



# HAMNET

Amateur Radio Emergency Service  
of the  
SA Radio League

## EQUIPMENT CHOICES FOR EMERGENCY COMMUNICATIONS

Getting the Message through - Power is not everything

To improve communications you need to improve the difference between the signal and the noise levels (signal to noise ratio) to achieve reliable communications.

For our purpose, noise is defined as any interference to transmission or reception of information (messages).

What form can this "noise" take?

Some of the more common ones are:

1. static or background noise on the air
2. equipment or voice sounds around you
3. inappropriate amount of lights
4. bad attitude or temper
5. improper transmission speed

What can be done to maximize message throughput?

Here are some of the more common ways to handle interference.

### 1. **Static and background noise on the air**

- a. Ensure you have the correct antenna for the job.  
On VHF/UHF a 1/4 wave ground plane, or a 5/8 vertical will work efficiently if you are close to the repeater, (within +- 50 kms) due to their size. If you are a fair distance from the repeater, the correct antenna would be a 5 or 7 element beam.
- b. Choose the best band for the job on HF.  
HF propagation differs by band. What distance do you want to cover?

### 2. **Equipment or voice sounds around you.**

- a. use a headset to minimize noise you will hear from the area you are in.
- b. if possible, use a noise cancelling microphone to minimize transmitted noise.
- c. when ever possible try and locate your station away from the noise source.
- d. make sure your equipment is grounded to earth.

### 3. **Inappropriate amount of light.**

Many people do not think of light as a potential problem. Think what happens when you have too much light when you try and read a computer screen or too little light when you try to read a printed document.

- a. stay out of the direct sunlight if at all possible.
- b. try and not be in the whilst having to look directly into the sun.
- c. ensure there will be sufficient light for you to work at night.

### 4. **Bad attitude or temper**

These are very hard to deal with. Your best bet is to ask the (NCS) Net Control Station for assistance.

### 5. **Improper transmission speeds**

- a. Practice sending at the appropriate rate where the other stations can copy. That means you should not rattle off your message text at high speed, but at the same speed as the other station is copying (about 15 wpm). This works to about one word every four seconds. As you speak., imagine you are writing the word down in your mind. If you do this correctly you will never get a request to repeat a message.
- b. When asking for part or all the message to be repeated, get into the habit of saying "say again" and not "repeat."

There is no one 'best' set of equipment that will ensure success for every assignment, but the following will help you make a better choice.

## **Transceivers.**

### **VHF/UHF**

The most universal choice for emergency communications is a 25-50 watt mobile transceiver. Radios in this class are usually rugged and reliable, and operate at a reasonable high duty cycle. Handheld transceivers should only be used when portability is needed, such as walking with an agency official, or when adequate battery or other DC power is not available. Handheld radios should NOT be relied upon to operate with a high duty cycle at maximum power.

Both portable and mobile dual band radios can be used to monitor more than one net, and some models allow simultaneous reception on more than one frequency at a time. For high traffic locations, such as Net Control or the Emergency Operations Centre, a separate radio for each net is a better choice, since it allows both to be used at the same time by different operators. Antennas must be correctly separated to avoid 'de-sensing'.

## **HF**

Operation from a generator equipped JOC can be done with an AC powered radio, and having both AC & DC capabilities ensures the ability to operate under all conditions. Most 12 volt HF radios fall in either the QRP (5 watt) or 100 watt category. Unless power consumption is extremely important, 100 watt output radios are adequate. This gives you the ability to overcome noise at the receiving station by using high power or to turn it down to conserve battery power when necessary. Do NOT use DC to AC inverters to power radios. Most use a high frequency conversion process that generates significant broad-spectrum RF noise at HF frequencies that are difficult to suppress. Using direct battery power is more efficient in any case.

