

Practical SailorTM

IP Estero

*Island Packet's
new shoal cruiser
keeps it simple.*



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Settling the Keel-shape Debate

With the Intracoastal Waterway shoaling getting worse each year, it's no wonder that we're seeing a flurry of shallow-water cruisers. Recent debuts include Rod Johnstone's J/95 (*PS*, August 2010) and Rodger Martin's Presto (*PS* June 2011), both centerboarders. This month, we look at another shoal-draft cruiser, the Island Packet Estero, a 36-footer with a full keel.

Bucking the tide of fin-keel designs that have dominated the market since the late 1970s, Island Packet's owner, CEO, and chief designer Bob Johnson is an unabashed proponent of a long, full keel for cruising. Granted, Johnson's U-shaped hulls and foil-shaped keels are a far cry from the traditional wine-glass shapes of the 1950s, but they still have much in common with these older designs.

Much of the debate over the pros and cons of a full-keel design center on performance. Full keel fans argue that full keels generally track better, ride more comfortably, and allow for a shallower draft while avoiding the problems associated with centerboards, ballast bulbs, or wing keels. Fin-keel aficionados will deride full keel's drag-inducing wetted surface, and point out that the low-aspect underwater foil can't deliver the lift needed for good windward performance.

As some have concluded, somewhat tongue in cheek, the full keel is superior for going nowhere—either hove to, or aground. Few would argue this. The lateral resistance of the keel helps maintain a constant angle to the wind and sea when hove-to, and grounding loads are widely distributed to the hull structure, reducing the potential for damage. In a sense, a full-keel copes well with worst-case scenarios, and this is not such a bad thing when cruising.

The tracking advantage often touted in full-keel boats is not so cut-and-dry. Full keel proponents contend that when broad reaching in tradewind conditions, a full keel reduces the strain on steering gear and the crew. Critics counter that while high-aspect racing designs are purposely skittish, a well-balanced fin-keel cruising boat will sail true and comfortably—and faster than a full-keel boat in the trades.

Opinions diverge even more sharply when gale-force winds and following seas enter the picture. Critics contend that the directional stability of a full keel, particularly one with a deep forefoot, can make it more difficult to recover from a near-broach, adding work to steering gear and crew. Full-keel proponents counter that full keels better resist broaching (particularly when towing a drogue or warps) and that for

short-handed crews, the ability to lie comfortably hove-to becomes more important than agility on the face of a breaking wave. Both schools have plenty of examples to support their claims.

As for arguments over stability and seaworthiness: Any contention that full keels are inherently more seaworthy than fin keels oversimplifies the subject. (We will be exploring structural strength and ultimate stability in an upcoming issue.) The seaworthiness of fin-keel cruisers is well established, and an ability to tack on 20 miles to windward per day certainly counts for something when trying to avoid bad weather.

At times I think the fin-versus-full keel debate overlooks an important point: The keel is just one of many components that make up a good cruising boat, all of which must work in concert. And when it comes to comparing modern cruising designs, good judgment and seamanship have more to do with seaworthiness than the cut of a jib or the shape of the keel.



Cover photo: The Island Packet Estero bucks the fin-keel trend. (Photo by Billy Black, courtesy of Island Packet.)

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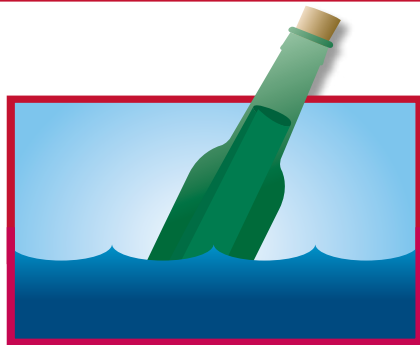
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BOTTOM PAINT WOES

Please see the photos of my Downeaster 38's hull bottom and prop (at right) after the boat was in the waters off City Island (Bronx), N.Y., from June 6 until Aug. 25. The bottom paint used was West Marine Bottomshield; Pettit Zinc Coat Barnacle Barrier 1792 was used on the prop. As you can see, the treatments were pretty much failures. Barnacles grew over the bottom and clustered on the prop in just a few months.

After lightly sanding the previous season's prop zinc treatment, I sprayed on three coats of new Barnacle Barrier. The previous season, I had applied the coating to bare metal and had much better results: Barnacles were fewer in number and much smaller in size. I do not see why one cannot apply Barnacle Barrier to a lightly sanded pre-existing zinc coating and get the same results as applying it to bare metal.

Regarding the use of the Bottomshield: In the 30 years I have had this boat, I have never had the growth of barnacles all over the bottom, usually barnacles on the waterline and slime on the rest of the hull bottom. Paints used in the past were Woolsey, Interlux VC, Pettit Trinidad, Pettit Trinidad SR, and more recently Pettit Unepoxy. My results make the use of Bottomshield and Barnacle Barrier very questionable for this area.

Jack Valdouw
Alcee Marie, Downeaster 38
City Island, N.Y.

While the Pettit-made West Marine Bottomshield (pre-2010) earned Recommended ratings in some past PS antifouling tests—even after 24



Reader Jack Valdouw was disappointed in the performance of his antifouling. Above is his Downeaster 38 with a fresh bottom job. At right, the hull and prop after 2½ months.

months (PS, October 2011)—test panels coated with the more recent formulations have not fared as well. Like many manufacturers, Pettit has reduced the copper content in some of its paints. Previous versions of the single-season Bottomshield were 46-percent copper, but the newer iterations contain only 29 percent. In the most recent report (PS, March 2012), it rated Fair after 14 months in Florida, meaning it was still repelling hard growth.

We also have seen year-to-year variability among antifouling paints of identical formulas (although not as significant as yours) in our tests. Pettit has several other paints that have

done consistently well over the years. The copper-heavy Pettit Trinidad (76 percent) and Trinidad SR (70 percent) have proven more effective in recent panel tests, earning Good ratings after 14 months and Recommended ratings after 30 months. We suggest going with one of those, especially if they historically have done well for you.

Regarding the Barnacle Barrier: We've not yet field-tested it, but we've had good reports from readers who use it. According to their reports, applying it to bare metal—as the directions call for—allows for better adhesion and, therefore, better results.

WWW.PRACTICAL-SAILOR.COM

Chime in on Boat Stink and SENDs

The *Practical Sailor* website is our platform for carrying on a dialogue with you, PS readers. It's also where subscribers can connect and share lessons learned and personal stories. Add your voice to the conversation.

The July 17 *Inside Practical Sailor* blog post on sanitation hoses prompted readers to respond with their own helpful tips on reducing onboard odors. Other recent hot topics have included our report on Satellite Emergency Notification Devices like the SPOT Connect, our review of the U.S. Coast Guard Academy's new fleet of Leadership 44s built by Morris Yachts, and preparing your boat for storms.

Be sure you've signed up for the magazine's e-letter, *Waypoints*, which will deliver PS's latest haps and tips to your inbox. Anyone can sign up for the free newsletter at www.practical-sailor.com.



Standard Horizon GX1700 Requires Firmware Update

If you purchased a Standard Horizon GX1700 VHF with GPS (PS Best Choice, June 2012) before mid-July 2012, it likely is in need of a firmware update. A bug in the original programming made it nearly impossible to save a waypoint using the Mark Position function.

Alerted to the problem by reader Bob Abbott (of Hinckley, Ohio), *Practical Sailor* confirmed the programming hiccup in our test unit. Each time a user tried to save a waypoint using the Mark Position function, the GX1700 failed to save it—unless the user did some creative keying, like changing one digit in the marked position, which then saved the edited position.

We contacted Standard Horizon about the problem, and according to Wes Gray, technical support supervisor for the maker's parent company Yaesu, the bug has been corrected with a revision to the GX1700's firmware.

The updated firmware, version 1.05, has been installed in all GX1700 radios manufactured since July 23, 2012, and those shipped to retailers before July 23 were

updated with the new firmware, according to the company.

Standard Horizon alerted its dealers of the problem, and at presstime, they planned to inform registered GX1700 owners of the steps they could take to have their units updated.

If you have a GX1700 that has the original firmware version, contact the retailer from which you purchased the radio. Some dealers are set up to install the 1.05 update, but many are not. If yours is not, then you will have to

send your unit to Standard Horizon to have the firmware updated. There is no charge for the service, but you will have to pay for return shipping. Ship the VHF to: Standard Horizon, Attn: Marine Repairs, 6125 Phyllis Dr., Cypress, Calif. 90630.

For more information, contact your dealer, or Standard Horizon at 800/767-2450 or visit www.standardhorizon.com.



Photo by Frank Lanier

MEASURING EPOXY SUCCESS

In the excellent comparison of marine epoxies in the June 2012 issue, one crucial aspect was left out of the evaluation: measuring out the ratio of resin to hardener. Get that wrong, and the whole project could fall apart, literally.

I have been using West System for about five years with excellent results; the mini-pumps make measuring a no-brainer, and the West System support system also is terrific.

The Interlux Epiglass looks interesting, but no mention was made of how to measure the proper ratio. Is it easier than the West System pumps?

Dwain Lovett
Mystique, Spirit 28
Montserrat, West Indies

The Interlux Epiglass pumps, just like the West System pumps, are calibrated for super easy mixing. With both brands, one pump dispenses the exact amount needed to get the right mixing ratio of resin and hardener, so their ease of application is pretty much equal. When using any maker's pumps, remember that they are not infallible. Pumps have a tendency to suck air as

the container volume lowers or when the prime is lost between uses. A better way to ensure mixing ratio accuracy is to use measuring cups and to mix based on the designated weight ratios of hardener and resin.

FLEET TRACKING APPS

Have you reviewed any apps that allow you to keep track of "buddies" on the water if they have AIS? We have a club that rafts up often, and it can be good to keep track of vessels that haven't arrived yet when the weather is a bit iffy. We currently use Google's Latitude App, but would be interested to know of any better ones out there.

Joel Rutzen
Via www.practical-sailor.com

We have not yet tested those types of apps, but we'd like to hear from readers who have. Email practicalsailor@belvoirpubs.com.

MIRACLE CLOTH RESOURCE

I just wanted to let you know that the Miracle Cloth, PS's Best Choice Metal Polish (PS, March 2007 and February 2009), is available from a source other

than West Marine. We've been buying it (and loving it) from West for years, but we've had problems finding it lately.

It's actually made by CAA Enterprises (www.caaenterprises.com). They sell direct, and if you buy 12, they are less than \$3 each! That's versus \$13 or \$14 each from West Marine. (Just one is \$6, delivered.) We have tested products from both places, side-by-side, and they appear identical.

Bill Streep
Merlin, Macintosh 47
Port Aransas, Texas

CLARIFICATION

The Sta-bil ethanol fuel treatment featured in our August 2012 issue was the marine formula, which is different from the standard formula sold in many hardware stores.

Practical Sailor welcomes reader letters. Send e-mail to practicalsailor@belvoirpubs.com; be sure to include your name, homeport, boat type, and boat name. Send Gear Graveyard entries and snail mail to PS at 7820 Holiday Dr. S., Suite 315, Sarasota, FL 34231.

BREWER PILOT'S POINT MARINA IN WESTBROOK

I was on the last leg of a six-day sailing trip heading back to Branford, Conn., when I badly injured my hand. As I was checking the engine's V-drive housing, my hand made contact with the spinning flange on the propeller shaft, mangling two of my fingers. One of my companions administered first aid, but it was obvious I needed medical attention quickly. The wounds were very deep, and there was a real possibility I could lose my fingertips.

Westbrook was the closest port, and having stayed at Brewer Pilot's Point (www.byy.com) many years before, I knew it would be an easy harbor to enter for my inexperienced crew.

We contacted the folks at Pilot's Point in Westbrook, and they jumped into action. They gave my crew clear instructions and told us they would be of any assistance we needed. They directed us to the service dock, and within minutes, employee Kris Schmid advised us he had contacted the ambulance and EMTs. They arrived shortly after that and transported me to the hospital for treatment.

I want *PS* readers to know how well I was treated by the Pilot's Point staff and how much I appreciate their assistance and genuine concern, and how impressed I am with their professionalism and skill in dealing with my emergency.

Hendrik J. Hali
Windrider, Pearson 365
Milford, Conn.

POLYFORM

I had a Polyform HTM-4 fender fail after several years of use. I spoke with Byron Liddle at Polyform (www.polyformus.com) and sent him some pictures. After a few questions were asked and a very helpful conversation, Byron and Polyform sent me a new replacement fender at no charge. They even inflated it for me!

Great product and great service!

Ron Rubin
San Diego, Calif.

The crew of this Pearson 365, including the injured skipper, Hendrik Hali, got a helping hand from the Pilot's Point staff.

QUESTUS MARINE

Many thanks to Rob Gorman and the team at Questus Marine (www.questusmarine.com) for their outstanding customer service and product support. My six-year-old, self-leveling radar mount was robustly built but self-destructing nonetheless. The Questus staff was tenacious, eventually diagnosing and correcting a small, but serious, installation error at a very reasonable cost.

A Questus mount will be one of the first things I buy for my next boat, and I would recommend it to anyone interested in a high-quality and thoughtfully engineered product.

David Ricciardi
Via email

EDSON CORP.

Recently, a well-intentioned, but heavy-handed friend snapped the retaining clip off the end of my Edson Wheel Storage Device (item No. 683-15). I emailed the company for information on a replacement part. After receiving a very prompt email from Ken Martin in customer service, two replacement parts arrived within a few days and at no charge. Edson even paid for the postage.

While other companies ream you for every small replacement part, Edson (www.edsonmarine.com) obviously understands that sometimes it's the little things that insure repeat customers!

Clint D. Harper, Ph.D.
Southern Cross, Catalina 42 Mk II
Channel Islands Harbor, Calif.

PRINCETON TEC

Over the past 20+ years, we have purchased five TEC 400 dive lights from Princeton Tec (www.princetec.com).



We love them for Scuba diving and for using around the boat. The two oldest lights had magnetic slide switches that eventually failed by sticking in the on position. We emailed Princeton Tec to see whether they sold a repair kit to replace the switches. They promptly responded and advised us to send the lights in for repair.

We were surprised to receive two, brand new TEC 400 lights at no charge. They even included batteries! Service doesn't get any better than that!

Susan and Bob Parker
Punta Gorda, Fla.

RAYMARINE

My 2004 Raymarine C80 Classic Multi-function Display went bad. After some troubleshooting to no avail, I looked online and found that Raymarine/FLIR has a flat repair fee of \$675 for the C80—ouch!—but the fee is actually the maximum charge for repair.

