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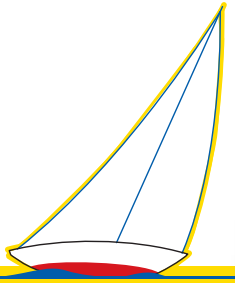

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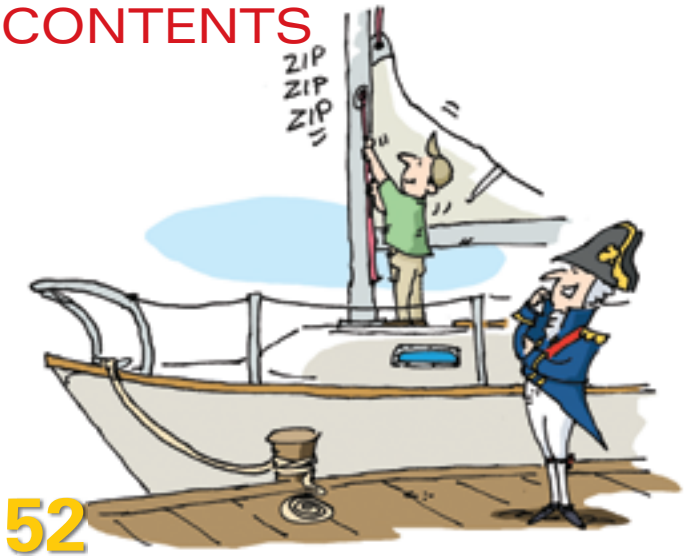

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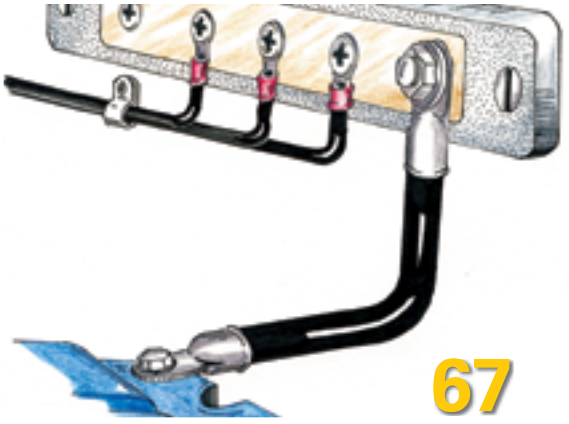
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Just for fun

What's more

About the cover . . .
On a sunny California morning, sailor Tony Silva rows to his Bristol 40 moored in the quiet harbor of Monterey. For more of Charles Scott's marine photography go to <www.seascott photography.com>.

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MMPA

Overcoming fear

The triumph of the do-it-yourselfer

by Karen Larson

The thing that separates the hard-core do-it-yourselfer from other sailors is just this: no fear. We were replacing a vinyl window in our 170 genoa when that bit of blinding insight came to me.

This 170 came with our boat when it was delivered to her first owner in 1976. That first owner didn't hang on to her long. He may have flown this sail a few times. But the second owner never did. So when we bought *Mystic* from him in 1992, he gave us a pristine original sail that had hung many years in his garage.

Since that time, however, we've just about used up that monster genoa. It has been *Mystic*'s only light-air sail. And we see plenty of light air in the summer on Lake Superior. Basically, this 170 has served as our ersatz spinnaker. Jerry's even run some — let's just call them *odd* — experiments by flying it poled out and free (as in not hanking on a hanked-on jib). I think he's even tried it sideways. The sky's the limit for the great innovator when we're not going anywhere fast and he's feeling creative.

So, after nearly 20 years of such abuse from *Mystic*'s third set of owners, the vinyl telltale window of our now very tired 170 cracked and split. It was confusing at first. From the cockpit we couldn't see the crack in the clear vinyl. But how else to explain the fact that *both* telltales were suddenly streaming on one side?

Easier to justify

The no-fear concept comes in when one contemplates cutting a hole in a sail or a boat . . . whether one is making a simple repair or contemplating a major change. It is somehow easier to justify if you're facing a good old sail, a good old bulkhead, or a good old hull.

Would we have undertaken the job on a brand-new sail of high-tech fibers and worth more than *Mystic*'s resale value? Maybe not. At least not without dread and misgivings. Would Jerry have undertaken that little experiment in which he added a reef to the old 150 jib? Nope. He could justify that "learning opportunity" only because the sail was already mostly shot. His modification turned out very well. But you never know.

We hear from readers who get out their Sawzalls and other brutish tools and — with no fear — modify their boats in ways that no sane owner of a brand-new yacht would ever consider. With these acts of bravery, they have gained valuable skills and moved on to attempt even more astonishing feats which probably would have been impossible for them in the past.

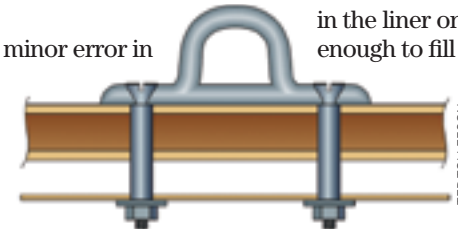
We have reached that point also. Throughout nearly 20 years of sailing, I have maintained that I would never . . . ever . . . build a sail. Our lives depend on these complicated and specialized pieces of cloth. I'd build canvas projects, to be sure. But no sails. Never!

But we keep repairing, modifying, and messing about with our sails and we've been pleased with the results so far. We have learned some things. And somewhere along the way we lost our fear. So I have slipped over the precipice. We ordered a spinnaker kit from Sailrite and, during the break between Christmas and New Year's, we set to work building our very first sail.

Moreover, I have to admit I looked forward to its arrival and enjoyed the project from start to finish. No fear.

Hardware, Pardey party, and

Hardware on soft decks


TED TOLLEFSON

In the March 2010 issue, there is a minor error in the figure accompanying Charles Doane's article "Hardware on soft decks." The text correctly describes using a backing plate to fill the gap between the deck and liner so hardware loads are carried directly by the deck instead of the liner. The figure instead shows compression tubes over the bolts.

While the tubes will prevent the liner from distorting as the nuts are tightened, upward loads on the hardware would bear directly on the liner and not the deck.

I expect it's a pretty rare case where you could insert a solid backing block to fill the gap between liner and deck. Injecting enough filler (e.g., thickened epoxy) through the fastener holes to fill an area larger than the hardware could do it. Even then, a backing plate between the nuts and liner would still be needed.

By the way, I received Charlie Doane's excellent new book, *The Modern Cruising Sailboat*, this past Christmas. It was impossible to put down (and not just because I was stuck in a house full of non-sailing in-laws for the duration).

–Tim Nye, Hamilton, Ontario

Charlie responds

You raise an excellent point regarding the compression-tubes illustration. As you correctly point out, if installed as illustrated the tubes will only transfer loads to the liner. In a correct installation, the tops of the tubes should bear on the underside of the deck which does serve to protect the liner. Such an installation, however, normally doesn't allow for a backing plate or block to be interposed, so the loads carried by the hardware should not be too large.

I like your idea of shooting some thickened epoxy into the void but would note that if the void is large the epoxy will have to be injected in stages. A big slug of epoxy hardening all at once can potentially generate enough heat to warp or damage a thin fiberglass liner (or maybe even the deck itself).

I'm very glad you are enjoying the book! If you find any more errors or dodgy bits, I urge you to share them with me, so they can be fixed in the second edition (God willing). I urge you, too, to drive by my blog at <www.wavetrain.net>, which also appears at <www.boatermouth.com>.

–Charles J. Doane, Portsmouth N.H.

Another solution

In the article on "Hardware on soft decks," I hope the last illustration showing the spacers used on a deck with a liner is a mistake. The way it is shown, the liner would take all the load, not the deck. What I do in this situation is very simple. I drill through the deck and liner from the outside. Put a piece of masking tape over the hole in the liner to protect it. Then, from the inside I use a ¾-inch hole saw to open up the hole in the liner only. I take a stick of hand-mix epoxy putty and mix enough to fill the gap between the liner and the deck to a diameter of about 2 inches. I push it all through the ¾-inch hole and use my finger to smooth it flush with the liner. After it cures, I re-drill the hole from the outside. This epoxy is rock hard and can take the compression load from the bolts very well. I just did the jibsheet tracks on my Etap 26. The factory used screws into the deck and they all pulled out. Now they are through-bolted, all 22 bolts!

–Gary H. Lucas, Hightstown, N.J.

Solutions to solutions

OK, OK, we let this one through. Wrists duly slapped. Actually, the conversation above went back and forth with solutions moving farther away from the problem. Charlie alluded to the tidiest solution in his article. That is, to cut a hole in the liner big enough that you can install a proper backing plate against the underside of the deck, then cover the hole (and the scalp-scraping nuts) with a handsome inspection plate — exactly what the builder should have done in the first place.

–Editors

The Pardeys throw a big party

Larry Pardey celebrated his 70th birthday on October 31, 2009. It also was the Pardeys' 44th wedding anniversary, *Taleisin*'s 26th birthday, and *Seraffyn*'s 41st birthday. (Both boats were launched on Halloween.) The event was held at the Pardeys' home on Kawau Island in New Zealand. Most of the 120 guests arrived in classic boats and several had traveled from Boston.

–George Dow, Marshfield, Mass.

George is one of those who heard the siren call and traveled to New Zealand for the celebration. It was probably impossible to do otherwise: he's the current owner of the Pardey's first boat, Seraffyn.

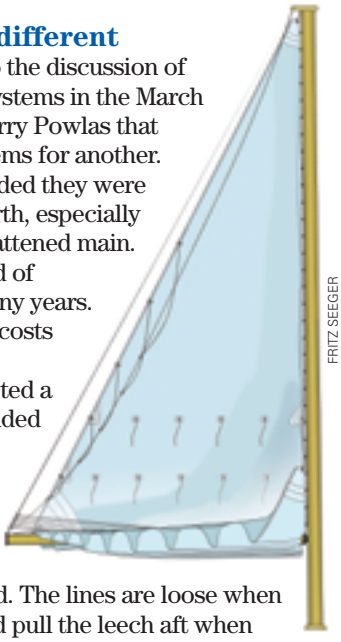
–Editors

what *was* I thinking?

Lazy-jacks — something different

I wanted to add my comments to the discussion of lazy-jacks and mainsail flaking systems in the March 2010 "Mail Buoy." I agree with Jerry Powlas that lazy-jacks trade one set of problems for another. I tried them on my boat and decided they were more trouble than they were worth, especially on a small boat without a fully battened main.

I would like to share a method of mainsail control I've used for many years. It's as effective as lazy-jacks and costs practically nothing to install.



FRITZ SEEGER

North Sails at one time marketed a system called LazyMate that avoided the drawbacks of lazy-jacks and the expense of the Dutchman or StackPack. It consists of lines attached to the leech of the sail and to rings that ride up the topping lift when the sail is raised. The lines are loose when the sail is up and they tighten and pull the leech aft when the sail is lowered, causing the main to flake itself neatly on the boom. (***Note:*** *The illustration shows the sail in the raised and the lowered positions.* ***–Eds.***)

I emulated this system, using the two reef cringles and two additional grommets in the leech. I use shock cords. They stretch tight when the sail is down but go slack as the sail is raised because the topping lift itself goes slack as the sail takes the weight of the boom. I have been using this for many years and love it. It is not as effective on the forward third of the sail as it is for the aft two-thirds because the lines have to be too long, but it does very effectively keep the sail out of the cockpit.

Try this experiment; it will cost you practically nothing. With your mainsail flaked on the boom, tie a light line or shock cord to the lower reef cringle. (Small boats with lighter sails can get away with the shock cord; heavier or stiffer sails will need regular line.) Stretch the line or shock cord tight and tie the other end in a loop around the topping lift. The line should be quite tight but free to slide up. Do the same with the second reef cringle and the third, if you have one. Now raise the main and go for a sail. When you drop the main, the aft part will flake itself neatly on the boom. You might have to experiment with line lengths and tension, but I think you will be pleasantly surprised at the results.

If the trial works well for you, you can add a couple of grommets higher up the leech to extend your control of the sail and replace the tied loops with rings or shackles.

–Henry Rodriguez, Minneapolis, Minn.

Tacking . . . watch

I still have a copy of your very first issue. As a matter of fact, I have all your issues. I once loaned a copy of one issue and didn't get it back. You graciously sent me a replacement. If I lend out an issue now, I have the borrower sign for it.

I read all your articles and smile when a younger person (under 70) makes a great discovery about sailing. I started sailing in about 1942. I have owned dinghies and small day cruisers, and ended up with a C&C Corvette (31 feet). As age started to creep up, we started to look for a trawler. A friend took us out for an afternoon sail on a Nonsuch 26. When the skipper said, "Tacking," I jumped up and asked what could I do. "Watch," was his reply. He turned the wheel and within a few seconds we were sailing on the other tack, and I hadn't spilled my coffee.

We have owned *Xtasea Tu*, our Nonsuch 26 for the last five years. I feel that this boat has extended our sailing life by about 10 years. We call her our "stick trawler." When the wind goes light or starts to pipe up to the point that makes it uncomfortable, we simply let go the halyard, down comes the main into the "cat's cradle," on goes the iron topsail, and we motor along nice and comfortable.

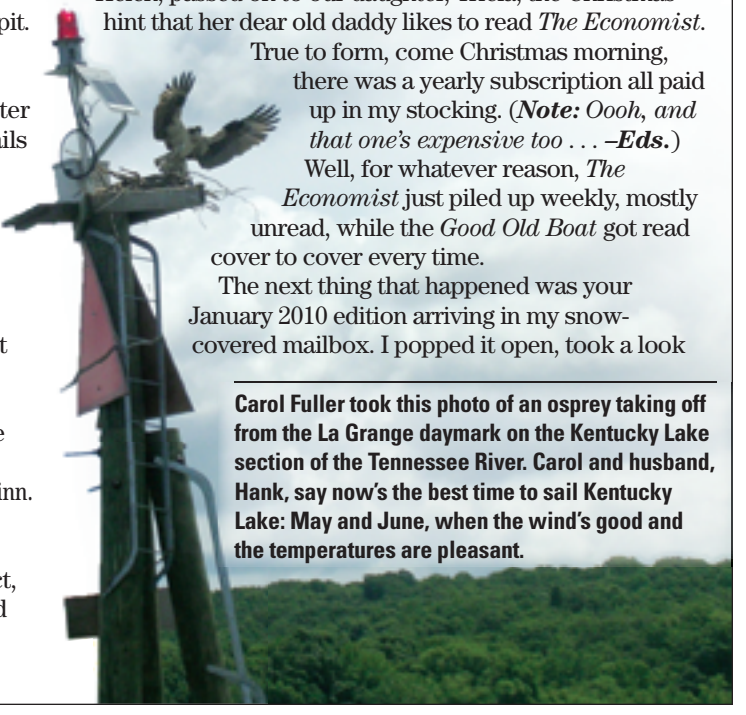
Thank you *Good Old Boat* for all the great articles and for putting a smile on my face.

–Chuck Jones, Trenton, Ontario

What *was* I thinking?

Yes sir, times are tough and we are always looking for ways to cut out unnecessary expenses. So it was with that mindset that I looked at the reminder to renew my *Good Old Boat* subscription and decided this was a qualifying item to go on the chopping block. (***Note:*** *Ohhhh, noooo!* ***–Eds.***) Currently, this magazine is the only one that enters the household simply because all others usually go unread. As an example, a year ago, my wife (first mate and navigator), Helen, passed on to our daughter, Tricia, the Christmas hint that her dear old daddy likes to read *The Economist*. True to form, come Christmas morning, there was a yearly subscription all paid up in my stocking. (***Note:*** *Oooh, and that one's expensive too . . .* ***–Eds.***) Well, for whatever reason, *The Economist* just piled up weekly, mostly unread, while the *Good Old Boat* got read cover to cover every time.

The next thing that happened was your January 2010 edition arriving in my snow-covered mailbox. I popped it open, took a look



Carol Fuller took this photo of an osprey taking off from the La Grange daymark on the Kentucky Lake section of the Tennessee River. Carol and husband, Hank, say now's the best time to sail Kentucky Lake: May and June, when the wind's good and the temperatures are pleasant.

at the index, and quickly realized that there wasn't an article in there that I *wouldn't* read. By the time I finished the first article of interest, "Doing the Twist," I confirmed the error of my ways. In this article was a prime example of why I have subscribed to *Good Old Boat* for many years: short, sweet, and to the point without a lot of extra words that only serve the purpose of filling the author's space quota.

Enclosed please find my renewal check. Please excuse the temporary insanity. Keep up the good work. And by the way, as good as *The Economist* is, it's always full of bad news.

–Jon Kuhl, Camden, Maine

*(**Note:** Phew! That was a close call! Thanks, Jon, we promise to focus on sailboats and ignore the bad news! **–Eds.**)*

Great little mag

Got my first copy of the magazine today. What a great little publication. I have been in and out of journalism and magazines (and old boats) for decades and it gives me enormous pleasure to see that a well-written, well-produced, no-baloney magazine can still survive by catering intelligently to its reader's interests.

–David Porter, Hong Kong

Keeping up with time

Our good old boat is a Pearson 10M, hull #14, which we have owned since mid-1975. Thus we have now owned it almost 35 years. Two hurricanes, two or three Awlgrips of the hull, one Awlgrip of the deck. My motto is that if you spend the entire value of the boat every two to three years on maintenance, you can keep up with time.

–Michael Graham, Dallas, Texas

The joy of ahh

I hope the future of sailing is strong; I believe taking a non-sailor for a ride is the best promotional tool we have. The aaaaahhhhh moment when the motor is shut off and the sails fill is priceless. Cheers.

–Rick Voss, Iowa City, Iowa

The only one worth . . .

Thank you. Now, with my back-issue CDs, I have every issue of the only magazine worth keeping the back issues of. (***Note:** Ken took advantage of our Good Old Holiday Deal with a two-year renewal. **–Eds.***) Keep up the great work of responding to my project list. I am currently installing a diesel engine in our boat and each time I reach a critical decision, you have provided me the answer in an article or two. In the future, if you need an idea for an article, just contact me and I'll be glad to share my project list. Thanks.

–Ken Parsons, Mansfield, Mass.

Send questions and comments to *Good Old Boat,*
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or by email to jerry@goodoldboat.com.

Pictured is *Lady Grace*'s last sail of the fall amid the beautiful colors on Lake Pleasant in New London, New Hampshire. Thanks to Dan Snyder for the great photo of his Rhodes 22. Send your sailboat photos to jstearns@goodoldboat.com and we'll post them on our website. If we publish yours here, we'll send you a good old T-shirt or cap.

Laguna 30

A solid, spacious cruiser with good performance

by Tom Wells

Serendipity II, a Laguna 30, owned by Rich and Brandi Wells, shows the cut and color of her jib as she makes smart headway in light air.

A young and growing family does not fit well into a 26-foot trailerable sailboat. That was the situation facing Rich and Brandi Wells (no relation to the author), who found a ready solution when they purchased a Laguna 30. They keep their *Serendipity II* at the Perry Yacht Club on Lake Perry, a sailing hotspot near Topeka, Kansas.

Rich and Brandi hosted a test sail for this review last August, on a day with clear skies and pleasant temperatures. Light winds were in the offing, but there was enough breeze at times to put the boat through her paces.

History and design

Bill Downing founded Laguna Yachts in Anaheim, California, in 1973 and began producing the Windrose 24. The boat proved so popular that the company quickly moved to a larger facility. In 1979, Laguna Yachts built a new facility in nearby Stanton. By this time, the Windrose line had grown to include the 18, 20, and 22, and the company had also acquired Coastal Recreation, the manufacturer of the popular Aquarius and Balboa lines of trailersailers. In 1980, the names of all Windrose boats were changed to Laguna. Production continued under the original ownership until 1986, when the company was sold. The new owners lasted just a year; in 1987 the firm was again sold and ceased to do business as Laguna Yachts. The company was moved to Chanute, Kansas, where it operated as Capital Yachts until it closed in 1995. The only Laguna model retained and produced was the Laguna 26, renamed the Classic 26.

The Laguna 30 was introduced in 1983 and production ended in 1987. It was designed by W. Shad Turner, as were all of the Windrose and Laguna boats produced by the company. His other design work includes many of the popular Santana boats built by W.D. Schock, showing that he favored speed as a primary design goal. The lines he drew for the Laguna 30 were intended to give the boat a good turn of speed while preserving the features needed for cruising. The wide cabin trunk and the shoal keel would seem to be compromises to Shad Turner's usual preferences, but he designed the keel with an airfoil shape and the boat proved to have very satisfactory performance. That's because the displacement/LWL ratio of 177 is on the low side for a cruising boat and the sail area/displacement ratio of 16.4 is adequate.

Construction

The hull and deck of the Laguna 30 are solid hand-layup fiberglass. Bill

The T-shaped cockpit makes it easier to move around the pedestal and enables the helmsman to stand outboard of the wheel. The downside: seats not long enough to lie down on.

Generous beam makes for a spacious saloon that will seat a crowd for meals, at left. The U-shaped galley is tight, but that makes it all the easier and safer when cooking under way, at right.

Downing insisted on hand layup and refused to use cheaper construction methods, such as the chopper gun. Hull areas that might flex under load were reinforced with Coremat and an inner fiberglass layer. Flat areas of the deck were reinforced with marine plywood and a second fiberglass layer to produce a very solid, stiff deck structure.

The keel shell was formed of fiberglass in the mold as an integral part of the hull. After the fiberglass cured, the ballast was placed inside it and encapsulated with more fiberglass on top. The result is a very shallow bilge. With this type of construction, there is no joint at the keel root to separate and leak, and there are no keel bolts to maintain. However, hard contact with a rock might be a bigger problem than with a bolted-on keel. Bill Downing states that no major keel issues were reported to Laguna Yachts.

Structural stiffness was enhanced with an interior liner, laid up in solid fiberglass similar to the hull. Flat liner areas were reinforced in the mold with Coremat and a second layup, rendering the whole liner assembly very resistant to twist or deflection. The liner was then tabbed to the hull all around the sheerline and in any location that could be reached. The liner and hull were clamped together while the resin cured. Bulkheads were bolted directly to the interior liner and so became a part of the structural envelope. The result is a very strong overall system, but it also means that access to the inside of the hull itself is nearly impossible in most locations. This could be a problem if the boat is holed below the waterline, so it's a good thing the hull is so soundly constructed.

To form the hull-to-deck joint, a down-turned flange around the perimeter of the deck closed over an in-turned flange on the hull, much like a shoebox cover. The joint was heavily fiberglassed on the inside, through-bolted horizontally, and finished on the outside with a rubrail.

The Laguna 30 has a single-spreader masthead rig with upper shrouds and dual lower shrouds set well outboard. The mast is deck-stepped over an interior compression post incorporated into the forward saloon bulkhead.

On deck

The Laguna 30 has a beam of 10 feet 8 inches, and the cabin trunk extends for much of that width to provide the ample space below. As a result, the sidedecks are narrow. They are of adequate width, though, except at the chainplates, where crew going forward must either squeeze past the rigging or step inboard and onto the cabin trunk to pass. A molded fiberglass toerail extends from bow to stern. It's not high enough to be a true bulwark but it does provide for safe footing along the sidedeck. A robust grabrail running the full length of the cabin trunk adds another measure of safety.

The cabintop is broad and flat and finished with an aggressive non-skid texture. The boats could be ordered with an optional opening hatch over the saloon but otherwise there is no provision for cabintop ventilation. The full-length grabrails also function as cabintop toerails, so the work area around the mast is ample and secure.

The companionway opening in the aft bulkhead is of normal width, but the cabintop is cut away on both sides outboard of the companionway. When the extremely wide sliding hatch is pushed forward, the clear opening overhead is huge. This is not a good feature in the event of a boarding sea; anyone sailing a Laguna 30 in brisk conditions should have a "hatch closed" rule. Also, with no sea hood covering the forward end of the hatch, mounting a functional dodger to help protect the area will be difficult. Unless the boat is intended for frequent use offshore, this is not a major drawback.

The foredeck incorporates an anchor locker. Bow cleats are provided, but there are no chocks. This makes protecting docklines and anchor rodes from chafe especially important, so the addition of chocks would be a valuable improvement to the foredeck area.

Dual lifelines supported through stainless-steel stanchions run the length of the boat from the bow pulpit to a stainless-steel stern pulpit. A folding swim ladder is standard and a gap in the stern pulpit provides access to the ladder when it is in the down position.

Seating in the cockpit is more than adequate. Port and starboard bench seats are 5 feet long, and the T-configuration provides good access and passage between the helm and the areas forward. Large cubbies in the coaming to port and starboard provide handy stowage for winch handles and other items. The starboard bench has a hinged cover that gives access to a shallow locker over an interior quarter berth. The port bench has a similar cover over a full-depth locker that provides access to the port side of the engine and to the battery bank.

The Laguna 30 even has a nav station, albeit on the small side. Drawers and chart stowage are always appreciated, at left. With the insert cushion in place, the V-berth becomes a roomy pad, at right.

The traveler is mounted on a track on the bridge deck aft of the companionway. While this location is not ideal for access from the helm, it is somewhat better than a cabintop traveler; with the mainsheet taken aft, its cam cleat can at least be tripped from behind the wheel.

The primary jibsheet winches are located so the helmsman might be able to control the jib. Self-tailing winches were an option on the boat and would indeed be a necessity for singlehanded control from the helm. *Serendipity II* does not have self-tailing winches.

Down below

One of the more enticing features of the Laguna 30 is its well-designed and spacious interior. It has standing headroom of 6 feet 3 inches. The sole at the base of the companionway ladder is teak. Forward of the galley, the non-skid liner surface provides sure footing, and two small hatches in the forward end of the saloon sole provide access to the shallow bilge and the bilge pump. A teak parquet sole was optional.

The U-shaped galley lies to port of the companionway. It features a two-burner pressurized alcohol stove with oven, dual stainless-steel sinks in a large countertop forward of the stove, and an icebox aft of the stove. Counter space is considerable for a 30-foot boat and, when the stove is not in use, a cutting board that covers the burners adds to the available space. A slotted cover can be placed over one of the sinks.

On the starboard side, opposite the galley, a forward-facing seat serves the nav station, which includes a sizable chart table and some storage. A single quarter berth extends aft from the nav station beneath the cockpit seating. A panel on the inboard side of the quarter berth is removable to provide access to the side of the engine.

The saloon is laid out attractively. A generous U-shaped settee to port wraps around a functional table that drops into place to form a double berth when needed. This arrangement provides easy access all around, when compared with the more standard L-shaped settee and fold-down table found in many boats. A straight settee to starboard completes the seating arrangements and serves as a single berth as well. The width of the cabin trunk and good use of the 10-foot 8-inch beam makes this a very spacious layout. Teak ceiling (a nautical term for any interior planking, generally to the hull sides) enhances insulating qualities as well as appearance.

Laguna 30

Designer: W. Shad Turner
LOA: 30 feet 0 inches
LWL: 28 feet 0 inches
Beam: 10 feet 8 inches
Draft: 4 feet 0 inches
Displacement: 8,700 pounds
Ballast: 2,800 pounds
Sail area: 433 square feet
SA/disp. ratio: 16.4
Disp./LWL ratio: 177
Fuel: 16 gallons
Water: 31 gallons
Holding: 25 gallons

The head compartment is small at just over 3 feet in width but, with the sink located on an angled counter against the forward bulkhead, it's functional. Locker space is provided above the counter and outboard of the marine toilet.

The V-berth forward, at just over 6 feet in length, creates berths for two, provided one of them is shorter than the other. Teak fiddles protect the edge of a narrow shelf molded into the liner along each side of the berth.

One of the limitations of this design is ventilation belowdecks. On a standard boat, none of the ports open except the one in the head. *Serendipity II* also has an opening port forward on the starboard side, but this was likely ordered from the builder as an upgrade. There are no cowl vents or Dorade boxes on the cabintop. While the huge companionway hatch allows ample air below when it's open, sailing in any kind of sea will dictate that it be closed. Rich has installed a solar-powered vent in the forward hatch to improve airflow.

