An Emergency Communication Station (Discussion Part III)

Your multimode emergency station, deployed or not, will most likely consist of several pieces including at the very least a radio, a computer, an antenna and a power system. I’ve discussed using a modern multi-mode transceiver in the previous section. As you’ll see in the next part, almost any radio can be used as a multimode transceiver. To review, if you are trying to fulfill needs, consider using WINLINK, CW, SSB or PSK-31 to get out of the hole. Providing a more dynamic response to the event and fulfilling some of the community desires may include you using other modes including VHF FM or UHF FM. Other digital modes like RTTY, or even SSTV are a bonus. It’s also possible you can operate on VHF/UHF digital modes like FUSION, DMR, or D-STAR if you can reach the appropriate repeaters. You will be limited by physics, the capabilities of your equipment and to some extent, your license. Typically, HF modes use radio’s capable of 100 Watts of power, although if using a digital mode, the power may be substantially less. VHF and UHF radios can be of the 50-watt class. Because of power supply considerations, using a linear may not be possible.

Antennas at your home QTH may not be an issue, but might be when mobilized. If you have participated in Field Day, some of the same antenna considerations are in play. For example, I have a large array I can take on the road, but it takes a bit to set it up. Wire antennas are great as long as you can find a way to put them up. VHF and UHF antennas are relatively easy as they are not large generally speaking and don’t take a great deal to set up. Along with the antenna, consider using an antenna tuner to optimize whatever you are using. N7LGN has one antenna that is a non-resonate vertical dipole that requires the use of a tuner, but is easy to set up and quite effective. The drawback is that it takes lots of real-estate for the radial system.

What you can do while mobilized depends on your Individual Capabilities Frontier and the size of the doughnut hole. If all you have is a two-meter five watt handy-talkie with a rubber duck powered by internal batteries, you may be most useful fulfilling needs by providing point-to-point communication within the doughnut hole. This is especially true if the doughnut hole is very large.

Once you determined what you want for a deployed station, location and infrastructure needs to be considered. The package of equipment and location including infrastructure are part of your Individual Capabilities Frontier. Basically, you need a place that is sheltered and not in danger of destruction from hole environmental conditions. As noted earlier, your location could be your home QTH. If at home, I will assume you have a physical structure that can house your station. In other words, you don’t need to pitch a tent. However, a shelter system if mobilized and/or if your home QTH is destroyed may be necessary. There are lots of options to consider including some military grade tents. For example, TEMPER, standing for Tent Expandable Modular Personnel is a great military shelter available on the surplus market. You should note that it takes a few people to erect TEMPER. An alternative is almost any large tent that can hold you and your equipment. Another alternative is to use a travel trailer or motor home. If you don’t have one ask around for someone to make one available if necessary. Whatever you get, consider issues like water, food, heat, cool and even restrooms.

Another aspect of your Individual Capability Frontier is power. If at your home station you may need to provide power other than from the power company. If mobilized you still need to get power for your operations. As noted earlier, that could be generators or storage batteries. With a generator, you’ll need to consider fuel requirements. Even if commercial power is intermittent or in some areas non-existent, there still may be gas stations where you can refuel. Beyond that, some generators are able to operate using LP gas or natural gas. One consideration in your preparations if you are using generators is ensuring your machine can operate on an alternate fuel type.

Using storage batteries is possible when mobilized or at home. You should consider creating a charging system that does not rely on commercial power. Solar is one option. Several of us have constructed power systems that use solar energy to keep the charge on storage batteries. The power system I’ve constructed uses a storage battery running an inverter to supply 120VAC to things like 12 Volt power supplies for a radio, computers, Starlink, and cell phone chargers. An alternative is to provide 12VDC directly from the batteries to your equipment. You can also consider using wind generators for battery recharge. They are efficient and fairly inexpensive.

When you are set up, you need to make it known either through signage or word of mouth that you are there to provide communication services. Somehow, you need to get the word out that you are there to “fill the communication doughnut hole.” In this case, advertising and marketing your services may be necessary.

Record keeping is important. One of my main contentions is that we will be providing third party traffic. Keping copies of messages sent and received is almost mandatory. There are FEMA Incident Command System (ICS) forms that you can use that aid in keeping track of events and messages in an emergency. If you are doing third party traffic, prepare for sending, receiving and delivering messages. People may ask you to send a message then leave. Some time later, you may get a reply. You’ll need to devise a system for delivering those reply messages.

Getting ready for a possible disaster also means it is very advantageous and even necessary to get Incident Command System (ICS) and National Incident Management System (NIMS) training. All the emergency managers in Idaho use NIMS for their emergency operations. Most if not all training is free and available from FEMA. The training is on-line, easy to take and very informative. The ARRL also has free on-line classes that can be taken to help you understand the world of emergency management.

As has been said several times, it is very important to note that prior to setting up a mobilized station or even operating from your home QTH in the disaster area, you MUST coordinate with the on-scene Incident Commander (IC). You may be able to recognize the IC by finding a vehicle or structure with a green light or by asking a first responder who and where the IC is located.

Determining how long amateur services will be necessary depends on the magnitude of the emergency, location, and how quickly commercial services can be restored. Commercial companies like AT&T can set up a portable tower restoring phone and internet service within a day if the emergency is in a large urban area and the company has resources close. Similarly, energy companies will have “all hands on deck” after an event to restore the utility within days if not hours. Restoration of services in rural areas may take longer.

I have talked about terrestrial solutions to filling the hole, but there are also non-terrestrial commercial and amateur platforms available. One subscription service that can offer full internet to people in the hole is STARLINK. Setting up a STARLINK is quick and easy although it does require a 120VAC supply. The down side is that it is expensive. Another consideration is to use OSCAR’s or HAMCUBES for communications, although that may require specialized equipment not easy to mobilize. Also, the available “talk-time” on an OSCAR and HAMCUBES is short. As an aside, development of space-based platforms that can be easily accessed is becoming more prevalent and may be an answer to emergency communications in the future.

These first three parts are a quick overview of how to do emergency communications using the USGS model. I’ve covered the Doughnut Hole, the Individual Capability Frontier, possible modes of operation, station composition, NIMS, ICS, and third-party traffic. If you see more that needs to be covered, please let me know. Also, if you disagree with what I’ve said, let me know. All this is an effort to get us ready for possible emergency operations.

**Late breaking news:** I received a request to specifically discuss WINLINK. As a result, there is a Part IV which delves deeper into the use of WINLINK as a method to send third party traffic for the community or first responders during an emergency.