

GOOD OLD BOAT™

THE SAILING MAGAZINE FOR THE *REST* OF US!

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Issue 82 January/February 2012



GOOD OLD BOAT™

THE SAILING MAGAZINE FOR THE *REST* OF US!

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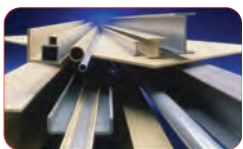
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CONTENTS

JANUARY/FEBRUARY 2012

For the love of sailboats

Review boat

8 Sabre 32

On the sharp end in performance and quality

by Allen Penticoff

18 Hunter Vision 32

Advanced concepts in styling and design

by Richard Smith

Refit boat

24 Learning what you love

A project boat helps a young man set his life's course

by Kegan Ambrose

Feature boat

49 Adena, a Bristol 35.5

In Bristol condition and a fine place to be

by Bill Jacobs

Boat comparison

53 The Bristol 35.5 on stage ...

... with two variations on the theme

by Ted Brewer



Speaking seriously

Sailboats 101

12 Boat Refrigeration 101

Systems that make stuff cool

by Don Launer

Cruising designs

14 Beauty is in the numbers

How the CCA rule influenced sailboat aesthetics

by Robert Perry

Practical restoration

22 Tips for sailboat restorers

A compulsive boat fixer shares some advice

by Kevin Walters

Interior improvements

28 Fixing dysfunctional drawers

Expanding storage and improving their function

by Tony Allport

30 Bamboo for the sole

Leftover home flooring brightens up a boat

by Bill Sandifer

Historical perspective

44 Coordinating coordinates

Degrees, decimals, and the synthesis of cultures

by Devin Ross

Making your own

56 A new holding tank

Its irregular shape dictated DIY

by Ken Poss

Useful modifications

60 LED lights revisited

Lightning induces a review of current lighting

by Clarence Jones



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Spotlight on . . . Exterior improvements

36 Davits — their ups and downs

A safe and reliable installation takes thought
by Alan Lucas



41 Sigfrid's boarding ladder

How a piece of flotsam became an asset
by Richard Toyne



What's more

The view from here

5 Prevailing winds

What's in a name?
by Karen Larson

Mail buoy

6 Beaching legs, whose boat?, and the CCA rule

Cruising memories

34 Rode show

Coming to an anchorage near you
by Karen Sullivan



34

Simple solutions

62 A sonnet for hatch cloths

Silent and stowable, they are easy to love
by Dan Cripe

Quick and easy

64 Instrument pod facelift

A new faceplate accommodates new gadgets
by Joe Orinko

67 Rope in the soap

Running rigging comes clean without tangles
by Gregg Nestor

68 Good old classifieds

75 Product launchings

Line-tailing assistant and chafe protection

Reflections

77 A law of the sea

Compassion for the lost transcends species
by Mathias Dubilier



About the cover . . .

Massachusetts photographer Paul Rezendes captured this scene in Pepperell Cove near Kittery, Maine. Early summer along this coast means fog and plenty of it. Paul frequents this cove, close to the New Hampshire border, as a nice stop between his home port in Long Island Sound and the Maine coast. Paul's site: <www.paulrezendes.com>.

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Prevailing winds

What's in a name?

by Karen Larson

It's hard to believe *Good Old Boat* is approaching its 15th birthday. It was 15 years ago this past fall that Jerry and I sat on *Mystic* in the Canadian Slate Islands of Lake Superior and decided to start "the sailing magazine for the rest of us."

Of course, we didn't think of it that way right from the start. Our concept was that this would be the magazine for the "orphan fleet," the many boats whose manufacturers had gone out of business in the 1980s. For what we had in mind in those early days, we had the *Catalina Mainsheet*, a magazine for Catalina owners, as a prototype.

At that point, choosing the name for it was perhaps the hardest part. We were yet to learn the many hard lessons that come to totally unprepared publishers. But choosing a name was not easy. I wanted to be clear that it was a *sailing* magazine, even though the words "sail" and "sailing" were taken by other publications. Still, it had to include something about "wind" or "breeze" or "sailboat" in the name. The name *Good Old Boat* came up early on the lists, but it was discarded since Jerry thought "old" was a misleading term (causing people to think of wooden boats) and perhaps too negative (isn't "young and new" somehow better than "old" in most people's minds?).

We settled at that time on *Prevailing Winds*. That name means the most frequent wind direction, of course, but it also meant to us that these fiberglass sailboats have managed to last and last and last beyond their manufacturers' wildest expectations. In fact, the prolific and enduring classic-plastic fleet eventually became the biggest competition the manufacturers faced when selling new fiberglass models.

And "prevailing" meant one more thing: the ability to keep going against the odds. This meaning is the one that is increasingly significant to me as we look forward to celebrating our 15th anniversary in the summer of 2013. This magazine has indeed prevailed through several economic impositions and explosions and has been growing for the past several years in spite of all odds. That growth has come thanks to you, our subscribers. We thank you, every one.

Our boats prevail and the magazine about our fleet of good old fiberglass sailboats prevails too. As for the name, *Prevailing Winds*, we did an Internet search at the time and learned that there was a magazine for mercenaries by that name. That news caused us to reverse course and choose the name *Good Old Boat* with the tagline (at the time) of "Still Sailing After All These Years" to get the sailing concept in the name somewhere. And we never looked back. ▽



Beaching legs, whose boat?,

Beaching legs

Your article in the November 2011 issue on beaching a boat (“A Low-Tide Solution”) was very interesting. I understand this method of deliberate grounding is common in the United Kingdom. I became interested in it when I found out there was a recall on the Groco valves I’d just installed while I’d had the boat at home. As I didn’t want to pay for another haulout, I decided to give it a try.

The Vega Association of Great Britain, <www.albinvega.co.uk>, helped by providing detailed measurements and instructions for making a set of legs to fit the Vega. These plans are now posted in the Files section on the Albin Vega Yahoo site at <groups.yahoo.com/group/AlbinVega>.

A couple of fenceposts and some band-sawing later, I had a workable set of legs that attach to a pair of ½-inch through-hulls installed above the waterline on each side of the boat.

My first experience was in a muddy bay, and it was a pretty messy business. But with the help of a good friend, I managed to change the four offending valves between tides. We were pressed for time and I had to lie on my back in the dinghy to get a lick of anti-fouling on the four areas as the tide rose under the boat.

The next beaching experience was in the same muddy bay. I’d overslept and rushed to get the boat in position before the water fell too far. Unfortunately, I managed to get in position with one leg over a depression in the bottom. As the tide receded, the boat started to list to starboard. A 22-pound Bruce anchor was quickly rowed out to port, attached to the main halyard, and the boat pulled upright using the halyard winch on the mast.

The last two beachings were done in a better location: a gravel-bottomed cove with a nice slope. This allowed for a clean and easy zinc change and prop cleaning.

Being able to access the bottom of the boat without a haulout is a real bonus, as long as you have time to sit in the cockpit and await the return of high water!

—Peter Jacobs, Victoria, British Columbia

Whose boat?

OK, Karen, now we know “the rest of the story!” When you signed off the editor’s page in the November 2011 issue with “... and sew the canvas for *my* boat” it sends signals to this male chauvinist that are powerful indeed! I don’t really



care whose boat it is, but “*my* boat” is not the same as “our boat.” In your position as owner/editor of the best sailors’ magazine out there, you do have to be careful about this gender thing that (like it or not) makes the world go ‘round!

—Jim Hildinger, South Lake Tahoe, Calif.

Did I SAY that?

The mainsail on *Mystic* is most definitely *my* mainsail. It was a Christmas present one year. That gave me the authority to decide when it must be reefed! This has been a long-standing joke with the two of us (even though we’re on a replacement mainsail that was not a Christmas present).

But *Mystic* is — in every way — our boat. I wouldn’t say that statement was a “gender thing,” but it was a bit too self-important, I agree. There are two equals in our relationship. We have built a magazine together. We run our household together. And we maintain and sail our boats together.

—Karen Larson, Editor

CCA Rule

You visited us in Maine to do an article on our 1965 Allied Seabreeze (that you published in 2000). That was in 1999. *Secret Water* was new to us then and here we are 12 years later. Can a 46-year-old boat continue to get better with age? Seems so. We’ve sailed her every summer except 2008 when we were totally consumed in a house-building project. She spent that summer tucked away in her barn. Yes that’s right, she has a dedicated building with shop attached. Kind of crazy when the off-season home is worth two to three times more than the boat, but it works out great because I can tinker through the winter.

My father-in-law is a naval architect who years ago worked for both Luders and Sparkman & Stephens — a pretty smart guy. He explains how the CCA rule only considered the weight of the ballast itself. Hence, the centerboarders



and the CCA rule

that were so popular then had the heavy bronze boards and equally heavy bronze cases for the boards — all the weight and no penalty. That likely explains the extreme thickness of glass down low and in the center of the Seabreeze. It is so thick my hole saw bottomed out when I put in my speedometer sender. I measured an honest 2-inch thickness at the turn of the bilge. Weight, but not “ballast.” So even then they played games. But I still think the CCA rule produced fine designs that have stood the test of time well.

—Art Hall, Belfast, Maine

You will like Bob Perry's article this month . . . in which he dissects the CCA rule and describes the boats it produced.

—Editors

Perry on Tripp

What a delight to read Bob Perry's article on Bill Tripp Jr. I've owned a Tripp-designed Seafarer Polaris for 43 years (she's 50 this year). When I was much younger, the prettiest boat in town was a striking Mercer 44.

Bob is a treasure for sharing his knowledge and his design opinions with readers. I've read his design reviews in the Great Lakes publication, *Sailing* magazine, for many years and have purchased his collected reviews as they have been published. You were wise to snag him for *Good Old Boat*. It's wonderful to hear what bright people have to say in their fields of expertise. First Ted Brewer and now Bob Perry; these articles on design issues are the first ones I turn to. Keep them coming.

—Chris Campbell, Traverse City, Mich.

Write about your cruising sailboat

Subscriber Peter Jacobs wrote recently to tell the editors about a new website he'd discovered: [Bluewaterboats.org](http://bluewaterboats.org). Sailor Will Lau began what he hopes will become a valuable resource for the cruising community. While the site is still in the development stages, a visit to <http://bluewaterboats.org> shows that much has happened since its launch early last year.