### **Receiving Performance**

For radios on all bands, several aspects of a radio receiver's performance can effect its suitability for emergency communication work. These include sensitivity (ability to receive weak signals), selectivity (ability to reject signals on adjacent frequencies), and intermodulation rejection (ability to prevent unwanted signals from within the radio which causes interference). When operating near public or business radio transmitters, and FM receivers 'intermodulation rejection' is very important. Receiver filters are important for effective HF operation. DSP (digital signal processing) may be the single most important filtering feature available. Consideration of an older crystal controlled radio could be considered where a number of radio frequencies near to one another are in use as the front end selectivity is far better than on a synthesized radio.

## **ANTENNAS**

### **VHF/UHF**

A good antenna, mounted as high as possible, is more important than high transmitter power. Not only does it provide gain to both the transmitter and receiver, but a higher gain antenna may also allow output power to be reduced, thus battery life is longer. In flat terrain, use a mast-mounted single band antenna with at least 3db gain. Operating in a valley, the low angle of radiation offered by a gain antenna may actually make it difficult to get a signal out of the valley. Low or unity gain antennas have flatter radiation lobes and are better suited for this purpose. Unity gain 'J pole' antennas are rugged, inexpensive and easily built. For directional 2 metre coverage with about 7 db gain, a 3 or 4 element yagi can be used. A magnetic mount mobile antenna is useful for operating from a vehicle. They can also be used indoors by sticking them to any steel surface such as a filing cabinet, beams or even upside-down however rubber duck antennas have negative gain. Use at least a 1/4 wave flexible antenna for most operations, and consider using a 5/8 wave antenna for long-range use. Even a 'roll-up j-pole antenna made from 300 ohm tape can be used in place of a 1/4 wave. As long as you get the J-pole tacked to the wall or raise it up with string. You can even use a 1/2 wave or 5/8 wave antenna with a handheld if you have the correct fitting.

## **HF**

There is no perfect antenna for HF. The choice depends on the size and terrain of the area you wish to cover.

For local operations (up to 500 km), a simple wire dipole is the easiest to deploy. An antenna tuner is necessary for most wire antennas and is a good idea for any HF antenna. Beam antennas are usually expensive, large and difficult to store or transport.

## **FEED LINE**

Feed-line for VHF/UHF should be low loss dielectric coax. For short runs, less than 30 meters, use RG58 but for longer runs use RG213 or RG214 (double screened).

## **OPERATING ACCESORIES**

Headphones are very useful and should be mandatory in many locations. Operators in a JOC or Incident Command where multiple radios are in use, headphones should be used. Consider using a mic/headphone combination which also works very well. Always carry an assortment of different adaptors for antennas.

## **BATTERY POWER**

Battery power is critical for emergency operations, as portable operation for extended periods are common. A.C. power cannot always be relied upon for any purpose. Batteries should be chosen to match the maximum load of the equipment and the length of time that the operation must continue before they can be recharged.

There are two types of batteries: the common lead-acid (wet) and the sealed lead-acid (sla). Wet batteries can spill and cause damage if tipped, but the sealed lead-acid cannot spill. This type can operated in any position, even upside down.

Note: if a sealed 12 volt lead acid batteries allowed to drop below 10.5 volts, the battery will be damaged. Sealed lead acid batteries should be charged slowly and carefully to avoid damage.

## **NiCad, NiMH and LiON**

For handhelds, the internal battery type is determined by the manufacturer. NiMH batteries store more energy than NiCad batteries of the same size.

Many smaller radios are using LiON (Lithium Iron) batteries which have higher power densities, without the so-called "memory effect" of NiCad's.

Many handhelds have optional alkaline battery cases, and are a recommended emergency communication accessory. Common alkaline batteries have a higher voltage (1.5 v) than NiCad's (1.2v) and are readily available at most stores, but unfortunately cannot be recharged. Most handhelds will work off external power (13.8 v) from an external battery or a cigarette lighter as long as the voltage polarity is observed.

For maximum flexibility, build a DC power cable for each of your radios, with suitable adaptors for each battery type you might use.

## **TYPES of BATTERIES**

There are two types of lead-acid batteries: flooded (wet), and sealed lead-acid. Wet batteries or car batteries can spill if tipped, whereas sealed lead-acid batteries cannot spill and can be operated in any position.