Propulsion

Serendipity II is equipped with a 15-hp Ducati diesel engine. Laguna Yachts literature lists the Universal 18 as the standard engine for the boat, but other powerplants were obviously installed in some early models. Late models were supplied with a Yanmar 2GM engine.

A nice feature on the Ducati aboard *Serendipity II* is an integral oil-change pump. Key maintenance points, such as the seawater-pump impeller plate, are accessible through a front panel behind the companionway ladder. Side access is more restricted, with the port side reached from within the seat locker. The starboard side can be reached through the removable panel in the quarter berth.

The boat moved smartly under power. The keel configuration and some prop-induced torque mean that constant attention to the helm is required when powering forward. Backing under power induces some port prop walk, but judicious use of the throttle and shift allows control once steerageway is gained.

Under sail

We conducted the test sail in fairly light conditions, but there was enough breeze to judge the general sailing qualities of the boat. Bruce Liese, the previous owner of the boat, joined Rich and Brandi as crew. A light-air genoa helped and, although the breeze was never more than 7 knots, the boat was able to hit almost 3 knots on reaches. Both Rich and Bruce report that the boat really comes into her own when the wind pipes up and, given the stiff feel and the fairly long waterline length, that is not surprising.

> **"The helm was balanced and had a firm feel and good feedback, even through the standard wheel steering."**

The Laguna 30 was responsive and tacked well even in the light air. The helm was balanced and had a firm feel and good feedback, even through the standard wheel steering.

With the wide footprint of the shrouds, only a rail-mounted genoa track is provided, limiting pointing ability somewhat. Adding an inboard track might improve sheeting angles when setting a small non-overlapping jib, but the improvement would not justify the cost.

Mainsail trim is easily accomplished at the bridge-deck-mounted traveler. The mainsheet exits the block at the traveler car through a cam cleat and the upward release angle makes it possible to lead the sheet aft for the helmsman to control it if necessary. However, adjusting the traveler requires the assistance of crew.

It is difficult to assess sailing qualities without a fresh breeze, but light-air handling and responsiveness mark the Laguna 30 as a good general performer. With her base PHRF rating of 180, she should be quite competitive with 30-foot boats of similar vintage. For comparison, the original Catalina 30 with standard rig carries the same 180 rating, while the C&C 30 rates 174.

Pricing and availability

With only around 40 hulls produced, availability may be limited at times. In the late summer of 2009, four boats were listed for sale: a 1984 model in California, at $22,500; a 1986 model in New York, at $24,500; a 1986 model in Michigan, at $26,500; and a 1986 model in Mississippi, at $20,000, the advertisement for which noted that the boat is "in need of TLC," which is the likely reason for the lower asking price.

Conclusion

Nothing is bulletproof but, in the world of classic fiberglass boats, the Laguna 30 comes close. It was well designed and robustly constructed. Its simple layout makes sailing it a snap even for less experienced crew. The boat is not intended to be a bluewater passagemaker, but it is capable enough that one sailed from the West Coast to Hawaii. Compromises, such as the narrow sidedecks and below-average ventilation, can be taken in stride given the overall construction quality.

Anyone considering a Laguna 30 might factor in ventilation improvements and self-tailing winches as desirable projects but, in any case, the Laguna 30 can be considered a good value as a spacious, well-built coastal cruiser with good performance.

The head features a marine toilet with large holding tank, a small sink, and a handheld shower. On the standard boat, the only opening portlight is here, at left. The starboard-side quarter berth is comfortably wide, below.

Tom Wells and his wife, Sandy, own and sail a 1979 Tartan 37, Higher Porpoise. *They have been sailing together since the 1970s and look forward to cruising upon retirement. Tom's musical contributions at the Annapolis boat show have earned him the title of Troubadour with* Good Old Boat.

All about keels

PART TWO

Of foils, fins, ballast, and bulbs

by Robert Perry

In the previous issue, in "All About Keels; Part 1," Bob Perry discussed the terminology and the compromises inherent in keel design. In this issue, he finishes up the discussion with a look at keel shapes.

Thanks to the development of airplane wings and the airfoil shapes that make them work efficiently, sailboat keels are now designed to work like wings, making them more efficient too. When I give talks to groups, one of the most frequently asked questions is, "If keels work like wings, how do they work when both sides of the keel are the same shape?" Leeway is the answer. Without leeway the keel would have no "angle of attack." It's the angle of attack that creates a high-pressure side of the keel and a low-pressure side of the keel. That's where the lift comes from that you need to pull the boat to weather and overcome the lateral force of the sail plan trying to push the boat to leeward. The keel has to provide lift on both tacks, so you need a symmetrical foil.

But lift comes at a price: drag. Without drag there can be no lift. To optimize the lift and minimize the drag, you must choose the correct foil. If you want to investigate the properties of different foil shapes, I recommend *The Theory of Wing Sections* by Abbott and Doenhoff. It's not easy to read but all the data on the individual foil sections developed by the National Advisory Committee for Aeronautics (NACA), including lift/drag curves, is laid out.

I use NACA 64-A010 or some minor variant of that parent foil. Keels operate in a very wide range of conditions, so it's difficult to pick one foil to work best in all conditions. Upwind we need lift. Downwind we don't need lift so the ugly word "compromise" creeps into the equation again. The foil I like has its maximum thickness at 40 percent of the chord length from the leading edge.

The problem with NACA 64-A010 is that it is narrow in the last 20 percent of the chord so it's hard to lay up in a hull mold. I often modify 64-A010 by increasing the thickness in that last 25 percent of the foil. Or I use what is called a "high area coefficient" foil. This foil is similar to the NACA 64-A010 for the first 40 percent but then it stays wide until the last 25 percent of the chord and tucks in from there without any hollow. This foil has more keel volume, helps to get the vertical center of gravity (VCG) low, and is easier to laminate.

Thickness ratio

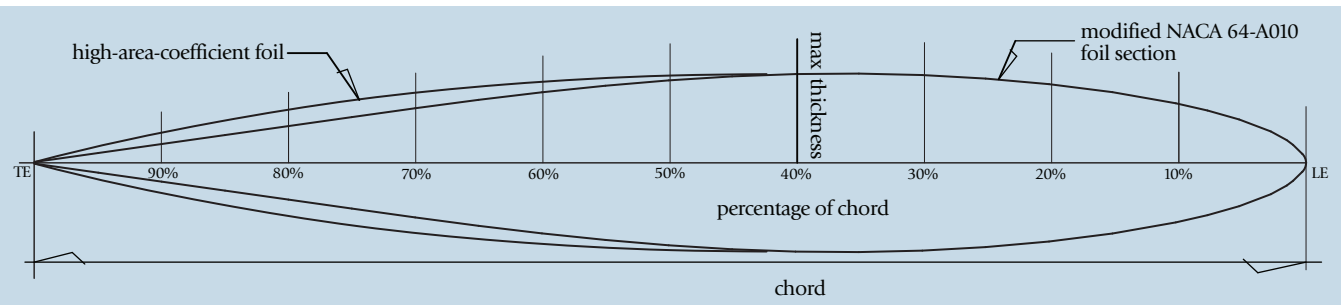
If you take the chord length and divide it by the maximum thickness of the foil, you get the "thickness ratio."
The optimal thickness ratio will depend on a number of factors. I will flex the 64-A010 foil to go between 9 percent thickness ratios for longer-chord keels and up to 16 percent for short-chord keels. If you have a long-span, high-aspect-ratio fin with a big bulb on the tip, you may need a higher thickness ratio just to get the internal structure into the fin to keep the fin from flexing and/or breaking. Sounds like "compromise" again, doesn't it? Higher thickness ratios can also provide more lift in a short-chord keel that does not have the chord length to generate enough lift with a thin foil. Some exotic raceboats have twin daggerboard foils that are asymmetrical because you will only have one board down at a time and the boards can be specifically designed for one tack.

For the typical cruising good old boat, the key factors in having a good keel shape, assuming that major changes to the keel are financially impractical, are: overall symmetry, meaning that the keel must be the same shape on both sides, the leading edge must be parabolic and not too pointy or blunt, and the trailing edge should not be a wide flat or wide radius.

Leading and trailing edges

Each foil family has its prescribed leading-edge radius. For NACA 64-A010 with an 8-foot chord, the leading edge radius is 0.687 percent of the chord or 0.66 inches.

For the same foil, the trailing edge radius is 0.023 percent of the chord or 0.022 inches. That is so small that it is impossible to achieve on any molded keel without hand fairing. For that reason, we clip the trailing edge off to a thin flat with sharp edges. How thin? I'd say use the prescribed radius as a guide and do what you can to make the trailing edge as thin as possible. Often, designers choose to make this flat at a 40- or 45-degree angle to the centerline of the chord. The idea is that, assuming absolute symmetry is impossible,



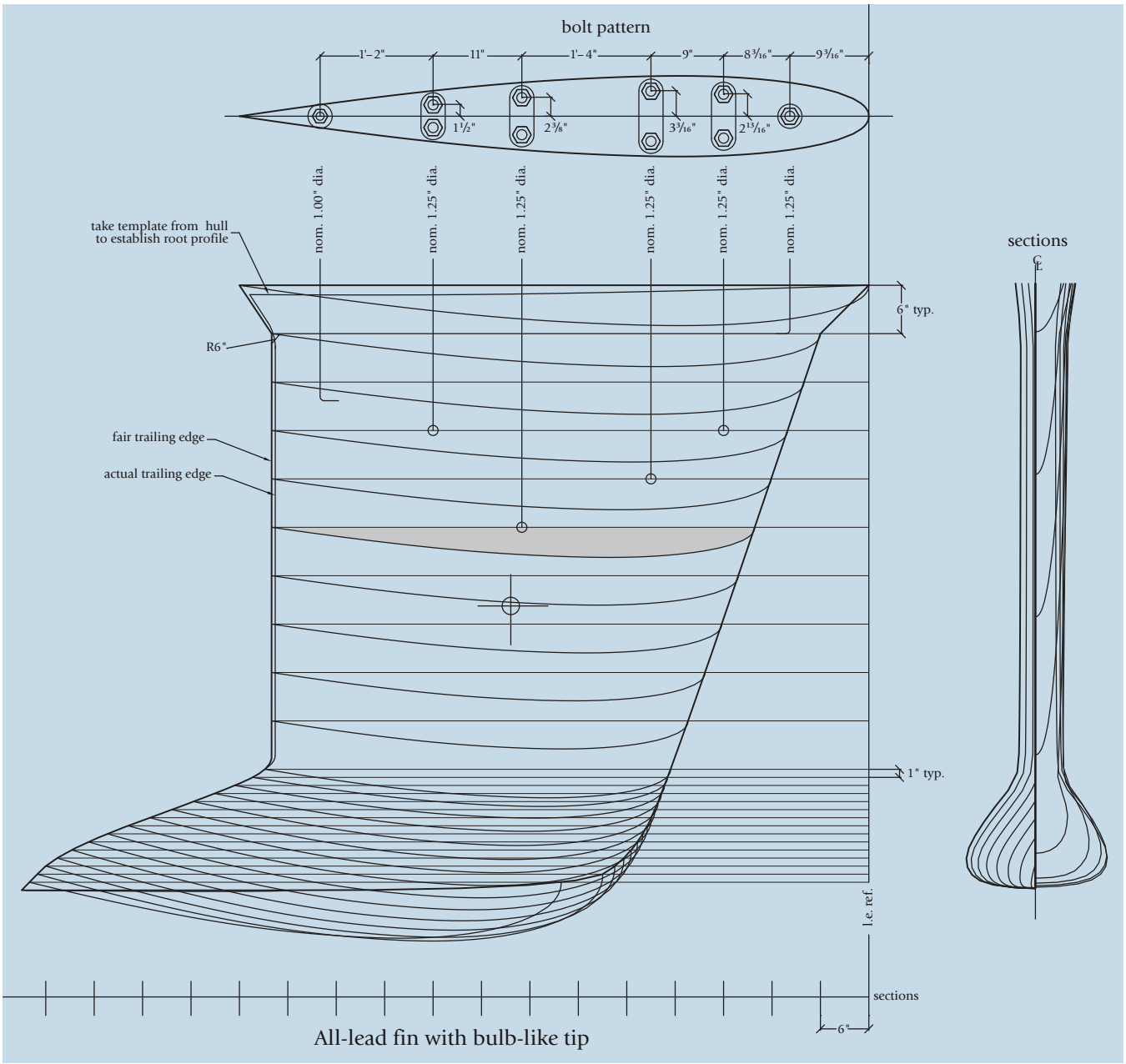
chamfering the trailing edge allows the designer to control the direction of flow over the trailing edge in order to avoid the "collapsing vortex phenomenon."

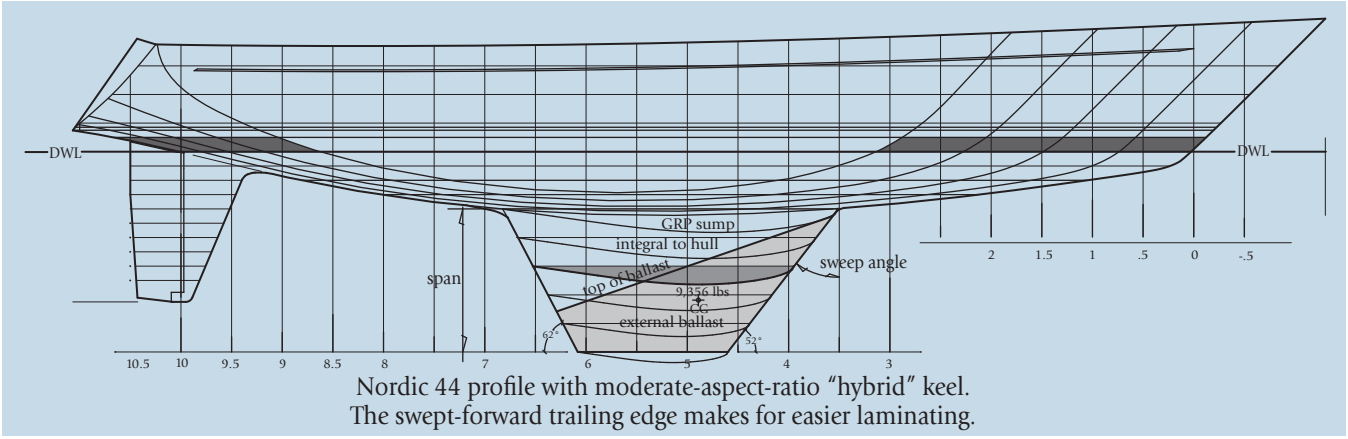
Maybe you have experienced this phenomenon yourself. Some boats, at specific speeds, develop a low-frequency vibration that can shake the entire boat. Above and below that speed everything is normal, but in a narrow and consistent speed range the boat will shake dramatically. That is due to a collapsing vortex on the keel. You can also experience the same effect to a lesser degree on the rudder, sometimes called "rudder flutter." This is a function of rudder asymmetry. Fair your appendages for symmetry and don't let trailing edges fair themselves into 50-cent-piece radiuses. If you are in doubt, a flat trailing edge with sharp edges is probably always better than a large radius.

Numbers to ponder

Any in-depth discussion of foils must include Reynolds numbers. These numbers are used to describe how foils work at various chord lengths over a range of speeds and are essential if the designer wants to use test data from a small-scale tank-test model.

Essentially, Reynolds numbers are used to determine where laminar (smooth) flow turns to turbulent flow over a given chord length at a given speed. In the yacht club bar after the race, you can bring almost any discussion of keels and foils to a grinding halt if you just ask innocently, "What Reynolds numbers are you using?" If you want to pursue a study of Reynolds numbers I would suggest Steve Killing's excellent book, *Yacht Design Explained*, or Frank Bethwaite's *High Performance Sailing*.





Nordic 44 profile with moderate-aspect-ratio "hybrid" keel. The swept-forward trailing edge makes for easier laminating.

Draft and ballast arrangement

Plenty of full-keel designs had external ballast, especially when they were built in wood. The ballast slug was just cut into the keel timbers and bolted on. GRP molding made internal ballast more practical for the builder.

External ballast gives the designer far more freedom in shape selection. External-ballast keels are cast in molds. The cast keel eliminates the pragmatic issues that come with having to hand-laminate inside the foil. Now the big decisions can be reduced to how much draft you can live with, how you are going to bolt the keel on, and how you are going to keep it bolted on.

Obviously, your choice of draft will be the biggest influence on your overall keel geometry. You may want a fin-and-bulb combo to get a low vertical center of gravity (VCG) and maximum righting moment from the keel. But if you have a 40-footer with only 5 feet of draft, the vertical height of the bulb will cut into your precious keel span and further reduce what already is, in all probability, a low-aspect-ratio fin. In that case, another compromise — stability over lift — is called for.

There is no substitute for draft when it comes to keel efficiency. You can put wings on the bottom of the fin in an attempt to increase the "apparent aspect ratio" of the fin. This can work but the wings also need to be of a reasonably high aspect ratio if they are to work efficiently, and high-aspect-ratio wings can be vulnerable to damage on a cruising boat. I see some models with fins and bulbs with stubby little wings coming off the bulb. In that case, I often wonder if the benefit of the wings is not just added low volume and the lowering of the VCG.

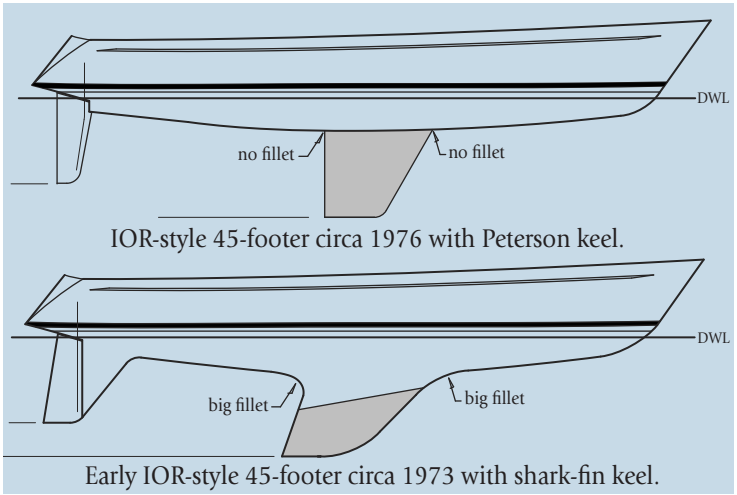
Wings on bulbs can reduce drag, as seen on the last crop of America's Cup boats. But if you look at the photos of those keels, you'll notice that the wings are very long and narrow. The span of these wings is limited by the old AC rule requiring that the beam of the wings not exceed the overall beam of the hull.

There are boats that have what I would call a "hybrid keel," where a deep GRP sump is molded as part of the hull and the lead bolted to the bottom of this deep sump. My own Nordic and Valiant series boats are examples of this approach. The advantage to this type of keel is that you get a deep bilge sump combined with outside ballast that has a very low VCG.

It's nice to have lead on the bottom of your keel. Lead is a good "bumper" — you can put a fist-sized dent in your lead ballast and not worry about interrupting your hull integrity. This is, of course, providing you have not suffered hull structural damage due to the ballast being shoved up into the hull at the trailing edge and the hull torn down at the leading edge at impact. Proper design and construction can help avoid this situation, but obviously there is a point where a major impact is going to damage the boat regardless of keel design or structural details.

Evolution of the fin

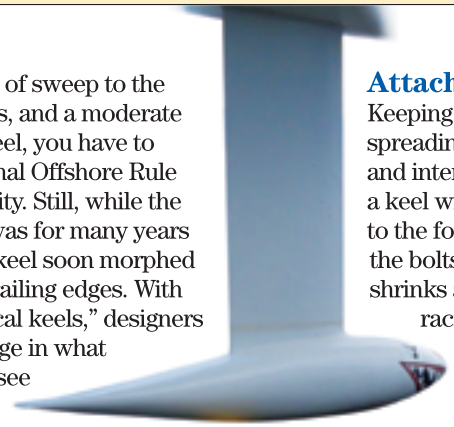
We have gone through a wide variety of external keel types over the years. My friend Kim tells me the fin keel was invented by Israel Garrard of Frontenac, Michigan, in 1881. In the 1970s, the "shark-fin" keel profile was popular and can be seen in many S&S, Frers, and C&C designs. The highly swept shark-fin keel just looked fast. And it was, relative to the keels that preceded it. The shark fin was usually well faired into the canoe body with large-radius tucks and long, graceful fillets at the ends. The transition from hull to fin was gradual. But these generous fillets and tucks cut into the planform of the fin and, in many cases, while reducing drag, also worked to reduce the effective span of the fin and further reduce the apparent aspect ratio.



IOR-style 45-footer circa 1976 with Peterson keel.

Early IOR-style 45-footer circa 1973 with shark-fin keel.

In about 1973, Doug Peterson came along with what we started to call the "Peterson keel." This was a simple trapezoidal fin with



a vertical trailing edge, about 40 degrees of sweep to the leading edge, no filleting or tuck radiuses, and a moderate aspect ratio. To evaluate the Peterson keel, you have to include how the then-current International Offshore Rule (IOR) measured and handicapped stability. Still, while the IOR came and went, the Peterson keel was for many years the dominant keel shape. The Peterson keel soon morphed into keels that had curved leading and trailing edges. With these, which we generally called "elliptical keels," designers were looking for a lift-over-drag advantage in what was called "parabolic loading." You can see these keels on the last group of boats designed to the IOR.

When the International Measurement System (IMS) rule took over, draft and stability were penalized less than under the IOR. Draft and keel spans began to grow under the influence of the new rule. Keels got longer in span and shorter in chord while starting to sprout bulbs and bulbish "things" on their tips.

Bulbs can be pure torpedoes just stuck on a straight fin with very little filleting or fairing into the fin. Or, like many of the J/Boats and some of the boats from the Bruce Farr office, the bulbs can be blended or faired into the fin so they seem to naturally grow out of the fin. Today, the dominant racing keel is the high-aspect-ratio fin with a vertical leading edge and a long bulb. With high aspect ratio, you need less leading-edge sweep. Boats with low-aspect-ratio fins do better with considerable sweep.

A bulb can be a T-bulb, with the fin coming down in the center of the bulb and the bulb protruding from either end of the fin. Or you can have an L-bulb with the bulb sticking out aft from the trailing edge of the keel and the leading edge of the fin being the leading edge of the bulb. It depends on what you're trying to do with the fin for helm balance and your LCG (longitudinal center of gravity) requirements. The VCG of this type of keel is very low and aided in many cases by fins that are not lead but steel, iron, or lightweight exotic composites. The idea is to get all the ballast in the bulb to maximize stability and sail-carrying power. The overall VCG of the modern raceboat is dramatically lower than in your typical good old boat. Stability is good.

This is great. Now we have a 40-footer that draws 8.5 feet with a tiny root chord on a non-tapered fin with a big bulb and the lowest possible VCG. We can even cant the keel from side to side to really increase the righting moment of the ballast. All that's left is to figure out how to attach the keel fin to the hull.

Attaching the fin keel

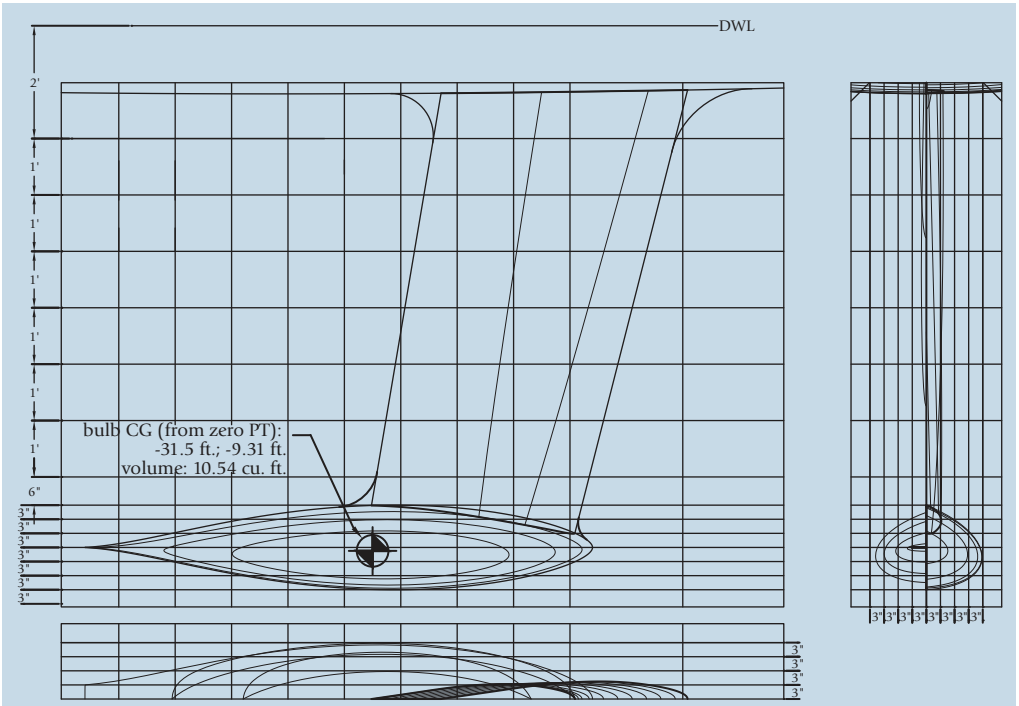
Keeping a keel attached to the hull is all about spreading out the loads of the keel over the hull and internal structure. This is easy when you have a keel with a long root chord and enough thickness to the foil (that comes with a long chord) to spread the bolts apart off centerline. But when the chord shrinks and the thickness shrinks, as with modern racing keels, the keel bolts end up being close together fore-and-aft and close to the centerline athwartships. This loads up a small portion of the hull. This does not work — especially if you intend to cruise the boat and expect to bump the bottom from time to time.

I don't have room here to go into all the ways of attaching fins to hulls, and it's not really relevant to the typical cruising sailboat. The keel on my friend's new rocket, *Giuletta*, above, illustrates this challenge. It hasn't fallen off yet.

Keel shape can reflect the overall design technology that was available at the time your boat was designed. A high-aspect-ratio fin and bulb is not going to do much good on a 36-foot, 20,000 pound, bluff bowed, gaff ketch.

As I fished this morning, I watched two bald eagles soaring above the ridge behind the office. I thought about this article. I marveled at the eagle's ability to vary the planform, foil shape, and tip treatment of its wings to suit its whims and needs. That's very good design. With a fixed keel, we don't have that luxury. Keel design remains a combination of science, pragmatism, and personal choice.

Robert Perry has been designing yachts, mostly of the sailing variety, for nigh on four decades. Because many of the boats built to his designs are aging with grace, he has a very active consulting business with owners of good old boats.



Modern steel-weldment fin with lead bulb

Small boat, large experience

A tall-ship captain sails a petite Dana 24

by Karen Larson

Minstrel is the perfect name for Karen Sullivan's Dana 24. Karen has done a fair amount of wandering from coast to coast and beyond and *always* with a guitar in tow. Her musical talent and the richness of her experiences make *Minstrel* the boat where the sailors gather, even though hers is typically the smallest vessel in the anchorage or at the dock. No matter. She's used to being at the epicenter . . . so long as the crowd that gathers doesn't sink her boat.

"The maximum number of bodies *Minstrel* can handle safely is nine well-fed adults," Karen says. "One time, on the north end of Vancouver Island, an impromptu party started when a bunch of friends showed up, and pretty soon there was a line on the dock waiting to come aboard. I looked at the bow pointing saucily skyward and the exhaust under water. I had to ask a few people partying with us to stay on the dock, and they did."

Karen grew up on the East Coast and experienced her bluewater epiphany as a child on the beach at Cape Cod. The horizon stretched forever, she realized. She asked a nearby adult if there was any land out there beyond what she could see. The answer was, "No," and an 11-year-old with salt in her hair realized she could get on a boat and sail over that horizon.