I sent the unit to Raymarine (www.raymarine.com), and to my surprise, I received the C80 back in the mail, postage paid, and no service charge. They found a loose jockey-board connection and re-seated the connection. While I would have been OK with their regular \$90 diagnosis fee, plus shipping, I think Raymarine demonstrated great customer relations.

Michael Dobrzensky
Wind Star, Hunter 33
Santa Barbara, Calif.



The Year's Best Gear

The Raymarine e7D (right), tested here against the Garmin 740s (left), earned the Practical Sailor Editors' Choice award as the compact chartplotter-sounder pick.

PS's marine systems, electronics, and gear must-haves.

A hybrid touchscreen multi-function display that can link with your iPhone; an iPad app that can serve as a backup for your chartplotter; a powerful, rechargeable LED spotlight that floats; an affordable vent filter that eats up holding tank odor; and a single-part varnish that retains a mirror-like gloss for more than a year—these are just some of the products that drew the highest praise from *Practical Sailor*'s editors in 2012.

Of the dozens and dozens of marine products we tested between September 2011 and August 2012, only 18 earned the designation as 2012 Editors' Choice gear. These are products that clearly stood out among their peers during our independent tests as the best in their category and whose performance

earned the confidence of *Practical Sailor*'s editors. Many of this year's Editors' Choice products fell in the upper range of the price spectrum, but there were also some priced well below their peers. (Sailors looking for Budget Buys—the most affordable recommended product in each category—should refer to the individual test reports.)

RAYMARINE e7D

Made by marine electronics giant Raymarine, the Ray e7D chartplotter-sounder, with its 7-inch screen, is the smallest and newest of Raymarine's networked multi-functions displays (MFDs), but it is loaded with many of the features that the larger units boast.

Practical Sailor evaluated the e7D in the July 2012 issue, comparing it to the Garmin 740s (a top performer in our review of compact plotter-sounders, which was published in the November 2011 issue). Both products excelled in tests, earning across-the-board Excellent ratings, but what sets the e7D apart is its expanded networking options and its long laundry list of new-to-the-marine-market capabilities like WiFi and Bluetooth interfaces to mobile computing devices such as iPads and iPhones. The e7D is capable of working as a stand-

alone unit or being fully networked with other members of the new Raymarine chartplotter family and the C and E-series widescreen units.

The e7D is a hybrid touchscreen unit that combines tactile knobs and buttons with touchscreen functionality.

The e7D comes with a Navionics "USA Raymarine" microSD map chip that offers the Navionics Silver charting package. It uses micro SD memory cards and has two slots to accommodate them. Testers noted chart detail and presentation in the 2D chart view was clear, and in the 3D view, it was the sharpest of the bunch.

Measuring approximately 9 x 6 x 3 inches, the e7D has an internal GPS antenna and a 48-channel, WAAS-capable GPS receiver. It can interface with radar, NMEA 2000/0183-capable devices, and AIS. It draws 1.09 amps and is rated as IPX6 water resistant.

The Ray e7D comes with a three-year warranty and costs \$1,600-\$1,700 (about the same as the Garmin); a sailboat transducer will run another \$100-\$445.

The e7D's networking options and features like WiFi and Bluetooth interfaces earned it a spot on this year's Editors' Choice roster. If you like bells and whistles, then this is the obvious choice.

Raymarine e7D



iNavX (right) was PS's top navigation iPad app, and *iSailGPS* (far right) was the pick for an inexpensive nav app.

INAVX & ISAILGPS

In 2012, *Practical Sailor* checked out dozens of iPad applications geared toward sailors and boaters. We tested top-tier navigation apps (PS, February 2012), budget chartplotting apps (PS, March 2012), and miscellaneous apps for things like weather, tides, and boosting your pirate vocabulary (PS, April 2012). Testers' top picks were the *iNavX* navigation app and the *iSailGPS* chartplotting app. Both impressed us enough to earn Editors' Choice honors.

iNavX bested more than 14 other well-established iPad navigation apps we tested, including iPad Navionics and Charts & Tides. While it's a bit pricey compared to most mainstream apps (\$50 for NOAA RNC global; prices for other versions vary), *iNavX* is the original and still one of the best navigation apps for the iPad.

It operates similar to a high-end dedicated chartplotter, but it does not come with charts. Users can easily download into the iPad's memory any or all of the NOAA raster charts for free, and updating is easy. For those who prefer vector, *iNavX* can do that, too.

Navigating with *iNavX* is straightforward, and anyone with experience using a GPS, Loran, or chartplotter will be immediately competent. Users begin by choosing a chart area (e.g. NOAA East Coast); the software will open the chart where you are located; and you're navigating.

About the only thing you cannot do is overlay radar images or open multiple windows to show a fish-finder or video cam. You can get other NMEA feeds (apparent/true wind, autopilot, etc.),



but you need to set up a WiFi system on your boat.

Testers noted that *iNavX* is designed as well as and is more user-friendly than most chartplotters we've seen. It earned Excellent ratings for stability, features such as satellite-image overlay and marina information, and pan/scroll speed using vector charts. The extremely intuitive, simple app concentrates on the essentials and does it well.

For those looking for a more basic and budget-friendly chartplotting app for iPad, there's the \$7.99 *iSailGPS* by James Associates.

Testers rated *iSailGPS* Excellent overall. It uses NOAA raster charts and has several distinct advantages over its nearest competitors, eSeaChart and Simple Charts, including the capability to create and edit waypoints and routes. It also has an excellent built-in "help" guide and more help on the developer's website; testers found this to be the best combination of text and screenshots among all the low-priced apps.

In basic navigating functions, this straightforward iPad app is the best of the low-priced options.

Both *iSailGPS* and *iNavX* enable the iPad to function similar to a regular chartplotter; however, we don't recommend using an iPad as your sole navigating tool. It and the apps will serve best as auxiliary or backup nav tools.

M604A and the Raymarine 218.

These fixed VHF radios go way beyond the basic capabilities of moderately priced units. Both are NMEA 0183 network compatible, have 30-watt hailers, and are remote-mic capable. They also are submersible, feature microphone handsets with various control options (from channel changing to channel scanning), come with three-year warranties, and have Digital Selective Calling (DSC) functionality.

Icom's most sophisticated marine VHF radio, the IC-M604A, features an alphanumeric keypad, large display, and a \$512 price tag, making it the second most expensive test radio. The only test unit with a keypad, the M604A also had the largest footprint (4.34 x 8.65 x 4.31 inches) and a detachable mic. When interfaced with a compatible GPS, the M604A will display time and position data, boat course, and boat speed.

Its transmit power stability was rated Good, while frequency stability and receiver sensitivity were Excellent. Audio quality was also top notch, with one of the loudest outputs at 97 decibels.

With very good overall performance, a keypad, and numerous other user-friendly features, the IC-M604A earned a 2012 Editors' Choice award.

Raymarine 218



ICOM IC-M604A & RAY 218

Two high-end marine VHF radios that PS reported on in the July 2012 issue earned their place among this year's Editors' Choice picks: the Icom IC-

Icom IC-M604A



The 2012 Marine Systems Standouts

The last year saw another bumper crop of marine-systems testing at *Practical Sailor*. Following our comprehensive look at marine toilets in 2011, our focus this year turned to the essential valves, filters, and auxiliary pumps. *PS* editors narrowed the lot to four systems standouts worthy of Editors' Choice status.

BIG ORANGE VENT FILTER

Practical Sailor rounded up three popular, commercial waste vents and a home-built system to evaluate in the March 2012 issue. After four months of creative field-testing—using 5-gallon buckets as holding tanks and a Chesapeake summer as our environmental “heat chamber”—testers tapped the Big Orange 5/8-inch filter as the leader, naming it Best Choice over waste vents from Dometic and Vetus.

As the name implies, the Big Orange filter was the largest of the test field. Its refills are either bulk carbon from the Canadian manufacturer (\$25), or you can find your own lo-



Johnson Aqua-Jet WD5.2

cal bulk carbon source (such as a pet store). Changing the carbon is a simple matter of pulling out a drawer, dumping, and refilling; it couldn't be easier. It is the only unit on the market that includes a vacuum break valve in the design, which is essential to protect the holding tank in the event of filter plugging.

The Big Orange filter's features and large size make it *PS* Editors' Choice, particularly for boaters who live aboard

or have larger holding tanks (40 gallons plus) and want to ensure maximum service life. While the filter has a higher initial cost—\$145—its operating costs over time are lower than others we tested.

JOHNSON AQUA-JET WD5.2

Johnson Pumps' Aqua-Jet WD5.2 earned a spot on the Editors' Choice list with its Best Choice showing in the October 2011 review of deck washdown pumps. Johnson has been one of the world's leading manufacturers of marine pumps for 30-plus years.

Based on our test criteria for the optimal washdown pump—reliable in salt water or fresh water, performs as advertised (or better), and can handle washdown chores aboard anything from a small weekender to a mid-size cruiser—the Johnson WD5.2 was the top pick for 12-volt, diaphragm pumps with a rating of less than 6 gallons per minute (GPM). The WD5.2 was one of only two pumps that exceeded its rated output (5.2 GPM, 70 psi) in the test. In open-flow testing, it managed a flow rate of 5.45 GPM, besting all other pumps with an advertised rating of 6 GPM or less. (The Jabsco Par-Max 7.0 kit got the nod among the higher-output pumps.)



Big Orange vent filter

The Raymarine 218 also offers a host of useful features, including a moderately sized display (2 5/8 x 1 3/8 inches) and a mount-anywhere microphone option. It can also connect to an optional remote mic to be operated as part of an intercom system. However, it does not have a keypad.

Performance-wise, the \$456 Ray 218 was outstanding. Testers found the 218's power output over the tested temperature and voltage ranges to be Excellent. Frequency stability and audio quality also were rated Excellent, while receiver sensitivity was Good. It measured 89

decibels for audio output.

The 218's phonebook will store up to 50 Maritime Mobile Service Identity (MMSI) numbers, and when it's interfaced with a GPS, the 218 displays time, boat position, course, and speed.

Buyers who want the convenience of a keypad should go with the IC-M604A; those who don't can save roughly \$83 by going with the Ray 218.

STREAMLIGHT FIRE VULCAN

In the January 2012 issue, we evaluated seven LED spotlights priced between \$50 and \$150 from West Marine, Sirius, Coleman, Brinkmann, and Streamlight. Testers' top pick in that test

was the Fire Vulcan made by Streamlight, a company that provides lights for the military and police and fire departments. The 2012 Editors' Choice awardee scored big points for its sheer ruggedness and versatility.

Powered by two lightweight, rechargeable lithium-ion batteries, the Fire Vulcan LED 44450 is shaped like a slender brick with a handle on top. At 1.8 pounds, it is much lighter and more ergonomic than any of the other rechargeable spotlights tested. It also was the only test light rated at IPX7 water resistance (1 meter immersion, 30 minutes), and it floats—beam up.

The Fire Vulcan has one C4 primary LED plus two very bright blue LEDs that shine rearward in a continuous or strobe



Streamlight Fire Vulcan

The \$143 WD5.2 has a metal motor housing attached to a four-hole metal mounting bracket. A large, plastic pump casing sits in front of the motor and contains the factory preset pressure switch. It comes with a spray nozzle, inlet strainer, multiple connection options, and a three-year warranty.

JABSCO DIVERter VALVE

As part of our marine sanitation test mania, we evaluated seven manual diverter valves and one electric valve (*PS*, May 2012) from seven manufacturers, including Groco, Forespar, Johnson Pump, and Whale. The best of the bunch, and our Editors' Choice pick, was the Jabsco 45490-1000. Jabsco—part of Xylem Flow Control, a spin-off from ITT Industries—is a worldwide player in the leisure marine market.

The 45490-1000 has a larger footprint than some other valves because it comes with two curved, 120-degree, 1½-inch discharge ports that can rotate in any direction to make plumbing it easier. It comes with both 1½- and 1-inch screw-in inlet port adapters.

The body and handle have holes for accommodating a padlock to prevent discharge and comply with discharge regulations. The valve body is made of chemical- and corrosion-resistant polypropylene with stainless-steel bolts, screws, and bright silver, inlaid flow arrows. The ports and diverter shaft have replaceable O-ring seals.

Testers found the Y-valve easy to disassemble for cleaning and lubricating, and its operation was notably smooth, with positive stops and no leaks.

Priced at \$73 (with a one-year warranty), it came in at the lower end of the price spectrum.



Trionic SP2020

TRIONIC HOLDING TANK

Trionic Corp.'s SP2020 got testers' nod in the February and April 2012 head-to-head evaluations of holding tanks. Pitted against a comparable holding tank from SeaLand, the 20-gallon SP2020 performed well in our tank-deflection tests.

Part of Trionic's super premium line, the SP2020 is constructed of 3/8-inch-thick

virgin polyethylene and complies with U. S. Coast Guard requirements. Polyethylene is the tank material of choice because it is lightweight, doesn't corrode, allows for seamless tank construction, is relatively inexpensive and (if thick enough) won't allow odors to permeate. In short, a good quality polyethylene tank could very well outlast the hull of the boat you're installing it in.

The SP2020 comes with a 5/8-inch barb vent assembly, 3-inch inspection port, 1½-inch inlet, and a 1½-inch discharge outlet and all fittings, as well as a 1½-inch screw in plug. A second overboard discharge is available as an option. All of its fittings are mounted at the top of the tank.

It also features a vacuum relief valve to prevent tank collapse at dock pump-out stations with high vacuum levels. Testers particularly liked the screw-cap design of the Trionic relief valve, which provided easy access for cleaning.

The \$200 SP2020 not only cost less than the SeaLand 20 HTS (\$400), but it also had less material deflection. Less deflection would seem to indicate greater strength. Taking the test results and the price difference into consideration, the Trionic SP2020 adds up to a better value in this holding tank size range.

Jabsco 45490-1000



pattern. Its three-way switch allows either of the two forward-firing power settings to include the rear-facing LEDs. Its selectable low and high beams are operated by a simple bat switch that can easily be operated while wearing heavy gloves. The Fire Vulcan's base allows it to sit on a flat surface with the handle up, and its charger rack (powered by 12-volt or 120-volt) is designed to be wall-mounted.

Testers looked at the spotlights' construction, battery life, beam angle, and illumination at both close (740 lux at 30 feet) and distant (one-fifth of a mile) targets. The handy and compact Fire Vulcan LED rated Excellent for beam pattern and illuminance at one-fifth of a mile, and it developed little heat. It lasted for 2½ hours before dropping to half-

strength. Its ruggedness, along with its waterproof rating, make it a good choice for cruising.

