Basic Emergency Radio Communication Skills

1 Why Are Emergency Communication Techniques Different?

Life and death communications are not part of our daily experience. Most of what we say and do each day does not have the potential to severely impact the lives and property of hundreds or thousands of people. In an emergency, any given message can have huge and often unintended consequences. An unclear message, one that is delayed or misdelivered, or never delivered at all can have disastrous results.

2 Listening

Listening is at least 50% of emergency communications. Discipline yourself to focus on your job and "tune out" distractions. If your attention drifts at the wrong time, you could miss a critical message.

Listening also means avoiding unnecessary transmissions. While you are asking, "when will the cots and blankets arrive?" for the fourth time that hour, someone else with a life and death emergency might be prevented from calling for help.

One of the important services that we offer to our ARES customers is providing them with continuous information on the extent and magnitude of the evolving crisis. Collecting that information involves a lot of listening. In some cases it may be 100% listening as you monitor voice communications such as police and fire channels on which we are not allowed to transmit. You may even be monitoring County voice frequencies that you are not allowed to transmit on unless expressly asked to provide status updates. For example, there may be a severe emergency in Santa Paula that is completely dominating the County repeater on 146.880 MHz. The last thing that County wants is you calling in to ask what is happening. However, knowing what is happening in Santa Paula could be extremely important to your EOC. So your assignment may be to quietly monitor the County frequency to "learn what is happening" and to report that to your EOC Incident Command System (ICS) Planning Section Chief. You could also be given similar assignments to monitor the Los Angeles County DCS-22 traffic (our ARES counterparts in L.A. County) to learn what is happening in Calabasas and Agoura Hills. Passive listening is a big part of "Intel Collection."

Sometimes the job of listening is complicated by noise. You might be operating from a noisy location, the signals might be weak, or other stations may be causing interference. In each of these cases, it helps to have headphones to minimize local noise and help you concentrate on the radio signals.

3 Microphone Techniques

Even something as simple as using your microphone correctly can make a big difference in intelligibility. 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.** This will reduce breath noises and "popping" sounds that can mask your speech.

Speak in a normal, clear, calm voice. Raising your voice or shouting can result in over-modulation and distortion, and you will not be heard any louder at the receiving end. Speak at a normal pace. Rushing your words can result in slurred and unintelligible speech. Pronounce words carefully, making sure to enunciate each syllable and sound.

The golden rule in emergency situations is "the worse it gets, the more you have to slow down and stay calm !"

If your radio has a microphone gain control, it should be adjusted so that a normal voice within 2 inches of the mic will produce full modulation. If your microphone gain is set too high, your mic will pick up extraneous background noise that can mask or garble your voice. The 2 meter, 220 MHz, and 440 MHz FM radios that we use for local repeater and simplex work generally do not have microphone gain adjustments available to you. The gain is set internal to the radio and can only be changed by members of our technical team.

Do not use VOX. Voice operated transmission (VOX), available on HF transceivers and some 6 and 2 meter SSB radios, is not recommended for emergency communications. It is too easy for background noise and off-air operator comments to be accidentally transmitted, resulting in embarrassment or a disrupted net. Use a hand microphone with a push to talk key.

Wait before speaking. When using a repeater, be sure to leave a little extra time between pressing the microphone's push to talk key and beginning to speak. Usually a count of "one, one thousand" is adequate. Failure to do this is probably the most common voice communication mistake that we all make. A variety of delays can occur within a radio system that will cause the first few words of your transmission to be lost if you begin talking too soon. These delays can include:

- CTCSS tone decode delays,
- Transmitter turn on time, including time to come out of the "power-save" mode,
- Time for the transmitters in a string of linked repeaters to all turn on.

Providing this extra time will ensure that all of your message is heard. If you start speaking too soon, the receiving station will have to ask you to repeat the first part of your last transmission, wasting valuable time.