Brave moves

Karen Sullivan — a very remarkable woman — has never been short on courage. She studied biology and became the teacher of classrooms full of junior-high and high-school biology students, a *courageous* act if ever there was one. But there was more to come.

In her early 20s, she followed up her childhood dreams with the purchase of a Folkboat named *Yeh Ming Tzu*, "the pearl that shines at night." The name was strongly influenced by Miles and Beryl Smeeton's *Tzu Hang*. "I made all the mistakes with that boat," she says. That's not to say that she now knows it all, but the learning curve was steeper then.

"I needed to learn more," she recalls. She searched for information and read books. She was inspired by a lecture by Irving Johnson. That lecture, delivered at the Goodspeed Opera House on the Connecticut River, has been produced as a DVD and is widely circulated and appreciated by sailors. Karen

was also transfixed by the books of Eric and Susan Hiscock (*Wandering Under Sail*), John Guzzwell (*Trekka Round the World*), and Donald Holm (*The Circumnavigators*). "*The Circumnavigators* was a seminal book for me," Karen remembers. But books are no substitute for the real thing.

When Karen was in her mid-20s, her sister died tragically. This loss was followed by her mother's grief and suicide two years later. A few other close family members also died during that time. Needing to reassess, Karen stepped off the teaching treadmill; she took a year off and signed on as crew on *Taormina*, an 80-foot ketch in St. Thomas, U.S. Virgin Islands.

"Joe Garrison, the captain, became a good friend," Karen says. "I learned a lot from him: celestial navigation, watchkeeping Navy style, and shipboard routines."

"Navigatrix" to "Roatan Rose"

They crossed the Caribbean and headquartered in Roatan, Honduras. They sailed to Belize, down the barrier reef, and among the Bay Islands of Honduras offering charters and dive trips.

At the end of a 10-day passage, as the boat was approaching Swan Island, Karen recalls, "Joe turned to me and said, 'This landfall is yours. I won't be checking your navigation.' I had a couple of nicknames onboard — one was Grace, because I kept sitting in wet varnish, and the other was Navigatrix."

It was time to earn that second appellation. Karen went below and checked, rechecked, and checked her figures once more. When she appeared topside at about 3 miles out to say, hesitatingly, that Swan Island should appear at any moment, they all looked ahead and noticed a small smudge just where she was pointing. The cry of "Land ho!" had never sounded so sweet.

The year was 1978. Caribbean Sailing Yachts Corporation (CSY) was just opening a new charter operation in Honduras. Yachties were a rare sight there. This may have been the first time that Karen found herself on the leading edge of a trend. It would not be the last.

While there, she volunteered to offer a daily weather advisory on the radio for fishermen and other boaters in the area. She reported it like any newscaster might, until CSY's Tim Short began to complain that her voice wasn't sexy enough.

She remembers Tim, well into his cups one evening, slurring, "Make your voice *drip*." She did, and the next day, "Roatan Rose" was born. Karen, who had been doing the broadcasts anonymously, suddenly became the voice behind a living legend. Roatan Rose received fan mail. But most of the boaters did not know the real identity of the weather woman.

Captain Karen

The next year, she was just another biology teacher once more. But she had the sailing bug. "I got my captain's license in 1980," she says, "and answered the call of the sea."

Her biology credentials gave her an edge and she became the second woman in New England to skipper a large vessel. Her ship was a 66-foot Chesapeake Bay bugeye ketch, an oceanography research-and-education vessel operated out of New Haven, Connecticut, by Schooner Inc. Like other bugeyes and their Chesapeake Bay cousins, the skipjacks, the *J. N. Carter* had no engine, and operated in close quarters with the help of a pushboat. There were no winches. The size of the crew varied, but generally included a first mate and deckhand, along with the passengers: a couple of scientists and a handful of students.

"We had a halyard and jig to raise the heavy, sharp-headed sails on mast hoops, and a yawlboat for pushing. There was no engine," she smiles. A woman captain was a rarity at a time when women were pushing the envelope in a number of male-dominated fields, such as firefighting, construction, and police work. "My job was front-page news," she remembers. Some of the regulars, fishermen in particular, in that male-dominated field were less than welcoming.

"When you're among the first to do something, you get interesting responses from people," she says. "They haven't thought about the concept and blurt out their first reactions. They generally led with 'You're not big enough' and 'What if . . . ?' " The answer to those questions was that Karen learned to do things smarter, using brains rather than brawn.

However, the fishermen operating in the area refused to take the *J. N. Carter*'s docklines and made jokes about "crazy women drivers." She soon realized she'd have to earn the respect of her fellow captains. She decided to forgo the yawlboat and sail to the dock. She told her first mate to "act cool." They operated using quiet hand signals and backed that 66-footer into her berth under sail as the fishermen watched.

Karen Sullivan is never more at home than when she's sailing or brewing up a cup aboard her Dana 24, *Minstrel*.

It's not difficult to understand why the Pacific Seacraft Dana would appeal to a sailor accustomed to larger vessels. The massive bronze portlights would suit a schooner. Karen, below, has added touches, including reupholstering the cushions, to make the boat her own.

After that, she became one of their own. One of the men frequently sang arias to her when the *J. N. Carter* docked.

Winning her heart

But in Roatan, Karen had met a British sailor. Colin had a 1937 55-foot wooden Gloucester schooner and an interest in starting a charter operation while enjoying the cruising lifestyle. He won her heart. As Karen had upgraded her license to a 100-ton captain's ticket, they were good to go.

Together, they took people out for daysails and overnight cruises and they ran longer cruises of a week or two. They made eight trips up and down the Intracoastal Waterway between Florida and New England, with charters along the way. They were also hired to deliver other people's boats. The Gloucester schooner, named *Windsong*, was one of the smallest of the American Sail Training Association's registered tall ships, so she also played a role in the occasional parade. Later they took her to the Caribbean for charters in St. Thomas and the British Virgin Islands.

One year, they put *Windsong* away and briefly entered another world as the skippers of a 100-foot ketch named *Fei-Seen*, belonging to the family that owned the Cargill Corporation. The crew of six sailed her thousands of miles, remodeled her interior, kept the yacht in Bristol condition, and hosted members of the family and their friends.

But it was good to get back to *Windsong* when the year was over. Those idyllic times didn't last, though, and the marriage ended. Karen took stock of the financial side of her life and realized it was time to hop back on the treadmill. "I realized I needed to make some money to finance the rest of my life," she says. "I made a 20-year plan. But I did it in 15."

Musical interlude

She joined the U.S. Fish and Wildlife Service, working first in Delaware and Washington, D.C., for seven years and later in Alaska for another eight years before retiring in 2006 in her mid-50s. During this time, Karen put sailboats on hold temporarily and discovered her talent for music. The Alaskan soil is particularly fertile for aspiring musicians. "There are more musicians per capita in Alaska than anywhere I've been," she says. She and musically inclined friends got together regularly to play folk and bluegrass and to learn from one another. Karen wrote wonderful songs and produced her own CD, which she had professionally recorded and mixed. "It's like a calling card up there," she says.

After a while, she realized there was a place in her life for another sailboat. "I'd kind of swallowed the anchor for 15 years but I realized how much I'd enjoy having the deck move beneath my feet once more," she says.

She had a second husband while in Alaska. It was his idea to get a boat, although he was not a sailor. "Michael and I agreed we couldn't buy a sailboat unless we test-sailed it first," she recalls. They chartered a Dana in Anacortes, Washington, and Karen was entranced.

"The lines are sweet," she says, "resembling a Northeast fishing smack. But I wondered if she could get out of her own way. I didn't want to buy a caricature. I wasn't familiar with Pacific Seacraft's reputation. But I learned that this boat sails faster than she has a right to with a 21-foot waterline (although not in light air)," she smiles. "The Dana will keep up with any boat 10 feet longer. It's a great design by Bill Crealock. The modern underbody makes her fast. And she tracks like a locomotive."

There's always room

Karen likes the small size of her boat. "It's manageable," she says. "In an anchorage or at the dock I like to say, 'There's always room for a Dana.'" But she's not small inside. The Dana has standing headroom of 6 feet 2 inches.

These boats are also seaworthy, as *Minstrel* and many of her sisters

who have ventured offshore and across oceans have demonstrated. Furthermore, Karen is quick to note, she's pretty. "You have to be *in love* with a boat," she says, underlining the opinions of all sailors through the ages. She found the Dana that would become *Minstrel* in Seattle. Built in 1988 (#105) and formerly called the *Mari-Dan*, she was no fixer-upper in need of oodles of TLC. In addition to keeping her up nicely, the previous owner had added a number of thoughtful touches, such as dish and binocular racks, a swing-out radar screen for viewing in the cockpit, and rattan work for ventilation at the anchor locker and the head. He also added refrigeration and a water heater.

"Buying this boat was a good decision," she continues. "I got back into sailing and asked myself, 'Where have I *been*? I *need* to do this.'"

In an uncommon role reversal, Karen did all the maintenance on the Dana and was clearly the skipper, with assistance from her husband. After installing a Webasto diesel heater, they sailed *Minstrel* home to Prince Edward Sound, Alaska. Once there, Karen re-covered the cushions and created a bag of pockets to hold safety gear at the ready by the companionway. She measured the boat for new sails and had Port Townsend's Carol Hasse make them. She bought a custom-packed life raft that can be stowed in the cockpit locker. And she has equipped *Minstrel* with the most thoughtful abandon-ship bags I've ever seen.

Early retirement

"The weather is hard on a boat in Alaska," Karen says. *Minstrel* spent five years up there before Karen was ready to retire early and move south. As her marriage had ended on a friendly note, Michael helped her move *Minstrel* part of the way from Seward. She did much of the delivery on her own, however, single-handing the passage between Juneau and Prince Rupert with the assistance of her dog, Jack, a Brussels Griffin.

In case you're wondering how to get the email address and phone number of this talented woman who has her own boat and can sing like an angel, create songs of professional quality, write sailing articles (you'll see her work from time to time in *Good Old Boat*), draw detailed pencil and pen-and-ink illustrations (did I mention that she's an artist too?), talk sailing with the best of them, maintain a boat, sail it away from the dock, bring home the bacon, and fry it up in the pan . . . the answer is you're too late.

Jim Heumann, a fellow sailor of a Dana 24, got together with Karen at a Pacific Seacraft rendezvous and asked her questions about rigging and Dana modifications until she fell in love with him. Last summer they took his Dana for a cruise around British Columbia's Vancouver Island and the Queen Charlotte Islands. They sailed 1,600 miles in four months. This summer, it's back to the west coast of Vancouver Island. From there, who knows? They have a "double Dana dilemma," as she calls it. They're thinking of renting out Karen's home in Port Townsend and sailing one of their Danas to Mexico, the Marquesas, the South Pacific, perhaps as far as New Zealand.

Wherever they go, there will always be room for a Dana, and that will be the boat where the party is. Count on it. You can keep up with these two at: <karenandjimsexcellentadventure.blogspot.com>.

Karen Larson and her husband, Jerry Powlas, the founders of Good Old Boat, *when not sailing their C&C 30 on Lake Superior, work on their C&C Mega 30 project boat in the backyard.*

Still building the Dana

Lovers of the Dana 24 can most likely recite the high and low points in the history of the Dana and the Pacific Seacraft company since the design was introduced in 1984, discontinued, reintroduced, and discontinued once again. What's important to know at this point is that Seacraft Yacht Sales in Seattle is building the Dana once more.

Seacraft Yacht Sales has been a dealer for Pacific Seacraft since 1984 and remains so today for Reid and Stephen Brodie, the new owners of the Pacific Seacraft company, now located in Washington, North Carolina. But the Brodies' purchase of the Pacific Seacraft company in 2007 did not include the Dana design.

Tom Cooper, co-owner of Seacraft Yacht Sales, tells us, "When Pacific Seacraft discontinued the Dana (for the second time), we inquired about purchasing the tooling and our offer was accepted. The construction of the hull, deck, liner, and fiberglass parts are done by Cascade Yacht Builders (dba Chinook Composites) in Portland, Oregon. We then bring the boat to Bainbridge Island (a ferry ride from Seattle) to complete the carpentry, mechanical, systems, and rigging. We completed our first boat in 2009 and displayed it in early 2010 at the Seattle Boat Show."

In addition to new boats, Tom says Seacraft Yacht Sales offers replacement parts. "We have (and can build) replacement or additional parts: bowsprits, sea hoods, coaming boxes, caprails, tables, rigging, and other parts. For Dana owners, we can also refurbish their boats, completely or partly."

Still being tweaked

As with all production boats, some tweaking continues to take place as buyers, owners, or the folks in the shop make suggestions. "It's hard to improve on an already perfect pocket cruiser, but we have tried," Tom says. "The major change has been using cherry for the interior cabinetry and the headliner (although we will do interiors of teak, mahogany, or any other wood). The headliner is completely and easily removable for access to wiring and deck hardware. All the interior lights, running lights, and anchor light are LEDs. We've added shelving in the lockers. We have also rerouted and repositioned plumbing, cooling, and fuel lines to be more efficient and easier to maintain. We have been working on these boats for more than 20 years and had many ideas in this area. We also asked for feedback from Dana owners and have incorporated many of their ideas in the boat. We are very pleased with how our first Dana has turned out."

For more information, contact Tom Cooper, Max Heller, or Ray Neglay at Seacraft Yacht Sales, 927 N. Northlake Way, Suite 100, Seattle, WA 98103; 206-547-2755; info@seacraft.com; <www.seacraft.com>.

Comparing the Dana 24 . . .

. . . with two other husky, seaworthy cruisers

by Ted Brewer

Selecting designs to compare to the feature boat is never easy; it often boils down to finding similar yachts of the same length. In this case, the feature boat is rather unusual with her short length on deck, heavy displacement, and offshore capability so I selected two boats with a reasonably similar waterline length, beam, and displacement, regardless of their length on deck. Actually, the Dana 24 measures 27 feet 3 inches with her bowsprit, so her overall length is quite close to the others, at least when you pay the slip fee!

In searching for two husky yachts to compare with the Dana 24, I resorted to a 35-year-old design I did with Bob Wallstrom in the 1970s. This design does make an interesting comparison, with her rudder separated from the aft end of the longish keel for better control. My other choice was a solid Alberg design, the Cape Dory 27, due to her reputation for quality and offshore ability.

The well-built Dana 24 is a very capable craft. At least one of these boats has made a successful circumnavigation and many others have made adventurous bluewater voyages as well. I would not be the least surprised to learn that a Cape Dory 27 has circumnavigated. The Hullmaster 27 has also proven capable offshore; one of the boats has been sailed, solo, between Vancouver, Canada, and Mexico for a number of years. All three are very husky yachts with a high displacement/length ratio for their size. Indeed, any of them will take you wherever you want to sail and bring you home again in safety, if not in absolute comfort — there are *some* limits to size.

Comforting numbers

The motion comfort figures of the three are quite good. The number for the Dana is unusually high for a small boat, with the Cape Dory a close second. Obviously, the Dana 24, having such short overhangs, will not develop as much reserve buoyancy as the longer-ended boats. This may make her wetter on deck in short, choppy seas but it may also reduce any tendency to hobbyhorse in certain conditions. The capsize numbers of these boats are also unusually good for their size. The Hullmaster's figure is a bit higher, due to her more generous beam, but this does add to interior space and form stability, one of the tradeoffs that designers often have to make.

All three boats have deck-stepped masts. This is not ideal for a bluewater cruiser, as it makes it much more difficult to set up a jury rig if the boat is dismasted . . . and it can happen. The careful seaman will ensure that every piece of rigging is in perfect condition and will carry ample spares when heading out on a long voyage. Fitting a strong tabernacle would strengthen the spar and could also simplify setting up a jury rig. That modification might be worth considering if distant waters beckon.

The Dana's measured sail area seems small at 358 square feet, but her working sail area with both jib and staysail set is actually 401 square feet. That makes quite an improvement to her sail area/displacement ratio and to her potential performance in lighter air. She is the only one of the three that comes with a double-headsail rig. That is advantageous when the wind pipes up, as it provides more combinations for reducing sail. In brisk winds, the Dana will get along very nicely with just the staysail and reefed main. In more extreme conditions, a storm main and storm staysail can be set.

There is no sign of the Dana having running backstays, however, and I feel these are desirable with a double-headsail rig. Runners can keep the staysail luff taut, thereby improving windward ability, and they can keep the mast from panting when everything around you has gone to hell in a handbasket. I strongly suggest that any sailor planning to head across the oceans in a small yacht consider adding a staysail stay and running backstays and having a storm staysail made.

There you have it: three small cruisers that can accommodate a crew of four. Each will make a good family weekender yet, unlike many small cruisers, also has the potential to take an adventurous couple to distant shores and sun-washed islands when the sea gods call.

Dana 24 | Cape Dory 27 | Hullmaster 27

	Dana 24	Cape Dory 27	Hullmaster 27
LOA	24' 2"	27' 1"	27' 3"
LWL	21' 5"	20' 0"	21' 6"
Beam	8' 7"	8' 6"	9' 3"
Draft	3' 10"	4' 0"	4' 3"
Disp.	8,000 lb	7,000 lb	7,400 lb
Ballast	3,200 lb	3,000 lb	3,000 lb
LOA/LWL ratio	1.13	1.35	1.27
Beam/LWL ratio	0.40	0.425	0.43
Disp./LWL ratio	363	391	332
Bal./Disp. ratio	0.40	0.43	0.41
Sail area	358/401 sq ft	365 sq ft	418 sq ft
SA/Disp. ratio	14.3/16.0	16.0	17.6
Capsize number	1.77	1.78	1.90
Comfort ratio	31.5	28.0	25.3
Year introduced	1985	1976	1975
Designer	W.I.B. Crealock	Carl Alberg	Brewer/ Wallstrom

Ted Brewer is a contributing editor with Good Old Boat. *As one of North America's best-known yacht designers, he has put his hand to most everything from America's Cup yachts to pocket cruisers.*

Replacing a backstay

Here's a rigging project you can do yourself

by Andy Schell

A suspect swaged fitting, at right, led Andy to replace the whole backstay on a Tartan 37. He chose to use Hi-MOD mechanical fittings, center. Adam, the boat's owner, was away on business, bottom, leaving Andy in charge.

My best friend Adam's new-to-him Tartan 37, *Audentia*, had never left the dock with him at the helm. He'd purchased her in February, and there is ice on the Chesapeake in February. She was berthed at a private dock in Whitehall Bay, just north of Annapolis, when Adam bought her. I had seen the boat before he did — Adam is a pilot with the Air National Guard stationed in Mississippi, so I became his ad hoc broker in Annapolis. I scoured the listings, talking to real brokers and diving into leads with the excited enthusiasm that accompanies any boat search, bolstered by the fact that I would not be writing any checks.

As a professional captain, and having just completed two boat searches in the past three years (for my father's Wauquiez Hood 38 and for my Allied Seabreeze yawl), I had the experience and confidence to fulfill my responsibility and find Adam the right boat. There are a lot of Tartan 37s out there, so the search was extensive.

Adam wound up buying his boat on my advice, after flying home to see her for himself. Unfortunately, on the day of the sea trial, she was iced-in, so her maiden voyage would have to wait. By the time the creek had thawed, Adam's dock lease was up and he planned to move her across Chesapeake Bay to the Eastern Shore. His insurance required a rigging survey, which revealed cracked swaged fittings on the backstay. He asked me to replace the backstay for him before we moved the boat.

The backstay

I'm a firm believer in using mechanical, rather than swaged, fittings for all of a boat's rigging, and talked Adam into going with the relatively new Hi-MOD fittings made by Petersen Stainless Rigging in the U.K. (and distributed by Hayn Marine in the U.S.A.) for his new backstay. The Hi-MOD fittings work on the same principle as the ubiquitous Sta-Lok and Norseman fittings, that of using mechanical compression to keep the wire in the fitting. They have a clever addition to the inner cone, a crown ring, which keeps the unlayed wire strands perfectly spaced inside the fitting.

We ordered the wire and the fittings from Rigging Only (<www.riggingonly.com>). Once we had the wire and pin measurements, which required the first of many trips to the masthead, the guys at Rigging Only were very helpful in determining pin sizes and turnbuckle sizes for the new stay.

Measuring

The first step was to measure the old stay and determine what, exactly, we actually needed to replace. The rigging survey required the replacement of just

the swaged fittings, not the wire, but Adam decided to scrap the whole lot and replace the stay entirely, including the turnbuckle. We weren't sure when the rig had been replaced last, and this Tartan had recently completed a circumnavigation with the previous owner. Better safe than sorry.

We used a simple wire gauge to measure the wire thickness (to the nearest 1/32 inch), the pin diameter on the chainplate, and the pin diameter at the masthead. With these measurements, the guys at Rigging Only advised us on what size Hi-MOD fittings and turnbuckle to order. We ordered the wire about 3 feet too long to give us room to botch the age-old rule of "measure twice, cut once." Once the shipment arrived, complete with detailed instructions for assembling the Hi-MODs, we set to work.

> "I slowly lowered the backstay with the lashing line while a helper below slowly pulled it onto the dock."

Removing the old stay

The key when replacing any piece of rigging on a sailboat is first, before actually disconnecting it, to properly support the mast wherever the wire is to be removed. To create a temporary backstay, I positioned one of the genoa sheet blocks as far aft on the track as possible, rove the main halyard through it, and cranked down hard with the genoa winch.

Up to the masthead I went to remove the fitting and lower the stay. Before removing the pin, it's imperative to tie a long, small line on the stay with a rolling hitch and lash it firmly to something solid at the masthead — the full weight of the backstay will at once be in your hand when that pin comes out, and dropping it on deck accidentally is not an option. I slowly lowered the backstay with the lashing line while a helper below slowly pulled it onto the dock, preventing it from touching the deck at all. With the old stay removed, it was time to build the new one.

Cutting and fitting

The easiest and most precise way to get the stay length correct in one go is to measure it against the old one. We stretched the old stay out on the dock, unscrewing the turnbuckle to its maximum length.

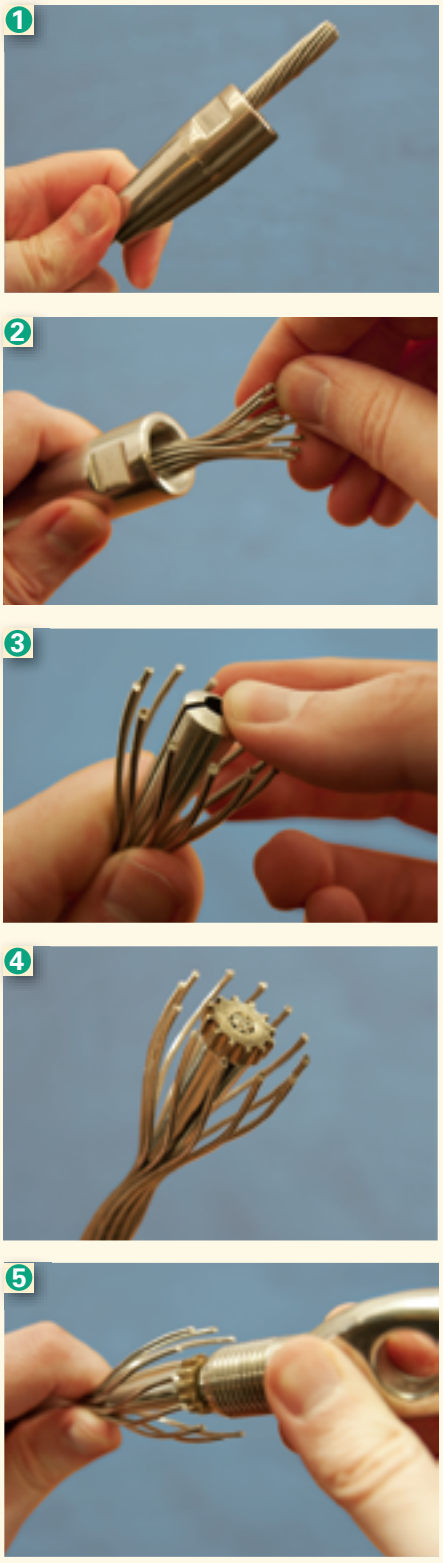
The next step was to assemble the Hi-MOD fitting to one end of the new stay. We chose to do the lower part, including the turnbuckle, in order to have something with which to compare.

Assembly is surprisingly easy and intuitive. First, slip the body of the fitting onto the wire, then unlay the end of the wire. This is amazingly easy: with your fingers, simply twist the wire in the opposite direction to the lay and it should come right apart. Slide the cone onto the core of the wire and add the slotted crown ring unique to Hi-MOD on top of this. Now carefully twist the wire, this time in the direction of the lay, to bring the strands back together around the cone and the slotted ring. This is a bit tricky the first time, but once the strands are in place, the slotted ring keeps them there. Be sure to screw the whole lot together in a trial run, then disassemble it and re-assemble it using permanent thread locker (the red tube) on the outer fitting. This whole process takes mere minutes.

We aligned the new turnbuckle with the old one and stretched both wires out along the dock. The trickiest part was to measure the other end correctly — you must account for the length of the new eye fitting for the masthead before you cut the wire. I was surprised to find that a 32-tooth hacksaw cuts through the stainless-steel wire with moderate effort. It's essential to smooth the newly cut wire end with a file before assembling the Hi-MOD fitting. Follow the same process as with the bottom fitting and you have a brand-new backstay.

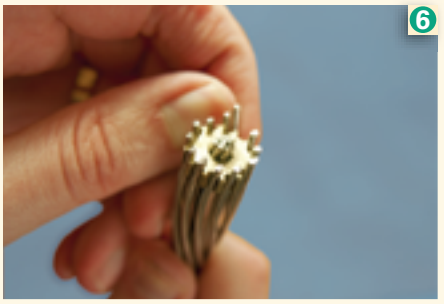
Installing the new stay

Adam chose to forgo, for the time being, both a backstay adjuster and SSB-antenna insulators on the new stay, for budget considerations. As he's not a racer, once we conservatively tuned the new rig, the odds of his adjusting it were slim even if he had an adjuster.



PHOTOS SUPPLIED BY HAYN ENTERPRISES LLC

To install a Hi-MOD fitting, start by sliding the body over the wire (1). Unlay the wire for a short distance by twisting it against the lay (2). Slip the cone over the wire's core (3). Slip the slotted crown ring over the core behind the cone (4). Push the ring and cone along the core using the end of the terminal (5). An indent in the terminal's end sets the ring at the correct distance.



With the cone and crown ring in place, gently twist the wire strands with the lay and set them in the slots in the crown ring (6). Pull the body up over the core and crown ring (7). Check that the wire strands are in order (8). Screw the stud into the body (9). The assembled fitting is neat and secure (10). *Audentia* awaits her new owner, and her new name, at right.

He'll add insulators before he goes cruising, but that's still years away.

To install the stay, I followed the same process as when removing the old one, this time in reverse. We attached the turnbuckle to the backstay chainplate, leaving it unscrewed to give me plenty of slack. I went up the mast a third time, but without the stay. Once at the masthead, I hoisted the stay with the same line we used before, making sure to lash it down to something before trying to fit it. It's amazing how heavy that wire is when you try to hold it with one hand and fit the pin through the masthead. We got the measurement correct, thankfully, and the stay went back together with no problem. Once I was back on deck, I tightened the turnbuckle.

Helpful hints

We tuned the rig at the dock, but I left the cotter pins out. I wanted to get the boat sailing and re-tune the rig if needed before locking everything down. Once we'd done this, I replaced the cotter pins with new stainless-steel ones. I almost always replace old cotter pins when I'm working with rigging.

The rig will need to be checked every few weeks, as the new stay will undoubtedly stretch under load when the boat is sailed hard a few times. In a worst-case scenario, the stay would have to be removed and shortened with the saw, but with the Hi-MOD fittings, this could be done quite easily without having to purchase any new parts.

Ideally, Adam would have replaced all the rigging at once, thereby getting a better price for buying more material and also having the peace of mind of a brand-new rig. However, considering both the rigging survey and our own surveys turned up only the questionable backstay, we felt comfortable leaving the old rig intact for Chesapeake Bay sailing. He intends to replace the rest of the wire before heading offshore.