With the \$120-\$146 Fire Vulcan, you get what you pay for, including a seven-year warranty that bested any other maker's offer.

DANARD DINGHY LAUNCHER

Wheeled dinghy launchers—like our Editors' Choice pick, the Danard Marine Launching Wheels (DW-1)—can give you the mechanical advantage you need to get your dinghy or small boat to the dock or ramp, or even across a beach.

The DW-1 was the hands-down Best Choice among the seven dinghy launchers we evaluated (*PS*, October 2011) from Davis Instruments, Garelick, Newport

Vessels, Defender Industries, and Danard. We tested each dinghy roller on three different terrains—flat concrete, a rocky shore, and a soft, sandy beach—and testers also considered ease of use and ease of installation.

A glance at the components tells plenty about the top quality of the Danard wheels: precision-machined, anodized-aluminum transom brackets and wheel struts, 16-inch Butyl tire tubes (rather than less-expensive natural rubber), and a brass, angled air fill to reduce wear to the stem. The DW-1 also doesn't require cotter or clevis pins for raising or lowering; instead, the system relies on gravity and buoyancy to hold the struts in place

Continued on page 11



The Marine Maintenance All-stars

Over the course of a year, *Practical Sailor* tests upwards of 100 different marine maintenance products, so selecting the cream of the crop for Editors' Choice honors is challenging, to say the least. This year, we whittled the list of maintenance all-stars to five.

DIY NONSKID OPTIONS

In the January and July 2012 issues, we reviewed 12 products that enable boat owners to put some stick back into a slip-and-slide deck. Topping the field of nonskid paints was Durabak, a tough, flexible polyurethane coating that is pre-mixed with specially treated rubber granules.

The coarse-aggregate paint led the pack among paints and additives in our resistance and traction tests. It was a little rough on knees, but the hard polyurethane will likely endure many years of service. (After one year on our test boat, it's still holding up well.) It was easy to clean and even easier to apply—just mix and roll on—and achieving a uniform grit was effortless.

Durabak is a hard coating with many color choices and above-average traction at an affordable price (\$120-\$140 per gallon)—a combo deserving of a 2012 Editors' Choice pick.

For boat owners who prefer nonskid mats to paints, there's none more grippy than Tiflex Treadmaster. The nitrile rubber/PVC mat's diamond pattern allowed testers to stay sure-footed beyond 50 degrees of incline in all but one test situation.

Made by UK-based Tiflex, Treadmaster was *PS*'s top pick in the July 2012; Feb. 1, 2003; and Nov. 1, 1995 evaluations, and now it holds the 2012 Gear of the Year designation.

Made of ground cork and nitrile rubber, Treadmaster is designed to resist stretch, wear and tear, and chemical damage. While it can handle a pressure washer, testers found it surprisingly easy to clean; it went from mud-caked to spotless with a quick once-over with a garden hose.

It comes in eight-plus colors and is applied with a proprietary,



Interlux Epiglass

tenacious two-part epoxy. Prices vary by sheet size; for example, a 35.5 x 47.5 sheet runs \$117.

DO-IT-YOURSELF MARINE EPOXY

Interlux's Epiglass HT-9000 marine epoxy resin got testers' pick over products from West System, MAS, Raka, and Evercoat in our June 2012 evaluation.

All the test resins exhibited Good or better adhesive quality, but Epiglass was the least viscous and nosed out the others when laminating multiple layers of material. The tenacious gripper was rated Excellent for wetout and adhesion. The leader in shear testing, it was the only product that repeatedly left resin patches stuck to the glass table when the bond finally failed.

Not surprisingly, the best of the bunch is also the most expensive. Epiglass HT-9000 costs \$145 for a 5-quart kit, or \$29 per quart.



Interlux Perfection after 2 years

EXTERIOR VARNISH

Practical Sailor wrapped up its long-term test of exterior wood finishes after two years of testing with a report in the September 2011 issue. When it came to selecting a one-part varnish with good durability and easy application, testers tapped Epifanes Clear High Gloss. Priced at \$27 per quart, it barely edged out Pettit's 2067—which had better gloss and color retention after one year of exposure, but proved to be less durable—for the honor.

The most durable of the dozens of wood finishes tested was the Interlux Perfection two-part varnish. Its test panel still exhibited Excellent coating integrity and gloss retention after two years of constant exposure to the central Florida elements. It costs \$60 per kit and is *PS* Editors' Choice wood finish for those who prize the look and durability of a two-part varnish over ease of application.



Tiflex Treadmaster nonskid mat



Durabak nonskid paint

Continued from page 9

inside the channeled transom brackets.

The Danard launcher, with a 350-pound capacity, was the only test product to earn across-the-board Excellent ratings as it can handle just about any kind of terrain.

At \$245, the Danard DW-1 also was the most expensive dinghy-launching system we tested, but not by much, and it is the only one that comes with a lifetime warranty. Its superior construction quality, ease of use, innovation, and warranty earned it the Editors' Choice award.

GILL & CAMET SAILING SHORTS

Practical Sailor editors chose a his and a hers pick for the apparel Editors' Choice: the Gill men's performance padded shorts and the Camet Wahine women's sailing shorts.

Our tests of padded sailing shorts, reported in the March and June 2012 issues, included products from top sailing apparel makers—Helly Hansen, Harken, Gill, Sailing Angles, Henri Lloyd, Zhik, and Camet International. We put the test shorts through a series of bench tests emulating a few seasons of active wear onboard a sailboat. The tests were designed to evaluate ruggedness and durability, comfort, ease of use (inserting foam pads), drying time, odor resistance, color retention, and any tendency for the fabric to shrink. Each pair also was evaluated on its features, including pockets, zippers, Velcro closures, fasteners, stitching, and the quality of material and construction.

The Gill men's shorts edged out the Camet Rio men's shorts to get testers'

top pick. Described as fashionable and functional, the lightweight and fast-drying Gill shorts can accommodate closed-cell foam inserts (in two interior rear pockets with Velcro closures) and are made of soft Nylon Tactel fabric with a water-repellent finish. According to Gill, internal pad pockets are better for hiking out and make the shorts more versatile for wear off the boat (without pads). The pads are imprinted with dotted cutting lines to help guide trimming for a customized fit.

The Gill shorts also feature belt loops, elastic comfort stretch bands on both sides of the waist, a sturdy zipper, and a button closure. They have two open slash pockets and a third front cargo pocket on the left thigh; the latter with a Velcro closure and weather flap.

Priced at \$89, the Gill shorts rated Excellent on all test points, except abrasion resistance, in which they earned a Good rating due to some abrasion to thinner areas of the shorts.

The women's Camet Wahine shorts are lightweight and designed with a woman's figure in mind. The shorts are low rise with an 8-inch inseam, and they have a flat front with pockets that lay flat. The fast-drying fabric is lightweight nylon with a durable water-repellent finish that offers UV protection (UPF 40+). Made in the USA, the shorts feature belt loops, a somewhat small dipper pocket, and a button closure.

The seat is reinforced with Cordura, which passed the abrasion test without significant wear. The seat pad is inserted into a pouch sewn on the outside of the



Danard Dinghy
Wheels

seat. Slightly stiff, the pads lend an ungainly overall look that can be tamed by trimming the pads to fit.

The \$75 Camet Wahines earned a spot on the Editors' Choice roster as they are tailored specifically for female bodies and they held up well during bench and field tests. ▲

CONTACTS

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EPIFANES YACHT COATINGS
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GILL, 678/730-5586,
www.gillna.com

ICOM AMERICA, 800/426-7983,
www.icomamerica.com

INAVX, www.inavx.com

INTERLUX (AWLGRIP)
908/686-1300, www.yachtpaint.com

ISAILGPS, www.isailgps.com

JABSCO, 978/281-0440
www.xylemflowcontrol.com

JOHNSON PUMPS
305/234-8941,
www.johnson-pump.com

RAYMARINE, 603/881 5200,
www.raymarine.com

STREAMLIGHT, 800/523-7488
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TRIONIC, 262/692-6336
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Gill men's padded
performance shorts



Camet Wahine women's padded
sailing shorts





Island Packet's Shoal Cruiser

The Estero's 9-ton displacement hull cleaves through chop to deliver a comfortable ride whether motorsailing or under sail.

Bob Johnson's shoal-draft Estero simplifies sailing adventures.

Florida-based Island Packet targets a relatively narrow niche, so the toughest competitors to its new boats are often older Island Packets. Introduced in 2010, the 36-foot shoal draft Estero is the company's latest attempt to introduce a distinctive model that doesn't stray too far from the company's proven formula for success: moderate displacement, full-keel cruisers designed to be lived on, sailed far and in comfort, and endure the bumps, scrapes, and storms that cruising boats inevitably encounter.

Like every new Island Packet, the Estero emerged from the drawing board of

founder, owner, CEO and chief designer Robert "Bob" Johnson. A graduate of Massachusetts Institute of Technology with a masters in naval architecture and marine engineering, Johnson worked for McDonnell Douglas for two years on ballistic missiles, dabbled in high-tech (for that era) surfboards, then followed his boat dreams to southwest Florida in 1974. He ran the Irwin Yachts plant for production-boatbuilding pioneer Ted Irwin, and then moved onto Endeavour. Johnson designs from that era include the Stamas 44, Endeavour 43, and the Endeavour 40.

Opportunity knocked in 1979, when Johnson turned the liquidated molds for the 26-foot Bombay Express into the Island Packet 26, a catboat-like centerboarder that quickly found a niche. The IP 26 eventually became the full-keel IP 27, which enjoyed a run of 249 hulls between 1984 and 1992. Island Packet has unveiled 24 new Johnson designs during the past three decades. With a few

exceptions—the Packet Cat catamaran, the Packet Express powerboat, and the recently introduced 42-foot motorsailer, the SP Cruiser—the line is dominated by full-keel auxiliary sailboats sharing the same basic traits: a U-shaped hull, Johnson's patented "full-foil" keel, conservative ballast displacement ratio, low aspect rig, and roomy interiors with an emphasis on cruising. Details oriented toward longer-term cruising such as storage space and tankage are an Island Packet strong point.

Currently, Island Packet produces seven boats, ranging from the Estero to the 48-foot flagship, the IP 485. The company's cult-like following, worldwide dealer network, and the popularity of the SP Cruiser have helped keep the factory operating four days a week through the recent downturn.

DESIGN

In many ways, the Estero represents a return to Island Packet's roots. The shoal draft and flat stern bring to mind boats like the Island Packet 31 (launched in 1983), which had a flat transom and appealed to gunkholers with a centerboard



The U-shaped dinette departs from traditional mid-ship arrangements.

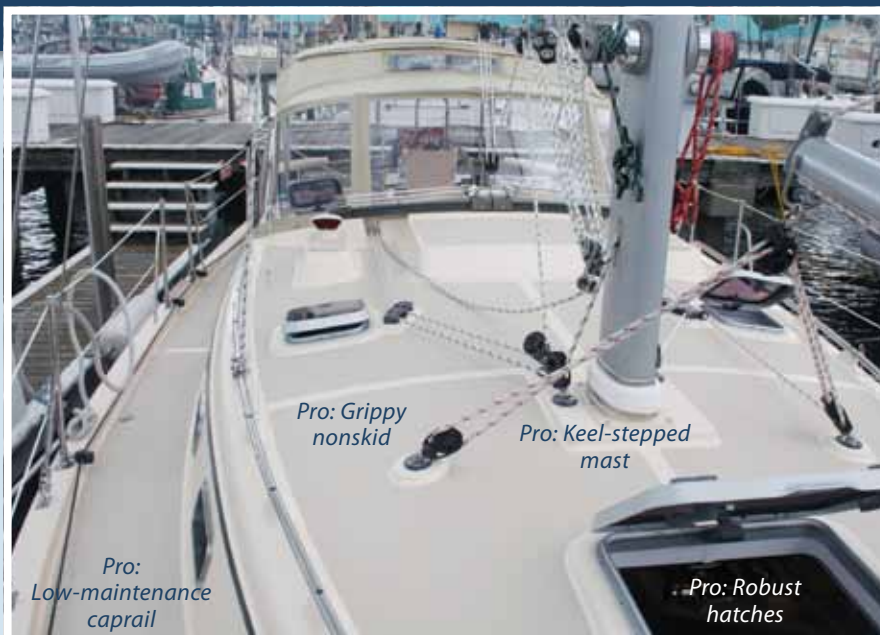
Photos by Billy Black, courtesy of Island Packet, except where noted.

PROS

- Wide sidedecks.
- Absence of teak minimizes maintenance chores.
- Self-tacking jib with tight sheeting angle.
- Dorades allow ventilation at sea.
- Shoal draft opens new cruising grounds.

CONS

- Hoyt boom dominates foredeck.
- Can't trim sheets from the helm.
- Lackluster light-wind performance.
- Shoal draft inhibits weatherliness.



Photos by Practical Sailor

version. All of Island Packet's mid-range cruisers have a relatively shallow draft, but the Estero's four-foot draft opens up Carolina backwaters and Florida canals where other Island Packet owners will have to play the tides.

Apart from the keel-haircut, the hull profile is otherwise consistent with Johnson's previous designs. Johnson is tall, so all of his boats carry plenty of headroom. The high freeboard and lack of any long windows to interrupt the expanse of buff-colored gelcoat make the deckhouse appear higher than it is, but the bowsprit, opening ports, and spring in the shear-line present the intended overall look of a classic, salty cruiser.

One traditional element missing from the Estero found on previous Island Packet designs is the traditional teak caprail—a signature feature for more than 30 years. This offers welcome relief from annual maintenance, although some old salts will no doubt miss the aesthetic appeal.

The boat's length-to-beam ratio of 2.95 is also in keeping with Johnson's previous designs, as is the conservative ballast displacement ratio of 40 percent. Comfort in a seaway—like seaworthiness itself—is difficult to quantify, but the boat's motion-comfort ratio (a calculation introduced by designer Ted Brewer) of 31 puts it not far below that of the Island Packet 370, which has a longer waterline and an additional 5,000 pounds of displacement.

Johnson, who represented the National Marine Manufacturers Association on the Conformité Européenne (CE) committee that helped establish the ratings categories for sailboats (Category A for Ocean, Category B for Offshore, etc.), is keenly aware of the importance of stability, scantlings, and resistance to down-flooding in a boat that is to be sailed on oceans. His boats' solid fiberglass laminate schedule, high freeboard, and conservative ballast-displacement ratios reflect his philoso-

phy on these matters. All Island Packet yachts meet CE Category Standard A for Ocean, "designed for extended voyages where conditions may exceed wind force 8 (Beaufort scale) and significant wave heights of 4 meters and above but excluding abnormal conditions, and vessels largely self-sufficient." Although PS does not regard the CE Category A to be an automatic stamp of approval of ocean voyaging, we do believe that Island Packets more closely approach our ideal of a cruising boat than some other boats that bear the same rating.

