Which Radio Is Best for Emergency Comms?

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The most common question among amateurs newly interested in emergency and public service is "what radio should I get?" I hesitate to recommend specific rigs, but I offer my thoughts based upon experience. It's tempting to get "one" rig, with "everything in one box," such as the IC706MkIIG or FT100D. They are neither the best 2-meter rigs nor the best HF rigs, but they do work. I don't favor this concept, but many do.

Rigs for EmCom should have been on the market long enough to have established a deserved reputation for reliability. If you favor the "one rig does-all" approach, I lean towards the IC706 simply because it has been in production long enough to for them to get most of the "bugs" out of it. You don't see many used IC706s when you consider that over a million have been sold worldwide. Many FT100s and FT817s are listed on the Internet, all the time, which suggests that impulse buyers were less than satisfied.

Keep equipment that works and sell what doesn't. Don't change very time a new rig comes out. Encourage others in your unit to quasi-standardize on proven rigs.

Seek equipment, which is simple to use, rugged and reliable. Controls should be intuitive and easy to "figure out." Personally, I find neither the IC706 nor the FT100 very user-friendly. Small displays, controls, layered menus and keystroke combinations defy anyone not familiar with it, to use one effectively without the manual.

Practice Redundancy! Multiple radios are better than one. Otherwise if your only rig fails, you then have nothing!

Get a 2-meter or dual-band FM mobile first. A good mobile costs no more than a HT, but has far better simplex capability. If you don't drive or have impaired mobility, THEN get a HT first. A HT is still needed as a spare and for "walk and talk" operation, but most people should get it later. If you have a General license, an IC706 makes more sense for your "go kit" instead of a 2-meter or dual-band mobile. If you can only afford one rig, get the very best that you can afford. In rural areas, a sturdy single-band 2-meter mobile is still an entirely viable choice.

In suburban areas I recommend a dual-band mobile *which also has DUAL RECEIVE.* In high RF urban environments 2 meters sometimes is not useable at all due to intermod. Often two meters is simply is less effective in the urban environment due to terrain and building attenuation. Emergency nets in urban areas may require you to work from inside, out of and around steel-reinforced buildings where VHF simply doesn't work very well. UHF and 220 are often more effective. Every urban RACES member should seek at least a HT, which works on either 220 or 440.

The 220 band has much to recommend it for EmCom. It has a lower noise floor, much quieter signals and fewer problems with intermod. "220" gets in, out and around buildings almost as well as UHF, but has better simplex range which is similar to 2 meters. If you must tie up a repeater or simplex frequency for an extended period for a public service event, you won't inconvenience many users, if you use 220. An advantage of 220 is that most scanners don't receive it. We also recommend 2m SSB for new-sensitive traffic that you would rather not have the public and news media listening to.

No amateur mode is "secure" in the national security sense. However, using amateur bands and modes not received on common consumer scanners is more "discreet".

Using modest output power of 25w and a compact horizontally polarized antenna such as a loop, 2 meter SSB is highly reliable for portable and mobile units up to 100 miles. It provides a good alternative to 75-meter SSB for "short path" during high SFI or solar storms when HF is unreliable for short paths beyond FM repeater coverage.

For 2 meter SSB to work reliably for your organization, enough of your operators must have it. This again weighs in favor of the IC706, though I still prefer separate 2-meter all-mode and HF rigs, because they generally have superior individual performance and provide system redundancy for reliability.

Any amateur equipment used for EmCom should be frequency agile and capable of being readily programmed from the keypad in the field and have at least ten programmable memories and CTCSS encode. CTCSS *decode* and receive outside of the amateur bands isn't needed. You shouldn't listen to anything except your assigned net. Don't use a transceiver needed for "Comm" as a "scanner" because you may be distracted by other events and miss important traffic to you.

Mobile radios, whether single or dual-band, should be simple to operate and rugged and have a large and easily read display. Transmitter output should be at least 25w output per band; ten memories per band, with CTCSS encode.

Intermod rejection is important but receiving outside the amateur bands is not.

Many amateur rigs, which receive outside the amateur band fail miserably in intermod rejection, so carry a notch filter. In Virginia RACES experience filters from Par Electronics are the "best bang for the buck."

An HT for RACES must be able to operate from three power sources: 1) its NiCd or NiMh battery pack, 2) from AA batteries using a battery case which fits the rig, and 3) from an external DC source using an adapter cord capable of connection to a gel cell battery, cigarette lighter plug or regulated power supply.

