Amateur Radio Emergency Service
Basic Emergency Communications Course

(Extracted from the ARRL Certification and Continuing Education Program EC001)

Learning Unit 1 – Introduction to Emergency Communications

Objectives: Following completion of this Learning Unit, you will be able to define the terms Communications Emergency and the Incident Command System. You will also learn how Amateur Radio interacts with served agencies.

Information:

What is a Communications Emergency?

The easiest way to think about a communications emergency – an incident – is to begin by using the definition in the ICS (Incident Command System) manual. Section 1.9 defines an incident as any "...planned or unplanned occurrence or event, regardless of cause, which requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources."

What is the Incident Command System?

The Incident Command System is a management tool consisting of procedures for organizing personnel, facilities, equipment and communications at the scene of an emergency. The ICS is designed to assist anyone who has the responsibility for the successful outcome of an incident. The ICS provides a method for multiple agencies – police, fire, EMS, ARES – to cooperatively interact through a common communications link.

What does my attitude have to do with Emergency Communications?

Everything! Public agencies such as the American Red Cross and Salvation Army welcome the support services provided by Amateur Radio operators. Hams are trained, provide their own equipment, and generally well organized. However, when a ham assumes he can assist by the sheer fact that he has an FCC license and 3 handheld transceivers (HTs), he takes on an attitude. Attempting to deal with such a person who lacks proper ARES training simply magnifies the seriousness of the emergency situation. This adds new problems and leaves a bad taste with the public service agency. We'll learn more about this in upcoming Learning Units.

What defines a communications emergency?

A communications emergency can be the result of a hurricane, tornado, flood or anything that disrupts normal communications. The common issue is when communications processes are inadequate to handle the flow of information required to service an incident, as defined in the ICS.

What role does Amateur Radio serve?

Our primary role is to support the emergency management community (responders, relief and recovery agencies) with communications during times of emergency and disaster when normal communications are unavailable or overwhelmed.

Please understand that we are NOT a rapid response team. If you arrive at the scene of an emergency just as the sirens are quieting, keep your mouth shut and get out of the way! We do not provide first aid, transport victims, provide traffic control, or any other function normally provided by public service agencies. We DO provide communication when public service systems are overloaded.

As a group we will, in many cases, do more than "just" communicate. You are free to do any work for the served agency that they may request, as long as you are comfortable doing the work AND it does not hinder your ability to communicate.

Most operators think of ARES (Amateur Radio Emergency Service) as a simple extension of the "talk time" in the hobby. This is not true. ARES are organizations that continually need more trained operators that are willing to learn to communicate rather than just talk. Do you have the time and the drive to do it well?

It's not just that the trained operators are willing to learn to communicate. It's that the trained operators have learned to communicate accurately in a timely fashion regardless of the obstacles in the event.

Learning Unit 2 - Prerequisite to Emergency Communications

Objectives: Following completion of this Learning Unit, you will be able to define the term "attitude." You will also learn how important your attitude is to the agency you are serving.

Information:

Emergency Communication (EmCom) Certification overview

ARRL EmCom certification is an opportunity to provide the public service community with trained Amateur Radio operators who will have a consistent level of expertise in Emergency Communication.

It is evident that there are areas in the U.S. that have few opportunities to train operators in disaster communication, while other areas have far more than any would wish. The certification program provides consistency in training wherever the person lives. The added benefit comes in that it will be easier to ensure the students understand the attitudes necessary to interface with the public service community in a manner which is beneficial to all.

The basic training presented here is taken from the ARRL's Emergency Communications Level 1 training course and is designed to establish a minimum level to qualify for a ARES identification card. Members of ARES are encouraged to enroll in and complete the ARRL Emergency Communications certification courses.

There are many personality types in Amateur Radio, some of which lack the necessary knowledge to participate in a positive manner. These people simply need guidance and assistance to understand what the position of Amateur Radio is in public service.

The goal therefore is to provide consistently knowledgeable communication people who have a very positive, service oriented attitude.

Attitude

Before you begin the technical material involved in earning a certification in Emergency Communication (EmCom) it is imperative that you understand your knowledge in EmCom is not actually as important as your attitude during emergencies.

Yes, technical ability will enable you to do a far better job of communicating. But your attitude will determine the success of the overall Amateur Radio effort. The person who brings a "know it all" or "I'll really show you just how good I am" attitude will only hamper the relations with served agencies.

The people you will be serving – remember that word – are professionals that have seen far too many people that are more interested in impressing someone that in getting the job done. You will actually impress them far more by being as quiet as you can and doing your job in the best way possible. Results, without interference of served agency people, will cement relations with your served agency.

Important Definitions:

Attitude: n. manner, disposition, feeling, position, etc. with regard to a person or thing; tendency or orientation, especially of the mind

Service: n. an act of helpful activity; help; aid

Positive: adj. explicitly stated, stipulated, or expressed

Or more simply, an explicit mental commitment to help others.

Are you really ready to commit yourself to this effort? It will take time -- a lot of time, if you are to be successful. If you are willing then ... **WELCOME**!

Remember the following:

Experience is the worst teacher when it gives the test before presenting the lesson.

Hams are patriotic, independent people and they are volunteers. The attitude among a few hams is that "Volunteers don't have to take orders." That's absolutely correct. We don't have to take orders. But if you are not ready to follow instructions, you may want to do something outside the scope of ARES.

Experience, if one learns, is an important teacher; failure to learn through experience is a waste. Failure to learn before experience is lack of preparation.

