

## Now Hear This...

### *Up Close and Conversational with FRS Radios*

The modern marine band VHF radio is as much a part of boating today as the life jacket. Unlike life jackets, however, radios are not mandated equipment although as safety gear, many boaters consider them just as essential.

The VHF, however, has more uses than just emergency communication: Radio ahead for a berth at a marina; hail the passing boat for advice on entering a new channel; send the crew to a restaurant ashore with a handheld VHF to report back on the wait ... *Whoa! That's illegal.*

Marine VHF radios, whether fixed or handheld, may not be used on land, period. It's the law. Once a VHF radio goes ashore, it cannot be used for marine band transmission (without a Coast Station

License). But wouldn't it be handy to be able to touch bases from time to time with the shore party? Communicate with the kids while they're "on liberty" in a new port? Give anchoring commands from the helm without yelling?

Well, of course you can these days — with cell phones, pagers or even text messaging on your Personal Data Assistant. But there's another way to keep in touch that isn't at the mercy of cellular towers or satellites and it can be much less expensive. It's Family Radio Service (FRS), designated in 1996 as a "two-way voice communication service to facilitate activities of immediate family members." In other words, they've brought back the walkie-talkie that you had as a kid. Only

now, thanks to the electronics manufacturers that immediately jumped into this market, the static, squeals and pops are gone and you can actually hear the person on the other end.

The FRS market is booming. Over 20 manufacturers now offer more than 100 models and since boaters might want to carry FRS for short-range communication, the BoatU.S. Foundation for Boating Safety and Clean Water decided to check out these radios.

#### **Breaker, Breaker!**

FRS radios are limited to one-half watt, also expressed as 500 milliwatts or mW. This gives a line-of-sight range of roughly two miles, although the Federal Communications Commission (FCC) says you can expect less than a mile, consistently. Radios in this class offer up to 14 channels with up to 38 subchannels, which means you have over 500 ways to find a clear signal.

General Mobile Radio Service (GMRS) radios available for recreational use transmit at up to two watts. They offer 22 broadcast channels (a mix of low wattage FRS channels and higher wattage GMRS channels). The extra wattage gives ranges of up to five miles or more — but be forewarned, it comes at a price. You must buy a \$75 FCC license to use the GMRS channels legally (see sidebar.)

Many radios that have subchannels advertise them as "privacy codes," but that is misleading. If you and another person agree to talk on, say, channel 12, subchannel 7, the general chatter on 12 will be blocked so you'll only hear each other. While it will sound quiet and private from your end, anyone on channel 12 will be able to hear everything you say.

#### **Can You Hear Me Now?**

Since the claims for both types of radios relate to broadcast range, we decided to put the units to an on-the-water distance test while taking notes on the clarity of the transmissions as well as ease of operation. For testing, we selected 11 pairs, five FRS and six GMRS, from



Testing entailed reading scripted sentences over the air at half-mile intervals. Eleven models of FRS and GMRS radios (at right) were tested on land and water.



five well-known manufacturers (see chart).

The test involved evaluating two-way transmissions at half-mile intervals. We established a control station at a local marina with a tester and a recorder equipped with a set of the radios. Then we sent out another team with radios in an open 16-foot outboard boat.

Beforehand, we drafted two lists of 10-word sentences, one for our land team and one for the boat team, and assigned a different sentence to each radio.

At each half-mile position, a tester would read the sentence for that particular radio over the air and the receiving person would repeat it as best they could to the team's recorder. Then the other tester, using that radio's twin, would read a new sentence back to the first team.

Establishing position with a handheld GPS, the boat team moved offshore one mile and the teams ran through the sequence with all 11 radios. The boat then moved off another half-mile to repeat the transmissions, and so on. When one team could understand less than 50% of the words transmitted by the other, we gave that radio a "spotty" performance grade. When a particular radio reached a consistent failure rate, we removed it from testing (see chart).

Each radio had fresh batteries or newly charged battery packs. In many cases, holding the antenna vertically and high up improved the signal, as did shielding it from the wind and using features such as "power-up" or turning off the auto-squelch, if available. Overall, we found the more time we spent with the radios, the better we became at improving the signal.

We also tried the radios on land and we can verify the manufacturers' warnings that changes in topography and obstacles will hinder signals. In a hilly area with many trees, we lost communication in

about a half-mile with one FRS. In a flatter area with trees, we were able to maintain spotty communication on several FRS radios for over a mile and on the GMRS radios for about two miles.

