How do I?

An occasional series

This week: Pathways to Amateur Radio: FRS, GMRS, CB

This summer I was introduced to a world I knew of, but knew nothing about.

Commercial concerns (railroads, construction companies, taxis, and the like) have used the **Private Land Mobile Radio Service (PLMR)** for at least 70 years. Initially this service used frequencies in the 10 and 11 meter bands. Then as technology improved, some of the business, and especially first responders, moved to frequencies around the 6 meter band and then to the 150-174 MHz VHF FM segment and 421-512 MHz segment where they are generally found today. First responders, in particular, have since migrated to the 800 MHz UHF segment as well. Land Mobile is highly regulated and frequency allocations are highly sought after. While some hams begin in or more frequently find careers in this segment, the real reason I am discussing this segment is because many of the rules and protocols for the other services have their roots here.

Private Land Mobile radios require almost no operator input. The user simply selects a "channel", listens to be sure the frequency is clear, presses the Push To Talk (PTT) and begins speaking. The channel frequencies initially were 25 KHz apart, but over time channel spacing was "narrowed" and since 2013 the standard spacing is 12.5 KHz. Nationwide 150-174 MHz is available, as is 450-470 MHz. If you are located in Detroit, Buffalo, or Cleveland you will find that 421-430 MHz is available in those cities. In addition, a group of eleven cites has been allocated 470-512 MHz which is shared with UHF TV. All operation is Frequency Modulated or FM. For examples of channelization see https://www.radioclub-carc.com/wp-content/uploads/2019/01/AAR-railroad-frequencies.pdf elsewhere in this series.

Equipment-wise, anyone familiar with a 2 meter or 70 centimeter ham radio transceiver will recognize the antennas used. Land Mobile licensing is not cheap. The system owner has a few hoops to jump through to get the system licensed and operators have to be trained.

Citizens Band Radio or CB is actually available in many countries. In the US it has been around since 1945 and evolved to its present form beginning in the 1960s. In the US Citizens Band Radio uses 40 channels near 27 MHz (11 meters). In the US, RF power is limited to 4 watts AM or 12 watts SSB. So depending on terrain, the typical communication range may be 3 to 20 miles on a good day. Since 11 meters is near the top end of the HF bands, skip (ionospheric propagation over long distances) can occur.

Initially there were 23 channels and many were reserved for intra-licensee operation. Only a few channels were available for one licensee to call and communicate with another licensee.

Initially the Citizens Band Radio service required a call sign and a license. In the early 1970s the license fee was $20, which was a lot of money in those days. In 1975 the license fee was reduced to $4. The minimum wage was $2.10 in 1975, so getting a CB license was fairly expensive.

The use of CB radio really took off in the mid-1970s. At that time it began to appear in songs such as C.W. McCall's *Convoy, in* movies such as *Smokey and The Bandit,* and in TV shows like *Movin' On* and the *Dukes of Hazzard*. First Lady Betty Ford was known to be a CB fan and used the handle *First Mama.* Mel Blanc, the voice behind Bugs Bunny and Daffy Duck, is another famous CB operator of that era.

The popularity of CB radio continued into the late 1970s but by the mid-1990s, as cell phones became available, interest began fading. Nowadays, CB radio is not dead, but other services, especially FRS and GMRS, have supplanted it.

General Mobile Radio Service (GMRS) consists of 22 channels. It is a licensed service. Currently the license costs $70 but at some point, maybe February 2022, it will drop to $35.

GMRS radios use UHF frequencies near the amateur radio 70 cm band (440 MHz). GMRS radios are often the "walkie talkies" found at department stores. They are popular with off roaders, hikers and others who may not have cell phone service and families looking for a cheap way to communicate.

A GMRS Handie-Talkie™ costs about the same as an Amateur Radio HT. Channels 1-7 are limited to 5 watts. Channels 8-14 are limited to 0.5 watts. Channels 15-22 can use 50 watts.

GMRS also has repeaters. https://mygmrs.com/browse is an online GMRS repeater directory. Some GMRS repeaters are open, meaning anyone can use them. Some repeaters are private, meaning you need permission to use them. There are 60 open repeaters in Pennsylvania.

Why GMRS? If you don't want to pass a licensing test and if you are willing to settle for limited frequencies, limited power, limited radio options and if you are OK with you choice of radio service filling a simple need, then GMRS may be for you.

Family Radio Service (FRS) is an offshoot of GMRS. It uses the same 22 channels as GMRS. On channels 1-7 users are limited to 2 watts. On channels 8-14 the limit is 0.5 watts and channels 15-22 permit only 2 watts. There is no license fee. The transmitting and reception range is probably a couple miles.

The benefits? It's free to use and an FRS-only radio may be slightly cheaper than a GMRS radio.

In Closing…

This concludes today's look at the various radio services If you are a user of one of these services, congratulations! You have made the first steps to getting your amateur radio license!

Please follow the trail to https://www.radioclub-carc.com/resources/

Catch 'ya on the air!