Are CB, FRS/GMRS, Marine, or MURS Radios "Good Enough" for Emergency Communications?

As both an amateur Radio operator of 35 years and an individual that's involved in the prepper field (both personally and as a vendor), I agree with most other ham radio operators and FEMA officials that the "best" grid-down communication tools normally involve ham radio gear at some level (see http://www.arrl.org/news/fema-administrator-calls-amateur-radio-the-last-line-of-defense) for more info on how FEMA views amateur radio's national and international communication capabilities.

You might also enjoy watching a 5 minute video entitled "**Katrina - the Untold Story**". **It's about how amateur radio operators re-established desperately needed communications throughout the huge area hit by Katrina**. See it for yourself at: https://www.youtube.com/watch?v=IvvvYdILHqM.

The problem for many folks is that their first step into the world of two-way radio frequency (RF) communications may not involve ham radio, sometimes due to their perception of difficulty getting started, or cost, or them not knowing the requirement for morse code is long gone, or even them not understanding how the different ham radio bands allow us to "target" our range (vs. a single band like CB, FRS/GMRS, Marine or MURS).

I'm not one of those ham radio guys that believe that ham radio is the "only" way to go for EMCOMM (emergency communications) either, although I agree it's normally the best overall way to go, but not because of any ego or my Extra Class amateur radio license, it's because of the vast ham radio infrastructure located all over the world available to any licensed ham radio operator with the proper level of license.

According to the ARRL (or Amateur Radio Relay League, the main club of ham radio operators within the U.S. with over 150,000 members), we have just over 22,000 repeaters in the U.S. as of January 2015, with thousands more located all over the globe.

Let me give you just one example of how that vast existing infrastructure can make a huge difference. Let's imagine a tornado (or fire, flood, etc.) that sweeps through an area, wipes out the local electrical grid, takes out the cell tower(s), destroys the local public service repeaters (Fire, Police, etc.), and takes out the local GMRS and ham radio repeaters, plus generally wrecks the community with downed trees, power lines, etc.

So if everything involving local communications is toast - including the local ham radio repeater tower(s), GMRS repeaters, and all public service repeaters, what's the difference between using a small 5 watt handheld (HT) ham radio vs. a FRS/GMRS, Marine, or MURS radio?

Simple, it's the vast quantity of communication options still available to the licensed ham radio operator, both with more repeaters ***and*** more HF bands to use. Since we have 22,000 plus repeaters located within the U.S., the odds of another ham radio repeater still being within range (and unaffected by the tornado, fire, or flood) is quite high. Adding up the multiple individual bands of ham radio repeaters in California, for example, revealed more than 2,447 machines within that state.

I live in AZ, which shows 567 amateur radio repeaters, many of which are mountaintop machines that provide 50 to 75 miles (or longer) coverage area with just a simple handi-talkie, or HT. Your coverage area may vary (depending on the height of the repeaters available and your local terrain), but if a tornado (or fire, flood, etc.) wiped out the downtown area where I live there are still 50 to 100 different ham radio repeaters that I can use in all different directions, and having so many options provides additional backup communication capabilities that I can depend on, because even a monster F5 tornado (or fire, flood, etc.) isn't going to destroy that many ham radio repeaters in a 360 degree pattern over 50 to 75 plus miles.

Many of these repeaters also have one or more backup power sources available, and many of them also support IRLP, D-Star or EchoLink modes, allowing those same small HT radios to "link" one repeater to another - thousands of miles away if needed.

This linking technology is available for free, but you do need at least the entry level Technician Class amateur radio license to make use of both these repeaters and the linking capabilities of them. Imagine your ability to contact your family or friends (perhaps even living in another state) to let them know you're ok just minutes after a disaster strikes - when the phone lines are down and even the Red Cross hasn't arrived on scene yet. **Hams enjoy the security of knowing they can get a message through in virtually any situation (without depending on a fragile wired or wireless infrastructure that can easily fail or be overloaded) when a man-made or natural disaster strikes**.

So by now, you're probably convinced that a small ham radio HT (or a mobile unit) will provide much more range (with repeaters) than anything else of similar size, cost, or weight. What about comparing the unit(s) without using any repeaters, are there any advantages to ham radio then? Sure, but first let's explain the various radio(s) you might already have (or are considering for purchase) and what their capabilities really are (vs. the marketing hype from the manufacturers).

FRS (or Family Radio Service) units are all 1/2 watt radios with non-removable antennas that will normally provide a range of approximately 1/2 mile. FRS/GMRS combo radios usually have all 14 FRS UHF channels and 8 more GMRS UHF channels, but these combo radios have their own set of limitations as well, including the non-removable factory antenna, plus their power levels are automatically set within the radio (1/2 watt on all 14 FRS channels, and normally up to 2 watts on the 8 GMRS channels, but some radios claim up to 5 watts on the GMRS only channels).

Due to the extremely short range of FRS radios, I refer to them as FRS-D units (or **F**or **R**eally **S**hort **D**istances). Real life FRS/GMRS range is very different than the "*Up to 50 Mile Range*" marketing hype shown on the new radio boxes at the various big box stores in your neighborhood.

Marine band handheld radios have specs that vary widely and are normally used by boaters, but in general have 16 VHF channels (but can have as many as 88 channels). Many (but not all) have non-removable antennas as well which help keep some (not all) of the marine handheld radios waterproof. Most units have 1 or 2 watts output, but some radios claim up to 5 watts output.

