

Experience and Training

One key to the success of emergency communications is the amount of education, training, and preparedness prior to the event. By learning, practicing, and evaluating prior to the emergency, the overall level of proficiency is raised. During the activation and operation, the time to develop one's skills and knowledge is limited or non-existent, yet this is the time when having that knowledge and experience makes the most difference and has the greatest impact. Because of this, practicing emergency communications is best approached as a team effort scheduled on evenings or weekends; not learning while the actual emergency is happening.

There are a number of ways to develop knowledge and practice. The best way is to learn from the experiences of other emergency communicators, taking the best practices and avoiding pitfalls that can occur in any setting.

Realistic Expectations - When you go out on a real emergency there are several things you need to understand. The four listed relate to expectations and attitude while the remainder of this chapter deals with specific actions that your group will need to handle.

- **Expect confusion.** When we respond to a field assignment, our served agencies are getting their response organized and are often being pulled in a number of directions. Expect that some people won't know why you're there, what it is that you are supposed to do, and for whom. It is important that Team leaders have coordinated in advance and that you only respond when and where requested. *Never* self-dispatch.
- **Be flexible.** Because of the confusion, we must always remain flexible and convey to those we are serving that we are here to help. Your Team officers will attempt to have location directions and contact names for each field assignment before the member goes mobile, but this isn't always possible. Sometimes our function is clearly defined and understood, other times it isn't. Remaining flexible reduces your stress level and proves to our served agencies that you are a team player.
- **Know your audience.** Avoid arriving to a field assignment looking like either Rambo or an attorney. Neither is good; don't overdress. Instead try to look the part that's required. Outfit yourself as appropriate for the situation. For example, don't arrive to assist the base camp of a wildfire in short pants and a tank top, you might be asked to leave because your clothing choices could put you in danger. Stop for a moment, consider your assignment and whom you will be assisting, and make appropriate clothing and appearance choices. Don't arrive like you just crawled out from beneath a rock. Always look clean and well groomed.
- **Be aware of your first impressions.** Some of us are shy, some are outgoing. Some are demure, others are outspoken. Know how others perceive you and adjust your character as needed for the situation. If you are a shy and quiet individual, know that you might have to be bold to find the official or area you have been assigned to assist. If you are typically loud and outspoken, look around you; you might need to tone it down a little. If you are assigned to a police or fire dispatch center, loud talking and bold action are not going to be appreciated by the dispatchers who are assisting citizens with emergency needs.

Simulations and How They Help

Skill is needed for handling simultaneous and multiple activities that can arise during emergencies. The very nature of responding to an emergency affords very little in the way of on-the-spot education and training. It is vital that the education, training, and practice occur ahead of time. Coping with equipment problems, people requesting attention and a response, listening for a station with a weak and distorted signal, all while simultaneously trying to absorb the situation and direct a team effort on and off the air are real-life situations that can occur. Fortunately, there are ways to learn and practice in a broader setting.

Simulations, exercises, and practice nets are proven ways to bring together these elements in a non-threatening and fun environment, develop the composure and skills, provide analysis and feedback, and gain new confidence to rise above any situation.

Radio operators are always in search of new knowledge, equipment, and operating opportunities. The learning and training sessions leading up to the simulations and exercises are excellent ways for specialists to introduce the rest of the team to new modes or techniques. There are a number of things you can arrange to try out and practice before the exercise, then test the team's proficiency during the event. Try alternate frequency and communications modes, such as simplex (non-repeater) operations, SSB, Near-Vertical Incident Skywave (NVIS) for HF coverage, satellite for reliable long-haul coverage, packet and digital modes for passing message text.

Simulations offer a safe environment for being an NCS or liaison/relay station. Other operators are trying out their skill and just as in practicing for team sports, an occasional error or two offers an avenue for review, learning, and improvement. Practice removes the fear, uncertainty, and anxiety of doing something you have not done before. Just that calming effect you feel afterwards with that sense of accomplishment is worth the experience. You have attempted an operating skill that few operators venture. Many operators will shy away from being an NCS, some believing that it is stressful, others thinking it's hard work (both are *right*). Many would rather sit on the side and listen. Being NCS is not a difficult skill to learn and master. The few who have accomplished the skill of handling nets have acquired a skill that is very useful in running and expediting meetings using a roundtable fashion, turning business and project meetings into a productive and enjoyable setting.

