

High-end Handheld VHF Radios



Standard Horizon models float to the top in a field of eight priced from \$130 to \$350.

Like the inexpensive handheld VHF we reviewed in the April 2009 issue, high-end radios are handy to have as backups to a fixed VHF or to include in an emergency ditch bag. However, shelling out a few extra bucks for the high-end units will get you added features and upgrades, and a handheld VHF that is better equipped for duty as a primary VHF for coastal sailors. While handheld radios typically will not transmit and receive at distances as great as fixed models, they do have the portability factor going for them. Sailors who plan to carry only a handheld VHF would do well to invest in one of the high-end units reviewed here.

WHAT WE TESTED

Practical Sailor tested eight handheld marine VHF radios that we classed as high-end models, those priced from \$140 to \$350.

Maximum power output on a portable handheld marine radio is limited to 5 or 6 watts, and most

Best Choice
Standard Horizon HX850S

have a 1-watt, low-power setting for harbor use. We evaluated five 5-watt VHF—the Cobra MR HH425 LI VP, the Uniden MHS450 and MHS550, and the Standard Horizon HX500S-LI and HX600S-LI—and three 6-watt radios—the Standard Horizon HX750S, HX760S, and HX850S. Most of the test radios also had a mid-power setting.

The HX500S-LI and HX600S-LI are upgraded versions of previous Standard Horizon radios. The company's other three test entries are floatable VHF's.

All eight radios tested are lithium-ion battery-powered and are waterproof. They all are rated for submersion to 3 feet for 30 minutes, and the Uniden radios are rated for submersion to 4½ feet for 30 minutes.

All units come with three-year warranties (all batteries have one-year warranties) and a belt clip and have an external antenna connection and a jack for an optional external microphone, speaker, and/or headset. Only the Standard Horizon HX600S-LI and HX850S have DSC capability, a feature we prefer in any VHF.

As we go to press with this report, we are in the process of testing a latecomer, the Icom M36, which also fits this group. As soon as the test is complete, we will publish an update.

The HX750S was one of three Standard Horizon radios we tested that floats. All of the test radios are waterproof.

HOW WE TESTED

With batteries fully charged, each radio was run through a series of bench tests. We tested transmitter power, frequency accuracy, frequency stability, receiver sensitivity, audio output, and audio quality.

Transmitter tests were done at room temperature and at temperature extremes. Our equipment did not allow us to test for receiver selectivity, so we listed maker specs for this in the Value Guide on pages 14-15.

Display ratings were based on readability, the value of information shown, and the quality of the backlighting.

To confirm the radios were waterproof, they were submerged in fresh water for 30 minutes. To rate shock-proofing, each radio was dropped from a height of 4 feet onto concrete. For the battery-life test, each radio was allowed to run for 15 hours.

For more specifics on how we tested, check out the online version of this article at www.practical-sailor.com.

In the final analysis, we considered performance, cost, warranty, battery life, included equipment, recharge time, display, audio output, and features.

COBRA HH425

The Cobra MR HH425 LI VP is a mid-sized dual-band marine handheld solidly constructed on an aluminum die-cast frame. At 13.3 ounces, it was the heaviest radio tested.

The HH425 comes with an AC charger that requires only four hours to fully charge its 1,900-mAH lithium-ion battery pack. The Cobra offers the most battery capacity of all radios tested in this group and was one of three to go the distance in our battery life test. It also comes with a DC charger cord, belt clip, AA battery case, and wrist strap.

The Cobra's volume and squelch controls are top-mounted. One-button control, via one of the 10 pushbuttons, is available for transmitter power selection, call tone, channel changing, weather channel selection, quick-select



channel 16 or 9, band selection, and some scanning options.

Scan modes include numerical, memory, and tri-watch. Tri-watch scans channel 16 and two user-selectable channels. The HH425 can use all Canadian, international, and U.S. marine VHF channels, NOAA weather channels, and 15 general mobile service radios channels.

One feature on this radio we've not seen on any other marine handheld VHF is Cobra's "Rewind-Say-Again" function. This records the last 20 seconds of speech received on a selected channel. So should you miss the call and want to listen to it again, all you have to do is press the "REW" key. Our tests confirmed this works as advertised.

The HH425 also has dual-band function, meaning it can be used as a regular VHF or as a walkie-talkie-type device with GMRS radios.

The HH425 display is large for a handheld and shows a lot of valuable information, including transmitter output, battery level, and signal strength.

