

Introduction to Emergency Communications

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What is a Communication Emergency?

A communication emergency exists when a critical communication system 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, a massive increase in the use of a communication system which causes it to be overloaded, or the failure of a key component in a system that has widespread consequences.

What makes a good Emcomm Volunteer?

Emcomm volunteers come from a variety of backgrounds and with a range of skills and experience. The common bond that all volunteers share is the desire to help others and to work as part of a team.

Where do we fit in?

Amateur radio operators have been a communication resource in emergency situations ever since there has been radios.

Amateurs are known as immediate available communication experts.

Amateurs have the equipment, the skills and the frequencies necessary to create expedient emergency communication networks under poor conditions.

However, just having radios, frequencies and basic radio skills is not enough. Certain emergency communication skills are very different from those you use in your daily ham radio life. This course, will hopefully, help you fill that need.

The emergency management community recognizes these two skills. We must use these skills to help provide the information that needs to be passed quickly and efficiently. As trained communicators we are expected to pass it accurately, even if we do not understand the technology.

Regardless of the message format used, the procedures cannot be picked up solely by reading or studying. There is NO substitute for actual practice. Avoid the feeling that you will know how to operate when the time comes – you will not unless you do it frequently, with other operators whose style of operating you get to know.

Without specific emergency communication skills, you can easily become part of the problem rather than part of the solution.

What you are not.

As important as what you are, is what you are not.

There are limits to your responsibilities. You are not a "first responder." Except on rare occasions, you will seldom be first on the scene.

You do not need flashing lights and sirens. In most cases, beyond reporting the situation to the proper authorities, hams have little use as communicators at the beginning of an emergency.

The only decision you can make is whether you will participate or not.

Also you are not in charge. You are there only to pass messages or information which is given to you by the agency.

Our job is to get the message through the best and fastest way possible.

Once operations begin, all kinds of things can occur. The volume of messages can grow quickly and confusion is common.

Basic Communication Skills

An emergency communicator must do his part to get every message to its intended recipient, quickly, accurately and with the 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 skill of the receiving party, the co-operation of others and adequate resources.

Why are Emergency Communications Techniques Different?

Life and death communications are not part of your daily experience. What we talk about everyday does not have the potential to severely impact on the lives of many people. In an emergency, any unclear message, or one that is modified, delayed, mis-delivered or not delivered at all can have disastrous results.

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

Listening also means avoiding unnecessary transmissions. A wise man once said "a person has two ears and one mouth, therefore they should listen twice as much as they talk".

It is advisable to have a pair of headphones, in your 'jump kit', to minimize local noise and help you concentrate on the radio signals.

Training.

Training should be a continual process. Each member should strive to be an excellent communicator. But what is an excellent communicator?

An operator may consider himself an excellent communicator if he can send morse at 35 w.p.m. He may think that regularly checking into the Hamnet net qualifies him as an excellent communicator. Or his car with all the radios and antennas like "SABC". All these qualities help, but Mr. Excellent Communicator – could probably use some training procedures, operating practices and communication skills. Once he has mastered these

skills, then he can truly consider himself an 'excellent communicator'.

This may sound very basic, but training in these areas are essential if you are to be effective in an emergency.

Remember: in an emergency radios do not communicate - people do.

The following suggestions are intended to help you become a better radio operator whether in an amateur radio contest or on an emergency or disaster mission. AS you will, most of the material is mainly for phone operations. Even something as simple as using your mic correctly can make a big difference to intelligibility.

