



HAMNET

**Amateur Radio Emergency Service
of the
SA Radio League**

Welcome!

As a member of Ham net KwaZulu Natal you have accepted one of the most exciting yet rewarding roles in emergency communications if not in amateur radio.

With these training modules, it is intended to help you acquire, develop and refine your skills which you need to function effectively in serving the public through amateur radio communications.

It takes a special person, a radio amateur with a strong desire to serve the community, to volunteer to be a member of Hamnet.

The following training modules present many examples to aid you in getting the job done properly.

Your role in Hamnet is important to you, the agency you serve and to your community.

Your dedication to your responsibilities today or tomorrow may indeed determine the safety of your neighbours tomorrow or in the future.

Purpose

The purpose of these training modules are straightforward. In addition to guidelines and procedures these modules are meant to make you a better amateur radio operator and to better serve the public. The final results depend upon you.

Obviously these sessions cannot anticipate every emergency that you may encounter, But every attempt has been made to provide you with the knowhow you may need to perform appropriately. Amateur radio public service efforts must continue to grow both in quality and quantity.

To achieve this, knowledge and experience must be shared for the benefit of all. These training modules are an important step in sharing that knowledge.

Acknowledgements:

I would like to thank Dan Miller, ARRL Emergency Communications Course Manager for all the assistance he has given me.

The Canadian ARES group

The Virginian RACES group

Emergency Preparedness at home:

Emergency preparedness literally 'begins at home' with the individual and his/her family. It begins when parents teach their children how to phone for emergency assistance.

Numbers for the local fire and police service, ambulance etc are but some of the numbers that should be readily available in the home.

In addition, parents must explain to their children the dangers associated with fire and the precautions to be taken in the event of a fire or a lightning strike.

Municipal Response

When a disaster situation has reached the level where it has the potential to have serious consequences for a community, the level of response escalates upward and becomes the responsibility of the local municipality.

A massive chemical spill or fire at AECI for example would require mass evacuation of citizens is but one of the many examples of a situation where local municipal officials would become involved. In order to prepare for intervention of municipal officials, municipalities pass by-laws and have contingency plans in place for emergencies.

Although emergency preparedness and response structures vary somewhat from one municipality to another, most have a similar structure. Virtually all municipalities in South Africa have enacted by-laws to deal with emergency preparedness and response. Small towns are encouraged to form a group of responsible members of the community to oversee the emergency plan.

Emergency Operations

Disasters come in a variety of types and sizes, each requiring a specific type of response. There are, however, certain basic elements of the response initiative that are common to all major emergencies or disasters. Some of these are as follows:

Designated Disaster area(s)

For the purpose of dealing with the problems created by the disaster, there are always one or more designated disaster area(s). These are usually the areas that are considered to be directly affected by the emergency or disaster.

Joint Operations Centre

In all emergencies or disasters a JOC is established. The JOC is generally a predetermined room where senior personnel/officials of participating departments or agencies meet to co-ordinate the response initiative. They facilitate and co-ordinate the response efforts of those emergency services at the site.

Telecommunications

Telecommunications between the disaster / emergency site and JOC are critical. Without vital telecommunication links, it is impossible for the JOC to know exactly what is happening, let alone co-ordinate activities. These telecommunication facilities are normally provided by and through the systems operated by the responding agencies, i.e. police and fire departments through their repeater systems.

It is customary for the JOC to have communication facilities at their disposal to communicate with the different departments involved.

Lately some JOC's have adopted cell phones as a means of communicating as a backup to radios, but when the network is overloaded or is 'down' - cell phones are useless, and that is when amateur radio is useful.

The Amateur Radio Roll

Amateur radio operators who understand the process and are properly trained can be of tremendous assistance to the Disaster Manager. A proper plan should be in place detailing what is to be done should amateur radio operators be called out. A Memorandum of Understanding should be in place to formalize the role to be played by Hamnet.

Our members can be used to transmit a wide variety of messages on behalf of agencies - particularly those who do not have their own telecommunication resources.

There is clearly a place for amateur radio operators in emergency and/or disaster operations as long as the details are worked out in advance.

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.