Transceiver performance was average. At temperature extremes, it went slightly off frequency but remained within industry and governmental standards.

Bottom line: For \$149, this is a brawny radio with a fast recharge time, a large display, and long battery life that doubles as a walkie-talkie—definitely a bargain.

STANDARD HORIZON FLOATERS

Standard Horizon introduced three floating handheld VHF's in 2008. To displace enough water to float, the radios combine relatively large cases with relatively light weight.

However, the design required some battery-size sacrifice to reach the floating point. Each of the three Standard Horizon floaters, the HX750S, HX760S, and HX850S, is powered by a 1,150-mAH lithium-ion battery pack, the smallest capacity-wise of all the radios we tested. The three came in at the mid to low end of the battery life performance test. All reached full charge after eight hours on

the supplied AC chargers.

Each of these each can use all Canadian, international, and U.S. marine VHF channels and NOAA weather channels.

Audio performance was outstanding for the trio. We measured 99 dBA in our output test, the highest of the radios tested.

The displays all use large numbers, sliding scales for volume and squelch levels, a low-battery indicator, and icons for varying transmitter power outputs.

Like some other Standard Horizons, the floating VHF's also have SOS strobe lights that can be seen up to a mile away, a handy safety feature for a portable radio. These radios also have some unique features that set them apart.

The Standard Horizon floaters compare favorably to the last floating portable VHF we tested, the Icom M34 (PS, January 2008). The Icom, while it lasted 12 hours in the battery life test, had less battery capacity, nearly double the charge time, weaker output, and a lower-rated display than the Standard Horizon units.

In November 2008, Standard Horizon noticed that some HX750S and HX850S radios showed stress cracks in the rear case and traced the problem to excessive tightening of the screws during assembly. The company resolved the problem and issued a voluntary safety check to consumers. According to the company, about 40 radios have been returned with this problem, but no models currently on the market were affected. (If you find a model with this problem, call 800/283-7839 ext. 6700.)

HX750S: An unexpected feature on the HX750S is a water-temperature sensor. It worked as advertised, showing the temperature on the display. While there might be a situation when knowing water temp could aid in survival, the testers were not keen about a feature that required soaking a radio (even a floating one) in sea water

for several minutes.

All functions of the HX750S are controlled with 11 front-mounted pushbuttons. We prefer knobs for volume and squelch. One button control is available for transmitter power, channel changing, weather channel selection, quick 16 or 9, and some scanning options. Scan modes are dual watch, tri-watch, memory, and priority. A preset key can be used to store and quickly recall up to 10 channels.

Transceiver performance was top notch, and the battery lasted longer than some batteries with higher capacities.

Bottom line: It floats, has good transceiver performance, decent battery life, superior audio output, and a reasonable \$139 price tag, making it the Budget Buy.

HX760S: Like the HX750S, the Standard Horizon HX760S features a built-in water thermometer. It was also the only test radio that could interface with a Bluetooth headset.

The HX760S, which comes with the Standard Horizon BH-2 Bluetooth headset and headset charger, offers hands-free operation when set up for VOX (voice operated transmit) communications. It also can be set up for push-to-talk transmissions.

Testers followed maker directions for coupling the headset and radio, and then made some voice calls to another VHF radio. The VOX technology activates the headset when the user starts to speak, so it is not necessary to push any buttons. We could hear the other radio well in the headset, and the tester on the other end reported hearing our transmissions with little to no static.

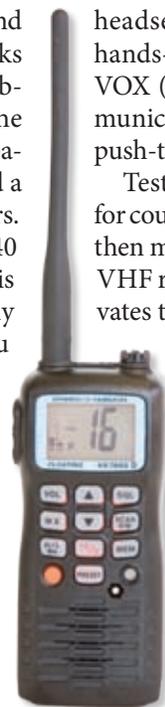
All functions of the HX760S are controlled with 11 push-buttons. One button control is available for transmitter power, channel changing, weather channel selection, quick 16 or