Learning Unit 3 - Communication Organizations

Objectives: Following completion of this Learning Unit, you will be able to define the terms ARES, RACES, SKYWARN, and NTS. You will also learn how these organizations are interactive.

Information:

I. Amateur Radio Emergency Service (ARES)

The Amateur Radio Emergency Service (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service when disaster strikes. Every licensed amateur, regardless of membership in ARRL or any other local or national organization, is eligible for membership in ARES. The only qualification, other than possession of an Amateur Radio license, is a sincere desire to serve. ARES is an amateur service, and as such, only amateurs are eligible for membership. The possession of emergency-powered equipment is desirable, but is not a requirement for membership.

A. Operation and Flexibility

We have discussed what a typical ARES unit is made up of. Just what shape the plan in your locality will take depends on what your Emergency Coordinator (EC) has to work with. An EC uses what he/she has, and leaves provision in the plan for what he/she hopes, wants and is trying to get. Flexibility is the keynote. The personnel, equipment and facilities available today may not be available tomorrow; conversely, what is lacking today may be available tomorrow. In any case, bear in mind that organizing and planning are not a one-person task. The EC is simply the leader, or, as the title indicates, the coordinator. His/her effectiveness inevitably will depend on what kind of a group he/she has to work with; that is, on you and your cohorts. Make yourself available to your EC as a member of his planning committee, or in any capacity for which you think you are qualified.

Local ARES operation will usually take the form of nets – HF nets, VHF (repeater) nets, even RTTY, packet or other special-mode nets, depending on need and resources available. Your EC should know where your particular interests lie, so that you can be worked in where your special talents will do the most good.

It is not always possible to use the services of all ARES members. While it is general policy that no ARES member must belong to any particular club or organization to participate in the program, local practical considerations may be such that you cannot be used. This is a matter that has to be decided by your EC. In some cases, even personality conflicts can cause difficulties; for example, the EC may decide that he cannot work with a particular person. In this case, the local ARES would be better served by excluding that person. This is a judgment that the EC would have to make. While personality conflicts should be avoided, they do arise. The EC on the job must take the responsibility for making such subjective evaluations, just as the SEC and DEC must evaluate the effectiveness of the job being done by the EC.

B. ARES Operation During Emergencies and Disasters

Operation in an emergency net is little different from operation in any other net, requiring special preparation and training. This includes training in processing written messages. This is generally known as "traffic handling." Handling traffic is covered in detail in the ARRL Operating Manual. This is required reading for all ARES members - in fact - for all amateurs aspiring to participate in disaster communications.

II. ARES and RACES

After World War II, it became evident that the international political situation was destined to be tense. The need for some civil-defense measures became apparent. The Civil Defense program was designated to head up a program that would call upon amateur representatives to participate. In the discussions that followed, amateurs were interested in getting two points across: First, that Amateur Radio had a potential for and capability of playing a major role in this program; and second, that our participation should, this time as never before, be in our own name, as an Amateur Radio Service, even if and after war should break out. These principles were included in the planning by the formulation of regulations creating a new branch of the amateur service, the Radio Amateur Civil Emergency Service, RACES.

Recognition of the role of Amateur Radio as a public service means responsibility - this time in our own name. The RACES regulations are printed in full in the ARRL publication the FCC Rule Book, along with the rest of the amateur regulations. Every amateur should study closely and become familiar with these rules; civil preparedness, now a major function, may become our only on-the-air function if we are plunged into war.

In roughly half the counties in Indiana, decisions have been made when working with the local Emergency Management Agency (EMA) to only use the ARES structure. However, to better understand the total emergency communications structure, information about RACES is included.

A. What is RACES?

RACES is administered by local, county and state emergency management agencies. It is supported by the Federal Emergency Management Agency (FEMA), and is a part of the Amateur Radio Service that provides radio communications for civil-preparedness purposes only. During periods of local, regional or national civil emergencies, this system may be activated. These emergencies are not limited to war-related activities, but can include natural disasters such as fires, floods and earthquakes.

As defined in the rules, RACES is a radio communication service, conducted by volunteer licensed amateurs, designed to provide emergency communications to local or state civil-preparedness agencies. It is important to note that RACES operation is authorized by emergency management officials only, and this operation is strictly limited to official civil-preparedness activity in the event of an emergency-communications situation.

While RACES was originally based on potential use for wartime, it has evolved over the years, as has the meaning of civil defense (which is also called civil preparedness), to encompass all types of emergencies.

B. ARES and RACES Cooperation

Although RACES and ARES are separate entities, the ARRL advocates dual membership and cooperative efforts between both groups whenever possible for an ARES group whose members are all enrolled in and certified by RACES to operate in an emergency with great flexibility. Using the same operators and the same frequencies, an ARES group also enrolled as RACES can "switch hats" from ARES to RACES and RACES to ARES to meet the requirements of the situation as it develops. For example, during an "undeclared emergency," ARES can operate under ARES, but when an emergency or disaster is officially declared by a state or federal authority, the operation can become RACES with no change in personnel or frequencies.

This organizational structure is still not well understood and practiced in parts of the United States. Where ARES and RACES still exist separately, emergency officials will have to determine the situation in their own area. Where there is currently no RACES group, it would be a simple matter for an ARES group to enroll in that capacity, after a presentation to the civil-preparedness authorities. In cases where both ARES and RACES exist, it is possible to join both or to be involved in either. As time progresses, the goal would be the merger into one strong organization, with coordination between ARES and RACES officials using the same groups of amateurs. This dual-hat approach is currently in place in many parts of the United States.

