c) Emergency, Health and Welfare, Priority, Routine.
d) Health and Welfare, Emergency, Routine, Priority.

Question 3:

Which of the following should the NCS operator *not* expect of trained net members?

a) To ask the NCS operator for permission to call another station.
b) To answer promptly when called by the NCS operator.
c) To follow established net protocols.
d) To rely exclusively on FCC call signs during net operations.

Question 4:

Which of the following are appropriate to use in an emergency phone net?

a) Plain English and 10-codes.
b) Plain English and prowords.
c) Q-signals and prowords.
d) Q-Signals and 10-codes.

Question 5:

Which is the best way to enlist the cooperation of the net?

a) Immediately criticize net operators who make a mistake so that other operators will learn from the error.
b) Issue an order demanding the cooperation of all net operators.
c) Explain what you are doing in a calm and straightforward manner.
d) Immediately expel from the net operators who do not follow net protocol.