My HF rig is an older Yaesu FT900CAT mobile, equipped with a head set / boom mic and hand mic, connected to an MJ-89 mic switch which permits using either the hand mic or a boom mic with headset connected to a foot switch for use in high noise environments. This is mounted in a quick-detachable mobile mount in a Pelican box. If limited to ONE HF radio it would be the FT900, because its controls are intuitive, simple and straightforward on the front panel. It has a large display, very loud audio, built-in antenna tuner, effective noise blanker works, sensitive receiver with IF shift and notch filters and you don't need a manual to use it if unfamiliar! The only thing it lacks which newer rigs have is Digital Signal Processing. I use the Am-Com Clear Speech DSP speaker for noise cancellation, which is very effective.

My portable field-deployable HF antenna consists of paired hamsticks on quick disconnects for 40 and 75m on quick disconnects, which can be used either on-the-go use on the vehicle ball mount, or mounted horizontally on a dipole adapter with 25 ft. of mast. I also carry extra hamsticks for 10 and 20 meters. If space is available, I also carry end-fed wires, 32 ft. for 40m and 55 ft, for 75m which are readily connected to my mobile antenna mount.
Crimp and solder 3/8 ring terminals on one end of the wire and bolt them onto Hamstick quick-disconnects. On the other end, tie a "dogbone," 50 ft of nylon line and a 2-oz. Surf casting sinker, which can be thrown up easily into the nearest tree to erect the wire as a low sloper. This works much better than a hamstick dipole or mobile whip. I also carry a military mast kit, two BCI Group 27 deep cycle batteries (total 190ah capacity) and two Siemens SM20 solar panels for battery charging.

All three of my vehicles have mobile radios. The 1984 Jeep I use for a RACES vehicle has the Yaesu FT900 HF and a Yaesu FT5100 dual-band 2m/440. The family passenger car has Kenwood TM742A with 2m, 220 and 440 modules installed, using a tri-plexer to connect it to a tri-band mobile antenna. My alternate commuting vehicle has a Kenwood TM255A all-mode with 5/8 wave whip and a KB6KQ halo on an A/B switch and an extra power cord from the battery which enables temporary installation of an HF radio, if needed.

I have a boom-mic, headset in the go kit for the TM255 all-mode which also works on the TM742 tri-bander, if its multi-band receive is needed for a command post or net control. Rigs are in quick-disconnect mounts to enable quick removal for portable use at a shelter or other fixed station. Another FT5100 dual-bander is mounted in a Pelican box with 17ah gel cell battery, 25 ft. of coax, dual-band mag-mount, extension cord and 10A power supply which can be deployed at a shelter or as a cross-band repeater.

For portable auxiliary power I carry either a pair of BCI Group U1 AGM batteries in .50 cal. M2A1 ammunition cans, which provide 64ah capacity, or a single Yuasa NP65-12 gel cell 65ah battery with retractable handles. I also carry a 20amp AC power supply, a Schumacher SE-600, 6A gel cell charger and 100 ft. heavy-duty UL-rated extension cord on a reel.

Good field deployable dual-band antennas are the Diamond X50N or Cushcraft AR-270, which are compact and fit easily in a vehicle for transport. While dual-band for 2m and 440, either "works" for low power on 220, with acceptable VSWR as an expedient tri-band antenna. I carry a mobile antenna adapter with mast clamp and radial kit as an extra field antenna.

My primary dual-band HT is a Yaesu FT50R. For it, I have three NiCd battery packs, a AA case, external DC power cord and 7ah-gel cell battery. My "spare" HT which stays in my "go kit" is an older Standard C558A, which I actually like better for RACES applications than the FT50R because it has dual receive.

In my go kit I keep two AA battery cases for the Standard HT, a Mirage BD35 dual-band brick amp, Comet CX722A dual-band half-wave rigid antenna with BNC, an extra CX72A flexible dual-band antenna, fused 20 ft. AWG10 gage power cord with battery clips for connecting the brick amp to a car battery, a KPC-3 TNC, laptop and 17ah gel cell for portable packet operation.

My "Extra" loaner and spare HT is a converted GE M-PD public safety radio which is type accepted Class "C" for use outside the amateur bands. It has a total of 46 RACES, VHF-marine, CAP, ground-SAR, EMS, fire and local government frequencies pre-programmed for emergency use.

The above doesn't provide "all" the answers, but I hope will provide your RACES or CERT team with some good "thought starters" for your emergency equipment and "go kit" planning.

(Graphic deleted to reduce file size by 1.7 meg to make file more assessable to those with slow speed Internet connections)