1. When transmitting, always remember to talk across the face of the microphone. Talking across the face of the mic. cuts down on breath sounds, the popping of the letter 'P' and similar sounds. This technique makes the communication more understandable.
2. Speak slowly, distinctly, clearly and do not let your voice trail off at the end of the sentence. A hastily given message saves no time if it has to be repeated. Raising your voice or shouting can result in over-modulation and distortion.
3. Hold the PTT. button down for at least one second before you start your message. This will assure that the first few words are not cut off or lost due to the slow opening of the repeater.
4. Know what you are going to say before you push the mic button. Do not clutter up the airwaves with uh, or ah. It is very easy to confuse the whole transmission if the operator does not have the facts right and ready to give the message in a crisp and orderly way.
5. Listen before you transmit. Make sure you do not double with another station.
6. Eating, chewing gum or other activities tend to clutter up the clarity of your speech.
7. Under stress many operators have a tendency to talk fast. If you are in the middle of the action, remember to talk slowly and clearly in order to get your message across correctly. Accuracy first – speed second.
8. Avoid angry comments on the air. You do not know who is listening.
9. If you are relaying a message for another person, be sure to repeat the message, exactly word for word as it is given to you.
10. Sound alert. Nothing destroys the confidence as much as a bored or tired sounding radio operator. If you are tired, get a relief.
11. Watch certain words. They sound almost like the opposite meaning. For example, 'cant' almost sounds like 'can' and with a poor signal, who knows. Rather use 'unable', a better choice. Use 'affirmative' instead of 'yes' and 'negative' instead of 'no'.
12. Always identify yourself at the beginning of each transmission, because voice identification may be difficult.
13. The word 'break' is never used unless there is an emergency.
14. Do not act as a 'relay station' unless another radio station or control requests you to do so.
15. When transmitting numbers (house, street, telephone) always transmit the number sequence as a series of individual numbers. Never use combinations. Example: 1234 12 avenue is given as 'one, two, three, four, twelfth avenue', and not as 'twelve thirty four, twelfth avenue'. There is a lot of confusion when sending numbers.
16. When having to spell a word, use the international phonetic alphabet. Do not improvise or use your own.
17. Always acknowledge calls and/or instructions. If you can not copy or respond to the call immediately, then ask the caller to repeat or to standby.

18. Never acknowledge calls or instructions unless you fully understand the call or the instruction perfectly.
19. If you call control or another station and do not get a reply, be patient and call again in a short while. Control or the other station might be busy with work that is not on the air or on another frequency. If it is an emergency say so and call more often.
20. Only transmit facts. Do not clutter up the air with non-essential information. Be careful what you say on the air.
21. If you are moving around with a search team or just mobile in a vehicle always take note of your surrounding location, as control may ask 'where are you at the moment?' Others may also need to know your exact location for one or another reason.
22. If you have to leave the net for some reason, always inform control and when you return, also notify control, so valuable time is not spent attempting to contact you.
23. Stay off the air unless you can be of assistance.
24. The following list of number pronunciations will help you in poor conditions:

one – wun	six – siks
two – too	seven - sewen
three – tree	eight - ate
four – fower	nine - niner
five – fife	ten – wun zeerow
zero – zeerow (never as a nought)	
25. Always remember: A - Accurate: B – Brevity : C – Concise
26. When using a repeater, remember to leave a little extra time between keying the PTT and talking.
27. Lastly pause a little longer than usual between transmissions so as to allow any other stations that may have emergency traffic to break in and pass their traffic to control.

The above list of "instructions" is given to provide for a better communications contribution during times of need.

Message Sending

The aim of all operators shall be to get the message through with complete accuracy and Minimum delay in order that the frequency is kept as clear as possible at all times for new traffic.

Send spoken messages at dictation speed, but not to the point of sending the entire message in one continuous transmission. Break up the message into groups of three or four words at a time. In a long message of more than 25 words or two sentences, break the transmission partway to allow the receiving operator to confirm. Any badly copied text can then be corrected then before continuing. In some cases it will be advisable to have the message read back to confirm it is correct.

In Search and Rescue operations, it may be difficult for some operators to send messages at dictation speed. Training will include techniques, which once learned by the operators, will allow them to focus on a single task and carry out the handling of that task to the exclusion of events or distractions incidental to that task.

The same type of message form, to be provided by net control, should be used at both ends of the transmission.

Talk in plain language and do not use 'Q' code except in 'cw' if that mode is being used.

Phonetics

To reduce requests to repeat words, use the universal phonetic alphabet. Standard practice is to say "I spell" then start spelling the word phonetically. In poor conditions, unusual phonetic words might be mis-understood.

Tactical Call Signs

Tactical call signs can identify the stations' location during an emergency/event, regardless of who is operating the station. Tactical call signs should be used for all emergency nets and public events if there are more than a few operators.

Station Identification

After the message has been sent, you would complete the call by giving his call sign followed by your call sign, which is required by law.

Recommended Voice Communication Procedures

What to do:

1. Listen

Make sure that the channel is clear.
Know what is going on around you.

2. Think

Think about what you are going to say.
Make your message clear and to the point.
Get on. Get off. Get done.

