Riding the Airwaves

A Quick and Dirty Frequency Reference Guide

By Trevor Sawicki

Personal Radio Services

Devices that are type-certified for these frequencies have short-range comms in mind. I'm providing information on these services and their respective frequencies purely for educational purposes. Transmitting on these frequencies with a device that is not type certified is illegal and the FCC will fine the shit out of you if they catch you doing it. **Do not use amateur transceivers on these services unless you understand and are at peace with potentially losing tens of thousands of dollars over it.**

FRS/GMRS

Lots of overlap between these two, so they get a combined section. Frequencies below:

Channel	Frequency	FRS Power	FRS Bandwidth	GMRS Power	GMRS Bandwidth	Notes/Usage
01	462.5625	2 W	12.5 kHz	5 W	20 kHz	(1)
02	462.5875	2 W	12.5 kHz	5 W	20 kHz	(1)
03	462.6125	2 W	12.5 kHz	5 W	20 kHz	(1)
04	462.6375	2 W	12.5 kHz	5 W	20 kHz	(1)
05	462.6625	2 W	12.5 kHz	5 W	20 kHz	(1)
06	462.6875	2 W	12.5 kHz	5 W	20 kHz	(1)
07	462.7125	2 W	12.5 kHz	5 W	20 kHz	(1)
08	467.5625	0.5 W	12.5 kHz	0.5 W	12.5 kHz	(1)
09	467.5875	0.5 W	12.5 kHz	0.5 W	12.5 kHz	(1)
10	467.6125	0.5 W	12.5 kHz	0.5 W	12.5 kHz	(1)
11	467.6375	0.5 W	12.5 kHz	0.5 W	12.5 kHz	(1)
12	467.6625	0.5 W	12.5 kHz	0.5 W	12.5 kHz	(1)
13	467.6875	0.5 W	12.5 kHz	0.5 W	12.5 kHz	(1)
14	467.7125	0.5 W	12.5 kHz	0.5 W	12.5 kHz	(1)
15	462.5500	2 W	12.5 kHz	50 W	20 kHz	(1) (2)
16	462.5750	2 W	12.5 kHz	50 W	20 kHz	(1) (2)
17	462.6000	2 W	12.5 kHz	50 W	20 kHz	(1) (2)
18	462.6250	2 W	12.5 kHz	50 W	20 kHz	(1) (2)
19	462.6500	2 W	12.5 kHz	50 W	20 kHz	(1) (2)
20	462.6750	2 W	12.5 kHz	50 W	20 kHz	(1) (2)
21	462.7000	2 W	12.5 kHz	50 W	20 kHz	(1) (2)
22	462.7250	2 W	12.5 kHz	50 W	20 kHz	(1) (2)
	467.5500			50 W	20 kHz	(3)
	467.5750			50 W	20 kHz	(3)
	467.6000			50 W	20 kHz	(3)
	467.6250			50 W	20 kHz	(3)
	467.6500			50 W	20 kHz	(3)
	467.6750			50 W	20 kHz	(3)
	467.7000			50 W	20 kHz	(3)
	467.7250			50 W	20 kHz	(3)

1: These are shared FRS/GMRS simplex frequencies
2: These are GMRS repeater output frequencies
3: These are GMRS repeater input frequencies; these should not be used for simplex communications.

FRS is an unlicensed, simplex only, personal radio service, and type acceptance for this service mean some pretty stiff performance concessions:

- no more than 2 watts PEP
- 12.5 kHz deviation
- no external antennas
- no external amplifiers

GMRS is basically FRS, but better. Higher permitted power outputs, wideband deviation, and even repeater operation are available to you on the GMRS service to extend your reach significantly beyond what you could get with an FRS radio, with the only real drawback being that you have to cough up some extra money for a license. The license is about $70, doesn't require an exam, is good for 10 years, and covers everyone in your immediate family.

CBRS

Gonna be a bit of a chore to shop for anything multi-purpose that supports these frequencies unless you mess with an amateur HF rig, and even those don't usually support CB out of the box; you're better off getting a stand-alone unit if you plan on doing CB at all. Sucks, but them's the breaks. Restrictions include 4 watts PEP on AM (12 watts PEP on SSB). Frequencies below. Note that channel 9 is reserved for emergency traffic and you shouldn't use it unless you're...well, in an emergency. While it's generally frowned upon to use it for this purpose and not something you should count on all the time, the bands are occasionally good enough for you to get some ionospheric propagation and go for some long-distance comms with the right set-up.