## **BATTERY CHARGERS**

For all your radios you should have two batteries per radio, so that one can be in use whilst the other is charging.

The type of charger required depends on the type of batteries that you use. For instance, NiCad chargers will also charge NiMH batteries but not LiON batteries.

Several new chargers are available that can charge almost any type of battery available.

A rapid rate charger can shorten the life of a battery's overall lifespan. It is best to low charge all batteries, since it helps to avoid overheating and extends their overall life span.

Gel cell batteries should be charged slowly to avoid damage. All batteries produce hydrogen sulphide gas while recharging.

Non sealed batteries vent the gas out. Sealed acid batteries do what is called "gas recombination". This means that the gas generated is recombined into the cells. Sealed acid batteries actually operate under pressure of about 3 psi for most batteries.

If the battery is charged faster than the gas can be recombined, it over pressurises causing it to overheat, swell up and it can be dangerous.

All batteries should be charged at about 1/3 of the rated capacity. i.e. if the battery is rated 7 AH then you should charge it at no more than 2 amps.

Most handhelds batteries can be charged from a 12 volt car battery.



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## **Health and Safety Guidelines**

- 1. Summary**
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  - a. Masts - erecting and dismantling
  - b. A voiding danger from overhead power lines
  - c. Generators
  - d. Installing radio equipment in motor vehicles
  - e. Fire extinguishers
  - f. Safety checks for portable electrical equipment
  - g. Setting up and maintaining equipment at temporary locations.
  - h. Personal responsibilities
  - i. Health & Physical condition
  - j. Weather conditions

### **1. Summary**

Although Hamnet, as an organization, is not bound by the Occupational Health and Safety act, nevertheless every member of Hamnet has a legal duty of care towards each other and members of the public.

To encourage good practices, Hamnet has drawn up the following rules for the guidance of all members.

The Hamnet group will provide radio backup communications for many different organizations and participate in training events in order to be prepared for emergency situations. Personal safety is a very important aspect when planning any of these events.

Each emergency situation will be different and we will try and involve members in a variety of situations in order to try to anticipate the type of situation in which members may be required to participate.

## 2. Introduction.

I think everyone has heard the saying, "watch out for number one, or else no one else will" Be it a training exercise or an actual emergency, your safety is up to you. It is your primary concern.

Your second priority is the safety of your fellow Hamnet members. There be times when two members will be working together and one may not notice unsafe conditions. You as the second member there will then need to be very careful about the safety of your fellow member.

During the course of your duties, Hamnet members may be dealing with a wide variety of situations, i.e. adverse weather conditions, a.c. voltages, generators and fuel, and crowds of people. Every situation should be evaluated for risks as early as possible and the appropriate controls put in place. This is called a risk assessment and involves identifying the hazards associated with it and the likelihood of and accident or incident happening.

## 3. Health and Safety Guidelines.

### a. Masts - Erecting and Dismantling

One member should have overall responsibility of the operation. When erecting a mast consider the suitability of the ground,

- soft or firm
- sloping or level
- check for any overhead power lines and consider existing and forecasted weather conditions.

For masts over four (4) metres the use of guy ropes are suggested.

- Does the mast have a base-plate?
- What guying is needed, if necessary?
- Is each section in good condition?
- Are the members familiar with the method used to the raise and lower the mast?
- Will all the guy ropes and ground pins be clearly identified to avoid someone tripping?
- If the mast should collapse, what damage could occur?

**b. Overhead Power Lines**

Check for any overhead power lines in the area.

**c. Generators**

- Place the generator at least 1 metre away from any building, tent, vehicle, etc
- Allow for adequate ventilation and NEVER use a generator in a confined space.
- Always operate a generator on a level surface.
- Never operate a generator with wet hands, and protect it from the rain.
- Make sure all those members who operate the generator are aware of the dangers involved.
- Ensure unauthorized people are kept away from the generator.
- NEVER refill a generator whilst still in operation.
- Always keep fuel in a clearly marked container and stored in a safe place.
- Always have a small (4.5kg dry powder) fire extinguisher located nearby.
- Be aware that an earth leakage unit will NOT operate correctly when connected to a generator.