The National Traffic System is an excellent vehicle for amateur radio operators to practice relaying large volumes of messages in a timely and coordinated fashion. NTS stations practice originating, relaying, and delivering messages (collectively called traffic) quickly and efficiently. The skills honed with NTS experience remove the hesitation and mishandling that can happen when faced with having to pass traffic with another station that is new to you.

Public Service Events

Public service events are the centerpiece of the training for many *REACT* Teams. These events provide an excellent setting where emergency communicators can practice teamwork and refine their confidence. Many public service events involve operators supporting and coordinating outdoor events such as parades or community fun runs, communicating using handheld radios. These outdoor operators are typically supported by Net Control Stations and/or relay stations using portable or mobile stations.

Public service events are excellent settings for practicing and refining skills on passing informal traffic, juggling amongst multiple operating frequencies, outfitting oneself with radio and personal equipment to comfortably operate in the field for a sustained period, all while enjoying and participating in a community event.

Real emergencies are the ultimate learning experience for emergency communicators.

Debriefing sessions should be held after each major operation to exchange lessons learned to be used for future operations. Since each event typically features a new set of operators, the lessons learned are frequently the same material being conveyed to a new audience. It is a wise use of time to learn from the experience of others and work toward mitigating potential gaps and obstacles rather than repeat past mistakes. Most of the considerations discussed in this manual were gleaned from past emergencies, exercises, and operations.

Teamwork and Attitude

The mission for emergency communicators is to use any available communication technique to forward the message to its final destination. Whether it's via regular telephone, fax, amateur radio, commercial and government radio, Citizens Band, Family Radio Service, or even bicycles; the method is immaterial. What counts is that the message got delivered in usable form to the correct recipient in a timely and accurate fashion so that the recipient could take action.

It is a team effort to relay messages from source to destination. Each person in the chain is needed. Each person in the chain is special.

At no time should anyone be put into a situation that endangers that person or the people nearby.

Move the message in a timely and accurate fashion.

Each emergency is unique. You have to use initiative to find the available and the best paths to route the message to its destination. Standard Procedures and protocols are important, but the message is more important. Do not get locked into blindly following *only* the Standard Operating Procedures if that procedure isn't working.

You need not operate the radio yourself. If necessary, you can turn the microphone or radio over to the person originating or receiving the message.

Whenever the telephone system is available, a phone patch is a desirable piece of equipment when authorized in the radio service being used. Phone patches are authorized in the Amateur Radio Service, but *not* in GMRS, for example.

You may have to dispatch a runner to hand-deliver key messages if the recipient is not nearby.

Emergencies may require creating an operating environment where none previously existed or where existing facilities have been destroyed. In a matter of minutes, you must create a new environment and chances are that it won't happen seamlessly on its own. Recognize and accept this reality; do not rely upon someone else when you can do your own preparations.

The time to prepare personally for emergency and disaster situations is *now*, while there is time to think it through, purchase what you need with no lines at the store, and assemble things into kits and checklists. Your single most important item in the field is fresh water (not beverages such as coffee or soda that will dehydrate you). Personal emergency preparedness is discussed in more detail later in this manual.

Now is the time to read about and learn practical skills such as CPR and first aid. This is a more practical use of time than watching TV.

Don't worry and be distracted about the condition of someone else's equipment and operational readiness.

When you are at your site (or heading to your assignment or evacuation shelter), focus on your own situation first, then deal with other situations as conditions permit. The better your preparations and the faster you arrive at your destination, the faster you will handle your immediate situation.

If you have safeguarded your personal records and key belongings in off site locations such as a safety deposit box, your equipment is already substantially packaged, you have a checklist made to include the last minute items, and a checklist for setting up operations, you've substantially increased your chances of success in an emergency.

Just remember that nothing is guaranteed to go right in a real emergency. Do not wait for someone else to do your preparations. *You* make it happen. *You* provide for your education and results. *You* make it go right.

Remember That You Are Emergency Communicators, *Not* Emergency Rescue Personnel

Keep your ID on you at all times – this includes your *REACT* ID as well as any other ID materials issued by your local emergency management agency or the agency you are serving.