BELOWDECKS

In the endless quest to turn a 36-foot boat into a comfortable second home, and still provide secure and comfortable berths while the boat is underway, the Estero takes a most radical step by placing the main social area forward of the mast. (The new IP 360 features the conventional V-berth/main saloon layout on the same hull.)



The Estero's non-traditional interior arrangements with the dinette forward of the mast (above) allow for a spacious galley (left) and super-sized head (top left), unusual for a boat of this size.

Photos courtesy of Island Packet

Boats with forward main saloons are by no means original, but they remain very rare birds. Perhaps the most familiar contemporary cruisers with this feature are those of the Gozzard line, which dedicate the space forward of the mast to a spacious sitting/dining area that easily converts to a queen-size berth. In the Gozzard version, the berth conversion can be a semi-permanent setup, because even the smallest Gozzard 37 has an alternate dining nook near the galley.

The Estero's forward saloon is principally a social/dining area. With the drop-leaf table down, there's comfortable seating for two couples. With the dining table up it could seat a family of four, and squeeze in a couple of guests, as needed. The table pivots, making it easy to slide in and out of the seats. Throw down sheets and pillows, and the two settees make comfortable berths.

Conversion to the larger berth is more complicated than it should be, considering the premium, well-ventilated sleeping space the saloon occupies. It requires two people (one on their hands and knees fiddling with a troublesome support pole) and optional filler cushions. And once it is set up for sleeping, there is no place to dine belowdecks. With room for four

(friendly, we presume) adults and a passel of kids, it is the proverbial feather bed, but the conversion could be easier.

Just aft of the mast and to port is the U-shaped galley. The galley placement is probably the biggest advantage of this layout compared with other boats in this size. Instead of being tucked into an aft corner or in the line of traffic, the galley is set near the fore-and-aft center of the boat, with a hatch overhead and opening portlights for ventilation and a view. The galley covers all the essentials such as counter space, cupboards, and deep well-insulated fridge-freezer systems, but we were disappointed in the shallow, 6-inch-deep sinks—unusual for Island Packet.

Johnson stands 6-feet, 3-inches tall, so his interior designs are sensitive to a tall person's needs. Just opposite the galley is a super-sized head featuring a bench seat in the separate shower stall.

The owner's stateroom, located aft and to port, has 6-foot, 4-inches standing headroom, with a cutout in the berth for sitting or getting dressed. A hanging locker, bureau, and full-length mirror add homey touches. A 9-inch overhead hatch and opening portlight offer ventilation, although the hatch won't allow much breeze if the boat is fitted with a

dodger. Our test boat was fitted with a single, full-sized inner spring mattress. We would ask for a folding or two-piece mattress here to simplify access to the storage below, as well as access to the stern gland and stuffing box.

Opposite the owner's cabin is the nav station with a fold-down chart table and a roomy pilot berth. This area could also be used for storage of larger items like sails, cushions, or guitars.

ON DECK

For the past 30 years, the standard Island Packet sail plan has been a cutter rig, featuring a high-cut foresail and a furling working staysail that sets on a Hoyt boom. While a deck-sweeping, club-footed staysail gobbles up foredeck space and leaves remarkable shin bruises, Island Packet owners praise the arrangement for balancing the helm and running wing-and-wing. The Hoyt boom has the added advantage of being self-vanging, keeping the leach clew from lifting as the sheet is eased.

The Estero breaks away from the cutter tradition (although its sistership, the soon-to-debut IP 360 brings it back). The Estero's working staysail is eliminated, and a foresail sets from a Hoyt boom

Estero's solid FRP hull, balsa-free deck is built to last

Island Packet Yachts has been building cruising boats for over 32 years. It builds five different hull designs—about 80 boats per year—to American Boat and Yacht Council and European Category A (offshore) standards.

Hull: The Island Packet Estero is solid, hand-laminated with heavy-knitted fiberglass. The leading edge of the keel, which has six layers of fiberglass, is more than an inch thick. Ballast (7,500 pounds of lead and iron) is laid in cavities in the keel and another thick layer of fiberglass is applied on top, in effect creating a double hull along the keel. The hull is reinforced with a structural grid. This is joined to a molded liner, and then bulkheads are taped into place. Vinylester gelcoat is used in the skincoat throughout the hull, polyester resin completes the laminate. Both are proprietary blends that have held up well. A 10-year warranty covers osmotic blistering.

Deck: The deck is cored with moisture-resistant Polycore, a proprietary mix of micro-balloons and resin that is applied by spray. Deck hardware is bolted into beefy aluminum plates. The mold incorporates several reinforced and sealed mounting bases for hardware.

Hull-to-deck joint: The hull-to-deck joint is an overlapping type (commonly referred to as a “shoe-box”), combining an adhesive bond between the deck and an inward hull flange with closely spaced bolts through the deck and hull around the yacht's entire perimeter. The deck is through-bolted (with Nylock nuts and washers) on six-inch centers and bonded with 3M 5200.

Rudder: The rudder post is a 2-inch solid stainless-steel shaft. The rudder is foam-filled molded fiberglass, backed by



The Estero features a solid mahogany and oak sole—not veneer.

a steel grid welded to the shaft. A full-length skeg protects the rudder. A stainless steel “shoe” extends aft from the keel to the skeg, protecting the rudder and keeping the prop from fouling on crab pots. The shoe is fitted with a Delrin bearing to accept the rudder post. Steering is a Cobra rack-and-pinion system from Lewmar.

Rig: The keel-stepped mast is a Sparcraft aluminum mast with in-mast furling. Both the mast and the Hoyt boom are anodized and powder coated. Rigging is continuous, linked to twin stainless-steel chainplates linked by a stainless-steel bar. The whole chainplate assembly is then molded into the hull.

fixed just forward of the stem on the bowsprit. In this way, both the jib and the main are self-tacking, so working to windward is as easy as turning the wheel. The arrangement also allows for tight sheeting angles.

Although conventional mainsails with lazy jacks were the standard on earlier Island Packets, the company has seen a clear trend toward in-mast furling. According to Bill Bolin, vice president of sales and marketing at Island Packet, the company has sold few, if any, boats with conventional full-battened mainsails in the past eight years. *PS* generally prefers conventional mainsails for voyaging in boats this size, but if you plan to do a lot of short coastal hops, the in-mast Sparcraft mainsail furler can make life easier, allowing you to set, reef, and furl both sails from the cockpit.

The mainsail and jib halyards are led to dedicated Lewmar Ocean Series 16C

two-speed winches on the mast; this reduces clutter at the cabin and makes sense for cruising boats with a furling mainsail. The mainsail roller-furling control line, jib sheet, and spare mainsail halyard lead aft through stoppers to the Ocean Series 30CT two-speed self-tailing winch on the portside of the companionway. The mainsheet and boom-vang lead through a stopper and matching winch on the starboard side of the companionway.

Those accustomed to contemporary sloops will be surprised to find that the only sail control line within easy grasp of the helmsman is the jib furling line, which is on 16CT Lewmar on the starboard coaming. Because the mainsail and jib set on self-tacking booms, the arrangement is not as inconvenient it would seem. Leading the mainsail traveler lines (fixed in cam cleats) aft allows limited sail control from the helm.

A port coaming winch will be missed when you want to kedge off a shoal, or when trying to warp the stern to port.

The 7-foot-long cockpit seats offer plenty of room to stretch out. A large starboard locker offers room enough for two folding bikes and more; a port tray keep small items accessible. Liner bins in the coamings keep the deck clear of running rigging. The emergency tiller has a dedicated spot in the starboard locker.

Visibility is excellent, and the twin 2-inch cockpit drains and high bridgedeck deal with any boarding waves. Drop boards are solid hardwood. Comfortable platform seats are integrated into the stern rail.

The boat we test-sailed had an optional stern swim platform. By eliminating the sugar-scoop transom/swim platform on other Island Packets, the Estero benefits from more usable interior space, a larger cockpit, and more cockpit storage space.



The self-tacking jib on a Hoyt boom emphasizes easy sail-handling.

A boarding ladder is accessible from the water for emergency reboarding. One drawback to this design is the inevitable “slap” that will accompany pitching at anchor. According to Johnson, the platform is elevated high enough (24-inches above displacement waterline) so that slapping at anchor or added drag underway is unlikely.

“This is an immensely strong installation typical of our approach to all structural components on an IP,” Johnson said. “(It) has been validated over a number of years . . . by other IPs that have this identical installation.”

A high coaming and wide passage forward leads to the foredeck where a deep locker with an aft-opening Lewmar hatch seals a deep anchor well. The divided well swallows up chain and fenders and drains into the bilge through a watertight bulkhead that seals the locker off from the rest of the boat. An optional VRC 1250 Muir windlass, single bow roller, and chain stopper handled anchoring duties on our boat.

SYSTEMS

Johnson brings his engineering expertise to bear on the Estero’s mechanical systems. The conventional drive train is the most sensible choice for long-term cruising. The solid Edson CD-I geared rack-and-pinion steering is well adapted to belowdecks autopilot. The propeller and rudder skeg are protected by a long “shoe” extending from the keel to the skeg.

Twin lead-acid house batteries and a dedicated engine battery serve electrical storage needs. Pre-tinned, labeled wiring meets American Boat and Yacht Council (ABYC) standards. A Charles 5000 series three-stage temperature-compensated charger with a galvanic isolator protect the electrical system and ensure it is well charged at the dock.

The 60-gallon fuel tank is made of heavy-gauge, marine-grade aluminum (5052-H32), while the freshwater (120 gallon) and holding tanks (35 gallon) are located below the cabin sole and made of fiberglass. All through-hulls are bronze and through bolted to flanged seacocks.

Cables for the anchor windlass and bow thruster are pre-wired. The LPG system meets ABYC standards with a self-draining locker and shut-off valve in the galley. LED lighting is an option. The bow thruster, located under the main-saloon settee, had tighter all-around clearances than installations we’ve seen on other boats with big V-berths.

PERFORMANCE

By contemporary fin-keel standards, the sailing performance of the Estero is unimpressive, but Island Packet owners aren’t the kind that go looking for the extra 5 percent of hull speed and the Estero isn’t meant to be a Wednesday-night racer.

Our test boat was provided by Ed Massey of Massey Yacht Sales and Services, and the test sail took place within sight of Massey’s Bradenton dealership on the Bradenton River, Fla., in squally weather, with light gusty winds from the east between 8 to 12 knots, with gusts to 14 knots.

At 2,400 rpm, the Yanmar 40-horsepower engine with a big 17-inch, three-

bladed prop pushed the boat at 6.6 knots. At wide-open throttle, 3,400 rpm, the average speed was 7.3 knots. The higher RPM is clearly not an efficient motoring speed, but testing it confirmed that reserve horsepower is available if needed. Unlike flat-bottomed fin-keel boats, the Estero’s hull speed is tightly constrained by its waterline length. At the lower cruising speed, we registered 79 decibels in the center of the main saloon and a quiet 74 decibels in the cockpit with the companionway open. Vibration at the higher RPM raised the main saloon volume to 83 decibels. (Conversation is about 60-70 decibels.)

Under power, the Estero embodies the typical tradeoffs of a full keel. The full keel’s tracking ability—so helpful on long passages—becomes a handicap in close-quarter maneuvering. The lateral resistance lengthens turning radii, and when backing, the boat has a stronger tendency to “walk” in the direction of the prop rotation. Our test boat was equipped with a \$6,000 Vetus bow thruster that took the drama out of docking and maneuvering at slow speeds. A good skipper will soon become accustomed to the Estero’s idiosyncrasies under power and learn to use prop-wash and spring lines to his advantage, but full-keel novices will appreciate the bow thruster.

Like her cutter-rigged cousins in the Island Packet line, the Estero is happiest on a reach. Broad reaching with the apparent wind at 135 degrees, the boat balanced well, but averaged only 4 knots speed over ground in about 9 knots of apparent wind—suggesting an asymmetrical spinnaker would be a wise addition in light-wind areas. On a beam reach in 9 knots apparent, average speeds were about 5.5 knots. The best sustained speed during our test was 6.3 knots, with the apparent wind at about 10 knots and 110 degrees.

Any shoal-draft boat must sacrifice windward performance, and the Estero is no exception. The Estero’s tight sheeting angles and foil-shaped full keel help add lift, but the windward performance is still held back by the increased skin drag and low-aspect keel.

The course made good on our test sail fell below fin-keeler standards, but it was



The Island Packet Estero's atypical interior plan squeezes an impressive amount of living area into a 31-foot waterline (above right). The Estero's self-tacking sail plan (above) yields a slightly better sail-area displacement (SA/D) ratio compared to the Island Packet 35. Long overhangs give the Creaklock-designed Cabo Rico 34 a deceptively high displacement-to-length ratio (D/L).

ISLAND PACKET ESTERO IN CONTEXT

	ESTERO	ISLAND PACKET 35	CABO RICO 34
LOA	36' 5"	38'	37'
LWL	31' 5"	30'	26' 7"
Beam	12' 4"	12'	11'
Draft	4'	4' 6"	4' 10"
Displacement	18,800 lbs.	17,500 lbs.	17,000 lbs.
Ballast	7,500 lbs.	8,000 lbs.	5,800 lbs.
Sail Area (100% foretriangle)	708 sq. ft.	640 sq. ft.	588 sq. ft.
Engine	40 hp.	38 hp.	38 hp.
Water	120 gal.	90 gal.	140 gal.
Fuel	60 gal.	48 gal.	40 gal.
SA/D ratio	16	15	14
D/L ratio	270	289	404
Price*	\$265,000- \$346,000	\$89,000- \$150,000	\$125,000- \$275,000

*Based on internet search, prices on used models can vary greatly based on condition.

comparable to that of similar boats we have sailed. The best sustained speed close reaching was 5.7 knots, and the boat tacked through 100 degrees, including leeway. (For a stark comparison, the lightweight J/95 daysailer, drawing 3 feet with its board retracted, tacked through 92 degrees in similar conditions.)

The Estero doesn't like to be pinched, and it will quickly let you know when the main is over-trimmed with an insistent weather helm. Like many full-keelers with low-aspect rudders, too much helm will stall the boat. It responds slowly but positively to the helm, and it is slow to pick up speed. We would not characterize the Estero as exciting in light winds, but in breezier areas, the boat's ability to keep her feet and to shoulder aside chop will be appreciated.