III. The National Traffic System

The National Traffic System plan is a means for systematizing amateur traffic handling facilities by making a structure available for an integrated traffic facility designed to achieve the utmost in two principal objectives: rapid movement of traffic from origin to destination, and training amateur operators to handle written traffic and participate in directed nets. These two objectives, which sometimes conflict with each other, are the underlying foundations of the National Traffic System.

IV. SKYWARN

Often referred to as the "eyes and ears" of the National Weather Service (NWS), SKYWARN is the organization of trained spotters and communicators who voluntarily watch, track and report unusual weather activity. (See http://www.skywarn.org)

Learning Unit 4 – The Primary Served Agency

Objectives: Following completion of this Learning Unit, you will be able to define the term "Primary Served Agency." You will also learn how to deal with the press.

Information:

When you are working any event, understand that you are there to help the served agency with a communications shortfall. This, in and of itself, is embarrassing to some agencies. If you keep that fact in mind, you can eliminate confusion and problems by acknowledging that the served agency runs the event. Show you understand this not just by your words, but by your actions.

The largest problem that Amateur Radio has is operators that go into an event and try to take over. A "know-it-all" attitude will discourage the served agency from ever using Amateur Radio services again. In one extreme case, it resulted in the Amateur Radio operator being arrested and removed from the scene.

Most, if not all, Public Service agencies use some form of the Incident Command System as the model for operations during an emergency. You will help your served agency and your ARES group if you understand how the ICS works.

I. Who talks to the Media (press) – the primary served agency Public Information Officer (PIO)

During an emergency do not make any statement(s) to the media/public about the emergency! The Public Information Officer (PIO) for the agency being served will make all statements. You can discuss non-detailed information about Amateur Radio if you have time and they ask. Do not include mode, frequency or any event-related information.

II. How you can get involved

Contact your local ARES group and volunteer. You can be of help to these organizations by training in the disciplines needed for appropriate communication. Training in Emergency Communications BEFORE you are needed will help you develop the skills necessary to be an effective ARES communicator.

During an event do your best to maintain a courteous, professional image. You may be working with several agencies such as police, fire, first aid squads, National Guard, etc. Extend every possible courtesy to members of these groups. Make sure they know who you are, and what your communications capabilities are. Remember we are primarily there to communicate.

Learning Unit 5 – Communications Guidelines

Objectives: Following completion of this Learning Unit, you will be able to define the terms Formal Traffic, Informal Traffic, and ITU Phonetics. You will also learn how to use these properly.

Information:

I. Basic Communication Guidelines

Let's face it; there are hundreds of people that can talk the ears off of a brass monkey. When they finish speaking you ask yourself "what did they actually say?"

Within Emergency Communication you will have two different levels of communication. The first is in passing traffic on behalf of a served agency. Under those conditions you pass traffic exactly as written. You change nothing. In some instances you will not understand what the message means. That is fine. Your job is to get the message to the destination as quickly as possible, not to understand it.

When you receive a message from a served agency, read it. If there is any part you cannot read, ask for clarification before accepting the message. You can't accurately transcribe what you cannot read.

When you transcribe a message from a served agency, make no changes! It does not matter if you do not understand the technical meaning. It does matter that you pass traffic exactly as written.

Review the last sentence. Pass traffic exactly as written. If you are the author, make your corrections before you are ready to send it. If the message was initiated by someone else, don't change it!

The second type of communication is where you originate the message, it is not written and where a written response is not required. In that situation you control what the text of the message will be. Therefore phrasing is up to you.

Plan your communications at least as well as you would prepare if you knew you would be quoted. Whenever reasonable, write down what you will say before you say it.

A loud voice cannot compete with a clear voice, even if it's a whisper - B.N. Kaufman

In Emergency Communication it is important to say as little as possible, yet convey all of the meaning.

Amateur radio is an Avocation as opposed to Vocation – unpaid, but not untrained, not undedicated, or not inexperienced; Amateur in the very best sense of the Olympic tradition.

II. Standard ITU Phonetics

While it may take less effort to speak into a microphone and listen than to operate CW, it does take some care to quickly and accurately convey exact information. Speak distinctly at all times. If information is to be copied manually, pace your speech accordingly.

For critical information, or under noisy conditions, spell words with standard ITU phonetics. ITU phonetics were chosen so that each word sounds completely different from all others. A list of ITU phonetics is available in The ARRL Handbook and the ARRL Logbooks. A compressed copy follows:

A - alfa (AL-fa)	B - bravo (BRAH-voh)
C - charlie (CHAR-lee)	D - delta (DELL-tah)
E - echo (ECK-oh)	F - foxtrot (FOKS-trot)
G - golf (GOLF)	H - hotel (HOH-tell)
I - india (IN-dee-ah)	J - juliet (JU-lee-ett)
K - kilo (KEY-loh)	L - lima (LEE-mah)
M - mike (MIKE)	N - november (no-VEM-ber)
O - oscar (OSS-cah)	P - papa (PAH-PAH)
Q - quebec (kay-BECK)	R - romeo (ROW-me-oh)
S - sierra (SEE-air-rah)	T - tango (TANG-go)
U - uniform (YOU-ni-form)	V - victor (VIK-tah)
W - whiskey (WISS-key)	X - x-ray (ECKS-ray)
Y - yankee (YANG-key)	Z - zulu (ZOO-loo)

III. Numbers

Numbers are pronounced individually. The number 60 is pronounced six zero, not sixty. The number 509 is pronounced five zero nine, not five hundred nine and not five oh nine.

Learning Unit 6 – Safety and Security Considerations

Objectives: Following completion of this Learning Unit, you will learn about personal safety. You will also learn when to talk and when to listen.