Lastly, pause a little longer than usual between transmissions any time there is a possibility that other stations may need to break in with emergency traffic to pass. Failure to do this is also one of the very common mistakes that we all make. Again delaying for a count of "one, one thousand" is usually sufficient.

Summarizing the above. If you need to transmit, then you of course wait until the person currently transmitting has finished. Then you wait for a count of "one, one thousand" before pushing your microphone push to talk key. Then wait another "one, one thousand" before beginning to speak.

4 Transmitting a Message

Speak slowly when transmitting a message. Remember, the radio operator receiving your message must write it down on a Message Handling Form so that it can be delivered to the intended recipient. Most of us talk much faster than a receiving operator can write. Consequently, the receiving operator will have to ask you to repeat portions of the message that he did not get. He may repeatedly ask you to repeat section after section as he laboriously tries to copy down your message. This common problem wastes enormous amounts of net time, preventing others from getting their messages transmitted.

One technique that works well to solve this problem is the following. Use the eraser end of a pencil to trace over the words of the message as you transmit it. In effect, copy down the message that you are sending as you send it. By doing this you are more likely to transmit the message at a speed which the receiving operator can copy.

Breaking a message into segments also helps a lot. Two natural segments are the message header and the body of the message. After sending the message header (the message handler ID, time, date, priority, who the message is being sent to, and who the message is from), ask the receiving operator if he copied the header ok. Asking the simply question "Copy?" is adequate. Once the header has been successfully received, send the message body. If it is a long message, break the body into several segments, identifying each segment as it is sent (segment 1 of 5, segment 2 of 5, etc.). Ask for confirmation of successful receipt after each segment is sent. This is exactly the procedure used by computer communications software to get messages successfully transmitted over Packet Radio and most other forms of data communication, including the Internet.

Conclude the last segment of the message with the phrase "end of message". The receiving operator knows that he has the entire message when he hears this phrase.

5 Brevity and Clarity

Each communication should consist of only the information necessary to get the message across clearly and accurately. Extraneous information can distract the recipient and lead to misinterpretation and confusion. If you are the message author and can leave a word out without changing the meaning of a message, leave it out. Avoid using contractions within your messages. Words like "don't" and "isn't" are easily confused. If someone else has drafted the message, work with the author to make it more concise.

Make your transmissions sound crisp and professional, like police and fire radio dispatchers and air traffic controllers. Do not editorialize, or engage in chitchat. An emergency net is no place for "Hi Larry, long time no hear." "Hey, you know that rig you were telling me about last month …..".

Be sure to say exactly what you mean. Use specific words to ensure that your precise meaning is conveyed. Do not say, "that place we were talking about'" when "Medea Creek School" is what you mean. Using non-specific language can lead to misunderstandings and confusion.

Communicate one complete subject at a time. Mixing different subjects into one message can cause misunderstandings and confusion. If you are sending a list of food supplies needed, keep it separated from a message asking for more sandbags. Chances are that the two requests will be forwarded to different locations, and if combined one request will be lost.

6 Plain Language

As hams, we use a great deal of "jargon" (technical slang) and specialized terminology in our daily conversations. Most of us understand each other when we do, and if we do not on occasion it usually makes little difference. In an emergency, however, the results can be much different. A misunderstood message could cost someone's life.

Not everyone involved in an emergency communication situation will understand our slang and technical jargon. Even terms used by hams vary from one region to another, and our ACS non-radio personnel will have no knowledge of most of our terminology.

For these reasons, **all messages and communications during an emergency should be in plain language that everyone understands.** "Q" signals, 10 codes, and similar jargon must be avoided.

Avoid words or phrases that carry strong emotion. Most emergency situations are emotionally charged already, and you do not need to add to the problem. For instance, instead of saying, "horrific damage and people torn to bits," you might say "significant physical damage and personal injuries."

