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What is the Best Radio for EmCom?

The most common question among enthusiastic new amateurs interested in EmCom is "what radio should I get?" Hams may fantasize about the perfect "one" rig, with "DC to daylight all in one box." If you can afford only one radio, an HF+VHF+UHF rig "may" be a viable choice. But the "do-everything" radio may, does so on only one band and mode at a time. It's neither the best 2-meter rig nor the best HF rig. Though it works for some people, I don't favor the "one-radio does all" concept. You must evaluate it for yourself.

Rigs for EmCom should have been on the market long enough to have established a reputation for reliability. If you want to follow the "one rig does-all" approach, the IC706 in its later Mk. II and MkII G versions has been in production a long time and is improved from the original, so there are few "bugs" in it. You see few used Mk IIs linger for long on the used market, although over a million 706s of all variations have been sold, which speaks well for the basic model. You see more used FT100s and FT817s, which suggest to me that impulse buyers were less than thrilled. Keep equipment that works and sell what doesn't, but don't change whenever a new model comes out.

Encourage others in your EmCom unit to quasi-standardize on the same models of proven rigs, so it is easier to use each others equipment. Radios for EmCom should be simple to use, rugged and reliable. Controls should be intuitive. Some newer rigs are not user-friendly, because small displays, confusing controls, layered menus and obscure keystroke combinations defy anyone from guessing how to use one without the book around.

Practice Redundancy! Multiple radios are better than one. If you put all of your eggs in one basket and the one rig you have fails, you have nothing!

If you drive a car, get a mobile rig first. A modern 2m mobile costs little more than a HT, but has far better simplex capability. For newly licensed un-coded technicians a sturdy 2-meter or dual-band mobile is a viable choice of first rig.

If you don't own a car or drive or have impaired mobility, THEN you should get an HT first. For most people the HT is the second rig you get later. Everyone should have an HT as a spare, and for solo foot assignments away from the vehicle. Get the best one you can afford.

In suburban areas a dual-band mobile makes the most sense. If you can, try to find one which also has which also has DUAL RECEIVE. In some high RF urban environments 2 meters may almost useable due to intermod. VHF is less effective in and around high rise buildings, and urban ground clutter due to shadowing, reflection and building attenuation. Having UHF or 220 capabilities make sense in urban areas, due to better

building penetration, depending upon repeater availability. Almost anywhere in the country there are more unused 220 and 440 repeater pairs than 2 meters and it is much easier for your group to get coordination.

Emergency nets may require working from inside, out of and around steel-reinforced buildings where VHF simply doesn't work very well. Every urban ARES or RACES member should seek at least a HT, for either 220 or 70 cm. If you will operate both voice and packet nets from locations in close proximity, putting them on different bands reduces problems with receiver desense and interference.

The 220 band has a lot going for it for EmCom. It penetrates buildings about as well as UHF, with better simplex range, similar to 2 meters. 220 also works very well for simplex, with a low noise floor, and range much like 2 meters.

In mobile ops 220 has less intermod than 2 m or 70 cm. Another advantage of 220 is that few scanners receive it, which makes it better to relay things you'd rather not read in the newspaper tomorrow. No amateur mode is "secure" in a national security sense, but using bands or modes not received on common consumer scanners, such as digital modes, SSB on 2 meters and any mode on the 220 band is more "discreet".

2 meters SSB, if enough people have it, works well beyond repeater range, when HF conditions are not in your favor. It is a viable alternative to HF for "short path" during high SFI or solar storms when even 40, 60 and 75 meter NVIS is unreliable for those "short paths" beyond repeater coverage. Using modest output power, such as 25w into a compact, horizontally polarized loop, 2 meter SSB is generally reliable for portable and mobile units to about 100 miles. This weighs in favor of the "do everything" radio, by providing long-haul capability which can be exploited by your un-coded techs.

If you have a General license, the one rig does all in the vehicle may make more sense for you than an FM only mobile. But you still have the disadvantage of listening and working only one band and mode at a time. Installing multiple antennas for different bands on the vehicle, getting power to the rig(s), addressing fuel pump and alternator noise to get decent HF mobile performance can be a challenge for new operators.