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

Stay out of the "hot zone" unless instructed. You don't want to endanger yourself and add yourself to the casualty list. Follow the directions of your lead operator or the chain of command. You may be required to perform duties beyond just emergency communications. Remain flexible to respond to the needs of the situation.

Test Your Techniques *Before* an Exercise or an Event.

If you want to experiment with a new technique or method, test it before you have a major exercise or event. You don't need more frustration or embarrassment, so why compound that chance when the stakes are higher?

Keep essential spare parts together with the equipment.

Operating Skills

Once you've learned the basics, gain as much on-the-air experience as possible.

Practice before the event. Publicize and hold practice sessions. Plan for them.

One cannot anticipate all the possible problems that can come up in the field, or on-the-air during a spontaneous event. By engaging in on-the-air activities, you practice solving problems spontaneously while simultaneously advancing the mission to communicate.

Don't be *overly* concerned with the problem solving during an exercise. Exercises are not so much about solving problems as about *identifying* problems. Once a problem has been identified, everyone can work together to develop *and test* a solution. What's important is that you experience and learn to cope with multiple, unexpected situations which will help you in future activities. You do not want to deploy into the field with uncertainty or hesitation. You want to work out your "butterflies in your stomach" ahead of time in a safe environment, such as an afternoon or evening net or on simplex with a couple of your buddies. During an exercise or drill, work with the situation as it occurs. Detailed analysis of what might have been a better way to accomplish some task is often best left until the critique after the exercise.

Message handling also means knowing how to find the most efficient route available to send formal or tactical messages between different frequencies and nets. Invest some time to practice and acquire this skill.

Practice being efficient with your time and the use of other people's time (like cutting out excessive chatter and getting immediately to the point) because during an emergency, time is of the essence.

Make your transmissions sound crisp and professional like the police and fire radio dispatchers and the air traffic controllers. Do not use any more transmission time on the radio than absolutely necessary. Someone *is* waiting to use the channel. (That's why frequencies are busy and congested during an emergency.) You don't like it when someone is hogging the channel when you need it, so you should be considerate and keep your time on the air short.

Your Training Isn't Complete Until You Are Confident That You Can Train Another Operator

During an emergency, expect people to walk-on to the project who were not previously trained. You need to feel comfortable training others on-the-job.

Ultimately, you want your trained students to be able to train others. Not everyone is capable or inclined to do this, but for those who can, it's a worthy art.

Operating Practices

Agree on a limited set of frequencies to monitor during the initial stages of any emergency. *REACT* Teams that utilize amateur radio should coordinate with other amateur radio organizations in the area, especially ARES, RACES, and SATERN. If possible, all groups should agree on a single shared frequency as the primary stand-by frequency when an emergency is expected or just beginning. Non-amateur members should consider monitoring the same frequency on a scanner. A repeater is one of the most efficient ways of keeping people informed and coordinated during the early stages of an alert. An HF NVIS frequency has similar coverage and characteristics.

Every Emergency Management Agency *should have* a completed ICS Form 217A COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET that lists radio frequencies designated for possible use. Obviously such a list will not include every possible frequency across all the ham bands or even all the CB and GMRS channels. But it should include every frequency that has been identified for possible use in an incident. In many communities, this list has not been compiled at all or is badly incomplete. In some communities the 217A lists only the local government radio frequencies, in other communities the 217A may have been prepared by the ARES EC and may list only the local amateur repeaters. If an ICS form 217A has been prepared, use it as a starting point. If the 217A has not been prepared, all stakeholders should work together to complete this important planning document.

If the situation is localized, chances are that at least some repeaters are unaffected, so they can be used to coordinate and pass messages. If the situation involves only a small area, you may want to establish one or more simplex frequencies on one radio band (VHF or UHF) for local operations, and a repeater frequency on another band (UHF or VHF) for calling and coordination. Those with dual band radios can take full advantage of this procedure.

If the designated repeater is down, have people monitor the frequency to inform and direct responders to the “new” repeater or frequency. Similarly, have someone monitor the national simplex frequency or a locally agreed frequency.

Establish a Calling Channel

Net operations within a metropolitan area are significantly improved when all stations can hear a common calling channel and move immediately to another frequency to handle the traffic. An amateur radio or GMRS repeater is frequently the best choice as a calling channel, especially if additional repeaters are also available for handling the traffic after the initial contact on the calling channel. Stations should call and confirm a usable frequency, then change frequencies to exchange the traffic. Do not converse or pass bulletins on this calling channel. You want to complete as many requests for contacts as possible. If you have need to pass a long bulletin, announce the frequency (another repeater or HF channel) and time (e.g., in two minutes) where you will pass the bulletin.