CONCLUSION

The Estero will appeal strongest to Island Packet fans who've been waiting for a shoal-draft, easy-to-sail boat that compares to the IP37 in terms of interior space. These strengths will be most apparent on intracoastal or riverine adventures like the Great Loop.

The novel changes aren't suited for everyone. Those who cruise warm climates in summer, for example, will miss the large overhead hatch of a V-berth. The self-tending headsail will please sailors who prefer a relaxing bay sail or motor-sail to winch-grinding and close-hauled excitement.

The list price of \$350,000 seems steep when you see IP37s going for less than half that, but Island Packet offers a generous 10-year warranty on both

the hull and deck, and a three-year stem-to-stern warranty. Past owners have done fairly well sailing their boat for a couple of years and then trading up or selling for close to purchasing price, while the boat is still covered under warranty.

For those who like the shoal-draft concept but would prefer a conventional layout, the cutter-rigged IP360, with 130 square feet of additional sail area, fits the bill. While we see a niche for the Estero, we expect the IP360 will be a more popular design. ▲

CONTACT

ISLAND PACKET, 727/535-6431
www.ipy.com

Seeing Under the Sea



The AquaLens streams real-time video to a small LCD screen worn on the user's forearm.

Ever wish you had X-ray vision and could see under the water—without going for a swim—to check the anchor or prop, or to inspect your hull? Well, Aquabotix Technology Corp. developed a product with the goal of giving you that power—at least a limited version of it.

Made in the USA, the AquaLens underwater viewing system features a boat hook-mounted plastic housing with a color video camera and LED lighting. A cord connects the housing to a battery-power supply worn on the user's belt, and a video output cord connects to a 3.5-inch LCD display that is worn on the user's forearm and streams real-time video. An articulating connector allows you to aim the camera in the desired direction. Eight AA batteries should run the device for about 10 hours.

PS testers used the AquaLens to inspect the hull of a test boat from the deck and from the dock. We found the 3-pound device easy to set up and easy to use; however, the telescoping boat-hook mount limits the area and depth that is viewable, especially when using it from a boat with high

freeboard. From the dock, we were able to see most of the Cape Dory 25's hull, but not the keel, and viewing the seafloor (in 15 feet of water) was impossible in average-visibility conditions. Testers also had difficulty viewing the LCD in sunlight.

Bottom line: We would not classify the AquaLens as a must-have gadget—especially with its \$475 price tag, one-year warranty, and inability to record footage. We like the idea of an underwater surveillance tool, but the boat-hook mount limits its practical uses. (Some users have rigged the camera to a long line to view deeper areas, but we can't imagine trying to control the camera without the pole for guiding it.) The device is a step in the right direction, and we hope Aquabotix continues to improve on its product. We'd like to see it have more range and a lower price. ▲

CONTACT

AQUABOTIX, 508/676-1000, www.aquabotix.com

Navisafe's Handy 'Mini' LED Light

Specializing in lighting for nautical and other outdoor activities, Norway-based Navisafe's products include the U.S. Coast Guard-certified Navi light 360, *Practical Sailor's* Recommended small-boat rail light (PS, May 2011), and now, the Navi light Mini.

The 1-ounce, palm-sized Mini is a cross between a dive light and a keychain flashlight. It is portable, waterproof, and packs a 1-watt glow in a small package.

The LED flashlight features five modes: a red light, three varying strengths for a steady white light (10 percent, 25 percent, and 100 percent), and a flashing white light. Users can select the preferred mode with a touch of the orange power button.

Testers liked the Mini's size and ease of use. It measures 1 5/16 inches long by 1 1/2 inches wide and is a half-

inch thick. Its petite stature means that sailors can easily keep the Mini on their person—in a pocket or wearing the supplied lanyard around their neck.

Designed as a personal light—not a safety light—the Mini has limited visible range at night. It appeared as only a small pinpoint of light from 100 yards away and not at all in daylight. The red light cannot be discerned from more than 50 yards away. That being said, it would be better to have a small pinpoint of light attached to one's body in a man-overboard scenario, than to have nothing because the heavy and cumbersome bright flashlight was still stowed onboard.

The Mini is rated as waterproof to 300 feet. PS tested it to 10 feet and used it underwater multiple times, without seeing any signs of water intrusion.

However, the Mini does not float, so we recommend using it with the supplied lanyard.

Powered by two AAA batteries, the Mini will

burn in its 100-percent white mode for two hours and its red light mode for 16 hours with fresh batteries. The sealed LED bulb is rated for a usable life of approximately 8,000 hours.

The Mini is available from watersports outfitter NRS (Northwest River Supplies, www.nrsweb.com). Retailing for \$40 with a one-year warranty, the Mini comes in black, white, pink, and yellow.

Bottom line: The Mini's ergonomic design makes it easy to use, but its convenient-to-carry size and other features make it a worthwhile purchase. However, we would not recommend it as a primary onboard flashlight.

For a primary one, check out our December 2007 review of LED flashlights. The Best Choice, the Pelican Recoil 2410 (www.pelican.com), can be found online for about \$47. ▲

CONTACT

NAVISAFE, +49 171 600 60 11, www.navisafe.no



Thermal Cooking

Safely and easily cook underway.

The humble vacuum flask, or thermos, is one of those 19th-century technologies that has withstood the tests of time. Originally a delicate, double-walled, glass vessel, the vacuum flask was given a new lease on life in 1978, when Thermos introduced a stainless-steel version. The ultimate domestic iteration of this, however, is the thermal cooker.

Unlike pressure cookers (*PS*, December 2010), which use heat and pressure to cook foods quickly, or slow-cooking Crockpots, which require a constant heat source, thermal cookers rely on thermal mass, retained heat, and insulation to maintain temperature and “cook” the contents. Basically, the thermal cooker is a large, stainless vacuum flask containing one or two fitted saucepans. The contents of the stainless saucepan are brought to boiling point on the stove, and then the pan is immediately placed in the vacuum flask (insulated base). The insulation traps the heat in the food and uses it as the heat source for cooking the contents. Hours later, once the contents are fully cooked, the dish requires only minimal re-heating before serving.

The main advantages of cooking with a thermal cooker are the cooking-fuel (or power) savings and the convenience of being able to safely cook a meal while underway—without constant stove-tending or worry over spilled pots—even in foul weather, when slaving over a galley stove can prove challenging and dangerous. Single-handers will particularly appreciate the ability to prep a meal before raising the anchor, leaving it to cook while sailing, and then enjoying it later—whether that’s once the anchor is dropped or when the night watch begins.

The shorter stovetop-cooking time also means the cabin isn’t turned into a sauna, a plus for those in temperate and tropical climates, and there is less danger

of burned food getting stuck on the pans—a common problem with some pressure cookers—making dish-washing easier.

Thermal cookers come in a range of sizes, from single-serving size (1.5 liters) to family sizes (4.5, 6, and 8 liters). They also are available with locking lids, making them a safer choice for cooking underway than standard nesting cookware (*PS*, April 2009). While they may be a bit bulkier than some pressure cookers we’ve tested, their low-profile handles make them easier to store.

Thermal cookers are ideal for cooking stews, casseroles, soups, desserts, and other dishes. You’ll find some good recipes on www.thethermalcook.com.

Thermos (Shuttle Chef), Tiger (Magic Thermal Cooker), and Zojirushi are the most widely available thermal cookers in the U.S. Sizes and designs vary only slightly among the brands, and all offer options for two smaller cooking pans (instead of one large) and a steamer basket, all of which neatly nest in the base.

OUR EXPERIENCE

PS contributor Jonathan Neeves—a blue-water cruiser currently living aboard his Lightwave 38 catamaran in Australia—has used Thermos-brand thermal cookers for 30 years, and he maintains that he would never sail without one.

Neeves noted that the Thermos Shuttle Chef has excellent heat retention and lives up to its maker’s claims, keeping food hot (up to 160 degrees) for up to eight hours. He recommends using an 8-liter model for family meals on shore, a stowable 4.5-liter model with a locking lid for on-board cooking, and a single-



The 4.5-liter Thermos Shuttle Chef comes with an inner saucepan and has an optional steamer basket. To its right is the 1.5-liter model.

serve model for on-watch meals and side dishes. While some boats have gimbaled fittings for the cookers, Neeves uses his in the galley sink, which has proven to be a safe place for cooking underway and for ladling out food without a mess.

The Shuttle Chef’s low fuel usage makes it economic, eco-friendly, and ideal for passagemaking or cruising. It comes with a one-year warranty, but its quality stainless components are well made and built to last, even in the marine environment. There are alternatives that use polystyrene instead of vacuum insulation, but they are much less efficient.

Prices for double-walled, stainless cookers run about \$150 for a 4.5-liter model to \$250 for an 8-liter—not cheap, but worth it for the convenience, safety, and fuel savings. You can find the Shuttle Chef at such online retailers as Amazon.com, Galtak Houseware (www.galtak.com), and Forum Appliances (www.forumappliances.com). ▲

CONTACT

THERMOS, 847/439-7821
www.thermos.com



The saucepan (left) is heated on the galley stove for a brief time, then inserted into the insulated base (right) for thermal cooking.

Although some class rules allow crew to hang outside the lifelines, this practice challenges the structure of the lifeline system and jeopardizes the crew.

.....

like Dyneema or Spectra. If socket-type bases are used, through-bolting, welding, or bonding is mandatory. Socket mounts with set screws or self-tappers have been known to work free. When using high-modulus fiber lifelines, the type of splice used should be what the manufacturer recommends; versions of the Brummel splice are often the preferred approach for placing an eye in single-braid line.

The U.S. Code of Federal Regulations 28.410 mandates that commercial vessels have lifelines, deck rails, or bulwarks that are a minimum of one meter (39.5 inches) high, with stanchion spacing no more than seven feet and no greater than 15 inches between wires or tubing. Despite the fact that human size doesn't vary between commercial and recreational craft, the lifeline minimums are scaled back for recreational sailboats. It's a legitimate design compromise, but there's little doubt that you are more likely to go over a side that's bounded by a 2-foot-high wire railing than when you're held in check by a restraint more than 3 feet high.

We are not advocating 40-inch lifelines on 30-foot sailboats, just pointing out that the minimum standards for recreational sailboats don't go very far toward preventing crew from ending up in the water. The recreational sailor needs to become more deck agile than the average passenger on a Block Island ferry. We learn to reach inboard for handholds, make sure that the nonskid on the deck and cabinhouse affords good grip, and avoid leaning outboard using the lifelines like a banister on a staircase.

Sailboat lifelines have jumped back into the spotlight thanks to a growing acceptance of—and some controversy over—high-modulus rope like Dyneema and Spectra being used as an alternative to stainless steel. Dyneema and Spectra are brand names for lines made from trademarked HMPE. One of the key attractions of these lightweight fibers is that they allow ropes to be made as strong as stainless-steel wire of equal diameter, yet they weigh a fraction of

Photos by Ralph Naranjo



The High-tech Option to Wire-rope Lifelines

Racers love lightweight fiber lifelines, but are they practical for cruising?

Lifelines are called “guardrails” by British sailors, but regardless of their designation, they represent a handhold of last resort.

Situated like a fence around the perimeter of most sailboats, lifelines often go unnoticed until a crew member is hurled to leeward and frantically reaches for something to keep from going over the side. If all goes well, the properly tensioned wire or rope accepts the impact load, transferring the energy into compression and bending moments that radiate through stanchions and pulpits. The energy dissipates in the deck, and the catapulted crew remains on deck.

The system comprises more than stainless-steel tubing and wire or high-

modulus rope. There's often an array of minor hardware playing a major role. These bits and pieces act like links in a chain or a fuse in a series circuit—any one of the lesser components lets go, and the entire system fails. Clevis pins, cotter keys, turnbuckles, swages, spot-welded pulpit connections, and gate hardware add up to a lot of potential points of failure.

The International Sailing Association and Federation (ISAF) Offshore Special Regulations give considerable attention to lifeline design. For boats over 28 feet, they must be a minimum of 24 inches above the working deck and be made of uncoated wire or the equivalent high-molecular weight polyethylene rope (HMPE)

AS VALUE GUIDE		LIFELINE MATERIALS				
ROPE	ENDURA BRAID		STS-12		PROTOTYPE	★ 1 x 19 SS WIRE
DIAMETER	8 mm	6 mm	4.76 mm	3.97 mm	5.1 mm	5 mm
BREAK STRENGTH	8,100 pounds	4,500 pounds	5,800 pounds	4,300 pounds	4,500 pounds	4,200 pounds
WEIGHT POUNDS/100 FT.	3 pounds	1.8 pounds	1.1 pounds	0.7 pounds	1.2 pounds	7.7 pounds
COVER	Polyester	Polyester	None	None	Dyneema Sk-75	None
CORE	Dyneema Sk-75	Dyneema Sk-75	Dyneema Sk-75	Dyneema Sk-75	Dyneema Sk-75	316 stainless
PRICE / FT.	\$2.63	\$2.43	95¢	85¢	N/A**	\$3.19
TEST RESULTS*						
EASE OF SPLICING	Fair	Fair	Fair	Fair	Fair	Poor
SNAG RESISTANCE	Good	Good	Fair	Fair	Fair	Excellent
EASE OF INSTALL	Good	Good	Good	Good	Good	Fair
CHAFE RESISTANCE	Good	Good	Good	Good	Good	Excellent
★ Best Choice *Test results based on field testing; bench tests to follow. ** This lifeline prototype is not yet on the retail market.						

The longevity of bare (for easy inspection) professionally rigged stainless-steel lifelines remains our first choice for cruising boats; our recommendations regarding high-strength, low-stretch fiber lifelines is pending the results of more testing.

the wire that they replace.

Practical Sailor has launched a long-term, in-depth set of seatrials linked with lab testing at the U.S. Naval Academy to determine the value of high-modulus rope alternatives versus stainless-steel wire lifelines. In this first phase of the test, we look at the issues involved in transforming one of our test platforms, Technical Editor Ralph Naranjo's Ericson 41 sloop, from wire to Dyneema SK-75 lifelines.

Steve Parola at New England Ropes has provided us with several high-modulus line options. For the first round of the comparison, we installed an HMPE 5.1-millimeter, special double-braid lifeline for the top lifeline and an Endura 12-strand single braid for the bottom. (The HMPE 5.1 is a prototype lifeline developed by New England Ropes; it is not yet on the retail market.)

Those who are already familiar with using cordage strops and lashings to attach hardware will feel more comfortable with a fiber lifeline installation. Obviously, strength and reliability are key concerns when installing a rope alternative to wire. Abrasion will become more of a

concern, and each hard spot or contact point along the run of the line needs some consideration.