Information:

I. Personal Safety Considerations

A. You

Each of us has heard the saying something to the effect: "Watch out for number one because no one else will." Be it a training exercise or an actual emergency your safety is up to you. This is your primary concern.

If at any time you are asked to handle an assignment that, for any reason, makes you uncomfortable, decline it. If your concern is with safety, let your group leader know why you declined.

B. Your Team

Your second priority is the safety of your team. There can easily be assignments such as ATV where the person with the camera will be very engrossed with ensuring the picture is the best possible and may not notice unsafe conditions. You, as the second person there, will need to be very careful about the safety of your team.

C. Your Mission

Your mission can only be accomplished after your safety and the safety of your team is ensured. During that mission, if the safety of anyone becomes an issue, speak up. If necessary, notify your team leader, or appropriate party, within the ICS organization, and leave.

The standing rule in fires is to always have two exits. Should one of them become unavailable, use the other one – IIMMEDIATELY. If necessary leave your equipment. Equipment can be replaced; people can't.

II. Worker's Compensation Insurance

During the briefing for the event you are about to go out on there should be mention about worker's compensation insurance. If it is not mentioned, ask! Make sure you sign in and out with the government agency you are serving (when you arrive and when you leave) to be covered under its insurance. Not every served agency will be able to provide you with worker's compensation insurance. If yours does not, feel free to decline the assignment, if the lack of insurance bothers you. If you are willing to participate without worker's compensation insurance that's fine but you must know in advance of going out, so you can make an informed decision.

Remember, an incident scene is not about radios and being a ham. It's about the incident. You will either be part of the problem or part of the solution. Keep your eyes open. Do your best to anticipate unsafe conditions before they happen.

III. Security and privacy considerations

Who is the message intended for?

The message is for the intended recipient and the communication should remain private. When handling the message, you should not reveal the existence or contents of the message, even after the operation. Let the receiving agency determine if they want to acknowledge the message publicly. It is the job of the Public Information Officer (PIO), or designated individual, to inform the media of any message content.

Who is listening?

You do not know who is listening. It could be the general public. It could be the media. During a hectic operation, it is unlikely they could monitor and track the full range of messages in transit. The media may pick up on one message out of context and expand upon it, rather than having the full benefit of all the information at the Emergency Operating Centers. Distortions and misrepresentations could result by third party monitoring.

Do not speculate! Be concerned with the passing of messages originated and signed (authorized). Log all messages, including the date/time of origin in case there is a need to verify the origin and timing of the message.

What you don't say

To the extent possible, do not pass along codes or account numbers over the air that are considered unlisted or private. Examples such as unlisted phone numbers, credit card numbers, and control codes for repeaters should not be sent on the air. If such codes or numbers are needed to fulfill an action, see if the message can be routed without the codes to a third person who has both the codes and regular (telephone) communication that can act on behalf of the affected party to complete the action. (For example, one method of completing a message would be to send the message to a relative who also has the unlisted telephone numbers to complete the calls.)

Be Compassionate

Be sensitive during times when fatalities may occur. If the operation involves the possibility of finding the remains of dead people, and there is a likelihood that relatives are listening at the receiving end or on scanners, do not refer to the need for additional resource people as "Need help. Send over more bodies." Hearing the word "bodies" under these circumstances could cause undue stress and worry to anyone hearing this. A better choice of words might be, "More workers are needed." Use headphones when operating to avoid having others nearby casually listen in.

Learning Unit 7 – Traffic Nets

Objectives: Following completion of this Learning Unit you will understand the types of nets and how they operate.

Information:

Net(work): n. 1: a fabric or structure of cords or wires that cross at regular intervals and are knotted or secured at the crossings; 2: a system of lines or channels resembling a network; 3a: an interconnected or interrelated chain, group, or system; b: a system of computers, terminals, and data bases connected by communications lines; 4a: a group of radio or television stations linked by wire or radio relay; b: a radio or television company that produces programs for broadcast over such a network.

I. Nets, what they are and how they work

A. CONTROLLED NET:

A means of ensuring orderly use of limited frequency resources to conduct communications for a scheduled event or during an emergency.

B. NET CONTROL STATION (NCS):

The person charged with control of information flow on the frequency used by a controlled net.

Please take a moment to study the NCS definition. During an emergency the NCS does NOT control the event! NCS is there simply to control information flow. The Incident Command System (ICS) provides a coordinated system of command, communications, organization and accountability in managing emergency events.

Net Types

1. Open (Informal) Nets

During an open net most any type of traffic or communication is permitted. Conversations (rag-chews) are permitted provided they break every so often to allow incident related traffic to flow.

2. Directed Nets (Also known as Controlled and/or Formal Nets)

A Directed Net is created when there are a large number of stations needing to use the frequency or the volume of traffic cannot be dealt with on a first-come first-served basis. The NCS will determine who uses the frequency and what traffic will be passed first.

3. Tactical Nets

Tactical nets are the primary coordination nets for the event. They will be directed nets, using tactical calls, restricted to traffic for the event only. NCS has absolute control over this net.

4. Resource Nets

The resource net is to acquire volunteers and make work assignments for the event. The resource net will be a directed net using FCC issued calls, normally restricted to traffic pertaining to the event. All traffic goes through the NCS.

5. Traffic Nets

Traffic nets are for the passing of formal, normally written, traffic. They are directed nets, using FCC issued calls. Traffic may be passed on the net frequency or sent off to another frequency at the option of the NCS. Casual conversations may be allowed at NCS discretion.