If you have the luxury of both VHF and UHF repeaters, consider which to use for a calling channel. The bulk of your traffic will probably be passed using one band, so you'll need a calling frequency on the *other* band to avoid desensing your radio. For amateur operators, this increases the utility of dual-band handheld and mobile radios with simultaneous dual receivers. Monitor the UHF side for calls and the VHF side for traffic.

Establish a Frequency You Will Monitor

Various agencies and nets need to cooperate and encourage sending stations to switch to the appropriate monitored frequencies and call to gain the attention of the receiving stations. If the use of the frequency or the net is directed, get an acknowledgment and permission by the Net Control Station before calling the receiving station.

Use a Scanner Rather Than a Transceiver To Monitor

A scanner has several advantages over a second radio for monitoring activity in the VHF and UHF bands: it scans faster, has more available frequency bands and memory channels, requires less power to operate, frees up your radio so you can talk, and allows you to delegate monitoring to a non-amateur with confidence that they will not transmit when you're not supervising the area.

Minimize the Need for Relay Stations

To the extent possible, communications should be made directly without the use of relay stations.

Each relay station doubles the amount of time needed to send a message. There are factors such as terrain and congested frequencies that greatly influence what can be done, but again, *to the extent possible* find a clear open channel and communicate directly.

Do Not Rely Solely on Radio Repeaters

Repeaters may go down during windstorms, weather situations, earthquakes, etc.

Alternate techniques include VHF/UHF simplex, HF NVIS, and digital modes.

Expect To Operate on Multiple Frequencies, Bands, and Services

There is substantial interference and desense from radios that are operated next to each other. For example, a ten watt VHF 2m FM radio will effectively wipe-out the receivers of all other VHF radios in the immediate vicinity; therefore, you will be limited to only one 2m conversation at a time. If your radio is susceptible to intermod interference from paging companies, you should also expect to be affected by nearby, in-band radio transmissions.

Consider the interaction of multiple radios and systems in the same or adjacent bands and look for ways to diversify your use of radio spectrum:

- UHF – ham 440 MHz/70cm, GMRS, FRS, various business frequencies, and many public service agencies (very common for police and fire departments in cities)
- Ham 222 MHz doesn't conflict with other systems in common use, but equipment is scarce in most parts of the country

- VHF – ham 144 MHz/2m, MURS, various business frequencies, and many public service agencies (very common for police and fire departments in smaller cities and suburbs)
- VHF Low Band – ham 50MHz/6m, a few business frequencies (mostly abandoned), some public service agencies and utilities (still common with some state police agencies, rural sheriffs departments, and rural utility companies), and the American Red Cross national frequency
- HF – Includes frequencies below 30MHz. Mobile ham 28MHz/10m (SSB, FM, and some AM) and CB 27MHz/11m (AM and SSB), low power mobile equipment is readily available at low cost. The lower frequency HF bands are generally only used by the Amateur Radio Service, although a few military units and federal government agencies still maintain some HF equipment. HF is excellent for long distance communications between amateur radio operators, but has limited local applications.

These are very solid reasons to consider licensing in multiple radio services and upgrading your amateur radio license class.

Consider VHF or UHF for local tactical use with another band/service for inter-EOC and inter-agency metropolitan communications. Consider CB and FRS for direct access with the public, which may be essential if phone service is knocked out across a significant area. Consider amateur HF for communications between metropolitan areas or beyond line-of-sight with the minimum use of relays.

Practice Handling Both Formal and Tactical Messages

The national standard for passing formal messages on amateur radio for many years has been the ARRL National Traffic System (NTS) Radiogram format and NTS handling procedures. Messages originated locally can be sent outside the affected area, even nationally without having to be reworked. The NTS "Radiogram" format is discussed elsewhere in this manual. Formal messages within the Incident Command System will normally be written on ICS form 213 for origination and delivery.

More recently the ARRL has advocated WinLink as a partially automated system for passing email via amateur radio.

Tactical messages should be short messages with:

- A recipient.
- A sender.
- A one sentence status or situation, and/or a one sentence request or directive.