#### Talk Radio

Both FRS and GMRS radios are available with a wide range of special features. Some had just a few features and those are listed as "Basic" on the accompanying chart.

The "Moderate" designation in our chart means the radios have several additional features like scan, built-in voice activation, battery strength meter (instead of a blinking light), and optional rechargeable batteries. Many have subchannels.

The "Loaded" models have additional bells and whistles: weather radio, signal strength indicator, clock, vibrating ring, stop watch and compass. The Motorola T6320 even has a barometer, altimeter, and thermometer. Since we were testing for use on the water, we were disappointed that only four were labeled as water-resistant.

Additionally, some units use only disposable alkaline batteries, two use only rechargeable battery packs and some can use either, all of which affects the price dramatically.

Noted in the chart are manufacturers' suggested retail prices per pair. However, we found that rebates and discounts can cut the price by 25% to 50%. They may be even cheaper when bought in pairs.

Price does not necessarily equate to features since, for instance, the "basic" Cobra 130 comes with rechargeable batteries and charger, and an ear bud and microphone. The inexpensive Uniden 520-2 comes with nothing but a belt clip, so there is plenty of variation in what you get for your dollar.

One of the drawbacks to the purchas-

ing decision, we found, is the packaging. Every unit comes blister-packed and unless the store has a demo unit, you can't grab a FRS radio and get the "feel" of it.

That's important since the configurations of the keys and buttons vary widely as does the size of the display screen. The Talk key on many units is on the side, just as on a marine VHF microphone or a handheld VHF. But on several test units, the Talk key is on the front, which took some getting used to.

#### Conclusions

Both Audiovox units we tested look like they were designed 20 years ago, with very boxy shapes. The GMRS unit had small buttons requiring sturdy fingernails and it proved difficult to access its features. That said, it tested very reliably and the FRS version, the least expensive unit, met its claim of two miles.

Both Cobra units, with more ergonomic design, reminded us of our cell phones. We liked the GMRS model's big screen with icons for all the features; however, this radio did not come close to its distance claim of five miles. The Cobra FRS unit exceeded its two-mile claim and came in on par with the more expensive Motorola FRS.

The Midland radios proved a pleasant surprise. Staff members who associated the name with CB radios did not expect these units to test well. The GMRS unit, however, gave perfectly clear transmission, although it has a tiny encoded display. Although small, the Midland FRS unit has an easy-to-read screen and its twist on/off/volume knob proved convenient. This radio met its two-mile claim on land and performed well at that distance in the boat test, although it claimed up to a five-mile range over water.

We tested three Motorola Talkabout

Radio Models Tested and their Features

	Manufacturer & Model	Channels & Subchannels	MSRP per pair	Features	Max. Power	Weather Radio	Water-resist	Battery Requirements (of models tested)
FRS	Audiovox FRS FR1420	14 channels	\$40	Moderate	.5 W	no	no	Alkaline
	Motorola Talkabout T5320	14 channels	\$60	Basic	.5 W	no	yes	Alkaline or NiMH
	Midland F10	14 channels	\$70	Moderate	.5 W	no	no	Alkaline or NiMH
	Cobra FRS 130	14 channels	\$80	Basic	.5 W	no	no	Alkaline or NiMH
	Motorola Talkabout T6320	14 channels/38 subchannels	\$200	Loaded	.5 W	yes	yes	Alkaline
GMRS	Uniden GMRS 520-2	22 channels/38 subchannels	\$40	Basic	.5 W	no	no	Alkaline
	Uniden GMRS 380-2	15 channels/38 subchannels	\$100	Moderate	2 W	no	no	Alkaline or NiMH
	Midland GMRS G30	15 channels/38 subchannels	\$120	Moderate	2 W	no	no	Rechargeable only
	Cobra PR 1100WX	22 channels/38 subchannels	\$130	Loaded	2 W	yes	yes	Alkaline or NiMH
	Audiovox GMRS 7000	15 channels/38 subchannels	\$140	Loaded	2 W	yes	no	Rechargeable only
	Motorola Talkabout T6400	22 channels/38 subchannels	\$180	Loaded	1 W	no	yes	Alkaline or NiMH

units and liked the durable rubberized casing, large display and ergonomics of the two more expensive models. Ironically, the basic T5320 FRS model tested as well as the loaded T6320 FRS, with both transmitting up to three miles. The GMRS showed spotty performance, but still worked well at five miles on the water.

