ARRL Introduction to Emergency Communication Course

Indian River County FL
ARES®
Introduction to Emergency Communication

Section 1: Topic 1 Through Topic 15
Presented for
Indian River County FL ARES®

With Thanks to:
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Indian River County ARES

Indian River County Amateur Radio Emergency Service (IRCARES) is a group of highly trained and dedicated volunteers. Training includes multiple FEMA courses as well as specialized training in Emergency Communications. Many members also have additional training from the American Red Cross (ARC), the National Weather Service (NWS), and other nationally recognized agencies.

IRCARES falls under the command of the Indian River County’s Emergency Management Division, and serves as an Emergency Service Function (ESF) at the county’s Emergency Operations Center (EOC).

We also work directly with the North Treasure Coast Chapter of the American Red Cross including providing primary communications to shelters and feeding sites during disasters.

Note: Guidelines for IRCARES emergency operations are outlined in the Indian River County ARES Emergency Operations Plan. The group-specific guidelines (frequencies to use, etc.) will not be included on the Intro to EmComm exam, but are additional information you need to know for the “real test” -- operating during an actual emergency. You can download a copy of the IRCARES Emergency Operations Plan at: http://www.ircares.org/wp-content/uploads/2013/07/operatingplan.htm.
Introduction to Emergency Communication

A Course Book is also available from ARRL: The ARRL Introduction to Emergency Communication Course, 4th Edition

Test Preparation Suggestions:

- Read each topic through completely.
- Questions and answers are included at the end of each section.
- Learn the actual answer. Do not memorize “A, B, or C”; they are different on the actual test.
- Be cautious of the True/False statement of a question.
What is a Communication Emergency?

“A communication emergency exists when a critical communication system failure puts the public at risk.”

A variety of circumstances can overload or damage critical day-to-day communication systems. It could be a storm that knocks down telephone lines or radio towers, a massive increase in the use of a communication system that causes it to become overloaded, or the failure of a key component in a system that has widespread consequences.
Introduction to Emergency Communication

Introduction to Emergency Communication Topic 1
Introduction to Emergency Communication

Introduction to Emergency Communication Topic 1
What Makes a Good Volunteer?

“The common attributes that all effective volunteers share are a desire to help others without personal gain of any kind, the ability to work as a member of a team, and to take direction from others.”
Introduction to Emergency Communication Topic 1

Where Do You Fit In?

“Amateurs have the equipment, the skills, and the frequencies necessary to create expedient emergency communication networks under poor conditions. They are licensed and pre-authorized for national and international communication.”

“Hams have the ability to rapidly enlarge their communication capacity to meet growing needs in an emergency, something commercial and public safety systems cannot normally do.”

“Many of the skills are the same ones that are used in everyday ham activities.”
What You Are Not!

- You are not a “First Responder.”
- You have no authority.
- The only decisions you can make are whether to participate or not, and those affecting your own personal health and safety.
- When the agency you are supporting runs short of personnel it is not your job to fill the void!
- You are not in charge “you are there to temporarily fulfill the needs of the agency whose communications system is unable to do the job. They tell you what they need and you do your best to comply.”
Day-to-Day Versus Emergency Communications (Continued)

- Emergency communicators need to contact specific stations quickly to pass important messages.
- Emergency operations have no schedule – They could last for days!
- Unlike commercial operations, amateur radio emergency communicators have the equipment and skills to create additional capacity in a very short time.
Introduction to Emergency Communication

Introduction to Emergency Communication Topic 1

The Mission

- The job you will be asked to do will vary with the agency you serve:
  - Red Cross Shelters
  - State wide emergency communications support
  - Hospital communications support
  - Forest fire communications support
  - Search and rescue
  - SKYWARN support for the National Weather Service
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Introduction to Emergency Communication Topic 1

Communications is Job #1

- VHF/UHF/HF Radios
- Phone and FAX
- CB, FMS and GMRS
- The agency’s radio communications equipment
Introduction to Emergency Communication

Introduction to Emergency Communication Topic 1

Anatomy of a Communication Emergency

- In the early phases of many disasters (except earthquakes, tornados, explosions, etc.) there is usually no need for emergency communication services.
- A “Watch” or “Warning” period gives you time to monitor developments and prepare to deploy while monitoring the NWS broadcasts.
- A supported agency or Emergency Operations Center (EOC) may put out a call for volunteers to deploy to field locations.
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Introduction to Emergency Communication Topic 1

Anatomy of a Communication Emergency

- A Rapid Response Team (RRT) may be deployed with a one hour notice.
- Communications assignments are made and supported until relieved.
- After the operation, a review of the effectiveness of its response by the supported agency, either alone by the amateur radio communicator or with the agency. This should be accomplished ASAP after operations have ended while the events are clear in everyone’s mind.
Introduction to Emergency Communication

Topic 1-1
When does a communication emergency exist?
A. Whenever the public is at risk.
B. When there is an earthquake in your area and the public is inconvenienced.
C. When a critical communication system fails and the public is inconvenienced.
D. When a critical communication system fails and the public is put at risk.

Topic 1-2
Which of the following is it most important for an emcomm group to do at the end of an emergency communication operation?
A. Review the effectiveness of its response.
B. Take photos of the activity.
C. Call the local newspaper to schedule interviews.
D. Review the activities of the first responders.
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Topic 1-3
Which of the following is it NOT a responsibility of emergency communicators?
A. Making demands on the agency being supported.
B. Having radios, frequencies and basic radio skills.
C. Being licensed and preauthorized for national and international communications.
D. Possessing emergency communications skills.

Topic 1-4
Which of the following describes the function of a Rapid Response Team (RRT)?
A. To Handle large-scale emergencies over an extended period.
B. To deploy a quick response in a very short time.
C. To establish and operate a storm watch prior to any emergency.
D. To review of the effectiveness of an emergency communications group.
Topic 1-5

In an emergency situation – when a served agency asks you to forward an urgent message – which of the following methods would you NOT employ?

A. CB radio
B. Family radio
C. Informal, conversational grapevine.
D. The served agency’s own radio system.
Amateurs as Professionals - The Served Agency Relationship
Topic 2

What does my attitude have to do with emergency communications?

- In a word, **everything**! It is even more important than your radio skills.
- The attitude of some Amateur Radio volunteers has been our weakest point.
- In situations where a professional and helpful attitude is maintained, served agencies point with pride to ham’s efforts and accomplishments.
- “Professionalism means getting the job done efficiently—with a minimum of fuss.”
- Do whatever you can, within reason, to accomplish that goal, and avoid becoming part of the problem.
Who Works for Whom

- The relationship between the volunteer communicator and the served agency will vary somewhat from situation to situation, but the fact is that you work for them.
- Your job is to meet the communication needs of the served agency.
- When you volunteer your services to an organization, you implicitly agree to accept and comply with reasonable orders and requests from your “employer.”
- When asked to do something not permitted by FCC rules, regardless of the reason, respectfully explain the situation and work with the served agency or your superiors to come up with an alternative solution.
Introduction to Emergency Communication

Amateurs as Professionals – The Served Agency Relationship

Topic 2

How Professional Emergency Responders Often View Volunteers

- Unless a positive and long established relationship exists between professionals and volunteers, professionals who do not work regularly with competent volunteers are likely to look at them as “less than useful.”
- Volunteers are often viewed as “part timers” whose skill level and dedication to the job vary widely.
- If your offer of assistance is refused, do not press the issue.
- Remember: the served agency’s authority should never be challenged – They are in charge, and you are not.
Performing Non-Communication Roles

- In today’s fast paced emergency responses, your job description will more than likely be “any function that also includes communication,” as defined by the served agency.

- Emergency communication groups should engage in pre-planning with the served agency to ensure that these jobs are clearly defined.
Performing Non-Communication Roles (Continued)

- Assignments could include radio operator, dispatcher, resource coordinator, field observer, damage assessor, van operator, etc.

- You may need to complete task-specific training courses and take part in exercises and drills in addition to those required for emergency communication and Amateur Radio.
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Amateurs as Professionals – The Served Agency Relationship

Topic 2

Specific Agency Relationships

- The relationship between the volunteer and the served agency can vary greatly from agency to agency, and even within an agency.

- “Memorandums of Understanding” MOU’s, “Statements of Understanding” SOU’s, “Statements of Affiliation” SOA’s are in place with many served agencies.

- Served agencies may be: DHS, FEMA, American Red Cross, The Salvation Army (SATERN), state/local Emergency Management, and SKYWARN.

- Some ARES® members may also serve as RACES registered operators, provided they have demonstrated a willingness to complete FEMA Independent Study Courses on NIMS and ICS. These courses are, IS-100, 200, 700, 800.
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Amateurs as Professionals – The Served Agency Relationship
Topic 2

Volunteering Where You Are Not Known

- If an emergency occurs outside of your area and you wish to offer your services, make your offer before making any significant preparations or leaving home.

- It is possible that your offer might be accepted, but it is equally possible that it will be refused. There are good reasons for this, particularly where the served agency has specific requirements, such as specialized training requirements, official ID’s and/or background checks.
Volunteering where You Are Not Known (Continued)

- If your offer of assistance is accepted, the situation you find may be well organized or not.

- A well organized effort will have someone to help orient you to the response effort, provide required information and answer your questions. Your assignment will be clear, a relief person sent at the end of a pre-determined shift, and arrangements for food, sanitation and sleep will be explained to you.

- If the effort is not well organized, you might be given an assignment, but with little additional information or support. You will have to improvise and fend for yourself.
Workers Compensation Coverage and Legal Protections

- In some states, Worker Compensation insurance coverage can be extended to volunteers working in behalf of a government or non-profit agency.

- Volunteers providing services to government agencies or Section 501 c (3) tax-exempt private organizations are provided immunity from liability by Federal law through the Volunteer Protection Act of 1997, 42 USC Section 14501.

- The law does not cover volunteers who cause harm while operating motor vehicles, or if the volunteer is grossly negligent, or engages in criminal acts.
Amateurs as Professionals – The Served Agency Relationship

Topic 2

Review

- The relationship between Amateur Radio operators and a served agency is a critical one.
- Emcomm volunteers should maintain a professional attitude at all times and remember that their relationship to the served agency is much like that of an employee – without the paycheck.
- Agency relationships will vary with the agency, region, and the needs and style of local management.
Review (Continued)

- When volunteering where you are not known, do not be surprised if your offer is refused.
- Response organizations often have requirements for training, localized protocols and skills that cannot be mastered during an actual emergency.
Introduction to Emergency Communication

Amateurs as Professionals – The Served Agency Relationship
Topic 2

Student Activity

- If you were asked to develop a Statement of Understanding (SOU) between your local emcomm group and a local served agency, what general topics would you include?

- The list should include at least a description of each organization and its purpose, methods and areas of cooperation, provisions for periodic review.
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Amateurs as Professionals – The Served Agency Relationship
Topic 2

Student Activity (Continued)
Full list for reference:

a. Description of activities for which the participation of emcomm group members would be solicited, including roles for each group, coordination of efforts, etc.;

b. Statement as to any special training or preparatory exercises required before emcomm members could participate with the local served agency as desired.

c. A policy on how media contacts should be handled (with the understanding on the emcomm side that in all instances, the local agency should be the resource consulted for any media contact).

d. How incurred expenses will be handled by each party to the SOU.
Amateurs as Professionals – The Served Agency Relationship
Topic 2

Student Activity (Continued)

Full list for reference:

e. Statement as to the FCC requirements under which amateur radio operators must operate and abide.
f. Description of the types of events that could precipitate a call for the emcomm group to provide assistance.
g. Protocols that must be followed when providing services. For example, check-in at local group's operating position, registration requirements, etc.
h. List of information to be shared between groups, and other cooperative activities that should occur before an emergency happens.
i. Provisions for periodic review and update.
Introduction to Emergency Communication

Topic 2-1
Which of the following best describes your main job as an emergency communicator?

B. Weather spotter.
C. Radio operator, using Amateur or served agency radio systems.
D. Resources coordinator, organizing the assignments of disaster relief volunteers.

Topic 2-2
Which of the following best describes the role of a modern emergency coordinator?

A. You are strictly limited to communication tasks.
B. You may be asked to serve any function that includes communication.
C. You do anything the served agency asks.
D. You transmit and receive messages.
Introduction to Emergency Communication

Topic 2-3
If you are asked by a served agency to perform a task that falls outside FCC rules, which of the following is a proper response?

A. Document the request, and then do what is asked.
B. Document the request, but refuse to do it.
C. Leave immediately.
D. Discuss the situation with the served agency, and develop an alternative solution.

Topic 2-4
An MOU is:

A. A legal contract between you and the served agency
B. Volunteer information and make yourself helpful to them
C. A document outlining what you can expect from each other
D. Ignore them and hope they will go away.
Topic 2-5

Which of the following will most affect your relationship with a served agency?
A. Your radio and electronic equipment.
B. Your knowledge of FCC regulations.
C. Your attitude.
D. Your radio skills.
Network Theory and the Design of Emergency Communications Systems Topic 3

Network Theory:

- The study of information transfer between multiple points is known as “network theory.”
- During an emergency, the available communication pathways vary in how well they handle messages having different characteristics.
- The best pathway is that which can transfer the information with the most efficiency, tying up the communication resources the least amount of time, and getting the information transferred most accurately and dependably.
Single verses multiple destinations

- Some messages are for one single addressee while others need to be received by multiple locations simultaneously.
- A specific instruction to a particular shelter manager is a completely different kind of communication than an announcement to all shelters.
- Yet, it is common to hear these messages on the same communications channel.
Network Theory and the Design of Emergency Communications Systems Topic 3

High Precision verses Low Precision

- Accuracy is not the same as Precision.
- All messages must be received accurately. But, sending a list of names or numbers requires precision at the “character” level, while a report that “the lost hiker has been found” does not.
- Over low-precision communications channels (such as voice modes) even letters can be misinterpreted unless a phonetic system, feedback, or error-correcting mechanism is used.
- Conversely, sending low priority logistics information over a high-precision packet link may be more time consuming than a voice report.
Introduction to Emergency Communication

Network Theory and the Design of Emergency Communications Systems Topic 3

Complexity

- Long complicated messages can confuse the recipient.
- Detailed maps, long lists, complicated directions and diagrams are best put in hard copy or electronic storage for later reference. This will lessen or completely avoid the need to repeat and ask for “fills.”
- FAX and packet radio modes, by their very nature generate a reference copy.
Introduction to Emergency Communication

Network Theory and the Design of Emergency Communications Systems Topic 3

Timeliness

- Highly time-critical messages must get through without delay.
- Timeliness also relates to the establishment of a communications link, i.e. telephone, FAX, voice, etc.
- What matters is the total elapsed time from the time the message originates to the time it is delivered to its final party.
Priority

- The concept of priority as used by Network Theory is better known to hams as QSK, the ability to “break in” on a communication in progress.
- Some communications modes and equipment allow for this; others do not.
Characteristics of Communications Channels

- **Telephones** – This voiced-based mode is surprisingly reliable. However, it can become overloaded during large scale disasters.
  - The telephone system is very good for transferring simple information requiring low precision.
  - The one-to-one communication pathway – It cannot be used for broadcasting.
  - Ideal for passing sensitive or confidential information, such as casualty lists.
  - Difficult or impossible to “break in” on a conversation for a higher priority message.
  - The system requires wires and cables that can be damaged or destroyed during severe weather.
Cellular Phones – They are simple to operate, are lightweight and eliminate the need for tracking individuals as they move around.

- Ideally suited for one-to-one communications.
- They are unsuitable for multiple recipient messages that are better handled by a broadcast-capable communications mode.
- They rely on a complex central switching and control system that is subject to failure or overloading.
- There is no “go to simplex” contingency option with cellular phones.
FAX – FAX machines overcome the limitations of voice communications when it comes to dealing with high-precision, lengthy and complex information.

- FAX machines can transfer drawings, pictures, diagrams and maps – information that is practically impossible to transfer over voice channels.
- FAX machines can be found at schools, churches, hospitals, government centers and other institutions involved in emergency disaster efforts.
- They produce a permanent record of the message.
- However, they rely on the telephone system and require 120VAC power.
- Laptop PCs may have a battery powered fax modem installed that can be connected to the telephone system.
Characteristics of Communications Channels (Continued)

- Two-Way Voice Radio – Whether on the public service bands or ham frequencies, whether SB or FM, via repeater or simplex, voice radio is simple and easy to operate.
  - Most radios can operate on multiple frequencies making it a simple matter to increase the number of available communications channels.
  - These units are generally self-contained, portable, increasing the reliability of the system in adverse environmental conditions.
  - They are ideal for broadcasting.
  - They suffer from the low-precision inherent in voice modes of communication.
Introduction to Emergency Communication

Network Theory and the Design of Emergency Communications Systems Topic 3

Characteristics of Communications Channels (Continued)

- Trunked Radio Systems – Similar to the standard voice radio communication systems described earlier with two exceptions:

  ✗ First. They allow increased message density over fewer frequencies. But, during an emergency the communication needs skyrocket and a priority queue is established and messages are delayed. Medium and low priority messages, and even some high-priority messages, may not get through.

  ✗ Second. Trunked systems rely on a complex central signaling system to dynamically handle the mobile frequency requirements. When the central control unit goes down for any reason, the entire system must revert to a pre-determined simplex or repeater-based arrangement. This fallback is risky because of the small number of frequencies available.
Packet Radio – Digital data modes, such as packet radio, ensure near perfect message transmission and reception accuracy and facilitate high-precision message transfer.

- Like FAX machines they provide a relatively permanent record of the message for later reference.
- Packet stations are generally self-contained, and if located within line-of-sight, do not need a central switching system.
- This mode is perfect for the distribution of high-precision information to a large number of destinations simultaneously.
- However, real time packet operators must use a key board, which makes this mode unacceptable for low-precision but lengthy messages.
Store-and-Forward Systems – Sometimes considered a subset of packet radio, bulletin boards, messaging gateways, electronic mailboxes, etc., can handle non-time-critical messages and reference material, in situations when the sender and receiver can not be available simultaneously.
Network Theory and the Design of Emergency Communications Systems Topic 3

Characteristics of Communications Channels (Continued)

- WinLink 2000 and D-Star
  - These two newer modes are gaining in popularity and are now “battle proven.”
  - Winlink is a system that allows for email type messaging using both radio and the Internet. It can provide a digital bridge into and out of areas where the Internet is not available.
  - D-Star provides for both digital voice and data. We will discuss them in more depth later.
Other Modes – Slow-scan and fast-scan television, satellite communications, human couriers, the internet, e-mail and other modes have their own characteristics.
Planning and Preparation – The Keys to Success

- Planning
  - Planners should give advance thought to the kinds of information that might need to be passed during each type of emergency. Will maps, long lists of names, addresses, supplies or other detailed identification be passed.
  - Planners should consider the origins and destinations of the messages. Will dissemination to multiple remote sites be required? Will there be many one-on-one communications? How about store-and forward system requirements?
  - Will there be a need for break-in for pressing traffic?
  - How will confidential and sensitive information be passed?
  - How many messages will have to be handled?
Preparation

- Now that you have identified the ideal pathways for the most common messages, you now need to ensure that the needed modes will be available during the emergency.
- Hams traditionally put together excellent “jump kit” emergency packs containing 2-meter radios, extra batteries and roll-up antennas. Include a list of critical phone numbers (including FAX, pager and cellular numbers) in the kit.
- It is a good idea to include copies of the operating instructions for the FAX and copy machines you might have to use at the served agency.
- Remember, if you plan for problems, they cease to be problems and become merely part of the plan.
Network Theory and the Design of Emergency Communications Systems Topic 3
Planning and Preparation – The Keys to Success

- Training
  - Who knows how to best use all the capabilities of today’s cellular phones?
  - Who knows how to use fax software?
  - Who knows how to upload or download a file from a packet BBS?
  - Who knows how to touch-type?

