

# How to Pick a FRS radio (2023)

## Introduction

Family Radio Service (FRS) was developed for consumer use in no small part thanks to Radio Shack, who saw a need to define and preserve special radio frequencies for consumers that were separate from other frequencies reserved for other types of communication. Radio Shack suggested that the FCC define frequencies between 462 and 467 MHz for recreational walkie talkie use, on which they have operated ever since. Essentially, anyone with a FRS two-way radio can freely use FRS channels. Any competition for bandwidth that comes from multiple parties with two-way radios trying to operate their devices in close proximity can be managed with the channel and privacy code features now offered on many walkie talkies.<sup>1</sup>

## Difference between FRS and GMRS

FRS features a lower output power (wattage) and handheld (walkie-talkie) radios. General Mobile Radio Service (GMRS) radios can also be handheld or mobile radios used as a base station such as at the ARKs, your home, or in your car. They can communicate with FRS and other GMRS handhelds as long as they are on the same channel and privacy code. While FRS use does not require an FCC license, GMRS radio users do need an FCC license: No Test, \$35, 10-year term, and covers the entire family.

For those who plan to use two-way radios infrequently, during emergencies, in close range like around your neighborhood, or in outdoor situations that aren't particularly technical, a FRS radio is just fine. If you plan to use your two-way radio more frequently, over a wider area, operate from the ARK with the City's GMRS radio packs, or in areas with more competition for a channel, you might want the greater flexibility and output power levels that a GMRS radio provides.

But let's focus on FRS Radios.

## FRS radio options

OK, you decided to buy a FRS radio. But which one? While there are a wide variety of FRS radios out there, here are a few things to consider before you make your choice:

1. **Power level.** The higher the power level, the better. This improves your transmit range – how far your signal can be heard. FRS has a high-power limit of 2 watts. Before 2018, the transmit power was limited to 0.5 watts and many older FRS radios still using that level.
2. **Ease of configuring.** Typically, once you set your channel and privacy codes (tones), you should not need to change them again. However, there may be times when this might be necessary, such as helping a neighbor get their radio programmed. For this write-up, *Ease of Configuring* is broken down into 3 categories:
  - a. Simple: All controls and settings can easily be made from the radio's buttons.
  - b. Medium: While manual settings can be made with the help of a manual, a computer program could be used to help you quickly get your radio programmed.
  - c. Complex: A thorough understanding of the radio's features is required to properly set up these radios. A computer program is almost always required to configure your radio without mistakes. NOTE: sometimes Complexity and Cost are inversely proportional meaning, less expensive radios are more complex.
3. **Commonality.** In most cases, radios from the same manufacturer usually have the same controls and configuration options making it easy for a FRS user of a particular radio to pick up another radio from the same manufacturer and immediately know how it works.

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<sup>1</sup> <https://midlandusa.com/blogs/blog/gmrs-or-frs-radio-how-to-choose>

4. **Cost.** Only comparing costs can be misleading without the considering the above. You may think you are getting a great deal only to find out later that one of the above is lacking.

The following is a table of some (not all) GMRS and FRS radios on the market as of 23 April 2023 (this list is subject to change). The first 6 entries (grayed out) are GMRS radios and not in scope for this discussion. The rest are FRS radios sorted by High Power Level. Please note the following columns:

1. Use/Config – Subjective assessment of the radios ease of use and configuration.
2. Type – Identifies the radio as either a mobile (base station) or HT (Handi-Talkie or Walkie-Talkie).
3. Lic Class – GMRS radios require a GMRS license. FRS radios do not.
4. Hi Pwr – The listed highest power that the radio delivers as listed on the FCC Certification page.
5. % Pwr – For FRS, this is percentage that a radio's highest power is relative to the 2-watt maximum power. The higher the percentage, the better.
6. Vendor, Price – Places, and prices, where the radio was found on line. This may not be the only source for this radio.
7. U/E – Unit of Issue. Essentially the number of radios that comes for the listed price.
8. \$/Watt – The output power relative to the radio cost; the lower the better.