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	26.965 MHz	11	27.085 MHz	21	27.215 MHz	31	27.315 MHz
2	26.975 MHz	12	27.105 MHz	22	27.225 MHz	32	27.325 MHz
3	26.985 MHz	13	27.115 MHz	23	27.255 MHz	33	27.335 MHz
4	27.005 MHz	14	27.125 MHz	24	27.235 MHz	34	27.345 MHz
5	27.015 MHz	15	27.135 MHz	25	27.245 MHz	35	27.355 MHz
6	27.025 MHz	16	27.155 MHz	26	27.265 MHz	36	27.365 MHz
7	27.035 MHz	17	27.165 MHz	27	27.275 MHz	37	27.375 MHz
8	27.055 MHz	18	27.175 MHz	28	27.285 MHz	38	27.385 MHz
9	27.065 MHz	19	27.185 MHz	29	27.295 MHz	39	27.395 MHz
10	27.075 MHz	20	27.205 MHz	30	27.305 MHz	40	27.405 MHz

MURS

Wal-Mart will get mad at you for using these even though these frequencies don't belong to them. You get to use external/removable antennas with these, but your transceiver's still going to be capped at 2 watts PEP and repeaters are a no-no, so range is still going to be pretty limited. Frequencies below:

Channel	**Frequency (MHz)**	**Max Bandwidth (kHz)**	**Name**
1	151.820	11.25	MURS 1
2	151.880	11.25	MURS 2
3	151.940	11.25	MURS 3
4	154.570	20	Blue Dot
5	154.600	20	Green Dot

Amateur Radio

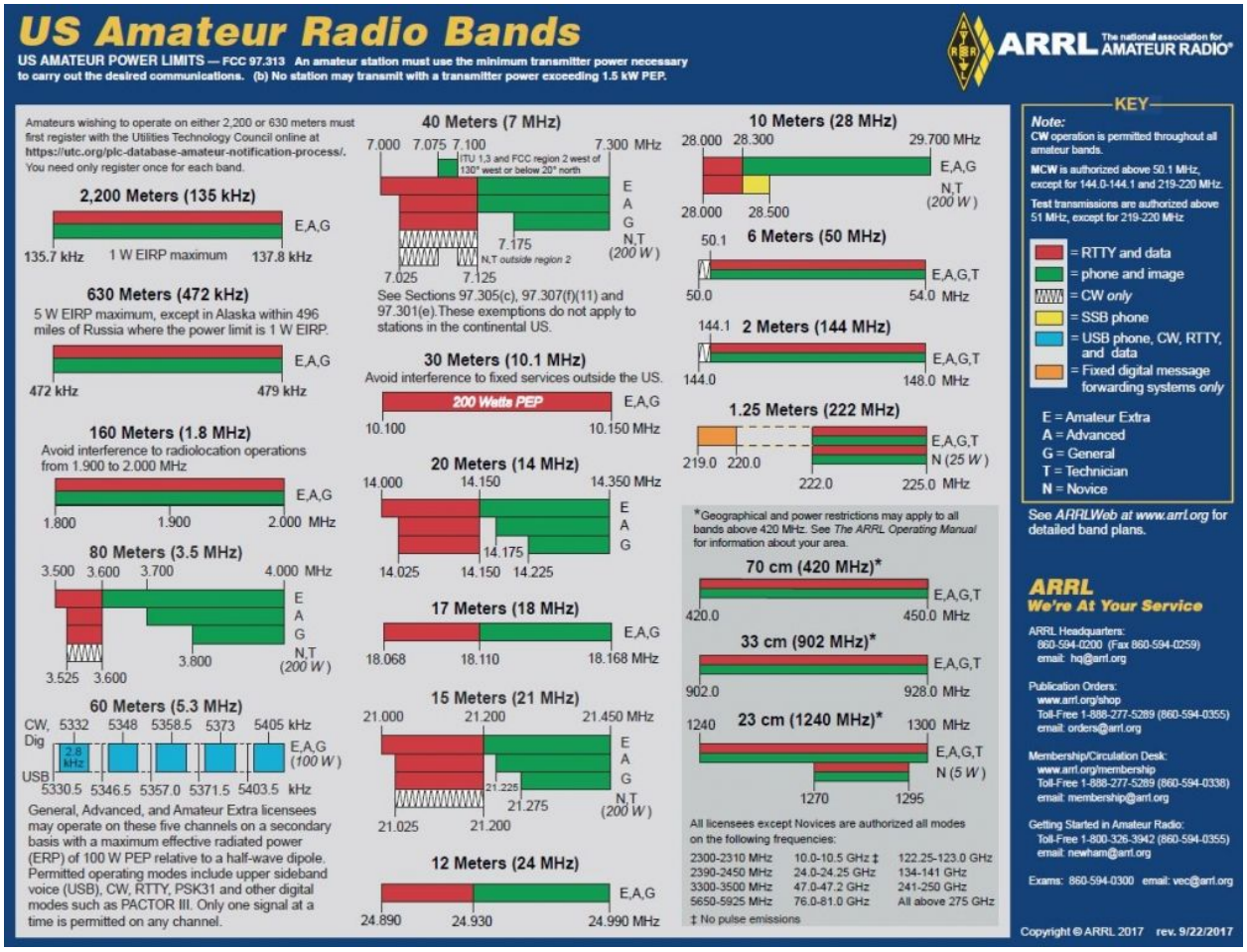
This section is going to assume you have a general class amateur radio license, for a couple of major reasons:

- That's what I had when I wrote this, and I need a reference sheet as much as you do.
- General class is when you get access to HF bands that you might actually get some propagation out of once in a while. Kind of a big deal if you want to talk to anyone more than a repeater's coverage blanket away from you.