Cobra HH425



Standard Horizon HX750S



Standard Horizon HX760S

AS VALUE GUIDE EXPENSIVE VHF HANDHELD RADIOS

MAKER	COBRA	STANDARD HORIZON	STANDARD HORIZON	STANDARD HORIZON
MODEL	MR HH425 LI VP	HX500S-LI	HX600S-LI ✓	HX750S \$
PRICE	\$150	\$130	\$166	\$140
PRICE SOURCE	consumersmarine.com	thegpsstore.com	consumersmarine.com	consumersmarine.com
12v DC CHARGER and AC CHARGER	Included	Included	Included	Included
AA OR AAA BATTERY PACK	Included	Optional	Optional	Optional
BATTERY CAPACITY	1,900 mAH	1,700 mAH	1,700 mAH	1,150 mAH
BATTERY MODEL NO.	110-010	FNB-V98LI	FNB-V98LI	FNB-V99LI
BATTERY REPLACEMENT COST	\$25	\$48	\$48	\$48
MAXIMUM CHARGE TIME	4 hours	8 hours	8 hours	8 hours
CLAIMED / TESTED OPERATION TIME	14 / 15 hours	16 / 15 hours	16 / 15 hours	16 / 13 hours
SCRAMBLER	N/A	Optional	Optional	N/A
WX ALERT	Yes	Yes	Yes	Yes
FREQUENCY BANDS *	M, GM	M	A, AM, FM, M	M
CHANNEL COMMENTS	No	Yes	Yes	Yes
DSC CAPABILITIES	None	None	DSC distress	None
UNIT SIZE (W x H x D)	2.7 x 4.9 x 1.6 inches	2.5 x 4.3 x 1.4 inches	2.6 x 4.3 x 1.4 inches	2.5 x 5.7 x 1.7 inches
WEIGHT	13.3 ounces	11.1 ounces	11.3 ounces	10.7 ounces
TX SETTINGS	5, 3, 1 watts	5, 2.5, 1 watts	5, 2.5, 1 watts	6, 5, 2.5, 1 watts
SELECTIVITY	60 decibels	65 decibels	65 decibels	70 decibels
AUDIO OUTPUT (1 FOOT)	93 dBA	95 dBA	96 dBA	99 dBA
RATINGS				
TRANSMITTER POWER STABILITY	Good	Excellent	Excellent	Good
TRANSMITTER FREQUENCY STABILITY	Fair	Good	Excellent	Good
RECEIVE SENSITIVITY	Good	Excellent	Excellent	Excellent
DISPLAY RATING	Excellent	Good	Good	Excellent
AUDIO QUALITY	Good	Good	Good	Good
DROP / SUBMERSION TEST	Pass / Pass	Pass / Pass	Pass / Pass	Pass / Pass

★ Best Choice \$ Budget Buy ✓ Recommended

* Aircraft (A), AM Broadcast (AM), Family (F), FM Broadcast (FM),

9, and scanning. There are four scan modes: dual watch, triple watch, memory, and priority. A preset key can be used to store and quickly recall up to eight favorite channels

Testers rated the HX760S's audio and transceiver performance highly, and battery life was a respectable 11 hours. It was the lightest radio tested.

Bottom line: Bluetooth capability doesn't come cheap. The \$349 price is a bit steep, in our opinion, but those who value hands-free communication will find the HX760S to be a quality radio.

HX850S: The Standard Horizon HX850S has a self-contained GPS receiver and full DSC capability, a rare find in a handheld. The HX850S can transmit and receive DSC distress calls, and can handle all ships, individual, and group calls, as well

as position requests or position reports. It was the only test radio capable of displaying current position data.

GPS information can be displayed in two modes. The position mode shows time and latitude/longitude while the navigation mode adds the boat's speed over ground (SOG) and course over ground (COG).

The push-to-talk switch and DSC buttons are side-mounted. All remaining functions are controlled with 11 push-buttons. One button control is available for transmitter power, channel changing, weather channel selection, quick 16 or 9, and scanning options. Scan modes include memory and priority.

Transceiver performance was very good, and audio quality was rated Good. Battery life was the radio's main

drawback: It logged only eight hours, a tradeoff for a radio that floats and has full-function GPS and DSC. If the GPS function is disabled, the company claims, battery life increases to 11 hours.

Bottom line: This innovative handheld gets our Best Choice rating for combining a floating VHF, top-notch performance, and full DSC capability. However, its battery life leaves much to be desired, so we recommend keeping charged back-up batteries on hand.

