communications

http://rallyingpoint.org/

One of the most important assets in anyone's home may be a reliable communications system. You can often avoid or prepare for something that is going to happen if you can receive an early warning from reliable sources. But also knowing what is happening as it happens in real times will allow you to adjust or even change your plans as situations develop.

The number 1 warning device I recommend everyone have in their home, vehicle, camp is a NOAA National Weather Service All-Hazards warning radio. This will keep you updated on weather disasters and major national disasters, Have at least one that will run on rechargeable batteries. If you are some distance from the NWS transmitter you may need an external antenna, and definitely will if the receiver is in a shelter. Not only are local warnings given, but the NWS transmissions are the only unified method of national warning dissemination and broadcasting of Presidential Statements in time of national emergency.

Every shelter and vehicle should have a good battery operated AM/FM radio. The shelter should have an antenna wire to the outside, since the radio will not receive very well, if at all, underground or through thick concrete walls. A small twelve-volt or internal battery operated TV is also a good idea. The normal broadcast stations and even today most people can pick up a local station especially with a antenna booster. They can give pretty good reports of a running disaster. But I have found that they can be somewhat inaccurate on details. Even the national TV networks vary considerably sometimes on the facts and figures of a disaster. The things-to-do reports of local radio and TV are fairly dependable for the general public, however.

A better source of information, although you have to interpret it yourself, is the communications of fire, police, and other government agencies using VHF-Lo, VHF-Hi, and UHF FM transmissions.

For the frequencies used by these agencies, you need a good public service bands scanner, preferably one that will run on both one-hundred-twenty volts AC and twelve volts DC. Many jurisdictions are going to trunking type radio systems. If your area is now using the system, or contemplating switching over, get a scanner with trunking capability.

If you can, have a second unit to use for searching for additional frequencies while the first is monitoring your main set of frequencies. You will also miss less during busy times with more than one scanner going. With only one scanner you can hear only one thing at a time, but with several scanners you can keep track of several different situations at the same time. With two or more scanners you can avoid the tactic that some agencies use to try to avoid people listening in. A dispatcher will key up on one frequency to lock up the scanners in the area while the actual information is transmitted a few moments later on another frequency while everyone's scanner is locked up on the other channel.

This same type of programmable scanner can also receive business band and FM marine transmissions, as well as the AM aircraft band.

For the larger picture around the world you need a good quality general coverage high frequency (HF) receiver. A short wave receiver covers most of the same bands but a general coverage receiver will also receive the Amateur Radio bands, which can be a good source of information. Many countries have at least some news programming in English. It is rather enlightening to hear of the happenings here in the United States, and of events abroad from a standpoint other than American.

You can keep up on world events rather easily by tuning in on various international news broadcasts. Plus you can hear other types of communications, including international maritime and aircraft.

A receiver should be one-hundred-twenty volt AC and also use twelve volt DC power. A few models will also use several C or D size batteries. You need an outside wire antenna coming into your shelter to use the receiver there.

It should receive AM, CW, USB, and LSB modes. It should have continuous coverage from at least 540 KHz to 30 MHz . 100 KHz to 30 MHz is better. All the major radio makers have good models widely available in many retail outlets. (Grundig, Kenwood, Yaesu, Icom) The two-hundred-fifty to seven-hundred-fifty dollar price range probably has a model for most. But some models go for over ten thousand dollars if you are so inclined.

If you can understand Morse Code by ear, so much the better. If not, there are interfaces for connecting the receiver to a computer to do the decoding for you. HF general coverage receivers can pick up the transmissions of WWV, the US Time Standard Transmitter in Colorado, or WWVH, the time standard station in Hawaii to cover the Pacific area. These stations transmit continuously, 24/7, simultaneously on 2.5, 5, 10, 15, and 20 MHz.

In addition to time, WWV and WWVH disseminate amateur and shortwave signal propagation forecasts, that is, “skip” conditions. They also give weather summaries and forecasts of a general nature. They give emergency warnings for weather and other disaster situations.

You many want a separate WWV receiver to allow continuous monitoring without tying up your main receiver.

Information input is important, but there will be times that you will need to communicate with others. Telephones should be installed in the shelter, but you cannot rely on phone service during an emergency. The service is just too apt to go out.

AM Citizens Band, the well known CB, will be crowded and there will be a lot of unfounded rumors flying around on the channels. SSB, single side band CB, is much less crowded and generally more stable with less of the wild rumors and more responsible people on the air. An added fact is the double or triple range of SSB over AM.

There are a few areas that have only a few sidebanders, but since sideband radios also have AM capability, you will have both options covered anyway. CB is okay for casual local use as long as you do not depend on it too heavily.

For long distance communications amateur radio is the answer. Amateurs have long been known for their work during disasters. They relay messages for civilians, and even the military depends on them occasionally. I highly recommend that you become an amateur radio operator since it is illegal to operate equipment on the amateur bands without the proper license.

