

License-Free
and
Easy License Bands

Requirements for Using MURS, FRS and GMRS

- MURS – Multi-Use Radio Service - Unlicensed
- FRS – Family Radio Service – Unlicensed
- GMRS – General Mobile Radio Service – Needs License
- A GMRS license is good for 10 years and covers the individual licensee and their immediate family members, which includes spouses, children, parents, and siblings under one license.
- Requires no testing

Emissions and Other Info for FRS/GMRS/MURS

- As other good radio operations dictate, station operators must take reasonable precautions to avoid causing harmful interference. This includes monitoring the transmitting frequency for communications in progress before transmitting, and other measures as may be necessary to minimize the potential for causing interference.
- 11K2F3E and 16K0F3E are the two types of emissions allowed for VOICE in these radio service ranges.
- MURS voice communications allows to have a frequency error of 5PPM for voice transmissions where GMRS is required to be 2.5PPM maximum.
- Digital (F3E, G3E, F2D, and G2D designation for FRS and A1D, F1D, G1D, H1D, J1D, R1D, A3E, F3E, G3E, H3E, J3E, R3E, F2D, and G2D for GMRS) transmissions are only allowed for short messages such as GPS location or status messaging. Digital messages must be one second or less in duration no more often than every 30 seconds if set up for automatic transmission. There is exemption for the time rule if the station is being interrogated by another unit and is issuing a response.
- A MURS transmitter must transmit only emission types A1D, A2B, A2D, A3E, F2B, F1D, F2D, F3E, and G3E. Emission types A3E, F3E and G3E may include selective calling or tone-operated squelch tones to establish or continue voice communications.
- These channels are sometimes referred to as 10kHz and 20kHz channels, but they are IN FACT THE SAME NARROWBAND (12.5kHz) AND WIDEBAND (5kHz Deviation-25kHz channel spacing) THAT WE KNOW AND LOVE!
- The 10 and 20 confusion comes from the specified bandwidth in the documentation that states the 2.5kHz deviation and 5kHz deviation of each which gets multiplied by 2 and guard band added to give allotted channel width.
- FRS/GMRS/MURS radio services are certified by the FCC under part 95 just like CB radio service. This is the reason they want only certified equipment in these bands since they were designed to be easy to use without causing interference with licensed operators near the same frequencies. I will not elaborate further on this point, but it is the letter of the law.
- Rules state: GMRS licensees are responsible for ensuring that their GMRS stations operate in compliance with power and bandwidth limits. (kind of confusing if already operating part 95 equipment, right??)

Other GMRS Rules

- 47 C.F.R, Part 95 Subpart E Defines all GMRS Parameters
- **Identification:** 95.1751- Users must transmit their call sign at the end of each transmission and every 15 minutes during extended conversations
- Any GMRS repeater station is not required to transmit station identification if:
 - (1) It retransmits only communications from GMRS stations operating under authority of the individual license under which it operates; and,
 - (2) The GMRS stations whose communications are retransmitted are properly identified in accordance with this section.
- **Authorized Users:** The licensee can authorize immediate family members and anyone to use the station during emergencies.

More MURS Restrictions

- 47 C.F.R, Part 95
- MURS is authorized five channels that were previously in the industrial/business radio service and were known as the “color dot” frequencies in Part 90 of the FCC rules. (Part 90 operating parameters!!!)
- 2 watts of transmitter output maximum
- The maximum height of a MURS (Multi-Use Radio Service) antenna is 60 feet total above the ground or 20 feet taller than the structure it is mounted to according to the FCC regulations. This means if a MURS antenna is mounted on a building, it can extend 20 feet above the building's roof, but that extension cannot exceed a total of 60 feet above the ground.
- No use of MURS from the air
- No repeaters allowed for MURS

MURS Band - The Forgotten Unlicensed Spectrum

Channel	Frequency	Maximum Authorized Bandwidth (Channel Width)	Channel Name
1	151.82 MHz	11.25 kHz (12.5kHz)	MURS 1 Unofficial Calling Frequency
2	151.88 MHz	11.25 kHz (12.5kHz)	MURS 2
3	151.94 MHz	11.25 kHz (12.5kHz)	MURS 3
4	154.57 MHz	20.00 kHz (25kHz)	MURS 4 (Blue Dot)
5	154.60 MHz	20.00 kHz (25kHz)	MURS 5 (Green Dot)