**d. Installing radio equipment in a vehicle**

- Batteries should be secured to prevent an accident
- All cables should be properly protected
- All flexible cables should be free from strain
- All mobile radio equipment should be connected to the power supply by a fuse in both lines.
- Make sure the radio equipment is secure
- The operation of the radio equipment should not affect the drivers' operation of the vehicle.
- Check that the voltage is correct for the equipment.
- Also make sure that the voltage rating is adequate for the equipment.

**e. Fire extinguishers**

- suitable fire extinguishers should be provided for the equipment. i.e. dry powder for the generator.
- If an electrical fire should start, switch off the generator and isolate the equipment.
- Dry powder type extinguishers work very well but have to be used correctly.
- The powder smothers the fire but does not cool it.
- CO<sub>2</sub> smothers the flames by starving it of oxygen, but in an open space this is more difficult because the fire is able to breathe easier.
- Foam blankets the fire and also cools it down.
- Sand can also be used to smother the flames, especially fuel.

**f. Safety checks for portable electrical equipment.**

External examination:

- examine the power cables for damage (cuts, abrasions etc)
- examine the plug for damage (cracks on the casing or bent pins)
- look for signs of overheating (bum or scorch marks)
- ensure that the cable is gripped properly in the plug

Internal examination:

- When opening the plug, check the following:
- the cable is gripped tightly in the cord grip
- the wires are connected to the correct terminals
- no bare wires are visible except at the terminals
- the terminals screws are tight
- check for any signs of internal damage (overheating, water, dirt or dust)

**g. Setting up and maintaining equipment at temporary locations.**

- Always check that no cables are trailing across walkways, if the cables have to be run across a walkway; they should be taped to the floor.
- Antenna cables should have a suitable point of entry into the building.
- Check that the location of the equipment does not obstruct the passage way through doorways, emergency exits, etc.

**h. Personal Responsibilities.**

Members are responsible for their own safety and for the safety of others.

**i. Health & physical condition:**

- Hamnet members should not accept duties beyond their physical capabilities.
- Controllers should take into account the age, state of health and any other factor which might affect the members' capabilities to do that duty in a safe manner.
- you may decline a duty which you feel is beyond your capability
- for your own protection carry a card stating important information such as:
- name and address of next of kin
- details of any physical condition which might be important \* details of any allergies blood group

**j. Weather conditions**

- Members should dress to suit whatever weather they might encounter during their time at their station.
- The NCS should periodically check with the members how they are particularly during adverse weather and nightshift.

#### **4. Contents of a basic first aid kit**

Rubber Gloves  
Assorted dressings  
Bandages  
Crepe bandages  
Adhesive tape  
Cotton wool balls  
Second skin (good for burns & blisters)  
Antiseptic wipes  
Antiseptic cream (Germolene or similar)  
Sling  
Survival blanket (if available)  
Scissors  
Safety pins

All these items can be packed in a small box or waterproof bag.

#### **5. On an Emergency site**

You are a radio operator and should become involved in no other activity. You shall maintain and operate your station until you are instructed otherwise by the net control.

#### **Identity Cards.**

Identity cards serve as a means of identifying members of Hamnet. These should be worn at each event that involves Hamnet personnel and should be available on demand by officials in control of emergency sites. You enter into emergency operations at your own risk and privately owned equipment is the responsibility of the owner. Equipment borrowed from Hamnet or other operators is the responsibility of the user at all times.

#### **6. Recommendations**

It must be that every Hamnet member has a duty to care for himself/herself and others. If more than one Hamnet member is involved in an activity at a particular location, the person appointed to co-ordinate the activity has the overall responsibility of the safety of the group.



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## **The Incident Command System**

The Incident Command System provides a coordinated system of command, communications, organization and accountability in managing emergency events. This training module will discuss the basics of the ICS system covering the points you as a Hamnet member need to know.