3. Make the call.

Give: the callsign or the identification of the station called,
the words "this is....."
the callsign or the identification of your station:
i.e. "zs5tub this is zs5gd"

4. Communicate.

Speak clearly
Use plain language
Repeat back critical information
End every transmission with your call sign.

5. Use standard phonetics.

For your station identification
Spell names and words that are not easily understood.

PRINCIPLES OF DISASTER COMMUNICATION

It is impossible to state exact rules that will cover every situation that arises. The good amateur faced with a disaster situation may, however, benefit greatly from certain rules of thumb. These rules are, or should be, part of their training. They are presented here at random and should be reviewed by all amateurs, even those not active in disaster communications.

1. Keep the QRM down.

In a disaster, it is essential that all stations remain silent unless they are called upon. If you are sure you should NOT transmit, then DON'T. Don't transmit unless you can help by doing so.

2. Monitor the disaster frequency.

If you are not actively involved, it is helpful to simply sit and monitor such frequencies.

3. Avoid spreading rumours.

During and after a disaster situation, you may hear a lot of stories. Rumours are started by mis-informed people or amateurs. In a disaster emergency situation, try and not make a statement on without foundation.

4. Authenticate all messages.

Every message which claims to be of an official nature should be written and signed by an official of the agency. Whenever possible, amateurs should avoid initiating disaster or emergency traffic themselves. We do the communicating, the agency officials supply the contents of the messages.

5. Strive for efficiency

Whatever happens in an emergency, it is advisable to work a few hours and get a relief for a few hours. Your health and efficiency are better served that way.

6. Select the mode and band to suit the need.

It is the habit of all amateurs to believe that their favourite mode and band is superior to all others. For certain specific purposes and distances, this may be true. There is, of course, no alternative to using whatever happens to be available.

Experience has shown the following advantages;

CW

- less QRM in most amateur bands
- secrecy of communications – contents are much less likely to be intercepted by the general public to start rumours or undue concern.

- simpler transmitting equipment
- greater accuracy in recording communications
- longer range for a given amount of power.

Voice

- more practical for portable and mobile work
- more availability of operators
- faster communication for control purposes
- more readily appreciated and understood by the public
- official-to-official communication.

Digital Modes

- same advantages as 1 and 2 of CW, and 2 of voice
- plus greater speed in recording of message
- packetradio provides the capabilities of digipeating messages from point A to point Z via numerous automatically controlled middle points.

A well balanced disaster organization will have all CW, Phone and Digital mode capabilities available in order to utilize all of the advantages.

7. Use all communication channels intelligently

While the prime object of emergency communications is to save lives and property, everything is incidental, operators should use all emergency channels correctly.

8. Do not 'broadcast'

While it is true that the general public may be listening, our transmissions are not and should not be made for that purpose. Our job is to communicate for the agency, and not for the general public.

Within the disaster area itself, Hamnet is primarily responsible for communication support. When disaster strikes, the first priority of those Hamnet operators who live in or near the disaster area is to make their expertise available to the agency or Provincial Director where and when needed.

Introduction of Emergency nets.

What is an Emergency net?

The purpose of any emergency net is to provide a means of orderly communications within a group of stations.

Activation of the net

The emergency network will be activated by net control or by a person appointed for the

purpose by the net control. In situations where it required that the net mobilize quickly this will be achieved using the telephone tree. It is possible during emergency situations that the telephone system will be rendered inoperable.

Regardless of the state of the telephone system, on becoming aware of a potential emergency situation operators should maintain a listening watch on 7070khz and 145.625/145.700mhz.

Net control will monitor this watch and will use the opportunity to inform stations on the developing situation or to gather information from participating stations.

It is the sole responsibility of the net control to maintain a clear frequency during an emergency period.

Directed net

In a directed net, a net control station organizes and controls all the activity. The Net Control Station is usually located at the headquarters of the organization, and is responsible for ensuring that the net discipline is maintained and that all stations have an opportunity to transmit when required.

Open net

In an open net, a net control is optional.

Types of nets.

Emergency net

Emergency nets may have different purposes, and a given emergency may require one or more of each type of nets. During a small operation, all functions may be combined into one net.

A traffic net handles formal written messages.

Tactical net – is used for real time co-ordination of activities related to the emergency.