**Sample of GMRS and FRS Radios on the market**

|   | Mfgr       | Model      | Use/Config | Type   | LicClass | Lo Pwr | Hi Pwr | %Pwr | Vendor  | Price     | U/E | \$/radio | \$/Watt  |
|---|------------|------------|------------|--------|----------|--------|--------|------|---------|-----------|-----|----------|----------|
|   | Midland    | MXT400VP3  | Medium     | Mobile | GMRS     | 5.000  | 40.000 |      | Amazon  | \$ 339.99 | 1   | \$339.99 | \$8.50   |
|   | Midland    | MXT115     | Medium     | Mobile | GMRS     | 5.000  | 15.000 |      | Amazon  | \$ 164.99 | 1   | \$164.99 | \$11.00  |
|   | Midland    | GXT1000VP4 | Simple     | HT     | GMRS     | 0.420  | 5.330  |      | Midland | \$ 89.99  | 2   | \$45.00  | \$8.44   |
|   | Radioddity | GM-30      | Complex    | HT     | GMRS     | 0.490  | 4.900  |      | Amazon  | \$ 34.99  | 1   | \$34.99  | \$7.14   |
|   | Midland    | T295       | Simple     | HT     | GMRS     | 0.500  | 2.850  |      | Midland | \$ 99.99  | 2   | \$50.00  | \$17.54  |
|   | Midland    | GXT1050    | Simple     | HT     | GMRS     | 0.455  | 2.500  |      | Midland | \$ 99.99  | 2   | \$50.00  | \$20.00  |
| A | Motorola   | T460       | Simple     | HT     | FRS      | 0.390  | 1.830  | 92%  | Amazon  | \$ 78.00  | 2   | \$39.00  | \$21.31  |
|   | Motorola   | T465       | Simple     | HT     | FRS      | 0.390  | 1.830  | 92%  | Amazon  | \$ 90.00  | 2   | \$45.00  | \$24.59  |
|   | Motorola   | T400       | Simple     | HT     | FRS      | 0.480  | 1.710  | 86%  | Amazon  | \$ 78.00  | 2   | \$39.00  | \$22.81  |
|   | Motorola   | T482       | Simple     | HT     | FRS      | 0.370  | 1.690  | 85%  | Amazon  | \$ 79.99  | 2   | \$40.00  | \$23.67  |
|   | Radioddity | FS-T1      | Complex    | HT     | FRS      | 0.360  | 1.600  | 80%  | Amazon  | \$ 29.74  | 2   | \$14.87  | \$9.29   |
|   | Motorola   | T600       | Simple     | HT     | FRS      | 0.400  | 1.300  | 65%  | Amazon  | \$ 96.91  | 2   | \$48.46  | \$37.27  |
| B | Motorola   | T605       | Simple     | HT     | FRS      | 0.400  | 1.300  | 65%  | Amazon  | \$ 119.00 | 2   | \$59.50  | \$45.77  |
|   | Motorola   | T380       | Simple     | HT     | FRS      | 0.500  | 1.100  | 55%  | REI     | \$ 110.00 | 2   | \$55.00  | \$50.00  |
|   | Motorola   | T260       | Simple     | HT     | FRS      | 0.400  | 1.000  | 50%  | Amazon  | \$ 42.99  | 2   | \$21.50  | \$21.50  |
|   | Motorola   | T270       | Simple     | HT     | FRS      | 0.489  | 0.988  | 49%  | REI     | \$ 90.00  | 2   | \$45.00  | \$45.55  |
| C | Motorola   | T800       | Simple     | HT     | FRS      | 0.400  | 0.750  | 38%  | Amazon  | \$ 99.99  | 2   | \$50.00  | \$66.66  |
|   | Midland    | LXT535PA   | Simple     | HT     | FRS      | 0.137  | 0.408  | 20%  | Midland | \$ 59.95  | 2   | \$29.98  | \$73.47  |
|   | Midland    | LXT535VP3  | Simple     | HT     | FRS      | 0.137  | 0.408  | 20%  | Midland | \$ 47.99  | 2   | \$24.00  | \$58.81  |
|   | Midland    | LXT500VP3  | Simple     | HT     | FRS      | 0.232  | 0.391  | 20%  | Amazon  | \$ 47.99  | 2   | \$24.00  | \$61.37  |
|   | Midland    | T50,A      | Simple     | HT     | FRS      | 0.247  | 0.305  | 15%  | Amazon  | \$ 49.99  | 2   | \$25.00  | \$81.95  |
|   | Midland    | T20        | Simple     | HT     | FRS      | 0.199  | 0.221  | 11%  | Midland | \$ 37.49  | 2   | \$18.75  | \$84.82  |
|   | Midland    | T10        | Simple     | HT     | FRS      | 0.199  | 0.221  | 11%  | Midland | \$ 37.49  | 2   | \$18.75  | \$84.82  |
|   | Motorola   | T100       | Simple     | HT     | FRS      | 0.190  | 0.200  | 10%  | Amazon  | \$ 27.49  | 2   | \$13.75  | \$68.73  |
|   | Midland    | LXT600VP3  | Simple     | HT     | FRS      | 0.081  | 0.101  | 5%   | Amazon  | \$ 59.95  | 2   | \$29.98  | \$296.78 |

## Selecting a FRS radio... Which one?

For Neighborhood and ARK use...