- By matching your needs with your personnel, you can identify areas where training is needed.

- Advance planning and effort can go a long way to turning a volunteer mobilization into a versatile, effective, professional-quality communication system.
Activity
Make a list of the kinds of messages that might need to be handled during a communication emergency likely in your area. Match the kind of message (tactical messages, served agency manpower requests, welfare inquiries, medical information, casualty lists, requests for supplies, shelter resident lists, etc) with the appropriate communication mode(s) (packet or other digital modes, FM phone, CW, HF SSB, etc.).
Quick Reference List

Tactical Messages  FM, SSB, CW, Tel, Cell
  Weather Observations  FM, SSB, CW, Tel, Cell, Digi, WinLink, email
  Manpower Requests  Fax, Digi, WinLink, email, Tel, Cell, FM, CW, SSB,
  Welfare Inquiries  Confidential: Fax, Tel, Cell, email, Courier; Digi

Non-Confidential: Any other

Medical Information  Confidential: Fax, Tel, Cell, email, Digi, WinLink, Courier;
Non-Confidential: Any other FM, SSB, CW

Casualty Lists  Confidential: Tel, Cell (or other, as available), Fax, Courier: (Served
Agency Responsibility, Never Transmitted on radio)

Supplies Requests  Fax, Digi (or other, as available), WinLink, email, Courier;
Shelter Resident Lists Confidential: Fax, Digi (or other, as available), WinLink, email, Courier;
Damage assessment  Tel, Cell, FM, SSB, CW, Fax, WinLink, Digi, (or other, as available)

Other non-confidential messages: Any method available

(Key:  Tel – Landline telephone (if available);  Cell – Cellular Phone (if available);  Fax – Landline Fax Transmission (if available);  Digi – Digital or Packet Radio, PSK;  FM – FM Phone;  CW – Morse Code Transmission;  SSB – HF/UHF/VHF SSB Phone;  Email- Internet email ;  Courier – Radio Dispatched Courier)
Introduction to Emergency Communication

Topic 3-1
What mode should be used to send a list of casualties?
A. A VHF repeater system.
B. A secure mode.
C. PACKET RADIO.
D. An HF net.

Topic 3-2
What types of messages are good to sent by fax?
A. High precision, lengthy and complex messages.
B. Simple low-precision, and short messages.
C. Messages to many destinations simultaneously.
D. High detail color photographs.
Introduction to Emergency Communication

Topic 3-3
What types of messages should be handled by a packet bulletin board?
A. Time sensitive messages of immediate priority.
B. Low precision messages.
C. Non-time-critical messages and reference material, when the sender and receiver cannot be available simultaneously.
D. Messages to be “broadcast” to numerous stations.

Topic 3-4
What is the pitfall that is common to telephone, cellular phone and trunked radio systems?
A. They do not take advantage of the benefits of Amateur Radio.
B. They are all difficult to use.
C. They are seldom available at shelters and public safety agencies.
D. They all require the use of a complex central switching system that is subject to failure in a disaster situation.
Topic 3-5
Which of the following is an example of an efficient communication?

A. A ham communicating a lengthy list of needed medical supplies over a voice net.
B. A lengthy exchange between two stations on a primary voice channel being shared by a numbers of users.
C. Typing out a digital message that “the delivery van containing coffee has arrived at this location” on a high-precision packet link.
D. Sending a shelter list on the office fax machine.
Imagine a random group of volunteers trying to tackle a full-scale disaster communication emergency, working together for the first time. They do not know each other well, have very different approaches to solving the same problem, and half of them want to be in charge.

Ask anyone who has been around emcomm for a while – they have seen it!

Emcomm organizations provide training, and a forum to share ideas and develop workable solutions to problems in advance of the real disaster.
Amateur Radio Emergency Service (ARES)

- Sponsored by the American Radio Relay League since 1935. Composed of “Sections.” Most Sections are entire states.
- The Section Emergency Coordinator (SEC) is appointed by the Section Manager.
- The District Emergency Coordinator (DEC) and Emergency Coordinator (EC), usually for a county, are also appointed by the Section Manager.
- The EC may appoint one or more Assistant Emergency Coordinators (AEC) as required.
Amateur Radio Emergency Service (ARES) (Continued)

- ARES has Memoranda of Understanding (MOU’s) with a variety of agencies at the national level, including FEMA, American Red Cross, Salvation Army and the National Weather Service.

- Local ARES groups often have MOU’s or other written or verbal agreements with state, county and city emergency management departments, hospitals, schools, police and fire departments, public works agencies, and others.
Radio Amateur Civil Emergency Service (RACES)

- Created by the federal government after WWII.
- The RACES rules addressed the need for Amateur Radio operators to function as an integral part of a state, county or local emergency management agencies in time of national emergency or war.
- The RACES authorization provides for the means to continue to serve the public even if the President of the FCC suspends regular Amateur operations. In this situation, the RACES rules provide for the use of almost all regular Amateur frequencies, but place strict limits on the types of communications made, and with whom.
- In many areas, ARES members are also RACES-registered operators and can “switch hats” when the need arises.
Salvation Army Team Emergency Radio Network (SATUREN)

- SATERN members are also Salvation Army Volunteers. Their HF networks are used for both logistical communication between various Salvation Army offices and for health and welfare messages.
- At the local level, ARES, REACT and other groups often help support the Salvation Army’s operations.
The Rapid Response Team (RRT)

- The RRT is a small team within a larger emcomm group. Their job is to put a few strategically placed stations on the air within the first half-hour to an hour. These stations will usually include the Emergency Operations Center (EOC), a resource net NCS, and often a few field teams where needed most. This is a Level 1 RRT response.
- A Level 2 RRT response follows within a few hours, bringing additional resources and operators.
- Level 1 teams have pre-assigned jobs, and short-term (12 – 24 hour) “jump kits,” ready to go whenever the call comes. Level 2 teams have longer term (72 hours) “jump kits,” and a variety of other equipment, including tents, portable repeaters, extended food and water, etc.
ARES Mutual Assistance Team (ARESMAT)

- ARESMAT consists of hams who are willing and able to travel to another area for a period to assist ARES groups based in the disaster area.
- They may bring additional resources, radios, portable repeaters, antennas, and other critical equipment.
- Remember, the local ARES group is still in charge and you do what they need to be done! In this case the local ARES group becomes a served agency.
Military Affiliate Radio Service (MARS)

- MARS is a Department of Defense sponsored auxiliary communication program.
- There are three separately managed and operated programs, Army MARS, Air Force MARS and Navy/Marine Corps MARS.
- MARS members are licensed hams who operate disciplined and structured nets on assigned military radio frequencies adjacent to the amateur bands.
- Special call signs are issued.
- The MARS system is specifically authorized to communicate with other government radio services in times of emergency, including the federal SHARES HF networks.
National Traffic System (NTS)

- The NTS consists of local, regional and national nets operating on a regular basis to pass messages from place to place.
- A more in depth discussion of NTS will follow later.
Local Radio Clubs

- Not every area has a working ARES program or other nationally affiliated emcomm group
- Void is filled by local radio clubs who work with served agencies, either informally or with a formal MOU.
National Communications System (NCS)

- A Federal agency, the NCS consists of 23 government organizations tasked with ensuring that the Federal Government has the necessary communication capabilities under all conditions from day-to-day use to national emergencies and international crises.
- Includes the Forest Service, FEMA, Coast Guard, FBI, ATF and others.
- The Manager of NCS is the Director of Defense Information Systems Agency (DISA), usually an Air Force General.
Shared Resources System (SHARES)

- Part of the NCS. It pairs certain MARS operators with various federal agencies and state emergency operations centers to provide a high frequency (HF) communication backbone if normal communications should fail.
- AT&T and the American Red Cross have SHARES radios.
- The SHARES system utilizes a number of nationwide and regional networks.
Emergency Communication Organization & Systems Topic 4

FEMA National Radio System (FNARS)

- This is a FEMA high frequency (HF) radio network designed to provide a minimal essential emergency communication capability among federal agencies, state, local commonwealth, and territorial governments in times of national, natural and civil emergencies.
- FNARS radios are at a state’s emergency operations center (EOC).
Radio Emergency Associated Communications Teams (REACT)

- REACT is a national emcomm group, that includes Citizen’s Band (CB) radio operators, Hams and others.
- In addition, they may use the General Mobile Radio Service (GMRS), Family Radio Service (FRS) and the Multiple Use Radio Service (MURS).
- REACT has MOU’s with ARRL as well as other agencies.
- They offer crowd and traffic control, logistics, public education, and other services that usually (but not always) include a need for radio communication.
Introduction to Emergency Communication

Emergency Communication Organization & Systems Topic 4

Emergency Warning Systems

- Emergency Alert System (EAS) – Broadcast Radio & TV – These stations relay emergency alert messages from federal, state and local authorities.
- Uses seven frequencies in the 162MHZ band for public broadcast.
- Specific Area Message Encoding (SAME): an alert mechanism that activates special radio receivers when the SAME code for a specific area is received.
- Do you have a weather alert radio?
Introduction to Emergency Communication

Emergency Communication Organization & Systems Topic 4

Emergency Warning Systems

- **National Warning System (NAWAS)** – A federal government maintained “hardened” and secure national phone network connecting the “warning points” in each state, usually the state police HQ or the state EOC.
  - Located at NORAD’s Cheyenne Mountain command and control complex in Colorado.
  - Provides notification in case of enemy attack, and to inform and coordinate alert and warning formation.

- **Statewide Warning Systems**: Similar to NAWAS, but at a state level.

- **Tsunami Warning System**: Information is relayed to a wide range of government, civil defense, military, and international tsunami research/warning points within each country or area.

- **National Earthquake Information Center (NEIC)** – Run by the U.S. Geological Survey. It is located in Golden, Colorado. Issues rapid reports of earthquakes at least 4.5 on the Richter Scale in the United States, or 6.5 on the Richter Scale in the rest of the world.
Introduction to Emergency Communication

Topic 4-1

Which of the following best describes the ARES organizational structure?

A. ARRL – District-Section-County
B. ARRL – Section-District
C. ARRL – County-Region
D. ARRL – State-Region-Section
Introduction to Emergency Communication

Topic 4-2

Which of the following best describes the ARES chain of command within a section?

A. Section Manager–District Emergency Coordinator–Emergency Coordinator – Assistant Emergency Coordinator – Section Emergency Coordinator

B. Section Emergency Coordinator– Section Manager—District Emergency Coordinator–Emergency Coordinator–Assistant Emergency Coordinator

C. **Section Manager–Section Emergency Coordinator–District Emergency Coordinator–Emergency Coordinator– Assistant Emergency Coordinator**

D. Section Manager–Section Emergency Coordinator–Emergency Coordinator – District Emergency Coordinator– Assistant Emergency Coordinator
Introduction to Emergency Communication

Topic 4-3
Which of the following best describes a Level 2 RRT?
A. Is a first responder in any emergency.
B. Operates a few strategically placed stations within the first hour of an emergency.
C. Responds within a few hours and is prepared with longer term (72 hour) jump kits.
D. Always affiliated with SATERN.

Topic 4-4
Which of the following best describes an ARES Mutual Assistance Team (ARESMAT)?
A. Is generally available for tasks lasting less than one day.
B. Is always from the local area.
C. An ARES team who are willing and able to travel to another area.
D. Is called out only when the President suspends regular Amateur operations.
Topic 4-5
Which of the following is true about REACT?

A. REACT is a part of the ARRL.
B. REACT does not have an MOU with ARRL.
C. REACT’s mission is more restricted than that of ARES.
D. REACT’s resources include CB, Amateur Radio, GMRS, FRS, and MURS.
Most served agencies will have their own communication systems and equipment. Many of these radio systems are quite different from ham radio, and special training may be required.
Served Agency Communication Systems Topic 5a

State and Local Government Radio Systems

- Licensed to police, sheriffs, highway and other state, county, or city departments.
- On air standard operating procedures will be different than those in ham radio.
- They may also use a non-ITU phonetic alphabets and “10 codes.”
Medical Radio Systems

- An older system, “MedStar,” used 10 simplex VHF frequencies with a dial type pulsed-tone encoder to signal specific hospitals.
- The newer Emergency Medical Radio Service uses 10 UHF duplex frequency pairs; one assigned to each hospital, the other to the ambulance and seven VHF simplex channels. The UHF channels are identified as “Med 1” through “Med 10.”
American Red Cross (ARC)

- They have a national FCC licensed frequency (47.42Mhz) that can be used by all ARC chapters. This frequency is intended primarily for disaster or emergency operations.
- Some chapters may use 47.50Mhz and/or rent space on commercial systems.
Served Agency Communication Systems Topic 5a

Types of Served-Agency Radio Systems

- Community Repeater Systems
  - A “community” or “shared” repeater system uses different Continuous Tone Squelch System (CTCSS) tones for each of several user groups.
  - In an emergency situation, these shared channel systems can become overloaded. Non-essential communications may be moved over to an Amateur system under these conditions.
Types of Served-Agency Radio Systems

- **Trunked Systems**
  - They use several co-located repeaters tied together, using computer control to automatically switch a call to an available repeater. When one radio of the group moves to a new frequency, all the others in the group automatically follow.
  - Most trunked systems suffer from a lack of reserve capacity and can become quickly overloaded.
Served Agency Communication Systems Topic 5a

Types of Served-Agency Radio Systems

- Association of Public Safety Communications Officers (APCO) Project 25 Radio Systems
  - The P25 radio systems are extremely flexible, with both forward and backward compatibility.
  - They can be configured to operate in both analog and digital modes and as part of trunked and conventional radio systems.
  - Specialized training will be required to operate this equipment.
Served Agency Communication Systems Topic 5a

Types of Served-Agency Radio Systems

- Telephone Systems
  - Your served agency may have a telephone system with many options and functions. If you will be required to use their telephone system, make sure you get the appropriate specialized training and obtain a copy of the system operating manual as part of your emergency kit.
Served Agency Communication Systems Topic 5a

Types of Served-Agency Radio Systems

- Satellite Telephones
  - Some phones or terminals require that an antenna be pointed directly at the satellite, others do not, but all require line-of-site to the satellite.
  - Besides voice, paging and FAX capabilities are available.
  - Again, if you are going to operate one of these systems, request the appropriate training and get a copy of the operating manual.
Served Agency Communication Systems Topic 5a

Types of Served-Agency Radio Systems

- Satellite Data Systems
  - Most popular system is the NOAA Emergency Management Weather Information System (EMWINS) which provides up to the second weather maps and information.
Served Agency Communication Systems Topic 5a

Types of Served-Agency Radio Systems

- Other Agency-operated Equipment
  - In addition to radio and telephone, you may need to use fax machines, copiers, computers, emergency power, security and surveillance systems.
  - If you may be required to use or operate any of these equipment types, get a copy of the manuals, or at least get the specialized training necessary to operate them safely and efficiently.
Introduction to Emergency Communication

Topic 5a-1
When emcomm team members are called upon to operate on Public Safety Radio Systems, which of the following may they not do?

A. Use special “10 codes.”
B. Use the served agency’s standard operating procedure.
C. Use the phonetic alphabet employed by the served agency.
D. Engage in casual conversations.

Topic 5a-2
Which of the following modes/devices would not be appropriate for you to use to transmit a message for a served agency?

A. Email on a computer with Internet connections
B. Fax machine
C. Land line telephone
D. ALL of these are appropriate and usable if needed
Introduction to Emergency Communication

Topic 5a-3
Which of the following best describes the newer Emergency Medical Radio Services?

A. Ten UHF duplex frequencies and seven VHF simplex channels.
B. Ten simplex VHF frequencies with pulsed tone encoders for each hospital.
C. Seven UHF duplex frequencies and ten VHF simplex channels.

Topic 5a-4
Which of the following statements is true about trunked systems?

A. Trunked systems are able to operate without the use of computer controllers.
B. The number of frequencies on a trunked system is always a multiple of 10.
C. Amateur radio does not currently use this type of system.
D. Most trunked systems have ample reserve capacity.
Introduction to Emergency Communication

Topic 5a-5
When emcomm teams work with a served agency, a number of assumptions are made. Which of the following assumptions are true?

A. Amateur Radio operators can operate any communications equipment they encounter.
B. There are NO significant differences between Amateur Radio operating procedures and the procedures used by the served agencies.
C. Served agencies must provide training if Amateur Radio operators are to be used effectively.
D. All phonetic alphabets are essentially the same and are thus interchangeable.
Many radio amateurs want to be of help when the need arises but are unable to commit the time or meet the schedule required for formal participation with an agency or Emcomm organization.
Becoming a resource in your community can also enhance the public’s understanding of and appreciation for Amateur Radio.
Help reduce the potential for conflicts when a ham wants to erect an antenna on his property.
Introduction to Emergency Communication

Topic 5b: Working Directly With the Public

How Do I Get Started?

- Neighbors may band together in a variety of ways to help one another.
- Law enforcement agencies often sponsor a Neighborhood Watch programs. Designed to deter local crime in residential areas.
- Many areas have implemented Community Emergency Response Team (“CERT”) programs.
  Basic skills – such as fire suppression, triage, first aid and light search & rescue – needed to survive when a disaster swamps the resources of official first responders.
- Find out what preparedness activities are going on in your area and join one or more local groups.
- Participation in local preparedness courses will also let you meet like-minded individuals.
The most popular and ubiquitous communication tools not dependent on the telephone system or the Internet are Family Radio Service (“FRS”) and General Mobile Radio Service (“GMRS”) radios.

Transmitting with GMRS radios requires a license. The fee covers a five-year term, and one license covers all the members of a family and as many separate radios as they may need. If you are going to use a GMRS radio, get the license!