Many world-cruisers recommend using the same diameter wire for all of a boat's rigging. I agree with this and intend to re-rig *Arcturus*, my Seabreeze, using this philosophy. By using the biggest wire size required by the rig for every shroud and stay, I will beef up the rig and need to carry fewer spares when far from port. One length of wire and a few Hi-MOD fittings will be usable for any part of the rig that may need to be repaired, even under way. The only headache with this theory is the need to upgrade the chainplates in many cases. A rig is only as strong as its weakest link, and often the wire is stronger than the chainplates.

We both learned, quite painlessly, that DIY rigging solutions on old boats are quite feasible and can be quite enjoyable as well.

Andy Schell is a professional captain, rigger, and freelance writer. He lives aboard his yawl, Arcturus, *and runs sail training and navigation workshops with his father, also a captain. Andy and his fiancée, Mia, are currently in Florida, fitting out for their spring transatlantic to Sweden, Mia's home country. Contact Andy at <www.fathersonsailing.com>.*

Lifelines 101

Ensure your first line of safety really is safe

by Don Launer

Lifelines are designed to reduce the chances of your going overboard. On many boats, however, these systems are poorly designed and installed and receive little maintenance. They're the most overlooked and least inspected hardware on deck.

The lifeline system consists of the lifelines themselves, terminal fittings, stanchions, stanchion bases, and the bow and stern pulpits or deck pad-eyes to which the lifelines connect.

Lifeline material

Lifelines on cruising boats are most commonly made of 1 x 19 wire rope (the same type used for standing rigging) covered by a vinyl coating, although you might find 7 x 7 or 7 x 19 wire rope in some installations. The wire inside the vinyl coating is usually 302/304 stainless steel. Although vinyl-coated stainless-steel wire looks and feels nice, the coating can foster corrosion in the wire by trapping moisture inside and eliminating the oxygen that keeps stainless steel stainless. What's more, the coating hides the corrosion.

To be on the safe side, saltwater sailors should replace vinyl-coated lifelines every five years. When doing so, it is far better to use a larger-diameter uncoated wire as it will be stronger, last longer, and simplify inspection. For uncoated lifelines, 302 or 304 stainless steel offers adequate corrosion resistance. For a brighter, less corrosion-prone lifeline, 316 is a good choice, but it is considerably more expensive. Also, it is not quite as strong as 302/304 stainless steel, so an increase in diameter is indicated.

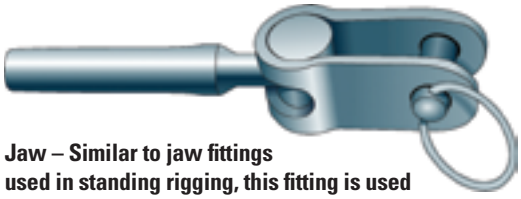
Swaged and swageless fittings

Swaged fittings, such as those used on the standing rigging of most sailboats, are pressed onto wire rope by machine and make a strong terminal connection. Many sailboat lifelines have terminal fittings that are similar in appearance to machine-swaged fittings but are in fact hand-crimped onto the wire rope with a special tool.

Inspect your fittings to see what type they are. The sleeves of hand-crimped fittings have thinner walls than those of machine-swaged fittings and are longer. They are usually crimped in three places, leaving three indentations on the sleeve. A swaging machine, on the other hand, presses the sleeve uniformly along its entire length.

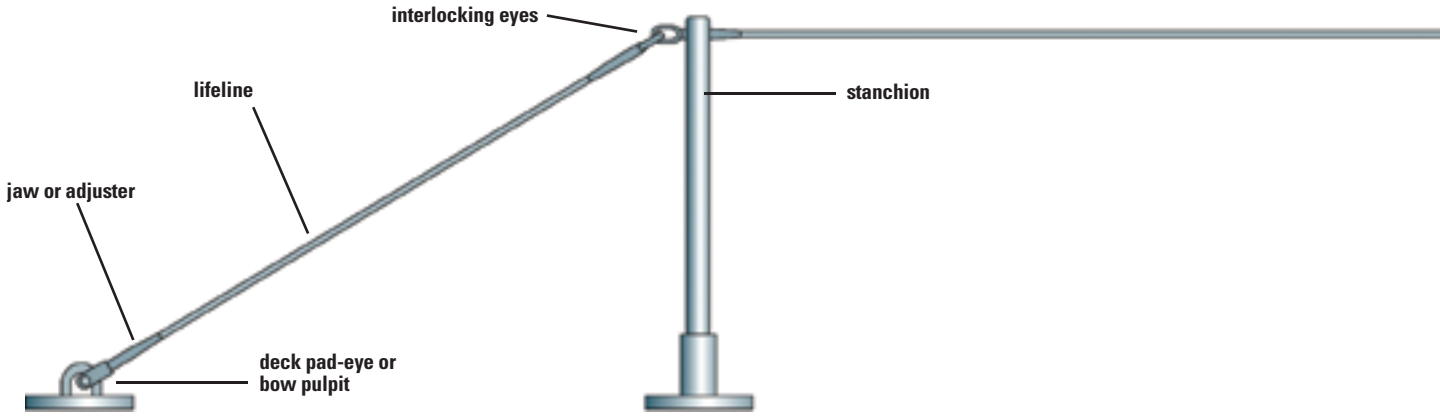
Due to their lesser strength, hand-crimped fittings should *not* be used in high-load applications, such as standing rigging, and I have strong reservations about using them for lifelines also.

LAYOUT AND ILLUSTRATIONS BY TED TOLLEFSON



Jaw – Similar to jaw fittings used in standing rigging, this fitting is used to connect a lifeline to a bail on a pulpit or stanchion. It may be combined with an adjuster.

Adjuster – This is a terminal wire fitting that allows lifeline tension to be adjusted.



> **“The stanchions that support the lifelines must be very strong and their bases must be very securely fastened to the deck.”**

Swageless fittings have become the standard standing-rigging fitting on world cruisers because of their higher strength and greater longevity than swaged fittings and because they can be reused. They are now available in all the terminal configurations used in lifeline systems and offer the do-it-yourselfer a means of creating a stronger lifeline system when the time comes to replace the old lifelines. Swageless terminals are easy to assemble using simple hand tools.

Lifeline height

Currently, the minimum height for lifelines recommended by the American Boat & Yacht Council (ABYC) is 24 inches, but there is an industry move to raise that to 28 inches. If the height is greater than 24 inches, ABYC recommends a second lifeline be fitted at mid-height. This may prevent an adult from rolling underneath but will not stop children or pets from going overboard; for them, it's necessary to install lifeline netting to fill the gap. The Offshore Racing Council (ORC) requires a minimum height of 24 inches and double lifelines on sailboats over 28 feet in length.

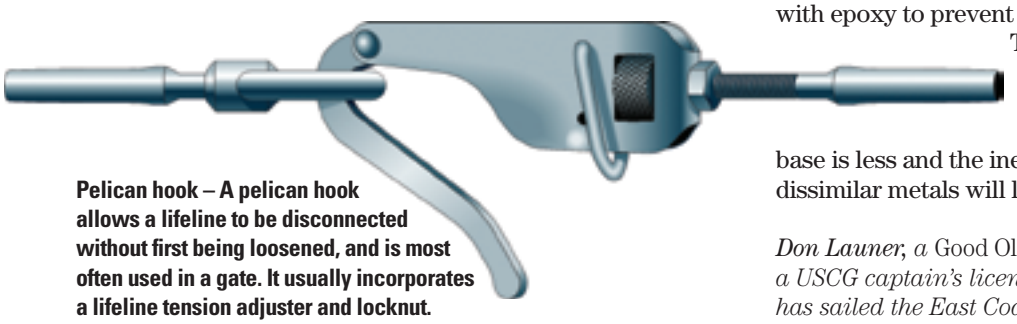
Stanchions and bases

The stanchions that support the lifelines must be very strong and their bases must be very securely fastened to the deck. The higher the stanchion, the stronger it and its base need to be to withstand the longer lever action created by a load on the upper lifeline.

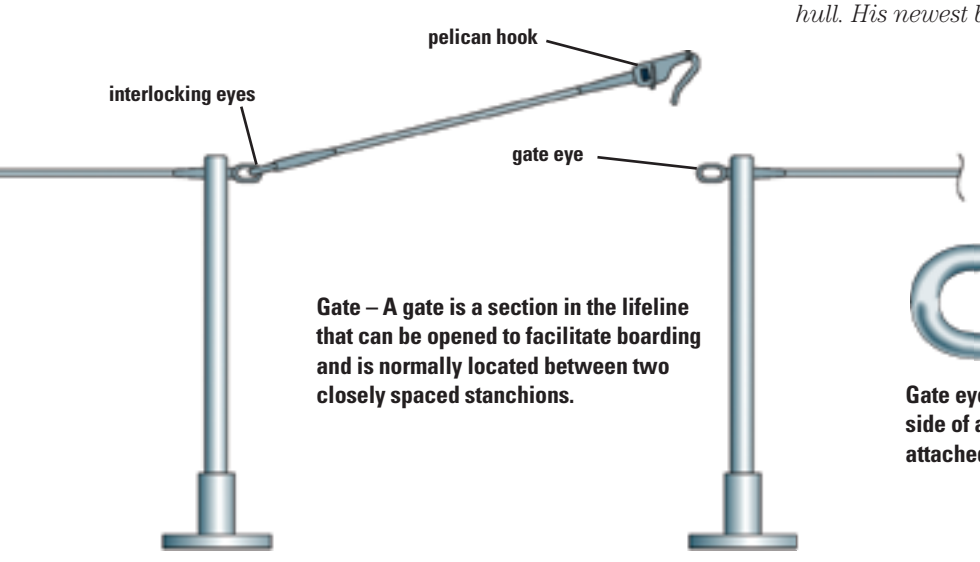
To distribute this load, stanchion bases must be through-bolted to large backing plates. These backing plates are normally ⅛-inch stainless steel or aluminum or 3⁄16- to ¼-inch fiberglass. On sandwich decks, the core material should be dug out and replaced with epoxy to prevent the deck from being crushed.

The combination of a stainless-steel stanchion and an aluminum base is a disaster waiting to happen because the initial strength of the base is less and the inevitable corrosion between the dissimilar metals will lead to early failure.

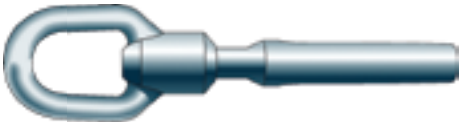
Interlocking eyes – These eyes are used wherever a lifeline makes a sharp bend and at the opposite side of the gate from the pelican hook.



Pelican hook – A pelican hook allows a lifeline to be disconnected without first being loosened, and is most often used in a gate. It usually incorporates a lifeline tension adjuster and locknut.



Gate – A gate is a section in the lifeline that can be opened to facilitate boarding and is normally located between two closely spaced stanchions.



Gate eye – This terminal fitting is used on the side of a gate to which the pelican hook is attached. It can be a fixed eye or a swivel.

Don Launer, a Good Old Boat *contributing editor, has held a USCG captain's license for more than 33 years and has sailed the East Coast from Canada to the Caribbean. He built his two-masted schooner,* Delphinus, *from a bare hull. His newest book is* The Galley: How Things Work.

Pictures that sell

Shooting stills and video for cruising articles

by Lin Pardey

To get photos with a difference, take your boat away from marina situations and find surroundings that are out of the ordinary.

This article is an excerpt from Lin and Larry Pardey's Capable Cruiser, *third edition, which was published earlier this year. The information, such as the technology discussed here, has been extensively revised in this new edition.*

Magazines need photographs and pay well for them. Sailors are hungry for sailing DVDs, and the Internet is making it far easier to market videos. Cruising can give you time to practice these skills plus wonderful subjects to shoot. Digital cameras and camcorders have never been more affordable. Storage capacity is cheap, and instant playback allows you to take lots of photos or footage, see the images almost immediately, and go out and get better shots at no extra cost. Online resources and excellent books are available to help you along the way. But the other side of the coin is that you will be competing with true professionals in both fields, and they took lots of time to learn their trade. So how do you slant the chances more in your favor?

Although the equipment and techniques for still photography and video have their differences, they also have a lot in common. The first rule of photography is: you need the right equipment and you need it readily available. It does not have to be the most up-to-date, expensive equipment. In fact, simpler is often better — for dependability and ease of use and also to stop you from playing with features you really don't need. Bob Grieser, a highly successful nautical photographer, states, "I forget all the bells and whistles, set the camera so it is correct for the current situation, then get out and watch for the moments I want. Once I start shooting, I can't be playing with settings — I might miss the action." Tory Salvia, a video producer and creator of thesailingchannel.tv, has been producing videos for three decades. He agrees with Bob: "You can get video gear today to do things we didn't even dream about 10 years ago. But that also means you can waste time playing with optional settings. The best thing newcomers can do is stick to the most basic camera, use the most basic settings, and worry about framing good shots."

Choosing still cameras

Bob strongly recommends a single-lens reflex (SLR) with interchangeable lenses: "Very few built-in zooms produce the same quality pictures." A wide-angle lens is vital, especially for interior shots. The largest lens he feels you can use on board is 300mm. Larry and I have found that we get "camera shake" with anything larger than 200mm. Bob recommends something like a Canon EOS Rebel as a good starter camera. When I mentioned we were using a five-year-old Nikon D40, he said, "That'll still do the job. It has been replaced by the D80 and at about $700 it is great for someone working toward being a pro. For today's editorial requirements, you need 8 to 10 megapixel (MP) capabilities."

You need a weatherproof shield. To get good sailing shots, your camera will often be out where spray is flying. We do not recommend a waterproof casing for your main camera. If you intend to take a camera in the water while you swim or dive, a relatively inexpensive dive camera would be a better choice. If it did get damaged, you wouldn't be left without a camera.

As mentioned above, the basic rule is that you need a camera when you see a picture. For that reason, we also carry a good-quality point-and-shoot camera that fits in my handbag. That way, we have a camera with us almost all the time. This seven-year-old 2MP camera has earned us more than our fancier gear has, because the "detail" pictures we get with it are very marketable: a stern anchor setup Larry snapped during a stroll through a marina, snapshots of people we meet along the way, gear we see at a boat show.

We have two batteries and two memory cards for each camera. With luck, this means we will always have a camera in working order, a battery with a charge in it, and lots of photo space ready for immediate use.

Choosing video cameras

Once again, simple is better. Do not be impressed with small size. You will find that it is far easier to hold a larger video camera steady as you shoot. From the moment we decided to make a video, we carried two identical cameras. Video cameras are far more sensitive to shocks and moisture than still cameras. We found that having a backup paid

dividends in another way. When we were in unique situations, such as on the beach at Rio, or at a street party in Angra dos Reis, each of us would use a camera. We seemed to shoot from different perspectives, and we even shot each other shooting footage. I caught a wide-angle shot while Larry was getting a close-up. This gave our editor a variety of images that worked far better than video shot only from one point of view.

Tory Salvia recommends buying a video cam with HDV capabilities. "This is the future of video," he says. "New videographers should shoot in at least HDV (1080i or 10080p) to future-proof their work. (You can always "down-res" to Standard Definition (SD).) Tory suggests buying the next-to-last version rather than the latest and greatest. "You'll save 30 percent and won't miss any so-called, newest, greatest feature." In 2009, his favorite for on-board shooting was the Canon HV20, which is less than $1,000 — compared to its newest reinvention, the HDV30, at close to $1,499.

Do not be impressed with extreme zoom capabilities. Even with a tripod and a built-in steady cam, you will not get usable footage with anything higher than a 6-power zoom. Handheld, a 2-power zoom is about all that works well.

A tripod is essential. Larry rigged a clamp and adjustable fitting that let us position the video cam almost anywhere on the boat. It clamped to the boom gallows, the edge of the sliding hatch, the backs of settees. It helped him shoot both of us working together on deck or setting oil lamps on his own while I was sleeping belowdecks. A water-resistant case or shooting hood is vital, plus a waterproof case for at least one of the video cameras. If you want to speak to the camera, or interview others for your program, you need a separate lapel-clip microphone with at least 12 feet of cable. You don't have to spend much money to get a good one. When our $400 Sony microphone failed as we were doing the final narrative for our *Storm Tactics* DVD, we had to use a mike we had bought at the local hobby shop for $30. In the editing suite, we were asked, "Nice sound, what mike did you use?" You can hear it for yourself — about 10 percent of the sound for *Storm Tactics* was done in a studio, the rest on our cheap mike. We also carried a wide-angle-lens adapter so we could get better shots inside the cabin and in the cockpit.

"Get photos of your boat under sail. Anchor your dinghy, then have your partner sail the boat around you."

No one will be impressed with a bulky, professional-looking video-cam case. In fact, such a case could invite theft. A low-key, nondescript bag will make your cameras less interesting to anyone with sticky fingers. When we dinghy ashore, we try to use the smallest possible padded bag that will hold our video cam and put this inside a waterproof carry bag, along with a small hand towel. We use the towel to wipe salt from our hands when we want to use the cameras.

Good pictures: a few hints

Whether moving or still, pictures have to tell a story. Take a good look at an array of *National Geographic* magazines. Read a few of the stories, then study the photos. You'll see that the photos often tell a different but parallel story. Next, look at your favorite sailing magazines and see which pictures grab your attention. They'll most likely be photos of people. Everyone likes to see what others look like. To make people look good, we try to get them to take off their sunglasses and their hats, if possible. Let us see their faces. If it is a hot, sunny day, try to maneuver your subjects into the shade of the sails for close-ups. Get people busy doing something and then take lots of photos quickly. When they are occupied, they forget about the camera.

If you find a subject truly interesting, be sure to take a wide-angle, a mid-range shot, and close-ups. Where you can, use the light to create varied effects. You'll be pleasantly surprised to find editors often use two or three shots of the same subject this way.

Everyone loves photos of people, but always ask before taking personal photos. Lin finds folks rarely refuse, especially if she can get them laughing beforehand, above and right. Lin and Larry's Tongan goddaughter, Linlarry (called Lini for short) was supposedly conceived the evening after her parents had dinner (and some extra wine) aboard *Taleisin* during the Pardeys' visit to Tonga 23 years ago. They were delighted to finally meet her and her daughter when they visited again last year, at left.

Be sure to take a wide-angle, a middle-range, and a close-up picture of any interesting situations. No matter how high the resolution of a picture, you can't crop a wide-angle shot to make a good close-up.

For the best-looking pictures — ones that have wonderful, rich colors — get up early. As a general rule of thumb, professionals don't shoot between 10 a.m. and 2 p.m., because the light is too flat and unflattering.

As you shoot, think about a story and get other pictures to fit with the ones you take. If you see a beautiful sunrise in a tropical setting, how about a shot of the tropical fruits filling your stores locker, your crew drinking from fresh coconuts, someone diving overboard into crystal-clear water, and the anchor of the boat dug into white coral sand? Since there is no cost for film, shoot lots of pictures. View them all and then cull them. First, delete every one that is not perfectly sharp; next, get rid of any you don't like. Then go away for a while, come back later, and get rid of 50 percent of the rest. You will probably end up with a useful selection of workable photographs. (*National Geographic* photographers say that they average one marketable shot out of 36.)

Get photos of your boat under sail. Anchor your dinghy, then have your partner sail the boat around you. For dramatic shots, consider climbing a hill and shooting while your crew sails through a narrow passage. If you meet another sailor who has photographic skills, ask her or him to use your camera and take pictures as you sail alongside. If you have a chance to get on board that boat, take shots of your partner sailing alone. We have also obtained some book and article illustrations by having our calling card available when we see someone taking a photo of our boat. We offer them our card and ask for a copy. Two out of three eventually send them. If we receive payment for that photo, we split the gains with them.

Special shooting tips for video

It was almost 20 years ago that Roy Blow of A-V Creative Services, an Australian video producer, suggested that we make a program together. He provided a camera (Hi8) for us to use and said, "Don't try to take moving pictures. Instead, frame up and take good still shots, and then let the images in the frame move. Make sure you keep the camera running for a few seconds after the action stops." He sent us to watch commercial films, and soon we began to see how each scene was made up of dozens of short clips, the camera rarely zooming in or out, rarely panning to follow the action. Roy reminded us to take close-ups, mid-range, and wide-angle shots and also to shoot the same scene from several different angles and get extreme close-ups. For instance, when Larry filmed me hoisting the drifter, he shot my face, over my shoulder, from the stern of the boat looking forward, and from the bowsprit looking aft. Then he got in close and showed only my hands on the winch. We have learned that it pays to script even short video sequences on the boat to make sure that we cover all these angles.

If the crew wears bright-colored clothing, it makes your photos look even better.

Learning to use a tripod is vital, but even more important is learning to be a tripod when you are shooting on board. Practice leaning against the mast to hold your body steady. Learn to put your elbows against your chest to steady your camera. If you plan to pivot while taking a shot, practice first so you will know how to place your feet so you stay steady as you follow the action.

There are downsides to shooting video programs. First, you have to keep your boat looking tidy at all times — lines coiled, sails nicely stowed. You have to look sharp when you are sailing, too. Otherwise, you

Always carry with you a good quality pocket camera (but not so expensive you'd be devastated if you lost or drowned it) so you can get spur-of-the-moment shots you would otherwise miss, at left. Lin had hers with her when she and Larry went to a church fundraiser in Tonga and was able to unobtrusively snap the feast.

will miss the good shots while you rush around tidying up, or you won't want to use shots with frayed or scuffed gear showing in the background, or others with the sails luffing or poorly trimmed. Second, you can get in trouble by forgetting seamanship just because you are shooting something interesting. We came close to plowing right into the chase boat in Fremantle, Australia, because we were so busy trying to make everything look good as we were being filmed. Another time, we actually put ourselves and the boat at risk. I was up the mast shooting footage, the windvane was steering, and Larry was running out the bowsprit to add some action to the shot. We realized soon afterward that had Larry accidentally gone off the bowsprit, the boat would have sailed herself right onto the rocky island a quarter of a mile ahead, and, since I was secured by safety lines, I could not have done anything about it. It all sounds amusing now, but it left us rather shaken at the time.

Tory Salvia recommends subscribing to <www.lynda.com> for $25 a month for access to literally thousands of tutorials on all aspects of video work. I also went online and searched "Learn to make videos." A large selection of well-known names came up, offering very low-cost or even free tutorials. For a crash course on travel videography, however, Tory recommends The Travel Channel Academy, a four-day intensive course with a tuition of $2,000 <www.travelchannelacademy.com>.

But the first step is to watch films more critically, then watch the videos that are selling in your chosen field. According to a very quick and unscientific survey of top sellers through Amazon.com, *Latitudes and Attitudes*, thesailingchannel.tv, and West Marine, the films with which you will be competing are, in no particular order: *Blue Water Odyssey, Being Out There*, *Cruising with the Shards*, *Storm Tactics*, and *Cruising Has No Limits*. Only one was produced by professional TV folks, the Shards. The others were shot by sailors just like you but edited by commercial video editors. In no case are they of *National Geographic* quality, but each of the programs has good content with solid how-to information, even if the story is based around a family cruise.

Lin and Larry **Pardey** *have just received the Cruising Club of America's Far Horizons Award. They recently sailed from the U.S. West Coast to New Zealand and are now gunkholing along the east coast of New Zealand on board* Taleisin *while they upgrade a 21 foot trailer/sailer so they can try brown-water sailing on some of the dozens of river estuaries along New Zealand's west coast.*

DARREN EMMENS

Whenever Lin and Larry see folks taking pictures of *Taleisin*, they try to sail up close and ask if the photographer could please send copies of the photos. They pass over one of their cards with a note promising to give credit for the use of the photo plus any payment they receive. When they saw Darren Emmens shooting pictures near Seattle, they didn't know he was a professional, but when they saw his work, at right, they were glad they'd approached him and made the offer.

Making your own

Rich found his weatherproof housing in the electrical supplies aisle in a building supply store.

Instead of taking the big hole saw to his cockpit coaming, he took it to the cover of the junction box.

Using the template that came with the control head, Rich cut the hole and drilled for the fasteners.

After leading the cable through two Cable Clams, he attached the box to the cockpit side.

A low-cost

A weatherproof housing for cockpit

I recently swapped out my 22-year-old, obsolete Autohelm 3000 wheel pilot. Neither original nor aftermarket parts were available any longer. The only place left to find a spare part was on eBay. I could have wound up bidding for one of the few remaining relics at a severely inflated, collector's-edition price. Instead, I decided to replace my old autopilot with a new Raymarine SmartPilot X-5 wheel autopilot. Now, when the time comes to replace a part, I'll have some reasonable options.

The new autopilot arrived with an ST6002 control-head display. This was a welcome feature, but it didn't include a pod-style weatherproof enclosure suitable for mounting in an open cockpit. To mount the control-head display, I would have to cut a 3½ inch-diameter hole in the cockpit coaming or bulkhead or purchase a commercially available waterproof instrument enclosure that I could mount in the cockpit without drilling large holes in the boat.

After reviewing these options, I decided on a third path, which was to mount the instrument in a custom-fabricated weatherproof enclosure. This would lower the cost of my installation by about $200 and eliminate the need to add a large, permanent, and undesirable hole in the cockpit coaming. I made the enclosure from a weatherproof non-metallic electrical junction box.

A simple junction box, or j-box, is an excellent alternative to an expensive purpose-made instrument pod. J-boxes of different sizes, shapes, and material construction are available at electrical supply stores, including the large chains, such as Home Depot. You can typically find the right j-box for any application. Mounting a j-box to a coaming or bulkhead requires only four small screw holes and one larger hole, only about ⅛ inch in diameter, for the through-deck power or data cable. This was a significantly better proposition than a 3½-inch void.

A convenient size

For the Raymarine ST6002 control-head display — commonly used in conjunction with the brand's S- and X-series autopilots — I needed a j-box measuring approximately 5 x 5 x 2 inches. To test my concept, I bought a Carlon E989PPJ 5 x 5 x 2 PVC junction box for $12, and it proved to be just the right size. The Carlon box seems as if it were specifically designed for the application: its size, shape, and even color are nearly an exact match. In fact, all the control-head displays and data repeaters in the Raymarine ST series are of a standard size and fit the same Carlon 5 x 5 x 2-inch non-metallic j-box.

Installation

The most important concern when installing an electronic instrument in an exposed cockpit is protecting the instrument from the elements. It takes just a few simple steps to install the control head in a j-box.

Step 1 Choose the correct size. Make sure that the j-box is at least ½ inch larger in width and length than the control-head display and that the depth of the j-box is sufficient to accommodate the cable connections on the back side of the instrument. Measure the depth from the back side of the instrument's faceplate to the back side of the instrument and add about an inch to accommodate electrical connections such as plug-in USB cables.

Step 2 Mark the hole locations on the j-box faceplate (the removable cover). Use the instrument's cutout template, if you have one, or use the instrument to carefully locate and mark the centers of all the holes you will have to cut or drill.

Step 3 Cut and drill the holes. It helps to use a vise to hold the j-box while cutting.

instrument pod

electronics

by Rich Ian-Frese

Step 4 Weatherproof the entry/exit holes for power or data cables. Fit a Cable Clam (from Blue Seas) to the outside of the j-box at each entry/exit hole. Alternatively, you can seal each hole with silicone after leading the cables through the hole. I like the Cable Clam because it provides a clean, weatherproof seal and the cables can be inserted or removed later without the need to remove and re-apply sealant.

Step 5 Insert the instrument into the modified j-box faceplate and fasten it securely with stainless-steel bolts, nuts, and lock washers.

Step 6 Run the cables from the electrical connectors on the back of the instrument through the j-box and out through the Cable Clam. Fasten the faceplate to the j-box with the provided stainless-steel screws. If you're running the cables through the deck, use another Cable Clam for a watertight through-deck connection.

Step 7 Mount the j-box to the coaming or bulkhead. Use the four reinforced mounting tabs provided at the corners of the j-box. If you are mounting the j-box on the steering-pedestal railing or any other rail-type location, rather than the cockpit coaming, you can attach the j-box to a Ram-Mount fitting and then attach the adjustable-angle Ram-Mount to the rail.

