

CB, FRS, GMRS, MURS, HAM License, Marine Radio

What are they and what are the differences?

CB Radio: *Citizen's Band*

- ▷ No License Required
- ▷ 40 Channels 29.965-27.45 MHz
- ▷ 4 watt max output
- ▷ CB radios must be FCC certified
- ▷ No call sign
- ▷ No programming required

Range: A few miles*

CB is Amplitude Modulated (AM) which tends to be noisy. All other options are Frequency Modulated (FM) which tends to be more noise free and clear.

FRS: *Family Radio Service*

- ▷ No License Required
- ▷ 22 Channels 462.55-467.7125 MHz
- ▷ 2 watt max output (on some channels)
- ▷ FRS radios must be FCC certified, handheld, and with non-removable antenna
- ▷ No call sign
- ▷ No programming required

Range: Line of sight to a few miles.*

GMRS: *General Mobile Radio Service*

- ▷ GMRS License required
- ▷ \$35 for 10 years for immediate family
- ▷ 30 Channels 462.55-467.725 MHz
- ▷ 50 watt max output (on some freq.)
- ▷ GMRS radios must be FCC certified and handhelds must have a non-removable antenna
- ▷ You are required to say your call sign
- ▷ No Programming required

Range: Line of sight to 25 miles or more with a repeater, *

MURS: *Multi-Use Radio Service*

- ▷ No License Required
- ▷ 5 Channels 151.82-154.60 MHz
- ▷ 2 watt max output
- ▷ MURS radios must be FCC certified
- ▷ External antenna allowed
- ▷ No call sign
- ▷ No programming required

Range: Line of sight to a few miles. The right antenna can increase range to 10 miles or more*

HAM Radio: *Amateur Radio*

- ▷ HAM License Required
- ▷ \$35 for 10 years (3 levels available)
- ▷ Several frequencies allowed, see chart, but they do NOT include with GMRS, FRS, or CB frequencies
- ▷ You are required to say your call sign
- ▷ Programming is required

Range: Can be very, very far*

Note: HAM license does not allow transmission on GMRS frequencies

Marine Radio:

- ▷ Basically you must be in a boat and on a navigable body of water
- ▷ 156 & 174 MHz which do NOT overlap with GMRS, FRS, CB or HAM allowed use.
- ▷ The Coast Guard doesn't mess around, so don't try it.

***Handheld radios may not work well from inside a vehicle**

Radios are generally available in hand held models (like walkie-talkies) and full sized mobile radios. Some offer hybrid models with an electronics box you can hide that have the controls in the handset or microphone. Additionally there are some with detachable faces. When choosing a radio, pay attention to the power output and the 'bands' or frequencies it will operate on. If there is a radio that will operate on the CB, FRS/GMRS, and other HAM frequencies it is likely very expensive and it is probably illegally doing so because CB, FRS, and GMRS radios are required to be FCC certified to transmit on those frequencies.

What is an example of each radio type? These are not recommendations or endorsements, just examples that came up on in a Google search.

HANDHELD

Cobra HHRT50



FULL SIZE

Cobra 29 ltd classic



HYBRID

Uniden CMX760



CB

FRS

Motorola T100



GMRS

BTECH GMRS-V1



Midland MXT105



Midland MXT275



MURS

Motorola RMM2050



HAM

Baofeng UV-5r*



ICOM 2300H 05*



Yaesu FTM-400DR/XDR*



***Although Baofeng and other HAM radios can be programmed to transmit on FRS, GMRS, or MURS frequencies, they are not FCC compliant or FCC certified for FRS, GMRS, or MURS transmission, so doing so is illegal.**

Antenna and cable selection is a complicated topic and beyond the scope of this info. However they are a very important aspects and will affect your radio system performance. So be sure to get a quality antenna that is designed for the type of radio and frequencies you will be transmitting on. At the most basic level antennas are usually available fixed or rubber-ducky (like a walkie-talkie), magnetic mount (example CB Wilson Lil-Wil), or hard mount (example CB Firestik). And CB antennas will not work well for FRS, GMRS, MURS, or other types of radios.