7 Phonetics

Certain words in a message may not be immediately understood. This might be the case with an unusual place, such as "Franconia" or an unusual last name, like "Smythe." The best way to be sure it is understood correctly is to spell it. The trouble is, if you just spell the word using letters, it might still be misunderstood, since many letters sound alike. "Z" and "C" are two good examples. For that reason, radio communicators often use "phonetics." These are specific words that begin with the letter being sent. For instance, "ARRL" might be spoken as "alpha romeo romeo lima."

Use phonetics anytime a word has an unusual or difficult spelling, or may be easily misunderstood. Do not spell common words unless the receiving station asks you to. In some cases, they may ask for the phonetic spelling of a common word to clear up confusion over what has been received. Standard practice is to first say the phrase, "I spell," then spell the word phonetically. This lets the receiving station know you are about to spell the word he just heard.

Several different phonetic alphabets are in common use, but the one used by public safety agencies, and those of us in ACS, is the ITU Phonetic Alphabet show below. Others use military alphabets.

A – Alfa	N – November
B – Bravo	O – Oscar
C – Charlie	P – Papa
D – Delta	Q – Quebec
E – Echo	R – Romeo
F – Foxtrot	S – Sierra
G – Golf	T – Tango
H – Hotel	U – Uniform
I – India	V – Victor
J – Juliet	W – Whiskey
K – Kilo	X – X-ray
L – Lima	Y – Yankee
M – Mike	Z – Zulu

Many hams like to make up their own phonetics, especially as a memory aid for call signs, and often with humorous results. Unfortunately, this practice has no place in emergency communications. In poor conditions, unusual phonetic words might also be misunderstood. We need to be sure that what we say is always interpreted exactly as intended. This is why most professional communicators use standardized phonetics.

Numbers are somewhat easier to understand. Most can be made clearer by simply "over-enunciating" them.

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

8 Tactical Call Signs

Tactical call signs indentify the station's location or its purpose during an event, regardless of who is operating the station. This is an important concept. The tactical call sign allows you to contact a station without knowing the FCC call sign of the operator. 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 will usually be assigned to provide some information about the location or its purpose. It is often helpful if the tactical call signs have a meaning that matches the way in which the served agency indentifies the location or function. Some examples are:

- Net – for net control
- Thousand Oaks City – for the city's Emergency Operations Center
- Checkpoint 1 – for the first check point in a public service event
- Los Robles Main – for Los Robles Hospital main campus

Notice in the above examples that "Plain Language" is being used for tactical calls. Plain language that everyone is likely to be familiar with. Cryptic abbreviations are avoided. Thousand Oaks City is fairly explicit. If we shortened that tactical call to Thousand Oaks or worse yet T.O., the question at the receiving site could well be "Thousand Oaks what?" Thousand Oaks Police Department, Thousand Oaks Red Cross Center, ……? The longer tactical call "Thousand Oaks City" is actually more quickly understood than the shorter "T.O.". If at all possible, a tactical call should be instantly identifiable, even to someone that does not live in the area.

8.1 Informal and Directed Nets

In an **Informal Net**, you are expected to directly call the station that you want to talk to, presuming that the frequency is not in use. For example, "Los Robles Main, Thousand Oaks City, what is your status?" However, in a **Directed Net**, the net is controlled by the Net Control Operator. If you want to speak with another site, then you must ask Net Control for permission to do so. Net Control may tell you to "stand-by" until higher priority traffic has been handled. Once that traffic has cleared, Net Control will tell you to proceed with your traffic

8.2 Calling With Tactical Call Signs

If you are at Thousand Oaks City during a directed net and want to contact the net control station, you would say "Net, Thousand Oaks City". **The tactical call of the station that you are calling is first and your call is second, following the "To" "From" format.** If you had emergency traffic, you would say "Net, Thousand Oaks City, emergency traffic for East County Sheriff's Station," or for priority traffic "Net, Thousand Oaks City, priority traffic for Los Robles East."

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

Note also that no FCC call signs have been used so far. None are necessary when you are calling another station.