The j-box pod is an attractive, versatile, protective, low-cost solution for mounting electronic instruments in the open. I was particularly pleased because by using this technique I avoided cutting another large hole in my cockpit.

Rich Ian-Frese has a background in research engineering and computing. His wife, Cat, is a primary school teacher. They spent 10 years refitting their Tayana 37 cutter, Anna, *for long-distance voyaging, with Patagonia in mind. In 2007, they took a one-year sabbatical and completed an 11,000-mile North Pacific loop. In 2008, they did another loop of 2,500 miles that included a visit to the ice and outer islands of southeastern Alaska.*

The foam gasket around the cover ensures that the junction box is waterproof.

In the finished installation, the box almost looks as though it came with the control head.

Rich has a new autopilot control mounted in a convenient spot and he doesn't have to worry about a big hole in his cockpit coaming.

Weatherproof junction boxes

After looking at commonly available j-boxes, I decided to go with a Carlon brand molded, non-metallic junction box that is UL 746C listed with a NEMA 6P rating. That's important because the j-box is manufactured from a PVC thermoplastic molding compound and has a foam-in-place gasketed cover attached with stainless-steel screws. These rugged enclosures offer the corrosion resistance and physical properties you need for applications in the ocean environment.

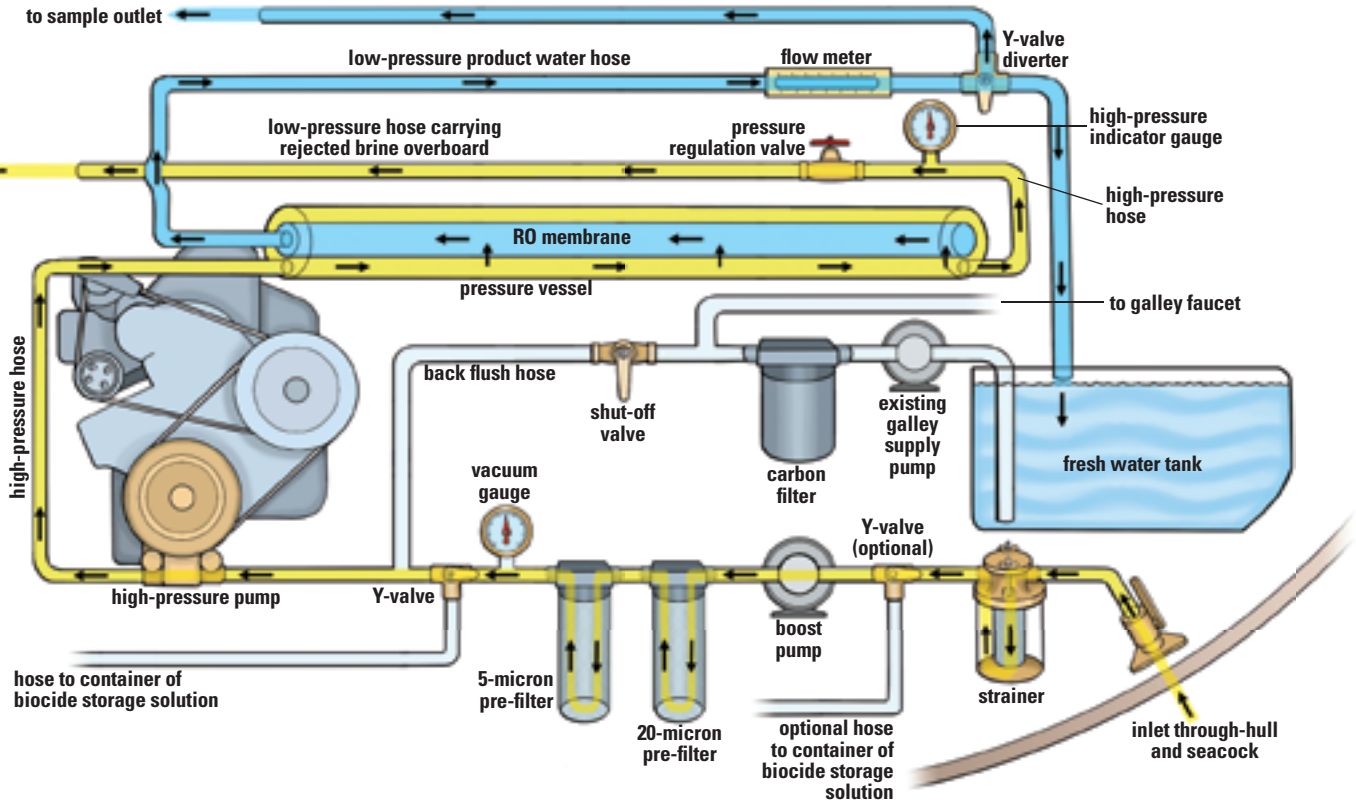
Type 6P enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection for the enclosed equipment. These boxes are impervious to dirt, hose-directed water, water entry during prolonged submersion at a limited depth, prolonged UV exposure, and external ice formation.

Under UL 746C, sample enclosures are exposed to 720 hours of twin-enclosed carbon-arc or 1,000 hours of xenon-arc weatherometer conditioning, water exposure, and water immersion for seven days at 70°C.

If, after these extensive exposure tests, the enclosures meet the UL standards for flammability, mechanical impact, and mechanical strength, the product earns the F1 rating, designating that the enclosure has met UL standards and is suitable for outdoor use.

How to make a water

The less costly route to water independence



FRITZ SEEGERS

A watermaker can be purchased "in a box" or assembled from individual components. This diagram shows the flow path for seawater and product (fresh) water through each piece of the puzzle.

When we decided to transit the Panama Canal and head across the Pacific, we knew we would face a problem that had cropped up occasionally during our years of Caribbean cruising. *Caribee* is a 1968 Nicholson 32, an excellent sea boat and a great little cruiser. Her only serious flaw for long-distance cruising is one shared by most compact boats: limited water storage. So when we committed to a major refit before this cruise, installing a watermaker was high on the list of projects.

We wanted a robust system built from non-proprietary components that could be purchased from industrial suppliers in any major country and at a price that wouldn't wreck the cruising fund. As we started the project research, we realized that watermakers are not really the esoteric devices we had supposed. They are, in fact, little more than a collection of pumps, hoses, valves, filters, and connections much like any other water system. OK, one of the filters is pretty high-tech and the pressures are higher than those on common plumbing arrangements, but the principles are essentially the same. We could build a system that met our needs without using too many parts that had that expensive little word "marine" attached to their names. (For another version of building your own watermaker, see *Good Old Boat*'s January 2003 issue.)

How it works

In its most basic form, a reverse-osmosis (RO) watermaker consists of a high-pressure pump that delivers seawater to a specialized filter element and housing (the membrane and pressure vessel) that removes the salt. A hose carrying seawater enters the pressure vessel and two hoses exit it, one carrying the product water at low pressure and the other carrying the rejected seawater. A flow-restricting valve on the seawater exit hose creates high pressure on the seawater side of the membrane, forcing some of the water through the membrane pores (the product water) while the salt and other impurities are blocked from passing.

maker

PART ONE

by Randy Baker

That's the whole concept in a nutshell: just a pump forcing seawater through an extremely fine-filter membrane (on the molecular level) and removing the salt. The primary conceptual difference between this and any ordinary filter is that only a portion of the liquid passes through the membrane and the rest is rejected (and carried overboard as higher-salinity brine). In an ordinary water filter, all the water passes through the element and only particulate matter is removed.

Sourcing the parts

That's the theory, but building a workable system will require several more components. Everything you need is commercially available from a variety of outlets, but sourcing components may be the most time-consuming part of the project, especially if you're intent on getting the most for your money, as I was. While several good suppliers exist, it is seemingly impossible to find a single source that carries most of what you need at a competitive price. Typically, a vendor will have some of the required parts at a good price, but other parts will be expensive or unavailable. Others may have just the part you're looking for at a bargain, but it may be difficult to find that out. The sources I've provided should help, but be prepared to spend time comparison-shopping, and even scrounging a bit, to uncover the best values. Don't forget to check eBay.

Power for the pump

You'll get the most bang for your buck by powering the high-pressure pump with your engine. Driving the pump with a V-belt off the propulsion engine is a simple and elegant solution. It's also possible to use a DC motor of 12-, 24-, or higher voltages or a 120- or 240-volt AC motor. If you do this, however, it will be an electrical-energy-intensive enterprise. Output may decrease substantially, especially if you use a small 12-volt motor in an effort to reduce electrical draw. Unless you have an abundance of energy (from solar or wind sources, for example) or are already running an AC generator, it doesn't make sense, except where mounting issues require it.

The system I describe is belt-driven. If you want to drive your pump electrically, you can find motors suitable for the task at most electrical supply outlets. It's then a matter of installing a coupling (often available as an option from pump manufacturers) and wiring the motor. One advantage of powering the high-pressure pump electrically is that it allows the safe use of a simple needle valve for pressure regulation. More on this later.

Follow the water flow

The easiest way to understand how the system works is to visualize the path the water takes as it reaches each successive component. The seawater enters through a standard through-hull and seacock arrangement. It's best to use a dedicated through-hull so as to prevent any possibility of water starvation or air intrusion. If you want to install a system without hauling the boat, you could tee off an existing inlet and add a dedicated through-hull at the next haulout. Just make sure the flow is not restricted and no fitting on the same circuit is opened to the atmosphere while the watermaker is running. This could allow air to be pulled into the system and damage the high-pressure pump. For the same reason (and to prevent any floating oil from entering) the inlet should be well below the waterline at all angles of heel. A through-hull of ¾-inch diameter is adequate and should be considered a minimum size.

The hose leading from the through-hull to the next element, a raw-water strainer, can be ordinary clear fiber-reinforced marine hose or any other good quality hose suitable for marine plumbing applications. The strainer should be a screen-type unit that can be opened for cleaning. Two good choices are the Shurflo models 253-221-01 and 253-220-01. Both use ¾-inch connections.

Boost pump

Another length of the same type of hose leads from the strainer to the boost pump, a small 12-volt pump of either the impeller or centrifugal type. It should deliver a minimum of 5 gallons per minute to provide a safety margin above the high-pressure pump's flow requirements. Two suitable models are the March Pumps model 809-BR-HS-C-12, delivering 7.2 gallons per minute and the Jabsco Water Puppy model 18660-0121, rated at 6.3 gallons per minute. Of the two, the Jabsco is considerably more affordable.

***Caribee*'s watermaker uses the engine to drive the high-pressure pump, top of page. The 12-volt DC boost pump, below, ensures that a steady supply of raw water flows through the system.**

To protect the delicate (and expensive) membrane from contamination, the seawater passes through two pre-filters before it enters the high-pressure pump, above. High-pressure pipe fittings, below, are a very different species from their low-pressure counterparts.

You can eliminate a boost pump from the system if you're certain your high-pressure pump will always be below the waterline at all angles of heel. To safely skip this component, you must make sure all fittings between the through-hull and the high-pressure pump are completely airtight so air cannot enter the system and cause pump-damaging cavitation. Even if you think you don't need a boost pump, it will prove useful in clearing the pre-filter housings of residual air following filter replacement.

Some designers recommend installing a Y-valve diverter downstream of the raw-water strainer and upstream of the boost pump. This allows using the boost pump to flush, clean, and pickle the membrane. This is not a bad idea, and probably should be done as a way to provide a flushing option, but I prefer to place a Y-valve downstream of the pre-filter housings (described next) and use the high-pressure pump for cleaning and pickling. In this case, the existing galley pressure-water pump (if you have one) would be plumbed for use in routine back-flushing. You can have both options available by simply installing both Y-valves.

Pre-filters

After leaving the boost pump, the water travels through another length of the same type hose to two sediment pre-filters. I like standard 10-inch housings and filters, which are commonly available and inexpensive. The Wateranywhere company offers standard clear-plastic filter housings with ¾-inch connections. The first housing will be fitted with a 20-micron filter element and the second with a 5-micron element. The 5-micron filter is the important one for protecting the membrane, but the 20-micron element will take most of the abuse and become clogged faster. Use pleated-polypropylene filters in preference to the spun variety, because they have more surface area and can be cleaned several times before they need to be replaced. Wateranywhere has standard 10-inch, 5-micron, pleated-polypropylene cartridges and 20-micron blown-polypropylene cartridges.

Vacuum gauge

Immediately downstream from the second pre-filter is the place to fit a vacuum gauge. While not required equipment, it will alert you when the pre-filters are starting to become clogged or your feed-water supply is restricted for any reason. These are available from suppliers of hydraulic and industrial equipment.

Just downstream of the vacuum gauge (if fitted) is the place to install the Y-valve diverter I referred to earlier. This will allow you to attach a length of hose leading to a container filled with storage or cleaning solution.

High-pressure components

The next length of standard hose leads to the high-pressure pump. That's the end of the line for the low-pressure components (for now), and this is where things start to get more expensive.

There are many choices available for the high-pressure pump. What you'll be installing is some brand of triple-plunger pump that can supply a minimum flow of 3 gallons per minute at a minimum pressure of 800 pounds per square inch (psi). The pump should be capable of considerably higher pressures (1,200 psi or higher) so it isn't operating near the limit of its capacity and to allow for wear. This is the same general type of pump used in all sorts of industrial applications, including pressure washers and car washes. You can spend a lot of money on this pump but you can also buy one at a reasonable cost that will get the job done (see "Pressure pump choices," page 37).

I purchased locally a slightly used Annovi Reverberi forged-brass pump that delivers three gallons per minute at 1,500 psi with a maximum pump speed of 1,750 rpm. It was already fitted with a clutch-and-pulley assembly, but I did see on eBay a remanufactured clutch/pulley combo with a 7-inch pulley, designed for a 24-mm shaft.

High-pressure hose

The hose between the high-pressure pump and the inlet fitting of the pressure vessel should be rated for pressures of at least 1,300 psi. Quality hose of this strength has a minimum burst pressure of 5,200 psi. There is nothing wrong with using higher-pressure hose, if that's what your local hydraulic hose supplier stocks. Hose rated SAE 100R2AT is reinforced with two braids of high tensile steel, providing excellent abrasion resistance. Hydraulic equipment suppliers are also sources of fittings, couplings, and gauges. All such parts should be stainless steel, bronze, or even brass, but not steel. Gauges should be rated for corrosive liquids.

It's a good idea to buy your main high-pressure components first (pump, pressure vessel, and pressure-regulation valve) and take them with you to a local hydraulic equipment supplier to ensure that couplings and parts you buy will fit together properly. If you don't have

“In warm seawater of average salinity, the system will produce about 23 gallons per hour with one 40-inch membrane.”

a well-equipped supplier in your area, there are many online sources (see “Resources,” page 38). Hose prices can vary widely, but should range between $2 and $5 per foot.

Membrane

Next comes the pressure vessel. This long slender tube, rated for a pressure of 1,000 psi or higher, houses the membrane. It comes with end-caps that have fittings for the membrane on the inside and for the hose connections on the outside. All connections use O-rings to ensure leak-free seals. Most seawater reverse-osmosis pressure vessels are constructed of fiberglass-reinforced plastic (FRP) or some similar composite material. I’ve heard of homemade pressure vessels made from heavy-gauge stainless-steel pipe but have never met anyone who used one.

The most efficient size for a typical sailboat installation is the 2½-inch by 40-inch size. If you have to use two 21-inch units, it will cost you almost twice as much for the same output. Remember, even though the unit is about 42 inches long on the exterior, it’s narrow and, for the price of some extra hose, you can mount it anywhere. You can almost double the output with an additional pressure vessel and membrane. In warm seawater of average salinity, the system will produce about 23 gallons per hour with one 40-inch membrane and about 43 gallons per hour with two.

Wateranywhere sells a complete FRP pressure vessel. There are several membrane manufacturers, including Hydranautics, Koch, AMI, and Filmtec (Dow Chemical). I continue to have outstanding service from

On this end cap of the pressure vessel are the inlet for high-pressure seawater (stainless steel) and the outlet for product water at low pressure (plastic).

Pressure pump choices

One of the main determinants of the cost of the high-pressure pump is the material from which the pump manifold is constructed. Stainless steel is the most expensive but not necessarily the best. It’s prone to crevice corrosion and electrolysis when in contact with seawater, especially stagnant seawater. Bronze is probably the best but it’s relatively expensive. Two models from Cat Pumps, the 277 and 271, are often used in reverse-osmosis applications. BPH Pump and Equipment offers the bronze-alloy model 277 3FR7 for $1,071 and the stainless-steel model 271 3FR1 for the attention-grabbing price of $1,852 — about the cost of the entire watermaker I propose building. It is possible to find discounts, but you won’t be likely to use the name Cat Pumps and the word cheap in the same sentence.

There is a third option, and the one I chose: pumps fitted with forged-brass manifolds.

You can buy at least two or three brass pumps for the price of a single bronze Cat pump, making the question of longevity somewhat moot, in any case. General Pump builds model TT9111, featuring solid-ceramic plungers and a forged-brass manifold. It delivers 3 gallons per minute at 1,500 psi with a maximum pump speed of 1,750 rpm — ideal for engine-driven applications on a sailboat. When a 7-inch pump-pulley is matched to a 6-inch engine-pulley, you can operate the watermaker at any engine speed between 1,000 and 2,000 rpm. The pump uses a standard 24 mm, solid, keyed, drive shaft. General also supplies a matching electromagnetic clutch/pulley combination with a choice of pulley diameters. The TT9111 represents an excellent value and is readily available from several suppliers. It was recently offered by Delaware Sales and Service and by Pressure Washer Parts. Annovi Reverberi builds a pump with similar specifications available from Delaware Sales and Service. Other makers of suitable pumps include Giant and Comet.

Brass pumps, though, come with a big caveat: none of these brass pumps is rated for use with seawater.

Some believe brass to be an unsuitable material for a reverse-osmosis pump manifold, because when left in contact with seawater it can suffer dezincification. This is a process whereby the zinc component of the brass, being highly reactive on the galvanic scale, is selectively removed from the alloy, leaving behind a porous, copper-rich structure with little strength. This problem is preventable if you back-flush the system with fresh water *immediately after every use* (always a good practice regardless of the materials used).

There is no doubt that good bronze alloys are superior to brass but, when the price difference is factored in, it’s hard to justify buying a bronze pump. In the event that you find the pump’s service life to be inadequate, you can always replace it with a more expensive pump at a later date. I’ve used an Annovi Reverberi forged-brass pump for four years without problems, and know other sailors who have been using brass pumps for long periods with no evidence of corrosion or dezincification.

a Filmtec membrane, which still gives full production with minimal reduction in water quality after four years of almost daily use. Wateranywhere sells the Koch, the AMI, and the Filmtec models.

Pressure gauge

Two hoses exit the pressure vessel: the product-water hose and the seawater hose. The seawater hose is another section of hydraulic hose, and leads first to a pressure gauge and then to the pressure-regulation (flow-restricting) valve. Gauges of this sort should measure pressure up to at least 1,000 psi and are available from suppliers of hydraulic and industrial equipment.

Regulation valve

The regulation valve must be rated for pressures of at least 1,000 psi. A higher rating is better in order to provide a safety margin. Cat Pumps valve model 7070 meets the requirement but, like their pumps, is expensive. Both Delaware Sales and Service and Pressure Washer Parts offer this valve.

You can also use a simple needle valve but there is a danger in this for an engine-driven system. Once the needle valve has been adjusted to maintain the operational pressure of 800 psi, any substantial increase in engine speed can over-pressurize the system, potentially damaging the membrane.

For the difference in price, you might decide it's nonetheless worth the risk and, if you're very cautious, it shouldn't pose a problem. I decided to take the risk. Most suitable needle valves sell for less than $50, so you could afford to buy two membranes for the difference. Pressure Washer Parts sells a brass needle valve using a stainless-steel needle and Grainger Industrial Supply sells an all-316 stainless-steel model. If you use a single-speed electric motor to drive the pump, the constant flow rate means you can use a needle valve without the risk of over-pressurizing the membrane.

The pressure-regulation valve is the last stop for the hydraulic hose. An ordinary low-pressure hose carries the rejected brine away from the valve and overboard via a through-hull, normally about ⅝-inch and made of plastic, located above the waterline.

Product-water path

The product water exits through a low-pressure hose that leads first to a flow meter. The meter should have a measurement scale a little higher than your maximum expected output. I found a Dwyer Instruments model RMB-84-SSV panel-mounted meter reading to 40 gallons per hour on eBay (Dwyer Instruments also sells direct to consumers from its website). If you plan to use two membranes, you should buy a meter reading to at least 50 gallons per hour.

The last part is another Y-valve diverter that lets you direct the fresh water (via ordinary marine-grade drinking-water hose) to either the sample outlet or the freshwater tank. After the watermaker has run for a couple of minutes, the water should be drinkable. You can then divert the water away from the sample outlet and to your tank or tanks.

For a convenient way to back-flush the system with fresh water, you can tee into your galley pressure-water plumbing at a point downstream from the carbon filter. If you don't have a carbon filter in the system, you'll need to install one. You can use the same kind of housing that is used for the pre-filters. Wateranywhere sells standard extruded-carbon filter cartridges. Run a hose from that point to a shut-off valve and on to another tee located in the low-pressure seawater supply hose at a point between the pre-filter housings and the high-pressure pump. When that valve is opened, fresh, carbon-filtered water will flow through the system, flushing away the residual seawater.

Brimming with water and pride

If you think this sounds like a complex project, it's probably because many of the components are unfamiliar to you. Even

Resources

Here are some alternative sources for parts listed in the table.

Flow meter
Dwyer Instruments
www.dwyer-inst.com

High-pressure pumps
www.bphpumps.com
Delaware Sales and Service
www.deindustrial.com
www.pressure-washer-parts.com

Hydraulic hose and components
www.abbottrubber.com
www.hosexpress.com
www.discounthydraulichose.com

Needle valve
Grainger Industrial Supply
www.grainger.com

though there is "some assembly required," it's really not very different from other plumbing projects once you have gathered all the pieces of the puzzle together. Some of the parts are complex, but you don't have to understand how they work to connect them together into a reliable system. If you need motivation, check the prices of ready-to-install watermakers now on the market, and calculate your savings. Remember, if you order a complete package, you'll still have to do most of the same work to get it installed. When you're sitting in that remote anchorage with your water tanks filled to the brim, you may not be able to resist feeling a little smug about the high-output system you built yourself — for a relative song.

Randy and Cheryl Baker have been living aboard and cruising Caribee, *their 1968 Nicholson 32 sloop, since 1992. They completed a major three-year refit and upgrade in Trinidad in 2004. After 16 years of cruising the Caribbean, they transited the Panama Canal and sailed across most of the Pacific in 2008.* Caribee *is now in Tonga.*

Cost breakdown

Component	Quantity	Price	Cost	Source
Low-pressure components				
Through-hull, ¾-inch	1	$30.99	$30.99	www.defender.com
Ball valve (Groco)	1	$34.99	$34.99	www.westmarine.com
Hose, ¾-inch (per foot)	12 feet	$1.99	$23.88	www.defender.com
Raw-water strainer Shurflo 253-220-01	1	$20.99	$20.99	www.defender.com
Boost pump Jabsco Water Puppy 18660-0121	1	$119.00	$119.00	www.amazon.com
LP valves	4	$20.00	$80.00	plumbing supply
LP fittings	varies	various	$35.00	plumbing supply
Filter housings H-H34XCE33	3	$10.00	$30.00	www.wateranywhere.com
Vacuum gauge	1	$30.00	$30.00	hydraulic supply outlet
Filters				
H-FS105PCAMI	1	$4.33	$4.33	www.wateranywhere.com
H-F1020CF	1	$3.00	$3.00	www.wateranywhere.com
H-F2510AC	1	$7.00	$7.00	www.wateranywhere.com
High-pressure components				
HP pump General Pump TT9111	1	$240.95	$240.95	www.pressure-washer-parts.com
HP fittings	7	various	$75.00	hydraulic supply outlet
HP hose (per foot)	9 feet	$3.00	$27.00	hydraulic supply outlet
Pressure vessel PV2540AM1000	1	$405.00	$405.00	www.wateranywhere.com
Membrane Filmtec SW30-2540	1	$187.50	$187.50	www.wateranywhere.com
HP gauge	1	$45.00	$45.00	hydraulic supply outlet
Needle valve ADI-130	1	$39.44	$39.44	www.pressure-washer-parts.com
Flow meter Dwyer Instruments RMB-84-SSV	1	$26.73	$26.73	www.ebay.com
Clutch and pulley*	1	$79.95	$79.95	www.ebay.com
Engine mount*	1	$100.00	$100.00	welding/machine shop
Engine pulleys*	1	$75.00	$75.00	machine shop
TDS meter*	1	$16.80	$16.80	www.ebay.com
Biocide mixture*	1	$25.00	$25.00	www.chemistrystore.com
Misc. cost, shipping, etc.			$125.00	
Total cost			**$1,887.55**	

*These items are described in Part 2 of this article.

This long tube, facing page, top, is the pressure vessel that contains the membrane. For the price of some tubing, it can be mounted almost anywhere on the boat it will fit. When the watermaker is running, the flow meter shows the rate at which product water is flowing into the tank, facing page, center. Fresh water used when back-flushing the system should first pass through a carbon filter to remove any contaminants that might damage the membrane, facing page, at bottom.

See the July/August issue of *Good Old Boat* for the second and final part of this article, in which Randy provides pointers on installing the watermaker's components, commissioning it, and then operating and maintaining it.

Making your own

A custom anchor sprit

Meticulous planning ensures a perfect anchor platform

by Richard Smith

When Bruce King designed the Ericson Cruising 31, he gave it a sharp entry. As a result, the deck at the stemhead is rather skimpy. And, without the bowsprit of its cutter-rigged sister ship, the Ericson Independence, the bow of the Cruising 31 seems to lack definition. Some owners of the 31, myself included, believe an anchor sprit or platform would make a practical and good-looking addition to this handsome boat.

A platform keeps an anchor off the deck and forward of the forestay and roller-furling drum, simplifying and improving anchor handling. It can provide a foothold when changing headsails or checking anti-chafing gear on the bow roller on a dark and windy night, and it's something to get a foot on when leaning over the roller to clear away seaweed and sort out other surprises that come up with the chain. It also helps prevent the anchor line from riding against the hull.

A platform can make handling docklines safer because it keeps the deck clear of anchor clutter and clean of seaweed and mud. A well-designed anchor platform can also provide a good perch from which to stare into fog or watch porpoises crossing your bows.

I built an anchor platform for my Ericson 31, *Kuma*, about 10 years ago. It's been tried and tested in almost every imaginable situation and I'm pleased with it. If I did it again, I'd do it a little differently, but not much.

Same boat, different approach

My friend Gary Stoop, with whom I frequently cruise in tandem, also owns an Ericson Cruising 31 and has eyed my sprit for years. He finally decided to build one for his boat, *Imagine*, but he decided he'd make a few changes. It would have two rollers, larger and more strongly mounted than mine, and he'd leave off of the stainless-steel hold-down strap, the massive wooden mooring cleat, and the manual windlass that he felt spoiled the teak platform. Because the anchor would be well snugged-up when under way, he would eliminate the sacrificial wooden cleats I'd fitted to protect the sprit from getting banged up. Gary's platform would be a bit more elegant — rather more in keeping with the rest of the boat.

When setting out to make a good old boat better, it's well to look at examples of the sort of thing you have in mind, to assess what's right and, certainly, what's wrong with others' solutions to the same problem. Most of our boats have been carefully designed to meet the needs of good sailors so, when planning alterations, the first rule is to do no harm.

Learning by looking

With this in mind, Gary and I began to walk the docks of local marinas looking at various ways of stowing anchors. Every bow had a lesson. Most boats over 30 feet or so had rollers fitted to one or both sides of the stemhead. Some had tiny rollers that could do little to reduce friction and wouldn't do much to prevent the anchor from slamming against the hull when under way.