These two services are described in detail in Learning Unit 24
Introduction to Emergency Communication

Topic 5b: Working Directly With the Public

Using FRS and GMRS Radios (Continued)

• Channel numbering can be a source of confusion for FRS and GMRS users because different manufacturers may assign a different number to a given frequency.
• If you are advising a neighborhood group on the use of FRS or GMRS radios, you can suggest one of the following:
  1. When equipping a group for the first time, have everyone buy one make and model of radio (or buy the same model in bulk for additional cost savings). This will assure consistent channel numbering.
  2. If different makes and models are already employed by group members, prepare a chart to go with each radio showing the channel number that goes with each frequency.
Radio Coverage

- The limited range of FRS and GMRS radios is both good and bad news.
- The good news: the distance from which users may receive interference from other users is relatively small.
- The bad news: there may be parts of a desired coverage area that cannot be reached from a given location.
- You can suggest or organize a coverage-mapping exercise in which your neighbors test their radios from different locations, indoors and out, to identify any hot spots and dead spots.
- Find the places you can transmit with the most complete coverage and prepare to use relays for hard-to-reach areas if necessary.
- Knowing this before a disaster strikes will be most helpful, and it will get people used to using their radios.
Introduction to Emergency Communication

Topic 5b: Working Directly With the Public

Radio Protocol

- During a disaster, time and radio resources may both be in short supply. People will be occupied with caring for their own families or performing their assigned team tasks.
- It benefits everyone to keep transmissions short and to minimize confusion over who is calling whom.
- Radio Amateurs are familiar with good radio protocol and can teach it to their neighbors to promote efficient use of whatever radios are in use.
Topic 5b: Working Directly With the Public

Radio Protocol (Continued)

- Here are some basic practices to consider.
  - Fire, police and military radio operators make use of tactical callsigns,
  - It is good practice to start each transmission by stating the party you’re trying to reach followed by your own call (“Supply, FROM Triage”).
  - It is also good practice to use the proword “Over” at the end of each transmission to another station.
  - Speak – don’t yell – somewhat more slowly and distinctly than you would in face-to-face conversation.
  - Avoid noisy locations when possible.
  - When people not accustomed to using radios practice these techniques, they are more likely to find their radios to be useful communication tools rather than distractions from their other duties.
Introduction to Emergency Communication

Topic 5b: Working Directly With the Public

Linking To the Outside

- Radio Amateurs may be called upon or expected to provide a link to adjacent areas or to first responders.
- You should be aware of the other Amateurs in your area who are active in the local Emcomm organizations and know the frequencies on which you can reach them.
- They will probably be your best access to first responders and aid organizations if there is any access to be had.
- You should set realistic expectations as to what you can accomplish. Surrounding areas may be experiencing the same problems you have locally.
- Fire department and law-enforcement agency communications will be very busy and will give priority to those groups with which they are familiar.
Linking To the Outside (Continued)

- You can learn more by getting to know the formal Emcomm organizations in your area. Even if you don’t have time to participate with the local Emcomm group regularly, you need to find out where they are likely to be stationed and how you can contact them.
- For example, if you know which hospitals will have Ham coverage and the best way to reach them, you may be able to determine whether a given facility is functioning in a disaster so that a seriously injured person can be transported there.
Community Emergency Response Teams (CERT)

- The Community Emergency Response Team (CERT) Program educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations.
- Using training learned in the classroom and during exercises, CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help.
- CERT members also are encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community.
Introduction to Emergency Communication

Topic 5b: Working Directly With the Public
Community Emergency Response Teams (CERT) (Continued)

The basic CERT trainings include:
- IS-317, "Introduction to Community Emergency Response Teams", is an independent study course that serves as an introduction to CERT. Click [here](http://fema.gov) to go to FEMA's website, where you will find a link to the course.
- Topics include: Introduction to CERT, Fire Safety, Hazardous Material and Terrorist Incidents, Disaster Medical Operations and Search and Rescue.
- It takes between six and eight hours to complete the course. Those who successfully finish it will receive a certificate of completion.

To become a CERT volunteer, one must also complete the classroom training offered by a local government agency such as the emergency management agency.

To learn more about CERT in Indian River County or to sign up for the classroom course, click [here](http://www.saferirc.us) or go to [http://www.saferirc.us](http://www.saferirc.us), and click on CERT.
Introduction to Emergency Communication

Topic 5b: Working Directly With the Public

Review

- The Community Emergency Response Team (CERT) Program is a volunteer program of trained people operating in teams under ICS protocols.
- In the role of gathering initial information, radio communication capabilities can be a major asset to CERT and other community teams.
- Many local community organizations are using FRS, GMRS or CB radios within neighborhoods and then Amateur Radio to relay information into formal operations centers.
Introduction to Emergency Communication

Topic 5b-1
Which of the following is not a good practice when using FRS / GMRS radios?

A. Using tactical callsigns
B. Operating away from sources of loud noise
C. Waiting for a frequency to be cleared by other users before transmitting
D. Speaking very loudly directly into the microphone.

Topic 5b-2
Which group might an Amateur contact about community-preparedness efforts?

A. Neighborhood Watch
B. Homeowners association
C. CERT team.
D. All the above.
Introduction to Emergency Communication

Topic 5b-3
CERT is:

A. A national certification program for ICS
B. A volunteer program of trained people operating in teams under ICS protocols
C. A program mandated by FEMA for all parts of the country
D. An auxiliary of local Fire Departments.
Introduction

An emergency communicator must do his or her best part to get every message to its intended recipient, quickly, accurately, and with a minimum of fuss.

A number of factors can affect your ability to do this, including your own operating skills, the communication method used, a variety of noise problems, the skills of the receiving party, the cooperation of others, and adequate resources.

In an emergency, any given message can have huge and often unintended consequences.

An unclear message, or one that is modified, delayed, misdelivered or never delivered at all can have disastrous results.
Communication Skills

- Listening
  - Listening is at least 50% of communication.
  - Listening also means avoiding unnecessary transmissions.
  - Local ambient noise and/or weak radio signal conditions may make it difficult to perform your emergency communication responsibilities. A set of head phones can help under these conditions.
Basic Communication Skills Topic 6

Communication Skills

- Microphone Techniques
  - For optimum performance, hold the mic close to your cheek, and just off to the side of your mouth. Talk across, rather than into, the microphone. Speak a little slower and pause longer between transmissions.
  - Voice operated transmissions (VOX) are not recommended for emergency communications.
Introduction to Emergency Communication

Basic Communication Skills Topic 6

Communication Skills

- Brevity & Clarity
  - Each communication should consist of only the information necessary to get the message across clearly and accurately.
  - If you are the author of a message, change the wording as necessary to make it as clear and short as practical. If you are not the author, work with the author to achieve same.
  - If you can not locate the author, pass the message as stated with any errors or redundancies included. DO NOT CHANGE MESSAGES!
  - Communicate one complete subject at a time.
Basic Communication Skills Topic 6

Communication Skills

- Plain Language
  - All messages and communications during an emergency should be in plain language.
  - “Q” signals (except in CW communications) or “10 codes” and similar jargon should be avoided.
  - Avoid words or phrases that carry strong emotions.
Basic Communication Skills Topic 6

Communication Skills

- Phonetics
  - Certain words in a message may not be immediately understood. The best way to be sure it is correctly understood is to spell it.
  - Use the ITU phonetic Alphabet unless the served agency requests that you use their standardized phonetic alphabet.
  - Numbers are always pronounced individually. The number “sixty” is pronounced as “six zero.”
  - Standard practice for unusual words is to first say the word, then say “I spell,” then spell the word phonetically.
Introduction to Emergency Communication

Basic Communication Skills Topic 6

Communication Skills

- Pro-words
  - Pro-words, referred to as “pro-signs” when sent in Morse code or digital modes, are procedural terms with specific meanings.
  - Clear – End of Contact.
  - Over – Used to let a specific station know to respond.
  - Go ahead – Used to indicate that a station may respond.
  - Out – Leaving the air, will not be listening.
  - Stand by – A temporary interruption of the contact.
  - Roger – Indicates that a transmission has been received correctly and in full.
Basic Communication Skills Topic 6

Communication Skills

- Tactical Call Signs
  - Tactical call signs can identify the station’s location or its purpose during an event, regardless of who is operating the station. It virtually eliminates confusion at shift changes or at stations with multiple operators.
  - Tactical call signs should be used for all emergency nets and public service events if there are more than just a few participants.
  - Tactical call signs are usually pre-assigned by the served agency. However, if one does not already exist, the NCS may assign a tactical call sign as each location is “opened.”
  - In a directed net, you, as “AID 3,” may call the NCS by “Net, AID 3,” or just “AID3” on a busy net. If you have traffic, say “AID 3, emergency (or priority) traffic.”
  - To pass traffic to a specific station, i.e. Firebase 5, say “AID 3, priority traffic for Firebase 5.” The NCS will then direct “Firebase 5, contact AID 3 for priority traffic.”
Basic Communication Skills Topic 6

Communication Skills

Calling with Tactical Call Signs

▪ If you are at “Aid 3” during a directed net and want to contact the net control station, you would say “Net, Aid 3” or, in crisper nets (and where the NCS is paying close attention), simply “Aid 3”.

▪ If you had emergency traffic, you would say “Aid 3, emergency traffic,” or for priority traffic “Aid 3, priority traffic.”

▪ Notice how you have quickly conveyed all the information necessary, and have not used any extra words.

▪ If you have traffic for a specific location, such as Firebase 5, you would say “Aid 3, priority traffic for Firebase 5.”

▪ This tells the NCS everything needed to correctly direct the message.

▪ If there is no other traffic holding, the NCS will then call Firebase 5 with, “Firebase 5, call Aid 3 for priority traffic.”

▪ Note that no FCC call signs have been used - so far...
Basic Communication Skills Topic 6

Communication Skills

- Station Identification
  - The FCC requires that you identify at ten-minute intervals during a conversation and at the end of the last transmission.
  - The easiest way to be sure you fulfill FCC station identification requirements during a net is to give your FCC call sign as you complete each exchange. This tells the NCS that you consider the exchange complete and fulfills all FCC identification requirements.
Basic Communication Skills Topic 6

Communication Skills

Completing a Call

- After the message has been sent, you would complete the call from Aid 3 by saying “Aid 3, <your call sign>”. This fulfills your station identification requirements and tells the NCS that you believe the exchange to be complete.

- If the Net Control Station believes the exchange is complete, and Aid 3 had forgotten to identify, then the NCS should say, “Aid 3, do you have further traffic?” At that point, Aid 3 should either continue with the traffic, or “clear” by identifying as above.

- For this method to work properly, the NCS must allow each station the opportunity to identify at the close of an exchange.
Introduction to Emergency Communication

Basic Communication Skills Topic 6

Communication Skills

A Review of Habits to Avoid

• Thinking aloud on the air: “Ahhh, let me see. Hmm. Well, you know, if…”
• On-air arguments, criticism, or rambling commentaries
• Shouting into your microphone
• “Cute” phonetics
• Identifying every time you key or un-key the mic
• Using “10” codes, Q-signals on phone, or anything other than “plain language”
• Speaking without planning your message in advance
• Talking just to pass the time.
Introduction to Emergency Communication

Basic Communication Skills Topic 6

Activities
Looking at the following exchanges, explain how you might revise the language to make them more clear and concise.

“KA1XYZ at Ramapo Base, this is Bob, K2ABC at Weston EOC calling.”
“K2ABC, this is KA1XYZ. Hi, Bob. This is Ramapo Base, Harry at the mic. Go ahead. K2ABC from KA1XYZ.”
“KA1XYZ, this is K2ABC returning. Hi, Harry. I have a message for you. By the way, remember to call me later about the get-together the club is having next month. Are you ready to copy the message? KA1XYZ, this is K2ABC, over to you Harry.”
Introduction to Emergency Communication

Basic Communication Skills Topic 6

Activities

This is as simple as:

Ramapo Base from Weston EOC, Traffic
Ready To Copy, Over
Introduction to Emergency Communication

Topic 6-1
In emergency communications, which of the following is NOT true?

A. Listening is only about 10% of communication.
B. Any message can have huge and unintended consequences.
C. A message that is never delivered can yield disastrous results.
D. Listening also means avoiding unnecessary communications.

Topic 6-2
Which of the following procedures is best for using a microphone?

A. Hold the microphone just off the tip of your nose.
B. Talk across, rather than into, your microphone.
C. Shout into the microphone to insure that you are heard at the receiving end.
D. Whenever possible, use voice operated transmissions (VOX).
Introduction to Emergency Communication

Topic 6-3
In emergency communications, which of the following is true?
A. Never use “10 codes” on Amateur Radio.
B. Use “Q signals” on served-agency radio systems.
C. Under NO circumstances use “Q” signals on a CW net.
D. Use technical jargon when you feel that it is appropriate.

Topic 6-4
Which of the following is always true of a tactical net?
A. Personal call signs are never used.
B. Personal call signs are always preferred.
C. Personal call signs are required at ten-minute intervals or at the end of your last transmission.
D. Personal call signs are required at ten-minute intervals during a conversation and at then end of your last transmission.
Topic 6-5
Which of the following is the most efficient way to end an exchange on a tactical net
A. Say “Over”.
B. Say “Roger”.
C. Give your FCC call sign.
D. Ask Net Control if there are any further messages for you.
TAKE A BREAK!
Introduction to Emergency Communication

Basic Net Operations Topic 7a

Why We Have Nets

- Our abilities to share information in a "group setting" in real time across multiple locations and even multiple served agencies.
- Our radio messages can be heard by everyone in the group at once - and they can respond.
- A high volume of disorganized messages can quickly turn an overloaded communication system into a disaster of its own.
- Amateur Radio operators use regular protocols called a “network” or “net” to organize the flow of messages.
- The mission of the net is to effectively move as much traffic accurately and quickly as possible.
- Nets can be either formal or informal as needs dictate.
- Nets can be in voice, Morse code, or digital modes depending on the situation.
Anatomy of Net Operations

• The Net Manager is the person in charge of a net, but is most often not the person who actually conducts the net on the air.
• Managers ensure that there is a Net Control Station (NCS) with enough operators for each shift, and monitors net and band conditions to see if changes in frequency are needed.
• If more than one net is operating, a Net Manager may be responsible for a group of nets.
• The Net Manager coordinates the various nets and their NCSs to ensure a smooth flow of traffic within and between nets.
• Managers may assign various human and equipment resources to meet the needs of each net.
• Net Managers may be responsible for a regularly scheduled net, or may be temporarily appointed to manage one or more ad hoc nets created for a particular emergency incident.
Introduction to Emergency Communication

Basic Net Operations Topic 7a

Anatomy of Net Operations (Continued)

- An NCS directs the minute-by-minute operation of the net on the air.
- The NCS controls the flow of messages according to priority, and keeps track of where messages come from and where they go, and any that have yet to be sent.
- Keep a current list of which stations are where, their assignments, and their capabilities.
- Liaison Stations handle messages that need to be passed from one net to another.
- The NCS or Net Manager may assign one or more stations to act as liaisons between two specific nets.
- These stations can monitor one or both nets, depending on resources.
- It is easier to monitor only one net at a time.
- This can be accomplished by having one station in each net assigned as the liaison to the other, or by having a single liaison station check into both nets on a regular schedule.
Anatomy of Net Operations (Continued)

- In the event that an “emergency” precedence message needs to be passed to another net when the liaison is not monitoring that net, any net member can be assigned to jump to the other net and pass the message.

- Learning proper NCS technique and handling such duties is one of the most important functions in Emergency Communications.

- During an emergency or disaster, the first operator to arrive on frequency is the NCS operator— at least until a Net Manager or a leadership official arrives on frequency to take control and perhaps to assign someone else to be the NCS.
Basic Net Operations Topic 7a

Net Types

Open (Informal) Nets

- During an open emergency net, there is minimal central control by a Net Control Station, if indeed there is an NCS at all.
- Stations call one another directly to pass messages.
- Unnecessary chatter is usually kept to a minimum.
- Open nets are often used during the period leading up to a potential emergency situation and as an operation winds down, or in smaller nets with only a few stations participating.
Basic Net Operations Topic 7a

Net Types
Directed (Formal) Nets
- Created whenever large numbers of stations are participating,
- Where the volume of traffic cannot be dealt with on a first-come first-served basis.
- In a communication emergency of any size, it is usually best to operate a directed net. In such situations the NCS can prioritize traffic by nature and content.
- In a directed net, the NCS controls all net operations.
- Check-ins may not “break into” (interrupt) the net or transmit unless specifically instructed to do so by the NCS, or unless they have an emergency message.
- The NCS will determine who uses the frequency and which traffic will be passed first. Casual conversation is strongly discouraged and tactical call signs will probably be used.
Basic Net Operations Topic 7a

Net Types (Continued)

Directed (Formal) Nets

- Tactical call signs can be assigned to stations at various sites, locations and different purposes.
- For example mobile operators can often be assigned the sign “rover 1”, “rover 2” and so on.
- At his/her discretion, the NCS operator may often elect to create a “sub net” depending on the volume of traffic and its content and nature.
- In this case a “sub net” NCS may be appointed to take over the newly created net
Basic Net Operations Topic 7a

Net Missions
Each net has a specific mission, or set of missions. In a smaller emergency, all the communication needs may be met by one net. In a larger emergency, multiple nets may be created to handle different needs.

- Traffic Net
- Resource Net
- Tactical Net
- Information Net
- Health and Welfare (H&W) Net
Introduction to Emergency Communication

Basic Net Operations Topic 7a

Net Missions

Traffic net –

- Handles formatted written messages between served agency locations or between other nets.
- In emergency operations, these nets may handle the majority of message originations and deliveries.
- Messages to or from outside the immediate area may be handled by a Section-level net, and depending on the distances involved and the degree to which the public telephone network and Internet are impaired, by Region Nets and Area Nets.
Basic Net Operations Topic 7a

Net Missions

Traffic net – (Continued)

- Even if you expect to handle traffic primarily on VHF/UHF repeaters, understanding how these layers of nets operate will help you to optimize your use of the system.
- HF traffic nets can provide you additional practice and expose you to traffic handling that you might not encounter on VHF/UHF.
- During an emergency ARES and the National Traffic System (NTS) work together closely, so it’s a good idea to understand emergency traffic from the NTS operator’s perspective.
Net Missions

Resource Net –

- When incoming operators arrive on scene this is the net that they would check into to receive assignments, or to be reassigned as needs change.
- A resource net may also be used to locate needed equipment, or operators with specific skills.
- Several different resource nets may be used in large-scale events.
- One might be used for collecting new volunteers over a wide area, and other local nets could be used for initial assignments.
- If required due to geography or high net activity, a third net could handle on-going logistical support needs.
**Basic Net Operations Topic 7a**

Net Missions

**Tactical Net** –

- In general, the tactical net(s) handle the primary on-site emergency communication. Their mission:
  - May be handling communications for a served agency,
  - Weather monitoring and reporting,
  - River gauging, or
  - A variety of other tasks that do not require a formal written message.
- Often a tactical net may be set up as a “sub net” to handle specific types of traffic during high volume emergency situations.
- In such cases an additional NCS may be assigned for the sub net.
Basic Net Operations Topic 7a

Net Missions

Information Net –
- An information net might be used to make regular announcements,
- disseminate official bulletins or
- answer general questions that might otherwise tie up other nets that are busy handling incident-related communications.
Basic Net Operations Topic 7a

Net Missions

Health and Welfare (H&W) Nets –

- These nets usually handle messages between concerned friends, families and persons in the disaster area.
- Most H&W nets will be on HF bands, but local VHF or UHF “feeder” nets may be needed within a disaster area.
- Band conditions, operator license constraints and specific use needs will most always determine which mode may be the best choice for determining the mode of certain net operations.
Basic Net Operations Topic 7a

Review

- Amateur Radio allows for multiple participants to hear and pass messages in a group setting.
- This capability is a major strength of Amateur Radio and is put to best use by using nets.
- Nets are used to control the flow of message traffic on a specific frequency.
- The net’s mission and overall operation is handled by a Net Manager, while the Net Control Station (NCS) is like a traffic cop directing the flow of traffic on the air. Liaison Stations pass messages between two different nets.
- Nets can be directed (formal) or open (informal) depending on the number of participants and volume of messages.
- Nets can serve many needs, including welfare message handling, resource management, and tactical message handling.
Introduction to Emergency Communication

Topic 7a-1
Which of the following requires no NCS to control net operations?
A. An Open Net.
B. A Directed Net.
C. An NTS Net.