The small Uniden GMRS 520-2 proved difficult to turn on, has tiny buttons and its screen is less than 3/8" wide. It performed only up to 2.5 miles. The GMRS 380-2 has an easier-to-use menu, a larger display, and an on/off/volume rolling dial. (It performed up to three miles, but if we're going to the hassle of getting the required FCC license, we want greater range.)

For FRS, we found that less is more. Two basic models, the Cobra FRS 130 and Motorola T5320, are easy to use, dependable, no-frills models, and a good value.

Our top GMRS performers were the Midland, by far the clearest signal, the Audiovox, heavy but dependable, and the Motorola, ergonomic, water-resistant and an all-around favorite of our testers.

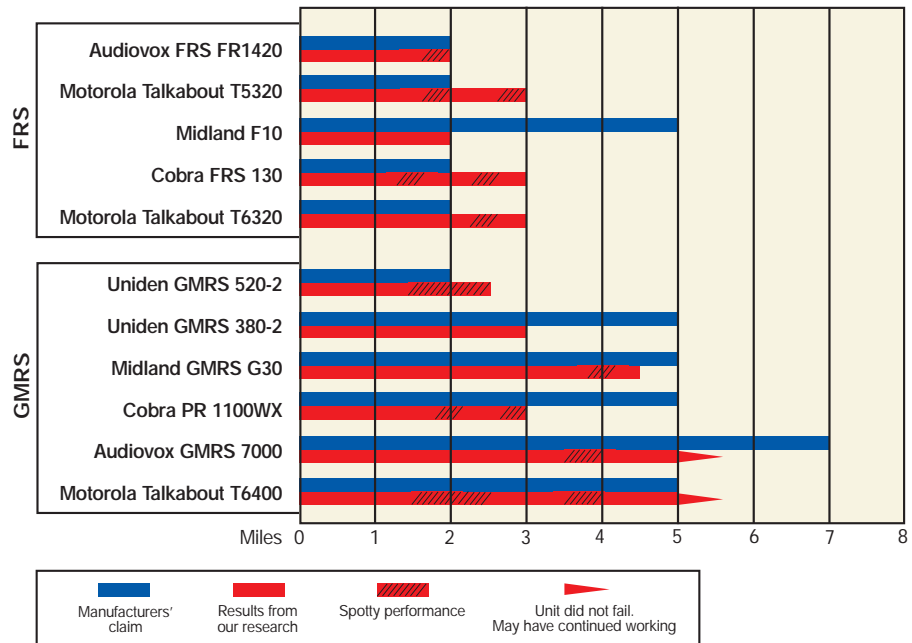
### Bottom Line

As a group, our team of testers, seasoned recreational boaters all, came to the conclusion that many boaters would find the license-free FRS radios a worthwhile communications tool even if they already have a VHF radio aboard and a cell phone or two. While not 100% reliable as a means of short-range communication, FRS offers a reasonably priced way for the entire crew to better stay in touch, afloat or ashore, without the added expense of the FCC license.

Under no conditions should you consider FRS or GMRS radio as a replacement for VHF in emergency situations. Place a mayday call with these radios and it's extremely unlikely that anyone will hear it. Also, be aware that you should check with local authorities before using either radio outside the U.S. There can be penalties for use in other nations.

We recommend that you analyze your boating and other outdoor recreation activities to see if FRS radio might be useful while going ashore or even on a hunting trip, to a sports event or to the mall. Consider whether the extra range of the GMRS is worth the license fee and application hassle. Then decide which additional features you might need and that will help you determine whether some of these radios should be on your list to Santa. ■

## FRS/GMRS Radio Distance Performance Over Water



### The FCC and Thee

While FRS radios with the added GMRS channels offer longer broadcast range, to use those channels, you must obtain a \$75 FCC license. The license is good for five years and you can register up to six units on one license. The application requires you to fill out multiple forms, however, which our test administrator found frustrating. (Hint: apply on-line; the auto-prompts make it much easier, [www.fcc.gov](http://www.fcc.gov).)

We also found it troubling that for the six FRS/GMRS units we bought, only three noted the license requirement on the package.

When questioned about this potential surprise for the buyer after the packaging had been destroyed to get at the unit, one manufacturer's customer service representative told us, "Oh, the sales clerk is supposed to tell you that. And it's on our Web site, anyway."

Thus, we suspect there are vast numbers of unlicensed units in use. But the fact remains, it's illegal and could be costly — the fine can run to \$10,000. To learn more about the application process, visit: [www.boat-us.com/foundation](http://www.boat-us.com/foundation).



Foundation testers select a subchannel (at top). Family radios are a handy option for short range ship-to-shore communications.