An informal net – is usually an open net used to collect or share information on the disaster, etc.

If a traffic net is busy and you have emergency traffic to send, you may need to “break” into the net. The most common method is to wait for a pause in transmission and simply give your callsign. The net controller will then know someone needs attention and bring you in by saying “go ahead ZS5??” to which you respond “ZS5?? with emergency traffic”.

Net control is aware that there may be difficulties in the field, which he or she may not necessarily be aware of. This will be taken into account by net control who will facilitate operators experiencing difficulties associated with the operation of a field station. These difficulties will be logged by the field station and also by net control and this information will be used to improve future activities.

Always acknowledge any instruction given by control. Ask for clarification if necessary. Once a message is fully received, confirm it by saying “message received”.

During certain operations stations using the nets should use their “tactical callsign” i.e. table

2 or start stage 4 on 145.625, so the control knows who to reply to.

During an actual emergency deployment do not enter into conversation with stations in activities outside of the Hamnet operation. Should interference arise from outside the network, net control shall politely ask them to leave the frequency. However no-one has the right to operate on any frequency to the exclusion of somebody else. The common sense rule, which requires operators to listen before using a frequency, should ensure that Hamnet activities are carried out on a frequency not required for another purpose. The net controller should announce the purpose of the net and that the repeater will be out of regular use for the duration of the operation.

Basic Message Handling

Formal vs Informal Messages

Both formal (written in a specific format) and informal (verbal or written but not in a specific format) messages have their place in emergency communication. In general, informal messages are best used for non-critical and simple messages, or messages that require immediate action, and 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.

Do not speculate on anything relating to an emergency. If you are asked for an estimate of an item, you would reply by starting with "the estimate is..."

Pass messages exactly as written or spoken. In addition to speed, your job as a communicator is to deliver each message as accurately as possible.

If you are given a message, always read the message to the author to make sure potential errors or misunderstandings can be corrected before the message is sent.

Message Priorities

1. Emergency

Any message having life or death urgency to any person or group of persons.

This also includes official messages from welfare agencies during emergencies requesting supplies, materials and instructions vital to the survivors.

2. Priority

This is for messages, important and having a specific time limit.

3. Welfare

Refers to an enquiry as to the health and safety/welfare of the people in the disaster area. Welfare traffic is sent only when all 1 & 2 above messages have been sent.

4. Routine

Traffic labeled routine should be handled last.

Message Forms

All formal messages passed by you should contain the following:

- a message number for reference purposes
- a letter indicating the importance of the message priority
- the station of origin of the message
- a check of the number of words in the message text, so the receiving station will know if there are any words missed.
- the time received and time sent, of great importance in an emergency message.
- date of message.
- your position or call sign.

Traffic Priority

1. Emergency traffic is first priority
2. Then traffic to and from control nets.

Logging of Messages

Accurate log keeping is a statutory requirement and logs can also be used to facilitate training for future Hamnet events. Messages will be recorded on separate message forms and the log will act as the normal record of on air operations. The following activities should appear in the log:

1. Location of portable/mobile station and the equipment being used at that location.
2. Date, time, and consecutive number of messages.
3. Opening and closing times of the station.
4. Changes in operating conditions, channel or location and any interference or difficulties experienced.
5. Sufficient reference data to identify all messages transmitted or received by the operator on the net.
6. Any unusual occurrences such as interference caused by/to other stations or to/by any non emcom stations.
7. Handover or takeover of the radio station where the relieving operator shall record his name and sign to record the transfer.
8. Any relevant details which has a bearing on the Hamnet operation.
9. Do not use the normal readability/strength type report, which makes sense to you, but not to a non-ham. Use a simple "OK", "Difficult", "Unworkable"

Good log-keeping is an essential aid to the operation of a radio station particularly at the control station where the operator is responsible for the other stations on the net.

Logs shall be kept for future inspection if required by net control or by any agency.

Lost or misdirected messages can be traced later and the log can be used during the

reportback meeting if there were any unusual happenings or problems. But normally a reportback meeting is always held.

Do not forget to write down all the above information and never rely on your memory.

Station activation report.

All Hamnet stations, when activated are expected to send a report as soon as they are operational, and a termination message upon closing their station including their call sign and time shutdown.

Voice Routing

If message is light, traffic may be handled on the working frequency.