Anytime a large group of people gather to perform some activity, an organizational structure is needed. Someone needs to be in charge, others need to follow. In most response activities, a group of volunteers is mixed together with other members of different agencies, such as police, fire etc.

Out of this mix of people, an organizational structure capable of performing all of the necessary response activities need to be quickly and efficiently formed. The ICS allows this to happen.

## **Functions in an Incident Command Post (ICP)**

There will be occasions when Hamnet members will be asked to report to an Incident Command Post that has been set up close to the incident. While many of the usual communication tasks will remain the same, there are additional aspects that you will not find in other field posts.

### **The Command Staff**

ICS personnel are divided into two groups:

The "Command staff" which are the Incident Commander, etc

The "General staff" which consists of the Operations, Planning & Logistics sections.

### **The Staging area**

A staging area is exactly what it sounds like. It is a location where resources are staged and managed prior to being sent into the field. There may be more than one staging area for different reasons, depending on the disaster and extent of the disaster.

### **A Unified Command**

Means that when a mission crosses jurisdictional borders or involves more than one response agency, all participants agree to the command of one I.C. Incident Commander. A hazardous chemical spillage at the Van Reenens' pass would involve numerous agencies ( Spoornet, SAPS, Dept. of Environmental Affairs, National Transportation Safety Board, Fire Department, Emergency Services etc), each of whom may reasonably assume to be in charge. But there will only be one I.C. with the decision making authority, who will use the combined expertise and experience of all role players to plan and direct the incident. That is a Unified Command.

#### **1. Security.**

An ICP is usually a secure area. Expect to be required to sign in/out or you will be issued with a badge to be worn around your neck on a lanyard. Always carry your Hamnet ID card clipped to your pocket.

## 2. Personnel and Duties

Hamnet operators assigned to an ICP will normally function as a two person team, with one operating the radio while the other will handle the logging and message routing between the radio operator and the agency message controller. Inexperienced operators should always be teamed with someone having greater experience.

In general, in the ICP you will be the Net Control Station for an Ops net. On some occasions (SAR, flood or fire fighting), you may liaise with other incident facilities, such as casualty control points, staging areas or are required to monitor the net.

Your primary duties are, but not limited to:

- a. Relaying information from tactical stations to ICS staff
- b. Receiving and routing formal messages to ICS staff
- c. Transmitting formal messages from ICS staff
- d. You may be asked to do other communication related tasks.

## 3. Interaction with ICP Personnel

Remember the agency is always in charge. You are there to provide a communication service to the ICS personnel. You may be requested to perform other duties, such as answer telephones, send/receive faxes but you must not allow those duties to interfere with your primary function of communications.

## 4. Handling Information in the ICP

In the "confusion" priorities for information flow in an ICP can become clogged. To prevent that from happening, remember the acronym, "ASAP" to guide you whenever you make decisions dealing with messages or contacts - either incoming or outgoing.

All written traffic originating from an ICP official should be either written and signed by that official or written onto the message form by the agency message controller, and initialled by the originating official to enable authentication

### **ASAP stands for:**

- A Accuracy: precise clear repeat back of critical information
- S Speedy: information is quickly copied and distributed.
- A Appropriate distribution: messages get to the right person
- P Permanent recorded: all messages/ information is correctly logged as per Agency requirements.



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## Introduction to Emergency Nets

In this module we provide an overview of operations in a radio network. It also contains information that is appropriate for Disaster communications and contingency plans and planning.

### What is a "Net".

Most Hamnet communications you perform will be on some type of "net," which is nothing more than a group of radio operators using the same frequency for a specific purpose. Nets may be relatively simple (a few (SAR) Search and Rescue members looking for a lost hiker) or complex and formal, such as a net to pass formal written messages and resource requests between local Emergency Communication centres and the Incident Command post during an emergency or disaster.