Topic 7a-2
Which of the following is true of Directed Nets?
A. There is minimal direction from a Net Control Station
B. There is no clearly assigned mission.
C. They serve only as Liaison Nets between several simultaneous nets during large operations.
D. They are used when the volume of traffic is too great to be handled on a first-come, first-served basis.
Introduction to Emergency Communication

**Topic 7a-3**  
Who is responsible for ensuring a smooth flow of traffic within and between nets?  
A. The Official Observer.  
**B. The Net Manager.**  
C. The Liaison Station.  
D. The NTS Emergency Coordinator.

**Topic 7a-4**  
Which type of net would handle non-formal communications for a served agency?  
A. Health and Welfare Net.  
**B. Tactical Net.**  
C. Resource Net.  
D. Traffic Net.
Topic 7a-5
Which of the following statements concerning nets is true?

A. Resource Nets are used to assign operators as they become available.
B. Health and Welfare Nets operate only on HF bands.
C. NTS Traffic Nets handle both formal and informal long distance messages.
D. Tactical Nets handle only formatted, written messages.
Introduction to Emergency Nets Topic 7b

Emergency Nets

- What is an Emergency Net?
  - An “Emergency Net” is a group of stations who provide communication to one or more served agencies, or to the general public, in a communications emergency.

- Net Formats
  - Directed (formal) Nets: A Net Control Station (NCS) organizes and controls all activity.
    - To call another station you must get permission from the NCS.
    - The best format when there are a large number of member stations.
  - Open (informal) Nets: A Net Control Station (NCS) is optional. Stations may call each other directly. Used when there are few stations and minimal traffic. There may still be an NCS, but he or she usually exerts little or no control.
Introduction to Emergency Nets Topic 7b

Emergency Nets

- Checking into an Emergency Net
  - You need to “check in” to a net when you first join and/or when you have messages, questions or information to send.
  - To become part of a Directed Net, wait for the NCS to call for “check ins.”
  - DO not be surprised if you receive a cool reception to your offer of assistance.
Introduction to Emergency Nets Topic 7b

Emergency Nets

- Passing Messages
  - If you told the NCS that you had traffic 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 on the frequency or another frequency.
  - The NCS will then ask you to send your message by requesting that the receiving station call you for your traffic.
  - The NCS may authorize that you contact the receiving station directly by saying “(your station) ‘go direct to’ (receiving station).”

- “Breaking” the Net
  - If the net is in progress, wait for a pause between communications and simply say “Break, (Your call).” The NCS will say “Go Ahead (Your call).”
Emergency Nets

- Checking Out of an Emergency Net
  - Always let the NCS know when you are leaving the net, even for a few minutes.
  - There are three reasons for checking out of (leaving) a net.
    - The location of your station is closing.
    - You need a break and there are no relief operators.
    - You have turned the station over to another operator.
  - There are two special situations to be aware of:
    - If someone in authority asks you to move your station, do so immediately and without argument.
    - If you are requested by someone in authority to turn off your radio, or refrain from transmitting, do so immediately and without question.
Introduction to Emergency Net Topic 7b

Emergency Nets

- Levels of Nets

  - Networks are often “layered.” There may be local nets, area nets and national nets. Message traffic can be passed between nets, i.e. local to area to national and back down. This network is called the National Traffic System (NTS).
Introduction to Emergency Nets Topic 7b

Emergency Nets

- Non-Voice Nets
  - High speed CW nets can actually handle more messages per hour than most voice nets.
  - Packet communication on VHF and UHF is often used for local communication where accuracy and a record of the message is required.
  - HF Digital modes such as AMTOR and PACTOR are used for long distance circuits.
  - Amateurs are currently experimenting with PSK31 on both HF and VHF/UHF bands.
  - WinLink 2000 is an automatic system that blends radio and Internet transmission paths to permit rapid and seamless email transfer to stations anywhere on Earth. For most emergencies, it will be possible for stations in the affected area to link to a WinLink 2000 PACTOR node outside the affected area, allowing rapid contact with the outside world.
Introduction to Emergency Communication

Topic 7b-1
Which of the following best describes a net?
A. A group of stations that purposely frequent the airwaves.
B. A group of stations who gather on one frequency with a purpose.
C. A group of stations who occasionally meet on various frequencies.
D. A group of stations who propose to meet at a particular time.

Topic 7b-2
What is a major difference between an “open net” and a “directed net”?
A. The presence or absence of full control by a Net Control Station.
B. The presence or absence of formal traffic.
C. The type of radio traffic on the net.
D. The approval or sanction of net operations by the FCC.
Introduction to Emergency Communication

Topic 7b-3
Which of the following is true of a “tactical net”?

A. The net is used to acquire volunteers and handle assignments.
B. The net is used for the coordination of activities associated with future emergencies.
C. The net may be directed or open, but will usually have a Net Control Station.
D. The net handles only formal traffic.

Topic 7b-4
When should you check into an emergency net?

A. When you want to comment on something that someone else has said.
B. When you are tired of listening.
C. When you first join the net and when you have messages, questions or relevant information.
D. When you first join the net and when you would like to send greetings to one of the participating stations.
Topic 7b-5
What should you do if someone in authority asks you to move your station?
A. Do so immediately without argument and report to the NCS as soon as possible.
B. Call the NCS for advice before moving.
C. Tell the person in authority how difficult it is for you to comply.
D. Demand a written order before complying
Introduction to Emergency Communication

Net Operating Guidelines Topic 7c

- 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 will be responsible for recruiting and training 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.
Introduction to Emergency Communication

Net Operating Guidelines Topic 7c

The NCS

- Think of the NCS as a “ringmaster” or “traffic cop.”
- Decides what happens in the net, and when.
- 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.
- Needs to be aware of everything going on around him and handle the needs of the net, its members and served agency as quickly and efficiently as possible.
- Can be located anywhere but should be in a position to hear most, if not all, stations in the net.
- The NCS is in charge of one specific net but should not be responsible for the entire emcomm operation.
- It is not possible to be in command of all aspects of an emergency response, and still run a net effectively, since both jobs require 100% of your 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.
Net Operating Guidelines Topic 7c

Net Scripts (Continued)
A typical net script might look like this:

Opening: This is [call sign], net control station for the New Hampshire ARES/RACES Emergency Net. This is a directed emergency net for liaison stations from all New Hampshire ARES/RACES regions. Please transmit only when requested to, unless you have emergency traffic,
Any station with emergency traffic, please call now. (Stations call in and emergency traffic is passed.)
Any station with priority traffic, please call now. (Stations call in and priority traffic is passed.)
All other stations with or without traffic, please call now. (Stations call in and any traffic is passed.)

Closing: I would like to thank all stations that checked in. This is [call sign] securing the New Hampshire ARES/RACES Emergency Net at [date and time] returning the [repeater or frequency] to regular use.
Net Operating Guidelines Topic 7c

Net Scripts (Continued)

- 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.
- Either the Net Manager or the primary NCS, depending on the situation, appoints both. All members of the net should be made aware of the backup NCS assignment early in the net’s operation.
  - The first type is at the same location as the primary NCS operator.
  - The second is a station at a different location that maintains a duplicate log of everything happening during the net.
- Whenever possible, an offsite backup NCS should be maintained, even if an on-site backup is present.
Net Operating Guidelines Topic 7c
Acting as a “fill-in” NCS
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.
Here are some basic dos and don’ts:

- Remember that although you are in control of the net, you are not “God.” 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 if necessary, but keep it short and to the point.
- Speak clearly and in a normal tone of voice. Use good mic technique.
Net Operating Guidelines Topic 7c
Acting as a “fill-in” NCS (Continued)

Here are some basic dos and don’ts:

• 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 the NCS operator well before an emergency occurs.
Net Operating Guidelines Topic 7c

Net Members

▪ Operators at various sites are responsible for messages going to and from their location. They must listen to everything that happens on the net, and maintain contact with the served agency’s people at the site.
▪ They assist the served agency 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, message origination, and work with the served agency’s 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.
Introduction to Emergency Communication

Net Operating Guidelines Topic 7c

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 served agency 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 at the served agency or have a reliable communication link to them.
Liaison Stations

- Liaison stations pass messages between two different nets.
- Messages may be passed as needed, or on a pre-set 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 who 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.
  - In the second method, one radio is used, and the liaison station switches between the two nets on a regular schedule.
Net Operating Guidelines Topic 7c

Relay Stations
- While not a regular net position, a relay station is one that 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 OK to volunteer to act as a relay station.
Net Operating Guidelines Topic 7c

Workload and Shift Changes

▪ No operator should try to work excessively long hours.
▪ When you become tired, your efficiency and effectiveness decline, and your served agency is not getting the best possible service.
▪ Net managers and NCS operators should work with the EC or other emcomm 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 fifteen minutes and review the logs with the present operator before taking over.
▪ This assures continuity in the net’s operation.
Net Operating Guidelines Topic 7c

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 really proper to speak of a “packet net.”
- Although messages can be transmitted between two stations “keyboard to keyboard” as with 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 a NCS.
Net Operating Guidelines Topic 7c

Non-voice Modes

Non-packet:

- Digital modes are not automatic, and may require a NCS operator to manage the net in much the same way as a phone or CW net.
- These include RTTY, PSK31, AMTOR and GTOR.
Net Operating Guidelines Topic 7c

Non-voice Modes

CW Procedures:

• Clean and accurate code sent at 10 words per minute is better than sloppy code sent at 30 words per minute.
• 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 “full break-in” mode (both stations are capable of receiving signals between each Morse character sent).
Net Operating Guidelines Topic 7c

Non-voice Modes

CW Procedures: (Continued)

• 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 pro-signs used, and interested Amateurs should be familiar with ARRL Publication FSD-218. (referred to as the “pink card”)

• When formatting an ARRL Radiogram message, use abbreviations and prosigns consistently and appropriately.

• For instance, do not send “R,” meaning you have received everything correctly, and then ask for repeats like “AA” (all after) or “AB” (all before).
Net Operating Guidelines Topic 7c

Interference Problems

- If the interference is coming from adjacent or co-channel stations that may be unaware of the emergency net, politely inform them of the net and ask for their cooperation.
- Alternatively, might ask an HF net to move over a few kHz.
- If cannot be resolved, each net should have one or more alternative frequencies that it can move to as required.
- The frequencies themselves should not be published or mentioned on the air.
- Never discuss, acknowledge or try to speak with an intentionally interfering station.
- If the interference is making communication difficult, simply announce to the net that everyone should move to the alternate frequency and sign off.
Net Operating Guidelines Topic 7c

Interference Problems (Continued)

- 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, contact an elected League official or an Official Observer Station, and ask that the FCC be notified of the interference.
Introduction to Emergency Communication

Net Operating Guidelines Topic 7c

Review

- As the net’s “ringmaster,” the NCS operator is responsible for keeping the net operating smoothly and assuring 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 served agency’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 served agency 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.
Introduction to Emergency Communication

Topic 7c-1
Which of the following best describes the responsibilities of the NCS in an emcomm operation?
A. The NCS is responsible for all aspects of the emcomm operation.
B. The NCS is responsible for station check in.
C. The NCS is responsible for all aspects of the net’s operation.
D. The NCS is responsible for writing the net script.

Topic 7c-2
As acting “fill in” NCS, which of the following practices would you avoid?
A. Try to run an existing net much as the previous NCS did.
B. Handle messages in order of precedence: Emergency-Priority-Welfare.
C. Keep notes as you go along: do not let your log fall behind.
D. Ask stations to pass messages on the main net frequency whenever possible.
Introduction to Emergency Communication

Topic 7c-3
Which of the following is true of a liaison station?
A. The liaison station mainly relays bulletins authorized by the served agency to all stations on the net.
B. A liaison station passes messages only on a pre-set schedule.
C. A liaison station handles only one-way traffic.
D. A liaison station passes messages between two nets

Topic 7c-4
Packet modes include which of the following groups?
A. FM packet, HF packet and PACTOR.
B. HF packet, PACTOR and PSK31.
C. PACTOR, PSK31 and AMTOR.
D. PSK31, RTTY and PACTOR
Introduction to Emergency Communication

Topic 7c-5
You are the NCS of a net involved in an emcomm operation and you notice that some other station is intentionally interfering with your net. Which of the following represents your best course of action?

A. Shut down the net and go home.
B. Address the interfering station directly and inform them of the error of their ways.
C. Move the net to an alternate frequency.
D. Contact the EOC and continue to operate
The FCC Ruling on Drills and Employees Topic 7d

On July 14, 2010 the FCC issued a Report and Order amending the rules to permit amateur radio operators to transmit messages, *under certain limited circumstances*, during either government-sponsored or non-government sponsored emergency and disaster preparedness drills, regardless of whether the operators are employees of entities participating in the drill.

Tests or drills that are not government-sponsored are limited to a total time of one hour per week; except that no more than twice in any calendar year, they may be conducted for a period not to exceed 72 hours.
The FCC Ruling on Drills and Employees Topic 7d

Federal Communications Commission FCC 10-124

Although public safety land mobile radio systems are the primary means of radio-based communications for emergency responders, experience has shown that amateur radio has played an important role in preparation for, during, and in the aftermath of, natural and man-made emergencies and disasters.

We emphasize, however, that the amendment does not permit communications unrelated to the drill or exercise being conducted.
The FCC Ruling on Drills and Employees Topic 7d

Final Rules

Part 97 of Chapter 1 of Title 47 of the Code of Federal Regulations is amended as follows:

§ 97.113 Prohibited transmissions.

(a) ** *

(3) Communications in which the station licensee or control operator has a pecuniary interest, including communications on behalf of an employer, with the following exceptions:

(i) A station licensee or control station operator may participate on behalf of an employer in an emergency preparedness or disaster readiness test or drill, limited to the duration and scope of such test or drill, and operational testing immediately prior to such test or drill. Tests or drills that are not government-sponsored are limited to a total time of one hour per week; except that no more than twice in any calendar year, they may be conducted for a period not to exceed 72 hours.
The FCC Ruling on Drills and Employees Topic 7d
Final Rules
Part 97 of Chapter 1 of Title 47 of the Code of Federal Regulations is amended as follows:

§ 97.113 Prohibited transmissions.
(ii) An amateur operator may notify other amateur operators of the availability for sale or trade of apparatus normally used in an amateur station, provided that such activity is not conducted on a regular basis.

(iii) A control operator may accept compensation as an incident of a teaching position during periods of time when an amateur station is used by that teacher as a part of classroom instruction at an educational institution.
Introduction to Emergency Communication

The FCC Ruling on Drills and Employees Topic 7d
Final Rules
Part 97 of Chapter 1 of Title 47 of the Code of Federal Regulations is amended as follows:

§ 97.113 Prohibited transmissions. (Continued)
(iv) The control operator of a club station may accept compensation for the periods of time when the station is transmitting telegraphy practice or information bulletins, provided that the station transmits such telegraphy practice and bulletins for at least 40 hours per week; schedules operations on at least six amateur service MF and HF bands using reasonable measures to maximize coverage; where the schedule of normal operating times and frequencies is published at least 30 days in advance of the actual transmissions; and where the control operator does not accept any direct or indirect compensation for any other service as a control operator.

* * * *
Note that not every Amateur transmission from a work location is necessarily on behalf of an employer.

For example, an ARES member using an employer-provided station to check into a local ARES net as an individual is not necessarily transmitting on behalf of the employer.

This is a new ruling for us all and specific examples will be debated and discussed for a long time to come.

Use your very best judgment.

We all want to be helpful, but keep Amateur Radio as “amateur.”
Topic 7d-1
What is a maximum amount of time a radio amateur can participate in a government sponsored drill on behalf of their employer?
A. One hour.
B. 72 hours twice a year.
C. There is no limit.
D. Never

Topic 7d-2
What is the maximum amount of time a radio amateur can participate in a non-government sponsored drill on behalf of their employer?
A. One hour a week.
B. Never.
C. There is no limit.
D. No limit if it is for a hospital.
Your employer wants you to design and operate an Amateur Radio system between office buildings so his business can still function even if the phones and intranet are down. He says that, for him, “No phones is an emergency.” Should you do it?

A. Yes
B. No
TAKE A BREAK!
Introduction to Emergency Communication

The Net Control Station (NCS) Topic 8

The NCS

- Formal (directed) nets will always have one station “in control.”

- This station is known as the “Net Control Station” (NCS), and its operator as the “NCS operator.”
- Think of the NCS operator as sort of a “traffic cop,” directing the orderly flow of messages.
- His or her skills are critical to the success of any emergency communication net.
- For this reason many emergency communication groups elect to have training and even classes designed to teach and train operators in NCS skills.
- Practice sessions are often helpful for this purpose, and many ARES groups schedule regular weekly practice sessions.
Introduction to Emergency Communication

The Net Control Station (NCS) Topic 8

When Do You Need An NCS?

- All formal (directed) nets require an NCS.
- Formal nets are used to maintain order when a large number of stations are in the net, or when a large volume of messages are being sent.
- The NCS operator decides who speaks when, in which order messages are passed, and keeps a log of which messages went where and when, and a list of messages that have yet to be passed.
- Some informal nets will have a “standby” NCS, although by definition informal nets are not controlled.
- This person is there to keep things organized when necessary, to answer questions, keep the frequency clear, and to step in and “upgrade” the net to “formal” status if it becomes necessary.
- This often happens with initially light-duty nets that have the potential to grow as the situation evolves.
When Do You Need An NCS? (Continued)

- SKYWARN® tornado watch nets are a good example.
- During the “watch” phase, not much is happening other than informal sharing of information between observers.
- If a tornado appears, the traffic on channel will increase, and if damage occurs on the ground, the net could quickly evolve into a high-volume disaster relief net.
- Having an NCS operator on standby helps make this a smooth transition.
The Net Control Station (NCS) Topic 8

How Important Is A Well-Trained NCS Operator?