The bottom line is that there is a big difference between a sharp-edged hole drilled through a stainless-steel stanchion and a smoothly rounded lead at the top of the same stanchion. In some cases, what was an adequately smooth lead for stainless wire will need a bushing to protect the less abrasion-tolerant fiber rope. However, the good news is that an all-rope system is easy to set up and terminations can be made without the need for swage machines or specialized hardware.

New England Ropes, Samson, Coligo, and others offer splicing guidance on their websites, and for those who already do their own bury-type splices in double-braid line, there's no reason not to learn one of the Brummel type splices that offer an efficient way to eye splice in single-braid Dyneema/Spectra line.

WHAT WE TESTED

All of the rope we are using in this round of testing is either 100-percent SK-75 Dyneema or a combination of Dyneema core and Polyester cover. The tensile

strength of new line is equal or greater to wire of equal diameter, and as Naranjo found out in his previous tests (see page 22), lifeline breaking strength is not the limiting variable when it comes to the failure of a regularly inspected and reasonably maintained system.

For the test, each line was attached at the stern pushpit using a D-shackle and a double turn in a spliced eye. The rope was run through the same fair leads on the stanchions that the stainless wire had been run through.

We did note that the running backstays, when eased and secured to the rail, rubbed against the lifelines. This hadn't been a problem with the wire lifelines, even though we sail more of the time with the running backstays in this slackened state. Our plan is to monitor this potential chafe point.

All of the top stanchion fairleads, and even the aftermarket lower lifeline leads, had smooth radius entry and exit points that need no modification. We intentionally chose a "no thimble" eye splice as the means of securing to the

Continued on page 23

USNA Lifeline Test Reveals Weak Spots

During the time *PS* Technical Editor Ralph Naranjo worked as the Vanderstar Chair at the U.S. Naval Academy, he organized a research project that was carried out by first-class midshipmen (seniors) in the Mechanical Engineering Department. The goal was to design a steel box beam jig replicating the perimeter of a Navy 44.

The unbending jig was fitted with a complete lifeline system that could be subjected to hydraulically generated destructive loads. The research tested how such systems fail and measured the load that led to such failure. It was a carefully controlled experiment that tallied input loads, and using strain gauges in numerous jig locations, it measured the effect on all system components.

A hydraulic ram replicated the force exerted by several crew being hurled against the lifelines. Surprisingly, stern pushpit failure proved to be the Achilles heel. Tension in the lifeline caused the vertical legs of the stern pushpit to crimp near their base, and as the structure folded toward the bow, slackening lifelines imposed bending loads on individual stanchions, causing them to fold outward. Each time the test was repeated, the same result occurred due to the geometry of the stern pushpit. Its right-angled legs made it more vulnerable to collapse than the steeply angled bow pulpit that handled more of the load in compression rather than shear.

The net result of this study revealed that when a 3/16-inch, 1-by-19 stainless-steel lifeline has a breaking strength of 4,200 pounds—and as long as there are no defects in the fittings—it's the strongest component in the system. Other structures will fail well before the wire itself.

In the USNA testing, the stern pushpits collapsed when there was only about 1,200 pounds of load in the wire. Once slack developed in the lifeline, stanchions bent outward, but the lifeline itself never parted.

Tales of broken wire usually involve vinyl coated 7-by-7 stainless steel, and years ago, ISAF Regulations were changed



Stanchions bent and pulpits bowed during lifeline load testing at the U.S. Naval Academy.

to eliminate the use of coated wire for lifelines. Swages and hardware have also proven to be weak links in the system, but with regular inspection of all components, a crew can catch potential problems. When it comes time to renew the standing rigging, it's also a good idea to renew the lifelines and hardware.

Many modern cruisers and larger race boats come with 30-inch-high double lifelines. The engineering behind such structures includes a careful look at the deck laminate. The designer/engineer needs to be sure that the point load on a stanchion doesn't result in crushed core, or even worse, a stanchion torn out of the deck.

On sailboats with an inward-turning hull flange and a deck that has a solid FRP perimeter, this high-density boundary is

often located where the outboard fasteners for the stanchion base penetrate. Unfortunately, when a stanchion is loaded with crew weight, the bolts that end up in tension are located at the inboard part of the stanchion base. This area is often part of the cored region of the deck. Better builders "infill" or close off the core in these locations. They insert high-density material during the molding process or add a load-spreading backing plate, rather than simply securing the stanchion with a larger diameter washer.

Damage resulting from deck density variation can be fixed with some epoxy putty and the installation of a G-10 topping and backing plate. These 1/8-inch to 1/4-inch-thick pieces of solid laminate are cut a bit larger than the stanchion base. They create a slight mounting plinth and backing-plate that spread loads at the stanchion base. Lifeline stanchions, like a rudder stock, should ultimately fail in a bending mode. If they are stronger than the deck or the hull that supports them, the resulting damage is a hole in the boat. The art of engineering and boatbuilding is coming up with structures that answer such complex challenges.

Make Sure Your Lifelines Are Up To Snuff

Lifelines and stanchions should undergo regular inspection. Common trouble spots include:

- ◀ **Terminal fittings:** Inspect for missing cotter pins and loose terminals.
- ◀ **Gate hardware:** Check regularly or eliminate opening altogether.
- ◀ **Backing plates:** Add topping and backing plates to stanchion base.
- ◀ **Wire coating:** Use uncoated wire.

◀ **Pushpit reinforcement:** Have a diagonal tube welded into the pushpit (stern pulpit).

◀ **Split bow pulpits:** Beware of open-split, two-leg bow pulpits. One piece pulpits spread loads to both port and starboard sides, even when only one side of the lifeline is tensioned. Split pulpits lose this load sharing ability and are inherently weaker.

◀ **Over-accessorizing:** Beware of compromising the stern pushpit with davits, antenna brackets, arches, and other ancillary loads that are vulnerable to breaking seas.



Dyneema lifelines can be lashed to the pulpit (above), rather than relying solely on a welded loop. Abrasion is the biggest foe of fiber lifelines (right). Using lifelines as handholds (below) is a bad habit; a safer practice is using only inboard handholds.



Continued from page 21

pushpit shackle, because we wanted to test the most chafe-prone alternative, which should be the most likely to show early signs of fiber damage. With the eye splice at one end secured to a D-shackle on the stern pushpit, the line was led forward through fairleads on top of the stanchions.

For the bow pulpit terminus, we chose a lashing rather than a more traditional eyesplice termination. Our choice was based upon a need to easily swap out lines being tested, and a splice would not fit back through the fairleads. An advantage of this direct-pulpit attachment was the elimination of a lashing lanyard, another potential weak link in the system. Our approach also allowed us to wrap the line around the pulpit leg, not simply depend on the integrity of a very small weld on a pulpit tube strap. Another sensible compromise is to splice an eye and lash the forward end, taking turns around the pulpit tube as well as engage the welded attachment point.

STS-12 is New England Ropes' name for its Dyneema core polyester cover double braid line that has gained quite a following as a low-stretch, high-tech, cost-effective rope. It has proven quite durable in running-rigging applications such as halyards, sheets, topping lifts, and guys. We wanted to test the idea of a lifeline with a very UV-resistant polyester cover and an SK-75 Dyneema core. From the start, we recognized that there will be a chance that the chafe at contact points will cut through the cover. But after a few months of testing, there's no

sign of such problems occurring.

STS-12 is an all-Dyneema, single-braid rope that incorporates a 12-strand weave, is friendly to Brummel splicing, and has a special chemical finish that prevents deterioration caused by UV rays. The braid configuration also more closely mimics the look of wire, and those averse to the "rope look" of modern fiber lifelines may want to opt for the slate gray color (one of several options) and texture of STS-12. With this line, your marina neighbor will wonder why your wire lifelines don't stain with rust, never realizing that they are rope.

New England Ropes has come up with a specific lifeline cordage that is made up of a tough tight weave of a Dyneema cover and a Dyneema core. The ultra-tight weave of the cover makes it very tough and snag resistant, and the load sharing between the core and cover affords very good tensile strength.

HOW WE TESTED

Our underway testing is as much about how these fiber lifelines function as how well they hold up in the marine environment. During the setup, we found that the transition was pretty straightforward with the major difference between reeving wire and rope being the need to avoid contact with hard, sharp edges. Underway, the behavior was quite similar. The taught, non-stretchy material replicates wire well, and the only surprise was when a ring-type retainer on a fiddle-block clevis pin decided to grab hold of the lower lifeline (Endura Braid 6 millimeter). Tacking the boat unloaded the

block and allowed us to quickly remove the errant ring-ding, replacing it with one that did not have a bent-out prong ready to snag lines.

We did find that installing spliced eyes at both ends and using a lashing pennant to tension one end of the lifeline is the most sensible approach to controlling deflection. ISAF regulations stipulate that an 11-pound weight midway between supports should deflect the lifeline no more than about 2 inches. This was easy to dial in with a lashing lanyard.

But just as with wire and a turnbuckle, trying to achieve banjo-string reso-



The Art of Splicing High-modulus Line

The tested lifelines used two types of splices, both of which can be mastered with practice. Anyone not confident with their own splicing ability should turn to a professional rigger; the consequences of a lifeline failure can be severe.

1 & 2 The double-braid eye splice creates a lock by separating the core and cover, tucking each into the other prior to burying the crossover point and tapered tail. NE Ropes' website details the steps: www.neropes.com/spl_doubleeye_splice.aspx.

3 & 4 Single-braid 12-strand eye splices are usually done with a Brummell or lock-stitch splice that involves twice passing the line through itself and then tapering the tail prior to burying it inside the sleeve.



1



2



3



4

nance will do more harm than good. The opposite—leaving lifelines too slack—also has negative consequences. Leaving race-boat lifelines so loose that crew weight migrates to the windward topsides can challenge the structure of the system and jeopardize the crew.

As pointed out in “Failure Analysis” (page 22), too much bending rather than compression loading on stanchions will cause premature failure. Lifelines were never designed as hiking augmentation, and their adaptation to this brings some compromises into play. Extra care must be given to making sure components are sound and chafe hasn't caused fiber or wire-strand damage.

During our underway testing, we quickly grew accustomed to the secure, seemingly non-stretchy rope lifelines. Stepping aboard or when grabbing in any of a dozen other different ways, they worked just like their wire relatives and afforded a user-friendly grip.

Time will tell how they handle environmental factors ranging from hands just lathered with sunscreen to the atmospheric deposition of diesel soot. According to NER's Parola, the life expectancy of fiber lifelines like HMPE will be measured in years, rather than the decades of service wire lifelines offer. We recommend checking lanyards and lashings annually, and keeping a

watch for chafe damage.

After a year or so, we'll haul the lines we've installed into the lab and test their tensile strength to see how it compares to their original breaking strength. Part 2 of this test will include feedback from a race boat crew and similar on-the-water testing and lab followup.

CONCLUSION

The popularity of high-modulus fiber lifelines among racing sailors makes it clear that the approach is well suited for the meticulous sort who wants to save weight and is prepared for the more frequent replacement interval. But what about the cruiser who is more interested in robust equipment that can stand the tests of time? That is what we hope to find out.

While the changeover to fiber is not without hiccups, the material gets high marks for do-it-yourself installation. Chafe is clearly more of a threat, but it can be mitigated.

When Naranjo cut away the stainless-steel lifelines to install a fiber alternative, he thought back to 1984, when he had installed the wire. The top wire was an oversized ¼-inch, 7-by-7 chosen because it allowed him to bend it over a thimble and double-nicopress his own fastening.

The approach had been DIY-simple, easy to inspect, and had certainly passed

the test of time. The new fiber makeover weighed mere ounces compared to the 10 pounds of wire and hardware he was abandoning, and yet, the breaking strength of the line was better than the 7-by-7 heavyweight stainless.

At the onset it seems to us that lashing, splicing, and stitching can ensure as much security in the system as one gains with a shackle and turnbuckle, perhaps even more. But the final answer to which is better lies in the longevity of the system and what type of dropoff we see as the rope ages or chafes and the marine environment takes its toll. We will carefully inspect lanyards and lashings, scrutinize metal on fiber chafe, UV, dust dirt, and the effect of atmospheric deposition—and then take our test lines to the lab and see what's left. ▲

CONTACTS

NEW ENGLAND ROPES,
508/678-8200,
www.neropes.com

NOVATECH BRAIDS,
902/742-4212,
www.novabraid.com

SAMSON ROPE, 360/384-4669,
www.samsonrope.com

YALE CORDAGE, 207/282-3396,
www.yalecordage.com



The test field comprised six waterproof remote microphones of similar size and function. Only one is a wireless model.

A Roundup of Remote VHF Mics

Standard Horizon and Icom top this closely contested evaluation.

Remote microphones for fixed VHF radios are great tools for both coastal and bluewater sailors, but they can be essential for short-handed crews. Remote mics allow the VHF transceiver to be mounted belowdecks—where the radio operator can safely make clear communications in heavy weather—yet they offer full-radio function at the helm, for times when leaving the tiller isn't an option.

Remote mics provide a helm station with greater power, range, and talk-time than a handheld VHF; however, they do not offer the redundancy of a second fixed VHF or limited-range handheld.

When considering a remote mic, your choices are determined by whether or not you already own a VHF. If you do, and you're not ready to upgrade, then you're stuck with the options that are compatible with your existing VHF. But if you're shopping for the whole kit-and-kaboodle, then it's important to first compare fixed VHFs and then remote mics, as they are merely accessories. Once you've narrowed your list of VHF candidates, you can weigh the pros and cons of the different mics available.

PS reviewed budget marine VHFs in the June 2012 issue and high-end fixed VHFs in the July 2012 issue. We highly

recommend reading both articles to supplement this review of remote mics.

WHAT WE TESTED

During our last look at remote mics in the November 2007 issue, Icom's CommandMic III took Best Choice honors, while both the Standard Horizon VHF310 and Raymarine's RayMic garnered Recommended ratings. For this remote mic test, we rounded up six units, each designed to work with two or more compatible, fixed-mount marine VHF radios. Five of the six test mics are hard-wired to their host radio, and one uses wireless technology.

Icom, a global company whose product line includes communications equipment and products for the marine, avionics, and wideband receiver industries, provided two units: the 2007 Best Choice CommandMic III and the CommandMic IV. From Raymarine, a subsidiary of FLIR and a world leader in marine electronics for recreational boating, we tested a new RayMic, and from electronics icon Standard Horizon, we tested

the RAM3 mic. Garmin, a worldwide provider of navigation, communication, and information devices, was represented in the test by its wired GHS10 and wireless GHS20 microphones.