### 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 7110 Khz and 145.625/145.700 Mhz.

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

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

### Definitions:

**Net:** a group of stations on a frequency, with a common purpose. It also allows an orderly flow of messages.

**Net Control:** the station in charge of the net

**Formal Message:** written messages that are sent in a standardized form

**Informal Messages:** brief verbal or informal written messages intended for direct and immediate delivery.

**Traffic:** a term referring to messages sent over the radio, usually formal written messages.

**Third Party Traffic:** messages transmitted on behalf of a person or organization other than a Hamnet operator.

### What is an Emergency net?

An Emergency net is a group of stations who provide communications for an Agency or the public during an emergency.

## General types of nets in use during Emergencies

There are several types of nets that may be in use during an emergency which you may encounter during a Hamnet assisted mission.

The choice of transmission mode and or bands, using repeaters, VHF/UHF simplex or HF depends on many factors such as the terrain, the geographical size of the incident, distance from the resource area and the capabilities of the field personnel plus other reasons. Due to the lack of severe weather locally, the possibility of ever working different nets seems remote. If we are requested to assist an Agency or NGO, you will find that only one net will be running and handling all the traffic, but that depends on the circumstances at the time.

a. **Formal net:**

In a formal net, a NCS organizes and controls all activities. If a station on the net wishes to send a message they must first ask the NCS for permission.

b. **Informal net:**

Informal nets are usually open nets used to collect or share information on a developing situation.

### Types of Emergency Nets:

Emergency nets may have different purposes, and a given emergency may require one or more of each net.

a. **Traffic nets:** handle formal messages in a specific format.

b. **Tactical nets:**

are used for real-time co-ordination of activities related to an emergency.

The operator serving this duty may not be called "net control", but could use another tactical call sign. In a Search and Rescue mission, the NCS is by default the SAR Base operator.

c. **Logistic nets:**

may be needed to acquire resources and volunteers and handle assignments.

The operator on the Logistics net is responsible for maintaining the status board and forms used for tracking the availability of resources and personnel, their assignments, and the status of operators who are either available for assignment, in service in transition.

d. **Operations Net:**

This is where command and control functions related to the response of the incident are monitored and directed, when time is of the essence for the protection of life and property. A NCS is usually present, and all traffic on an Operational net must be logged. If you leave this net for any reason you must book out.

e. **Directed Nets:**

Directed nets use a Net Control Station (NTS) to control, prioritize and direct the flow of traffic. The NCS' s job is to efficiently assess the changing situation and facilitating contacts between stations on the net with traffic.

f. **Tactical Call Sign nets:**

The operator serving this duty may not be called "net control", but could use another tactical call sign. In a Search and Rescue mission, the NCS is by default the SAR Base operator.

### **Checking into to an Emergency Net:**

- a If you are part of the organization operating the net, do not just check in and offer to assist. Listen for a while. Be sure that you have something specific to offer before checking in, such as the ability to deliver a message close to your location, when there is no one else that can do it.
- b Do not be surprised if your offer is not accepted. It is nothing personal. Emergency nets are serious business.
- c Most net control stations prefer to deal with operators with known training and capabilities, and with whom they have worked with before.

### **Breaking into a net:**

- a If the net is busy, and you have emergency traffic to send, you may need to "break" into the net.
- b The most common procedure is to wait for a pause between transmissions and say "break ZS5??". The net control station will acknowledge you and say "go ahead ZS5??" and then respond with "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 net should use their "tactical call sign" 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 require 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.

### **Leaving a net:**

Always check out of a net with the NCS. If the control thinks you are still there, it could cause a problem if you are called and there is no reply.

### **Two Special Situations to be Aware of:**

1. If you are requested by an official or someone in authority, such as a Police Officer, to move your station for one or other reason, then do it immediately, and without argument. Notify the control station of the situation at the first opportunity.
2. If you are requested by someone in authority to turn off your radio and stop transmitting, then do so immediately. Do not notify the control station until you can start transmitting again, or by cell phone, if you have one.



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## Introduction to Emergency Communications

This module will introduce you to the general concepts of emergency communication and how you as a volunteer can best help.