☐ Have you ever listened to or participated in a poorly run net?

- One where routine messages are passed on-channel, while emergency or priority messages wait in line?

- Or where the NCS operator “loses his cool” and alienates half the net’s members?

- Or nets where messages are not kept organized, are lost, changed, or misdirected?
The value of the NCS operator’s skill is unquestionable.

A well run net meets the needs of the served agency – a poorly run net can end Amateur Radio’s relationship with the agency altogether.

The NCS operator must be a good organizer, and know how to defuse tension and stress with an appropriate sense of humor.

The NCS operator also must have the ability to absorb new terminology quickly, as there is no more fertile environment for the growth of jargon than in the emergency management community!
The Net Control Station (NCS) Topic 8

The Right Stuff

Do you have what it takes to become a good NCS operator?

Here is a short list of basic pre-requisites:

• A clear speaking voice – someone who talks as though they have a mouthful of marbles won’t do.

• Fluency in the language – if you have a thick accent or cannot use the language precisely, it may make it difficult for others to understand you accurately.

• The ability to handle mental and physical stress for long periods. Information and demands will be coming at you from all directions all at once, sometimes for hours on end. Can you handle it without losing your composure, or your voice? Can you think and act quickly when seconds count using prudence and are you able to make decisions under pressure?
The Net Control Station (NCS) Topic 8

The Right Stuff (Continued)

- The ability to listen and comprehend in an often noisy and chaotic environment. Can you tune out all the distractions and focus only on the job at hand?
- Good hearing - If you have a hearing loss that makes it tough to understand human voices, NCS of a voice net is not the job for you. Hams with limited hearing problems may elect to act as NCS for a digital mode net, according to one’s abilities.
- The ability to write legibly what you hear, as you receive it, and to make good notes as you go, not rely on memory.
- Above-average general knowledge and operating skills in the modes used (phone, digital, or CW).
The Net Control Station (NCS) Topic 8

“Transferable” Skills

Some of the skills you use in everyday amateur radio activities will be useful in your position as NCS operator.

A well-designed and maintained station is critical to success. You must be able to:

- choose the correct antenna,
- know how to get the best sound from your microphone
- be radio agile,
- know how to operate, program and maintain the radio on short notice
- have all controls and supplies within easy reach.
Introduction to Emergency Communication

The Net Control Station (NCS) Topic 8

“Transferable” Skills (Continued)

In addition,

• You need to understand propagation so that you can choose the appropriate frequency as band conditions change.

• Many of the skills used in contesting are applicable to controlling a net. Both activities involve dealing with many stations on the same frequency at the same time.

• The mission of the NCS operator is to move as much traffic as possible in the least amount of time, accurately and effectively.
“Learned” Skills
A good NCS operator is trained, not born. Here are some skills you may need to learn to perform at your best.

- Working as a team player to achieve the goals of the net
- Effective leadership skills – keeping the team on track and motivated by developing a confident, self-assured management style
- Decisiveness – the ability to make quick and appropriate decisions
- Record keeping – log sheets (writing, thinking and talking all at once)
- Planning ahead – net scripts, assignments, materials on-hand
- HF propagation and antenna choices – knowing when to move to a different band
- Dealing with stress – a “burned-out” operator is a danger to the net
- Delegation – knowing when and how to “hand off” some jobs and responsibilities
- A working knowledge of the Incident Command System (ICS) and how we fit in
Introduction to Emergency Communication

The Net Control Station (NCS) Topic 8

Learning and Practicing Your Skills

- Book learning alone will not make you a competent NCS operator.
- It takes practice to learn these skills in a way that they will be ingrained and useful in a real emergency.
- Continued practice is necessary to maintain these skills once learned.
- Local nets on a weekly basis with rotation of NCS operators are a good way to gain practice, which is often done by many ARES groups.
- Net control skills can be learned and honed through
  - classroom sessions,
  - tabletop exercises,
  - regularly scheduled training nets.
Introduction to Emergency Communication

The Net Control Station (NCS) Topic 8

Learning and Practicing Your Skills

Actual emergency conditions can be simulated with periodic drills and simulations such as:

- The annual Simulated Emergency Tests (SET),
- public service events such as road races, marathons, and bike rides.

Some ARES units have simulated emergency nets weekly. For example, some have simulated emergency weather nets during the severe weather season.
A real emergency is not the time to learn or practice new skills, unless there is no other option. A poorly trained or inexperienced NCS operator can do as much harm as good.

- To begin your own NCS training, find out if your local group offers any formal training.
- Some will begin with tabletop exercises, in which a group sitting around a table will simulate a net operation, taking turns as NCS and net member stations.
- Tabletop exercises allow quick feedback and greater interaction among participants.
Other groups will simply let you take over as NCS for several scheduled training nets.

- Before you do this, try to listen to other, more experienced, operators on your own net and as many other formal nets as you can.
- Pay close attention to how they run the net, what scripts (if any) they use, and any mistakes they make.
- If your group or local club provides communication support for events such as marathons, parades, or races. These provide opportunities to get some “real world” NCS operator experience.
- Participation in regularly scheduled nets is important so that anyone who is or may become an NCS during a disaster or emergency can be effective and vital to the overall success of the mission.
The Net Control Station (NCS) Topic 8

What the NCS Operator is Not

- The duties of the NCS operator should be limited to running the net.
- This is a full-time job all by itself. The NCS operator should not be in charge of the overall communication effort, or of any portion of the response beyond his or her own net and shift.
- The Net Manager generally handles the assignment of NCS operators, frequencies, and schedules, and may also recruit members for the net.
- Also, it is best for the Net Control Station to work away from any location that is also a significant originator or destination of message traffic.
The Net Control Station (NCS) Topic 8

Review

- The NCS operator is in charge of controlling the flow of information on a net.

- In addition to training and practice, a good NCS operator has several attributes including a clear speaking voice and patience.

- The Net Manager assigns an NCS for each net session or operating shift.

- The duties of the NCS operator should be limited to running the net.
Introduction to Emergency Communication

Topic 8-1
Which is the primary purpose of a “standby” NCS in an informal net?
A. To make certain that the informal sharing of information flows smoothly.
B. To encourage others to join in the informal conversations.
C. To upgrade the net to formal status if it becomes necessary.
D. To acquire monthly service points.

Topic 8-2
The NCS operator is responsible for which of the following?
A. Being in charge of the overall communication effort.
B. Being in charge of the net during his shift.
C. Being in charge of net operations beyond his net and shift.
D. Being in charge of frequencies, schedules and recruiting.
Introduction to Emergency Communication

Topic 8-3
Which is least desirable time to train new operators?
A. During an emergency.
B. During a tabletop exercise.
C. During a public service event.
D. During a regularly scheduled training event.

Topic 8-4
Which best describes the primary mission of the NCS operator?
A. To train net operators.
B. To understand the Incident Command System (ICS).
C. To help the net move as much traffic as possible in the least amount of time, accurately and effectively.
D. To tune out all distractions and to focus on the job at hand in an often noisy and chaotic environment.
Introduction to Emergency Communication

Topic 8-5
Which of the following does not represent “the right stuff” to become a good NCS operator?

A. The ability to handle mental and physical stress for long periods.
B. The ability to write legibly.
C. The desire to be seen as important in a response despite lack of training.
D. Above average operating skills.
NCS Pre-Net Check List

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 location?
- Is the NCS location sufficiently separated from the served agency’s operations?
- Do you have the best performing antenna for the conditions?
Introduction to Emergency Communication

NCS Operator Practices Topic 9
NCS Pre-Net Check List (Continued)

- If you are running your radio with battery power, do you have at least one hour of battery capacity available?
- Are you using a headset with a noise-canceling microphone?
- Do you have sufficient pencils/pens and paper to run the net for your shift?
- For VHF/UHF repeater operation, are you familiar with the characteristics and control commands of the repeater system hosting your net?
- Do you have a runner, liaison, or logging person to support you?
- Do you have a designated back-up 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?
NCS Operator Practices Topic 9

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 of time or as long as it takes to complete the net’s business. Emergency nets are often opened and closed as needs dictate.
- NTS nets operate on a “cycle” that can be increased or decreased as the traffic load dictates.
- 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.
- 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.
NCS Operator Practices Topic 9
The Importance of Message Precedence

- In a communication emergency, one of the NCS operator’s primary concerns is “information overload.”

- When this happens, a message requesting “more bedpans for a shelter” may be sent before one requesting “a trauma team for a train wreck.”

- This condition is usually caused by messages that are fed into the “system” in an unregulated manner.

- Failure to organize this information flow could result in critical messages being delayed or lost.
There are four message precedences:

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

2. **Priority** (served agency and ARES messages directly related to the emergency, but not as time sensitive as an Emergency precedence message.)

3. **Health & 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.)
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, since they usually have little or no bearing on the emergency itself or the served agency’s needs.

Other nets may handle only *emergency and priority* messages, or primarily *health and welfare* messages.
NCS Operator Practices Topic 9

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, but 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 fifteen minutes, so that new stations may join the net.
NCS Operator Practices Topic 9

Asking for Check-Ins

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

Studies show that "This is" and unkeying before sending call sign just wastes time. Better for the NCS to just read back the calls they received.
NCS Operator Practices Topic 9

Time Tested Techniques

- Listen!
- Check-ins -
- Pair up stations to pass traffic
- Every net has a particular style
- Be as concise as possible
- Take frequent breaks.
- Control the tone of your voice.
- Legally Identify Yourself

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.
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.
NCS Operator Practices Topic 9
Net Disciplines (Continued)

- Expectations aside, you must keep in mind that you are working with volunteers.
- You cannot order compliance -- you can only ask for cooperation.
- Probably the best way 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 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.
NCS Operator Practices Topic 9

Microphone Technique

- Know how to use your microphone.
- Articulate, don't slur.
- 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.
NCS Operator Practices Topic 9

Microphone Technique (Continued)

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

1. Noise-cancelling
2. Unidirectional
3. Omnidirectional

- **Noise-cancelling** - you have to get quite close to it for best effect.
- **Unidirectional** - you'll probably want to speak directly into it (on axis) for best performance.
  - However, these mics tend to get bassy as you get closer; this is called “proximity effect”.
- Consistent technique is critical with these microphones. Small changes in angle and distance can have a pronounced effect on volume and frequency response - making it hard for others to understand you.
NCS Operator Practices Topic 9
Microphone Technique (Continued)

- **Omnidirectional** - equally sensitive in all directions.
  - The electric mics that are commonly supplied with most rigs
  - 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 air flow.

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.

Try placing a foam windscreen over the microphone.

The best microphones are relatively impervious to wind noise, and speaking directly into the mic may yield the best sound.
Microphone Technique (Continued)

- 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.
Introduction to Emergency Communication

NCS Operator Practices Topic 9

Microphone Technique (Continued)

- 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 regardless of background noise. With a little practice, you can train yourself to keep your volume and tone uniform regardless of speed and background noise.
NCS Operator Practices Topic 9
Microphone Technique (Continued)

Here's a good hint:

- 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 yourself can hear what you sound like and make corrections.
- Last but not least, when you find a technique that works, use it consistently.
NCS Operator Practices Topic 9

Review

- The NCS operator has many skills, some of which are transferable, and some specific to the NCS’ 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.
**Introduction to Emergency Communication**

**Topic 9-1**
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 ten minutes during the operation of the net.

**Topic 9-2**
In which order should messages be handled during an emergency?

B. **Emergency, Priority, Health & Welfare, Routine.**
C. Emergency, Health & Welfare, Priority, Routine.
D. Health & Welfare, Emergency, Routine, Priority.
Introduction to Emergency Communication

**Topic 9-3**
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.**

**Topic 9-4**
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
Introduction to Emergency Communication

Topic 9-5
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 operators from the net who do not follow net protocol.
The Net Manager (NM) has overall responsibility for the planning and operation of one or more nets. Whether you have one net or a dozen, you need a Net Manager.
The Net Manager Topic 10

- The NTS Net Manager is a full ARRL member appointed by the Section Manager, usually on the recommendation of the Section Traffic Manager.
- During an emergency, “ad hoc” nets may be created to meet specific needs. These may either be assigned to the permanent NM, or to a temporary NM for the duration of the event.
The Net Manager Topic 10

- Organization
  - Net Managers may be assigned to handle only one net, or many.
  - All ARRL NMs, both NTS and ARES, should work under the Section Traffic Manager (STM) and/or Section Emergency Coordinator (SEC) guided by a coordinated section traffic and ARES Communications Plan.
  - Some NTS nets cover more than one section but operate within the NTS at the section level.
• Duties
  ▪ The Net Manager’s duties include resource management and quality control.
  ▪ The nature of this job, like other leadership positions, demands excellent people and management skills
The Net Manager Topic 10

• **The Net Frequency**
  - In most cases, the Net Manager (NM) will choose the net’s frequency(s). Scheduled and pre-planned nets usually operate on designated frequencies, but temporary nets often choose a frequency based on which bands and frequencies are available.
  - HF nets that operate on a regular schedule will usually have less difficulty getting a clear frequency than those who only operate when needed.
  - Net frequencies on HF should always be listed as “plus or minus 5 kHz” to allow for interference. In some emergencies, it may be necessary for an emergency management official to request an FCC Emergency Communications Declaration (ECD) to clear a particular VHF/UHF frequency.
The Net Manager Topic 10

• The Net Frequency (Continued)

- But in the MF/HF Amateur Service bands, an ECD will, at best, only authorize use of 1 or 2 channels in the 60 Meter Amateur Service band.
- The FCC is not providing ECD’s for MF or HF frequencies as was done in the past. This policy became effective August 2, 2004.
• The Net Frequency (Continued)

- Section 97.401(b) provides that when a disaster disrupts normal communication systems in a particular area, the FCC may declare a temporary state of communication emergency.
- The declaration will set forth any special conditions and special rules to be observed by stations during the communication emergency.
- The FCC has not done this in several years and there are no expectations they will resume this option.
The Net Manager Topic 10

- The Net Frequency (Continued)

  - One or more alternate frequencies should be chosen in advance, and should be known by all net members.
  - In the case of VHF/UHF nets, alternate frequencies should be chosen for both repeaters as well as simplex frequencies since in an emergency, many repeaters may be off the air. In the event that interference or band conditions render the primary frequency unusable, net members should automatically switch to the alternate.
The Net Manager Topic 10

- The Net Frequency (Continued)

- FM simplex nets should use a frequency that is seldom used by local hams for day-to-day conversations, **and never on a national calling frequency** such as 146.52 or 446.000 MHz.
- Nets that use repeaters should make prior arrangements with the repeater’s owner.
- If a net uses a repeater as its primary meeting place, a backup simplex frequency should be chosen and publicized in the event the repeater fails.
Introduction to Emergency Communication

The Net Manager Topic 10

• The Net Frequency (Continued)

- One way to do this is to give instructions that in the event of repeater failure, the first place to meet is the OUTPUT of the repeater.
- All NCS operators and responders must know and fully understand how to operate their individual radios so that they can adjust the offset for simplex duty.
- Another ploy used by some ARES units to provide a backup for their own repeater is to have an agreement with a local radio club to use their repeater in the event that the ARES repeater fails during an emergency.
The Net Manager Topic 10

Some Points for Net Managers to Remember:

- You are responsible for managing the net, but do so with tact and diplomacy.
- Ensure that traffic on the net is handled in a timely manner.
- Know your operators’ capabilities, and their locations, especially when you may need to go simplex and what their coverage range is, taking terrain and other factors into account.
- Know how and where your net fits into the overall net structure at all times, since the situation may change periodically.
- Assign or identify liaison stations to move traffic from one net to the other(s).
- Assign an alternate NCS to stand by in case the primary NCS goes off the air.
Some Points for Net Managers to Remember: (Continued)

- Get all the information you can (type of situation, needed station locations, potential shift lengths, frequencies, agency or agencies involved, etc.) before you put a net into service.
- Provide direction in the routing and handling of various types of messages.
- Monitor the net(s) to be sure proper procedures and message formats are being used.
- Training is crucial to success “when the big one hits.” A varied and interesting training schedule will help keep net members ready to go.
The Net Manager Topic 10

Review

- The Net Manager has overall responsibility for:
  - the operation of a net,
  - recruiting and training NCS operators, net members,
  - frequency choices, and scheduling.
- A Net Manager may be appointed permanently for one or more regularly scheduled nets, or temporarily to manage ad hoc nets created for a particular event or disaster.
Introduction to Emergency Communication

Topic 10-1
What are the requirements and qualifications of the ARRL Net Manager position?
A. There are no specific requirements or qualifications for the position.
B. **Amateur Radio license; full ARRL membership; and any appropriate local or Section qualifications.**
C. An Amateur Extra Class license; and the approval of ARRL Headquarters.
D. The approval of the emergency management agency holding jurisdiction in the area.

Topic 10-2
Which statement best describes the Section Net Manager’s job?
A. Coordinate public information in the Section.
B. Provide technical information to members of ARES and/or NTS.
C. Appoint the local Emergency Coordinators.
D. **Coordinate and supervise traffic handling and net activities in the Section.**
Introduction to Emergency Communication

Topic 10-3
Which factor does NOT affect the number of Net Managers appointed in each Section?
A. The Section's geographical size.
B. The number of nets operating in the Section.
C. Other factors having to do with the way the Section is organized.
D. The ARRL Emergency Preparedness Manager.

Topic 10-4
Who appoints the NTS Net Manager?
A. Section Manager.
B. Division Director.
C. ARRL Headquarters staff.
D. Local EC.
Topic 10-5
To whom does the Section Net Manager report?
A. Division Director is responsible for supervising all Field Organization activity.
B. ARRL HQ staff is responsible for supervising all Field Organization activity.
C. Section NMs work under the STM and/or SEC, guided by a coordinated Section traffic or ARES communications plan.
D. Emergency Management personnel.
Introduction to The National Traffic System (NTS)  
Topic 11

What is the NTS?

