

Multi User Radio Service aka MURS

1. What is the Multi-Use Radio Service (MURS)?

MURS is a private, two-way, short-distance voice or data communications service for personal or business activities of the general public. It is not available for the transmission of images. [95.401(e)]

2. Where did MURS come from?

The MURS frequencies were formerly available exclusively to licensees in the Business Radio Service. The FCC created MURS as an unlicensed, Part 95 service in order

- * to drop the licensing requirement (so long the technical conditions are met), and

- * to permit personal communications as well as business communications.

3. Are personal and family communications permitted?

Yes. Even though the five MURS frequencies were formerly available only for business communications (authorized under 90.31 of the FCC Rules), the FCC's creation of the MURS makes those frequencies also available for personal and family communications. Business communications are also still permitted. No one type has any preference or any other type, except that all communications must yield to any emergency communication on the same channel. [95.1301]

4. Is MURS "VHF CB"?

Yes. MURS is the only "VHF Citizens Band" in the United States available for general two-way voice and data communications.

MURS is one of five Citizens Band Radio Services. (See 95.401.) The others are the (original) Citizens Band Radio Service at 27 MHz, the Low Power Radio Service (LPRS) at 216-217 MHz, the Medical Implant Communications Service (MICS), the Family Radio Service (FRS) at 460 MHz, and the Wireless Medical Telemetry Service (WMTS).

The General Mobile Radio Service (GMRS) at 460 MHz is sometimes (if incorrectly) described as "the old UHF CB." That description has no legal or historical basis in fact. GMRS is the former Class A of the Citizens Radio Service, but was never "Citizens Band" as such.

LPRS, though legally a form of CB, allows only certain limited uses including theft tracking, auditory and health care assistance devices and control stations in automated maritime radio networks. No two-way voice communications are permitted in LPRS.

MICS and WMTS, though also legally a form of CB, allow only certain limited medical telemetry transmissions, usually in a hospital or health-care setting.

The FCC is currently considering an additional CB service. "Personal Locator Beacons" (PLBs) would be alerting devices that persons would be able to use in remote areas to summon assistance in emergencies.

MURS, CB, GMRS, FRS, WMTS and LPRS are all members of the Personal Radio Services

as designated by the FCC. The Personal Radio Services should not be confused with the Personal Communications Services (PCS) in the 900 and 1900 MHz bands.

5. What are the MURS channels?

Channel (MHz) [95.632]

151.820 MHz
151.880 MHz
151.940 MHz
154.570 MHz
154.600 MHz

6. Do I need a license to operate a MURS unit?

No license will be issued, and none is required. [95.1301] You are allowed to operate a MURS unit if you are not a representative of a foreign government, and if you cooperate in the selection and use of channels in order to reduce interference to others. [95.1309]

7. Is my MURS radio an unlicensed Part 15 "intentional radiator" like a cordless phone?

No. It is a radio station in the Citizens Band Radio Service, "authorized by rule" (rather than by license) under the Communications Act.

Unlike Part 15 intentional radiators, MURS users are subject to operator rules.

MURS radios must be manufactured to meet, and must be operated to comply with, the technical standards found in Part 95. MURS radios must be certificated (FCC approved) in accordance with 95.603 of the FCC Rules. Radios that were certificated for MURS use under the Business Radio Service rules (90.203) prior to the date of implementation of the new MURS rules (November 12, 2002) may also be used, even if they were manufactured or first used after that date.

8. Must I identify my MURS station or transmissions?

You do not need to identify your MURS station by any particular callsign or other designation. [95.1305]

9. May I communicate from my MURS radio to a Business Radio Service-licensed station
on the same frequency?

Yes, you may communicate with former BRS licensees of these frequencies.

In implementing the new MURS Rules, the FCC removed these frequencies from the Business Radio Service (BRS). Persons who believe that they are operating in MURS under an existing FCC license may not have learned yet that these frequencies are no longer part of the BRS. These former licensees must comply with all of the new MURS rules except those where the previous BRS rules granted some additional or less restrictive operation. A "grandfathered" former BRS-licensed user may also continue to operate under the condition of any special waiver authorized on his/her/its former BRS license. [95.1317]