Rubber Ducky



Magnetic Mount



Hard Mount



For more information see the FCC Mobility Division, Wireless Telecommunications Bureau:

CB: <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/citizens-band-radio-service-cbrs>

FRS: <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/family-radio-service-frs>

GMRS: <https://www.fcc.gov/general-mobile-radio-service-gmrs>

MURS: <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/multi-use-radio-service-murs>

If you want to see the official regulations that govern mobile radio use, you are looking for:

[Title 47 → Chapter I → Subchapter D → Part 95](#)

A current link is: https://www.ecfr.gov/cgi-bin/text-idx?SID=a60e3523e754ded7168e7d5eac9ab088&mc=true&tpl=/ecfrbrowse/Title47/47cfr95_main_02.tpl

The various "Subparts" cover the different types. (FRS, GMRS, MURS, CB, etc)

CB Radio Frequencies		FRS & GMRS Channels in order of ascending frequency.					
CB Channels	Frequency MHz	FRS Channel #	FRS Frequency MHz	FRS Max Power All 12.5 kHz Bandwidth	GMRS Frequency MHz	GMRS Max Power & Bandwidth	GMRS Radios allowed
1	26.965	15	462.5500	2w	462.5500	50w - 20 kHz	HH, M, B, F, RO
2	26.975	1	462.5625	2w	462.5625	5w - 20 kHz	HH, M, B
3	26.985	16	462.5750	2w	462.5750	50w - 20 kHz	HH, M, B, F, RO
4	27.005	2	462.5875	2w	462.5875	5w - 20 kHz	HH, M, B
5	27.015	17	462.6000	2w	462.6000	50w - 20 kHz	HH, M, B, F, RO
6	27.025	3	462.6125	2w	462.6125	5w - 20 kHz	HH, M, B
7	27.035	18	462.6250	2w	462.6250	50w - 20 kHz	HH, M, B, F, RO
8	27.055	4	462.6375	2w	462.6375	5w - 20 kHz	HH, M, B
9	27.065	19	462.6500	2w	462.6500	50w - 20 kHz	HH, M, B, F, RO
10	27.075	5	462.6625	2w	462.6625	5w - 20 kHz	HH, M, B
11	27.085	20	462.6750	2w	462.6750	50w - 20 kHz	HH, M, B, F, RO
12	27.105	6	462.6875	2w	462.6875	5w - 20 kHz	HH, M, B
13	27.115	21	462.7000	2w	462.7000	50w - 20 kHz	HH, M, B, F, RO
14	27.125	7	462.7125	2w	462.7125	5w - 20 kHz	HH, M, B
15	27.135	22	462.7250	2w	462.7250	50w - 20 kHz	HH, M, B, F, RO
16	27.155		x	x	467.5500	50w - 20 kHz	F, RI
17	27.165	8	467.5625	0.5w	467.5625	0.5w - 12.5 kHz	HH
18	27.175		x	x	467.5750	50w - 20 kHz	F, RI
19	27.185	9	467.5875	0.5w	467.5875	0.5w - 12.5 kHz	HH
20	27.205		x	x	467.6000	50w - 20 kHz	F, RI
21	27.215	10	467.6125	0.5w	467.6125	0.5w - 12.5 kHz	HH
22	27.225		x	x	467.6250	50w - 20 kHz	F, RI
23	27.255	11	467.6375	0.5w	467.6375	0.5w - 12.5 kHz	HH
24	27.235		x	x	467.6500	50w - 20 kHz	F, RI
25	27.245	12	467.6625	0.5w	467.6625	0.5w - 12.5 kHz	HH
26	27.265		x	x	467.6750	50w - 20 kHz	F, RI
27	27.275	13	467.6875	0.5w	467.6875	0.5w - 12.5 kHz	HH
28	27.285		x	x	467.7000	50w - 20 kHz	F, RI
29	27.295	14	467.7125	0.5w	467.7125	0.5w - 12.5 kHz	HH
30	27.305				467.7250	50w - 20 kHz	F, RI
31	27.315						
32	27.325						
33	27.335						
34	27.345						
35	27.355						
36	27.365						
37	27.375						
38	27.385						
39	27.395						
40	27.405						

HH=Hand Held, M=Mobile, B=Base, F=Fixed station, RI=Repeater Input, RO=Repeater Output

FRS Hand Held only. Fixed may only communicate directly with other Fixed Stations