6. ICS Nets

During an emergency a large percentage of our served agencies use the Incident Command System as a model for their operations. When this system is used by your served agency you will need to understand what term in ICS corresponds to what term in ARES.

ARES/RACES	ICS Name
Tactical Nets	OPERATIONS
Resource Nets	LOGISTICS

The name you use for any given net IS a local option. The same holds true for tactical identifiers. Use the name for your nets and locations that convey the most information to the largest number of people at your event.

II. Participating in a net

Enjoy yourself - Amateur Radio public service is fun!

Prepare yourself. Are your batteries charged? Are you on your best antenna for the frequency/repeater you will be on? Do you have pencil, paper and other items you think you will need?

Listen. If you are there at the start of a net or join one in progress, listen for several minutes before you check in. NCS will announce/ask for what they want.

Follow NCS Instructions. NCS will ask for specific people/categories of people as they are needed. Follow instructions.

Do not editorialize. "This is Phred in the North East portion of the county at 9300 feet where it is snowing, but it was sunny five minutes ago when I came in from feeding the birds, geese and hamsters, but it's cold right now and it looks like it could rain in the next day or so - just checking in" is unnecessary and unwanted. This ties up the net and does nothing to add usable information. Check in with your CALLSIGN. Add name and other information as requested by NCS.

Plan your transmission. If you have more information than just your Name/Call then jot it down. You can, if necessary, just read your note. This promotes clear concise communication.

Check in only if you are going to be part of the net. Do not check in as "in and out" or "for the count," unless the net is a club, social, or third-party sponsored net, where it is polite to simply check in and show your support for this use of the frequency.

Checking in with "This is" then a pause or unkey followed by the call may work on a few nets, but causes delays and potential problems on most. It is the option of your local net.

Unless your transmission is longer than ten minutes, you need only identify at the end of the transmission/exchange of information.

Let NCS know when you leave or if you need to leave early. Do not go into details of why you need to leave.

During an event, if the authorities ask you to move, do so immediately and without comment, then notify the NCS of your change in status as soon as you can.

If an on-scene authority requests that you shut your radio off, or that you not transmit, do what they ask immediately and without question. This is one circumstance where you do not notify the NCS of a change in your status. This would normally occur only if there is a presence of explosives or explosive chemicals or vapors, and there is the possibility that a spark-producing electronic device is present which might be triggered by an RF signal.

Be patient with the NCS. An NCS operator is under high stress. His or her questions and requests should be clear and crisp; but as he/she begins to tire, there may be a tendency to become rather terse. Typically, there is a whole lot going on at an NCS that the field operators never know about.

Hams are patriotic, independent people and they are volunteers. The attitude among a few hams is that 'Volunteers don't have to take orders.' That's absolutely correct. We don't have to take orders. But if you are not ready to follow instructions, you may want to do something outside of ARES.

III. Leaving a net

Don't leave a controlled net without permission or informing the NCS. (This does not apply to club, social-type nets, where it is polite to check in and show support for this use of the frequency.

Potential reasons for leaving a net include:

1. The location is closing. If NCS has given you directions to secure (close the location), simply identify with your FCC issued call, the location tactical call and the word "SECURED" or "CLOSED". The NCS will tell you if anything else is needed.

   If you are closing the location on orders of the served agency, you will identify wth your FCC issued call, location tactical call and the phrase "location CLOSED per (name of person – served agency identification)."

2. You need a break and there is no relief operator. Tell NCS that "I will be away from the radio for (number of minutes)" and end with "Tactical ID, (your call)."

3. You have turned the location over to another operator. You will normally need to tell NCS that you are leaving. However if there are specific instructions from NCS then follow those instructions.

4. Net closed and secured, implicitly releasing all remaining stations. In some events, NCS will excuse each station for logistical paperwork, but in other cases, it's more efficient to release everyone.

IV. Don't over identify

There is nothing that will expend more time, needlessly, than over identification. Someone that uses their FCC issued callsign in every transmission is usually a person that is unsure of himself or worse yet, someone that is more interested in having their call known to everyone at the event. In the latter situation, help them find work elsewhere.

The FCC tells us that you need only identify at ten-minute intervals during a conversation (NOT during a net unless you talk for more than ten minutes) and during your last transmission.

If you end each exchange with your call, that tells everyone that you are of the opinion the exchange is complete and you fulfill all FCC requirements.

V. Write it down

The easiest way to minimize what you say during a net is to write down everything before you key the microphone. Since very few of us like to write lengthy notes, this will promote brevity.

An excellent place to keep this information is in your location log. This serves two purposes:

1) You have a complete log of everything that came from your location, and

2) It will become very brief.

Learning Unit 8 – Basic Training Checklist

Objectives: Following completion of this Learning Unit, you will be able to identify entry-level training and equipment preparations needed to respond. You will also be able to define the terms "equipment" and "hot zone."

Information:

I. Why training is important!

Educated communication is what Amateur Radio brings to the table! --Anonymous

Education and training are important because you need to have the confidence to execute the required process in the minimum amount of time. Hesitancy and indecisiveness will quickly tire you. If you are expending more mental energy than required, your senses will become dulled. Educate yourself and train before the skills are needed.

Education and training are important so that you acquire the basic skills required to function as part of a team. Emergency communicators are part of an adaptive team that can rely on and support one another. All members must function as a cohesive unit. Individuals may possess great operating skills. However, they will perform inadequately and impact the level and quality of service to the served agency if they cannot communicate and work as part of a team.

II. ID Cards

Keep your ID cards on you at all times. This includes your FCC license, driver's license with photo ID, and IDs you have received from ARES, Red Cross, FEMA or other volunteer service agencies.