- The National Traffic System (NTS) is a unique arrangement for handling messages that was designed over 50 years ago.
- Organized traffic handling was a central purpose of ARRL at its founding in 1914!
- Its goal is to enable a message to be passed across the continent within 24 hours.
- NTS does this with a group of specialized nets operating in a “cycle” that allows messages to move smoothly from a local net, to a regional net, to various transcontinental nets, and then back down to regional and local nets at the destination.
Introduction to The National Traffic System (NTS)  
Topic 11

What is the NTS?  (Continued)

- Ultimately, someone in a local net near the addressee should be able to deliver the message by phone, in person, by mail, or email and even amateur radio. Many NTS messages reach their address by radio, and it should be included as a viable delivery resource.
- One of the most important features of the NTS is the “system concept.”
- No NTS net is an independent entity; it interfaces with other NTS nets.
- Each net performs a specific function in the overall organization.
- To the extent a net fails to perform any of its functions, it can affect the performance of the overall system.
What is the NTS? (Continued)

- In the days before inexpensive long-distance telephone, and well before the Internet and email, the NTS was used heavily for routine daily communication between Amateur Radio operators, family, and friends.
- This daily traffic kept NTS members in practice for handling large volumes of traffic during emergencies and disasters, the ultimate reason for the NTS’s existence.
- Today, routine daily traffic on the NTS is light, and large-scale emergency operations are generally during major disasters with widespread infrastructure damage.
- However, this does not lessen the importance of the NTS in assisting our served agencies.
What is the NTS? (Continued)

- One of the most important duties of NTS and its benefits to served agencies is “health and welfare” traffic as we will discuss.
- However use of NTS is dependant to a large degree upon the served agency and their traffic requirements.
- It is wise to note that not all served agencies will elect to use the NTS system, opting instead to use their own forms, such as during an incident where an ICS-213 form may be required.
- We must remember the principal that we serve at their pleasure and must employ the format which they direct us to use.
- The NTS is not part of ARES, but is a separate and distinct ARRL program.
Introduction to The National Traffic System (NTS)  
Topic 11

What is the NTS?  (Continued)

- The NTS and ARES work together.
- Think of the NTS as a “long distance carrier,” and of ARES as the “local exchange carrier.”
- This analogy is not perfect, but it is close.
- The NTS is not intended as competition for the many independently organized traffic networks.
- When necessitated by overload or lack of outlet for traffic, the facilities of independent networks can function as alternate traffic routings where this is indicated in the best interest of efficient message relay and/or delivery.
Introduction to The National Traffic System (NTS)

Topic 11

What is the NTS?  (Continued)

- Nets may sometimes find it necessary and expedient to adopt temporary measures to ensure the movement of traffic.
- This is considered improper operation only when no attempt is made to return to the normal schedule.
- Nevertheless, improper operation of any NTS net is the concern of all NTS nets, and every effort should be made to assist in returning any non-functioning or improperly functioning net to its normal operation.
Introduction to The National Traffic System (NTS)

Topic 11

What is the NTS? (Continued)

Quick Review

The NTS is not part of ARES, but is a separate and distinct ARRL program.
The NTS and ARES work together.
Think of the NTS as a “long distance carrier,” and of ARES as the “local exchange carrier.”
Introduction to The National Traffic System (NTS)  
Topic 11

How the NTS Works

- The National Traffic System consists of four different levels of nets.
- These operate in an orderly time sequence to move messages in a definite pattern from origin to destination.
- A message flows through the NTS in a manner similar to a business person who travels between two small rural towns at opposite ends of the country.
- The transcontinental message starts with the originating station in a local net, is carried up to the “Section” net, then up to the “Region” net, then up to the “Area” net, across to another “Area” net, and then back down the line to the point of delivery.
Introduction to Emergency Communication

Introduction to The National Traffic System (NTS)

Topic 11

How the NTS Works (Continued)

- Of course, the message can “get on” or “get off” at any point if that is the origin or destination.

- Thus, a message from San Francisco to Los Angeles would not go beyond Region level, and one from Syracuse to Buffalo would remain in the Section net(s).

- At the local level, messages may be passed into or out of local ARES or other nets for delivery to served agencies, or may be delivered to private citizens directly.
Introduction to The National Traffic System (NTS)  
Topic 11  
How the NTS Works (Continued)

- NTS nets may use FM, SSB, CW, and IRLP and VoIP (Voice over Internet Protocol).

- Messages may also be passed through NTS-affiliated local and Section traffic nodes that employ digital modes such as AMTOR, packet, D-Star, WinLink, PSK-31 and other such new technology modes with store-and-forward capabilities and bulletin-board operations.

- Long hauls can be made by the NTS digital stations on HF that interface with Section traffic nodes and the traditional nets of the system.
Introduction to The National Traffic System (NTS)

Topic 11

Local Nets

- “Local” NTS nets are those that cover small areas such as a town, city, county or metropolitan area, but not a complete ARRL Section.
- They usually operate on two-meter or 70cm bands at times and on days most convenient to their members.
- Other nets are designated as “emergency” (ARES) nets that do not specialize in routine traffic handling.
- Local nets are intended mainly for local delivery of traffic, with a goal of delivery by non-toll telephone calls.
- A local net, or “node”, may also be conducted on a local packet system, where messages may be stored, forwarded, and picked up by local operators for subsequent delivery.
Section Nets

- The purpose of the “Section” net is to handle messages within the Section, and to handle messages moving to and from the “Region” nets.
- Either liaison stations from local NTS nets and nodes, individual stations, or both, handle messages passing within the Region.
- The Section may have more than one net (e.g. a CW net, a VHF net, an SSB net, or a Section packet BBS).
- In an area with low population density or NTS activity, two or more Sections may combine to form a single net operating at Section level.
- Section nets are administered through the office of the Section Manager, with authority for this function often delegated to an appointed Section Traffic Manager and/or designated Net Managers.
Introduction to The National Traffic System (NTS)

Topic 11

Region Nets

✓ “Region” nets cover a wider area, such as a call area. At this level, the object is representation of each ARRL Section within the Region. Participants normally include:

• A Net Control Station, designated by the Region net manager.
• Representatives from each of the various Sections in the Region, designated by their Section Net Managers.
• One or more stations designated by the Region net manager to handle traffic going to points outside the Region.
• One or more stations bringing traffic down from higher-level NTS nets.
• Any other station with traffic.
Region Nets (Continued)

- There may be more than one representative from each Section in the Region net, but more than two are usually superfluous and will only clutter the net.
- The purpose of the Region net is to exchange traffic between the Sections in the Region, put out-of-Region traffic in the hands of liaison stations, and distribute traffic coming into the Region among the Section net representatives.
- Regional nets are administered by managers elected by the NTS volunteers and supported through the Membership and Volunteer Programs Department (MVP) at ARRL Headquarters.
Introduction to The National Traffic System (NTS)

Topic 11

Area Nets

At the top level of NTS nets is the “Area” net. Participation at the area level includes:

- A Net Control Station, designated by the Area Net Manager.
- One or more representatives from each Region net in the Area, designated by the Region Net Managers.
- Transcontinental Corps (TCC) stations designated to handle traffic going to other Area nets.
- TCC stations designated to bring traffic from other Area nets.
- Any station with traffic.
Introduction to Emergency Communication

Introduction to The National Traffic System (NTS)

Topic 11

Area Nets (Continued)

- There are three Areas, designated “Eastern,” “Central” and “Pacific,” the names roughly indicating their coverage of the US and Canada except that the Pacific Area includes the Mountain as well as the Pacific time zones.
- Area nets are administered by managers elected by the NTS volunteers and supported through the Membership and Volunteer Programs Department (MVP) at ARRL Headquarters.
Introduction to The National Traffic System (NTS)

Topic 11

Transcontinental Corps

- The handling of higher priority messages between “Area Nets” is accomplished through the facilities of the Transcontinental Corps (TCC).
- TCC members handle “routine” messages only in times of extreme overload.
- This is not a net, but a group of designated liaison stations that have the responsibility for seeing that inter-Area traffic reaches its destination Area.
- TCC is administered by TCC directors, or as delegated to the Area Digital Coordinator, in each Area who assign stations to report into Area nets for the purpose of “clearing” inter-Area traffic, and to keep out-of-net schedules with each other for the purpose of transferring traffic from one Area to another.
Introduction to Emergency Communication
Introduction to Emergency Communication

Introduction to The National Traffic System (NTS) Topic 11

Transcontinental Corps

(Continued)

Fig 5-3 — National Traffic System flow chart. See text.
Introduction to Emergency Communication

Introduction to The National Traffic System (NTS) Topic 11

Transcontinental Corps

(Continued)

Fig 5-3 — National Traffic System flow chart. See text.
“Hotline” Circuits

- In certain situations, a large volume of traffic may be moving between two locations, such as from a large refugee center to an American Red Cross office.
- Rather than attempting to move these messages through the normal system, a “hotline” circuit is established between two or more stations at or near these locations.
- This avoids overloading normal nets, and speeds delivery of critical messages.
Introduction to The National Traffic System (NTS)
Topic 11

Increased Operations During Disasters

- In day-to-day operation, the National Traffic System passes routine messages around the country.
- In its emergency role, the NTS is dedicated to disaster communication on behalf of ARES.
- The NTS is capable of expanding its cyclic operation partially or fully depending on the level of need.
- The normal cycles can be expanded to handle an increasing volume of messages with greater speed.
- In extreme cases, the cycles can operate continuously.
Introduction to The National Traffic System (NTS)  
Topic 11

Activation for Disasters

- Emergency Coordinators in disaster areas consult with served agencies to determine which communication resources will need to be activated.
- The Section Emergency Coordinator, working along with and in direct communications with the appropriate Section Manager(s), consults with affected DECs and ECs, and makes an activation recommendation to the Section Traffic Manager, and Section or Regional NTS managers as appropriate.
- The decision to alert the NTS Region management may be made by any combination of these officials, depending upon the urgency of the situation.
- The scope of the activation will depend on the scope of the disaster.
Introduction to The National Traffic System (NTS)

Topic 11

Activation for Disasters (Continued)

- If messages need to be passed only within the Section, then only those nets will be activated.

- If the disaster is widespread and communications are disrupted over a large area, Region or Area nets may be needed.

- In such cases the Traffic Managers and SEC’s, working with their Section Managers will need to coordinate the effort between sections or regions.

- The TCC then needs to become involved.
Introduction to The National Traffic System (NTS)

Topic 11

Activation for Disasters (Continued)

- Handling outbound Health and Welfare (H&W) traffic has a higher priority than inbound H&W – each outbound H&W message delivered may head-off several more H&W inquiries about the same person, since the person receiving the outbound H&W message may share the news with other friends and relatives.
- Managers of NTS nets at local, Section, Region, and Area levels are directly responsible for activation of their nets at the request of ARES or NTS officials.
- Each EC is directly responsible for activating their local ARES nets.
NTS Alerting Plan

Section Traffic Manager (STM) and Section Net Manager Roles:

- During a disaster, the STM and certain Section net managers may be contacted by the Section Emergency Coordinator or the Section Manager to activate needed Section NTS and ARES nets, either to provide Section-wide contact or, in the case of NTS nets, to provide liaison with the nets outside the Section.
- The STM and Section Net Managers make contact with NTS Region Net Managers in the event that messages connected with the disaster need to cross Section boundaries, and may recommend extraordinary activation of the Region net.
NTS Alerting Plan (Continued)

- **Section Traffic Manager (STM) and Section Net Manager Roles:**
  - Specific Section net stations are designated to conduct liaison with the NTS Region net, either through another Section net or directly.
  - This is the responsibility of Section officials, not the Region net manager.

- **Region Net Manager Functions:**
  - Should a disaster situation’s needs extend beyond the Section level, any one of the Section officials in a Region or a neighboring NTS Region may contact the Region Net Manager.
  - The Region Net Manager should be able to predict such contact based on the circumstances, and should be available to receive their recommendation.
NTS Alerting Plan (Continued)

- Region Net Manager Functions: (Continued)
  The Region Net Manager makes contact with the NTS Area Net Manager in the event that communications connected with the disaster transcend Region boundaries, recommending extraordinary activation of the Area NTS net.

- Area Net Manager Functions:
  - There are only two Area Net Manager appointees for each of the three Areas in the US, but their function during and after disasters is of paramount importance.
NTS Alerting Plan (Continued)

Area Net Manager Functions:

- Area Net Managers maintain a high sensitivity to disasters that extend to or beyond Region boundaries.
- In the event that high-precedence inter-Area traffic is involved, the Area Net Managers contact the two Transcontinental Corps directors in the Area to assist by arranging to pass the traffic directly to other Areas.
- The Area Net Managers in the affected Area also contact the other NTS Area Net Managers to discuss the possibility of opening extra net sessions if required to handle the traffic reaching them through NTS inter-Area handling.
- The Area Net Managers maintain close contact with all Region Net Managers in the Area and make decisions regarding overall NTS operation in consultation with them.
NTS Alerting Plan (Continued)

- Transcontinental Corps (TCC) Directors:
  - These NTS officials will be involved only where traffic of a precedence higher than “routine” is to be handled between NTS Areas, or when extreme overloads are anticipated.
  - TCC Directors are ready to alert TCC members and set up special out-of-net schedules as required.
  - TCC Directors may be called upon by the Area Net Manager to set up “hotline” circuits between key cities involved in heavy traffic flow.
  - TCC Directors know which of their TCC stations are located in, or close to, large cities to operate such circuits.
Introduction to The National Traffic System (NTS)  
Topic 11

Area Staff Chair Responsibilities
- The three Area Staff Chairpersons administratively oversee the NTS Officials and their operations above the Section level, and will advise their TCC Directors, and Area and Region Net Managers when appropriate.
- Their advice may be based on information forwarded by ARRL Headquarters.
- The chair maintains a high sensitivity to disasters and other emergencies that may develop.
- In a large-scale disaster, the chairperson should be able to contact one another via the International Assistance and Traffic Net and on other prearranged nets.
Introduction to The National Traffic System (NTS)

Topic 11

General Policy for all NTS Operators

• NTS operators should be “self-alerting” to disaster conditions that might require their services, and should check-in to their regular net or perform assigned functions without being specifically called upon.
• Assignments should be worked out with the Net Manager in advance. If the operator cannot answer the question, “If I hear of a disaster, what should I do?” they should seek an answer through their Net Manager.
• It may be as simple as “report into the X Net on Y frequency.”
• If the operator concerned is highly specialized, it might be “report to your TCC director in the X net on Y frequency for a special assignment.”
Introduction to The National Traffic System (NTS)  
Topic 11  
General Policy for all NTS Operators (Continued)

- Such an assignment might be an extra TCC function, or it might be as a functionary in a “hotline” point-to-point circuit needing special abilities or equipment.
- Most NTS operators participate for one or two periods a week, and some are active daily.
- Although every net member should have a specific assignment, they must also remain flexible enough to change assignments when the need arises.
Digital Communication and NTS

- Late in 2010 the Area Staff Chairs of the NTS approved updates to the ARRL Public Service Communications Manual (PSCM) Appendix B, Methods and Practices Guidelines, Chapter 6, NTSD and Radio-email.
- These revisions provide for a structure and guidance on how the ARRL Field Organization may use Radio-email to provide nation-wide messaging in the modern email format via Amateur Radio with near real-time delivery anywhere in the country, 24/7.
- It also provides for integration of the ARES®, NTS and NTSD efforts nation-wide.
Introduction to The National Traffic System (NTS)

Topic 11

Digital Communication and NTS (Continued)

▪ The new Radio-email system uses the WinLink 2000 network, infrastructure independent local automatic email service modules, plus station-to-station, radio-all-the-way transport services provided by the NTS/D to support all Sections.
▪ The WinLink 2000 network also provides us with a firewall and white list protected interface with the public internet for handling welfare and agency messaging with internet addresses.
▪ New types of message formats are included, and guidance on handling ICS-213 and other similar message formats is included.
▪ As with any email system, it is necessary to know the addresses of stations on the network in order know how to address messages.
Introduction to The National Traffic System (NTS)

Topic 11

Digital Communication and NTS (Continued)

- *Radio-email* may be sent to multiple addressees with multiple copies and binary attachments.
- NTSD is assigning client Target Station addresses to be the outlet clients for messaging on the network.
- What this means for you, for example, is the ability to send public welfare emails from shelter victims directly to internet addresses, or at other shelters, and receive replies.
- You may also send Radiograms in the standard ARRL format, carried by *Radio-email*, directly to network stations in the NTS/D for handling.
You may have agency and our own leadership officials, using their own computers, exchange *Radio-email* messages between all sites where amateur field stations are deployed. In each of those examples, no intermediate relaying manpower or nets are required within your “last mile” disaster area.
Introduction to The National Traffic System (NTS)  
Topic 11  
Review

- The National Traffic System is a set of scheduled nets operating on a cycle that permits messages to be routed across the country in less than 24 hours.
- The cycles can be increased to allow for larger volumes of messages to be handled during an emergency.
- Nets operate at the local, Section, Region, and Area levels.
- The Transcontinental Corps can help expedite critical messages by bypassing the normal routes.
- Hotline circuits can be established between high-volume locations when needed.
- NTS nets provide a great venue for participants to practice using phonetics, and paying focused attention to details – which are required to take traffic and operate as an effective NCS.
**Introduction to Emergency Communication**

**Topic 11-1**

Which of the following statements about the National Traffic System is *true*?

A. It is highly reliant upon CW.
B. It was designed within the last 25 years.
C. Each net within the System is an independent, “stand alone” entity.
D. It is a unique system for efficiently handling messages.

**Topic 11-2**

The Area Nets include which of the following?

A. The Eastern, the Central, the Canadian, and the Pacific.
B. The Eastern, the Central, the Mountain, and the Pacific.
C. The Central, the Mountain, and the Canadian.
D. The Eastern, the Central, and the Pacific.
Topic 11-3
Which is the purpose of a “hotline circuit”?
A. To move a modest amount of routine traffic between two locations in small town.
B. To move a moderate amount of traffic between two served agencies across the country.
C. To move a high volume of traffic between two locations during a disaster.
D. To move a high volume of holiday traffic across the country

Topic 11-4
Which of the following statements is true?
A. NTS was designed to compete with independent traffic networks.
B. NTS generally encompasses five different levels of operation.
C. Section nets exclusively handle traffic between Local and Regional nets.
D. Regional Nets exclusively handle traffic among Sections within their Region.
Specialized Nets and Their Operations Topic 12

Why We Have Specialized Nets

- Specialized nets are created to serve specific agencies that are served by Amateur Radio emergency communications.
- These vary from region to region, as not all sections and districts will be serving the same agencies.
- From a general standpoint, the most common served agencies are:
  - The American Red Cross,
  - The Salvation Army,
  - The National Weather Service (NWS)
  - Other such national organizations that have Memorandums of Understanding (MOUs) with the ARRL and its ARES program.
- These nets are customized to fit the needs of an individual served agency, and are most often quite different in nature from the basic net, resource net or other general types of net operations that we have discussed so far.
Specialized Nets and Their Operations Topic 12

Differences in Specific Specialized Nets

- In the many sections and districts, we work for and with different served agencies.