10. May I set my MURS radios up as a repeater station?

The FCC prohibits using any MURS frequency as the input or the output of a conventional repeater (a station that retransmits a signal nearly simultaneously on a different frequency), unless that station was specifically licensed for such operation under Part 90. The FCC also prohibits "store-and-forward" packet stations (which retransmits the digital signal after a time delay, often [but not necessarily] on the same frequency). [95.1311]

11. May I connect an external antenna or power amplifier to my MURS radio?

The FCC Rules permit connecting an external antenna to your MURS radio. However, the Rules limit the height of your antenna to a maximum of 20 feet over the mounting structure (exclusive of the tower, mast or pole on which it is mounted), or to 60 feet above ground, whichever is greater. (These are the same limits that apply to the original Citizens Band Radio Service at 27 MHz.) [95.1315]

The FCC Rules [95.1311] prohibit connecting your MURS radio to a "booster" or to a power amplifier. The Rules limit you to a maximum of 2 watts transmitter power output (TPO). [95.639(h)]

12. May I connect my MURS radio to the telephone?

The MURS Rules prohibit connecting a MURS station to the public switched telephone network. [95.1313]

The only exception will be for stations authorized under a Part 90 (Business Radio Service) license as of November 13, 2000, if that BRS license specifically authorized interconnection with the public switched telephone network on that frequency.

13. May I broadcast music over my MURS radio?

The MURS Rules [95.1307(a)] permit the transmission of voice or data signals. The Rules do not address the issue of transmitting music or other sounds.

14. May I use my MURS radio to transmit one-way paging messages?

The MURS Rules do not prohibit tone or voice paging.

15. May I use my MURS radio to transmit data communications?

Yes, so long as the emissions are authorized in 95.633 of the FCC Rules. The maximum authorized bandwidth is 11.25 KHz on the three 151 MHz frequencies (151.820 MHz, 151.880 MHz and 151.940 MHz). The maximum authorized bandwidth is 20.0 KHz on the two 154 MHz frequencies (154.570 MHz and 154.600 MHz). [95.631(j)]

FCC Rules require that you transmit on a MURS frequency only with a radio model certificated for MURS. You may transmit data communications in MURS only if the radio is certificated for data communications, or if those transmissions otherwise comply with the rules and those transmissions can be imposed on a conventional voice emission. You may not make any internal modifications or additions to a MURS

radio to transmit data communications.

However, the FCC Rules prohibit the retransmission of data signals, for instance in a store-and-forward packet network. [95.1311]

16. May I operate my MURS radio anywhere?

You may operate your MURS radio anywhere the FCC Rules permit CB operation. [95.1303]

If you want to use MURS aboard a vessel owned or operated by a U.S. citizen or company, you will need permission from the captain. [95.1303(a)(2)]

You must not operate your MURS radio aboard any aircraft in flight. [95.1303(b)]

There are additional requirements with which you must comply if you wish to operate a MURS radio in Puerto Rico or certain other Caribbean Islands, in order to avoid interference to the Arecibo Observatory. [95.1303(c)]

17. May I transmit continuously over my MURS radio?

No, with one exception: A station authorized under a Part 90 (Business Radio Service) license as of November 13, 2000, may continue to make such continuous transmissions under the conditions and on the specific frequencies authorized on that former license. [95.631(j)]

18. Must I listen to the MURS channel before I transmit?

You must share the channel with other users [95.1309(a)], and you must monitor before transmitting. [95.1307(d)] The FCC considers these requirements to be essential in a shared-use service.

Also, you must at all times and on all MURS channels, give priority to emergency messages.

19. Doesn't my radio monitor the channel before transmitting?

The FCC does not require that radios do this by themselves. If your MURS radio has some form of "selective calling" or "receiver muting," you must first disable this function and monitor "open frequency" before you transmit.

20. What kind of range can I get from a MURS radio?

At the 150 MHz frequencies of MURS, communications range is dependent on antenna height relative to the surrounding environment. Range between two handheld MURS radios will vary, but should be between a half mile to perhaps several miles (in open terrain with no obstacles). If you are using the radios inside a vehicle, the range will be somewhat less.

An advantage of MURS is that you may connect an external antenna to your radio. Using an antenna mounted on the vehicle's roof, and communicating with another similar unit, you should expect to get at least a couple of miles (except in the most harsh conditions), and possibly up to ten miles or more.

Using a base station-type antenna, you should be able to communicate with a vehicular-type MURS unit described in the previous paragraph over a range of three to perhaps ten or fifteen miles. From that same base station, you might get two to six miles communicating with a MURS handheld radio.