Do not impede the work of professional responders such as fire fighters, police and emergency medical personnel.

A "hot zone" is any area which presents known or unknown hazards, such as a hazardous material spill, lowered (or downed) electrical power lines, unauthorized people with weapons, etc. Stay out of the "hot zone" unless instructed. You don't want to endanger yourself and add yourself to the casualty list. Follow the directions of your lead operator or the chain of command.

You may be requested to perform duties beyond just emergency communications; remain flexible to respond to the needs of the situation.

III. Test your techniques before an exercise or an event.

If you want to experiment with a new technique or method, make all your preparation tests prior to a major exercise or event. You don't need more frustration or embarrassment, so why compound that chance when the stakes are higher?

IV. Equipment

Equipment is defined as the set of articles or physical resources serving to equip a person or thing, such as the implements used in an operation or activity.

Handheld transceivers are excellent for shadowing VIPs, EMTs, and personal backups. At the Boston Marathon, several recommendations are made for maximum efficiency of Amateur Radio operators. These include a gain antenna rather than a rubber-duckie; a well-insulated earphone(s) and hand-mike or Push-To-Talk mike on a headset; and lastly, plenty of spare batteries.

NOTE: When using a headphone-mounted boom-mike, do not use VOX (Voice Operated Transmit). Use push-to-talk as this eliminates nearby loud noise triggering your transmitter inadvertently.

On VHF/UHF, use mobile radios, not Handheld Transceivers (HTs) for portable station operations when sustained emergency communications will be needed. Some agencies will provide equipment. Quite often, you'll need to run power -- at least 1 watt -- over a sustained period of time. Most HTs are compact, with small heat sinks. If you operate your HT at high power -- say 5 watts -- for more than a few minutes, the thermal shutdown circuit will activate to protect it from overheating. HTs are good for monitoring, and the occasional acknowledgement -- not high volume message handling. The solution is to run a mobile radio on low or medium power. Use a good antenna and deep-cycle battery.

Remember you are trained emergency communicators, not trained emergency rescue personnel!

Don't use more power. Improve your antenna.

Your signal will radiate better with a better antenna, allowing you to conserve battery power. Therefore, you get more operating time for the amount of battery you are carrying.

Transmitting with lower power also allows more receivers to operate in the same area by minimizing receiver desensing.

Mounting a two-meter base antenna even ten feet above the ground will substantially improve your capabilities. It will also improve your reception.

Even a "ribbon J-pole" antenna made from 300-ohm TV ladder feedline is better than a rubber duck antenna. It is small, cheap and light, so there's no excuse for not using something better than a rubber duck antenna.

Be prepared to use longer coax runs to position your antenna if you're in an office building.

For select applications such as point-to-point long-haul communications, directional antennas such as beams, quads and corner reflectors are excellent to increase your range and reduce the amount of local in-band interference. Position your antenna so that other antennas are placed to the side and rear -- away from the main power lobes of your antenna.

Make photocopies of your manuals and store them with your radio.

Don't leave the details of how to operate your equipment to your memory. Your mind gets fuzzy when it is fatigued. Having a spare manual gives others a chance to study your radio during spare moments they may have. (Lost User Manuals can be found by contacting manufacturers and by searching on the Internet).

Bring extra fuses.

Tape them on the outside so that they are readily visible to others, and so that each radio has its matching fuses already preselected and ready to use. You can house the spare fuses in clear prescription containers or 35mm film canisters and tape them to the power cord, or you can tape the fuses directly to the power cord with vinyl electrical tape.

Bring headphones.

There is substantial audio interference from operating in a confined space. Headphones cut down the noise and allow you to hear your QSO without interfering with the operator next to you. When using a headphone-mounted boom-mike, use your push-to-talk switch. Do not use VOX because it could be inadvertently activated into transmit mode by nearby noise.

Use a foot switch.

For many mobile and base radios, it's very easy to fashion a connector that enables you to control the radio with a foot switch. This will free your hands when you need them the most to do more things, especially writing down messages.

Standardize on the type of batteries you will use.

If you are successful in standardization of batteries, you'll find that you need only AA and D-cells for the majority of your radio and lighting equipment. The use of AA alkaline cells instead of rechargeable batteries is encouraged for short-term operations. A set of alkalines typically has about five times the life of an equivalent ni-cad (nickel-cadmium) battery, thereby eliminating the weight and bulk of additional battery packs and a charger. You may not have reliable AC power to recharge your batteries. If you are responding to a long-term situation with AC power, bring multiple ni-cads, chargers and a power strip to simultaneously recharge the ni-cads and conserve alkaline batteries.

You'll need a handful of AAA and 9-volt batteries for the odd-ball equipment such as a VOM meter and digital pagers.

Renewal rechargeable alkalines have the advantages of both shelf-life with 1.5V nominal and repeated use.

V. Personal Equipment Checklist

This list is not meant to replace common sense -- only to offer suggestions. Give full consideration to the type of event(s) you will be participating in when gathering your equipment.