Will tells us, “We're taking the first steps in creating what hopefully one day will be an encyclopedia of bluewater cruising boats . . . Any sailboat that's bluewater-capable is eligible — modern, classic, multihull, etc. Most of the boats we've been covering are the good old boats that are much loved. We write these articles because these boats have a popular following. In a perfect world with an army of writers, we'd cover every bluewater sailboat.

“We'd love for members of the cruising community to write short articles on the boats they live on or have sailed on or perhaps the ‘next boat’ they're researching. Even a simple three paragraphs is enough. Articles then get edited, cleaned up, and, in some cases, more info is added. Then we publish

them with the author's attribution. Over time, the article becomes a cluster of knowledge as readers add further comments that our editors then roll into the main article. In effect, the articles become “living documents” reflecting the latest we know. The first to review a specific boat gets the author attribution with his or her name.

“We also need editors who are keen to help us manage the articles. We have a hit list of boats our readers want to see reviewed and our editors are chipping away at this list!”

Will concludes with this afterthought: “It's a long-term evolving project and I expect things will change as new ideas come about.”

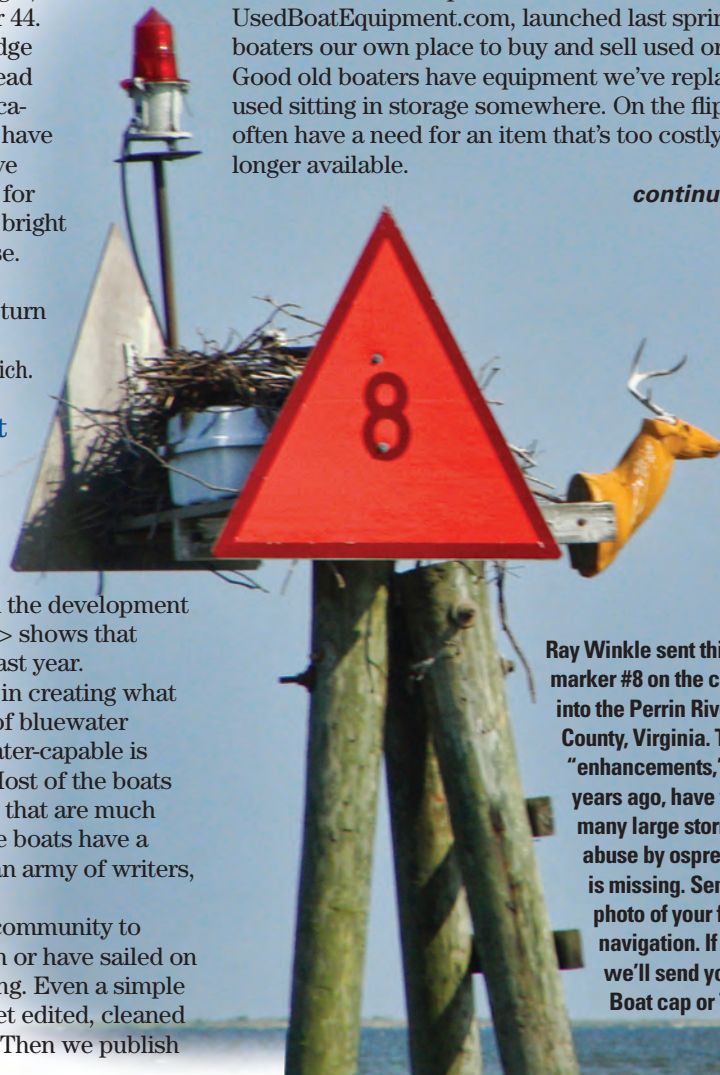
Since *Good Old Boat* magazine evolved much the same way, we're here to tell Will that's the best part of the process!

—Editors

Recycle, reuse

Our new service helps *Good Old Boat* readers save money. UsedBoatEquipment.com, launched last spring, gives boaters our own place to buy and sell used or unused gear. Good old boaters have equipment we've replaced or never used sitting in storage somewhere. On the flip side, we often have a need for an item that's too costly new or no longer available.

continued on page 74



Ray Winkle sent this photo of marker #8 on the channel leading into the Perrin River in Gloucester County, Virginia. The marker “enhancements,” added several years ago, have weathered many large storms and some abuse by osprey: one antler is missing. Send a high-res photo of your favorite aid to navigation. If we publish it, we'll send you a Good Old Boat cap or T-shirt.

While in Burlington, Vermont, looking for a way to get out on beautiful Lake Champlain, I had a chance to sail *Trilogy*, Fred and Vicki Meade's 1985 Sabre 32 aft cabin. Picture this boat anchored near the Burlington town waterfront while awaiting the Fourth of July fireworks display.

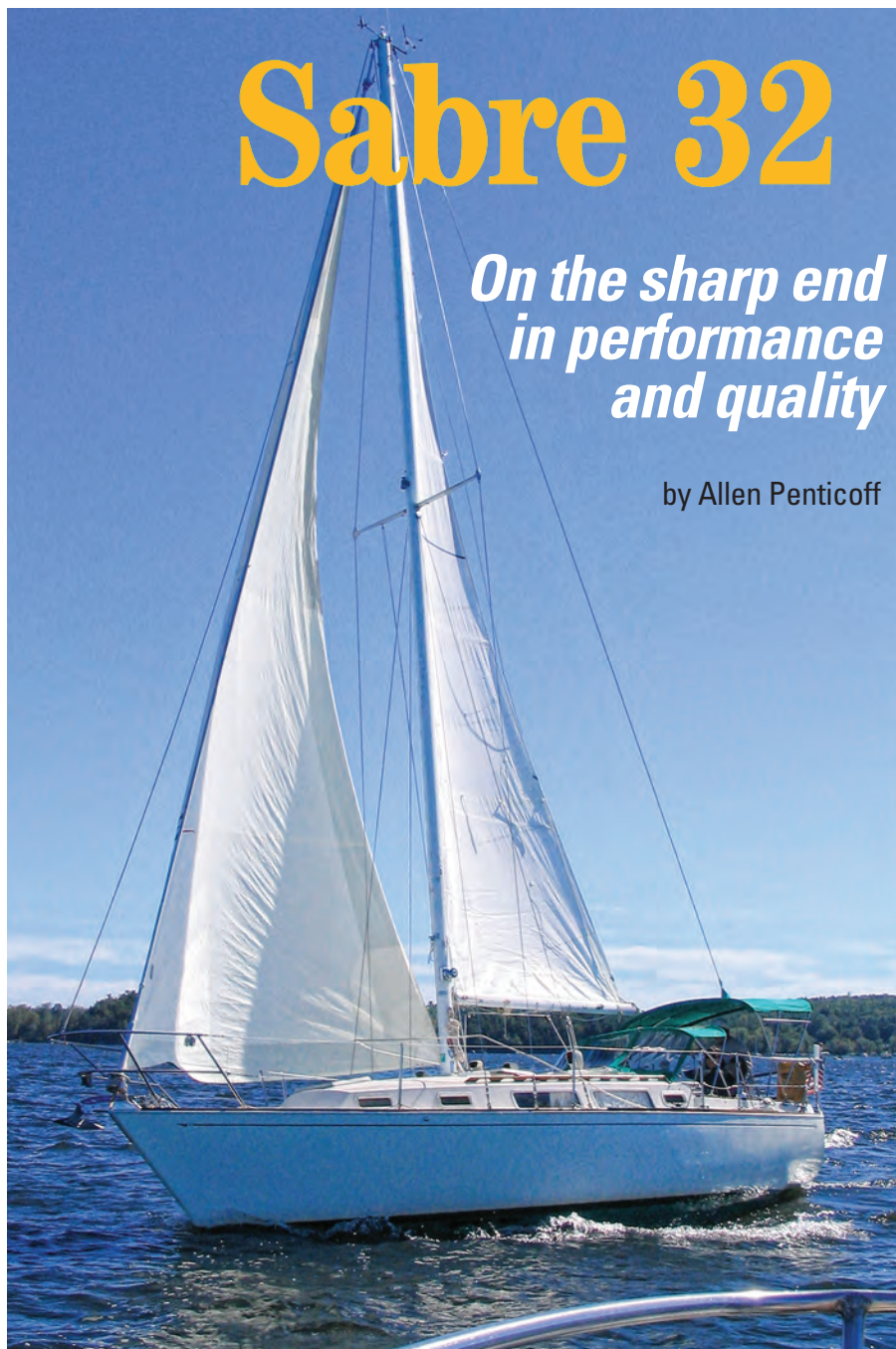
The Meades live in the mountains near Sugarbush, Vermont, but spend plenty of time in the summer aboard *Trilogy*, their fourth boat.

Background and design

Sabre Yachts was started in 1970 by Roger Hewson, who wanted to build the finest 28-foot sailboat possible. Over 15 years, Sabre built 588 of them, and went on to develop a catalog of speedy comfortable boats, sail and power, in its facilities in Raymond, Maine, 25 miles north of Portland. More than 2,500 boats have been built to the tagline "Crafted In The Maine Tradition." Having long outgrown the original building of only 4,000 square feet, the company now builds Sabres in an 83,750-square-foot complex. Under new ownership since the early 1990s, Sabre Yachts has weathered the ups and downs of the marine industry and is still thriving and building boats on a semi-custom basis. In 1994, Sabre Yachts acquired North End Marine of Rockland, Maine. That company diversified into non-marine fiberglass construction and was renamed North End Composites. It continues to make molds for Sabre.

A total of 87 Sabre 32s were built from 1983 to 1987. They were available with the aft-cabin arrangement, as in *Trilogy*, or with the "classic" cabin. The Sabre 32 was offered with a fixed fin keel drawing 5 feet 7 inches or in a shoal-draft keel-centerboard version with a draft of 3 feet 8 inches. No model number was assigned to differentiate the various configurations, but you might see "CB" tacked onto the 32 when boats are advertised for sale.

All Sabres are known for their construction quality, speed, and comfort. Sabre Yachts claims racing had a strong influence on its designs, and that can be seen in the Sabre 32's short overhangs, raked bow, flat sheer, and reverse transom. Firm bilges for form stability and plenty of ballast (4,100 pounds) keep the boat on its feet.



Sabre 32

*On the sharp end
in performance
and quality*

by Allen Penticoff

Fred and Vicki Meade sail their Sabre 32, *Trilogy* on Lake Champlain. The Sabre 32 is a handsome boat with conservative lines that have never gone out of style.