STANDARD HORIZON UPDATES

Two Standard Horizon handheld VHF's were updated with lithium-ion batteries since we tested them. *Practical Sailor* reviewed the nickel metal hydride-powered HX500S and HX600S units in July

	STANDARD HORIZON	STANDARD HORIZON	UNIDEN	UNIDEN
	HX760S	HX850S ★	MHS450	MHS550
	\$350	\$220	\$160	\$185
	westmarine.com	consumersmarine.com	consumersmarine.com	consumersmarine.com
	Included	Included	Included	Included
	Optional	Optional	Optional	Optional
	1,150 mAH	1,150 mAH	1,400 mAH	1,400 mAH
	FNB-V99LI	FNB-V99LI	BP-550	BP-550
	\$45	\$45	N/A	N/A
	8 hours	8 hours	3 hours	3 hours
	10 / 11 hours	7 (with GPS) / 8 hours	12 / 12 hours	12 / 11 hours
	N/A	N/A	N/A	N/A
	Yes	Yes	Yes	Yes
	M	GPS, M	M	A, AM, F, FM, M
	Yes	Yes	Yes	Yes
	None	Full (See text)	None	None
	2.5 x 5.7 x 1.7 inches	2.5 x 5.7 x 1.7 inches	2.7 x 4.4 x 1.3 inches	2.7 x 4.4 x 1.3 inches
	10.8 ounces	12 ounces	11.8 ounces	12 ounces
	6, 5, 2.5, 1 watts	6, 5, 2.5, 1 watts	5, 2.5, 1 watts	5, 2.5, 1 watts
	70 decibels	70 decibels	70 decibels	72 decibels
	99 dBA	99 dBA	88 dBA	88 dBA
RATINGS				
	Good	Good	Good	Good
	Good	Good	Good	Good
	Excellent	Excellent	Fair	Fair
	Excellent	Excellent	Good	Good
	Good	Good	Good	Good
	Pass / Pass	Pass / Pass	Pass / Pass	Pass / Pass

* Land Mobile (LM), Marine (M),

* General Mobile Radio Service (GM), GPS (GPS)

2006 and took a look at the updated releases, the HX500S-LI and the HX600S-LI, for this test. The HX600S was named Best Choice among high-end portable VHF's in the 2006 review.

The switch to lithium-ion batteries means the LI models offer more capacity (1,700-mAH) than their predecessors, reach full charge faster (about two hours quicker with the supplied AC charger), and offer more charge cycles. The portable LIs also are lighter weight and more compact than the original models.

In our battery life tests, the HX500S-LI lasted two hours longer than the HX500S we tested. Both the HX600S and

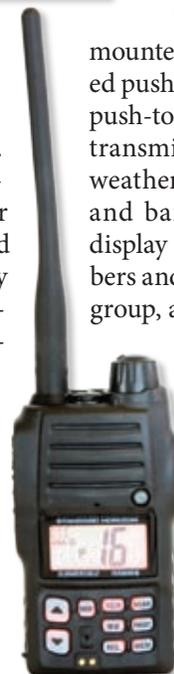
HX600S-LI went beyond the 15-hour test cutoff.

The HX500S-LI and HX600S-LI both have an SOS strobe light. Both can use all Canadian, international, and U.S. channels, and offer dual watch, tri-watch, priority, and memory scan modes. A preset key can be used to store and quickly recall up to eight favorite channels.

A re-hatched version of an older model, the HX500S-LI can be found at a bargain price. Following the release of the Standard Horizon floaters, the HX600S-LI was discontinued. However, it is still available from



Standard Horizon HX500S-LI



Standard Horizon HX600S-LI

distributors and can be had for a good deal.

HX500S-LI: The HX500S-LI operates on the marine band only. The volume knob is top-mounted. Side-mounted pushbuttons control power, squelch, and push-to-talk. Eight other pushbuttons control the other functions.

The HX500S-LI display uses large channel numbers and shows transmitter power and the selected channel, its name, use, and group.

The HX500S-LI earned mostly Excellents in our bench tests.

Bottom line: With its low price, rugged construction, and very good performance, the HX500S-LI is a good deal.

HX600S-LI: The HX600S-LI is one of only a handful of handheld radios on the market with DSC capability. If it is sitting in its charger (plugged in or not) and the charger is receiving NMEA 0183 position data from a GPS unit, the HX600S-LI will transmit vessel position data along with the boat's Maritime Mobile Service Identity (MMSI) number when making a DSC emergency call. The position data is saved in the radio's memory as well, a handy feature in an emergency.

The HX600S-LI has a top-mounted volume knob and side-mounted pushbuttons for power, squelch, and push-to-talk. Pushbuttons also control transmitter power, channel changing, weather channel selection, scanning, and band choice. The HX600S-LI's display uses large block channel numbers and shows channel name, channel group, and transmitter power.