Some were over-designed — heavy and substantial enough to have served much larger boats — but most retrofitted platforms were flimsy and ill-considered. Many had awkward or tortured ways of getting the anchor chain and line below-decks. Others carried an off-the-shelf roller unit that appeared hastily stuck on and poorly positioned for best service. Some were badly mounted with poor lead angles, making chafing inevitable. Others showed little evidence of ever having been used, testifying to shallow thinking and corner cutting. But among these what-not-to-do examples, were many good platforms that provided ideas and inspiration of the best kind.

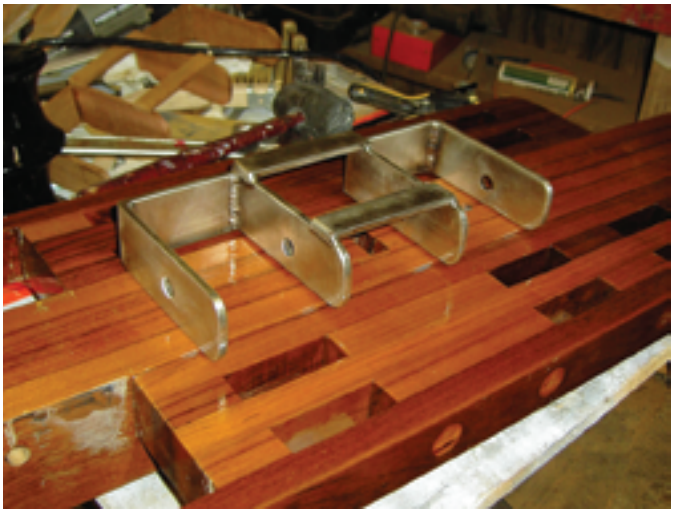
It was easy to lay a tape measure on the various platforms jutting over the dock. We made sketches and took a lot of photographs, from close up and from a distance to capture the effect of the platform on the profile of the boat. Gradually, after weeks of scrutinizing the work of others and perusing books and magazine articles, Gary began to form an idea of the sort of sprit he wanted.

After studying the essential geometry, at top, and working through a series of mock-ups, above, Gary eventually built the anchor sprit that he felt his Ericson Cruising 31 deserved, opposite page. It compliments the boat's profile, gives him a secure working platform, and is sturdy enough to meet any expected conditions.

Stout and finely styled

His 35-pound Delta anchor would be held snugly up against one of the two large rollers at the end of a stout teak platform. For reasons of strength as well as appearance, the platform would project as little as possible beyond the stemhead. The platform would simplify and coordinate the placement of deck hardware as much as possible while ensuring good lead angles and minimizing chafe. And while he was at it, Gary would install a power windlass. Apart from strength and convenience, Gary's paramount concern was how the new anchor sprit would conform to the fine lines and general character of the Ericson Cruising 31.

With the aid of many carefully drawn sketches setting forth critical dimensions, Gary built several plywood mock-ups of the projected platform — about six in all. Each one addressed matters of function and appearance in different and increasingly specific and detailed ways.



For looks and durability, Gary built the sprit of teak, at top, and stainless steel, middle, and the end result fits the boat to a T, at bottom.

He made the first mock-up of scrap pieces of door-skin plywood stapled together. It was his first attempt to deal with two exceptionally large rollers. Earl Hinz, in the definitive *The Complete Book of Anchoring and Mooring*, holds that rollers should never be smaller than 3 inches in diameter. Gary would use 4-inch diameter Delrin rollers. In comparison to rollers used by most other boats of a similar size along the docks, these were huge.

The first mock-up satisfied all practical problems but was a visual disaster: it made poor *Imagine* look like an anchor-delivery system. It took several more mock-ups before Gary could match the extraordinary-sized roller with all his other requirements.

Final mock-ups brought together correctly dimensioned pieces of wood and helped him decide exactly how the platform would lie on the deck and where fastenings and hardware, such as the bronze mooring cleat (earlier thoughts about a samson post were abandoned), chocks, and bails would be located. These mock-ups also permitted a more detailed appraisal of the platform's appearance. Gary determined the locations of new pulpit pads after careful study to ensure that all stanchions and rails were placed correctly.

Crafted of teak

Gary based the overall dimensions of the platform largely on good examples, common sense, and what he thought looked right and built it from lengths of 1 x 1½-inch teak. The overhang was modest and didn't seem to require additional bracing to support the considerable loads the anchor and chain can impress on it. He separated the individual teak pieces with shorter lengths of the same stock, then glued them with epoxy and bolted them together to form a solid unit. He recessed and plugged the bolt heads and nuts and took care to ease and smooth all edges, particularly where the rode would ride when the boat sheered to the anchor and on the underside, where abrasion can occur.

Specially fabricated stainless-steel channels house the Delrin rollers and have hefty strap bails welded to their tops to keep the rode from sliding or lifting off the rollers when the boat pitches. The platform is mounted firmly to the deck by the four bolts that secure the mooring cleat and forward by through-bolts that anchor the deck assembly and toerail to the hull. All bolts have ¼-inch aluminum backing plates under the deck. A retaining pin near the anchor's fluke end, along with a pin through a U-bracket attached to the platform at the after end of the shank, prevents any movement of the hook when it's stowed.

The platform projects beyond the stemhead to meet functional requirements but it also extends and accentuates Bruce King's gracefully drawn sheer. The Delta's flukes continue the line of the clipper bow upward, and the forward edges of the flukes line up with the top and middle rails of the pulpit. Even the bails are angled to echo the pulpit's geometry. Such meticulous attention to details of form and function has made Gary's anchor sprit an exceptional addition to a good old boat.

***Richard Smith** is a contributing editor with* Good Old Boat. *He has built, restored, and maintained a wide variety of boats and sailed them on Michigan lakes and Oregon reservoirs and from harbors and mud berths in the Irish Sea. He and his wife, Beth, sail* Kuma, *their Ericson Cruising 31, on Puget Sound.*

Inspect and be safe

For peace of mind, check what's out of sight

by Bob Tigar

Some of the mechanical components on your sailboat are so reliable you probably don't give them a thought. But don't assume they'll last forever. Take an hour to inspect these items to ensure they are functioning properly.

Seacocks – Every below-water through-hull connection should be fitted with a seacock. Seacocks keep seawater on the outside if a hose should fail. If you haven't exercised yours (from open to closed to open) recently, you should. If a seacock is stiff, work the handle back and forth gently until it moves the full distance. When the handle is in line with the seacock, the valve is open. When it's perpendicular, it's closed. You may be tempted to add an extension to the handle for greater leverage. That's not advisable. The extra leverage could cause the handle to snap off.

When your sailboat is out of the water, you can disassemble the valves and lubricate them with waterproof grease to ease the movement.

Y-valves – These valves are used to divert liquid from one place to another (in waste lines, for example, to divert sewage overboard or to your holding tank). Like seacocks, these valves can stick and should be exercised from time to time . . . gently.

Engine control cables – These are the shielded cables that run from the shift lever and throttle controls to your transmission case and engine fuel pump (diesel) or carburetor (gasoline). If your shift or throttle is getting stiff, the cable may be due for replacement. Run your hand over the cable cover (usually red plastic). Check for cracks, abrasions, or other deformities. Moisture may be causing deterioration to the cable inside the cover. If a cable seizes up, you'll be unable to work the cockpit control. Replacement cables are not expensive.

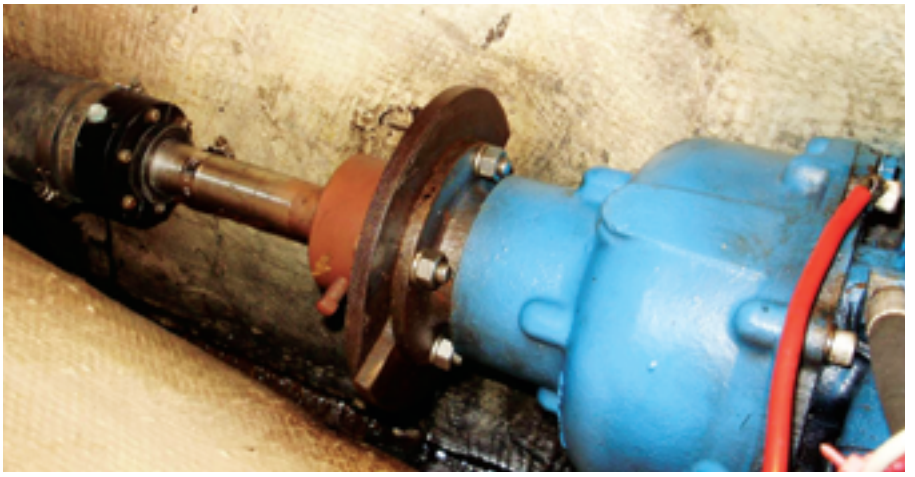
Hose clamps – Even a small sailboat has a few dozen hose clamps securing hoses to barbs on engine cooling lines, fuel lines, water lines, and cockpit drains. You probably check the ones that are most visible. But look around for the ones hiding behind and underneath obstructions and equipment. Look for hidden clamps in the engine compartment. Grab an appropriate-sized nut driver and torque them down. Don't use an extra-long extension on a socket set to tighten the clamps. That much tension isn't necessary and could snap them.

While most hose clamps have stainless-steel straps, the tightening screws are not likely to have been made of stainless steel. These screws can corrode and rust through. While 100-percent stainless-steel hose clamps are available, they cost four to five times as much as regular clamps. They may be a wise investment for those located in hard-to-access locations. If you have any suspect clamps, replace them with new ones.

Even Marelon seacocks get stiff, at left. This one is in the open position with the handle vertical. Exercise it by moving the handle to the 90-degree position. Note that the screws on the two clamps securing the hose oppose each other. The handles on this Y-valve line up with the direction of the fluid flow, center. Exercise it toward the direction of the alternate flow, an approximate 120-degree rotation. One of the front engine mounts, at right. A bolt above the bracket secures the assembly. Remember to torque the lag bolts that hold the engine mount to the hull.

Hoses – Run your gloved hand up and down the rubber hoses that supply seawater to the engine and dispose of it. Check the exhaust hose and any hydraulic hoses. Investigate any abrasions, bulges, or stiff sections. Replace suspect hoses.

Running lights – Your running lights probably get minimal use. From a safety and legal aspect, however, they are important. Lack of use and moisture can cause their contacts to corrode. Remove the bulbs, spray a little WD-40 into each socket, reassemble, and test.



The two halves of the shaft coupling are secured together with four bolts. Use a feeler gauge to check the space between the two halves at 90, 180, 270, and 360 degrees.

Engine mounts – These are the posts that hold an inboard engine to the hull. If your engine seems to be bouncing around a bit, they might be loose. There are usually two at the front of the engine and two more toward the rear. There are two nuts on each post. The lower nut supports the engine. The upper nut locks it down. Torque the upper nut clockwise. As long as you're there, tighten the bolts that secure the mount to the hull.

Shaft coupling – Two plates secure the propeller shaft to the transmission. One side of the plate is secured to the transmission. The other half is secured to the shaft. The two halves are bolted together. Make sure the halves are bolted together tightly. Check the gap between the two halves with a feeler gauge at 90-degree intervals. The width of the gap should vary by no more than 0.001 inch for each 1 inch of the diameter of the coupling (a 4-inch coupling should not vary by more than 0.004 inch on each measurement). A large variation in this gap might mean the engine and shaft are not properly aligned, which can cause vibration and other problems.

Miscellaneous – While you're poking around, look for bolts, nuts, and screws that that vibration may have loosened over time. Put a wrench or screwdriver on every one you can spot to make sure key parts (like those that hold the engine to the transmission) are tight. Make sure a lock washer is properly installed.

Investing a little of your time inspecting these mechanical components will pay off in a big way by ensuring you have fewer hassles and problems when you're under way.

*Bob and Joyce **Tigar** began their marriage and sailing on small inland lakes in the Midwest in the late 1960s on a board boat. They next moved to larger sailboats on Lake Michigan. Since moving to southeast Florida 12 years ago, they sail their Morgan Out Island 33,* Diversion, *on annual trips to the Bahamas, adventures in the Florida Keys, and weekend excursions around southeast Florida.*

Changes in course

A circumnavigator adjusts to life's shifting winds

by James Baldwin

James Baldwin trims his sails to fair winds on a passage from the Virgin Islands to Georgia.

Last spring, a friend of ours sailed from our adopted homeport of Brunswick, Georgia, on the first leg of a planned circumnavigation. For three months, I worked alongside Kirk, preparing his Alberg 30, *Salsa*, for the voyage. We replaced the sails, rigging, and chainplates, installed new radar, SSB, windvane self-steering, anchor windlass, and solar panels, and we completed dozens of other jobs to make his boat more safe, functional, and comfortable.

As we watched *Salsa* hoist sail for the first leg of her journey to Panama, I thought back to a time 24 years earlier when I began my first circumnavigation aboard my Pearson Triton, *Atom*. The contrasts between *Salsa*'s and *Atom*'s stories were many. While *Salsa* carried most of the equipment today's sailors consider essential — from rescue beacon to refrigeration — *Atom*'s simplicity reflected her skipper's extremely tight budget. *Atom*'s electronics consisted of a VHF radio, depth sounder, and an erratically functioning radar detector. Her newest sail was 15 years old and patched. She lacked even the basic comfort of a companionway dodger. I pieced together her oversized rigging from a boatyard's junk bin.

James and Fernando take Fernando's Triton, *Pajaro*, on a shakedown sail.

Before I had the nerve to set out on a circumnavigation, I sailed *Atom* thousands of miles over four years, many of them in the course of several long solo offshore passages.

Salsa's skipper had much less experience and hired me to fast-track his project. Ideally, he would have taken more time for shakedown trips, but he had started sailing 10 years later in life than I had, and I understood his desire to get under way right away before any more time was lost and life intervened to frustrate his plans. Yet, we were identical in our desire for an adventure under sail, to captain our little ships as far as we could, harnessing the wind to discover a new life . . . a purposeful voyage.

Back to the nest

In 2002, I came home from two circumnavigations having fulfilled my youthful dreams, including finding my wife. Mei summed up my situation with the old Chinese saying, "Tired bird returns to nest."

It was not so much weariness of travel but, rather, family obligations too long neglected and new goals that drove me ashore to acquire a house and start a small business. Suddenly I was navigating the thorny passages of a new life. To our previous low-cost life afloat we added monthly expenses for the house and shop, vehicles, tools, phone, and taxes. I was told to buy liability insurance before I could work and more insurance to keep my boat at the local marina. Buying insurance to protect other people is a strange concept I'm

still trying to grasp. Everyone tells me it's too late to go back to a system where people buy their own insurance to protect themselves from their own worries. It's no wonder sailors feel a need to break free from society from time to time.

Despite a busy shore life, we still sail — locally and on one or two long offshore delivery trips each year. After a months-long refit of an elegant 20-year-old Liberty 49 center-cockpit cutter, we recently sailed her from Georgia to the Virgin Islands, then brought her back home the following spring. Everything the owner needed or wanted for a comfortable passage was aboard this boat, from an icemaker to hot showers.

I would not have thought it possible but, on our nine-day return passage, mostly under spinnaker with light following winds and calm seas, not a drop of seawater landed on deck. This yachting style is seductive and a world away from the early years I spent living close to nature on *Atom*.

Less awe and respect

Today, people typically begin a voyage with a shortage of experience and a surfeit of equipment. Technology has taken away some of the awe and respect for the sea, though I suspect every generation has sung this same tune. Three years ago, I was happily reminded that there are, and will always be, exceptions to the rule. A young musician from Spain, named Fernando, contacted me for advice on his plan to come to the U.S., buy a fixer-upper Pearson Triton as I had done, and sail her home across the Atlantic.

A year later, he sailed his new boat here to Georgia for final fitting out on a budget as tight as mine had ever been. With few possessions and fewer excuses, his goal was a challenging adventure, rather than a comfortable routine cruise. Fernando crawled all over *Atom*, eyes wide and head filled with ideas to apply on his own boat. Since he had not a single dollar more than he needed, we exchanged labor. He assisted me with the varnishing on two customers' boats and I helped ready him and his boat for sea. It was as rewarding work as I'd ever had. He completed his solo passage to Bermuda and emailed me from the Azores, thrilled with the experiences of his voyage and eager to continue.

Fernando and *Pajaro* prepare each other for an Atlantic crossing.

From an earlier devotion to my own voyages, I find satisfaction in assisting others as they realize their dreams. Compared to those past trade-wind passages, I now sail in the latitudes of variables, changing life's course as the winds shift around me.

James Baldwin and his wife, Huang Huo-Mei, are based in Brunswick, Georgia, where they continue to fit out cruising sailboats for offshore passages. Their voyages and other boat-project articles are available on their website: <www.atomvoyages.com>.

Shearwater 28

Phil Bolger's take on a gunkholer is . . . different

by Allen Penticoff

Phil Bolger's small boat designs are quite unlike those of other designers. Not many builders would have the courage to put one into series production, but Bolger found a willing partner in Edey & Duff, which built his Dovekie and Shearwater 28. Our review boat, *True North*, is a Shearwater 28 owned by Nick and Gayle Scheuer of Rockford, Illinois, who have towed it to many great sailing destinations in the Midwest, East Coast, Canada, Texas Gulf Coast, and west coast of British Columbia.

Peter Duff and Mait Edey started out in 1968 building the Sam Crocker-designed Stone Horse in Peter's Mattapoisett, Massachusetts, backyard and living room. They went on to build 150 of the full-keel 23-foot cruisers and nearly 1,200 boats in all — from the tiny Fatty Knees dinghy to the Nathaniel Hereshoff-designed Doughdish, the Stuart Knockabout, and more recently, the handsome Joel White-penned Sakonnet 23 daysailer. In 1978 they introduced the Bolger-designed Dovekie, a 21.5-foot, 600-pound, extreme shoal-draft sailboat. The Shearwater 28 evolved from this design and E&D built 11 of them between 1985 and 1997. The partners sold the business to Tony Andersen (who owned three E&D boats) in 1987; in 2007, Harding Boat Works bought it from Tony's estate and continues to build boats in its Aucoot Cove facility under the name of Edey & Duff.

Design

The Shearwater 28 is a good example of Phil Bolger's "form follows function" design philosophy. Edey & Duff intended the Shearwater 28 to be a larger Dovekie. Both designs have kick-up rudders and twin retractable leeboards to get into the thinnest of waters and keep going to windward: 4 inches minimum draft for the Dovekie and 6 inches for the Shearwater 28. The hull form of the Shearwater 28 is more akin to a long canoe than a sailboat. The bottom is flat and turns sharply into flat topsides with no deadrise or rocker — not quite a sharpie but nearly so. The transom is heart-shaped and incorporates the engine mount. The shape gives a lot of initial or form stability but not a lot of ultimate stability. There is 660 pounds of water ballast or 600 pounds of lead (an option taken in half those built, including *True North*) to make the Shearwater 28 self-righting in a knockdown.

An unusual feature of both the Dovekie and the Shearwater 28 is a small bow centerboard. Originally installed to cure a lee helm problem with the Dovekie, the feature was retained in the Shearwater 28, where it is used for trimming and holding the bow into the wind, particularly in

Nick and Gayle Scheuer get a lot of use out of their Shearwater 28, *True North*. Here they are sailing on the wind with a reef in the jib and the windward leeboard raised.

The hatches are intended to eliminate walking on the deck; Gayle Scheuer emerges from the forward hatch, at left, to tend the mooring line at a raft-up. The stern of a Shearwater 28, at right, is a busy place, with outboard, fuel tank, boomkin, mizzen mast, mizzen sheet, main sheet, rudder, and control lines for the rudder's kick-up mechanism.

combination with the mizzen sail. Nick Scheuer removed the bow centerboard and trunk and glassed over the slot. Fellow owner Harry Mote, owner of the standard rig Shearwater 28, *Ardea*, ordered his built without the feature, finding it less useful than advertised and believing that it would hinder boat speed. Nick followed Harry's lead in adding 400 pounds of lead ballast to stiffen the boat.

Nick's boat is the only Shearwater rigged for headsails. The rest are considered cat yawls. The deck hatches provide access to running rigging on the mast and to ground tackle forward.

The Shearwater 28 has a sweeping sheerline at the hull-to-deck flange, and a dark hull shows it off very nicely against the straighter line of the flush deck. With a beam of 6 feet 6 inches and a weight of 1,200 pounds empty, the boat is well within legal trailering limits.

The hull and deck are a sturdy sandwich of ⅛-inch skins of unidirectional E glass and polyester resin either side of a ¾-inch Airex foam core. Together with additional flotation, the volume of the core makes the Shearwater 28 unsinkable. The bottom of the hull has extra laminations as the boat is designed and engineered to be beached and to sustain minimal damage from the occasional altercation with rocks.

The hull/deck joint has no mechanical fasteners; outward flanges on the hull and deck are stuck together with 3M 5200 and the joint is glassed over on the inside. This kind of outward-turned joint can be unkind to the topsides of other peoples' boats during a raft-up.

The rudder is wood encased in fiberglass. It retracts into a sturdy transom-hung fiberglass housing that serves as a short rudder even with the rudder blade fully raised. The aluminum mizzen mast attaches to the transom and the sail sheets to a boomkin clamped atop the stern.

Symmetrical wood and fiberglass leeboards give the boat a draft of 3 feet 4 inches when down. Weighted to drop, they can be set to varying depths with a stopper to hold the pendant. Nick and Harry modified their leeboards to provide a lifting foil, claiming better windward performance. Edey & Duff felt no such need, insisting that for maximum lift and resistance to leeway, both boards can be left down while sailing; they claimed the Shearwater 28 can be tacked through 84 degrees.

Shearwater 28

Designer: Philip Bolger
LOA: 28 feet 3 inches
LWL: 24 feet 9 inches
Beam: 6 feet 6 inches
Draft, board up: 6 inches
Draft, board down: 3 feet 4 inches
Displacement (light): 1,860 pounds
Ballast (water): 660 pounds
Sail area: 233 square feet
Disp./LWL ratio: 55
Sail area/disp. ratio: 24.6

On deck

Although Phil Bolger intended that the sails and ground tackle would be handled from the hatches, there are times when you need to walk on the cabintop. As there is no non-skid, you must take care when it's wet. A very large forward hatch lets you handle the ground tackle and docklines and, in the case of *True North*, the jib as well. Mid-deck is another large hatch intended to provide access to the mast. Both hatches have hinged, solid-fiberglass covers that can be removed quickly. The deck has two molded-in recesses to receive optional 30-watt solar panels.

Like the Dovekie, the Shearwater has a mid-cockpit fiberglass boom gallows to support the mast and sprit when lowered. This is useful for trailering, of course, but the spars can be easily lowered while under way, making it possible to pass beneath bridges with 6-foot or more clearance. The gallows/arch also serves as a foundation for a full-cockpit canvas enclosure that combines with the companionway dodger to make the cockpit an outdoor saloon.

A well aft accommodates a 10-hp outboard motor and its tank. The cockpit seats are exceptionally long and deep

Placing the portable toilet next to the galley is bad *feng shui*, but that's life aboard a camping cruiser. The molded fiberglass seat forward of the icebox is nicely contoured, at left. The interior is simple and utilitarian, but with the board folded down and the center cushion in place, a sailing couple has a comfy queen-sized berth, at right. Note the platform forward for standing on when handling the jib or ground tackle.

with high backs that make for comfortable sitting or sleeping. The self-draining cockpit is 8 feet 6 inches long by 52 to 58 inches wide with three lockers.

The footwell is just right for windward bracing and can be spanned with a filler board to make a queen-sized berth. The companionway has a very low sill and four weather boards. It's a handy spot to stand out of the breeze while sailing, with or without the dodger. There are no lifelines or pulpits.

Accommodations

Molded interior components line each side of the boat. They are stuck to the hull with 3M 5200 and pop riveted to the inner laminate of the sandwich hull. They incorporate the forward berth flats, a low, ergonomically shaped and quite comfy seat each side, a molded sink/galley/storage area on the port side, and an insulated non-draining icebox or optional 12-volt refrigerator on the starboard side.

Originally, four hinged, removable boards supported the 72 x 65-inch V-berth. Nick replaced these with a single reinforced plywood panel that makes going forward much easier. A small anchor locker below the forward hatch is accessible from the inside.

Two sliding drawers pull out into the cabin from under the cockpit seats, and there is some additional space below and forward of these drawers. Nick has located his portable toilet to starboard.

An electrical panel with circuit breakers and battery switch is to starboard on the bulkhead, while to port is a sort of medicine chest cabinet with a mirror. Headroom is only 49 inches under the companionway hatch and 46 inches at the galley. Crouching and crawling are necessary for getting about inside the cabin, but it has more than adequate storage for most gunkholing that a couple might undertake.

There is no ceiling or overhead cabin liner, just the painted hand-laid glass of the inside hull. With the three deck hatches open, the cabin is very light, fresh, and airy. Four screened opening ports provide good ventilation when the hatches are closed.

Rig

As unique as the hull is, the rig is equally uncommon on a boat of this size. The roachless main and mizzen are of a "leg o'mutton" style supported by an aluminum sprit in lieu of a boom. A "snotter" line at the forward end of the sprit acts as both outhaul and vang and is adjusted by moving it up and down the mast. Two reef points are provided on both sails. Depending on the boat, the sails may or may not have battens. Battened sails are furled conventionally, while those without battens furl to the mast.

The deck-stepped aluminum mast can be easily raised and lowered by one person. *True North* has upper shrouds and baby stays (for mast stepping), while the others in the fleet have only single shrouds. There are no spreaders or backstays and deadeyes, not turnbuckles, tension the shrouds. The sprit is well above anyone's head and much safer than a standard boom. There are no sheet winches for the mainsail or jib. Halyards and snotter controls are handled from the mid-hatch, except on *True North* where some lines have been led aft to the cockpit. In brochure photos of the Shearwater, no lines lead from the cockpit forward because of the cat rig. The mizzen's lines are on the mast and boomkin.

Depending on the tack, the sails may press up against the sprit, but owners say chafe is not a problem and performance is not affected. At only 29 square feet, the mizzen is not intended to provide much drive except off the wind. Its contribution is more for balance and as a steadying sail at anchor. The 204-square-foot mainsail of the cat yawl rig is sufficient to drive the long narrow hull. Edey & Duff literature states the Shearwater 28 has held up well in winds up to 35 knots.

Resources

Edey & Duff
www.edeyandduff.com

Shallow Water Sailors
Where most Edey & Duff Dovekie and Shearwater owners congregate
www.shallowwatersailor.us

Trailer Sailors Association
www.trailersailors.org

Philip Bolger
www.en.wikipedia.org/wiki/Phil_Bolger
www.hallman.org/bolger/BolgerBio.html

Let's go sailing

We sailed *True North* on a cold and dreary late-October day on Wisconsin's Lake Geneva. Nick said the Shearwater 28 will capsize if attention to placement of "bio ballast" is not taken seriously. I believe him.

The Shearwater 28 feels like steering an aircraft carrier — the view is long, wide, and flat. Turning is sluggish. On the plus side, pulling the line to extend the rudder to vertical took little effort and, as long as the rudder is properly secured down, the helm is light. The tiller is a short, solid, wooden affair that does not tilt up — a feature that would have been handy on several occasions. Steering from the helmsman's seat was a bit uncomfortable as the tiller was near shoulder level and there aren't many other places you can sit and still steer.

The mainsheet is attached to the rudder head and is held by non-removable belaying pins through the tiller. In steady or light air, the sheet can be tied off and left alone. In gusty conditions, however, the Shearwater 28 is tender, so we gave the mainsheet half a wrap around the tiller and held it by hand. The sheet ran easily when we needed to depower the rig. I felt weather helm as we sailed to windward, but we later realized that the rudder had been trailing partially up. Nick says the boat usually has a neutral to slightly lee helm that can be corrected with the mizzen. On the day of the test sail, the waves never got high enough to determine if the flat hull pounded in chop, as one might suspect.