Construction

The Sabre 32 is all hand-laid polyester resin and fiberglass. A layer of .75-ounce mat backs up the gelcoat, followed by alternating layers of 1.5-ounce mat and 24-ounce woven roving in various numbers from five in the topsides above the waterline to 24 layers at the keel attachment. In flat areas of the forward sections of the hull, a core of ¼-inch balsa provides added strength and stiffness. Construction of the

deck is similarly hand laminated with molded non-skid and a first layer of .75-ounce mat, followed by one layer of 10-ounce cloth, one layer of 1.5-ounce mat, a ¾-inch end-grain balsa core, one layer of 1.5-ounce mat and one layer of 24-ounce woven roving. Plywood and additional reinforcements are used in high-stress areas.

The cabin overhead liner is made separately and bonded to the underside of the deck with fiberglass putty.



The foredeck is relatively clean, at left, with twin cleats for docklines and ground tackle, a bow roller for the plow anchor, and a small anchor locker. Fred installed the windlass, just forward of the locker. The twin lazarette hatches provide storage space for deck gear such as fenders and docklines, at right. The engine control panel is under the starboard hatch.

A ½-inch space between the liner and the deck provides insulation and conceals hardware fasteners. Another fiberglass liner bonded to the hull supports the cabin furniture.

To form the hull-to-deck joint, the deck lands on an inward-turning hull flange. A butyl sealant is applied between them and they are fastened together with ¼-inch bolts on 6-inch centers that pass through the flange, a vinyl rubrail, and a teak toerail. The lead keel is attached to the hull with large stainless-steel bolts; the nuts are accessible in the bilge. The owner's manual notes that filler in the hull-to-keel joint will crack on the first sail due to flexing of the keel.

The spade rudder is made in the conventional way. Two fiberglass sides are joined together around a backbone made up of the rudder stock and a welded stainless-steel web. This shell is then filled with closed-cell urethane foam. The rudder is mounted aft of a short skeg but not connected to it.

A walk about the deck reveals a number of nice features: wide sidedecks with excellent non-skid, long teak grabrails on the cabin trunk, jib tracks recessed in the sidedecks, and genoa tracks mounted on the toerail. The shrouds will block your path as you move along the sidedeck, but you can pass

around outside of them while the double lifelines keep you aboard. Lifeline gates are located aft on both sides.

Two fixed windows and six opening portlights are fitted in the cabin sides. More ventilation comes from two large opening tinted hatches, one forward and one above the saloon, and a smaller one above the head, as well as four Dorade vents with plastic cowls on the cabintop.

The anchor locker has plenty of room for ground tackle. Fred has added an electric windlass just forward of the anchor well and keeps his plow at the ready on a roller mounted on a short sprit. All the deck cleats are large and adequate to their tasks.

The cockpit is fairly roomy, although with the aft-cabin arrangement, the

side benches, while they each seat two, are not long enough for a good nap. The stern seat is nice and wide and the backstay does not interfere with the helmsman. Storage space is provided in shallow lockers under both seats and in pockets in the seatbacks. The seatbacks are at a comfortable angle and chamfered edges ease the transition to a wide coaming on which self-tailing winches are conveniently at hand.

Two hatches give access to the lazarette under the stern seat, and the start and stop controls for the engine are under the starboard one. The engine panel is to port, exposed at the aft end of the side seat. A manual bilge pump is installed where it can be operated by the helmsman, and removing a small cover

exposes the top of the rudder stock for fitting the emergency tiller. A folding table is mounted to the steering pedestal, to which Fred has added a grab bar. A gate in the stern pulpit provides access to a long swim ladder over the transom. Stove fuel, either CNG or LPG, is stored behind a removable panel.

Rigging

The Sabre 32 is a masthead sloop with a deck-stepped single-spreader aluminum mast supported underneath by either a stainless-steel or teak compression post. It has a single backstay and cap shrouds and double



The cockpit is spacious enough and has high comfortable backrests, but *Trilogy's* aft-cabin arrangement comes at the expense of cockpit length, so the seats are not long enough to nap on.



The head is aft of the saloon, on the port side, at left. Two countertops hinged on bulkheads provide extra counter space for the galley, which lacks it. The saloon has classic symmetry, at right, and passage is relatively easy on either side of the centerline drop-leaf table. The numerous storage bins, compartments, and drawers are a mark of a boat of above-average quality.

lower shrouds that terminate inboard of the toerail to allow narrow sheeting angles. The high-aspect-ratio mainsail is sheeted at mid-boom and the sheet, traveler controls, and halyards are led to self-tailing winches and rope clutches on the cabintop.

Trilogy has a 135 percent Mylar genoa on a roller furler, a new mainsail, and a soon-to-be-added Dutchman flaking system. Sabre designed the 32 to sail with a 150 percent genoa and full mainsail in moderate winds.

Accommodations

After descending the wide three-step companionway ladder, you are in the Sabre 32's small aft cabin. To port is the nav station, with the electrical panel and electronics tucked outboard under the deck. Its seat is the head of the port quarter berth. To starboard is a double berth and a locker. Cleverly, the locker door acts as a privacy cover for an opening in the bulkhead between the cabin and the galley. Both berths and the nav station have plenty of drawers and storage areas. A teak bi-fold door closes this area off from the main cabin, but privacy in the aft cabin is limited, particularly when under way.

Between the aft cabin and the main cabin, the head is to port and the L-shaped galley is to starboard. The head contains a marine toilet and a sink. *Trilogy* is fitted with

optional hot-and-cold pressure water. For showering, Fred installed a sink faucet with a detachable spray head.

The galley has a sink, icebox, and a CNG gimbaled stove (finding CNG for the stove can be a problem; its advantage is that, unlike LPG, it's lighter than air). The work area is augmented by two small folding tables forward of the galley and head. A stack of small drawers (one of them a specially designed tool drawer) is to port, forward of the head. Plenty of drawers are provided in the immediate galley area as well. I measured standing headroom at the galley and aft cabin at 6 feet 2 inches, an inch more than stated in the manual. A nice feature is the angled sections on either side of the teak-and-holly cabin sole that

provide sure footing when the boat heels. Two long teak grabrails overhead provide security for moving about while under way. The cabin is well lit and airy.

In the saloon, port and starboard settees of equal length (and more than adequate for sleeping) flank a folding table with two leaves that straddles the centerline around the compression post. It's easy to get by on either side. The port settee slides out to create a double berth and storage spaces are located under and behind each settee. A 25-gallon water tank is under the starboard settee and the 20-gallon holding tank is located under the port settee.

The V-berth is forward of a solid door, has 5 feet 10 inches of headroom, has a removable insert, and is roomy enough to be called a cabin. Under the V-berth is a 30-gallon water tank.

The textured-gelcoat cabin headliner is attractive and easy to clean. Vinyl fabric covers the hull where it's exposed (most of the interior surfaces are teak). All the storage lockers appear designed to keep their contents secure while the boat is sailing. Some of their doors have an interesting basket-weave pattern.

We did not access the engine during my inspection. It appears to have the standard access behind the companionway ladder and through panels from the quarter berths — not great, but acceptable.

Sabre 32

Designer: Sabre Yachts Design Team

LOA: 32 feet 2 inches

LWL: 26 feet 2 inches

Beam: 10 feet 4 inches

Draft (fixed keel): 5 feet 7 inches

(centerboard up): 3 feet 8 inches

(centerboard down): 7 feet

Displacement:

(fixed keel): 10,500 pounds

(centerboard): 10,800 pounds

Ballast:

(fixed keel): 4,100 pounds

(centerboard): 4,400 pounds

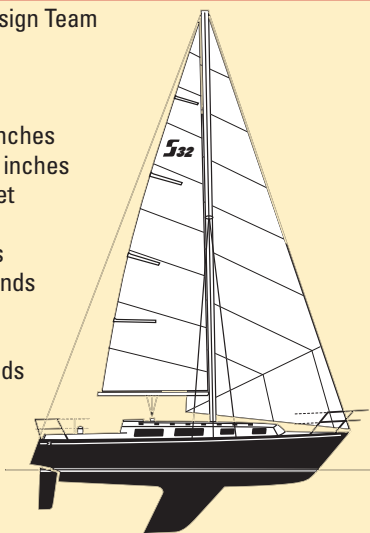
Sail area: 481 square feet

Disp./LWL ratio

(fixed keel/CB): 262/269

Sail area/disp. ratio

(fixed keel/CB): 16.0/15.8



Under sail

The Meades could not give up their prized anchoring spot for long as the bay would soon fill with boats waiting for nightfall and the fireworks, but we did get a brief sail in conditions windy enough to produce white-caps. The helm felt moderate to light, with good feedback. The sails could be easily trimmed for a neutral helm. Upwind and down, *Trilogy* was stable, and she happily tracked as the helmsman desired. Judging by this boat's design and heritage, I doubt it will produce any surprises when sailing. Hull speed is 6.85 knots, and I'm sure *Trilogy* can exceed that on a blustery Lake Champlain day.

The few Sabre 32s racing under PHRF are rated at 159 to 162 seconds per mile, faster than a Pearson 32 at 168-171 and competitive with a C&C 32, which rates 153 to 165 in most fleets across the country.

A 21-hp Westerbeke diesel powers the boat, and the prop shaft is offset to minimize prop walk in reverse. The fuel tank holds 20 gallons.

Conclusion

Overall, I liked the aft-cabin arrangement. While it causes the cockpit to be a bit short, it places the head



The galley is tight but has all the essentials — and lots of drawers!


and nav station close to the cockpit, which is handy when under way. As in most boats, the number of places for people to sleep exceeds the ability to carry their gear. However, most are crewed by two, so those extra berths become storage areas, and *Trilogy* is no exception. An option was to forego the port quarter berth and substitute a large cockpit locker. I think I would have preferred that arrangement.

As with any 25-year-old boat, you need to have a good look at some areas when considering a purchase. If it has a teak mast-compression post, check to see if it's soggy at the base where it rests on top of the keel. End-grain-balsa core in the deck warrants a careful sounding of the deck for voids and a

close inspection wherever hardware is attached. Leaks at the hull-to-deck joint are not uncommon, but tightening the bolts often cures the drip. Hull blisters may be present and a survey should reveal any wet areas in the hull. The bilge is large but shallow — not a great feature. Centerboard boats should receive a close out-of-water inspection of the centerboard and its hardware.