Base-to-base station communications should be possible over at least several miles, perhaps up to twenty miles or more on a clear channel. However, this kind of operation is not consistent with the traditional use of these frequencies for short-range base-to-mobile and mobile-to-mobile communications.

There are other factors that affect communications range. An especially important consideration is channel occupancy. In most urban areas, some MURS frequencies (especially the two MURS 154 MHz frequencies) are already heavily populated with handheld and mobile operations, and (on some channels) base stations as well.

21. How does MURS compare with other unlicensed and personal radio services?

Compared with FRS (Family Radio Service) at 460 MHz:

- * MURS (at 150 MHz) permits four times more power (2 Watts TPO instead the 0.500 Watts ERP limit for FRS).

- * At MURS frequencies, signals bend over hills better, but FRS signals are better at bouncing off of surfaces and penetrating into/escaping out of buildings.

- * You may connect a MURS radio to an external or exterior antenna. FRS radios must employ a non-detachable antenna. For vehicle-to-vehicle operation with external (roof-mount) antennas, MURS should provide three to ten (or more) times the range possible with FRS radios.

Compared with GMRS (General Mobile Radio Service) at 460 MHz:

- * GMRS handheld radios have typically two to five watts transmitter power. GMRS vehicular units transmit typically with ten to 50 watts. There is no limit on the ERP of GMRS stations operating on the primary channels. GMRS stations may transmit with no more the 5 Watts ERP on the seven "interstitial" frequencies (those shared with the FRS).

- * GMRS operation requires an FCC license.

- * At MURS frequencies, signals bend over hills better, but GMRS signals are better at bouncing off of surfaces and penetrating into/escaping out of buildings.

- * For vehicle-to-vehicle operation with external (roof-mount) antennas, MURS should provide one-and-a-half to four times the range possible with GMRS handheld radios also connected to roof-mount antennas. Depending on the surrounding terrain, MURS units connected to roof-mounted antennas might even outperform full-power (50 watt) GMRS mobile units, although the GMRS units should have a greater range in open terrain.

- * Many GMRS radios can communicate through repeater stations for extended range (typically up to twenty miles or more, sometimes much more). The new FCC Rules will prohibit repeaters in MURS.

Compared with CB (Citizens Band Radio) at 27 MHz:

- * CB radios may transmit with more power than MURS units may, but communications range is highly dependent on channel congestion and atmospheric conditions. CB communications can also be significantly degraded by noise from vehicle ignition systems and from other man-made sources.

- * CB signals bend over hills and around obstacles much better than MURS (at 150 MHz) or FRS/GMRS (at 460 MHz) signals.

- * Vehicle-to-vehicle MURS communications will probably be comparable and possibly quite superior to that available in the CB service.

* MURS communications will not suffer from the kind of long-range "skip" interference frequently encountered on CB radio at 27 MHz.

22. How much does a MURS radio cost? (NOTE: VHF commercial HT's can be used, and can be found cheap.)

The typical price for equipment currently available is \$100 to \$500. We expect prices to drop if equipment manufacturers go into mass production of MURS-certificated radio models.

23. When and where can I get MURS radios?

Radios suitable and permissible for use in MURS are available now from many mail-order and on-line radio dealers and retailers. More models are expected in the near future.

However, a problem that you may encounter is that some of these current and older models may still be labeled as requiring an FCC license. Some models also include an operating capability on nearby but non-MURS frequencies. (Authority to operate on those non-MURS frequencies does require an FCC license!)

To determine if a particular radio is permissible to use as a MURS station, you will need to verify

- * that it is certificated specifically and exclusively for MURS use under the new FCC Rules;

or

- * that it is currently certificated (type-approved) for Part 90 operation, and was certificated for this use prior to November 12, 2002;

- * that the frequency(ies) on which it will operate are authorized in the MURS;

- * that its transmitter power output (TPO) does not exceed a maximum 2 Watts, and that the radio has no provision for increasing its TPO above that limit [95.649];

- * that the maximum deviation is not greater than +/- 2.5 KHz (or +/- 5.0 KHz and it transmits only on the two MURS 154 MHz frequencies); and

- * that the transmitter maximum bandwidth does not exceed 11.25 KHz on the three 151 MHz MURS frequencies, or 20.0 KHz on the two 154 MHz MURS frequencies. Also see Question 15 above.