Handling Weak Stations

If you have a weak station on the net, consider splitting the net so the weak station won't hold back the operations of the main net. You'll have too many stations on hold waiting while you try to communicate with the weak station. Perhaps another station can be NCS or a relay station, move to a second frequency, and work with the weak station to relay needed information.

Use Tactical Callsigns

You don't have to use a full FCC callsign to ID every transmission. Amateur radio operators are only required to identify by callsign at the end of a transmission or series of transmissions, or once every ten minutes if a transmission or series of transmissions lasts over 10 minutes. The rules for GMRS operators are essentially the same except that the time limit is fifteen minutes instead of ten minutes. Use tactical IDs to name stations at other times.

Tactical Callsigns are most commonly assigned based on the station location and/or function, such as North Street Shelter or Fire House One. Another method, if you have fewer than 26 stations, is give each one a letter unit designation and call them by their ITU phonetics. For example, the first shelter could be designated "Unit Alpha." You can then say "Alpha, call Bravo" instead of wasting time giving out the full callsigns. Every trained operator is familiar with ITU phonetics, so this is nothing new. The drawback to this method is that there is nothing about the designation that helps anyone remember who any station is or where that station is located. In some situations this can actually be an advantage in that it makes information a little more secure from casual listeners (or the media) monitoring the net.

For a relatively stable group, such as a *REACT* Team or an organized ARES or RACES group, individual unit designations can be assigned in advance and the same designation used for every event. This increases familiarity with the designation and makes it less likely to be forgotten in the stress of an emergency or the boredom of a long event.

If you have operating locations, such as hospitals, police, and fire stations, you can use the hospital and substation names as tactical callsigns. These have the advantage of being easily recognized and not changing each time an operator is replaced. The disadvantage, of course, is that the individual operator needs to remember a new tactical call each time he moves.

Remember that you don't even have to give your callsign at the beginning of the transmission series – only at the end. Use this fact to speed up the call sequence. In a well disciplined net there should rarely be any need for both the sender's and receiver's call sign on a transmission.

Use Rollcall IDs for Nets

If an amateur net has been running for a while in a tactical mode, you can take roll-call IDs. Let the NCS call out the tactical call and have the station reply with their callsign (W1XYZ). That's all you need to do. Announce callsigns using letters (W ONE X Y Z) (7 syllables) and refrain from using phonetics (WHISKEY ONE XRAY YANKEE ZULU) (9 syllables), which wastes time and holds up the net. You can also use the acknowledgment to verify that the stations are present and available on the net.

If the net is on a repeater where all stations can hear each other equally, let the stations ID individually in the order of their unit designation when NCS calls for the ID break. This technique works well in a disciplined net with experienced (and alert!) operators, but will tend to break down if more than one or two operators miss their spot.

For Packet Radio, the User Interface Is Most Important

The software and interface for packet radio should resemble e-mail so that clerical, non-radio people can operate the equipment. JNOS, with its Internet-style e-mail interface is recommended.

Packet stations used to receive long lists should have a printer so the list can be used without tying up the station computer. A packet station at an EOC or other prepared location may be able to pass data to the served agency on floppy disks, provided that the format is agreed in advance.

Winlink

Winlink, also known as the Winlink 2000 Network or simply Winlink 2K, is a worldwide radio messaging system that uses amateur-band radio frequencies to provide radio interconnection services that include email with attachments, position reporting, weather bulletins, emergency relief communications, and message relay. The system is built and administered by volunteers and administered by the Amateur Radio Safety Foundation Inc. Winlink networking started by providing interconnection services for amateur radio. It is well known for its central role in amateur radio Emcomm messaging. The system runs several central message servers around the world for redundancy. A subset of HF gateway stations operate since 2013 as the Winlink Hybrid Network, offering message forwarding and delivery through a mesh-like smart network whenever internet connections are damaged or inoperable. During the past decade it increasingly became what is now the standard network system for amateur radio email worldwide. Email via High frequency (HF) can be used nearly everywhere on the planet, and is made possible by connecting an HF single sideband (SSB) transceiver system to a computer, modem interface, and appropriate software. The HF modem technologies include PACTOR, Winmor, and Automatic Link Establishment (ALE). Note that all aspects of Winlink messages are still subject to the regular FCC Rules and Regulations for Amateur Radio.