Bottom line: The HX600S-LI is well constructed, did well in our performance tests, has a long battery life, and features reception on broadcast and aircraft bands, a bonus in an emergency radio. Although it's been discontinued, models are still available, and for \$166, we still think it's a good buy and recommend it.

UNIDEN MHS450

The Uniden MHS450 is solidly constructed and partially covered by protective rubber padding. The unit fits well in hand and weighs in the mid-range of our test radios.

The MHS450 comes with an AC charger that will bring an empty battery up to full charge in a very short three hours. Other accessories included are a DC charger, wrist strap, and AAA battery case.

Top-mounted knobs control volume and squelch, and eight pushbuttons control transmitter power, channel changing, weather channel selection, quick 16 or 9, and all scanning options. Scan modes include dual watch, triple watch, and weather alert. You can also memory select various channels and monitor them in numerical order. This radio can use all Canadian, international, and U.S. channels.

The MHS450 display uses moderately large numbers and medium-sized letters. Power level and battery level also are indicated.

Overall performance of the MHS450 was average, but the unit lasted a respectable 12 hours in our battery life test.

Bottom line: The Uniden MHS450 is a solidly constructed radio that is held back by weak audio output.



Uniden MHS450

UNIDEN MHS550

The Uniden MHS550 is a multi-band marine handheld radio capable of transmitting and receiving on the marine band and the family radio service band. It will also receive on the AM and FM broadcast bands and aircraft band.

The radio is constructed from die-cast aluminum and has protective rubber padding. It comes with an AC charger that will bring the standard 1,400 mAh lithium-ion battery from empty to full in only three hours. Other accessories include a DC charger cord, wrist strap, and AAA battery case.

Top-mounted knobs control volume and squelch. Eight pushbuttons control the remaining functions. One-button control is available for transmitter power, channel changing, weather channel selection, quick 16 or 9, and some scanning options. Scan modes include dual watch, triple watch, and weather alert. You can also memory select various channels. This radio can use all Canadian, international, and U.S. channels.

The MHS550 screen displays the selected band, channel, channel name, power level, and battery level.

Overall performance of the MHS550 was average. Audio performance was somewhat anemic: 88 dBA. This battery lasted for 11 hours in the test.



Uniden MHS550

Bottom line: This is a well-constructed radio with decent transceiver performance. Weak audio output is a drawback.

CONCLUSION

Standard Horizon made a sweep of the high-end, portable VHF test. The HX850S garnered the Best Choice award for its unique features and top-notch performance. We'd like to see better battery life, but it's a tradeoff we're willing to make for full DSC capability, a built-in GPS receiver, and excellent performance.

The Budget Buy HX750S floats and offers good transceiver performance, outstanding audio performance, good battery life, and the lowest price. The HX600S-LI—the nickel metal hydride model of which was Best Choice in previous tests—gets the *PS* recommendation for its lengthy battery life, multi-band function, good output, and low price. ▲

CONTACTS**COBRA**773/889-3087, www.cobra.com**STANDARD HORIZON**, 714/827-7600, www.standardhorizon.com**UNIDEN**www.uniden.com**BUYER'S CHECKLIST****PS Shopping List for the Ideal Handheld VHF Radio**

We put together a list of features that our ideal handheld VHF radio would have. Some of these features are absolute necessity while others are nice-to-have items.

1. Rugged, waterproof construction: The nature of handheld marine electronics require that they be able to withstand being dropped—on decks, cabin soles, docks, etc.—and being splashed, used in the rain, or accidentally dipped in the drink.

2. Excellent transmit and receive properties: All the features in the world won't help if the radio doesn't operate well.

3. Long battery life: The longer the better—10 to 12 hours is acceptable, 15+ is preferred.

4. Quick recharging: Anything more than overnight (10 hours) is too long.

5. Reasonable replacement battery cost: It's always a good idea to keep an extra battery on hand and fully charged.

6. Optional AA or AAA battery tray: VHF's usually don't operate as well when using AAs or AAAs, but these are easier—and cheaper—to stock up on for emergencies.

7. Readable display screen in all lighting conditions.

8. Features: While we find some features to be over the top, others add to the safety benefits of a handheld VHF. A radio with DSC capability, built-in GPS receiver, SOS strobe light, and aviation-band reception will serve well in an emergency.

9. Long warranty, backed by good customer service.