- There are some that we do have in common however, and we will use examples of the most common among ARES operations, and how they differ.
Specialized Nets and Their Operations Topic 12

Differences in Specific Specialized Nets

- For example:
  - Many of us work with The American Red Cross (ARC) and local Emergency Operation Centers (EOC’s).
  - When we are conducting a net on behalf of the ARC, much of the information is relative to their functions.
  - The information that they need varies depending on which type of disaster we are dealing with.
  - If there is an evacuation due to fire or flood, then the Chapter will want to know detailed information about the number of “clients” who check in at the shelter and the provision of adequate supplies that are needed to accommodate them.
Specialized Nets and Their Operations Topic 12

Differences in Specific Specialized Nets

- For example:
  - While most of these nets can be operated by simplex voice, there are times when the distance between locations would indicate that a repeater might best cover the area needed.
  - Bear in mind that not only will the Chapter office need to communicate with EACH shelter, but the shelters will often need to talk to each other as well.
  - For this reason a strong, well organized NCS will be needed so that the traffic will flow smoothly and in an orderly fashion.
  - Also you must remember that traffic that contains sensitive information must be confined to a SECURE communications method and never be transmitted through direct voice communication where proper names and/or health conditions are mentioned.
Specialized Nets and Their Operations Topic 12
Differences in Specific Specialized Nets

Again: Traffic that contains sensitive information must be confined to a SECURE communications method and never through direct voice communication where proper names and/or health conditions are mentioned.

- Amateur Radio is not a secure method of communication.
- Using various digital modes we can greatly decrease the possibility of interception, but it is not secure nor should we ever allow a served agency to assume it is.
Specialized Nets and Their Operations Topic 12

Differences in Specific Specialized Nets

▪ After the first several hours of an event, Health and Welfare traffic may be the most valuable type of traffic for your served agency, so every communicator working with such a served agency will need to have a good supply of NTS forms (and other forms as required for your individual area) so that such traffic can be passed if and when called upon.

▪ Working with a local EOC can be much different in nature, since most Emergency Managers are looking for different kinds of information to be passed during a callout.

▪ Since the creation of the Department of Homeland Security (DHS), the NIMS or ICS system has become more widely used.

▪ For this reason being familiar with the ICS 213 and other such forms used in that system is also good practice.
Specialized Nets and Their Operations Topic 12

Differences in Specific Specialized Nets

- We must be accustomed to the proper format and protocol that is dictated by the served agency, and not what we would elect to use.
- Again, we serve at their pleasure, so advance preparation would indicate that we become familiar with what their needs are so that when the time comes we are on the same page with them.
- This will vary from area to area, and the relationships formed between agency leaders and ARES leadership is vital.

- We must be accustomed to the proper format and protocol which is dictated by the served agency, and not what WE would elect to use.
Introduction to Emergency Communication

Specialized Nets and Their Operations Topic 12
Differences in Specific Specialized Nets

- As has already been discussed, an EOC is usually not the best place for a NCS to operate, since the chaos and noise factors can make such operation difficult.
- It is often better to have the NCS located off-site in a different location for best results.
- Also, an EOC will often require communications and tracking of information among a variety of different agencies they work with.
- Good advance preparation in your area of responsibility might consist of identifying and appointing a specific person as liaison for each of the other agencies that an EOC works with.
Specialized Nets and Their Operations Topic 12

Health-Oriented Served Agencies

- Many health organizations such as hospitals and health departments have discovered the value of amateur radio communications.
- Working with these types of served agencies can present some unique methods and challenges.
- For example: Some elect to involve amateur radio for the relay of information while engaged in “Point of Dispensing or “PODs” for mass inoculation and vaccination.
- Often they will ask that we link to an area hospital, EOC and/or health department so that they can track how many doses have been expended and in what length of time.
They would also need to know how many people have passed through a particular POD location and what remaining supplies are on hand.
For this type of traffic a directed net usually works best.
Each POD location would have communicators on hand to gather information then pass it on in regular intervals.
NCS operators must be sensitive to accuracy of the information being relayed from each point.
It can be noted that this application is also a good workout for packet and digital communication systems with specially assigned frequencies so that normal traffic does not conflict with the POD voice traffic in progress.
Introduction to Emergency Communication

Specialized Nets and Their Operations Topic 12

Are we alone?

Remember that your group may not be alone!

- The American Red Cross has a corps of Amateur Radio operators dedicated to them and who are their own ARC volunteers.
- The Salvation Army has SATERN volunteers working ham radio.
- The Southern Baptist Men's Group also has volunteer Amateur Radio operators within their ranks as communicators.
- These groups may need to bring their full resources into your region depending on the severity of the situation.

What is your plan to work cooperatively? How will your nets integrate with their needs?
Introduction to Emergency Communication

Specialized Nets and Their Operations Topic 12

Advance Planning and Drills

▪ Working with different served agencies and providing nets to each can be difficult.

▪ The agencies often interact with each other, so advance planning and knowing assignments such as NCS operators can make a huge impact on the success of our operations with such agencies.

▪ Sitting down well in advance with agency leadership to determine their needs and requirements will help to make things flow smoothly during an actual event or emergency.

▪ One good way to handle such advance training would be a tabletop exercise during which a demonstration of Amateur Radio in action is shown, and interaction between agencies can take place.
The BIG one!

- One other specialized type of net needs to be discussed, even though we hope never to have to use it.
- In a truly major disaster you cannot plan on your own local people being available.
- They may be victims.
- Help will come in from your neighboring sections and even from across the country.
- But the task of the local or district ARES members is not over!
- Working with your SEC, DEC and others, they will need to form a special resource net which efficiently tracks needs and locations for operators, to whom they should report when they arrive, and what skills and equipment they bring to the task.
- In this case, the "served agency" is ARES itself!
Specialized Nets and Their Operations Topic 12
The BIG one! (Continued)

- With this in mind, it is necessary to form solid working relationships with neighboring sections and conduct drills and testing of a “Mutual Aid Net”.
- It is good to establish a communications plan under which such requests are made and resources gathered.
- Depending upon the geography, many different bands and modes may be chosen, depending on the individual situation.
- Assuming that the Internet is not down, an IRLP, D-Star or EchoLink node or system to link wide areas might be the mode of choice.
- If it is down, WinLink 2000, or similar mode of operation might help.
- In any event, this will be unique to your own area and situation, and advance planning and testing of such Mutual Aid scenarios is a must.
Specialized Nets and Their Operations Topic 12

Working Together

- Finally, remember that this is not the place for "my group, my repeaters, my plan" small-mindedness.
- The NCS of a specialized net reports to both the EC and liaison directly involved with the agency for which the net was created and (usually via that liaison) to the leadership of the agency for which the net was created.
- We serve the public, not our egos, and the best service we can render in a truly major event is to provide and distribute a corps of trained operators into the right places of the scene in those first critical 48 hours.
- Table-topping such a major event and developing a special resource net with your SEC - and even with neighboring sections - is excellent preparation.
- The same holds true at the local level.
- Working with neighboring ARES units during table top and even more extensive practice nets is a must.
Introduction to Emergency Communication

**Topic 12-1**

**What is the purpose of a specialized net?**

A. To work with a government agency or EOC.

B. To determine what resources are available for service.

C. **To serve and be customized for a specific served agency.**

D. For passing of health and welfare traffic only.

**Topic 12-2**

**Which statement best describes a Specialized Net?**

A. **A net geared to a specific agency and its unique requirements.**

B. A net for finding out which resources are available for service.

C. Communications with ARES personnel only.

D. Passing of Health & Welfare traffic only.
Introduction to Emergency Communication

Topic 12-3

How should a NCS plan prior to a Specialized Net?

A. Work with the SEC, DEC and EC.
B. Meet and plan with the served agency itself.
C. Work with a liaison specially assigned to the actual agency.
D. All of the above.

Topic 12-4

To whom does the NCS of a specialized net report?

A. The EC or liaison directly involved with the agency for which the net was created, and also to the leadership of that agency.
B. The SM or SEC.
C. Only to the top leadership of the agency for which the net was created.
D. The ARES team leaders
The name "SKYWARN," like "ARES," is a registered name and cannot be used by other organizations.

Like ARES, it is a program and not a club or organization.

Amateur Radio operators and other SKYWARN® volunteers report actual weather conditions in their own communities.

These are sometimes called “ground truth” observations.

Accurate information and rapid communication during extreme weather situations have proven to be indispensable to the NWS.

Amateur Radio SKYWARN® operations have become integral to many communities’ disaster preparedness programs.
Unlike most Amateur Radio operators, SKYWARN® observers are a “first-response” group, invaluable to the success of an early storm-warning effort.

Weather spotting is popular because the procedures are easy to learn and reports can be given from the relative safety and convenience of a home or vehicle.

To become a registered SKYWARN® volunteer, you must complete a short course of training in severe weather observation and reporting.

Once completed, NWS personnel may assign you a spotter number and a toll-free number to call with your reports.

Many amateurs are members and registered spotters and they provide a valuable service to NOAA and local NWS offices around the country.
Severe Weather Nets Topic 13

What is generally reported?

- Reports on a severe-weather net are limited to specific critical weather observations, unless the NWS office requests other information.
- For this reason, amateurs without SKYWARN® training should monitor the net and transmit only when they can offer needed help.
- If they ARE members, they should report as requested and as needed by their local leadership and NWS office, and using their assigned SKYWARN® spotter number.
- Many areas open a net for the collection of such severe weather data.
- Weather forecasters, depending on their geographical location, need specific types of data.
Severe Weather Nets Topic 13

What is generally reported? (Continued)

- During the summer or thunderstorm season, SKYWARN® observers report:
  - Tornadoes, funnel clouds, and wall clouds
  - Hail – usually measured with a specific size
  - Strong winds, usually 50 miles per hour or greater
  - Flash flooding
  - Heavy rain, with a sustained rate of 1 inch per hour or more
  - Damage.
  - Adverse traffic and driving conditions affecting travel
Severe Weather Nets Topic 13

What is generally reported? (Continued)

- During the winter they report:
  - High winds
  - Heavy snowfall
  - Freezing precipitation
  - Sleet
  - New snow accumulation of 2 or more inches per hour
  - Damage caused by snow or ice.
Severe Weather Nets Topic 13

What is generally reported? (Continued)

Here is a four-step method to describe severe weather you see:

1. What: Tornadoes, funnel clouds, heavy rain, etc.
2. Where: Direction and distance from a well-known location; for example “3 miles south of Newington Center, on Route 15.”
4. Details: Storm’s direction, speed of travel, size, intensity, destructiveness.
   ▪ Include any uncertainty as needed e.g. “Funnel cloud, but too far away to be certain if it is on the ground.”
   ▪ Indicate if amounts are measured or estimated; i.e. wind gauge vs. visual estimate.
Severe Weather Nets Topic 13

Activation

- **SKYWARN®** observers are usually aware that the potential for severe weather has been forecast.
- As conditions begin to deteriorate, they should monitor the primary net frequency and the NOAA All Hazards Weather Radio (NWR)
- The **SKYWARN®** net may be formally activated upon the request of the local NWS office, or by net members if conditions warrant immediate action.
Severe Weather Nets Topic 13

Operating the Weather Net

- The format and operation of weather nets will vary from area to area, and should be designed to meet local needs.
- In areas with specific hazards, such as in “tornado alley,” the net may be formal and well disciplined.
- In other areas with less sudden dangerous weather, the net may be less formal, and may not even have a NCS operator.
- When it is a directed net, the NCS maintains control over traffic being passed to NWS, and may organize liaison with other area repeaters.
- Often wide area, high level repeater systems will work best due to their coverage.
- Many ARES organizations designate an EC or AEC assigned to the NWS who become NCS during activation.
- Many of these also become Weather Net managers.
Severe Weather Nets Topic 13

Operating the Weather Net (Continued)

- The Net Manager or NCS should designate one or more alternate frequencies in anticipation of an overload, the loss of a repeater, or if the net needs to split to handle different tasks or regions.
- If a disaster should occur during a severe-weather net, the net may take on disaster-relief operations in addition to tracking the progress of the storm.
- If the traffic on the net increases substantially, a separate net should be set up to handle relief operations to ensure that critical information gets through in a timely fashion.
- At least one station should be assigned as a liaison to monitor both nets and relay any critical messages or information between nets.
Severe Weather Nets Topic 13

Operating the Weather Net (Continued)

- **At the National Weather Service –**
-    In some areas, a permanent or temporary Amateur station is operated from the local NWS office.
-    In other areas, an off-site station relays information to the local NWS office via telephone, fax, or email.
-    In either case, this station receives, collates, and organizes the information being sent to NWS and passes it on to the forecasters as quickly as possible.
- **They need to be aware of which frequencies are to be monitored so that they may receive the most accurate and up to date information in real time.**
- **This arrangement allows them to monitor incoming traffic directly.**
- **All traffic should be written on report forms and passed quickly to the forecasters.**
Severe Weather Nets Topic 13
The Hurricane Watch Net (HWN) - http://www.hwn.org

- Serves as eyes and ears for the National Weather Service
  - in the Caribbean,
  - the Gulf of Mexico,
  - along the US Atlantic and Pacific coasts.

- Net members relay official weather bulletins to those monitoring the net in affected areas, and field observation reports back to NWS - primarily to the hurricane forecasters in the National Hurricane Center which has an on-site amateur radio station, WX4NHC.

- It also serves as a backup communication link between NWS forecast offices, National Specialized Centers, critical EOCs, and other disaster relief efforts.
Introduction to Emergency Communication

Severe Weather Nets Topic 13
The Hurricane Watch Net (HWN) (Continued)

- HWN differs from SKYWARN® in two important ways.
  - First, its volunteers are exclusively Amateur Radio operators.
  - Second, its operations are primarily on HF-SSB rather than VHF or UHF-FM.
- Membership in the net is not restricted to stations in hurricane areas. Amateur operators outside hurricane-prone areas can participate as relays or net control stations.
- The net has an urgent need for stations in the Midwest and on the west coast as propagation shifts westward.
- The net also has a need for stations that are available during the workday in all areas.
Severe Weather Nets Topic 13
The Hurricane Watch Net (HWN) (Continued)

- If you live in a hurricane-prone area, and your Amateur license class will not allow operation on the 20-meter band, you can still participate in the system.

- The National Hurricane Center monitors the APRS packet reporting system.

- You can submit your information manually via APRS, or better yet, connect a weather station to your packet station for automatic reporting.

- In some areas, local FM nets relay observations to NWS through HF operators on the HWN net.
The Hurricane Watch Net (HWN) (Continued)

- **Activation**
  - The Hurricane Watch Net activates for all hurricanes that are a threat to land in the Atlantic and eastern Pacific Oceans.
  - The net will normally activate when a hurricane is moving toward land at a range of 300 miles.
  - On occasion, it may activate for tropical storms, or at any time when requested by the National Hurricane Center.
  - Before checking into the net, listen long enough to determine the nature and immediacy of events.
  - If the storm is still hours from any serious impact, the net control will provide a window of opportunity to check in.
Severe Weather Nets Topic 13

The Hurricane Watch Net (HWN) (Continued)

- Net Operations
  - The Hurricane Watch Net, and WX4NHC at the National Hurricane Center in Miami, are staffed entirely by volunteers.
  - While net operations are normally conducted on 14.325 MHz USB, the net may move to 3.950 MHz LSB if band conditions warrant.
Severe Weather Nets Topic 13

The primary functions of the HWN are to:

1. Disseminate hurricane advisory information to marine interests, Caribbean island nations, emergency operations centers, maritime mobile Amateur stations, and other interests for the Atlantic and Eastern Pacific as released by the National Hurricane Center in Miami, Florida.

2. Obtain ground-level weather observations and damage reports from reporting stations and observers who are not part of the routine network for the National Weather Service, or the World Meteorological Organization, and forward it quickly and accurately to the National Hurricane Center.
Severe Weather Nets Topic 13

The primary functions of the HWN are to: (Continued)

3. Function as a backup wide-area communication link for the National Hurricane Center, Emergency Operation Centers, the National Weather Service, and other vital interests involved in the protection of life and property before, during, and after hurricane events.

4. Relay initial assessments of hurricane damage to the National Hurricane Center.
   Damage assessments come in about roads, power outages, structural damage, phone and communication problems, and of course, reports on the number of injuries and deaths.
Introduction to Emergency Communication

Severe Weather Nets Topic 13
Safety Concerns for All Weather Net Stations

- As an Amateur Radio operator providing communications in the path of a dangerous storm, you need to be concerned for your own safety.

- **Under no circumstances** should you place yourself in physical danger in order to gather or report information.

- If the area is under an evacuation order, it is too dangerous for you as well. Antennas and supports should be placed so that winds will not carry them into power lines.

- Stations should be located as far from potential flood, flash flood, or storm surge areas, and as close to an escape route as possible.
Severe Weather Nets Topic 13
Safety Concerns for All Weather Net Stations (Continued)

▪ If setting up a portable station, choose buildings that were specifically designed to withstand storm winds.

▪ Stay away from unprotected windows, and make sure that you have more than one down-wind emergency exit should a fallen tree or other debris block the main exit.

▪ Park vehicles down-wind from buildings and structures to protect them from flying debris.

▪ Bring adequate supplies to remain in place for an extended time should evacuation or re-supply not be possible.
Introduction to Emergency Communication

Severe Weather Nets Topic 13

VoIP MODES

- Radio amateurs using voice over Internet Protocol (VoIP) modes such as EchoLink are also supporting forecasters tracking hurricanes.

- The EchoLink and IRLP partnerships created for hurricanes and severe weather has seen upward of 100 VoIP connections during storm emergencies, many of which represent repeaters and conference rooms with many people listening.

- The VoIP-WX Net also has a large number of Technician class operators who were not able to report via HF in the past.

- Those connecting via VoIP modes often do so using VHF/UHF radios on battery power via an IRLP or EchoLink-equipped repeater.
Severe Weather Nets Topic 13
Weather Net Operating Tips

- For nets spanning more than one time zone, use UTC time in all reports, not local time.
- If you are not sure of the correct UTC time, use local time and be sure to notify the net control that you are using it.
- If you are going to give a damage, injury, or casualty report and it is not based on your own personal observation, be prepared to provide:
  - the time,
  - the name of the person providing it,
  - their call sign or official position if any,
  - and if possible, a telephone number, address or other means of contact so it can be confirmed later.
Severe Weather Nets Topic 13
Weather Net Operating Tips (Continued)

- Also be keenly aware that sensitive information should NOT be broadcast over general nets and must be kept to more secure modes such as telephone, Fax, or direct delivery if possible.

- This will avoid release of proper names and sensitive information to those who might be listening and not directly involved with disaster efforts.

- Use “push-to-talk” – not VOX.

- Use headphones if possible at on site locations to ensure that you receive accurate information without disruption from background noise.
Topic 13-1
When is the Hurricane Watch Net normally activated?
A. Every morning at 1000 UTC during hurricane season only.
B. **When a hurricane is within 300 miles of making landfall.**
C. When a tropical storm approaches a populated land mass.
D. When a tropical wave develops west of Africa.