The amateur bands give you a lot of flexibility in terms of equipment and coverage, though with the caveat that anyone in your crew who wants to join in on the fun has to study up and get themselves licensed, too.

"But Trevor, in an emergency, shit-hitting-the-fan scenario, it's not going to matter whether I'm licensed!" some of my readers will no doubt say to me, stupidly. The reason you should get licensed anyway (and especially well before an emergency situation hits) is that in your dream scenario where you get to use these with no license without consequence, you'll be sitting in front of that fancy transceiver you've gotten your mitts on **and have zero fucking clue how to use it to contact anybody**. Using these effectively for comms is going to take practice, and you can't practice unless you get legal first.

As a general class operator, you have broad, but not all-encompassing reach of the ham bands. I'll provide some helpful visuals on the next page.



The above chart shows all of the bands allocated to the amateur radio service here in the US. You're gonna want to pay particular attention to anything in each band with the letter "G" next to it; those frequency ranges are the ones you're legally permitted to transmit on. Stuff in red is a range dedicated to data modes, stuff in green is for voice traffic. Additionally, there are some "considerate operator" band plans for the HF range courtesy of the ARRL that I'll post below:

The Considerate Operator's Frequency Guide

The following frequencies are generally recognized for certain modes or activities (all frequencies are in MHz) during normal conditions. These are not regulations and occasionally a high level of activity, such as during a period of emergency response, DXpedition or contest, may result in stations operating outside these frequency ranges.

Nothing in the rules recognizes a net's, group's or any individual's special privilege to any specific frequency. Section 97.101(b) of the Rules states that "Each station licensee and each control operator must cooperate in selecting transmitting channels and in making the most effective use of the amateur service frequencies. No frequency will be assigned for the exclusive use of any station." No one "owns" a frequency.

It's good practice — and plain old common sense — for any operator, regardless of mode, to check to see if the frequency is in use prior to engaging operation. If you are there first, other operators should make an effort to protect you from interference to the extent possible, given that 100% interference-free operation is an unrealistic expectation in today's congested bands.

Frequencies	*Modes/Activities*
1.800-2.000	CW
1.800-1.810	Digital Modes
1.810	CW QRP calling frequency
1.843-2.000	SSB, SSTV and other wideband modes
1.910	SSB QRP
1.995-2.000	Experimental
1.999-2.000	Beacons
3.500-3.510	CW DX window
3.560	QRP CW calling frequency
3.570-3.600	RTTY/Data
3.585-3.600	Automatically controlled data stations
3.590	RTTY/Data DX
3.790-3.800	DX window
3.845	SSTV
3.885	AM calling frequency
3.985	QRP SSB calling frequency
7.030	QRP CW calling frequency
7.040	RTTY/Data DX
7.070-7.125	RTTY/Data
7.100-7.105	Automatically controlled data stations
7.171	SSTV
7.173	D-SSTV
7.285	QRP SSB calling frequency
7.290	AM calling frequency
10.130-10.140	RTTY/Data
10.140-10.150	Automatically controlled data stations
14.060	QRP CW calling frequency
14.070-14.095	RTTY/Data
14.095-14.0995	Automatically controlled data stations
14.100	IBP/NCDXF beacons
14.1005-14.112	Automatically controlled data stations
14.230	SSTV
14.233	D-SSTV
14.236	Digital Voice
14.285	QRP SSB calling frequency
14.286	AM calling frequency
18.100-18.105	RTTY/Data
18.105-18.110	Automatically controlled data stations
18.110	IBP/NCDXF beacons
18.162.5	Digital Voice
21.060	QRP CW calling frequency
21.070-21.110	RTTY/Data
21.090-21.100	Automatically controlled data stations
21.150	IBP/NCDXF beacons
21.340	SSTV
21.385	QRP SSB calling frequency
24.920-24.925	RTTY/Data
24.925-24.930	Automatically controlled data stations
24.930	IBP/NCDXF beacons
28.060	QRP CW calling frequency
28.070-28.120	RTTY/Data
28.120-28.189	Automatically controlled data stations
28.190-28.225	Beacons
28.200	IBP/NCDXF beacons
28.385	QRP SSB calling frequency
28.680	SSTV
29.000-29.200	AM
29.300-29.510	Satellite downlinks
29.520-29.580	Repeater inputs
29.600	FM simplex
29.620-29.680	Repeater outputs

ARRL band plans for frequencies above 28.300 MHz are shown in *The ARRL Repeater Directory* and on **www.arrl.org**.

You don't have to follow the above plan, per se, but it's a pretty good starting point for figuring out who's going to be doing what where.