

Ham 152 - Ultimate emergency simplex

Dr. Marc & Rosemary Durham, Theway Labs, Bixby, OK © 241219

What radio should I get for emergency?

That was a great question. Answer: There is no easy answer. It depends on the emergency. For a catastrophic scenario, assume the power is off and there is no cell service. We have seen variations of that in the past year, so it is a reasonable design consideration. Under that situation, after the batteries run out, there is no repeater, anywhere locally. So, you are now SIMPLEX!

Who do you want to talk to?

You can talk to Europe or the coasts. That is cool and relatively easy; but can you talk across county? That is hard. Atmosphere and physics create three ranges: local (~20 mi), regional (up to 400 mi), and national. Hills, buildings, trees, and other barriers reduce the distances.

Distance determines which frequency may work, which determines the radio and antenna.

Space waves, which are near line-of-sight (NLOS), operate at VHF and above. A vertical antenna is typical.

Surface waves, which may go beyond line-of-sight (BLOS), are predominant in upper high frequencies generally using omni-directional vertical polarization.

Sky waves, below about 10 MHz, reflect from ionosphere. For more local, use a near-vertical-incident-skywave (NVIS) antenna. These are a horizontal or an inverted-Vee. For DX below 28 MHz, use dipole or long wire.

Even if operating on the same frequency, a DX antenna does not work for local, because of differences in angles.

For local, normal every day communications, VHF repeaters win hands down for quality, simplicity, and coverage. UHF has shorter range, but can fill in gaps. Its big win is it requires a much smaller antenna.

Challenges. According to the First Law of Thermodynamics: "There is no free lunch." Every choice is a trade-off. Simplex is simpler, but does not have the same coverage. Remember, it is near line of sight. Even if you can communicate on one-band simplex, you may not on a different band. Practice often to find out. Barriers change with frequency, time of day, and the seasons. Clouds, raindrops, and atmosphere conditions change. Wind moves antenna relative positions and tree leaves. How do you know what is happening? You do not. If it does not work, try something else. A Tech license is suitable on 70-cm, 2-m, and 6-m.

First choice for Simplex is 2-m VHF. You already have the radio and antenna. Just change frequency. It works well. UHF 70-cm may be a poor choice, because of very line of sight. Still, you have the equipment, so try it.

The magic band, 6-m, is very good. FM sound quality and noise is good. The range is generally better than 2-m. The wide bandwidth makes antennas easier to tune than HF. The wavelength is short enough that a reasonable antenna is possible most anywhere. Some DX is possible, but atmospheric changes are not dependable for emergencies.

The HF high band, 10-m, is very similar to the old CB on 11-m. The antenna is longer than 6-m. Techs cannot use FM, and bandwidth begins to narrow. Uniquely to this band, the same vertical triad antenna can talk local and DX to the coasts.

These four bands are best for local, simplex, emergency communications, using FM. A 6-m and 10-m triad combination, with loaded, tuned inductors, requires only one coax. Both 2-m and 70-cm are on a 9" CompacTenna with only one coax. A duplexer like Comet CF-530C isolates 6-m and below from 2-m and above. If you add a duplexer, one coax to the radio covers all four bands, Coax may be cheaper. The TYT TH-9800 radio works well on all four bands, is inexpensive ~\$300, and small w/BTech RPS30M power. TYT trade-offs are a sometimes-difficult display, less intuitive, and a little less flexibility. Still, it is viable.

Attic antennas are affected by metal ducting, wires, and electrical appliances. Move antenna to change effects. With metal roofs, try antenna near the gable-end for some exposure. Alternately, put antenna under eaves. It works well. Check Scooter's under metal and mine. This is lightning country. Outside antennas, away from structures, bring lightning inside. Install more lightning protection and grounding than you think you need.

Test your equipment and practice often to know whom you can reach in an emergency. A rag-chew Simplex net follows the regular net to allow you to test with the whole team.

VHF	146.470	ch. 11
UHF	446.025	ch. 14
6m	50.330	
10m	29.250	

Handheld not reliable
for emergency.

Life is good. Enjoy!