On the plus side, the seacocks are bronze and the owner's manual is thick and thorough. In general, Sabre

Yachts has always paid close attention to detail and quality when constructing its boats and has fitted them out with top-quality hardware. This is reflected in the Sabre 32's excellent resale value — an Internet search turned up asking prices of \$42,500 to \$54,900.

Sabre Yachts maintains a list of regional Sabre owner associations at <www.sabreyachts.com>. 

Allen Penticoff is a contributing editor with Good Old Boat. He has trailersailed on every Great Lake and on many inland waters and has had keelboat adventures on fresh and salt water. He presently owns an American 14.5, a MacGregor 26D, and a 1955 Beister 42-foot steel cutter that he's restoring.



The head is nicely trimmed in teak and the white laminate surfaces make it bright, at left. Its location aft near the companionway is unusual on a boat of this size. The nav station is at the head of the quarter berth, center. The bi-fold door provides some privacy in the aft cabin. The dedicated tool drawer, at right, is a Sabre trademark and a nice touch.

Boat Refrigeration 101

Systems that make stuff cool

by Don Launer



When considering refrigeration for your boat, it's imperative that you match the type of refrigeration system to the boat's potential sources for energy. Several choices are available.

Compressor power options

Any type of mechanical refrigeration system needs a power supply for the compressor. It also needs power for a fan, if the condenser is air-cooled, or for a raw-water pump, if the condenser is cooled by a raw-water heat exchanger. On a boat, the power for a compressor can come from belting the compressor to the engine, from the DC battery system, from an onboard generator, or from shorepower.

Compressors that are belt-driven off the boat's engine are usually of the type used in automobile air-conditioning systems, in which an electromagnetic clutch engages the compressor when energized by the refrigerator's thermostat.

Whether to use an engine-driven or electric-powered compressor depends to some extent on how a boat is used.

For a boat kept on a mooring or a cruising boat that seldom spends time in a marina, the engine-driven compressor might be the right choice. Whenever the engine is running, whether it's to charge the batteries or make progress in light winds, the compressor will be cooling the refrigerator.

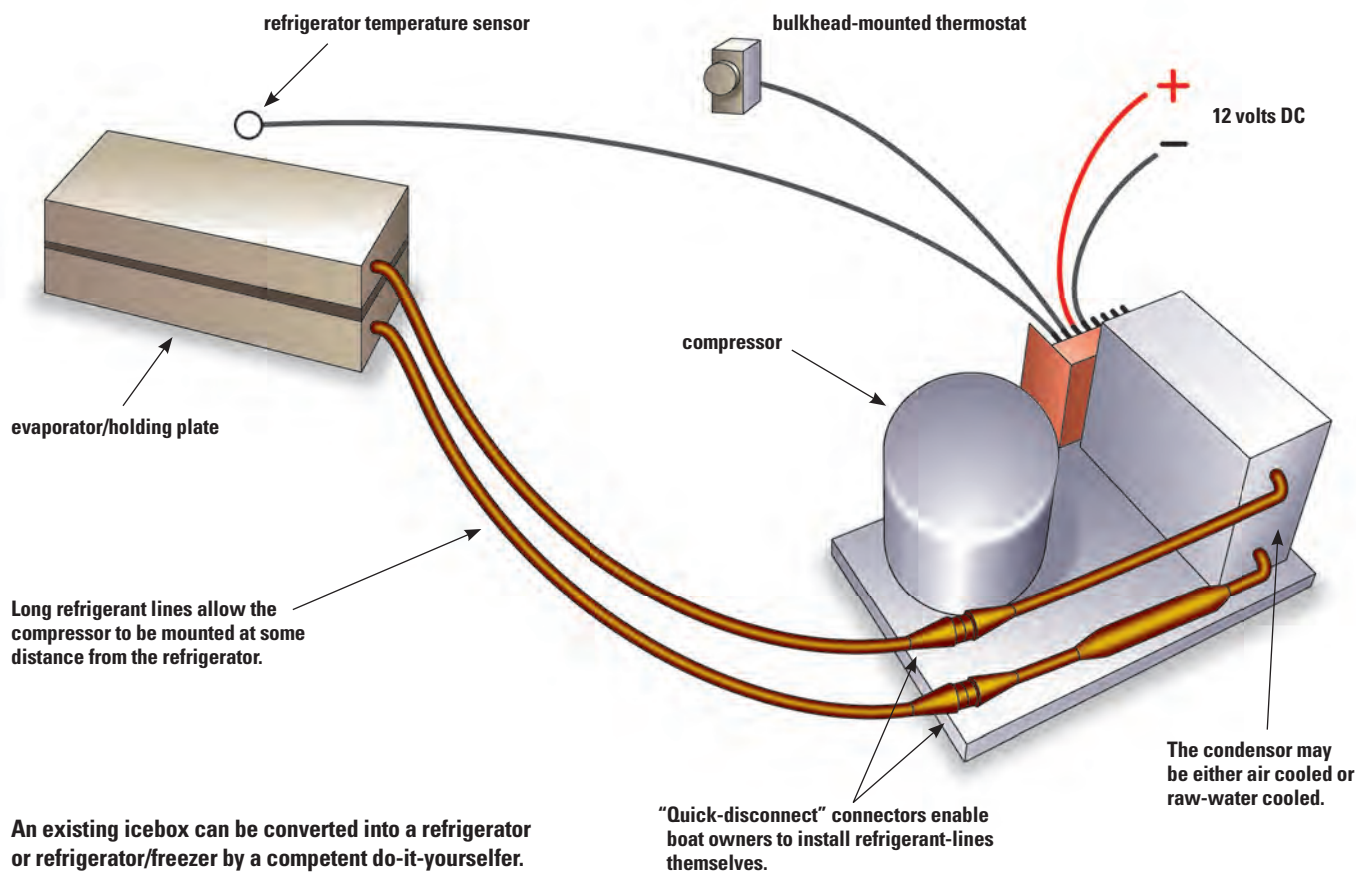
On a boat that is often at a dock where shorepower is available, a DC compressor that can run off the batteries or a dual-voltage compressor is probably the better choice, as it eliminates the need to run the engine for the sole purpose of providing refrigeration while at the dock.

Holding plates

Some boat refrigeration systems are just like a household refrigerator, in which the compressor must cycle on and off continuously to maintain the temperature. For cruising sailboats, a better system is the type that uses a holding plate.

A holding plate is a tank in which the refrigerator's evaporator coils are surrounded by a solution, usually called a "eutectic solution." When the holding plate has been frozen, it acts like a very cold block of ice and will keep a well-insulated refrigerator box cool for up to 24 hours without the compressor having to run.

Most thermostats for boat refrigerators monitor battery voltage. When they sense a battery voltage that's above normal — such as when the boat is on shorepower with the battery charger operating or when the engine is running with the alternator charging the batteries — they will automatically turn on the refrigeration system to refreeze the holding plate. These "smart" thermostats will not turn on the refrigeration system if they sense a battery voltage that's below normal.



Installing refrigeration

Systems designed to convert an icebox into a refrigerator are available for owner installation. They come in two basic parts, the condensing unit and the evaporator or holding plate with the refrigerant lines attached. The whole system comes pre-charged with refrigerant, including the refrigerant lines that connect the evaporator or holding plate to the condensing unit. To prevent the loss of refrigerant, the ends of these connections are covered with thin seals.

To install the system, you mount the evaporator or holding plate in the icebox and snake the refrigerant lines to the condensing unit, which can be located some distance away. You connect the refrigerant lines to the condensing unit with connections that have special fittings that puncture the seals when the connection is tightened. The system is then pre-charged and ready to go.

In some systems, the condenser is cooled with air, just like a home refrigerator. In others, the condenser is cooled with raw water delivered by a built-in raw-water pump.

An air-cooled condenser can work well in cool or temperate climates but will run nearly constantly when the temperature is in the 90s. In addition, there has to be some way of getting rid of the hot air produced so it doesn't raise the temperature in the interior of the boat. Air-cooled condensers are not practical in regions where the summer temperatures are very hot.

Water cooling is about 25 percent more efficient than air cooling but is subject to other drawbacks. If not included in the refrigerator package, a fine-mesh filter should be placed in the incoming cooling-water supply between the refrigerator and the raw-water pump. Because components are made of dissimilar metals, many water-cooled units have a sacrificial zinc anode that should be checked yearly and replaced when necessary.

Portable refrigerators

Portable refrigerator/freezers are available that look just like coolers but contain all the components of a normal refrigerator: a small compressor, evaporator, and condenser. They are made with interior volumes from 6 gallons to more than 25 gallons and weigh from 25 to more than 75 pounds empty. Models are made that operate on 12 volts DC, 24 volts DC, or 120 volts AC.

Finally, there is the old standby — the cooler — that, when packed with ice, will provide all the cooling needed for a day's outing or an overnighter. *▲*

Don Launer, a Good Old Boat contributing editor, built his two-masted schooner, Delphinus, from a bare hull and has held a USCG captain's license for more than 36 years. He has written five books, including The Galley: How Things Work and Navigation Through the Ages.

Beauty is in the numbers

How the CCA rule influenced sailboat aesthetics

by Robert Perry

It's not unusual for people to look at older boats and marvel at their beauty and remark how today's boats just aren't as good looking. I do it. But you might be surprised to learn that the features you admire on some older boats are in fact artifacts of the rating rules that were in place at the time the boats were designed.

Rating rules came about to allow boats of different sizes to race against each other. They varied from place to place, but the boats we commonly see today that date from the 1950s to the late 1960s were usually influenced by the CCA (Cruising Club of America) rule, and those from the late '60s through the '70s by the IOR (International Offshore Rule). I could argue that the International Rule that governed 12-Meters, 6-Meters, and 8-Meters, had a lot of influence also. The famous *Dorade* that put Olin Stephens on the map was based upon meter-boat shapes.

Is this rule stuff important to us? Not really. We like our boats for what they are. But from studying the basics of these rating rules you may better understand why your boat and other older boats are the way they are. I'll focus on the CCA here (and the IOR in a future article) because these rules were in effect in the U.S. early in the era of GRP production-built boats. For this article I am going to use a late (1967) revision of the CCA rule because it's the only one I have saved intact. Like all rating rules, the CCA went through a number of revisions over the years to "plug loopholes" and ensure that the boats not venture into extreme proportions. But for many years, the CCA provided a lot of fun and highly competitive racing.