How does Hamnet fit in the picture

In virtually all communities in South Africa, amateur radio, where it forms part of the local emergency plans, is considered to be a volunteer resource. As such, it comes under the jurisdiction of the municipal Disaster Manager. Amateur radio operators are generally considered to be a backup to, or a means to augment, existing telecommunication systems. In a disaster they may become the only telecommunications system available.

In some municipalities, there are some officials who do not understand what amateur radio is all about and can rarely appreciate how amateur radio could be utilized in an emergency. Most officials have difficulty contemplating telecommunication system failure.

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 i.e.

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.
- Hamnet operations are the public relations pinnacle of the Amateur Radio service. Try to represent amateur radio to the skeptics who think that "amateur" means non-professional.



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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 originator 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 originator 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 urgent messages that require a reply within 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. a message number for reference purposes
- b. a letter indicating the importance of the message priority (refer to E,P,W,R)
- c. the station of origin of the message
- d. a check of the number of words in the message text, so the receiving station will know if there are any words missed.
- e. the time received and time sent, of great importance in an emergency message.
- f. date of message.
- g. your position or call sign.

Traffic Priority

Emergency traffic is first priority
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 Ito 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 an 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 report back meeting if there were any unusual happenings or problems. But normally a report back 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 the message volume is light, it 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. Always use the correct procedures and maintain good radio discipline.
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. Field stations to acknowledge all instructions.
6. Listen carefully before transmitting to ensure the channel is clear.
7. Leave a short pause at the end of a conversation before starting another transmission.
8. Release the PTT promptly.
9. 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

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.



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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 every day 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, misdelivered 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 themselves an excellent communicator if they can send Morse at 35 w.p.m. They may think that regularly checking into the Hamnet net qualifies them as an excellent communicator. Or their car with all the radios and antennas like "SABC". All these qualities help, but an Excellent Communicator - could probably use some training procedures, operating practices and communication skills. Once they have mastered these skills, they can truly consider themselves an 'excellent communicator'. This may sound very basic, but training in these areas is 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 observe, most of the material is designed for phone operations. Even something as simple as using your microphone 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 microphone 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 PIT. button down for at least one second before you start your message. This will ensure 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 microphone 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 muffle the clarity of you 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 'affirm' 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 house, street or telephone numbers say the phrase "Numbers Follow" 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 proper word "I spell" before using the international phonetic alphabet. Do not improvise or use you own.
17. Always acknowledge calls and/or instructions. If you can not receive or respond to the call immediately, then ask the caller to repeat or to wait one.
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 you 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 - sevven
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 before continuing. In all cases the message must be 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 miss-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 will be issued by Net Control.

Tactical call signs should be used for all emergency nets and public events if there more than a few operators.

Station Identification

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

Recommended Voice Communication Procedures

What to do:

1. Listen
 - Make sure you are on the correct channel.
 - Make sure that the channel is clear.
 - Know what is going on around you.
 - Make sure the volume is turned up.
2. Think
 - Think about what you are going to say.
 - Make your message clear and to the point.
 - Get on. Get done. Get off.
3. Make the call.
 - Give:
 - a. the call sign or the identification of the station called is given Twice.
 - b. the words "this is .
 - c. the call sign 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.



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PRINCIPLES OF DISASTER COMMUNICATION

It is impossible to state exact rules that will cover every situation that arises. The 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 miss-informed people.

In a disaster emergency situation, amateurs should refrain from making any Statement on any situation without authorization from an approved designated official. i.e. PRO or Provo Director.

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.

If possible use standard message forms

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

1. less QRM in most amateur bands
2. secrecy of communications - contents are much less likely to be intercepted by the general public to start rumours or undue concern.
3. simpler transmitting equipment
4. greater accuracy in recording communications
5. longer range for a given amount of power.

Voice

1. more practical for portable and mobile work
2. more availability of operators
3. faster communication for control purposes
4. more readily appreciated and understood by the public 5 official-to-official communication.

Digital Modes

1. same advantages as 1 and 2 of CW, and 2 of voice.
2. plus greater speed in recording of message
3. packet radio 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.

They should NOT freelance but work within the structures of the Hamnet organization