With the breeze building, Nick felt we'd be safer if we reefed the main. This involved lowering the sail as normal and hooking the tack on the reef hook, but the sail had to be released at the clew and the sprit lowered to the gallows. The main flew like a flag while we rolled the foot up and secured it with many reef points. Nick then reattached the clew to the sprit, and pulled the snotter line tight, which raised the lightweight sprit and exerted outward tension on the sail. A separate outhaul line on the sprit can trim the sail as well. A reef in the jib also was an option.

As always seems to happen, as soon as we had reefed the main, the wind abated. We cruised comfortably past the elegant homes surrounded by muted fall colors. In the light air, we had to back the jib to come about.

A shift brought fresh wind and we broad reached back along the 10-mile length of the lake, with the leeboard pennant singing. *True North* tracked straight and true with good acceleration to what felt like 5 knots (Edey & Duff claims the Shearwater 28 is capable of 10 knots in heavy air). She probably could have done 7 knots with the genoa hanked on. Off the wind, steering from a perch on the aft cockpit coaming provided a great view and was easy and comfortable. The boom gallows didn't impair visibility nor was it in the way when we moved about in the cockpit.

Throughout our sail, the large hatches proved very handy. We could comfortably stand with our torsos protected from the cool breeze and be secure while working. The same was true of the forward hatch when we were docking or attending to the jib. The mid-cockpit gallows is another place to stand and feel secure.

Under power, Nick's Yamaha 9.9 high-thrust outboard gives powerboat-like handling. His ability to "slam on the brakes" as he approaches the dock and stops the boat is the envy of the marina.

Conclusion

All in all, the Shearwater 28 is a comfortable, capable boat that can explore very shoal areas few others can. For the Florida Keys and the backwaters of the Chesapeake Bay, it's ideal. Being light and shallow, it has limitations in open water, so you have to bear that in mind when deciding on where you want to go sailing.

Finding a Shearwater 28 for sale is a matter of being in the right place at the right time. As of this writing, none were listed for sale on the Internet. According to Nick and Harry, selling prices in the last 10 years have been between $12,000 and $18,000. Edey & Duff still has the molds and might build you a new one if you can afford it. However, there are other boats out there designed by Phil Bolger that embody his design philosophy: keep it simple to construct, simple to sail, and efficient under sail or power.

Allen Penticoff is a freelance writer, sailor, and longtime aviator. He has trailer-sailed on every Great Lake and on many inland waters and has had keelboat adventures on fresh and salt water. He presently owns three sailboats: an American 14.5, a MacGregor 26D, and a 1955 Beister 42-foot steel cutter that he's restoring.

The mast can be lowered under way, to duck under a bridge. The procedure is even easier on land and can be done by one person, but two always helps, at left. *True North* motoring toward the beach with her dinghy, *Due South*, near the shore of Kentucky Lake, at right.

What would a

Be a model captain by acting like one

When you're the skipper of a boat, you're responsible for everything that happens on and to the boat. Nerve-racking, isn't it? It's hard to know everything about sailing. Even what you *do* know, you sometimes forget. Things go wrong. Equipment breaks. Sometimes the crew doesn't know what to do. It's enough to make you scream.

Don't scream. Take a deep breath and ask yourself what a great skipper would do. Bad skippers scream and yell. Great skippers speak just loud enough so the crew can hear and understand, and they never insult or demean. If somebody does something wrong, these skippers suggest, "Let's try it this way . . ." Great skippers take their time, even when things go wrong. They know that a classy response to a problem can make them look good. But they're not obsessed about what others might think if they "look bad." Great skippers know that others think better and work faster when they're surrounded by calm confidence. Even when they aren't feeling especially calm and confident on the inside, these skippers realize that being calm and confident on the outside can make things go better.

Stereotypical models

In the world of sailing legends, we can learn from two of history's most famous characters. One name has become synonymous with "floating tyrant": Captain Bligh of the *Bounty*. He was an incredibly skilled sailor. His boat-handling and navigation talents were exceptional. But when we hear his name, we think of the problems he had with crew morale and motivation. Nobody wants to be known around the docks as "a real Captain Bligh."

On the other hand, Admiral Lord Nelson, the British naval hero of the Napoleonic Wars, was famous not only for his sailing skills but also for his ability to inspire the devotion and loyalty of all who served with him. We all know which one of these men we want to emulate on our boats, yet when we become nervous or unsure of our actions, we frequently end up looking more like a Bligh than a Nelson.

Plan ahead

How does the *average* skipper make that magical transformation to *great*? A good way to start is by always knowing what's important, and having a Plan B. Knowing what's important is easy: crew safety and boat safety. In that order. On my boat we have three rules: Rule 1. Be safe. Rule 2. Have fun. Rule 3. See Rule 1.

What is a Plan B? It's what you turn to when your first plan falls apart. A stressful situation can develop as soon as something goes wrong: an engine stalls, a halyard breaks, or any mechanical or human failure occurs. When this happens, if you already have a Plan B, your response is likely to be a good one. Not having to improvise means you can implement Plan B with confidence and class.

Picture Bligh-type and crew motoring upwind in the marina while raising the mainsail. Unfortunately, something gets stuck. Bligh-type immediately starts yelling at his crew to pull harder and, when that doesn't work, he's soon screaming, "What's wrong?" Despite a lot of running and shouting, the problem goes unsolved and suddenly Bligh-type and crew find themselves out in the wind and waves with a sail that won't go up and maybe won't come down either.

Now put a Nelson-type in the same situation. Even on the best-run boats, sails get stuck sometimes. What does he do differently? First he runs through his mental checklist to see what might be wrong. If a quick fix doesn't solve the problem, it's time for Plan B: turn the boat around and motor back into the marina . . . pull up at the public dock, perhaps, and sort out the problem. This strategy gives the crew time to look things over carefully and try again at everybody's leisure.

Nelson-type is not necessarily smarter. Neither skipper solved the problem with a blinding flash of insight. But which crewmembers had more fun sailing that day? Which boat was less likely to have had serious damage done to rigging and sails? Nelson-type might have been feeling just as confused and helpless as Bligh-type. But Bligh-type got so focused on the short-term goal — getting out sailing — he forgot his first priority: keeping crew and boat safe. Nelson-type had a Plan B at the ready and knew ahead of time what he would do if he had trouble setting sail. He also had a Plan B ready in case of engine failure in the middle of the marina as well as plans for other potential problems.

Having a Plan B is one of the key elements of good seamanship. Since we don't do our best thinking under critical time pressures, having a plan into which we have invested some thought and even practice can make the difference between a graceful exit from a problem or an expensive disaster.

Examine the "what ifs"

Some common situations are worth considering in the light of "What we would do if . . ." For example, we are

ILLUSTRATIONS BY TOM PAYNE

great skipper do?

by Bill Kinney

motoring straight into the wind in that narrow approach channel and our engine quits. What is the *first* thing to do?

The instinctive first response for most sailors who haven't taken the time to develop a Plan B might be to try to restart the engine. It is very unlikely that the engine will simply restart. Some problem made it stop and we haven't the time to fix that problem. We are far more likely to drift out of the channel and go aground while we have our head down fussing with the engine. So what's our Plan B? If there's room, it might be better to turn the boat downwind and start drifting under bare poles down the channel. Perhaps there's room to put a jib up so we can gain some power and control. Is there enough sea room to sail? If so, we can keep going while we troubleshoot the motor. If not, we can ready an anchor so we can put the boat in a safe place while we fix the problem or call for help. Many of the details will depend on the local conditions and the way a specific boat handles. The whole key is in thinking out Plan B ahead of time.

Another time to have a Plan B at the ready is when docking. Everybody who has to put a boat into a narrow slip has had to deal with a crosswind or crosscurrent, making the timing of the turn into the slip critical and prone to error. If I miss the turn into my slip, I may try to back out or drift quietly to the other side of the fairway where I can hold position well fendered while I take stock of the situation. Maybe I'll pull into the empty slip nearby.

Depending on the local conditions, any of these answers might work. You'll be far more likely to make the right decision and to execute it with care and confidence if you've spent some time thinking it through carefully before the crisis.

Sometimes you'll develop your Plan B on the fly in response to a situation. Every time a Nelson-type approaches another boat out on the water, he puts together a mental checklist. What will I do if he continues on this course? What if he turns left or turns right?

Calmness breeds confidence

I learned the importance of calm and control when I started teaching sailing on San Francisco Bay. During most of the year, we teach in winds of 20 to 30 knots that blow straight into our marina across San Francisco Bay with a wave-building fetch of 8 miles. Yet every day, we put three novice sailors, who may never have been on a boat before, on a 24-foot keelboat and let them take the helm. Then we send them out into what most sailors would consider rather challenging conditions off a rocky lee shore.

That first day of class has become my favorite. We take landlubbers and start them on the path to being sailors by making sure they don't panic. How? By being calm. Instructors maintain a quiet voice, a tolerance for mistakes, and a basic understanding that there are really very few things that anyone can do that would put the boat and the people on board at serious immediate risk. We take care to protect the new sailors from situations where they could get into trouble (like accidental jibes), while letting them revel in the wind and waves and learn about sailing a small boat.

Explanations and questions

With your own crew, think of the relatively few things an inexperienced crew could do that would really be dangerous. Spend all of your effort preventing those things from happening. You may have to spend a few extra minutes explaining things and asking questions to make sure everyone understands. Maybe there are some things you don't ask the crew to do, but do yourself. As for all those other things that frustrate you, if they don't threaten crew or boat, they're just potential learning situations.

No matter how irritating it may be to see one of your new crewmembers coiling a line incorrectly or stowing something in the wrong place, it's not worth raising your voice. It's far better to calmly suggest that you prefer an alternative approach. It might be even better to let something go until you're quietly tied up at the dock at the end of the day before offering suggestions for alternative ways to do things. If you want someone to do something in a way that is new and different to them, it always helps to explain why you want them to do it your way. It's OK to say that your way is not better than their way, it's just the way you expect to find things on your boat.

Act the part

When things really go wrong, if you are frustrated, angry, or scared, it's far better to *act* calm and quiet. Take your time when giving orders, be sure what you say is exactly what you mean. In a difficult situation, a few well-chosen words can be far more effective than a flurry of contradictory commands.

Think for a moment about the great old-time movie heroes played by the likes of Humphrey Bogart, John Wayne, and Clint Eastwood. They rarely raised their voices, yet they were still commanding presences. Yes, they were acting, but there's a message in that. In moments of crisis, when things are going wrong, *acting* like a calm and competent skipper can, in a bizarre turnabout, actually *make* you one.

Bill Kinney has been sailing for 16 years and living on a 40-foot sailboat for 10 of them. After a career as an engineer in biotech, he now teaches sailing full time at OCSC Sailing in Berkeley, California.

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New-era navigation lights

Converting light fixtures to use LEDs

Bulbs for boat lighting come in a range of types and sizes. The 9 mm socket at right takes miniature bulbs.

by Clarence Jones

All the lighting on my sailboat now uses light-emitting diodes (LEDs), which consume only about one-tenth of the battery power the old incandescents did. What's more, every single light is now brighter than it was with incandescent bulbs.

I'd been thinking about making the conversion for several years but waited until the price of LEDs dropped and a wider range of products became available. Many people have experimented with this and failed, because the LEDs weren't bright enough. Manufacturers have now figured out how to arrange several individual LEDs within different bulb types to meet a variety of purposes. With help from these latest LED bulbs, I figured out how to convert my lights successfully.

I converted:

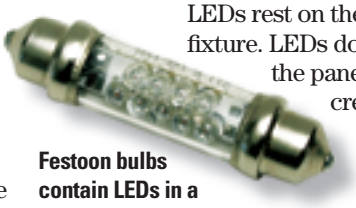
- Two overhead dome lights in the cabin – $22 each
- A white running light at the stern – $12
- A combined red and green running light at the bow – $7
- A masthead anchor light – $20

These were so affordable because I was able to use all the existing light fixtures. Even though the price of the LED bulbs was a little steep ($83 total), it was a fraction of what new LED fixtures would cost. These new LEDs have an estimated life of 50,000 hours. They're very shock-resistant, and create less battery drain than one incandescent even if all the LEDs are lit at the same time.

The multi-LED bulb at left fits an adaptor base for an 1142 socket. Clarence used this for his anchor light.

Before you start your own conversion, you'll need to know what kind of bulbs are in your present fixtures. They're probably one or more of these:

- ***1142*** – These bulbs have a metal base 15 mm in diameter with two contacts. There are two pins on the side of the base opposite each other, near the bottom. The metal base does not conduct electricity; it just holds the bulb in place. The two contacts at the base carry power to the bulb. This bulb requires both a positive and negative wire. These are very common in boat lighting.
- ***BA9 socket*** – This socket holds a miniature bayonet-base bulb 9 mm in diameter with a single contact. Here, the metal base provides one side of the circuit. These are also very common in boat lighting.
- ***Festoon or bullet*** – These bulbs have a double-ended torpedo shape with metal ends and a glass center. Festoons come in various lengths and widths. The ends of the bulb fit between spring-loaded contacts in the fixture. Depending on how the LEDs are arranged within the bulb, festoon LEDs can aim light in one direction or all around.



Festoon bulbs contain LEDs in a range of numbers and colors.

Overhead dome lights

Let's start with the easy conversions. My overhead lights in the cabin were standard circular 5-inch-diameter fixtures made by Sea Dog with a toggle on-off switch on the side. Removing the lens, I found an 1142 base and a 10-watt bulb in each.

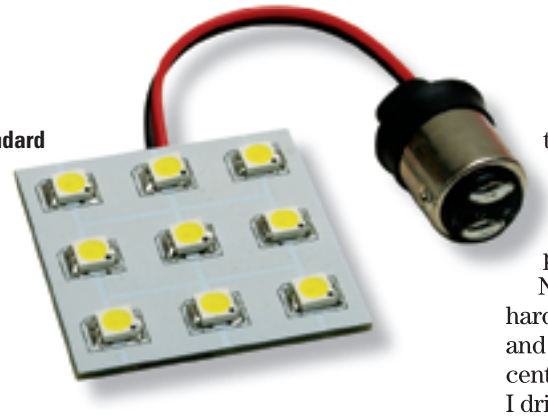
I replaced these with a great LED solution: an 1142 base wired to a 1½-inch panel holding nine high-power LEDs. The panel provides a 120-degree spread of light. All I had to do was insert the base in the socket and let the panel of LEDs rest on the glass lens of the dome fixture. LEDs don't get hot, so putting the panel on the dome lens won't create a problem.

I used a cool-white LED bulb. A warm white LED would be closer in color to an incandescent bulb but would seem less bright.

Stern light

My stern and bow navigation lights were made by Hella, and each of them used a 10-watt festoon bulb. The stern light fixture has a clear lens. The bow fixture has a split red/green lens. Each bulb was 42 mm in length and 10 mm in diameter.

The stern light was as easy as the interior dome lights. I just removed the old incandescent and replaced it with a 44 mm festoon bulb containing 12 LEDs in banks of three lined up in four directions. It is now much brighter. The difference in battery drain? Ten watts before the conversion; one watt now.



A 9-LED panel bulb, at right, replaced the standard bulb in a cabin light, at left on facing page.

In most fixtures that take 42 mm festoon bulbs, you can use a 44 mm bulb. The contacts just spring a little wider. Do it if you can because 44 mm LED replacements contain more LEDs than the 42 mm size. Two millimeters is about 1/16 inch.

Combination bow sidelights

The red/green navigation light at the bow was a little more complicated. Most people who've tried this conversion give up because the LED just isn't bright enough. When you put a white LED behind a red or green lens, the lens filters out most of the light. It only lets the red or green light through, so most of the bulb's brightness is blocked.

This seems counter-intuitive, but if you put a red LED behind a red lens, *all* the light goes through. The same goes for a green LED behind a green lens. So, converting bow lights requires two LED bulbs in place of the single incandescent. But how do you put two bulbs in a spot that was made for one? There are several ways, depending on the type of original bulb. The one you use will depend on the bulb that's there now and how much room is inside the fixture.

For a festoon-bulb fixture, I came up with a simple solution.

The festoon bulbs I used were 44 mm long and 11 mm in diameter. Each contained nine LEDs mounted on a panel, all facing the same direction, all red in one, all green in the other. The trick was to arrange them to give light across the arc required in a sidelight and fit both bulbs to a single-bulb fixture.

Under the Navigation Rules, each sidelight must show through an arc from the bow to 112.5 degrees aft of the bow. This means that the panel within the bulb should aim in the center of that arc, or 56.25 degrees aft of the bow.

I laid the bulbs side by side and turned them until the LED panels were oriented correctly, then taped them to the workbench across their metal ends. (***Note:*** *The 60-degree angle of a 60-30-90 triangle is a good guide for this. The lens on the fixture will make the cut-off at 112.5 degrees.* ***–Eds.***) I then glued the bulbs together using hot glue, taking care to apply glue only to the glass portion of the bulb. Solder would not be a good idea here as temperatures high enough to melt solder can fatally damage an LED panel unless applied very briefly.

Next, I cut a 36 mm length of 3/8-inch hardwood dowel. I used a miter saw and was careful to cut it square. In the center of each end of the dowel, I drilled a 3/32-inch hole to a depth of 1/2 inch and put a #4 brass screw (stainless steel would work as well) into each end of the dowel.

This is delicate work, sort of like tying fishing flies. I found a bench vise was almost a necessity.

With the brass screws in each end of the dowel, I laid it beside a bulb and marked where the metal bulb caps sit. With a hacksaw, I cut narrow notches in the dowel at each of these points. The notches are to hold copper wire.

I laid the joined bulbs on the bench with the LEDs facing down, added some more glue on the back side of the bulbs, and stuck the dowel to the bundle with the notches facing up. I added more glue between the bulbs

The cool-white LED bulb, above left, left fixture, is as bright as the incandescent bulb it replaced, right fixture. With its LED replacement bulb, the stern light is very bright, at right.

A profusion of bulbs

Some automobile bulbs may appear similar to marine bulbs, but there are differences. The 1156 automobile bulb has the same 15 mm metal base and pins as the 1142 bulb but has only one contact at the base. In cars, the metal body is grounded to the battery, so any metal in the vehicle can provide the negative contact in a circuit, eliminating the need for a second wire. The 1157 automobile bulb also has a 15 mm base but with two contacts at the base. The bulb has two pins that are offset, one higher than the other so the bulb can only be inserted one way. This is a double-filament bulb and is used where a single bulb serves two purposes. The two contacts provide two different feeds, one for each filament in the bulb, while the base is the negative side of the circuit. The most common application is in a combination tail light and brake light.

and the dowel, but was careful not to block the light path for the LEDs.

At this stage, the assemly looked sort of like the space shuttle with two fuel tanks attached.

I held the dowel in the bench vise while I applied the wiring. I wrapped stranded copper wire (22- or 20-gauge works well) around the bundled dowel and bulbs with the wire in the dowel notch, then twisted it tight with the twist between the two bulbs.

The red and green festoon bulbs are glued together.

I cut off one of the strands at the twist, then brought the other strand to the brass screw, wrapped it around the screw, and tightened the screw. I did this for both ends and used small washers under the screw heads for security.

The dowel is aligned with the bulbs and notches cut in it for the binding wire.

The height of the screw head is important to ensure good electrical contact. The screws, when tight, needed to be 44 mm from head to head, which I adjusted with washers. The screw head fits into a depression or hole in the spring-loaded fixture contact. Both of the bulb ends will probably make contact in the fixture but, if they don't, the screw will complete the circuit and the wire ensures that the 12-volt supply runs from the screw to both bulbs when the switch is thrown.

If your bow navigation light uses a 15 mm or 9 mm bulb, you'll have to rewire it to make two sockets and figure a way to anchor the new LED bulbs so they stay pointed in the right direction. The same places that sell LEDs also sell pre-wired sockets. The wiring is extremely simple and bayonet-based LED bulbs come in a greater variety than festoon bulbs.

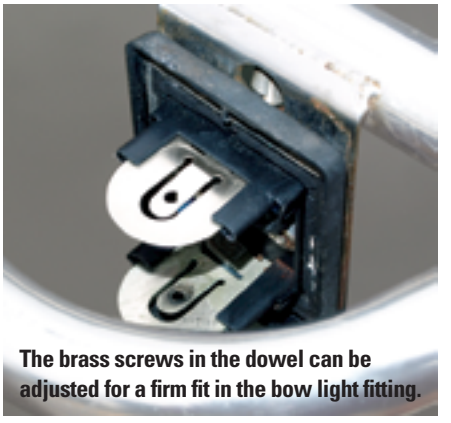
Whether you use festoons or bayonets, make sure you have red LEDs behind the red lens and green LEDs behind the green lens. If you reverse them, very little light will be visible through the lenses.

While I have no way to measure the difference, I'm sure my new LED navigation lights are brighter than the original incandescents. With the original bulbs, I had to lean over the stern or bow rail to make sure they were burning. The replacement LEDs are so bright they light the outboard at the stern and cast a red and green glow at the bow.

Understand that with LED bulbs, the *number* of LEDs in the bulb usually determines how bright the light appears. Some manufacturers' LEDs are brighter than others, but the primary way to measure brightness is the *number of LEDs per socket*. Go as bright as you can. Cool white will appear brighter than warm white.

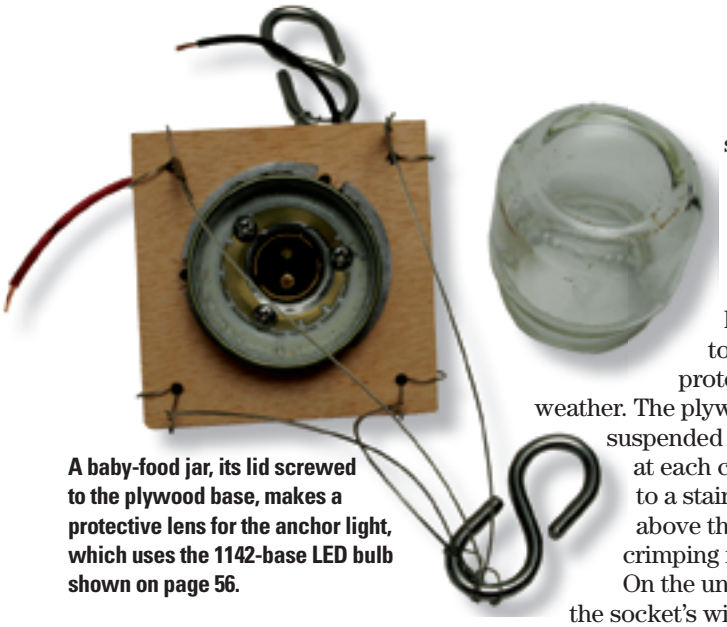
Be aware that your modification will not be U.S. Coast Guard-certified. The Navigation Rules require, for boats of less than 39.4 feet in length, visibility at a distance of 2 nautical miles for white stern and all-round lights and visibility at a distance of 1 nautical mile for red and green sidelights. For more details, drawings, and animated illustrations, check the BoatU.S. website at <www.boatus.org/onlinecourse/reviewpages/boatusf/project/info2c.htm>.

Test your lights after conversion to make sure they conform to Coast Guard regulations. Document the results with photographs and a witness. If another



The brass screws in the dowel can be adjusted for a firm fit in the bow light fitting.

Clarence's combination bow light is brighter now with LED bulbs.



A baby-food jar, its lid screwed to the plywood base, makes a protective lens for the anchor light, which uses the 1142-base LED bulb shown on page 56.

boat should hit yours, you don't want the other captain to claim that he couldn't see you because your lights didn't meet specifications.

Anchor light

One of the major power drains when we spend a night on the boat has always been the anchor light at the top of the mast. The Navigation Rules require it to burn all night. So the next time I need to lower our mast, I'll replace my masthead light bulb. Meanwhile, I've made a temporary anchor light with the LED bulb that will eventually go in the top of the mast. It's an 1142 base and 15 LEDs that shine in all directions. Very bright.

For some reason, I couldn't find this bulb as a unit. But all I had to do was stick the two wires coming out of the 360-degree, 15-LED panels into the base and it was complete. I had an old 1142 socket from a previous fixture I repaired (they're also available at the websites that sell LEDs and from boating stores).

I mounted the socket on a 3-inch-square piece of plywood, drilling a ¾-inch hole in the center of the wood and a baby-food-jar lid. The lid is screwed to the wood. The jar protects the LEDs from weather. The plywood platform is suspended by fishing leader wire at each corner that connects to a stainless-steel S-hook above the jar. I closed the S by crimping it in a bench vise.

On the underside, I connected the socket's wires to 10 feet of double-stranded 16-gauge electrical wire. This leads to the socket at the base of my mast where the original masthead light is plugged in. When I use the temporary anchor light, I unplug the fixed masthead light and plug in the temporary light.

I also attached a ¼-inch Dacron line under the temporary light. I use this line to hold the light in position when it's raised and to pull it back down. I don't want to use the power wire for this.

The temporary anchor light can also serve as a deck light if I hang it upside down. It is *bright*. Also, I no longer worry about how much the anchor light is draining the battery over night.

The best selection of bulbs and prices I found was at <www.superbrightleds.com>. But this industry is changing so fast, an even better place may open tomorrow. Search "LED boat lights" online and you'll find dozens of places to shop.

Clarence Jones is a writer, news media consultant, photographer, sailor, tinkerer, and inventor. He and his wife, Ellen, live on, work from, and sail their Precision 21 from Anna Maria Island in the mouth of Tampa Bay, Florida.

The LED anchor light can shine all night without draining the ship's battery.

Pushing the season

A springtime sail dishes up variety

by Parsons Clark

It was my fault, really. I had unwittingly set the ball in motion by giving my husband, Dave, a copy of John Kretchmer's *Used Boat Notebook* as a birthday present, thinking he'd have fun tormenting himself during the winter. Sure enough, he disappeared each evening into the realm of Yachtworld.com and upon hearing, "Come see this . . . " I wound up by his side perusing the listings with him.

"What if. . . " soon became "Let's. . . " We were happy with the boat we owned — a wonderfully quirky 31-foot Herreshoff cat ketch named *Puffin*. Had we not known someone who repeatedly said, "Let me know when you want to move up, because I love your boat," I don't think we would have progressed quite as quickly as we did, if at all.

Dave had his wish list: fiberglass, less than 30 years old, and speed. I had my wish list: semi-classic lines (exterior and interior), a good galley, and a head that didn't make me feel like a tinned sardine.

Thirty-two feet became 34, then 36, and topped out at 40. We became weekend road sailors. A trip to Rochester, New York, at the end of January (no standing headroom) was followed by a two-state day trip to Rhode Island (extensive water damage to the cabin sole and no opening ports) and Connecticut (met all of Dave's criteria and none of mine). A quick dash over to Ipswich (beautiful classic boat but some major structural issues) on a Wednesday evening was followed by a trip to Maine (a very wet roof on the cabin) the next day. Mixed in were email messages and phone calls to brokers from Maine to Annapolis and a vacation to the Abacos with friends. We went as far as to enlist our friends (also sailors) to check out a couple of the Annapolis listings for us if we couldn't find something in the greater New England area.

April fog, at left, couldn't keep the first-sail-in-a-new-to-us-old-boat smile off Dave Clark's face, below.

Happy compromise

We headed to Greenport, New York, to look at an Islander 36. On paper, the Islander seemed about as close to a happy compromise as we'd been: IOR design, fiberglass, less than 30 years old, semi-classic lines, nice galley with refrigeration, and a roomy head! We held our breath as we took our first steps on her deck, as we'd learned that pictures posted with boat listings were by no means accurate. Three weeks and an acceptable survey later, we passed over the check and were the proud new owners of a 1983 Islander 36 we renamed *Red Tail*.

So there we were: the middle of April, after a very long snowy New England winter, with a bad case of sailingitis. We had a boat in Long Island that we needed to move up to our mooring in Padanaram. Trucking the boat wasn't an option; sailing it was. We set our sights on the last weekend of April as boat delivery time and started praying to Mother Nature to grant us good weather. We both heard my mother's voice in our ears, whispering, "Aren't you pushing the season a bit?"