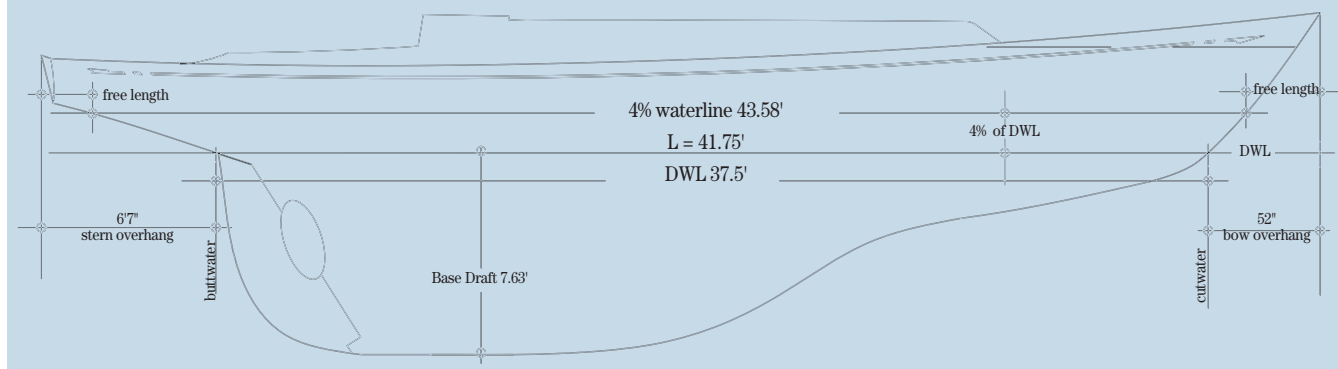


DICK DIXON

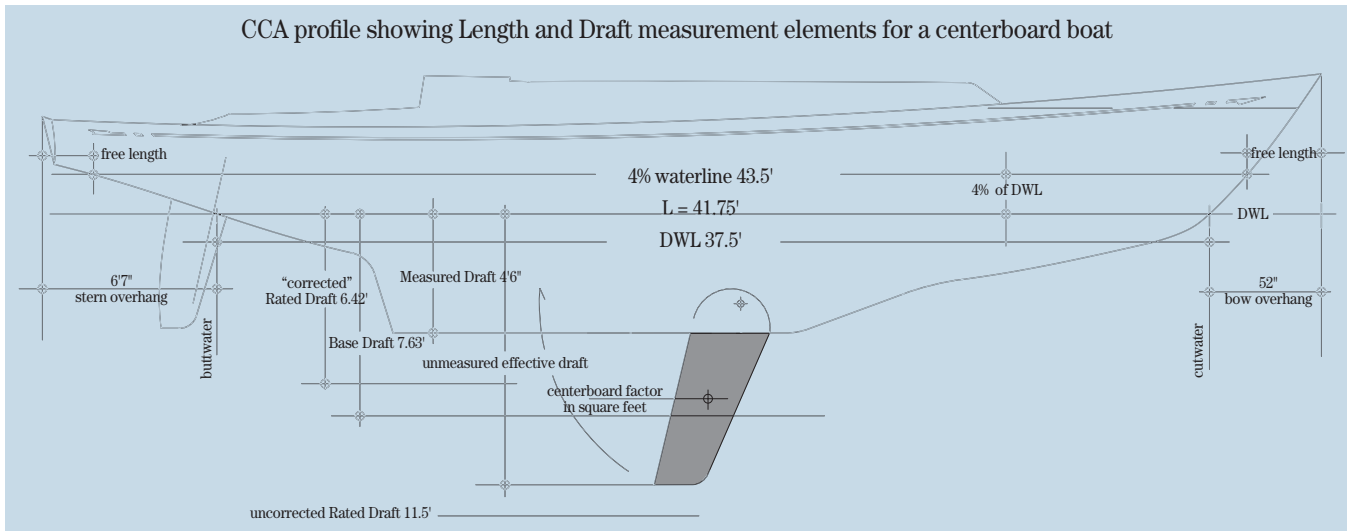
Sailing at speed, an Allied XL 242, a late CCA design, gains sailing length when its long stern overhang becomes immersed.

Not all boats show the effects of raceboat rating rules. A lot of cruising boats were developed without regard to any rating rule. The Colin Archer types and Colin Archer wannabes are examples (although Colin Archer had his own rigid rule for distribution of volume). Many of our traditional types were modeled after sailing workboats, so you could argue that their restricted or focused purpose did, in fact, impose a "rule" on them. Some boats just grew out of the designer's idea of what a "perfect" boat would be and rules be damned. Bill Garden's amazing *Oceanus* comes to mind as a great example of that type, as does L. Francis Herreshoff's *Ticonderoga*. That *Ticonderoga* was very successful racing under the CCA rule is a sign of the skill of L. Francis. Today, with the popularity of one-design racing, we see a lot of modern "rules be damned"

CCA profile showing Length and Draft measurement elements for a fixed-keel boat



The CCA rule formula was very simple (and is further simplified for presentation here): $\text{Rating} = (L + Bf + Df + Vf + Sf)$ times a Stability factor and a Prop factor. Bf, Df, Vf, and Sf are correction factors for beam, draft, displacement, and sail area and might be positive or negative depending on whether a penalty or credit was taken. Measured Length (L) would be adjusted by these factors and the Rating was supposed to represent an accurate sailing length of the boat. The draft factor was further adjusted for centerboard boats, top of facing page.



boats. My own Flying Tiger 10 Meter class is an example of that. I just wanted to design a fast, fun boat. Rating rules generally penalize this type of boat heavily.

Weighing fast and slow elements

Now please sit up straight, spit out your gum, and pay attention.

The origins of the CCA rule were laid down in 1932 by Wells Lippincott of Chicago. With minor changes, the rule was adopted by the Cruising Club of America and the CCA rule was the dominant U.S. handicap rule until 1970. If you want to see typical CCA boats, look at the designs of Bill Tripp Jr., Bill Lapworth, Kettenburg Boatworks, Bill Shaw, C&C, Phil Rhodes, and Sparkman & Stephens. This is my short list — many designers produced CCA-type designs.

Rating rules balance the speed-producing elements of a boat against the speed-reducing elements. Length is speed-producing as are sail area, draft, and stability. Beam, displacement, and prop drag are speed-reducing elements. The key to understanding how the CCA (and the IOR) work is in the way each rule dictates exactly how to measure and “weight” those elements.

The one element common to almost all CCA designs was overhangs. Today, we look at those boats from the 1950s and early '60s and admire their overhangs and strong spoon bows. Primarily, overhangs were a product of how the CCA measured length. The actual rule is short and simple (see the cutline on the facing page). It begins with a Measured Length, which it adjusts with a series of factors based on other dimensions.

Length

Measured Length (L) is the most important factor and it was established by measuring the waterline length (DWL) of the boat and another waterline length 4% of DWL above the DWL. These measurements were weighted: 30% of the DWL was added to 70% of the 4% waterline. What does this mean? It means that to have a low L you needed a short DWL and a short 4% waterline. But once you got beyond where the 4% waterline crosses the bow and the stern counter, your length was free, i.e., unmeasured. This is why CCA boats almost always had long overhangs.

The overhang was an attempt to capture back some of that length lost to the L measurement. If you look at the designs of Lapworth, Kettenburg, and Bill Tripp Jr. you will see very full bow sections. By pushing volume forward in this way, the designer was trying to make the bow overhang do some “work” in adding to sailing length. Fine bow sections would not do this. Unfortunately, full bow sections don't help a boat on the wind as the half-angle of entry becomes excessive. But the good news is that full bow sections can make for a boat that is fast when reaching and running. I'm not sure why sterns were not wider in those days. Bill Tripp Jr. did push his sterns out to what at the time was considered almost extreme, as did Lapworth, but the sterns of S&S and Rhodes designs were relatively trim, although broader than the sterns of meter boats. If the 4% waterline intersected the transom, a correction factor was added.

Beam

Beam was measured at the DWL and the 4% waterline and *not* at the deck. That's why CCA boats look rather slab sided. Once you had hit your Measured Beam points at the DWL and 4% WL, there was no reason to go on increasing beam and you would pay when you got to the stability correction. The Beam correction factor was based on a “Base Beam” of $.187(L) + 3.2$. If your Measured Beam was below the Base Beam, you gained L. If your Measured Beam was above the Base Beam, your L was reduced. But the way the corrections were weighted, there was little incentive to go above Base Beam and going below Base Beam incurred a more punitive correction to L.

Draft

Draft also affected L. If your actual draft, Measured Draft, exceeded the Base Draft of $.147(L) + 1.5$, 85% of the excess draft was added to Measured Draft to obtain a Rated Draft. Draft on CCA boats tended to be modest, so it is evident that designers seldom took the draft penalty. For instance, for an L of 34 feet the Base Draft is 6.5 feet. But Rated Draft was measured differently with centerboard boats, where the exposed centerboard area in square feet was

divided by .167 L to give a CBF (Centerboard Factor). This was added to the measured draft. If Rated Draft was less than Base Draft, centerboard-down draft was “cheaper” than fixed-keel draft as CB boats had low Measured Draft. As time went on, the low-aspect-ratio centerboards like *Finisterre*’s were replaced by centerboards with higher aspect ratios, like the one on Charlie Morgan’s successful *Paper Tiger*, to reduce the CBF without giving up board-down draft. (More on the centerboarder’s advantage when we discuss stability.)

Displacement and stability

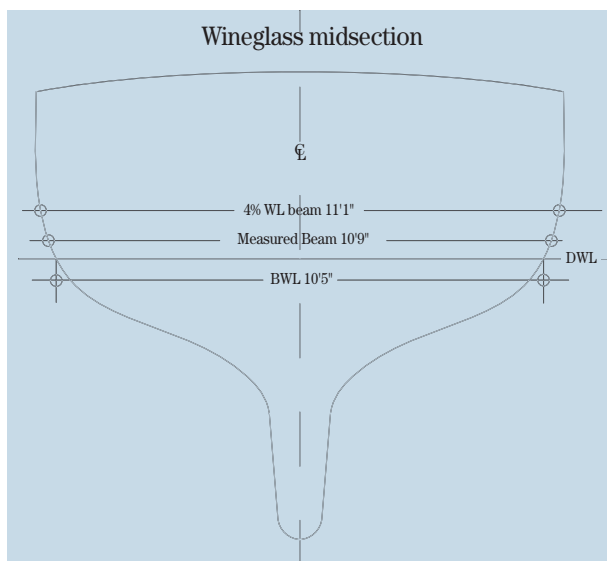
Displacement went through a similar correction by comparing actual displacement to a Base Displacement. Boats were actually weighed to determine displacement. Due to space restrictions, I am going to avoid Displacement corrections.