### Disaster Communications.

1. Most emergency service radio systems are designed to perform in emergencies at any time day or night. Such systems generally fulfil the demands placed on them by "normal" emergencies and will operate within the limits of that system's design.
2. The inadequacies of a system only emerge when the system is over-extended or are expected to function beyond its design, as happens in times of real disasters.
3. Local authorities often employ systems that can only cover their own local areas and cannot extend beyond limited boundaries.
4. To clarify this distinction, the term "Disaster Communication" is used instead of "Emergency Communication".
5. Disasters seldom happen in KZN and are thus forgotten or form a *small* part of the usual annual exercises and planning strategy. Any system that cannot cope with a disaster situation puts at risk lives, property and public welfare.
6. It is here where Hamnet comes into its own. We as Hamnet operators are equipped to deal with local emergencies via VHF and to operate over long distances, nationally or internationally via HF over extended periods on a self supporting basis in the field or from a fixed station.
7. Disaster communications can be chaotic, organized or somewhere in-between. Not only do disaster communications vary from disaster to disaster, they can vary from minute to minute in many cases.
8. Preparedness is the key. A well trained Hamnet unit with a flexible, understanding and a rational emergency plan will provide communications on a professional basis whether it is an emergency or disaster.
9. Nobody can predict what to expect when a disaster strikes.
10. The priorities to bear in mind are :-
  - a. be prepared to operate from any location at a moments notice.
  - b. train yourself in emergency communication techniques
  - c. stick to your task as a communicator
  - d. prepare a jump kit so as to be ready to move at a moments notice
  - e. develop a good relationship with the Disaster Management and emergency personal in your area.

The above few points are only a guide. As you plan your own strategy, you will develop further ideas and you can share them with other Hamnet members in your area or with the rest of the group.

### What is a Communication Emergency?

A communication emergency exists when a critical communication system failure puts the public at risk. A variety of circumstances can overload or damage critical day-to-day communication systems. It could be a storm that knocks down telephone lines, a massive increase in the use of a communication system which causes it to be overloaded, hospital or emergency service systems can fail or the failure of a key component in a system that has widespread consequences.

## What makes a good Emcomm Volunteer?

- a. the common link that all volunteers share is the desire to help others without personal gain of any kind and the ability to work as members of a team, They must also be able to think and act quickly, sometimes under stress and pressure of an emergency.
- b. we have the equipment, the skills and the frequencies necessary to create expedient emergency communication networks under poor conditions.
- c. however just having a radio, frequencies and the basic radio skills is not enough. Certain emergency communication skills are very different from those used in our daily ham radio life.
- d. 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.

Just remember you are not a "first responder" except in rare cases will you 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 initial phase of an emergency.

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

The only decisions you can make are whether you will participate or not, and of those effecting your own health and safety.

## "Day-to-Day" versus "Emergency Communications"

In your daily radio life there is no pressure to get any particular message through. You do things at your leisure and no one's life depends on you. But in an emergency all that changes.

Here are some of the differences:-

- unlike regular activities, emergency operations happen in real-time and cannot be delayed.
- unlike events that are planned or scheduled, emergency communicators are often asked to organize and co-ordinate field operations with little or no warning.
- unlike home installations, emergency stations must be portable and be able to set up and to be operational anywhere in a very short time.
- unlike contests which involve contacting any stations for points, emergency operators need to contact specific stations quickly and pass important messages. Teamwork is important.
- unlike a field day which lasts one day, an emergency may last several days.

## What is your job?

Your number one job is communication. Our job is to get the messages through. Do not think about how to use ham radio and send the message - just think about the best and fastest way to send the message.

## **Anatomy of a Communication Emergency.**

- a. In the early stages of many disasters /emergencies, there is no immediate need for emergency communication services.
- b. Once a potential or actual need for more communication resources is identified, then the authorities put out a call for Hamnet.
- c. Depending on the situation, operators and field equipment might be needed at the JOC or to be set up in field locations or both.
- d. Once operations begin, all kinds of things can happen. The volume of messages can increase and confusion will be common.
- e. Nets will be set up, re-arranged and closed as needs change. Volunteers will need to remain flexible in order to meet the changing needs of the JOC.
- f. Not long after the operation has ended, Hamnet should hold a report back meeting to review its effectiveness of its response, with all its members that assisted.
- g. Critiques, done properly, can greatly improve Hamnet's and your own effectiveness.