In high traffic loads use an alternative frequency to maintain a listening watch on the working frequency.

Radio Discipline

Radio discipline is a fundamental ingredient of voice procedure without which a radio net cannot function efficiently. Good radio discipline results in improved communications efficiency, improved accuracy and high standards.

The Control Station Operator irrespective of his or her level of experience is in charge of the net and is responsible for radio discipline.

The following rules are mandatory on all radio nets:

Stations on the net must:

1. Use the correct procedures and radio discipline as follows.
2. Maintain a constant listening radio watch while the net is active.
3. Ensure that you are on the correct frequency or channel.
4. Answer all calls in the correct order and without delay.
5. Listen carefully before transmitting to ensure the channel is clear.
6. Leave a short pause at the end of a conversation before starting another transmission.
7. Release the PTT promptly.
8. On releasing the PTT, check to see that the radio has returned to the receive condition. A stuck PTT can be disruptive to a net if the fault is not quickly detected and rectified.

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Stations on the net must not:

1. Make unnecessary or unduly long transmissions.
2. Engage in conversation or operations not controlled by the net.
3. Disrupt other transmissions as allowances must be made for transmissions where only one of the participants can be heard by you.
4. Speak faster than the receiving station, which may be experiencing poor reception conditions, can be expected to receive.
5. Act without instructions from the Net Control.

6. Exit the net without good reason and without first obtaining permission of the net controller.
7. Operate a de-briefing session on the air as this is more productively accomplished off the air when the net has been closed.
8. Use terminology other than that recommended in these notes on the air.

Actions by Local Authorities

In the initial stages of an emergency, i.e. lifesaving, fire fighting etc the local authorities will act in support of the emergency services. Care of evacuees, emergency feeding, keeping road open, making dangerous structures safe etc are all examples of local authority tasks. Later on they will co-ordinate the recovery work and then return to normality. Many authorities maintain a Joint Operations Centre (JOC) from where all emergency response by the various departments are co-ordinated

Integrated Emergency Management.

The term "Integrated Emergency Management" refers to the co-ordinated and response required from a wide variety of statutory agencies. For most organizations this means establishing 3 layers of Command and Control:

- Strategic
- Tactical
- Operational

Integrated Emergency Management is carried out by senior officers of the Emergency Services in conjunction with local authority Emergency Planning Officers.

HAMNET must endeavor to maintain contact with the Emergency Planning section.

HAMNET must aim to be seen as an integral part of the process of Integral Emergency Management. Credibility is absolutely essential if HAMNET is going to be allowed to work alongside the professional services in a major emergency.

What HAMNET is likely to be asked to do

Reports which follow major Civil Emergencies often identify communication channels becoming quickly overloaded or failing altogether. Hamnet can offer a flexible communication facility which can be adapted to suit the requirements of the emergency. This could fall into a number of categories e.g.

1. Provision for personnel with equipment to go to locations where communications have failed.
2. Provisions of temporary additional channels to support links which have become overloaded.

REMEMBER

- We can only assist if we are asked to do so
- We will only be asked if we are considered to be part of the response team
- We will only become part of the team by becoming a recognized player.

Principles of Repeater Operation

1. Use minimum power – low power also saves batteries
2. Use simplex whenever possible – so as not to tie up the repeater with idle chatter.
3. Observe the pause between exchanges – count to 3 before pressing the ptt to talk so as to give time for any breakers.
4. Listen much, transmit little – announce you're your presence on the repeater when you are certain of being able to assist in an emergency.
5. Monitor the emergency frequency – when you are not busy talking
6. Think before you talk – Stick to facts, control your emotions. Remember, during an emergency is the time when you are most apt to act and speak rashly.
7. Articulate, do not slur – speak across your microphone, not into it. Keep your voice down. In an emergency one often gets excited and tends to shout.
8. Talk slowly and calmly. This is the mark of an experienced communicator.
 - If you get overly excited, then this feeling is transmitted to others on the net
 - Speak clearly and make sure your directions are clear
 - Have authority in your voice
 - Giving unclear instructions or information can confuse the station being addressed.
 - Save all your logs and notes, as they may be important for reportback meetings later.

Amateur radio operators value their ability to operate in adverse conditions.

We have a combination of skills that can be of use and value to the community. This value can multiply when common sense and proper procedures are followed.

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