Operating Locations

Your planning should include consideration of the hazards and special operations needs of various locations such as hospitals, etc.

Be prepared to deploy into the field and an office building.

You may have to operate from an evacuation shelter, which is typically a school cafeteria or gymnasium. Such locations may provide little more than four walls, a concrete floor, a roof over your head, and rows of hard tables and bench seats. School gyms are even worse, having bleachers for seats, no tables, and a floor that must not be scratched and that they may not even want anyone to walk on.

In some areas, the school gym or other large building used for a shelter may be a pre-fab, which is structurally equivalent to a giant lawn shed. The walls will be metal which effectively blocks most radio communications (including cell phones) inside. You may need to locate your station (or at least the antenna) outside or near an open doorway.

If you are assigned to an office building, chances are it is not designed to readily operate a radio station, so you will encounter long coax cable runs and a less than ideal antenna mounting location. Modern office buildings are typically designed so it is impossible to open any windows.

You should also anticipate the possible need to operate outdoors in a field, so get some sturdy and comfortable boots or work shoes to protect your feet and pack some suitable rain gear (such as a decent poncho, not one of the fifty cent “emergency” ponchos). You won’t know ahead of time that the situation may or may not require quality protection for your feet. Athletic shoes can be used in situations that are not hazardous. Use sunscreen if outdoors. Bring along insect repellent and/or insect spray to deal with annoying insects. Store spare batteries, water and other personal items in a fanny pack.

You need to keep in mind that during emergencies, operations will take place at locations that normally do not accommodate groups of people. As a result, you’ll probably find that there may be no accommodations for food, water, restrooms, personal hygiene, and first aid. You will need to prepare and bring whatever you need. Realistically, plan on supplies for at least two more people because you’ll be working in a team environment and there will be other responders. Packaged foods such as MREs, bottled water, prepackaged baby wipes, and rolls of toilet paper are signs of a well-prepared emergency communicator. But also remember that you can’t expect to travel with a truckload of steamer trunks. You need to be able to carry EVERYTHING that you bring.

Equipment

Although we have emphasized the equipment you need to bring (or at least have available), also keep in mind that you will have to carry everything you bring. Sometimes you will have to carry it for a considerable distance and often you will need to carry it all in one trip. Plan your equipment *and your packing* so you can carry everything you need with you. If the minimum equipment for a particular station really cannot be carried by one person, look for the best way to break it down. This may be one large container with good handles for two people, or it may be a couple of suitcases. Whatever your solution, plan how to pack, carry, and transport everything, and try to coordinate the transportation arrangements in advance.

On VHF/UHF, use mobile radios, not handhelds for portable station operations whenever possible. Contrary to popular thinking, handhelds are not good for sustained emergency communications operations, especially in portable operations. Very often, you’ll need to run at least 1 watt, over a sustained period of time. Most new handhelds are very compact and have very small heat sinks. If you operate your handheld at high power, say 5 watts, for more than a few minutes, the thermal shutdown circuit will activate to protect it from overheating. Handhelds are good for monitoring, and the occasional acknowledgement, not for prolonged message handling. The solution is to run a mobile radio on low or medium power. Use a good antenna and a deep cycle battery.

Instead of using more power, improve your antenna. Your signal will radiate better with a better antenna, allowing you to conserve battery power. This will allow you to get more operating time from whatever amount of battery you are carrying.

- Transmitting with lower power also allows more receivers to operate in the same area by minimizing receiver desense.
- Mounting a VHF or UHF base antenna even ten feet above the ground will substantially improve your capabilities. It will also improve your reception.
- A simple quarter-wave antenna provides adequate performance over a wider frequency range than a loaded antenna. A VHF quarter-wave (about 18" to 19") will also perform adequately as a 3/4-wave for UHF. This is especially useful with today's dual-band radios.
- A VHF discone is a nearly perfect emergency base antenna for VHF and UHF. You can find plans for one in most antenna manuals or buy one from several companies. The old Radio Shack #20-043 is typical and sometimes still available. An even simpler and cheaper dual-band antenna for field use is sold by many companies as a scanner antenna. The old Radio Shack #20-176 is typical. This antenna is chrome-plated brass and steel, uses a standard coax connector, is durable enough to last for years and still cheap enough to throw away. Whatever your antenna choice, be ready with something better than a rubber duck.