- ARES/SERVED-AGENCY IDENTIFICATION CARD
- COPY OF AMATEUR RADIO LICENSE
- HANDHELD RADIO (dual band if possible)
- SPARE BATTERY PACKs (CHARGED ni-cad and AA)
- HEADSET, SPEAKER-MIC.
- 19-INCH MAG. MOUNT/GROUND PLANE ANTENNA (will function on 70cm)
- COAX JUMPERS AND CONNECTORS
- CONNECTOR ADAPTERS (BNC/PL-259)
- DUCT TAPE
- SHORTHAND NOTEBOOK, PEN & CLIPBOARD
- WATCH
- MAPS of area (Topo and street)!!!
- COMPASS and/or GPS
- Copy of Section ARES Communications/Operational Plan and Local Plans
- COPIES OF MESSAGE FORMS
- TAPE (Boundary-Marking Tape)
- HAT

Survival Items:

- 3-DAY SUPPLY OF PERSONAL MEDICATION!
- WARM CLOTHING & BOOTS (bright colors for shirts and jackets)
- FIRST AID KIT
- MOIST TOWELETTE PACKETS
- SUN SCREEN (winter or summer)
- RAIN SUIT
- SPACE BLANKET
- PLASTIC GROUND COVER TARP
- HAT
- GLOVES
- BLAZE-ORANGE VEST (for use if your clothing is drab colored)
- SPARE GLASSES (spare contact solutions if you wear them)
- SPARE SHOELACES (and some twine)
- WOOL BLANKET
- FANNY PACK/BACK PACK
- SUPPLY OF WATER
- WATER BOTTLE (Sports/Bicycle water bottle)
- HIGH ENERGY SNACKS
- LARGE TRASH BAGS
- TOILET PAPER/KLEENEX
- FLASHLIGHT W/EXTRA BATTERIES
- WHISTLE

Tools:

- SWISS ARMY KNIFE
- SCREW DRIVER (Phillips and Flat Head)
- PLIERS
- SIDE CUTTER
- CRIMPING TOOL (including wire stripper)
- ASSORTMENT OF CRIMP CONNECTORS (nails, brads, tacks)
- CRESCENT WRENCH
- FENCE PLIERS (includes Hammer)
- ELECTRICAL TAPE
- VOM

For public service events:

- HAT
- COOLER with FOOD & DRINK
- LAWN CHAIR
- UMBRELLA (sun or rain)

Optional Items:

- 3 Wire AC Extension Cord w/2-3 pin adaptor
- AC to 12V power supply
- Soldering Iron w/solder
- 2M Beam Antenna w/Tripod, mast & guy rope
- Nut Driver set
- Folding set of Allen/Torx wrenches
- Zip Cord
- Hard Hat
- Safety Glasses
- Cash (if power is out)
- Transistor radio
- Binoculars

Learning Unit 9 – Emergency Call-Outs

Objectives: Following completion of this Learning Unit, you will understand how notification is done when Amateur Radio personnel are needed.

Information:

I How will I know?

As an Amateur Radio emergency communicator, you should register with the amateurs associated with ARES. Make arrangements so that you will be available in the event of an alert or activation. In some operational plans, two or more amateurs serving as liaisons are on pager notification. The pagers and/or telephone voice message are typically activated by a Served Agency.

Once these amateurs are notified, a number of alert mechanisms may be used. A common contact method is to disseminate the alert/notification via a pager and/or telephone tree. The pager code may indicate the six digit frequency of a local repeater, followed by a three-digit action code (i.e., 911 for an emergency, 000 for test). Some groups use a two-tone paging (or DCS) signal on a local repeater with wide coverage, activating commercial voice pagers that have been modified to monitor the amateur radio repeater.

When the activation notice has been sent to check into the local command repeater, an NCS establishes a check-in net while the ICS communications command team establishes itself at the Emergency Operations Center. The operation teams are expected to activate and respond according to their normal response plan. The command team will issue bulletin elements for the net as needed, directing and fine-tuning the activation. They will cancel the alert as needed should the situation warrant it.

Not all activations call for the implementation of a massive undertaking, with multiple nets. In situations involving the weather, amateurs can also monitor National Oceanic & Atmospheric Administration (NOAA) National Weather Radio (NWR) for information direct from the National Weather Service or monitor Amateur Radio frequencies as reflected in the Skywarn Operations Plan.

Learning Unit 10 – Why use Amateur Radio?

Objectives:

Following completion of this Learning Unit, you will understand why Amateur Radio is so important during emergencies and disasters. You will also learn how emergency communications compares with other Amateur Radio activities.

Information:

Since Amateur Radio equipment does not rely on wires and communications facilities provided by common carriers and phone companies, it is immune to disruptions with the telephone system.

Licensed Radio Amateurs use a wide range of radio bands, each one with its particular strength in overcoming the barriers to radio communications. VHF (Very High Frequency -- 144 MHz) and UHF (Ultra High Frequency -- 440 MHz) radios are small and portable with lots of channels to handle a multitude of short-range communications. HF (High Frequency) can propagate over mountains and valleys and between islands to provide coverage beyond VHF and UHF. Hams can use a wide range of communications modes, whether TV, data, voice or Morse code to exchange messages. The very nature of the Amateur Radio service encourages amateurs to learn how to make contacts, regardless of the challenges that may abound.

Amateur Radio operators are distributed throughout the community, near schools, churches and park facilities which are often used for evacuation shelters. Many companies have Amateur Radio operators within their employment. They may already be near the scene of the trouble area and can respond. Should for any reason, a section of the town or city be devastated, there are enough equipment and operators ready in other parts of the community to respond.

Regardless of the specific brand and model of radio equipment, amateurs using the same frequency band and mode can communicate with each other. Amateur Radio has more flexibility in the frequencies, range, modes, and kinds of persons with whom one many communicate -- which is the experiential advantage of Amateur Radio.

Hams are already licensed and pre-authorized to communicate internationally into and out of places hard hit during natural disasters.

Amateur Radio operators are allowed to run higher power than other licensed and unlicensed personal radio services such as Citizen Band (CB) and the Family Radio Service (FRS) and have more flexibility with the equipment. Therefore, hams can communicate over greater distances.