Measuring the stability of the boat went through major changes over the life of the CCA. In its early years, the rule did not require an inclining test but used ballast-to-displacement (B/D) ratios. This assumes the lower the B/D the more tender and slower the boat. Problems arose defining “ballast” after designers put very heavy metal structures in the bilges of centerboard boats to support the large centerboard trunks. These were effectively ballast but were not technically counted as such, so a more accurate way was needed to measure stability. By 1967, the boats were physically inclined in calm water to obtain an accurate Vertical Center of Gravity (VCG) and Righting Moment (RM). This actual RM was compared to a Base Righting Moment to produce a Stability Factor. A penalty to L was incurred if your Measured RM exceeded your Base RM. Early CCA boats tended to have a firm turn to the bilge because this was not measured. This produced relatively stiff boats.

The Prop factor was based upon the type of installation, diameter of the prop, and whether the blades were fixed, folding, or feathering.

Beauties and rule beaters

When we look at drawings or photos of the old S&S boat, *Finisterre*, launched in 1954 and three times the winner of the Bermuda Race, we see a beautiful, “classic” looking yacht. But *Finisterre* was a CCA-rule-designed boat and considered, at least by Olin Stephens, an “extreme” example of the type. In the Cal 40, designed by Bill Lapworth in 1963, we see another boat that by today’s standards shows beautiful “classic” lines. But the Cal 40 represents the epitome of CCA-rule-induced design features. In its day, the Cal 40 was a “rule beater” and won just about everything for a few years.



These were pretty boats, and the obvious conclusion you could come to was the CCA produced beautiful, wholesome boats. But the Worth Brown-designed *Hoot Mon*, a contemporary of *Finisterre*, was anything but pretty. *Hoot Mon* was a CCA-rule freak and a very successful one. On a LOA of 39 feet, she had a DWL of 21 feet 7 inches and extremely full ends. In fact, you could consider *Hoot Mon* almost a scow-type hull form. I recall thinking, even as a kid, how ugly she was and, at the same time, how intriguing this approach to the rule was. Over time, just about every rating rule

eventually produces freaks as clever designers learn where the loopholes are and how best to exploit them to achieve the greatest boat speed for the lowest rated speed.

Sails and rigs

Let’s look at how the CCA approached sail area and gave us the rig proportions you see in the boats of the ’50s and early ’60s. Measured Sail Area (MSA) was determined using the basic sail-plan dimensions; today we call them “I,” “J,” “P,” and “E” but the CCA used other initials. Base Sail Area (BSA) was calculated based upon Measured Length, L. In the early days of the CCA, yawls like *Finisterre* were popular because staysails and spinnakers flown off the mizzen were not counted in the MSA. Off the wind, these mizzen flying sails gave you additional unmeasured and effective sail area. In time, that loophole was closed and you paid for that area, and yawls quickly disappeared from the racecourse.

Also in the early days of the CCA, mainsail area was more heavily weighted compared to the overlap (or LP) of genoas. Bill Luders saw the loophole here and designed a 44-footer called *Storm* that was technically a yawl but had no mainsail at all, resulting in a very low RSA. *Storm* carried big overlapping genoas, a mizzen, and a complement of mizzen flying sails and won everything her first year. This annoyed the rule makers, who decided you had to have a mainsail and changed the rule to reflect that. Bill Luders, still looking at the loophole, modified *Storm* so she carried the mainsail, as I recall, of a Penguin dinghy, and still had a low RSA. The next year, the rule was again changed to require that the boat would be rated with a mainsail area based upon the CCA “P2” dimension (the height of the foretriangle) whether it carried a mainsail of that size or not. So big mainsails were back in vogue.

Throughout most of the CCA days, genoa overlap was not heavily weighted, so we saw genoas with LPs in excess of 160%, with some so long that they sheeted to the corner of the transom. Obviously, this was a not a good trend, and the rule in time addressed this with LP weighting changes.

If Rated Sail Area exceeded the Base Sail Area you were penalized with a correction factor of 1.15 times the excess. I’m really not sure why mainsails stayed big under



***Touché*, at left, designed by Bill Tripp Jr., shows the long bow overhang and squat sail plan encouraged by the CCA rule. Even when reefed, *The NE 38*, also designed by Tripp, carries a big overlapping genoa, at right. The famous *Finisterre*, below, gets a big push from her "free" mizzen staysail.**



the CCA and base foretriangles stayed small. My best explanation is that it was just the style of the day and designers were still clinging to the old accepted rig geometries. The 1.15 factor for excess sail area was a heavy penalty, so the typical

to remember that today's boats have the advantage of newer and lighter construction methods and a general improvement in the science of what makes sailboats go.

CCA rig was quite short by today's standards. The classic Tripp Bermuda 40 had a sail-area-to-displacement ratio (SA/D) of only 16.36 and the Cal 40, a later design, had a SA/D of 18.38. Both of these numbers would be considered anemic on the racecourse today. The typical mom-and-pop cruising boat today has a SA/D of around 17.0 or better.

The CCA legacy

Let's say you own a nice old early '60s boat. What characteristics would it have acquired from the CCA rule?


I hate to generalize, and in that day we saw some real variations in design, but given the CCA's focus on DWL, it probably has a short DWL and longish overhangs. This translates to a small interior for a given LOA. Accommodations were further reduced because cockpits were just bigger then and seldom extended to the transom as there was little volume in the overhang aft. The accommodations of a Bermuda 40 would be similar to those in a modern snub-ended 32 footer. Beam on the CCA boat would be relatively narrow. The L/B of the Bermuda 40 is 3.46. *Finisterre*, considered almost excessively beamy in her day, had an L/B of 3.42. These relatively high L/Bs would further reduce interior volume.

One thing the CCA boats had going for them was stability. Although I don't have any numbers for them, I think some of the centerboard models might have had low ultimate stability, but the typical deep-keel, wineglass-section, firm-bilge CCA boat would have had both good initial stability and good ultimate stability. CCA boats were heavy by today's standards. *Finisterre* had a displacement-to-length ratio (D/L) of 478! The Bermuda 40 had a D/L of 404 and the radically "light" Cal 40 a D/L of 236.

In terms of sailing performance, your typical CCA boat was not close-winded, and for several reasons. Sails in those days were not as efficient (and that has nothing to do with the CCA) but the low-aspect-ratio rig of the CCA boat with its huge overlapping genoas was not weatherly. Sheeting angles would have been wider than on today's boats, so it was physically impossible to point as high as a modern boat. It's important

Also keep in mind that, in the early '60s and before, true fin keels were not common. Ben Seaborn in Seattle, C&C, and Bill Lapworth had begun playing with fin keels but the successful CCA boats that I raced on in high school had what today we would call modified full keels. The rudder was attached to the keel's trailing edge. In an effort to reduce wetted surface, rudders moved forward, and this resulted in some boats that were hard to steer off the wind. If there was any doubt that the fin keel and spade rudder was the fastest underwater configuration, the Cal 40 quickly put an end to the debate.

The CCA boat would have been slow in light air. Excessive genoa overlap did not make up for the low aspect ratio of the overall rig. Interestingly, in the early years of the CCA, fractional rigs were common. Over time, many fractional-rigged boats were converted to masthead rigs. Today, we know the fractional rig is the more efficient rig. Off the wind, the CCA boat was usually a nice boat to sail, especially when it had a spade or skeg-hung rudder. With the full ends, the boat was usually stable downwind and fast. The sail area distribution on squatty rigs with the big mainsails was well balanced, so going dead downwind in a blow was seldom a problem.

But the heyday of the CCA was before my time. I graduated from high school in 1964 in time to see Ted Turner and his radical Cal 40 win the SORC. But I had raced on CCA boats and I knew the type well, if not the inner workings of the rule itself. I have probably missed some or even many of the nuances to the CCA rule here. CCA experts are very hard to find today. I think I have covered the basics. In the next issue I will compare the CCA rule to the often dreaded IOR. 



Robert Perry is a contributing editor with Good Old Boat. He began his career designing yachts on the cusp of the change from the CCA to the IOR. He has designed many boats to the IOR, many to no rule at all, and some of his designs pay tribute to the CCA rule in terms of style.

Hunter Vision 32



Walking down the dock on review day, I couldn't help but notice the sharp contrast between Jeff Carey's 1989 Hunter Vision 32, *Endolyne*, and her older and more traditional neighbor, a vintage Pearson 30. The Hunter's designers were looking at a very different market, and in creating the Vision, took advantage of the opportunities for design and styling that modern materials and construction methods have to offer.

History

Hunter Marine, a subsidiary of the Luhrs Marine Group, is the product of a long tradition of shipbuilding that has its origins in the 1800s when Henry Luhrs and his grandson, another Henry, outfitted trading ships, later owned a chandlery, and eventually owned their own ship. Grandson Henry, together with his sons, John and Warren, shared a love for the sea. In time they took the work to New Jersey and built more than a thousand boats a year.

In 1965, the company was sold to Bangor Punta, a large timber conglomerate. Eventually, John and Warren (the latter a passionate sailor with a keen

business sense) went off on their own. They sought to bring production line efficiencies to the sailing industry and in 1973 commissioned John Cherubini, a much-admired naval architect in the 1970s, to design a 25-foot sloop. That boat became the first Hunter. It launched the company that now turns out around 2,000 boats per year in Alachua, Florida, and ranks with Catalina and Beneteau as one of the largest producers of mid-priced sailing yachts in the world. (Hunter Marine should not be confused with the similarly named British boatbuilder. The American firm uses the brand name "Legend" for its boats sold in the United Kingdom.)

Design

Hunter prides itself in responding to market forces in both aesthetic and functional details and consequently changes its designs, specifications, and model designations frequently. It has been very successful at producing boats that appeal to buyers looking for good value for money, that are easy to sail shorthanded, and that provide comfortable living quarters with plenty of headroom and elbow room.