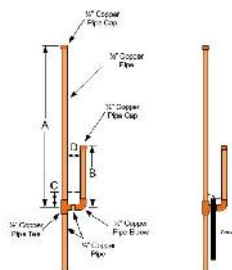


Radio Shack 20-043

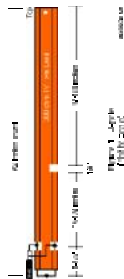


Radio Shack 20-176

- J-pole and "Slim Jim" antennas are easily made and are readily available at low cost. These antennas may be constructed of metal tubing (usually for permanent installation) or flexible wire antennas (excellent for temporary or portable installations). Both the J-pole and the similar Slim Jim are readily available as dual band antennas covering both VHF and UHF. One supplier of high quality Slim Jim antennas is N9TAX who makes dual band versions optimized for ham 2m/70cm or for VHF/MURS/GMRS. Even a ribbon J-pole antenna made from 300 ohm TV ladder feedline is far better than a rubber duck antenna. It is small, cheap, and light. There is no excuse for not using something better than a rubber duck antenna.



Copper J-pole



Twin-lead J-pole



Twin-lead Slim Jim

Be prepared to use 20 foot or longer coax runs to position your antenna in most temporary locations and even longer coax runs if you're in an office building.

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

Make Photocopies of Your Manuals and Store Them with Your Radio

Don't leave the details of how to operate your equipment to your memory. Your mind gets fuzzy when it is fatigued. The manuals give you and others a chance to study your radio during spare moments you may have.

If your manual has a Quick Reference Sheet, make a copy *and laminate it*. If your manual doesn't have a one or two page quick reference section, make your own "cheat sheet" *and laminate it!*

Decide *in advance* whether or not you would ever be willing to let someone else operate your radio in an emergency. If someone else might be operating the radio make sure that all the needed directions are readily available (this may include information that *you* don't need).

Bring Extra Fuses

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

Bring Headphones

There is substantial audio interference from operating in a confined space. Headphones cut down the noise and allow you to hear without interfering with the operator next to you.

Some dual-band radios have a stereo headphone jack. This works well for some operators, but not for others. If you use a dual-band radio (or expect to seriously monitor two radios) try using stereo headphones to see if this works for you.

Try different headphones to see what works well for you and your radio. Good communications headphones are not the same as music headphones. Music headphones provide a wide flat frequency response; communications headphones are optimized for voice frequencies. Some headphones deliver good sound and good isolation (they keep out the outside noise) but they may be too heavy to wear comfortably for very long. Lightweight headphones generally don't offer much isolation.

Some headphones are made specifically to *not* block outside sound, supposedly to make them safe to wear while jogging. Such headphones might help keep you from disturbing others, but won't keep them from disturbing you. Many of today's cheap headphones don't block the sound in either direction enough to be useful. They are really just two small speakers hanging on your head.

Consider Using a Foot Switch, a Boom Mike, or a Base Mike

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

A good boom mike mounted to your communications headset will eliminate most background noise on your outgoing message. Such boom mikes do take some getting used to, so practice before using one in an emergency or public service event.

A desk mike is less work to use than a hand mike, but may have problems with background noise if your station is in a noisy environment.

Standardize on the Type of Batteries You Will Use

If you are successful in standardization of batteries, you'll find that you probably need only two size cells for the majority of your radio and lighting equipment. Typically either AA or AAA and something larger like C or D.

The use of AA alkaline cells instead of rechargeable batteries is encouraged for short-term operations. Try to use newer battery technologies rather than old style NiCad batteries. A set of alkaline or lithium-ion batteries typically has about five times the life of an equivalent NiCad battery, thereby eliminating the weight and bulk of additional battery packs and a charger. You may not have reliable AC power to recharge your batteries. If you are responding to a long term situation with AC power, bring multiple batteries, chargers, and a power strip to simultaneously recharge the battery packs and conserve your alkaline batteries. Always try to have a dry-cell battery pack for any handheld radio.

You may also need a handful of batteries for equipment such as a multi-meter. Know what kind of batteries each piece of your equipment uses, and have them available.

Keep spare batteries on hand, and be sure to rotate your batteries to keep them fresh. When you need a new battery, put the "spare" into the equipment and buy a fresh spare.