Any amateur equipment used for EmCom should be frequency agile and capable of being readily programmed from the keypad in the field and have not less than ten field-programmable memories and CTCSS encode. CTCSS decode.

Intermod rejection is important but receiving outside the amateur bands is not. Many amateur rigs with wide receive fail miserably in intermod rejection, so carry a notch filter. The ones made by Par Electronics offer the best "bang for the buck."

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. If your served agency wants you to monitor their nets they will issue you a radio.

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

An HT for EmCom should ideally 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, cigarette plug or external power supply.

My personal HF rigs are Yaesu FT900CAT mobiles. These are discontinued, but fairly common used. They are great rigs because the. Controls are intuitive; the ones you use on all the time are on the front panel, which can be remoted. The display is large display, the rig has very loud audio, a built-in antenna tuner, an effective noise blanker, a sensitive receiver, IF shift and notch filters. If you know how to use almost any HF radio, you don't the manual to an FT900. The only thing the FT900 lacks which newer rigs have is Digital Signal Processing. I use the ad-on Am-Com Clear Speech DSP units for noise cancellation, on mine, which are very effective.

I live the FT900 so much I couldn't bear the thought of being without one if a rig needed to go to the shop for repair, so I use three identical HF rigs for base, portable and mobile. These have been modified for 60 meters and are programmed alike. My base radio is equipped with a Gregoire head set / boom mic with Heil element. The hand mic and headset are connected to an MJ-89 mic switch and the Clear Speech DSP unit, which permits using either the hand mic or a boom mic headset connected to a foot PTT switch.

My portable HF is another FT900 stored in a quick-detachable mobile mount bolted into a waterproof Pelican box. The field deployable HF antenna is a set of paired ham sticks on quick disconnects for 40, 60 and 75m. One of each pair may be used on-the-go; or when stationary, mounted horizontally on a dipole adapter with 25 ft. of military mast on a tripod base.

If I know I will set up stationary and not need to move quickly, I carry end-fed quarter wave wires for each HF band with dog bone insulators, 100 ft of nylon cord and a weight to throw up into a tree. Then I just drive the Jeep forward enough to draw the wire out as a sloper, connecting it to the mobile antenna mount using a ham stick quick-disconnect.

My primary EmCom vehicle is equipped with two batteries. The single-band VHF and UHF rigs are connected directly to the Optima "red top" AGM battery which is the vehicle starting battery. My HF rig is connected directly to a Yuasa NP65-12, 65ah gel cell which is boxed and strapped behind the front passenger seat. The auxiliary battery is charged on the go through a 10A fused cigarette lighter plug using AWG14 gage wire from a dashboard power port which is "hot" only when the engine is running. I also carry a military mast kit, two Group 27 deep cycle batteries and two 20w solar panels for battery charging.

The family car has two stacked 2 meter and 70 cm radios. The 2 meter rig is a Kenwood TM255 all mode and the UHF rig is a commercial ICOM which is programmed both with GMRS for which I am licensed, and 70 cm band. The VHF and UHF mobiles are duplexed into a Diamond SG7200 dual-band antenna mounted on an NMO through the trunk lid. A mast mounted horizontal KB6KQ loop is also connected to the TM255 via an A/B switch into the 2 meter side of the mobile duplexer.

I have an extra spare power cord connected to the battery which exits the firewall through the glove box, out of the way and coiled up. This is quickly, accessible to get going again if a primary cable blows a fuse, or to enable the temporary installation of an HF rig using a 6-pin Molex to OEM-T pigtail. If you run an HF rig using a standard mobile power cord, limit transmitter output to 50w with the smaller AWG 12 gage wire and 15A fuses.

My old FT5100 dual-bander is set up to carry for portable operation 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 regulated power supply, a 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 dual-band HT is an old but reliable Standard C558A with 200 channel expanded memory. In the go kit I carry two AA battery cases plus an external DC power cord and 7ah-gel cell battery. I like the old Standard better for EmCom than most new rigs because it is as solid as commercial radio, with dual receive and the best intermod rejection of any amateur HT I have used.

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.

I hope this article provides you with some good "thought starters" for your EmCom and radio "go kit" planning.