Channels 1–3 must use "narrowband (2.5 kHz deviation; 11.25 kHz bandwidth). Channels 4 and 5 may use either "wideband" FM (5 kHz deviation; 20 kHz bandwidth) or "narrowband" FM. Because previous business band licensees who have maintained their active license remain grandfathered with their existing operating privileges, it is possible to find repeaters or other operations not authorized by Part 95 taking place. These are not necessarily illegal. If legal, such operations may enjoy primary status on their licensed frequency and as such are legally protected from harmful interference by MURS users.

FRS and GMRS

FRS

- Fixed antenna
- .5 to 2 Watts ERP allowed (frequency dependent)
- Narrowband Only
- No Repeaters

GMRS

- Any Antenna
- .5 to 50 Watts TX Power allowed (frequency dependent)
- Narrowband and Wideband depending on channel used
- Repeaters use 5MHz split (Repeater Input @ 467MHz)

Chan #	Freq	FRS ERP	FRS CH BW	GMRS Power	GMRS CH BW	Notes/Usage
01	462.5625	2 W	12.5 kHz	5 W ERP	25 kHz	FRS and GMRS simplex
02	462.5875	2 W	12.5 kHz	5 W ERP	25 kHz	FRS and GMRS simplex
03	462.6125	2 W	12.5 kHz	5 W ERP	25 kHz	FRS and GMRS simplex
04	462.6375	2 W	12.5 kHz	5 W ERP	25 kHz	FRS and GMRS simplex
05	462.6625	2 W	12.5 kHz	5 W ERP	25 kHz	FRS and GMRS simplex
06	462.6875	2 W	12.5 kHz	5 W ERP	25 kHz	FRS and GMRS simplex
07	462.7125	2 W	12.5 kHz	5 W ERP	25 kHz	FRS and GMRS simplex
08	467.5625	0.5 W	12.5 kHz	0.5 W ERP	12.5 kHz	FRS and GMRS simplex
09	467.5875	0.5 W	12.5 kHz	0.5 W ERP	12.5 kHz	FRS and GMRS simplex
10	467.6125	0.5 W	12.5 kHz	0.5 W ERP	12.5 kHz	FRS and GMRS simplex
11	467.6375	0.5 W	12.5 kHz	0.5 W ERP	12.5 kHz	FRS and GMRS simplex
12	467.6625	0.5 W	12.5 kHz	0.5 W ERP	12.5 kHz	FRS and GMRS simplex
13	467.6875	0.5 W	12.5 kHz	0.5 W ERP	12.5 kHz	FRS and GMRS simplex
14	467.7125	0.5 W	12.5 kHz	0.5 W ERP	12.5 kHz	FRS and GMRS simplex
15	462.5500	2 W	12.5 kHz	50 W	25 kHz	GMRS Simplex or Repeater Output
16	462.5750	2 W	12.5 kHz	50 W	25 kHz	GMRS Simplex or Repeater Output
17	462.6000	2 W	12.5 kHz	50 W	25 kHz	GMRS Simplex or Repeater Output
18	462.6250	2 W	12.5 kHz	50 W	25 kHz	GMRS Simplex or Repeater Output
19	462.6500	2 W	12.5 kHz	50 W	25 kHz	GMRS Simplex or Repeater Output
20	462.6750	2 W	12.5 kHz	50 W	25 kHz	GMRS Simplex or Repeater Output
21	462.7000	2 W	12.5 kHz	50 W	25 kHz	GMRS Simplex or Repeater Output
22	462.7250	2 W	12.5 kHz	50 W	25 kHz	GMRS Simplex or Repeater Output
	467.5500			50 W	25 kHz	GMRS repeater input only.
	467.5750			50 W	25 kHz	GMRS repeater input only.
	467.6000			50 W	25 kHz	GMRS repeater input only.
	467.6250			50 W	25 kHz	GMRS repeater input only.
	467.6500			50 W	25 kHz	GMRS repeater input only.
	467.6750			50 W	25 kHz	GMRS repeater input only.
	467.7000			50 W	25 kHz	GMRS repeater input only.
	467.7250			50 W	25 kHz	GMRS repeater input only.