Early that week, however, it looked as if our prayers would be answered. The weather guessers were predicting unusually high summer-like temperatures for the weekend. Our spirits lifted at the gift of sailing a new boat from Long Island to Massachusetts in 80-degree weather and the prevailing sou'westerly to take us home. Yes, the water temperature was just about 50 degrees, but the air temperature would be warm. Dave packed his shorts and laughed when I grabbed hats, gloves, and winter jackets.

A few obstacles

We spent Friday in Greenport getting the boat ready for her journey. Small obstacles popped up: a badly rusted propane tank that the local station refused to fill resulted in the

purchase of a single-burner butane stove; a rather "fragrant" holding tank; and a time-consuming learning experience while bending on the sails and rigging the Dutchman system. But there was rum on board and the boatyard was walking distance from an Italian restaurant. After a very full day of work and an excellent dinner, we unfolded the double settee in the main cabin (did I mention the fragrant holding tank was under the V-berth?) and called it a day.

Saturday morning started off well. The 42-hp VW Pathfinder fired up, we backed out of the slip at 6:15 and were on our way. We headed out of Greenport and right into pea-soup fog. There was no mention by NOAA of the thick coastal fog that encased us, just the expected excessive heat inland. We agreed that NOAA figured no one would be crazy enough to be boating in April, so why report it? This was going to be interesting, to say the least.

Foghorn ready by the helm, we motor-sailed our way through Long Island Sound. There was not a ripple on the water's surface. Not a swell of any kind. Two hundred yards of visibility diminished to 100 feet or less. The only signs of life were loons startled by our appearance. The air temperature sank into the 50s. NOAA kept insisting it was in the mid- to upper-80s. The hats, gloves, and winter jackets made their appearance, along with an "I told you so" look only a wife can give her husband. Three layers of clothes, hot beverages, fresh cookies, and a flat-calm, empty, Long Island Sound. It could have been a lot worse.

A host of flies

Then the flies arrived. By the dozens, the small black housefl ies one usually sees at the end of sailing season, hitched a ride with us. Our one dishtowel became the weapon of choice. We had a fighting chance, as the cold caused the flies to move in slow motion. Within a couple of hours, the cockpit looked as if a throng of four-year-olds had ripped open boxes of raisins, scattered them on the floor, and stomped on them. Ironically, I had made raisin cookies for the trip. These we renamed. (See "Slo' fly cookies," page 63.)

The fog lifted slightly by late morning and the sun tried to burn its way through, not enough to de-layer but enough to break out sunglasses. The wind filled in as we neared Block Island and we shut off the engine. *Red Tail* soared like the hawk after which she was named and we hit 7.5 knots on a beam reach. The wind stayed with us for a couple of hours, dropping out just as we passed Narragansett Bay, and the fog socked in once more. With one freighter headed outbound from Newport, we fired up the VW, placed Securité calls to alert the big guy that we were out there, and pushed our way across the shipping lane.

As we approached the Buzzards Bay Tower and Gooseberry Neck, the prevailing southwesterly wind filled in, the infamous Buzzards Bay chop kicked up, and the fog lifted. We reveled in the sight of land for the first time since departing Long Island. We sailed by our familiar haunts of Cuttyhunk, Mishaum and Salters points, rounded Dumpling Rocks, and headed into

***Red Tail*, an Islander 36, takes stock of her new quarters.**

Padanaram. We slid unceremoniously into a slip just as the sun dipped below the horizon in a gorgeous sunset. It had taken us a smidge over 12 hours (and several hundred dead flies) to make the trip. But *Red Tail* was in her new home.

In the weeks that followed the delivery, we replaced the cracked holding tank and sanitation hoses, installed a new sink fixture in the head, purchased a new propane tank, and gave *Red Tail* a thorough cleaning from bow to stern. She is tugging on her mooring lines in anticipation of warm summer days with the usual 10 to15 knots of wind from the southwest, as are we.

Parsons gets the feel of the helm on *Red Tail*.

Parsons Clark and her husband, Dave, sail their 1982 Islander 36, Red Tail*, out of Padanaram, Massachusetts, cruising favorite haunts in and around Buzzards Bay. They are upgrading* Red Tail *before cruising her to Maine. When not on the water, Parsons can be found in the garden or in the kitchen cooking up "good boat food."*

Slo' Fly Cookies

What could be better on a boat than a raisin-spice cookie laced with rum? This recipe is easily assembled and, as the cookies barely spread while cooking, you can fit a lot of them on a sheet.

Ingredients

4T dark-to-black rum (Gosling's Old works extremely well or a blend of Mt. Gay and Goslings, which is pretty good in a rum-and-tonic too!)
½ cup butter at room temperature
1 cup brown sugar
2 large eggs
2 cups flour
1 t baking powder
½ t salt
1½ t cinnamon
¼ t cloves
¼ t nutmeg
2 cups seedless raisins

Method

1. Coarsely chop the raisins and place in a bowl. Stir in 2T (or more, if desired) of rum and set aside. If available, microwave on high for 20-25 seconds or heat slightly in a sauté pan over medium heat. Warming the raisins allows them to absorb the rum a little better.
2. Cream together the butter, sugar, and remaining 2T of rum.
3. Add eggs and mix to combine.
4. In a separate bowl, combine the flour, baking powder, salt, cinnamon, cloves, and nutmeg, and whisk to combine. Add to the butter mixture and combine.
5. Mix in the raisins and any rum juice.
6. Drop by teaspoons onto a greased or parchment-lined baking sheet.
7. Bake at 350°F for 10 minutes.

Makes 12-24 cookies, depending on how big you want your cookies.

Protection for the engine panel

Crucial dials and controls go under cover

by Chris Ferro

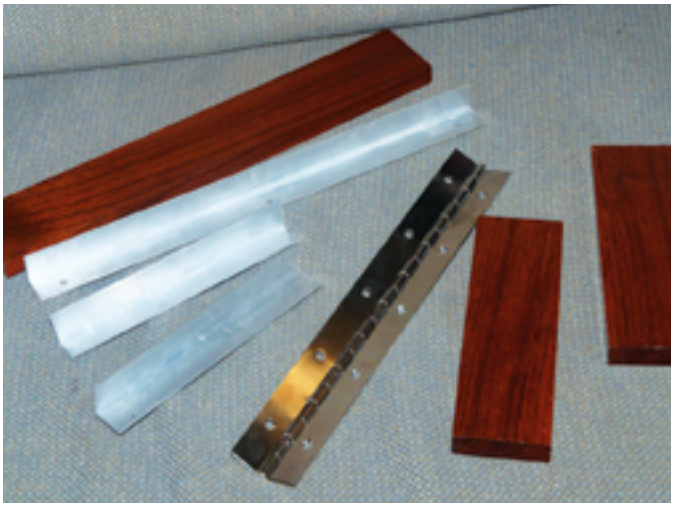
Scrambling around my boat's cockpit, or watching someone else (especially kids) doing the same, has usually left me wondering *when*, not *if*, the engine control panel for the trusty Yanmar 2GM would suffer a fatal kick. Because it was uncovered and vulnerable, one wrong step and the "pull to stop" knob could have been bent or broken, the tachometer could have been cracked, or the ignition key could have been snapped off in the keyhole. Even though the controls had survived 26 years relatively unscathed, I thought it best to push luck no further. I built a simple cover to protect them.

All I needed was 90-degree aluminum angle ($7); a length of 1- x 2-inch teak, though any wood will work if it's to be stained and varnished, ($30); a small piano hinge ($8); some screws, nuts, and bolts; and a piece of tinted acrylic that I already had, left over from a previous project.

I measured the engine panel and cut the aluminum angle with a hacksaw into three pieces to form a stout frame for the cover. My original plan was to use one horizontal piece at the top and two vertical pieces on the sides to strengthen the structure but, because the fuel gauge is in the way and I couldn't figure out how to move it, I omitted the right-side piece and hoped for the best. The engine panel itself is attached to the fiberglass cockpit side with six screws. I replaced these with slightly longer screws that would hold the aluminum between the panel and the fiberglass.

After I'd cut and varnished three pieces of the teak, I promptly threw one of them away due to the

The 26-year-old engine control panel was intact, although dirty, weather-beaten, naked, and exposed.



The components await assembly. Chris discarded the parts for one short side because they wouldn't fit next to the fuel gauge.

Even without the right-hand side of the frame, which he omitted because of the fuel gauge, Chris says the cover is still plenty strong.

When closed, the cover protects the panel from wayward feet. Sealant along the edges keeps water from dripping behind the panel.

aforementioned fuel-gauge problem. I would add that applying the many coats of varnish was the most time-consuming part of the entire project. Once I'd screwed the teak to the aluminum, I installed the frame and added an "L" corner brace between the two pieces of wood for strength.

I cut the acrylic rectangle with a RotoZip, then rounded and smoothed its edges and corners with a small palm sander. After I cut the hinge down to size with a hacksaw, the final steps were to bolt the hinge to the acrylic then screw the hinge to the wood. The 2-inch width of the teak provided perfect clearance so the closed cover doesn't hit the butt of the ignition key. A final feature is that the cover, when it's open, stays up and out of the way while I start or stop the engine.

Chris Ferro has spent five years, upgrading his first sailboat Vita Brevis, *a 1983 Seidelmann 30T. Between projects big and small, he and his wife, Shannon, explore the Chesapeake from their base in Deale, Maryland.*

The teak-and-aluminum frame, at left on facing page, is held in place with the screws that secure the panel, so no new holes had to be drilled into the boat.

A dual-purpose anchor holder

One project serves dual roles in the dinghy

Micheal Mathews

A length of PVC pipe contains the dinghy anchor and displays the decals required by law.

There are times when boaters face minor problems that appear unrelated but can be resolved together.

After I purchased a used Avon dinghy, I realized it had nowhere to stow a folding anchor to keep it from rolling around underfoot. Then, when I painted the dinghy to cover the name of the original owner's yacht, I added the state registration numbers but I had nowhere to place the registration decals — they rarely survive for long on an inflatable tube.

The solutions to these apparently separate problems came together when I found some scrap PVC pipe in my shop. With it, I created an anchor holder that sits vertically in the bow of the dinghy and is high enough to display the decals required by local law.

This project took only a few simple tools: a drill and ¼-inch bit, awl, screwdriver, wrench, hand saw, sandpaper, and a router or a keyhole saw. For materials, I used a short length of 4-inch-internal-diameter thin-wall PVC pipe, two pipe caps, PVC adhesive, two nylon tie-downs with buckles, a simple drawer pull, and a couple of #10 screws with matched washers and nuts. Depending on your personal taste, a little paint may improve the appearance of the finished holder. Some dinghies may not have D-rings conveniently located in the bow, so they will need to be installed.

The only trick is to cut the PVC long enough for the decals to be visible over the tops of the tubes. For my Avon, I made the cut at 15 inches, which included an allowance for the upper cap so it doesn't cover the decals.

I drilled ¼-inch weep holes in one of the caps and glued it to the pipe. This was the bottom of the holder. Next, I made an outlet for the rode by cutting a 2-inch-long by ½-inch-wide slot down the length of the pipe on the open end. This can be done with a router, but a fine-toothed keyhole saw works just as well. This slot allows clearance for the anchor rode when the cap is in place. I smoothed all the cut edges with sandpaper.

Easily mounted

My Avon was fitted with D-rings and a rubber mount for a spray hood. When fitted with a short dowel, these provided an excellent place to attach the holder using two nylon tie-downs. If your dinghy has no suitable D-rings you may need to attach a pair inside at the bow, one 4 inches above the other. Experiment with where your tie-downs should go.

I set the anchor holder pipe in the bow and worked with the tie-downs until they were tight. I then marked the location where the tie-downs cross the back of the holder and drilled a hole for each tie-down. Then, using the awl to make a hole through the webbing, I attached the tie-downs with screws.

The final job was to make a top from the remaining PVC cap. To make removing it easier, I added a handle made from a simple drawer pull. All I had to do was drill a hole in the middle of the cap. Finally, with the top cap in place, I affixed the registration decals as high as possible on each side. To add color, I painted the drawer pull and a stripe above the bottom cap with leftover paint. To help me find the dinghy at night, I added reflective tape to the top cap.

The holder keeps our dinghy anchor out of the way and provides a prominent place to display the decals. Most of the parts in my holder came from material I had saved from other projects but, during a recent visit to a home store, I noted that the total price for the caps, pipe, and adhesive was roughly $20. D-rings can be purchased from most marine chandlers or whitewater-raft dealers for as little as $4 each. Hypalon and PVC D-ring adhesives start around $15 but vary in price.

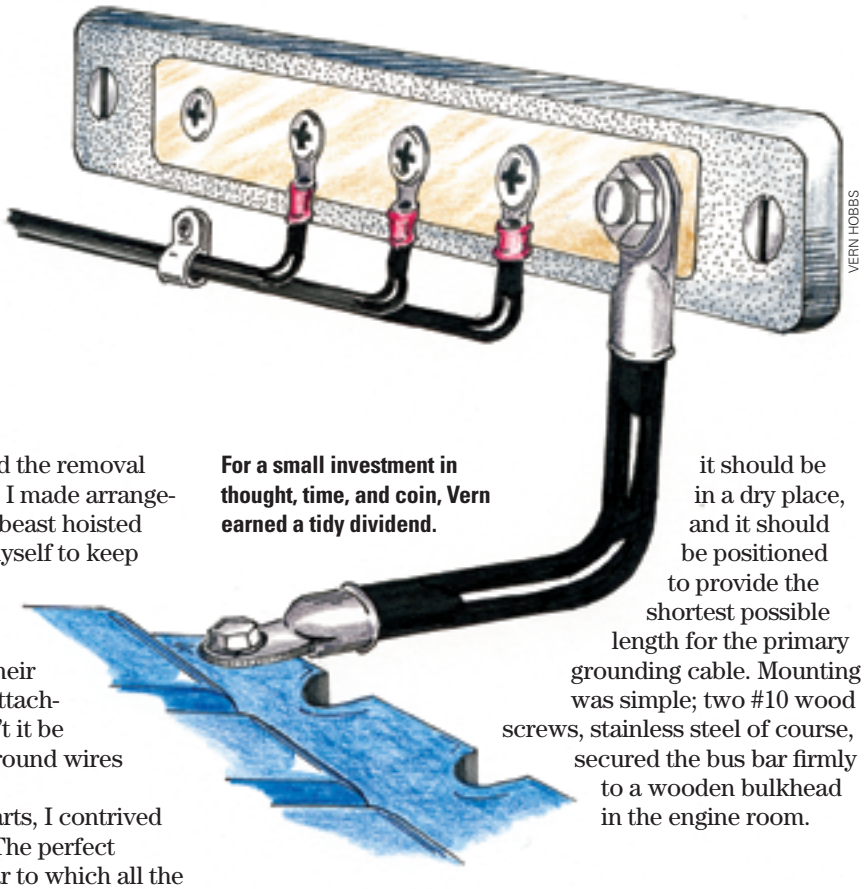
Buying all of the parts listed above would cost about as much as a dedicated registration kit and the associated mounting hardware, but then there would still be an anchor left to stow.

Micheal Mathews has been sailing on keelboats since he moved to Galveston Bay in the early 1990s. Thanks to good friends, he has enjoyed sailing some good old boats in the Gulf of Mexico and the Caribbean. Over the past few years, he has been sailing and restoring a 1974 C&C 27 Mk II.

An uncommon common ground

Unruly wires get herded onto a bus

by Vern Hobbs


VERN HOBBS

For a small investment in thought, time, and coin, Vern earned a tidy dividend.

Recently, a failed torque damper required the removal of our good old boat's good old engine. I made arrangements with the yard boss to have the iron beast hoisted out but resolved to do all the prep work myself to keep the labor cost down. As I set about de-coupling couplings and un-clamping clamps, I found myself tracing innumerable black and green grounding wires to their many individual and often solidly rusted attachment points on the engine block. "Wouldn't it be great," I muttered to myself, "if all these ground wires were attached to one common point?"

While the ancient Perkins waited for parts, I contrived a solution to my ground wire infestation. The perfect remedy, I reasoned, was to install a bus bar to which all the various ground wires in our DC electrical system would be attached. The bus would, in turn, be connected to a master grounding point — the engine block — by a single, heavy-duty cable. To sort out the technical details, such as appropriate wire gauges and required electrical load capacity of the bus bar, I consulted two handy references: *Sailboat Electrics Simplified*, by Don Casey, and *Pocket Ref.*, by Thomas Glover.

Five steps to a tidy solution

***Step 1:* Purchase a bus bar.**
This component would have to accommodate at least one 2 AWG grounding cable on a 5/16-inch stud, provide connection points for a minimum of eight grounding wires ranging in size from 6 AWG down to 14 AWG, and be adequately rated to meet or exceed the maximum electrical loads of the system. Blue Sea Systems makes a number of products that meet these requirements. All are available through marine suppliers for less than $30.

***Step 2:* Ensure the boat's electrical power is OFF.**

***Step 3:* Choose a suitable location for the bus bar.**
Ideally, the bus bar should be mounted well away from any fuel system components, it should be positioned in a protected space where errant contact with it is unlikely, it should be in a dry place, and it should be positioned to provide the shortest possible length for the primary grounding cable. Mounting was simple; two #10 wood screws, stainless steel of course, secured the bus bar firmly to a wooden bulkhead in the engine room.

***Step 4:* Prepare the wires and cables.**
I carefully pre-positioned each one, checking for adequate length and alignment, and replaced the few that failed to measure up. When I had the wires where I wanted them, I bundled them together and secured them to the bulkhead using nylon hanging straps and stainless-steel screws. Next, I fitted each wire with a tinned-copper marine-grade ring terminal of the appropriate size. I purchased the straps, ring terminals, and screws at a local chandlery for less than $15.

***Step 5:* Attach the wires to the bus bar in an orderly way.**
When our old, reliable 4-107 was back on its mounts, I connected the primary grounding cable from the bus bar to a suitable point on the engine block, ensuring that this final connection was against clean bare metal.

The benefits I've gained from this easy and inexpensive project are a less cluttered engine room, fewer electrical faults, easier diagnosis of faults when they do occur, and simpler removal and reinstallation of the engine sometime in the future when that will be required again.

Vern Hobbs and his wife, Sally, sail a 1974 35-foot Bristol cutter along Florida's Atlantic coast and the Intracoastal Waterway. Their day jobs pay the rent, but Vern finances the boat projects through his work as an artist. He specializies in maritime subjects.

Boats

O'Day 30
1977 sloop in good cond. Main, RF jib, storm jib. Edson steering, AP, Yanmar diesel, VHF, AM/FM/CD w/speakers in cabin and cockpit. Steel cradle. Winter storage paid. Detailed equipment list and photos on request. Berthed in Chicago and sailed on Lake Michigan only. $12,000 OBO.

Patrick McSteen
773-213-2112
pmcsteen@hotmail.com

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Michael O'Reilly
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John Bougearel
219-878-0216
jb2@structurallogic.com

Contest 31
1972 sloop. 27 hp Westerbeke diesel (rebuilt 2009). Mast/boom/rigging refurbished '08. Sails in good cond. Hull Awlgripped '05. GPS chartplotter. Radar, helm Bimini, jib furling. Original owner. Well maintained and in good cond. Chelsea, MA. $17,900.

Robie Maclaughlin
617-387-9007
chasmac1@verizon.net

Bristol 24
1966. Very good cond. 9.9 Honda, RF jib. Bottom recently blasted, epoxied, barrier coated. Slip paid thru June '10. A wonderful little sailer. Middle River, MD. $4,800.

David Griffin
240-527-9441
islander@myactv.net

Bavaria 8.9 meter
1984 sloop. '09 survey. Great cond. Fully equipped. Volvo 18 hp, new fuel pump and separator. Lake Champlain. (Slightly smaller) trade considered. $23,500.

Philip Lambertucci
450-826-0657
plamb202@hotmail.com

Tartan 34C
1972. Black hull, gorgeous lines. Cruised all over East Coast and Chesapeake Bay. Solid hull and deck. 4' draft gets you into hidden places. Atomic 4 runs too well to replace. New settee cushions not shown. See pictures of the boat having a good time. Deltaville, VA. $28,000. http://www.flickr.com/photos/22784769@N04/sets

Roland Anderson
804-750-1520
Roland52@verizon.net

S2-11.0A 36
1984. Freshwater boat lying Keweenaw Bay w/very, very low hrs on Yanmar 28-hp. New Schaefer furler, new Ultrasuede interior, new Bimini, dodger, sailcover. AC/heat, high output alt., Force 10 propane stove, electric head. 2nd owner (18 yrs). Lake Superior. $29,900.

Grant Fenner
906-201-0028
gfenner@live.com

Nimble 30
1986 fiberglass sloop, designed by Ted Brewer, built in Florida. 18-hp Yanmar. 4'6" draft. A simple boat w/standing headroom, ideal for two people. We lived aboard *Madrigal* for several months each summer and enjoyed visiting most ports and anchorages between New York City and Bar Harbor, Maine. Bought a larger sailboat. Currently in Branford, CT. Specs and pictures available via email. Price: $29,000

Steve Bailey
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stephenbailey@earthlink.net

C&C 38 MkIII
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Lewis Gravis
704-896-9735
indgov@bellsouth.net

Blackwatch 22
1981. Hull #73. Featured in GOB Jan/Feb '99, May/June '04. Quote: " . . . small enough to trailer and work on at home, yet comfortable and seaworthy enough for serious coastal voyaging — a sweet sailing boat." 4-year refit from bare hull built from the heart without strict adherence to cost. Sailed BC Coast. Winter stored. Numerous features and updates including full galley, heat, furler, Dutchman for main. Unique interior. Showroom state, a real treasure. Squamish, BC, Canada $22,000 OBO.

Gerry Cotter
604-898-5709
gericotr@shaw.ca

Hinckley Bermuda 40
1964 yawl. Great-running 1989 Westerbeke 46 hp w/1,805hrs. Set up for singlehanding, dark blue, recent sails/covers, radar, A/P w/remote, new windlass w/remote, h/c pressure H20, solid-fuel fireplace, 3rd owner. Upgraded annually. New price: $110,000. Ocean City, NJ. http://tinyurl.com/kqzmsb. YouTube video: http://www.youtube.com/watch?v=1EUWlmi2PJg.

Joe Scafario
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Dale Weston
910-455-9916
majortest@earthlink.net

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Paul Nelson
504-899-1279
pnelson42@gmail.com

Tripp Lentsch 29
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Ed Holahan
203-367-3598

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Edward Kress
231-766-2561
amyjohn1218@comcast.net

Cape Dory 30
1977 ketch. Barient S-T winches, Yanmar 2G engine (640 hrs), compass, Autohelm ST 4000, Bilge Pro 12V bilge pump, Gusher bilge pump installed, ICOM IC-M1 handheld radio, Simex MK 1 sextant, signal flags, Avon dinghy (6 person), new CQR 25 anchor w/rode, full-batten main. New paint topsides and bottom job, w/4 coats of Interlux 2000E, June '08. Stockton State Park Marina, Stockton, MO. $30,000.

Bennie Jagears
417-634-3107
bennielj@centurytel.net

Fales Navigator 32
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timladson@verizon.net

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Gray Sweeney
Gray@asu.edu

Nor'Sea 27
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patrickadams1587@hotmail.com

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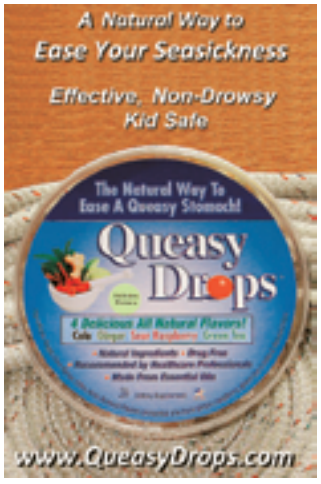

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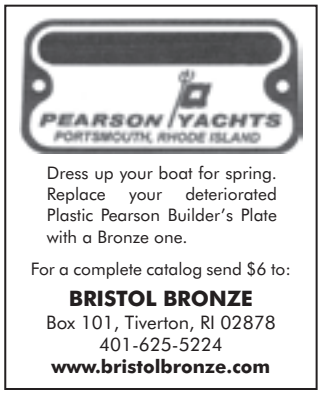

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Boats

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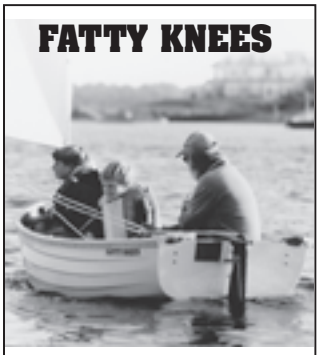

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Laid-back racing

Fun comes first in the St. Petersburg GOB Regatta

by Karen Larson

The crew of *Tio*, a Pearson Invicta 37.5, skippered by cigar-smoking Jack Monteagudo, demonstrates the laid-back nature of good old boat racing.

Steve Lang started something big in St. Petersburg, Florida. As a *Good Old Boat* subscriber, beginning with the very first issue, it was only natural that when fellow sailors decided Tampa Bay needed one more sailboat race he'd think of a race involving good old boats and, inspired by the popular Annapolis regatta by that name, he'd think to name it the Good Old Boat Regatta. He planted a seed among other St. Petersburg sailors. Pretty soon there was a gung-ho committee. Not too long after that, a race was born that was successful beyond anyone's wildest dreams.

More than 50 boats and many associated crewmembers turned up on Saturday, January 23, for Tampa Bay's first-ever "sailboat race for the rest of us." The boats were divided into four fleets from spinnaker racers to a "good old fun class." The boats ranged in size from a 44-foot CSY to a wooden racing dinghy, the 21-foot Fish Class gaffer. There were a whole lot of boats in between . . . just about one of every sailboat type ever built. Or so it seemed. You can see what they were, who sailed them, and how they fared at the race website, <www.spsa.us>.

Although we didn't get to sail that day, Jerry Powlas (my husband and *Good Old Boat* co-founder) and I had the best seats in the house. We hopped aboard a small Boston Whaler, courtesy of the St. Petersburg Sailing Center, driven by Zac Oppenheim, watercraft program coordinator at the University of South Florida, St. Petersburg. We zipped around the fleet, taking photos at the start, a couple of the marks, and at the finish. We wound up with photos of all the participants, I hope. That was my goal. I had about 400 photos when the day was done.

***Sea Nile* took honors as the oldest boat in the race and as the boat with the oldest skipper (Harold Balcan is 92). As a 21-foot Fish Class racing dinghy, she could have also won as the smallest boat, had there been such an award.**

Fun for all

The real appeal of Good Old Boat Regattas is that, although these may be races and they're officiated like races, the pressure's off. They're fun for observers and fun for participants. There's none of that shouting aboard about "trim, trim, trim!" Only a few crews take the trouble to sit on the windward rail. And there are no protests.

Instead, these racers are taking photos of other racers. They're smoking cigars. A few have dinghies in davits. The best captains make sure no one aboard misses out on lunch. Some of the beverages may have some alcohol content. They're fairly laid-back about the start (it was the rare boat that crossed the line at the gun).

Instead of arriving with a cutthroat attitude, they went out for a daysail with a bunch of other good old boats and then retired to the yacht club afterward to discuss what each observed from his own unique spot in the race. In that regard, a sailboat race is not unlike the six blind men and the elephant: each has a perspective of events that is unique to that boat. Only Jerry, Zac, and I on the Boston Whaler had a broader perspective, but we all knew the sailors were having more fun.

In fact they were having so much fun it's a sure bet there will be another Good Old Boat Regatta in St. Petersburg next January. The enthusiastic committee members have already started making plans. Next year, they'll be ready for the crowd that is sure to come. It's time now for Steve Lang and the committee that made this first-time event so successful to take a bow.

Karen Larson and her husband, Jerry Powlas, the founders of Good Old Boat, *have been sailing their C&C 30 on Lake Superior for nearly 20 years, but not in the hard-water season — that's when they go see what good old boaters are up to in parts of the country where it's still warm enough for sailing.*

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