## **General Operating Procedures**

1. Once you have established your station, check your access to the repeater, if *t* your group is using one, to check that you have combs and that you are not in a "dead" area. You may be able to hear the repeater but not be able to access it from your location.
2. It must be remembered at all times that transmitting message under emergency conditions, you must maintain the highest standards of efficiency in order to pass the messages clearly with complete accuracy and in a calm manner.
3. When transmitting make sure that you are on the correct frequency and that the frequency is clear of other traffic. You should give your call sign followed by "with traffic", or if you have an emergency, your call sign with "priority traffic". Always talk across the face of your microphone for clarity.
4. Do not use the word "break" unless you have a true emergency.
5. Speak slowly, clearly, distinctly and do not let your voice trail off.
6. Only start speaking after you have pressed the PTT for at least one second to avoid clipping words.
7. Know exactly what you are going to say before you press the PIT.
8. Avoid doubling with another station. Listen before transmitting.
9. The NCS will always leave a pause at the beginning and at the end of a transmission to see if another station wishes to call in.
10. When using a handheld, do not move around as you may lose the link with the repeater.
11. When working via a repeater, make sure the NCS can hear you.
12. Remember to talk slowly and clearly as a lot of operators, under stress, have a habit of talking fast.
13. If you are relaying a message - relay the message word for word as you receive it.
14. Always use "affirmative" or "affirm" for yes and "negative" for no.
15. Do NOT use the Q codes.
16. Always give your call sign at the end of every transmission as per radio regulations.
17. Do only what the NCS requests of you. Do not act as a relay station unless requested to do so by the NCS.
18. Always use the ITU phonetic alphabet when spelling words. Do not invent your own, as all emergency agencies use the ITU alphabet.
19. Always acknowledge calls and instructions.
20. Transmit only facts. Be careful what you say on the air. You do not know who is listening. Accuracy first- speed second.
21. If reporting an accident you must give all relevant information such as, road name, direction of travel, number of vehicles involved, number of injuries if possible and visible injuries, any spillages, race of injured, etc.

22. You must stay at the scene in case the authorities require more information or until the emergency services arrive.

### **Where do we fit in?**

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 terminology.

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.

### **Why Amateur Radio works when other methods don't**

- a. Amateur radio does not rely on wires and communications facilities provided by telephone companies etc, thus it is not prone to disruptions as with the telephone or cell phone system is.
- b. Public Service agencies can only communicate on one frequency whereas Amateur radio operators have a wide number of frequencies to choose from.
- c. Amateur radio operators use a wide range of radio bands, each one with its particular strength in overcoming the different communication barriers. VHF and UHF cover short range communications, while HF provides coverage beyond VHF /UHF.
- d. Amateur radio operators are distributed throughout the community and can respond quickly if there is a disaster. Please note, Amateur radio operators are NOT "first responders" in their capacity as Hamnet .
- e. Hamnet (amateur radio operators) are encouraged to use their equipment regularly which means that it is maintained and operational. Thus we are familiar with the operation and capabilities of our equipment.



# **HAMNET**

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

## **SUGGESTED JUMP KIT**

Hamnet ID card  
Copy of your transceiver licence  
Vhf transceiver (+- 25 watt) if possible  
spare fuses for above radio  
Antenna & or mag mount  
Antenna mast (2x2 metre aluminium mast) if possible  
Extension coax with barrel connectors  
Power supply, batteries (NiCad's & or AA's)  
Extra mic  
External speaker/headphones  
Extension lead (ac)  
Message forms Pen, pencil & eraser  
Extra connectors, cables/patch cords- bnc-pl259, bnc-pl239, etc  
Small tool box  
Soldering iron & solder  
Small first aid kit  
Small torch with spare batteries & globe  
Small ball of string (to hang the antenna)