- If you are looking to operate FRS in your neighborhood or talk to the ARK, then consider the radios in *GROUP A*. Cupertino Citizen Corps purchased the Motorola T600 for the GMRS Radio Packs at the ARKs. These radios are waterproof and can be submerged down to 1 meter.
- The Motorola T460 is very similar to the T600 except it is water resistant (can be splashed, not submerged). Other than the Power-On and Volume controls, it's configuration is identical.
- You may be tempted by the price to go for the Radioddity FS-T1. Before you buy, I recommend you watch this review: <https://www.youtube.com/watch?v=lvXMwxJwoUM>

### For Neighborhood use, or close to the ARK...

- If you are looking to operate FRS in your neighborhood or if you live close to the ARK, then consider the *GROUP B* radios. The Motorola T260 has reasonable power, operates on 3AA batteries with easy access to the battery compartment.

### For Neighborhoods only...

- Any of the GROUP A, B, and C radios will work with most of the Group C radios sporting low power. Note that the \$/Watt is higher than most radios in the other two Groups. If you only intend to operate within your neighborhood, then I'd recommend the Group B Motorola T260.

### What if I have a GMRS license

Having a GMRS license opens up more options for higher power radios with more features (that sometimes translates into more complexity). Your radio choice also depends on what you want to do.

- For FRS neighborhood use, any of the above radios in Groups A, B, or C will work fine.
- If you are looking for a GMRS handheld, consider the Midland GXT1000VP4. This works on all the same channels as the FRS radios but, unlike the FRS 2-watt limitation, GMRS users can transmit up to 5 watts with this radio.
- If you live in a big neighborhood or want to help with our planned quarterly radio nets, consider the Midland MXT115 (15 watts) or MXT400 (40 watts) mobile radios as a home station or in your car. With an external antenna, you can cover a very large area. The MXT115 is the radio in the ARK GMRS Radio Kits. This radio is also capable of talking with GMRS Repeaters (Note: Cupertino does not have one).

### Final thoughts

1. All the radios suggested in this document are **Simple** to use and configure.
2. If I were to put a short-list together for FRS radios to consider, then it would be these 3:

| Mfgr/Model   | Use    | Type | Lic Req | Batteries |          | Max Pwr (w) | WaterPrf |
|--|--------|------|---------|-----------|----------|-------------|----------|
|  |        |      |         | Recharge  | Alkaline |             |          |
| Motorola T480  | HT     | FRS  | No      | Yes       | 3AA      | 1.80        | IP54     |
| Motorola T600  | HT     | FRS  | No      | Yes       | 3AA      | 1.30        | IP67     |
| Motorola T260  | HT     | FRS  | No      | --        | 3AA      | 1.00        | IP54     |
| Midland MXT400   | Mobile | GMRS | Yes     | --        | --       | 40.00       | --       |
| Midland MXT115   | Mobile | GMRS | Yes     | --        | --       | 15.00       | --       |
| Midland GXT1000VP4   | HT     | GMRS | Yes     | Yes       | 4AA      | 5.32        | IP54     |
| IP54: product will be protected from water sprays from all directions.   |        |      |         |           |          |             |          |
| IP67: product will be protected against water and liquids, up to and including immersion in up to one meter of water |        |      |         |           |          |             |          |

3. A GMRS license is not needed to operate a FRS radio. If you decide to buy a GMRS radio, then you must get a GMRS license (\$35, no test, good for 10 years). Its easy to get!
4. If you want more flexibility (read: complexity) with your FRS (or GMRS) radio, then check the Radioddity radios and then do your homework! [www.youtube.com](http://www.youtube.com) has plenty of video reviews.
5. There are other FRS and GMRS radios out there on the market. If you find one that is not on the above list, then do your research to make sure you know what you are getting and that it will meet your needs. Also, if you find one with which you need help evaluating, then let us know and we can help check it out!
6. Finally, the above is not an indorsement by the City for what or from who to buy a radio. Instead, it reflects the experiences from CCC members interested in radio communications.