Topic 13-2
Who should check in to the Hurricane Watch Net an hour before a hurricane makes landfall?
A. All amateurs should check in.
B. Amateurs with weather stations only.
C. Only those stations on the net roster.
D. **Only amateurs in the affected area, or amateurs with important information that would be needed by the net or the National Hurricane Center.**
Topic 13-3
Does a station have to be located in a hurricane area to be a member of the Hurricane Watch Net?
A. Yes, the net is made up solely of stations in hurricane areas.
B. There is no membership in the Hurricane Watch Net. Anybody can check in at any time.
C. No. The net has a need for stations in Canada and on the west coast that can control the net as propagation shifts to the north and to the west.
D. No. The net has a need for stations in the Midwest and west coast that can control the net as propagation shifts to the west.

Topic 13-4
Which answer best describes the four step method to describe severe weather?
B. What, Where, When, Details.
C. What, Where, Why, General Comments.
SKYWARN® participants would generally not report which of the following?

A. Fog.
B. High winds.
C. Sleet.
D. Hail size
Introduction to Emergency Communication

Basic Message Handling Part 1 Topic 14

Consider the following scenario:

• There are 330 hurricane evacuees in a Red Cross shelter. ARES is providing communications, working in 12-hour shifts. An elderly diabetic woman is brought in at 1400 hours. She will require her next dose of insulin by 2300 hours. The manager goes to the radio room. There is an operator wearing a red baseball hat with funny numbers and letters on it. He asks the operator to inform the county EOC of the medication need. The operator calls the Red Cross EOC and says, “Hey, we have a diabetic lady here who will need insulin by 2300 hours,” but doesn’t write the message down or log the request.

• At 2030 hours the medication has still not been delivered. The shelter manager goes to the radio room to inquire about its status. There is now a different person with a blue baseball cap with a new set of funny letters and numbers.
Consider the following scenario: (Continued)

- He knows nothing of the earlier request, but promises to “check on it.” In the meantime, EOC personnel have discarded the message because it was written on a scrap of paper and had no signature authorizing the order for medication. No one sent a return message requesting authorization.

- If each operator had generated and properly logged a formal message, with an authorized signature, it would be a relatively simple matter to track. The informal message has no tracks to follow. Also, by sending a formal message, you are nearly guaranteeing that the receiving station will write it down properly (with a signature) and log it, greatly enhancing its chances of being delivered intact.
Formal vs. Informal Messages

- In general, informal messages are best used for non-critical and simple messages, or messages that require immediate action, those are delivered directly from the author to the recipient.

- Formal messages are more appropriate when two or more people will handle them before reaching the recipient, or where the contents are critical and contain important details.
Informal Oral Messages

- Some emergency messages are best sent informally in the interest of saving precious seconds.
- If you need an ambulance for a severely bleeding victim, you do not have time to compose and send a formal message.
- The resulting delay could cause the patient’s death.
- Other messages do not require a formal written message because they have little value beyond the moment.
- Letting the net control station know where you are or when you will arrive need not be formal.
- The message is going directly to its recipient, is simple and clear, and has little detail.
- Many of the messages handled on a tactical net fit this description.
Basic Message Handling Part 1 Topic 14

Formal Written Message Formats

- A standard written message format is used so that everyone knows what to expect.
- This increases the speed and accuracy with which you can handle messages.
- The ARRL message form, or “Radiogram,” is a standard format used for passing messages on various nets, and is required for all messages sent through the National Traffic System.
- While this format may not be perfect for all applications, it serves as a baseline that can be readily adapted for use within a specific served agency.
- Regular practice with creating and sending messages in any standard format is recommended.
Basic Message Handling Part 1 Topic 14

The Standard ARRL Radiogram

- The ARRL Radiogram is a standard format for passing messages on various nets, and is required for all messages sent through the National Traffic System.
- It serves as a baseline that can be readily adapted for use within a specific served agency.
- Click [here](#) for an interactive Radiogram form.
Basic Message Handling Part 1 Topic 14
Components of the Standard ARRL Radiogram

- The “Preamble” – The header. Consists of administrative data, i.e. Message number, precedence, handling, and date and time of origination.

- The “Address” – The “to” block. Includes the name, address, city, state and Zip code of the recipient. It should also include a telephone number as most Radiograms are ultimately delivered with a local phone call.

- The Text” - Limited to 25 words or less. Punctuation is not used! The “X” may be used to separate phrases or sentences, but never at the end of the text.

- The “Signature” – A full name and title, a name and call sign, or a single name.
Basic Message Handling Part 1 Topic 14

Details of the Preamble

- There are eight (8) sections or blocks in the preamble. Two of them, “time filed” and “handling instructions,” are optional for most messages.
- Block #1 – Message Number – Any number assigned by the originating station. Common practice is to start with the number “1” at the beginning of the emergency operation. Alphanumeric combinations are acceptable, but not recommended.
Introduction to Emergency Communication

Basic Message Handling Part 1 Topic 14

Details of the Preamble

- Block #2 – Precedence – The relative urgency of the message. There are four levels of precedence:
  - Routine – “R” – Most day-to-day message traffic.
  - Welfare – “W” – Used for an injury as to the health and welfare of an individual in a disaster area, or a message from a disaster victim to friends and family.
  - Priority – “P” – Time limited messages. Only used with official traffic to, from or related to a disaster area.
  - EMERGENCY – “EMERGENCY” – No abbreviation. Used for life or death situations. Due to lack of privacy on radio, EMERGENCY messages should only be sent via Amateur Radio when regular communication facilities are not available.
Basic Message Handling Part 1 Topic 14

Details of the Preamble

- Block #3 – Handling Instructions – The seven standard HX pro-signs are:
  - HXA – Collect telephone delivery authorized.
  - HXB – Cancel if not delivered in (X) hours of filing time.
  - HXC – Report to originating station date and time of delivery.
  - HXD – Report to originating station, relay station and date and time of delivery.
  - HXE – Get and send reply from addressee.
  - HXF – Hold delivery until (specify date).
  - HXG – Deliver by mail or telephone. If expense involved, cancel message.
  - HX combinations can be used, i.e. HXAC.
Introduction to Emergency Communication

Basic Message Handling Part 1 Topic 14

Details of the Preamble

- Block #4 – Station of Origin – First station to put message in NTS format.
- Block #5 – The check – Number of words in the text section only. The originating station counts the number of text words and the receiving station confirms the number upon receipt.
- Block #6 – Place of Origin – The name of the community, building, or agency where the originator is located, whether a ham or not.
- Block #7 – Time Filed – This is an optional field unless handling instruction “HXB” is used. During emergencies, it is better to use local time indicators such as PST or EDT.
Basic Message Handling Part 1 Topic 14

Details of the Preamble

- Block #8 – Date – The date that the message was first placed into the traffic system. Use same date as the time zone in Block #7.

- Header Example:
  - CW – NR207 P HXE W1FN 10 LEBANON NH 1200EST JAN 4
  - Spoken – “Number two zero seven Priority HX Echo Whiskey One Foxtrot November One Zero Lebanon NH One Two Zero Zero EST January 4.”
Basic Message Handling Part 1 Topic 14
Pro-Words and Pro-Signs

- When sending formal traffic, standard “pro-words” or “pro-signs” (CW) are used to begin or end parts of the message, and to ask for portions of the message to be repeated. They save considerable time and confusion.

- ARRL Form FSD-218 – Available on-line at arrl.org.
Basic Message Handling Part 1 Topic 14

Sending a Message with Voice

• When the receiving station is ready to copy, read the message at a pace that will allow the receiving station to write it down.

• Once you are done, if the receiving station has missed any portion of the message they will say, “say again all after____,” “say all before,” or “say again all between____ and ____.”

• In some nets, the practice is to say “break” and then unkey between sections of the message so that a station can ask for missing words to be repeated before going on (these repeated words are also known as “fills”).

• All numbers in groups are spoken individually, as in “three two one five,” not “thirty-two fifteen,” or “three thousand two hundred and five.”
Basic Message Handling Part 1 Topic 14

Time Savers

- What NOT to say:
  - When passing formal traffic, do not add unnecessary words.
  - Since the parts of the header are always sent in the same order, there is no need to identify each of them.
  - The only exception is the word “number” at the beginning of the header.
Basic Message Handling Part 1 Topic 14

Time Savers

- Here is an example of how not to read the header of a message on the air:

  “Number two zero seven precedence, Priority handling instructions, HX Echo station of origin W1FN check one zero place of origin, Lebanon NH time one two zero zero EST date, January 4. Going to Mark Doe Red Cross Disaster Office Address figures one two three Main Street Rutland VT, ZIP figures zero five seven zero one. Telephone Figures eight zero two five five five one two one two”
Basic Message Handling Part 1 Topic 14

Time Savers

- This example added many unneeded words to the message, including “station of origin,” “check,” “time,” “going to,” “address,” “ZIP,” and “telephone” and other block titles.

- If there is something about the message that deviates from the standard format, or if an inexperienced operator is copying the message without a pre-printed form, then some additional description may be necessary, but in most cases it just wastes time.

- (The pro-word “figures” is used correctly, and “number” is always spoken before the message number.)
Basic Message Handling Part 1 Topic 14

Review

- Formal messages are more likely to be delivered intact than oral comments.
- Using a standard format for formal messages makes it easier and faster for both sending and receiving stations to handle.
- Frequent practice with any formal message format is essential if you are to be able to use it accurately and quickly.
- Both the X and question mark should be used only when the meaning of the message would not be clear without them.
Introduction to Emergency Communication

Topic 14-1 The preamble to an ARRL radiogram message contains a block called “Precedence.” Which of the following represents the correct precedence for an EMERGENCY message?

A. “URGENT.”
B. “U.”
C. “EMERGENCY.”
D. “E.”

Topic 14-2 The preamble to an ARRL Radiogram message contains a block called “Handling Instructions.” What is the meaning of the handling instruction “HXE”?

A. Delivering station to get and send reply from addressee.
B. Report date and time of delivery to the originating station.
C. Cancel message if not delivered within (X) hours of filing time.
D. Collect telephone delivery authorized.
Introduction to Emergency Communication

Topic 14-3 ARRL Radiogram messages contains a block called “Time Filed.” Which of the following is true of entries in that block?

A. This field is always completed.
B. Time entries are always Universal Coordinated Time.
C. During emergencies “local time” is used.
D. During emergencies “local time” along with the local date is used.

Topic 14-4 ARRL Radiogram messages contains a block called “The Check.” Which of the following is true of entries in that block?

A. The check contains a count of the words in the entire message.
B. The check contains a count of the words in the preamble and the text of the message.
C. The check contains a count of the words in the preamble, address and text of the message.
D. The check contains a count of the words in the text of the message.
Introduction to Emergency Communication

Topic 14-5 Which of the following statements is true of the punctuation within an ARRL Radiogram?

A. Punctuation is always helpful; it should be used whenever possible.

B. Punctuation is rarely helpful; it should never be used.

C. Punctuation should be used only when it is essential to the meaning of the message.
Introduction to Emergency Communication

Basic Message Handling Part 2 Topic 15

Message Handling Rules

▪ General Comments
  ❖ Do not speculate on anything relating to an emergency! There are many people listening and any incorrect information could cause serious problems for the served agency.
  ❖ You do not want to be the source of a rumor.
  ❖ Pass messages exactly as written or spoken. Send text with misspelled words or confusing text exactly as received. Only the originator of the message may make changes.
  ❖ Non-Standard Format Messages should be passed exactly as received. This applies to most of the tactical messages passed during an emergency.
Basic Message Handling Part 2 Topic 15

Non-Standard Format Messages

- Much of the tactical information being passed during a major emergency will not be in ARRL format.

- It may have much of the same information, but will be in a non-standard format or no format at all.

- Messages should also be passed exactly as received.

- If necessary, use the ARRL format and place the entire non-standard message in the “text” section.
Basic Message Handling Part 2 Topic 15

Message Handling Rules

- The Importance of the Signature
  - It is critical that you include the signature and title of the sender of every message.
  - Because, the message may include requests for expensive and limited shelf life supplies, or for agencies that will only respond for properly authorized requests, i.e. Medivac helicopters, blood supplies, prescription medicines, etc.
Introduction to Emergency Communication

Basic Message Handling Part 2 Topic 15

Message Handling Rules

- ARRL Numbered Radiograms
  - These are a standardized list of often-used phrases (ARRL Form FSD-3).
  - Each phrase on the list is assigned a number.
  - There are two groups:
    - Group One – 26 phrases numbered consecutively from “ONE” to “TWENTY SIX” and preceded by the letters “ARL.”
    - Group Two – 21 routine messages.
  - Be sure to decode a message containing an ARL text into plain language before delivering it.
  - A copy of FSD-3 can be obtained from arrl.org.
Basic Message Handling Part 2 Topic 15

Message Handling Rules

- **Copying Hints**
  - The standard ARRL Radiogram form is set up for hand copying with spaces for each word.

- **Modified Message Form for Disasters**
  - A served agency may have a specific message form unique to their support functions or type of emergency.
  - A popular form is the Incident Command System (ICS) form ICS-213 uses by most government agencies.
Basic Message Handling Part 2 Topic 15

Message Handling Rules

- **Service Messages**
  - A “service message” lets the originating station know the status of a message they have sent.
  - During emergencies, service messages should only be sent for Priority and Emergency messages.

- **Logging and Record Keeping**
  - An accurate record of formal messages handled and various aspects of your station’s operation can be very useful, and is required by law in some cases.
  - Log all incoming and outgoing messages. Record the name of the sender, addressee, and station that passed the message to you.
  - The NCS may have another person maintain a station log when the net is busy.
Basic Message Handling Part 2 Topic 15

What to Log

- Log all incoming and outgoing messages.

- Log which operators are on duty for any given period, and record any significant events at your station.

- Copies of all messages should be kept and catalogued for easy retrieval if needed later for clarification or message tracking.

- Should informal messages be logged? This is usually up to the stations involved, and depends on the circumstances.
Basic Message Handling Part 2 Topic 15

Log Formats

- At a station with little traffic, all information can be included in one chronological log.
- However, if a large number of messages are being handled and you have a second person to handle logging, separate logs can make it faster and easier to locate information if it is needed later.
  - One log for incoming messages,
  - One for outgoing messages,
  - Third for station activities.
- The NCS will also need to keep a log of which operators are assigned to each station, and the times they go on and off duty.
Basic Message Handling Part 2 Topic 15

Who should log

- If activity is low, the net control operator can handle logging.
- In busy nets, a second person can keep the log as the net’s “secretary” and act as a “second set of ears” for the NCS.
- If an “alternate NCS” station has been appointed, they should keep a duplicate log.
- Each individual operator should keep his or her own log.
- In a fast moving tactical net, keeping a log while on the move may be impossible for individual stations.
- Logging is a good position for a trainee with limited experience, or an unlicensed volunteer.
Basic Message Handling Part 2 Topic 15

Message Handling Rules

- Writing Techniques For Message Copying
  - Logs should be neat and legible.
  - Logs that will become legal documents should always be written in permanent ink on consecutively numbered pages.
  - If a message, exchange or event should be logged, try to do so as soon as possible afterwards, or ask the NCS to add it as a notation in his log.
  - If there are other operators available, it is a good practice to assign one of them to log incoming and outgoing messages.
Message Handling Rules

- Message Authoring – Them or Us?
  - Should emcomm operators author (create) agency-related messages. Probably not. They usually have no direct authority and usually lack necessary knowledge.
  - If a served agency message originator request that you “take care of the wording for me,” it is a good idea to get their final approval and signature before sending the message.
  - However, you may be able to generate an official message if you have been given the authority to do so.
  - Messages that deal solely with communications, i.e. frequencies, relief operators, etc. should be authored by the emcomm operator.
Basic Message Handling Part 2 Topic 15

Message Handling Rules

- Message Security & Privacy
  - Information transmitted over Amateur Radio can never be totally secure, since FCC rules strictly prohibit us from using any code designed to obscure a message’s actual meaning.
  - Messages sent via Amateur Radio should be treated as privileged information, and revealed only to those directly involved with sending, handling, or receiving the message.
  - Messages relating to the death of any specific person should never be sent via Amateur Radio. Sensitive messages should be sent using telephone, landline fax, courier, or a secure served-agency radio or data circuit.
Basic Message Handling Part 2 Topic 15

Informal Messages

- Informal or “tactical” messages are not written out in ARRL format, or not written at all.
- This does not mean that accuracy is any less important.
- Here is an example of what might happen if you are not careful to maintain the precise meaning of the original message:
  - The original message:
    - “The shelter manager says she needs fifty cots and blankets at Hartley Hill School by tonight.”
  - After being passed through several people:
    - “He says they need a bunch more cots and blankets at that school on the hill.”
Basic Message Handling Part 2 Topic 15

Review

- You learned how to format, send, and receive a formal ARRL style message, and the importance of the signature, logging, and accuracy.
- Formal message formats make message handling more efficient and accurate.
- Amateur Radio is not a secure mode, but you can take steps to protect messages.
- You should never discuss the contents of messages with anyone else.
- Officials of a served agency normally originate messages
- Whenever possible, you should work with a message’s author to create a clear text using the minimum number of words necessary.
Introduction to Emergency Communication

Topic 15-1
As part of an emcomm group handling message traffic in an emergency, you are asked to forward a message that contains typographical errors. Which of the following is your best course of action?
A. Delay sending the message.
B. Forward the message exactly as received.
C. Return the message to the originating station.
D. On your own, correct the error in the message and forward it.

Topic 15-2
As part of an EMCOMM net handling message traffic in an emergency, you are asked to forward a message in a non-standard format. Which of the following is your best course of action?
A. Delay sending the message until you have conferred with the originator.
B. Return the message to the originator.
C. On your own, rewrite the message in proper format and forward it.
D. Forward the message exactly as received.
Topic 15-3
You have been asked to send an ARRL Radiogram dealing with birthday greetings. Which of the following is the correct way to write it in the message text?
A. ARRL 46
B. ARL 46
C. ARL FORTY SIX
D. ARRL FORTY SIX

Topic 15-4
When delivering an ARRL numbered radiogram, which should be done?
A. Deliver the message exactly as received.
B. Deliver the message exactly as received but add your own written explanation.
C. Decode the message into plain language before delivery.
D. Deliver the message exactly as received but add your own verbal explanation.
Introduction to Emergency Communication

Topic 15-5 During an emergency, service messages should be sent for which of the following categories of message?

B. Emergency, Priority and Welfare.
C. Priority and Welfare.
D. Emergency and Priority.
Homework for next week

Compose four complete ARRL formatted radiogram messages, one example for each Precedence, in written form. Use Handling Instructions and include the time and date sent. Minimum of ten words in each message.

Create a formal ARRL style message using an ARL numbered radiogram text. Be sure the word count is correct.

Introduction to Emergency Communication
• Homework

• Evaluate the equipment you now own to see if it is suitable for emcomm operation.

• Make a list of equipment you already own, and a second list of the items you will need to complete a basic emcomm package appropriate to your needs.