Amateur Radio operators use their equipment regularly, which verifies that it's maintained and operational. Some of the equipment includes hand-held portables or mobiles installed in vehicles. The Amateur Radio operators are familiar with the operation and capabilities of their equipment, and how to overcome obstacles to radio communications that may exist within their neighborhood.

Why the Phone Company may not Operate During Emergencies

Communications between agencies and the general public are handled by common carriers such as phone, paging and Internet companies. Phone companies invest large amounts of monies into equipment that provide reliable phone service, including durable and secure buildings, highly reliable phone switches, diesel generators, large banks of batteries. Cellular, paging and Internet companies in turn, rely on communications services provided by the phone companies.

These phone systems (a) are sized for business reasons for the peaks in regular daily usage, not peaks in emergency usage, (b) usually rely on copper or fiber optic cables that when exposed are prone to damage during high winds and storm conditions, and (c) are usually not portable and reliable enough to respond to the demands of the emergency. These are the most common reasons why normal public communication needs are not met during emergencies.

How does Amateur Radio emergency communications Compare with Other Amateur Radio Activities?

Emergency communications uses basic skills and activities as a foundation.

Amateur Radio operators will find that much of emergency communications borrows from existing aspects within our hobby. For example, each operator is federally licensed after a period of study and examination on varying levels of technical, operating and regulatory knowledge. Each operator routinely uses that privilege to practice and build upon the ability to communicate via radio. One uses general operating practices to converse on repeaters and HF. National Traffic System (NTS) practice offers skill sets for passing formal traffic efficiently and accurately. Contesting emphasizes speed, listening skills and endurance. Field Day offers the chance to practice operating out of tents, handling radios powered by generators. Public Service events let us practice flexible communications practices while walking around serving a public event. These are some of the ways that regular Amateur Radio activities resemble skills used for emergency communications.

It extends upon this foundation.

Emergency communications builds upon and extends this foundation in ways that normally do not occur in regular daily living, and are present only during times of emergency or disaster.

Unlike public service events that are scheduled and planned in advance, emergency communicators are often activated with little or no previous warning to organize and coordinate field operations.

Unlike public service events where the communicators serve primarily under the direction of one lead organization, emergency communicators must handle several key organizations simultaneously.

Unlike NTS which may have one or two nets, emergency communicators are often dealing with several nets simultaneously to pass messages within a limited timeframe.

Unlike repeaters and tower installations, stations must be portable and must be set up and operational in a matter of minutes or at most, a couple of hours.

Unlike contesting which involves contacting any station for points, emergency communicators are looking for specific stations to contact now, to pass traffic. Teamwork, not competition between stations, rules the day.

Unlike Field Day, where one can plan on a single 24- or 27-hour operation, emergency operations are likely to continue for at least several days.

Unlike general Amateur Radio activities, emergency operations happen in real-time. Things can't be delayed.

Unlike general Amateur Radio activities, which involve primarily Amateur Radio operators, emergency communications involves both amateurs and non-amateurs alike.

Unlike commercial communications solutions, where there is no reserve for handling an instantaneously massive increase in communications needs, emergency communicators have the equipment, skill and knowledge to innovatively manufacture additional communications capacity in very short order.

And, in all this, leadership, teamwork and initiative are key factors to success. Simply put, Amateur Radio emergency communications offers a very rich, challenging and rewarding environment to apply Amateur Radio knowledge and skills in unique situations where no one else has a viable solution. Amateur Radio operators that have honed out the knowledge and skills have truly earned their certification.

Learning Unit 11 – Communications

Objectives:

Following completion of this Learning Unit, you will understand the "Rule of Thumb" for effective traffic message content. You will also learn a few "dos and don'ts" for over-the-air communication of messages.

Information:

Brevity and Clarity

The standing "rule of thumb" for net communications is if you can leave a word out without changing the meaning, leave it out. If a description of an item will not add to the understanding of the subject of the message, leave it out.

Another item to remember is do not use contractions within your messages. Words like "don't" and "isn't" are easily confused. Add to that the stress and confusion during an emergency and they will create problems.

Do Not Editorialize

Literally hours can be lost by people inserting their opinion on unrelated subjects. What someone thinks about a ball game or the weather is irrelevant unless weather or the ball game is the subject being discussed.

Listen

The first requirement for communication is the ability to listen. But, you say, I can tell someone what is required without listening. Not really.

Communication is the two-way exchange of thoughts, ideas or information. Two way. That requires listening.

An old timer once told me "A ham has two ears and one mouth. Therefore he should listen twice as much as he talks."

Formal Written Traffic

Insure you have asked all questions necessary to have obtained the following:

A. Who is requesting, and from whom?

B. What is the **requestor's** full name/title/agency and location?

C. What is the **recipient's** full name/title/agency and location?

D. What are they requesting, and how many do they want/need?

Is it a list or single item?

If it's a list, do all items come from the same place?

If multiple sources then do multiple messages.

E. Is the subject the transportation of an item, or the acquisition of that item, or both?

Where it will come from is not always the same as the location of the person receiving the request.

Where it will go to is not always the same as the location of the person requesting the item(s)?

F. When is it needed?

What time/date?

Communication IS:

- A two way exchange of ideas/information.
- The fewest words that completely define the thought.
- One complete thought/task at a time.
- Sometimes eloquent but usually not, because it is precise.
- Unemotional.
- **Communication will be acknowledged.**

Communication is NOT:

- A bunch of unstructured words.
- Fill noise such as Aaahhhhhh.
- Vindictive or argumentative.