Hunters present a departure from traditional design, so they don't have the lively sheers, well-balanced ends, or low houses of their CCA forebears. The Vision 32, in production between 1988 and 1994, has features similar to those found in European boats, such as Beneteaus and Jeanneaus, and much larger yachts. Its superstructure, with its wraparound tinted windows, resembles a pilothouse. The exaggerated volume of the hull form allows an interior arranged more like a modern living room, with curvy sectional sofas and large windows, than the snug accommodations common to more traditional yachts of this size. Freeboard is high, and the displacement/LWL ratio of 279 indicates moderately heavy displacement.

Deck and rig

The Vision 32 is fitted with an enormous tapered unstayed mast that has a 38-inch circumference at deck level. Two folding mast steps attached near the base, a

Showing off her rakish lines, *Endolyne*, above, a Hunter Vision 32 owned by Jeff Carey, stands up to a 20-knot breeze.



The arched helm seat, at left, provides support for the helmsman when the boat is heeled and lifts up to provide access to the transom-mounted swim ladder. The T-shaped cockpit allows easy movement around the steering wheel, at right, but the seats are too short to lie down on.

lower one to starboard and a higher one to port, get the foredeck crew up off the deck to assist in raising the sail and fitting the mainsail cover. A solid boom vang supports the boom when the sail is being lowered. A block and tackle is incorporated in the vang to control leech tension with downward force. The mainsail is sheeted mid-boom with a 6:1 tackle that's attached to a traveler mounted on the cabintop just aft of the sea hood.

All sail-control lines are led aft to the cockpit. The main halyard, boom vang, and first jiffy-reefing lines run along the starboard side while the mainsheet, jib halyard, and second-reef lines are led to port. Lines on either side of the companionway are handled by Barient 21 two-speed self-tailing winches. It's all done neatly, with the lines partly concealed in deck recesses and under the sea hood, but the attendant routing through gangs of turning blocks produces a lot of friction, especially with the main halyard. The 350-square-foot mainsail is equipped with full-length battens, furling lines, and lazy-jacks. Consequently, the highly touted simplicity of the unstayed rig can quickly become a handful. On later Vision 32 models, the mainsail halyard was led to a power winch.

The 100 percent working jib is on a Hood SeaFurl roller furler and trimmed by Barient 22 two-speed self-tailing sheet winches. Some owners going to a 130 or 135 percent jib report much-improved performance. The small headsail is intended to help the Vision's relatively

weak pointing ability and it may well do this. However, several factors contribute to a general lack of weatherliness with an unstayed rig. The large-diameter mast creates a considerable amount of turbulence and, in the absence of a backstay, the headstay sags in a gust, making it difficult to flatten the jib for that windward-hugging slot. The weight of the large mast also contributes to raising the boat's center of gravity, and that can adversely affect stability.

Without shrouds to hold onto, crew must take extra care when working on deck. They must keep their bodies low at all times when moving forward and aft and make good use of handrails and toerails.

That said, an unstayed rig has its advantages. With no backstay to interfere with it, the mainsail can have greater roach. In a gust, the mast bends to leeward, spilling wind out of the top of the sail. This lowers the center of effort and reduces heeling. Plus, there are no chain-plates to leak and no complicated rigging to tune. And the small jib is a joy to tack and jibe.

The advantages can extend to the accommodations. In the Vision 32, for instance, the keel-stepped mast is carried well forward and is fully contained in the forward cabin where it's entirely outside the saloon.

The cockpit

The large T-shaped cockpit has a curved helmsman's seat, a walk-through transom, and a swim platform with seats on either side — an

advantage when debarking to a dinghy from a high-sided boat. The manual bilge pump is fitted in the lazarette to starboard of the walk-through, and the port-side locker houses the batteries, two for the house and one dedicated to starting. Two 5-pound propane bottles and miscellaneous items are stowed in compartments in the transom on either side of the swim step. The starboard cockpit seat and back open "gull wing fashion" to a very large locker. *Endolyne* is equipped with a Raytheon autopilot. The cockpit drains very effectively through the sugar-scoop transom.



Two steps are fitted on the mast to allow crew to reach the mainsail's halyard shackle and work with the sailcover.



Endolyne's owner, Jeff Carey, modified the wraparound settee to provide easier entry into and out of the forward V-berth, at left. For privacy, he also fitted louvered panels into the openings in the main bulkhead. In the galley, at right, a decent volume of storage space is accessible in compartments above and below the two-burner gas stove, double sinks, and Corian countertops.

Construction

Endolyne's 22-year-old hull shows little sign of wear. No evidence of crazing is visible in the gelcoat and no blisters have appeared on her bottom. The hull is solid fiberglass. The deck is laminated with fiberglass skins on either side of a core material consistent with good practice in the 1980s. The two moldings are set in 3M 5200 and bolted together through an external flange.

The interior is virtually free of bulkheads. The hull derives its strength from its laminate and the hull-to-deck joint. A modular system of interior moldings strengthens the hull further and establishes a base for cabinets, berths, nav table, and other components.

The steel fin keel with bulb and wings was grit-blasted and coated with an epoxy system shortly after Jeff bought the boat.

Belowdecks

The forward berth is well ventilated and lighted by a tinted translucent deck hatch. A 45-gallon water tank is underneath. The berths are accessed by stepping over the seatback of the wraparound settee; Jeff modified this area on *Endolyne* with custom-built stowage lockers. For privacy, Jeff also installed twin louvered doors in the bulkhead cutouts.

The general appearance of the saloon is striking. The designers emphasized the look, comfort, and convenience common in up-market houses rather than the requirements

of a fast boat working to windward in a chop. The cabin is highlighted by a wraparound tinted windshield and large matching side windows. Jeff says they have never leaked. Some owners report otherwise and that replacing them is expensive.

The settees are very comfortable for sitting but not for sleeping, except for the smallest of crewmembers. There is copious stowage beneath them. A nav table is tucked into the after end of the starboard settee. The bilge contains two separate compartments served by a single electric pump. A third panel in the teak-and-holly sole gives access to the transducer. A Volvo Ardic diesel furnace heats the cabin.

In the galley, on the port side of the boat, a two-burner propane stove and oven is next to a double sink set in a Corian countertop and served by hot and cold water through a pressure system. A 6-gallon hot-water tank is located under the forward settee. Storage space in the galley is akin to that found in a small but well-appointed kitchen. An icebox is fitted with hinged Corian tops that lift on gas struts similar to those that raise the trunk lid on the family car. The box is located amidships between the galley flat and the nav station. Jeff rebuilt the icebox mounting after the original proved weak.

Aft of the galley, a door opens to a cabin with a commodious athwartships double berth under the cockpit and a hanging locker. The large head with sink and shower, and many built-ins

and splash guards, is to starboard of the companionway. (There is also a hot- and cold-water shower in the cockpit.) Both of these compartments are lighted and ventilated by hatches on deck, and the sleeping compartment also has a fixed portlight at pillow level and an opening portlight.

The accommodations are well thought out. There are no visible hoses in the head with improvised twists and turns or hose clamps to nick your fingers and it was a pleasure to use the Vision's dedicated companionway ladder without worrying about stepping in the salad (a hazard on many more traditional boats). However, the open plan and style of furniture makes it difficult to find places to drill holes to add special features or to personalize the space.

A marina neighbor of Jeff's who also owns a Vision 32 (1990) told me he'd had a blockage in the 10-gallon holding tank. To solve the problem, the handsome, curved, teak-slatted top of the shower seat had to be cut out so the aluminum tank could be removed bit by bit. He had the enclosure rebuilt and a more appropriate polyethylene holding tank installed to the tune of about \$14,000. Insurance covered the cost as the reason for the work was deemed a "manufacturer's defect."

Jeff thinks that many of the problems with *Endolyne* have to do with awkward or difficult maintenance that could be attributed to innovations in design and construction — specifically those that conceal the boat's systems.

The engine

The front and top of the Yanmar 3GM30F diesel are accessible when the companionway ladder and a panel at bridge-deck level (above the oil filler) are removed. Removable panels in the head give access to the dipstick and stuffing box and another removable panel under the aft sleeping compartment gives access to the gearbox, sea strainer, engine, raw-water seacock for the toilet, and the secondary fuel filter. The engine enclosure is rigorously soundproofed and the fuel tank holds 22 gallons.

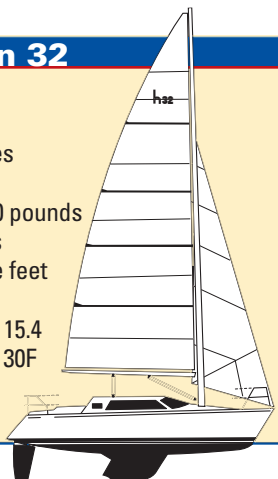
Under way

We backed out of the slip precisely — the three-blade, 16-inch Max-Prop feathering propeller gets a good grip on the water. With Jeff cranking on the main halyard winch, fellow crewmember John Wolfe mounted the folding steps at the mast base to urge the big luff along its way while I steered and tried to keep the leech from entangling with the lazy-jacks. It kept the three of us busy even in the light 10-knot wind. In spite of the manufacturer's claims about the ease of sailing the boat singlehanded, Jeff said he'd never willingly attempt it.

Once the small jib was unfurled, the Vision demonstrated some of her better qualities. Close-hauled, we could tack easily without having to worry about a large overlapping headsail. We jibed

Hunter Vision 32

LOA: 32 feet 0 inches
LWL: 27 feet 0 inches
Beam: 11 feet 4 inches
Draft: 4 feet 3 inches
Displacement: 11,400 pounds
Ballast: 4,500 pounds
Sail Area: 486 square feet
Disp./LWL ratio: 259
Sail area/displ. ratio: 15.4
Engine: Yanmar 3GM 30F
Fuel: 22 gallons
Water: 45 gallons



frequently in the light air to maintain momentum. The boat seemed well balanced and light to the touch, tracking very well with just a slight weather helm. In heavier wind conditions, Jeff says, the Vision is dry and stable. He's never found it necessary to reef in winds up to about 20 knots. We found some slightly stronger breezes farther out and, with sheets eased, *Endolyne* settled into a groove and gave us a nice ride back to the marina.

While taking photos of the Vision under way, I was able to see how she made light of blustery 20-knot winds. She sailed relatively upright, even in the considerable gusts. She jibed over smartly and seemed to make little disturbance in the water. Our chase boat, running at full revs and making about 6 knots, was barely able to keep up with *Endolyne* as she sailed happily off on a beam reach, her favorite point of sail.