Similar in size and weight, the plastic test mics range in price from \$90-\$400 (including required hardware). They all have full dot-matrix LCD displays, similar controls (buttons, knobs, dials, etc.), and provide full control of the mated VHF (so, for example, if the paired radio has a hailer or fog signal, you can use or initiate it from the remote). These features are described in more detail in our June and July 2012 reports on VHFs.

The extension cables of the five wired mics all have two wires for connecting the mics to external passive speakers.

.....
All six test mics passed our dunk test with flying colors.



PS VALUE GUIDE REMOTE VHF MICROPHONES

MAKER	GARMIN		ICOM		RAYMARINE	STANDARD HORIZON
MODEL	GHS10	GHS20 ✓	CommandMic III	CommandMic IV ✓	RayMic	RAM3 ★ \$
PRICE	\$200	\$300 (\$399 with GWH20 wireless hub)	\$170	\$200	\$150	\$90
WARRANTY	2 years limited (Americas and Caribbean)	2 years limited (Americas and Caribbean)	3 years	3 years	3 years	3 years
TYPE	Wired	Wireless	Wired	Wired	Wired	Wired
WATERPROOF	IPX7	IPX7	IPX8	IPX7	IPX7	IPX7
COMPATIBLE VHF RADIOS**	VHF200*, VHF300, VHF300AIS	VHF200, VHF300*, VHF300AIS	IC-M504A*, IC-M604A	IC-M424*, IC-M423	Ray 55, Ray 218*	GX1256, GX1280S, GX1500, GX1600, GX1700 GPS*, GX2150 AIS, GX3000, GX2360, GX3500, GX5000, GX5500, CPV350 & CPV550
DIMENSIONS (H x W x D)	6 3/8 x 2 3/4 x 1 1/4 inches	6 3/8 x 2 3/4 x 1 1/4 inches	5 29/32 x 2 19/32 x 1 1/2 inches	5.69 x 2.66 x 1.46 in	6 x 2 1/2 x 1 3/8	5 3/4 x 2 5/8 x 1 1/2
DISPLAY SIZE (DIAGONAL)	2 inches	2 inches	1.75 inches	1.75 inches	1.75 inches	1 7/8 inches
DECK CABLE LENGTH	30 feet	Wireless	20 feet	20 feet	30 feet	23 feet
PUSHBUTTONS	10 + rotary knob	10 + rotary knob	11 + jog wheel	13 + rotary knob	8 + 2 MFD rocker switches	13
TEST RESULTS & RATINGS						
AUDIO OUTPUT (@ 3 feet)	83 decibels	76 decibels	87 decibels	87 decibels	93 decibels	82 decibels
ERGONOMICS AND OPERATION	Good	Good	Very good	Excellent	Good	Excellent
DISPLAY RATING	Very good	Very good	Good	Good	Very good	Very good
AUDIO QUALITY	Very good	Good	Good	Very good	Very good	Good
COMMENTS	Both it and the GHS20 have the largest displays of the test group.	Requires GWH 20 wireless hub; cannot turn radio on and off remotely. Lowest audio output of test group.	Left button at top of mic controls jog wheel functions (volume, squelch, channel select).	Radio display indicates when remote mic is in use.	Highest audio output; can't turn radio on or off.	Three soft keys can be user-programmed for up to 10 functions; least expensive.

★ Best Choice \$ Budget Buy ✓ Recommended * VHF used for testing ** VHF's in RED are PS Best Choice, in GREEN are PS Recommended

All of the test mics are waterproof. The Icom CommandMic III was the only one rated as IPX8, which means it can withstand continuous immersion. The others are rated IPX7, able to withstand immersion to 3 feet for 30 minutes.

The test handsets all feature a covered, well-marked Digital Selective Calling (DSC) distress calling button, and they can control the DSC functions

their mated radio offers. For example, the RayMic allows users to make individual, group, and all ships calls remotely when it's paired with the Best Choice Raymarine 218 VHF, which has the same DSC capabilities.

Testers found it odd, and inconvenient, that two of the test mics, Garmin's GHS20 and Raymarine's RayMic, were designed without the ability to turn on/off the host VHF. All of the mics, except

the battery-powered GHS20, are powered through their mated VHF's and draw less than an amp at maximum volume.

HOW WE TESTED

Power was supplied to each hardwired microphone through its accompanying radio via a single cable. All host radios were supplied with 13.8 volts DC provided by a regulated power supply, and the wireless GHS20 had its battery fully



Icom CommandMic III



Garmin GHS10



Standard Horizon RAM3



Raymarine RayMic

All of the tested remote microphones feature well-marked, easily accessible buttons for making DSC distress calls. The buttons all have covers so that they cannot be activated accidentally.

charged prior to testing.

Each test microphone was run through a laundry list of operations. The more capabilities a microphone possessed, the higher it was rated. Criteria for higher ratings in functionality included the ability to control every function on the host radio and the ease of operation (intuitive controls, one-handed operation, ergonomics, etc.).

Microphone display screens were rated based on readability, the amount and quality of data shown, and the lighting. Larger screens displaying lots of data received the highest ratings.

To rate the audio systems, we measured sound pressure levels at maximum volume while inputting a 1-kHz tone. Sound levels were measured from 3 feet away. Testers also monitored a weather channel at various volumes to determine overall sound quality.

Each microphone was immersed in 1 foot of fresh water for 30 minutes to confirm it was waterproof. We then tested them for proper operation immediately after the dunking and again 24 hours later.

GARMIN GHS10

The GHS10 mic, which provides full radio control of Garmin's VHF200 or VHF300/300 AIS radios, features a 2-inch LCD display, matching the GHS20 for the largest screen in the test field. The GHS10 has dedicated rotary and push buttons for common tasks, and three soft buttons for dynamic controls. All buttons and knobs are similar to those on the host radio. In addition to

being able to be connected to an external speaker, the GHS10 has intercom capabilities when connected to an appropriate speaker.

Testers did note one negative: Adjusting volume, a very common task, requires multiple steps. The user must push the VOL/SQL button twice, then adjust volume using the rotary knob. This is not ideal, in our opinion.

Testers rated the GHS10 display Very Good. Data was easily discernible, and the channel numbers were among the largest of the group, matched only by those of the GHS20 and RayMic. Audio quality was also rated Very Good.

The \$200 GHS10 comes with a two-year limited warranty that is valid in the Americas and the Caribbean.

Bottom line: The GHS10 is a well-built mic that offers complete control of the mated radio, but its shorter, limited warranty is a concern.

GARMIN GHS20

The only wireless microphone in our test, the GHS20 can be mated with Garmin's VHF200, VHF300, and VHF300 AIS series radios, although some radios may require a software update before being compatible.

Garmin GHS10



The GHS20 is physically the same as the GHS10, but it has full wireless capability. Function-wise, the only difference is that the GHS20 cannot turn the host radio on and off and the GHS20 requires a GWH20 wire-

Garmin GHS20



less hub to interface with the host VHF. The hub can be bought separately (\$150) or as part of a bundle with the \$300 GHS20 for an added \$99. Each GWH20 provides intercom capability with the VHF and can support up to three mic handsets.

Setting up the GHS20 with the radio was simple and straightforward.

The convenience of being able to transmit over VHF from anywhere on board using the GHS20 is unmatched by the wired mics we tested. However, having a handset that is battery powered has its down sides, including a finite run time and battery replacement costs. The GHS20 uses a rechargeable lithium-ion battery that charges when the handset is in its provided cradle. An LED light on the mic face shows charging status and provides basic troubleshooting indications (battery over temp, defective battery, etc.), and an icon showing charge status is displayed on the mic screen.

According to the owner's manual, a fully charged battery provides 18 hours of operation and recharging can take up to four hours. To test this, we charged the battery overnight and then set the mic to a weather channel, leaving it on at low volume. Fully charged, the battery lasted for 17.5 hours. The maker claims the battery's life expectancy is 100 charge cycles at 90-percent capacity, or 500 cycles at 75-percent capacity. The battery is not user-serviceable, so when it dies, you have to ship the mic off to Garmin to have it replaced. If this happens after the two-year warranty



Testers found the CommandMic III's flush-mounted top buttons hard to use one-handed.

period, the service will cost you \$120.

The GHS20's battery life far exceeded that of the last wireless mic we tested, the Uniden WHAMx4 (PS, November 2007). The WHAMx4's nickel metal hydride battery last a mere two hours after a 14-hour charge.

To test the effectiveness of the GHS20's wireless link, we monitored incoming voice transmissions while gradually moving away from the host radio. Reception was very good for an unobstructed distance of about 125 feet—a pleasant surprise to testers—but we experienced a gradual increase in static past that point. Reception between the mic and the VHF through two walls at our test facility was excellent.

The GHS20 does not float, and while Garmin supplies a wrist lanyard and belt clip for it, we would prefer that the mic float or that it have a lanyard with an integral float (like those often used on waterproof cameras). For installations where the mic's charging cradle is belowdecks, we suggest an additional mount in the cockpit, so there's always a dedicated place to find it. Garmin sells these for about \$2.

Testers rated the GHS20 display as Very Good and audio quality as Good, but volume was rated the lowest of the test group. The GHS20 performed well and the wireless connection eases installation headaches, but at \$400 for the mic and required wireless hub, it's the most expensive unit of our test group—even without accounting for the potential \$120 battery replacement cost.

The GHS20's limited warranty is valid only in the Americas and Caribbean.

Bottom line: Held back only by limited warranty

and cost, the GHS20 is a top performer and carries the added wireless conveniences of easy installation and more mobility. It gets our recommendation for those seeking a wireless remote mic.

ICOM COMMANDMIC III

The CommandMic III is designed to provide full functionality of Icom's IC-M504A (Recommended VHF, July 2012) and IC-M604A (Best Choice VHF, July 2012). It features a multi-function rotary dial that provides quick access to settings like channel selection, AF volume, squelch, and menus. Testers found that the front panel dial on the CommandMic III made the most common tasks—adjusting volume, squelch, and channels—super easy.

Pushbuttons located on the front panel control channel selection, quick 16, scan, and menu functions. On top of the mic are three buttons that also select volume, squelch, channel, distant or local reception, intercom, and hail. Push-to-talk and high/low power buttons are mounted on the mic's side.

The CommandMic III's screen was in the middle of the pack for size, but testers found it easy to read and rated it Good overall. Audio output and quality also were rated Good. The mic appeared to be well constructed, and controls were intuitive to operate, although testers found the buttons on the mic top to be a bit awkward in use and not very conducive to one-handed operation.

The CommandMic III has the only IPX8 waterproof rating of the group. Both CommandMics come with three-year warranties.

Bottom line: A solid performer with an easy-to-use jog dial, the 2007 Best Choice CommandMic III was eclipsed in this test by its younger sibling, the CommandMic IV. However, we still find the III to be a quality product, and it is a great choice for owners of the IC-M504A and IC-M604A VHF's.

ICOM COMMANDMIC IV

Icom's latest remote VHF option, the CommandMic IV, has the

same soft-key user-interface as its compatible VHF's, the fixed Icom IC-M424 (PS, July 2012) and the handheld Icom IC-M92D, which we're currently testing.

Icom designed the soft-key interface to be easier and faster to use—with fewer button pushes—than a menu-driven interface. Testers gave it two thumbs-up, noting that the interface was very intuitive. They also liked the mic's "in hand" feel and the buttons' ergonomic layout.

It was the only unit tested that indicated when the remote mic was in use by showing a message on the host radio's display, a feature testers liked.

Although the rotary volume/squelch knob was located at the top of the mic, it was easy to access and operate, primarily because it offered more relief than the CommandMic III's flush-mounted top buttons, which require the user to tilt the mic forward to see what they are doing.

Testers rated the CommandMic IV's display Good, but its channel numbers were the smallest of the test group. Audio quality earned a Very Good rating.

Bottom line: Good performance coupled with innovative software, user-friendly operation, and a three-year warranty make the CommandMic IV a great choice. It gets PS's Recommendation.

RAYMARINE RAYMIC

The RayMic provides full remote control of the Raymarine Ray55 and Ray218 VHF radios. Its pushbuttons are all located on the mic face, the same place as those of the Ray218. The only exceptions are the push-to-talk, which is located on the mic side; the DSC distress button, which is on the back; and hailer control, which is handled through a menu.

The RayMic has all the usual controls one would expect—volume, channel selection, squelch, intercom, quick 16, and scan—but it does not allow users to power on/off the mated VHF.



Icom CommandMic IV



Icom CommandMic III

A displayed message lets users know when the Icom CommandMic IV is in use.

Three soft keys just below the screen offer easy access to menus and instant selection of three preset channels. (Up to three favorite channel groups can be stored in memory.) DSC calling is controlled through a menu.

Just as the mic pushbuttons mirror the VHF's buttons, the handset screen is identical to the radio's display. It shows large, easy-to-read channel numbers with comments scrolling below, and all the same icons for transmit, receive, transmitter power output, and the channel group selected.

Testers rated the mic's display and overall ergonomics Very Good. The RayMic had the loudest audio output of the test group, but the sound was a bit distorted at maximum volume.

The RayMic comes with a 30-foot control cable. If you need more cable length, Raymarine recommends using a maximum of two, 30-foot-long cables connected in series.

The RayMic, a Recommended product in our 2007 test, comes with a three-year parts and labor warranty.

Bottom line: A top performer, the RayMic is a good choice for those with Raymarine VHF's, including the Ray218, our Best Choice among high-end VHF's (PS, July 2012). In a tight comparison with fairly equal competitors, the RayMic was held back by its inability to turn on the host VHF.

STANDARD HORIZON RAM3

Standard Horizon's RAM3 remote microphone provides full remote control of its Quantum, Matrix, Quest-X, Quest+, and Phantom series fixed VHF radios. This also includes intercom function between the mic and connected radio, as well as between two RAM3 mics (Matrix and Quantum models). Additional features include a mic speaker with Standard Horizon's Noise

Canceling Clear Voice Technology, three user-programmable soft keys, and backward compatibility to RAM+ (CMP25).

When connected to the Matrix GX3000S or the Quantum Series VHF, the RAM3 also controls the 30-watt PA and hailer functions. Its mounting spot can be up to 70 feet from the host radio using two of the optional 23-foot extension cables.

Audio quality for the RAM3 was rated Good, while the display was rated Very Good, as were the overall ergonomics of the mic. In addition to large and easy to read channel numbers, testers noted that it was comfortable to hold and that the locations of controls and buttons were convenient and made operation simple. Testers also liked being able to configure the mic's three soft keys, which can be user-programmed for up to 10 functions that can be displayed in a user-prioritized order.