Amateur Radio Bands http://www.arrl.org/frequency-allocations									
License Type		Novice		General		Extra			
2200m (135kHz) 135.7-137.8 kHz 1 W max		No		135.7-137.8 kHz CW, Phone, Image, RTTY/Data 1 W EIRP Max Must first register					
In between, not authorized									
630m (472kHz) 472-479 kHz		No		472-479 kHz CW, Phone, Image, RTTY/Data 5 W max Must first register					
In between, not authorized									
160m (1.8MHz)		No		1.800-2.000 MHz CW, Phone, Image, RTTY/Data					
In between, not authorized									
80m (3.5MHz) 3.500-4.000 MHz		3.525-3.600 MHz CW Only		3.525-3.600		3.500-3.600			
				CW, RTTY/Data					
				3.800-4.000 MHz		3.600-4.000 MHz			
				CW, Phone, Image					
In between, not authorized									
60m (5.3MHz) 5 specific channels (see special rules)		No		5332 kHz (5330.5kHz) 5348 kHz (5346.5kHz) 5358 kHz (5357.0 kHz) 5373 kHz (5371.5 kHz) 5405 kHz (5403.5 kHz)					
In between, not authorized									
40m (7MHz)		7.025-7.125 MHz CW only		7.025-7.125 MHz CW, RTTY/Data					
				7.175-7.300 MHz		7.125-7.300 MHz			
				CW, Phone, Image					
In between, not authorized									
30m (10.1 MHz) 200w Max		No		10.100-10.150 MHz CW, RTTY/Data					
In between, not authorized									
20m (14 MHz)		No		14.025 -14.150 MHz		14.000 - 14.150 MHz			
				CW, RTTY/Data					
				14.225 -14.350 MHz		14.150 -14.350 MHz			
				CW, Phone, Image					
In between, not authorized									
17m (18 MHz)		No		18.068-18.110 MHz CW, RTTY/Data					
				18.110-18.168 MHz CW, Phone, Image					
In between, not authorized									
15m (21 MHz)		21.025-21.200 MHz CW Only		21.025-21.200 MHz		21.000-21.200 MHz			
				CW, RTTY/Data					
				21.275-21.450 MHz:		21.200-21.450 MHz:			
				CW, Phone, Image					
In between, not authorized									
12m (24 MHz)		No		24.890-24.930 MHz CW, RTTY/Data					
				24.930-24.990 MHz CW, Phone, Image					
In between, not authorized									
26.965-27.405 MHz		CB use see special rules 4w max							
In between, not authorized									
CW=Continuous Wave (ie. morse code) Phone=Voice (ie. what we do) Image=(nothing we do) RTTY/Data=(nothing we do) MCW=(nothing we do)									

License Type		Novice		General		Extra	
10m (28 MHz)		28.000-28.300 MHz CW, RTTY/Data Novice (Max power 200w PEP)					
		28.300-28.500 MHz		28.300-29.700 MHz			
		CW, Phone (Novice Max power 200w PEP no Image)					
In between, not authorized							
6m (50 MHz)		50.0-50.1 MHz CW Only					
		50.1-54.0 MHz CW, Phone, Image, MCW, RTTY/Data					
In between, not authorized							
2m (144 MHz)		144.0-144.1 MHz CW Only					
		144.1-148.0 MHz CW, Phone, Image, MCW, RTTY/Data					
In between, not authorized							
MURS (151 – 154 MHz)		151.820 MHz (11.25 kHz) 2w max Channel Name: MURS 1 151.880 MHz (11.25 kHz) 2w max Channel Name: MURS 2 151.940 MHz (11.25 kHz) 2w max Channel Name: MURS 3 154.570 MHz (20.00 kHz) 2w max Channel Name: Blue Dot 154.600 MHz (20.00 kHz) 2w max Channel Name: Green Dot No MURS transmitter shall, under any condition of modulation, transmit more than 2 watts transmitter power output. MURS is licensed by rule. This means an individual license is not required for an entity to operate a MURS transmitter. Phone, Data, or Image signals may be transmitted https://www.fcc.gov/wireless/bureau-divisions/mobility-division/multi-use-radio-service-murs#:~:text=The%20Multi%2DUse%20Radio%20Service,function%20similar%20to%20walkie%2Dtalkies.					
In between, not authorized							
156 and 174 MHz Marine Radio (156 and 174 MHz) 25w max. See special rules. Basically you must be in a boat and on water.							
In between, not authorized							
1.25m (222 MHz)		219-220 MHz Only for fixed digital message forwarding systems. See special rules					
		222.00-225.00 MHz CW, Phone, Image, MCW, RTTY/Data					
In between, not authorized							
70cm (420 MHz)		420.0-450.0 MHz CW, Phone, Image, MCW, RTTY/Data					
In between, not authorized							
462-467 MHz HAM Lic not authroized. FRS/GMRS only See special rules and power limits. GMRS license may be required.							
In between, not authorized							
33cm (902 MHz)		902.0-928.0 MHz CW, Phone, Image, MCW, RTTY/Data					
In between, not authorized							
23cm (1240 MHz)		1240-1300 MHz CW, Phone, Image, MCW, RTTY/Data					
In between, not authorized							
Higher Frequencies:		All modes and licensees (except Novices) are authorized on the following bands [FCC Rules, Part 97.301(a)]					
		2300-2310 MHz		2390-2450 MHz		5650-5925 MHz	
		10.0-10.5 GHz		24.0-24.25 GHz		76.0-81.0 GHz*	
		122.25 -123.00 GHz		134-141 GHz		All above 300 GHz	
		* Amateur operation at 76-77 GHz has been suspended till the FCC can determine that interference will not be caused to vehicle radar systems					
Above, not authorized							