

## Mecklenburg County ARES<sup>®</sup>

### Emergency Radio Station

## No Net Next week as it falls on Christmas Day!!

Since the creation of Amateur radio more than 100 years ago, Hams have been providing integral Emergency Communication during times of disaster. Assisting our communities and saving lives is one of the reasons many Hams get their licenses. We should all be proud of the capabilities that we possess, our unique set of skills and our willingness to provide assistance to those who are suffering.

Tonight we will review the basic components of an emergency radio station. They come in all shapes and sizes, from a go box, to a mobile communication trailer, to a home radio station. Regardless of their size they all serve to achieve the same goal. And that goal is to reach out and communicate with other stations to bring aid and lifesaving services to effected areas.

The basic components of an emergency station are

#### **Radio –**

ARES primary task is to provide local communication within a 20 to 30 mile radius. This can be achieved with a rather modest rig. Regardless of the brand or model that you use, it is highly recommended that your primary radio for this task have variable power levels so that the most economical use of emergency power can be achieved.

The 2 meter band will be heavily used because of the wide area coverage repeaters that we have available. The 70 cm (440 band) may also be used if the emergency situation is wide spread and requires more band width than our 2 meter repeaters can provide. All of the repeaters that we use have emergency power capability. We will rely on repeaters for at least the first 3 days of an emergency. Most repeaters can be accessed with as little as 5 watts if you are within 10 to 15 miles.

If our repeaters loose power then our primary back up is 2 meter simplex. 2 meter simplex does require higher power levels to achieve the same capabilities as using a repeater.

In summery – the radio or radios that you use for an emergency station should have the flexibility to change power levels to suit the communication methods available. An HT and a mobile radio that has several power levels will suffice for most of the emergency situations we should experience.

#### **Antenna –**

Hams describe the antenna system as the life blood of any station. A good antenna is worth it's weight in gold especially when an emergency occurs. It is recommended that antennas used for an emergency station have gain. An antenna with gain increases our effective radiated power and the distance that our stations can communicate. Gain also enhances our stations receiving ability.

There are many high gain vertical antennas on the market that are a good fit for emergency stations. Directional antennas such as Yagis are also very useful during emergencies if they can be rotated using emergency power. Mobile antennas with gain are usually much longer than zero gain antennas so a gain antenna may not fit your mobile application.

Regardless of the antenna that you will be using, always be sure to check the SWR. High SWR can damage your radio.

### **Feed line –**

It is highly recommended that we use high quality low loss coax for our emergency stations. The best commonly available coax to use is LMR400. A good coax for all around to use is RG8U/RG213. High loss coax like RG58 should be avoided. Using a low loss coax will increase your effective radiated power, increase the range of your radio and allow the use of lower power levels.

### **Power –**

Batteries, generators and solar power systems are very popular with folks constructing an emergency station capable of operating under adverse conditions. Regardless of which system you choose to provide off grid power always check your system periodically to ensure that it will function properly when you need it. Be sure that your batteries are fully charged and have not fallen below the lowest recommended voltage. Batteries that have fallen below the lowest recommended voltage may be permanently damaged and need to be replaced.

If you are going to deploy to a shelter or other similar location the please be aware that generators may not be available immediately and plan accordingly. You may have to operate from your own emergency power until generators arrive.

Be sure to always use a power supply when taking power from a generator. Generator power is notorious for having spikes and dips that may damage your radio if it is connected directly to the generator.

## **Operating Tips**

### **Power Consumption –**

To ensure that we can provide communications for the longest amount of time, especially when operating on an emergency power source, we should use the least amount of power to achieve effective communications. In general, start using the lowest power level of your radio and increase power only if circumstances require additional power to make your signals more readable.

In a long term emergency situation lowering your power can double or triple the time that you can be on the air providing communications. Most manufactures list the power consumption specifications of their radios and there are many sites on the internet where individuals have published power consumption versus power level tables and charts for many of the most popular radios. If you have multiple radios then use the radio that uses the least amount of power.

As an example: An HT attached to a large capacity marine battery may operate a few days but a mobile radio powered by the same battery may only last for a few hours.

### **Maintenance and Upkeep –**

Radios and associated equipment should be tested at least every 3 months to ensure that everything is functioning correctly. Always have readily available equipment to repair coax connections and other integral cables. Tools such as extra coax, solder, a soldering iron, extra coax connectors, barrel connectors and a multi-meter are recommended in every radio tool kit.

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