Equipment is available in all price ranges. From low priced simple kits for fifteen or twenty dollars up to ten thousand dollars or more for state of the art equipment. Equipment for disaster communications can be relatively simple. A good transceiver covering the HF bands is probably adequate for most long range uses if a good commercial beam antenna is used.

One-hundred to four-hundred watts power output is also preferred. Yaesu, Drake, Kenwood, and Collins all make excellent equipment, as well as several lesser known companies.

Both twelve volt DC and one-hundred-twenty volt AC power supplies for the radios should be obtained. A separate VFO on transceivers allows you to transmit and receive on different frequencies, an important tactic when static or other interference is a problem. Separate transmitter and receiver combos have this capability built in. Linear amplifiers can be a help, but few that are designed for amateur service can run on twelve volt DC power.

Give amplifiers low priority. Get a good transmatch, an electronic device that matches the output of your radio to non-standard antennas, so you can run simple-to-build antennas if your main antenna is damaged.

For short range communications the amateur radio 2 meter, 1¼ meter, and the 70 centimeter band units, especially the walkie-talkie units, are ideal. These amateur bands are close to the police bands and give comparable service. Hand held, base, and mobile units are available. Coverage up to ten miles between hand held units is reliably achieved with some units. 2 meter operators often use repeaters to extend the range of both mobile and especially hand held units.

These are base stations that receive a signal and retransmit it simultaneously on a different frequency. While repeaters can dramatically extend the range at these frequencies, they are not too common in rural areas, and in a major disaster, they are vulnerable to damage or loss of power. Do not count on their use in emergencies. 2 meter units usually have more range than 1¼ meter or 70 centimeter units, but the band is much more crowded than these higher bands. Choose a couple of popular frequencies in your area, and also a

couple of not too common in your area for a little more private communications.

If you prefer reliable communications to be at least a little more private, you can probably get a Business Band license. This is not the private radio band so many people think it is. Several people in other parts of the country will have the same assigned frequency, but are usually spaced so that there is only minimal interference. However, anyone in your area with a programmable scanner that finds your frequency by searching the bands will be able to listen to your conversations.

Being a much more limited market, business band radios are usually relatively expensive, especially hand held units, but they are highly reliable and give good service if you stick to the major brands.

I prefer the VHF-Low band for increased range, but the UHF band, with slightly less range, is subject to less interference and they are almost immune to EMP damage. I particularly like the Motorola series of hand held units. AC and DC quick chargers are available.

There are a myriad of companies manufacturing Family Radio Service (FRS), Multi-Use Radio Service (MURS), and General Mobile Radio Service (GMRS) short range radios that are adequate for short range use. Some are listed as capable of operating for twenty or more miles. Don't count on it. For around the home, family outings, and convoying, they are a good choice.

There is an important legal fact regarding monitoring of the various bands. You may not disclose to a third party what you have heard, nor may you profit from it for any personal gain. The situation is a little different concerning CB and Amateur Radio, but it is still a good idea to be rather closed mouthed about anything you hear.

As much of the electronic equipment as possible should run on twelve volt DC as well as on one-hundred-twenty volts AC. By keeping an automatic twelve volt battery charger or solar battery charger connected to one or two deep discharge type batteries you will have power for communications gear and emergency lights in case both commercial and emergency power plant

sources fail, or you do not want to be running the power plant.

This also allows you to disconnect everything from outside lines yet still have power to some equipment, and with only one antenna connected, still provide good EMP protection for essential equipment.

You need a good quality, filtered, automatic battery charger of eight to fifteen amp capacity. But keep only one battery at a time on the charger just in case the charger malfunctions. The batteries should be heavy-duty twelve-volt deep cycle batteries, with the sealed type being preferred. They need to be well ventilated so, if you must keep them in the shelter, put them in a protective box where air flow is across them and out the exhaust vent.

If you opt for deep discharge batteries, be sure and use the special chargers made for them. All other cautions apply.

Attach a voltage regulator and a filter to prevent any interference that gets through the charger, or that is produced by the charger, from getting to your equipment if you plan to use the batteries with the charger attached and running.

For reliable internal communications in and around your home and grounds, provide outlets generously both inside and outside for sound powered phones. These are cheap on the surplus market and new ones are reasonable. All it takes is a couple of wires and you are ready to go. Several phones can operate on one set of wires, thereby linking all areas of the house and grounds in a reliable communications net.

With all the various communications equipment you are likely to have, you need a good antenna system to get the maximum use from your equipment.

For simple AM/FM portables, string a length of just about any kind of wire outside the shelter, and run one inside. Just bring the radio close to the part of the wire inside the shelter. This is an absolute minimum antenna system.

Most general coverage receivers have a terminal for a single long wire antenna, the longer the better for reception. This same wire, of course, would

do also for your AM/FM radio.