8.3 Station Identification

Proper station identification is required to satisfy FCC's rules. The FCC requires that you identify at ten minute intervals during a conversation and at the end of your last transmission. During periods of heavy activity in tactical nets it is easy to forget when you last identified, but if you identify at the end of each transmission, you will waste valuable time. What to do?

The easiest way to be sure you fulfill FCC station identification requirements is to give your FCC call sign at the end of your information exchange with another site. That is, when you have finished your conversation with that site. In an emergency situation, most exchanges will be far shorter than ten minutes. This serves two important functions:

1. It tells the Net Control Operator that you consider the exchange of information complete and that you are releasing the net back to Net Control. If you use this procedure, there is no need to say "back to Net Control." Simply giving your call sign conveys that information, saving time and extra words.

2. It fulfills all FCC identification requirements.

For example, suppose that you are Thousand Oaks City and that you requested Net Control for a "Direct" to Los Robles Main, that is, you want permission to talk directly with Los Robles. Net Control gives you permission for your "Direct". During your conversation with Los Robles you may give your tactical call a couple times, but you give your FCC call only once, at the end. When you complete your conversation with Los Robles, you would give your call, for example "N6MDA." There is no need to end the conversation with your tactical call. From the context of the message exchange it will be clear that N6MDA is the Thousand Oaks City radio operator. This procedure fulfills your station identification requirements and tells the Net Control Operator that you completed your "Direct".

If the Net Control Operator believes the exchange is complete, and Thousand Oaks City had forgotten to identify, then the Net Control Operator should say, "Thousand Oaks City, do you have further traffic?" At that point, Thousand Oaks City should either continue with its traffic, or "clear" by identifying as above.

Once you have begun a dialog with another station, there is no need to use your tactical call on each transmission. You both know who you are talking to and so does Net Control who is monitoring your traffic. Use your tactical call only when it seems to clarify the message exchange.

Below is an example of a message exchange between Los Robles Hospital Main Campus (LRM), Net Control (Net), and East County Sheriff's Station (ECSS):

LRM: Net, Los Robles Main with a routine message for East County Sheriffs Station.

Net: Los Robles Main please standby.

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(Some time later)

Net: Los Robles Main, do you still have a message for East County Sheriff's Station?

LRM: Affirmative

Net: East County Sheriff's Station contact Los Robles Main for a message.

ECSS: Los Robles Main, East County Sheriff's Station, unable to accept message, will contact you when we are ready to copy, KI6DJV

LRM: Understand. Will wait for your call, KI6YVI

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(Some time late)

ECSS: Net, East County Sheriff's Station, ready to copy routine traffic from Los Robles Main.

Net: Los Robles Main send your traffic to East County Sheriff's Station.

LRM: East County Sheriff's Station, Los Robles Main, Message Handler is 982, Time 1145, Date 11-13, Priority routine, To Bill Davis Traffic Enforcement ECSS, From Tim Clark Security Supervisor Los Robles, Copy?

ECSS: Negative, repeat To address.

LRM: To Bill Davis Traffic Enforcement ECSS, Copy?

ECSS: Copy

LRM: Message begins. Request road block at east driveway to admit emergency vehicles only. End of Message.

ECSS: Message received. KI6DJV.

LRM: KI6YVI (implied back to net).

This message exchange is straight forward and crisp. It is easy to see what to do. Doing it well simply takes practice.

9 Habits To Avoid

- Thinking aloud on the air: "Ahhh, let me see. Humm. Well, you know, if …"
- On-air arguments or criticism
- Rambling commentaries
- Shouting into your microphone
- "Cute" phonetics
- Identifying every time you key or un-key the mic
- Using "10" codes, Q-signals, or anything other than plain language
- Speaking without planning your message in advance
- Speaking too fast
- Talking just to pass the time.

Acknowledgement

This material is based in part on the ARRL CCEP Amateur Radio Emergency Communications Course, Levels 1, 2, and 3. Refer to the ARRL web site at http://www.arrl.org/ for information on these courses.