You can make up a battery holder for nearly any DC powered equipment. A holder with five to eight size D batteries (depending on the voltage needed) will power a handheld radio nearly forever! And standard batteries are available just about everywhere.

Resources

Resource planning is a major element of preparedness. This is the role of *everyone* involved in emergency response, from the Federal Emergency Management Agency down to each individual responder and the general public. Your role in this chain as an individual responder is to be prepared to provide those resources needed to support yourself and anyone you are responsible for (your family, anyone assigned to work for you, etc.) *and* to ensure that your emergency manager (generally a Team officer) knows what resources you have and any needed resources you don't have.

People Considerations

Shift rotation and overwork

- Radio operators are of value only when they show up at the operations site, and as a result, it's very easy to overwork those operators who respond if there is little response. Team leaders and operators as a whole must recognize this and anticipate bringing in fresh operators to relieve those on shift. Sometimes this means *not* using all available operators immediately when an emergency begins, but sending some of them home (or to a staging area) to rest up and report back as the next shift.
- While most of us are accustomed to working in an office or similar environment for eight hour days, radio operators should be allowed to take a break every hour. Ideally speaking, their shift should be no more than four hours in a 24 hour period, allowing them time to handle personal, work, or family matters.
- Often during emergencies, the demand for emergency communications far exceeds the available operators. A well staffed operation for a site requires a minimum of three operators at a time for adequate coverage and rest *during* a shift. Therefore, such a site would require about 18 operators per day to sustain operations. This level of staffing is very rarely available. Two or three operators dedicated to a single site is the best we can usually expect to see. During continuous operations a site with only two or three operators assigned will require support from non-operator "runners" and will still experience outages, communications failures, and operator burnout.

Lack of replacement equipment (Yes, this is a *people* consideration.)

- Sometimes, as shift communicators leave, they will take back their personal equipment brought to the operation. This is understandable and should be anticipated.
- As people respond to an extended operation, managers must take a moment to find out how long they will remain and ask them if they're willing to let others use their equipment. If they indicate that they can only loan the equipment for a limited period of time, begin putting out a request for replacement equipment early.

Everyone is "stressed out." Some sources of stress include:

- Emergency communications is a very challenging assignment. There's a lot of need being placed on people in a short amount of time.
- Operators need to meet with the appropriate person in charge to establish the working relationship, the boundaries of responsibilities, and the means of handing off working and communications. The person in charge is often too busy for any detailed discussion of these issues.

- Having a work table, lighting and similar considerations for your operating location is often a problem.
- The need to rapidly install equipment and antennas in a safe and durable fashion, dealing with equipment problems, and forgotten pieces of equipment, all are sources of stress.
- For those operating at an evacuation shelter, it is necessary to explain to members of the general public that we're communicators and not shelter managers.
- Dealing with problems and shortcomings on the radio nets, and within the operations center or assigned area.
- The level of fatigue after operating for a period of time.
- Dealing with people's differences in priorities, attention span, and ability to respond voluntarily.
- Demands for information from the EOC or agency headquarters which cannot be met by the on-site personnel.

As these demands wear down the individual's capacity for tolerance, flexibility, and creativity, the person shows signs of stress. People show it as varying levels of irritability and emotional outbursts, which affect the interpersonal relationship present.

Steps are needed to anticipate oncoming stress and mitigate the results after the onset. Some steps leaders should take include:

- Informing the emergency communicators that tensions can form, so don't take anything personally.
- Telling people up-front that we're all in this together, and reminding everyone of the objective. (Since the objective changes from event to event, there is no one single answer. It could be riding out the event, getting out of danger's way, stabilizing and transporting victims to an area hospital, etc.)
- Establishing teamwork and cooperation, and that working together will achieve the most results. We have to make do with what we have.
- Informing each person of who is in charge.
- Looking ahead to secure the essentials for the comfort of those present, such as food, water, sanitation, chairs and mats. Finding out what's available to meet the needs of parents with small children if they are present in the scene.
- Securing a broadcast radio so that those present can monitor progress as reported by the media.
- Activating stress management personnel. While you probably don't have your own people with the necessary skills to lead a Critical Incident Stress Debriefing, there is a good chance that one of the served agencies does. Team leaders should make arrangements for their volunteers to be included in the served agency programs.

Everyone should strive to be cooperative and not bruise someone else's ego