Even if you live in the city and can use rabbit ears for TV reception, you will need an antenna outside the shelter if you plan to have TV inside the shelter. The type and size depends entirely on the reception characteristics of the area. A set of rabbit ears just outside the door might be sufficient, or you may need a super-fringe antenna as high as you can get it.

For CB, a well constructed ground plane will do for strictly emergency use. During high sunspot activity, you may need some type of directional antenna, particularly if you use the CB on a daily basis.

Scanners generally use a small pullout antenna similar to that on an FM radio. Again, if the scanner is to be used inside the shelter, you will need an external antenna. Besides, you will hear much more with one, especially the mobile police, fire, and ambulance units. A strong, well constructed ground plane will do. And you can use coaxial tees to feed all your scanners from one or two antennas without too much loss in performance. The National Weather Service radios use the same antennas as the police scanners. For VHF amateur bands, a simple vertical ground plane for each band will do.

To get the maximum from your HF amateur gear, you need a versatile antenna system. There are ground planes cut to work on the 10 through 80 meter bands that do a good job. They are designed to cover just those frequencies that amateurs use. There are beam antennas with from two to six elements designed the same way, to cover only the amateur bands of 10, 12, 15, 17, 20, 30, and occasionally 40 meters.

These factory made antennas are excellent for everyday use, but the beams tend to be susceptible to physical damage in a disaster. With a good antenna matcher (transmatch), you can use any reasonable length of wire and two or three insulators for an antenna and still do a good job for emergency use and, in fact, this is all many amateurs use anyway. Single or multi-band dipoles are acceptable for emergency or everyday use.

A beam for use with both shortwave and amateur radios requires a wide bandwidth configuration instead of the limited width of most amateur beams.

The only practical beam I have seen is a log periodic array. They are very large and expensive. They are rather difficult to build from scratch, unlike most other types of antennas. Continuous coverage from 3 MHz to 30 MHz is available in various combinations. If you want a directional antenna for shortwave and amateur frequencies, this is the way to go.

The various antennas should be mounted on a strong tower. Avoid the common TV mast. It is much too flimsy. I do not particularly like the various TV store variety of telescoping poles either.

A three leg tower using zigzag bracing is best. There are several strength ratings available and most look essentially alike, so ask about the strength. If you mount very many antennas on the tower or if it is over forty feet tall it should be firmly guyed to properly installed ground anchors using steel cable, not light clothesline wire, and using steel turnbuckles to maintain the proper tension. The tower should have a hinged base to allow easy tilt-over, so you can work on the antennas without the need for climbing and working from a somewhat exposed and precarious perch.

There are retracting, fold over antenna towers taller than forty feet that do not need to be guyed. They are very expensive.

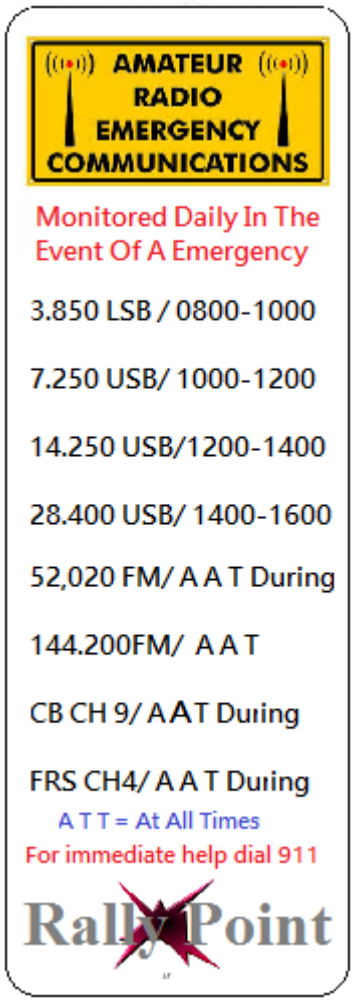
The base of the antenna should be grounded to a good ground rod. Galvanized conduit running underground from the tower into the shelter should be fastened to earth grounds at each end.

The coax lines feeding into the shelter should be in conduit, and run as close to the radios as is practical before exiting the conduit. Expose no more than enough cable to easily go to the individual equipment.

For EMP protection, install Gas-Gap protectors on a coax tee fastened to the radio and fasten the coax to the other arm of the tee. All power lines and all other lines entering the shelter should have Thyristors across them, and to ground, for EMP protection. Confer with an experienced electrician for more information on the use of Gas-Gap protectors and Thyristors.

You should maintain an extensive spare parts inventory for each piece of

equipment where it is practical to do so. You also need to keep spare antennas to replace any damaged during a physical disaster



We at Rallying Point have put together a communications plan as you see to the left. We try to monitor certain frequencies at certain times. How ever we are unable to cover all areas at this time our hope is that as our membership grows so does our ability to cover more areas and more disasters.

As we continue to develop this plan we will be releasing several guides as a companion to this file. If you know other amateur radio operators interested in survival and preparedness please suggest they consider joining us at rallyingpoint.org