MURS radios (or the Multi-Use Radio Service) was previously a VHF business band service that required a paid license (just like the GMRS service), but several years ago the FCC eliminated the MURS license requirement. Most of the handheld radios used on MURS are former business band units and can have up to 5 watts of power, but normally have 2 watts of power out. MURS units can have removable antennas, which will allow better performance or range than their FRS, GMRS, or Marine radio counterparts, but MURS business band radios tend to cost more than their FRS, GMRS, or Marine radio counterparts.

CB radio communication has several unique issues to overcome in our disaster example. First, it's highly unlikely that a CB tower and antenna would have survived intact (if all other public service, GMRS, and ham radio fixed installations did not), so let's assume that as well for the CB owner. That leaves CB mobile installations or handheld CB units, but that still doesn't overcome the biggest physics issue with counting on using CB radio for emergency communications - let me explain.

CB radio (within the U.S. at least) is located within the 11 meter HF band between 26.965 and 27.405 MHz. That's much lower in frequency than Marine or MURS bands (approximately 152 MHz) or FRS or GMRS bands (approximately 462 MHz). Being located on an HF band allows the CB signal to "skip" great distances (depending on the current state or condition of the various layers of the earth's ionosphere, which will cause the HF radio wave to reflect). That effect, however, can cause problems.

Unlike ham radio operators (that have multiple HF bands to chose, each with a different angle of radio wave reflection - thus allowing hams to "target" an area that we wish to communicate with), CB owners are stuck with whatever band conditions are present at that time on 11 meters. So one day a CB signal starting in Phoenix, AZ may be heard in Pittsburgh, PA, but a few hours later that same CB operator's station may now be heard in Miami, FL. That may make for some interesting conversations for the casual CB user, but since you can't control where your CB signal is actually going, it means using CB radio for emergency communications is highly unreliable.

Portable, or handheld CB units, are even worse performers, since the majority of these units are 4 watts (or less), only use AM voice modulation, and also have very poor performing short antennas (usually only 2 to 3 feet long) - instead of a typical CB antenna, which is normally 9 feet or 108" long.

Another potential problem some preppers may have is the mistaken idea that when the "skittles hits the fan" (SHTF), they will just grab any radio for any band (including any ham radio or GMRS radio) and use it, since they believe no one will care at that point. While that "*may*" be correct in a truly end of the world event (like a giant asteroid striking our planet within 48 hours), anything short of that will likely mean those preppers will be very surprised to learn it won't be that easy to still communicate using GMRS or ham radio repeaters. Why not?

Well, for one, counting on using the local GMRS repeater for extended coverage has it's own set of issues already discussed (will it still even be operational?), plus you would have to already have the knowledge of the GMRS repeater's frequency, the offset frequency, and the CTCSS or DCS codes to access it. Without all of these pieces of information (and assuming the GMRS repeater is still working), you are totally out of luck, not to mention the licensed users of that GMRS repeater may take a very dim view of your group suddenly popping up on their repeater. In our example, the GMRS repeater has already been destroyed in our disaster scenario, it's very doubtful you'd be able to use this repeater anyway, since the tower holding the antenna is probably a mangled wreck or the electric power is out, or both.

Amateur radio repeaters are also monitored for non-licensed use (even during Hurricane Katrina, Hurricane Sandy, wildfires, floods, and earthquakes) and the various control operators have several different ways of restricting non-licensed use by various remote control methods. Waiting until the SHTF is ***NOT*** the time to discover you can't access the repeater that you had counted on for your prepper communications.

As many of you know, the entry level Technician Class FCC amateur radio license isn't very difficult to obtain. (***We offer two different ways to study, one is a small book and the other is an internet based online training course that will provide you with all of the answers to the 350 questions you need to study.***) Your actual test consists of 10% of those multiple choice questions, or 35 total. Get 26 right (out of 35) and you pass and join the 730,000 plus hams already in the U.S. (more now than ever before in FCC history).

I'm all for using any communication tool you have available in a disaster or emergency situation, but you simply can't count on your home's antenna system to have survived, nor should you count on any local existing infrastructure either, which means you really have to count primarily on the radio gear you can carry (and if you're lucky, what you have in your vehicle). Most ham radio operators prepare a radio "go-bag" in advance (with all they will need to communicate should a disaster strike and you have only a few minutes to grab what you need), an idea I highly recommend.

Sure it's great "**if**" your landline or cell phone works, or "**if**" your CB, FRS/GMRS, Marine, or MURS radio can reach someone for help when the SHTF (with their various range problems already discussed). Again, any working radio (of any type) is better than no radio, but amateur radio gear gives you so many more reliable options it seems almost silly to depend on very limited range communication gear that provides you with the least amount of range and communication options - when you need it the most.

With today's low cost radios (***we have models that start at just $49.95***), combined with the ease of getting your entry level Technician's license, amateur radio communication is really the best EMCOMM choice (it's also great for everyday chatting, hiking, shopping, traveling, etc.), but if you want to dip your toes into two-way radio by first trying CB, FRS/GMRS, Marine, or MURS radios, that's ok too, so long as you now understand their built-in range, frequency, and physics limitations.

When you decide you're ready to communicate at greater ranges and with greater reliability than what CB, FRS/GMRS, Marine or MURS radios can provide, give us a call. Remember our motto, "***Gear Up before Venturing Out***".