The RAM3 remote mic costs \$90 and carries a full, waterproof three-year warranty.

Bottom line: The RAM3 is a highly rated, full-function mic that works with nearly every fixed-mount VHF in Standard Horizon's current lineup—including several of our Best Choice radios. The least expensive of the bunch, it secured our Budget Buy and Best Choice picks.

CONCLUSIONS

While a boat owner wishing to add a remote mic to an existing VHF is limited to mics offered by the radio's manufacturer, those owners not yet committed can compare the pros and cons of the entire test group to help with both mic and radio purchasing decisions.

There was no Super Mic in this test field. All were on pretty equal footing, performance wise, so testers



Raymarine
RayMic



Standard
Horizon
RAM3



had to get down to the nitty-gritty details in choosing top picks. In the end, Best Choice and Budget Buy went to the best-priced Standard Horizon RAM3, followed very closely by the highly Recommended CommandMic IV. The GHS20 gets our recommendation for the wireless niche, though we'd prefer that it float and have a user-serviceable battery.

If you're shopping for a mic and a fixed VHF, consider the RAM3 mated with one of several Recommended Standard Horizon VHF's (PS, June and July 2012), including the AIS-equipped Matrix GX2150, the affordable GX1600, or the GPS-equipped Explorer GX1700 VHF, which was the Best Choice among mid-priced VHF's. If you purchase a GX1700, be sure to confirm with the retailer that it has the latest firmware. (See "Product Update" in Mailport for more on this.)

The RayMic would serve well paired with the Ray218 VHF, our most recent Best Choice among high-end radios, and a good Icom package would be the CommandMic IV with the IC-M422, which testers recommended among high-end VHF's. For those who must have a wireless mic, check out the GHS20 with the Garmin VHF 300, a solid performer in our last test. ▲

CONTACTS

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RAYMARINE, 603/881 5200,
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Climbing Gear to Take Sailing

Hardware that can save money while doing double-duty.

By **DREW FRYE**

It's no secret that any product stamped "marine" likely will be more expensive than its counterpart in a different market. In some cases, we've found, that crossover gear serves us just as well as "marine" gear, but it can be had at a better price. There obviously are exceptions, but we're always on the lookout for crossover products that can be used in lieu of pricey marine gear.

In this "Ocean Tested" report, *PS* contributor Drew Frye, an avid sailor and rock climber, makes the case for using recreational climbing gear in marine applications. He's had over 20 years of experience with the climbing products described below in all sorts of marine applications.

NOTE: While this recreational gear is certified to perform reliably in its intended environment, it is possible to overstress the gear by using it in ways it was not designed for. Also, gear that is to be used for climbing or other safety-critical applications should be used only for that purpose.

FROM ROCK FACES TO HEELING DECKS

Like sailors, rock climbers and mountaineers demand a lot from their gear. It must be strong, dependable, versatile, simple, and light. Because the cost of gear failure is often death, standards development is advanced and quality control is strict. And because the climbing gear market is significantly larger than the marine gear market, the pricing is dramatically lower—often two to five times cheaper than equivalent marine gear.

Also, climbers use the same gear over and over again, but in different combi-

nations. It is designed to be versatile, so that a climber can piece together a rigging solution with what he has—and do it with one hand quickly. While there are marine alternatives that offer better durability for permanent installations, there are few alternatives that can offer the same combination of speed, versatility, strength, reliability, and economy.

The test standards for rock climbing equipment, as set by the International Mountaineering and Climbing Federation (www.theUIAA.org), are based on the energy generated by a "standard" falling climber, 5,000-6,000 pounds of load. The Occupational Safety and Health Administration (OSHA) and sailing safety gear standards are often based on UIAA work, and so generally have similar load limits.

CLIMBING 'BINERS vs. MARINE

About 20 years ago, the rock-climbing industry realized that wire-gated carabiners had substantial advantages over conventional carabiners. Because of their simple construction, they are not prone to corrosion or jamming with grit. The gate is also very light and does not flutter open when slapped against a cliff in the course of a fall. Marine chandleries are now filled with stainless-steel look-alikes of the aluminum carabiners. However, the strength and corrosion resistance promised by stainless steel doesn't deliver much real advantage in most on-deck applications, and the weight and cost of stainless is many times greater.

While we would not advise using a climbing carabiner in place of marine-rated hardware on safety tethers, harnesses, or halyards, we have found multiple other onboard uses for them: lifting the tender on davits; lifting an outboard from the dinghy to the stern rail; re-directing mooring lines to avoid chafe; setting up boom preventers and other

temporary rigging. We've also found they are much easier to use than fiddling with shackles while leaning over the rail in a lumpy sea. However, using any non-locking carabiner as a halyard shackle is bad; they have a nasty tendency to clip onto the lazy jacks and standing rigging, which leads to much swearing.

All climbing carabiners are tested to 50-percent of rated strength, and most are tested to destruction. With proper care, the aluminum carabiners have good corrosion resistance—just don't expect a long service life if they are continuously in salt water. They should be rinsed with fresh water after use and stored ashore or in a dry box.

The gate action on climbing carabiners is super smooth—climbers, clinging to the smallest of holds, have no use for carabiners that won't clip on easily every time, nor one that unclips too easily.

Lightweight aluminum carabiners—weighing 27 grams versus 136 grams for stainless—also have less potential for chipping gel-coat. In 20 years of using them onboard, I've never had a wire-gate climbing carabiner fail.

Carabiners can be subject to abrasion, if worked long and hard against a burred steel fitting, but they are hardly fragile, and when ease of use and economy are factored

in, wire-gate climbing carabiners are often the better choice. This is not so true of conventional solid-gate carabiners, which are prone to seizing when salt dries in the hinge. However, one locking solid-gate aluminum climbing carabiner, the Kong Tango, has made its way to the marine market and is found on West Marine's newest tethers made to International Sailing Federation (ISAF) specifications. *Practical Sailor* testers gave the tethers top marks (*PS*, May 2009 and September 2011), but tests revealed the Kong Tango has some corrosion susceptibility, so rinsing the clips with fresh water and lubricating them with



Wire gate carabiner



Kong Tango



Bolt hanger

waterproof grease is advised.

Look for carabiners with anodized coatings, which will greatly reduce corrosion. Black Diamond (www.blackdiamondequipment.com) and Omega Pacific (www.omegapac.com) are quality brands, and prices start at about \$7.

CLIMBING SLINGS

We've all seen the pictures: a rock climber working his way up a cliff, with all manner of gear slung over his shoulder and distributed on his harness. The staple of this rack is the runner, a tied or sewn webbing sling measuring 24 to 48 inches in length and rated to handle more than 5,000 pounds of load.

The potential onboard uses for a climbing sling—a strong link requiring little time or effort to place, with minimal bulk and without knots—are many. Some sailing gear makers have begun using slings and “loops” in place of harness and tether shackles to save weight. However, the climbing equivalent is cheaper, and perhaps more versatile. We've used them for rigging blocks, as a forward genoa lead, or as a spinnaker sheet twing for an asymmetrical chute. A sling and carabineer can redirect a dock line for reduced chafe. In combination with carabiners and rescue pulleys, simple tackles can be rigged in moments. They also have served well as dinghy hoisting slings.

The added benefits of using a sling are that there are no knots to deal with, their low-profile stitching makes for easy handling, and many lengths are available, from 4 to 48 inches.

Climbing slings come in nylon, Spectra, and Dyneema. Mammut (www.mammut.ch) and Bluewater Ropes (www.bluewaterropes.com) offer slings priced from \$4-\$14.

PADEYE ALTERNATIVE: BOLT HANGERS

Need a strong and dependable attachment point? If you have an accessible single 3/8-inch bolt on deck, then look no further than the bolt hanger. On the sheer granite faces of Yosemite, thousands of feet above the valley floor, climbers secure these to wedge bolts drilled into the rock and trust them to catch epic falls.

Rated at 5,400 pounds in shear and available in stainless steel, these are

secured by a single 3/8-inch bolt and will accept two carabiners or a shackle up to 3/8-inch. Direct lashing is not recommended for critical applications.

Onboard, we've used these for lashing deck cargo and rigging running gear. They have served us well for attaching swivel blocks to the end of a genoa track, extending the track without drilling holes. They've also allowed us to add blocks at stanchion bases, the mast base, and toerail. No one likes drilling holes in their boat, and these can save a lot of angst, particularly for temporary modifications or testing ideas. You can give a theory a test drive before drilling, sealing, and bedding fittings. But remember that they are only as strong as the bolt and backing plate.

Note that if the available bolt is smaller than 3/8-inch, some strength is sacrificed; however, in most cases, the existing hole can be drilled to accept a 3/8-inch bolt and the penetration re-bedded. Make sure the backing is sufficient.

Caveat: We do not recommend using bolt hangers as anchors for jackline webbing or to provide a tether attachment point. Bolt hangers are intended to swivel to meet the load, which is usually down in rock climbing; a tether anchor can be loaded in any direction.

Acme Climbing (www.acmeclimbing.com) and Metolius (www.metoliusclimbing.com) both offer stainless bolt hangers, which cost about \$2-\$3 each.

RESCUE PULLEYS vs SNATCH BLOCKS

The climber's rescue pulley is a simple pulley comprising a sheave and two side plates that swivel to open but are locked together with a carabiner when in use. It is simple, light, and strong, making it a good fit for odd onboard lifting tasks like raising a dinghy outboard, an engine from a well, or a tender up on deck.

Both Black Diamond and



Climbing gear like rescue pulleys, carabiners, and runners can be quickly rigged as MOB retrieval tackle.

CMI Gear (www.cmi-gear.com) make quality rescue pulleys priced about \$20-\$40—a big savings over a \$100-\$400 snatch block.

MOB TACKLE: PUTTING IT ALL TOGETHER

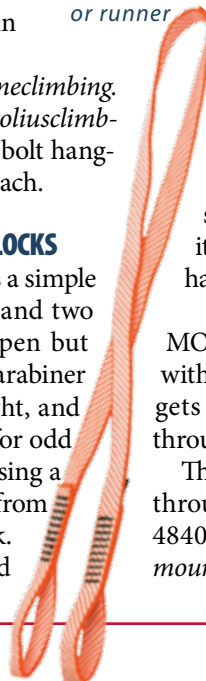
Though every boat is different, testers found that climbing hardware—basically purpose-built rescue equipment—can be put together as a very compact, fast, and simple solution for man-overboard tackle. It's quicker to rig than to describe and is compact enough to live in a cockpit pouch. For example:

- Clip a carabiner to the boom end, using a sling if needed, or a spinnaker halyard. Tie a figure-8 on-a-bight on the end of the halyard and clip on a carabiner; do not use the shackle.
- Tie a figure-8 on-a-bight in the working end of the spinnaker sheet (leave long tail), and clip a wire-gate carabiner to the end. The spinnaker sheet is always available during pick-up, has a dedicated winch, and the turning block is near the cockpit.
- Load the working part of the sheet into a rescue pulley and clip it to the boom-end carabiner (or the halyard).

• Clip the end of the halyard to the MOB—who has been pulled to the boat with a Lifesling—and grind. When he gets hip-high to the deck, pull him through the side or stern gate opening.

The gear described above is available through REI (www.REI.com, 800/426-4840) and Mountain Gear Inc. (www.mountaingear.com, 800/829-2009). ▲

Climber's sling or runner



Practical Sailor™

A Boat Buyer's Recourse

What can you do when a surveyor lets you down?

I recently purchased a “got to have it” sailboat. I have found that the surveyor’s assessment was way off base.

The AC pump passed inspection, but it never turned on again. Then there was the leaking diesel fuel. The previous owner had added see-through, 30-micron filters where the fuel exited the tank because the metal ones at the engine are hard to reach and inspect. I have since learned that this type of filter is sure to leak, as diesel will soften the plastic housing. I am told that the Coast Guard will hammer you if they find them installed.

I would like to register a complaint against the surveyor. Any advice?

Alan Bream
Via email



PS ADVISOR

Our first suggestion would be to discuss your concerns with the surveyor you used. Many of them will bend over backwards to accommodate a client—as we found out in our last look at choosing marine surveyors (PS, September 2005), they regard the relationship with their clients to be one of the most important ingredients in their success.

Secondly, find out whether the surveyor is an accredited or certified member of the National Association of Marine Surveyors (NAMS, 800/822-6267, www.nams-cms.org) or the Society of Accredited Marine Surveyors (SAMS, 800/344-9077, www.marine-survey.org). These groups were formed to create operational and educational standards for the industry’s professionals, and most reputable surveyors are members of one or the other. Each group has its own ethics department you can contact to lodge a complaint.

If your surveyor isn’t interested in discussing the issue with you, and he is not a SAMS or NAMS member, then we recommend filing a complaint with the Better Business Bureau (703/276-0100, www.bbb.org).

In the future, choose your surveyor carefully. It’s worth the effort of researching local prospects to ensure

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PS tester and SAMS-certified surveyor Capt. Frank Lanier inspects a 1903 Friendship sloop.



ON THE HORIZON
BOTTOM PAINT UPDATE
HOLDING TANK ADDITIVES
HANDHELD VHF's
PORTABLE CHAIRS

you pick one who is competent, knowledgeable, and qualified to inspect your particular vessel. (If you’re buying a cruising sailboat, you don’t want a surveyor whose majority experience is with sportfishing boats.)

The first item on your evaluation checklist should be NAMS or SAMS membership. There are non-members who are qualified surveyors, but to play it safe, look for pre-purchase marine surveyors who have current certification with NAMS/SAMS, which offers some insurance that they have the appropriate experience, knowledge base, and peer approval. When you’ve narrowed your list of prospects, check out their sample survey reports and ask for references from previous clients.

As with most services, you tend to get what you pay for, so don’t choose a surveyor just because they offer the lowest bid. And, when possible, be present during the survey, so you can observe the surveyor’s process and ask any questions that may come up. (For more on choosing a surveyor, check out the online version of this article, or “Evaluating Marine Surveyors” in the September 2005 issue.)

Unfortunately, no surveyor can guarantee old equipment. If you want a more detailed look at the electric and mechanical systems, it would be a good idea to have an in-depth inspection done in addition to the survey.

If you don’t want to hire a surveyor every time a boat catches your fancy, a DIY survey will help you thin out the lemons. Our June 2012 article, written by PS contributor Frank Lanier, a SAMS-certified surveyor in Chesapeake, Va. (www.captfklanier.com), explains what to look for when conducting your own pre-purchase survey.



Bottom photo by Frank Lanier