Conclusion

The appearance and accommodations of the Hunter Vision 32 contrast markedly with those of more traditional cruising sailboats and are more akin to modern European and emerging American design concepts. Some buyers will certainly be attracted to the stylish interior lit by the wrap-around window and fluorescent accent strips. The Vision is a family boat with plenty of room for kids to romp about and friends to gather in the spacious cockpit and lavish saloon.

The pros and cons of an unstayed mast should be looked at carefully, particularly with regard to handling and safety, and the aluminum tanks can be costly to replace. Hidden wiring and plumbing can be troublesome.

An Internet check shows a large number of used Hunter Vision 32s available. Prices range from \$26,000 to \$69,000 with the majority around \$30,000.

Your reviewer gratefully acknowledges the continuing good work of Marty Bower and Jerry Riggs of the Edmonds Corinthian Yacht club who cheerfully provided good photography platforms.

Richard Smith, a contributing editor with Good Old Boat, is an architect. He specializes in designing and building very small houses and has built, restored, and maintained a wide variety of boats. These days, he and his wife, Beth, sail their Ericson Cruising 31, Kuma, on the reaches of Puget Sound.



The Yanmar engine, at left, is accessed through a removable panel behind the companionway ladder and an overhead hatch. Other points of access are in the head and in the aft cabin. A door aft of the galley opens to the private sleeping cabin, center. The berth lies across the boat under the cockpit. In the head, at right, the mirror behind the vanity, slanted to provide stoop-free viewing, is one of many stylish details.

Tips for sailboat restorers

A compulsive boat fixer shares some advice

by Kevin Walters

Join an online sailing forum

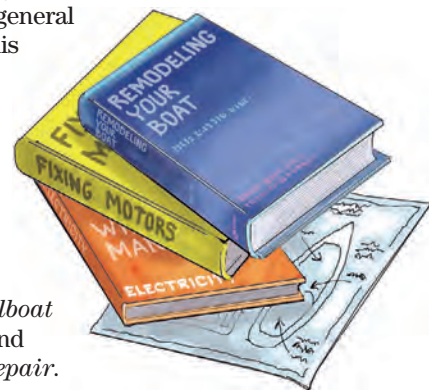
I am active on several online sailing message boards and get immeasurable advice and help from other members. I'm also a member of a couple of online communities specific to my sailboat's manufacturer. Online communities of enthusiastic owners support many makes of sailboats. By joining one, you are likely to find expertise, new ideas, and hard-to-find used parts from other members. (**Note:** one place to start looking for these communities is www.goodoldboat.com/resources_for_sailors/owners_associations.php. —Eds.)

Get your hands dirty

You probably know this already if you're considering the restoration of a sailboat. I am amazed at the projects even a novice can accomplish. All you need is the motivation to begin and the readiness to take your time. Before I began restoring my boat, I had never done any fiberglass repair work. After doing a little research and giving it a try on my boat, I am now confident I can handle other such repairs in the future.

Visit your local library

Several very good books on sailboat restoration are available and your local library probably has many of them. Start by checking out Don Casey's books. They are easy to read, easy to follow, and generally filled with sound advice. *This Old Boat* is a great general reference, and many of his other books give more details. Some of Don's most relevant books include *Don Casey's Complete Illustrated Sailboat Maintenance Manual*, *Sailboat Refinishing*, *Sailboat Electrics Simplified*, *Sailboat Hull and Deck Repair*, and *Canvaswork and Sail Repair*.



Over the last few years, I have restored a 1972 Helms 25, reconditioned a 1977 Irwin 28, and begun researching another project boat. Boat projects have become my all-time favorite hobby and something of an obsession. People I come across now recognize me as “the guy who tinkers with old sailboats.” I was recently asked what advice I would give to someone beginning a restoration. This is my response.

Document the process

Take pictures and videos and keep a restoration logbook. A website or blog is a great place to document the process. You'll track and record your own progress and help countless other sailors learn from your successes and errors. You'll be amazed at how much feedback you'll receive through the website and/or blog. You may even have blog readers offering unsolicited advice that helps you with your project. Blogspot.com and Sailblogs.com provide free blogs. You can see my blog as an example at www.sailislandbound.blogspot.com.

**“If you learn to enjoy the journey
that a restoration project inevitably becomes,
you will be rewarded
with a most memorable destination.”**

Become familiar with sources for parts

We all know a few major stores that carry parts and materials for boating. However, the big superstores don't always have the best prices or the hard-to-find specialty items specific to your boat. Look for online and alternative sources. I've found good deals by posting want ads on Craigslist. Most ads on Craigslist are for items people are trying to sell. My approach, though, has been to post ads for specific items I'm looking for. I'm always surprised at the responses I get from people who have just what I need or something similar. Many times they didn't think about selling or even know they could sell the item until they saw my ad. The online auction site eBay is another great source for deals on hard-to-find parts. At the very least, try an Internet search to see if you can track down a hard-to-find part. (**Note:** Don't forget consignment stores. Check out <www.goodoldboat.com/resources_for_sailors/consignment_stores.php>. —Eds.)



Be conservative when estimating costs

Despite readily available good deals and free stuff, sailboat restoration is an expensive endeavor. I think I am being conservative when I plan the restoration of a boat prior to starting, but once I start taking things apart, I invariably find more things that need to be fixed or upgraded. Also, the more I started to restore, the more I enjoyed the process. I kept finding more parts to upgrade and more add-ons to improve the boat's utility, comfort, and sailing characteristics. As the saying goes, "There's nothing more expensive than a cheap boat." Take your best estimate for the cost of a restoration job and double it. If you don't spend the full estimated amount, put the savings into your cruising kitty!

Walk the docks


I gleaned many great ideas by checking out other boats at nearby marinas and boatyards. If you have a problem and need a unique solution or if you want creative ways to individualize your boat, there's a good chance someone on the dock has already applied the solution or added that unique feature to his boat. You'll also run into a few sailors happy to show off their boats and share ideas that can help during your restoration.

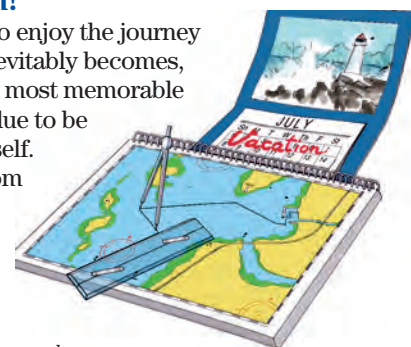


Go sailing!

Sailboat restoration takes time, dedication, and motivation. Anyone starting a restoration has a goal of one day sailing the boat that he has poured so much of himself into. So during the restoration process, make sure you sail OPBs (other people's boats). Ride along with a dock neighbor or join a Wednesday evening race as a crewmember. There is no better motivation for a sailboat restoration project than getting a taste of the joy the finished product will bring.

Have fun!

If you learn to enjoy the journey that a restoration project inevitably becomes, you will be rewarded with a most memorable destination. There is real value to be had in doing the work yourself. You will swell with pride from knowing you gave her the care your good old boat deserves — and she will sail better. 



Kevin Walters, his wife, Erin, and two daughters, spend summers cruising the Great Lakes from their home port in Grand Haven, Michigan, aboard their 1977 Irwin 28, Island Bound. They began sailing in 2007 after restoring a Helms 25. Kevin always has an eye out for potential project boats.

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Learning what you love

A project boat helps a young man set his life's course

by Kegan Ambrose

Occam's Razor, a Sailstar Corinthian, tugs at her mooring after Kegan successfully restored her to sailing condition.

For as long as I can remember, I was scheming to buy my first sailboat. I spent many hours of my childhood poring over classified ads searching for free fixer-upper sailboats. I first wanted a simple 8-foot sailing dinghy, but as I grew older and larger, my vision grew too. I started looking at boats in the 16- to 19-foot range. During this search, the “ultimate” boat on my mind was the Cape Dory Typhoon. If you’ve spent any time shopping for boats, you know the Typhoon isn’t a boat a kid can afford on income earned mowing lawns.

Once I left home for the Maine College of Art in 2006, my focus switched and sailing wasn’t on my mind as much. This lasted until 2007 when I landed a summer job working as a deckhand on the schooner *American Eagle* out of Rockland, Maine. I was 20 and had a desire to be on the water

and to see how a schooner worked. Little did I know this was going to be one of the hardest summers of my life. Sailing a schooner is nothing like sailing my family’s 25-foot Catalina. But the schooner taught me a lot about what sailing means to me. I once again began the search for my own boat.

In March of 2008, I saw *Occam's Razor*, a 1964 Carl Alberg-designed Sailstar Corinthian. Shrink-wrapped and sitting on jack stands, she looked a lot like a Cape Dory Typhoon. Unlike a lot of “fixer-uppers” I had looked at, *Occam's Razor* hadn’t yet lost her soul and I believed I could complete the project. The boat was surprisingly original. There were no crazy modifications, such as portholes below the waterline or “custom” motor mounts on the transom. The original light-blue gelcoat, although faded, was in pretty good shape. The decks seemed solid (in

reality, the rotten parts were just frozen). Most important, this boat had decent sails and overbuilt standing rigging.

The boat needed work — lots of it. All the wood needed to be replaced but I felt I could accomplish these repairs myself. Everything seemed right, even the price. While working on the schooner, I had saved some money and \$900 seemed reasonable. A few days later, I signed a bill of sale, paid the money, and became the owner of my first sailboat. In the middle of May, she was transported to my parents’ house in Denmark, Maine, and the restoration got under way.

Expectations meet reality

When calculating how long a boat project is going to take, I’ve learned to take whatever arbitrary number seems to be about right and multiply by three or four. This was a common theme

throughout my restoration. I spent more time looking for tools than actually restoring the boat.

Early in June, demolition began. I removed the old wood — cockpit seats, main bulkhead, and cockpit support beams. My original plan was to remove the seats, add some extra support to the cockpit, and patch the main bulkhead. But the project grew bigger and bigger. As I took things apart and realized how difficult demolition was, I kept saying, “Well, I might as well replace this rotten piece of wood right now because the boat isn’t going to be taken apart like this again anytime soon.” Before I knew it, I was doing a complete rebuild and spending a lot more money and time than I had anticipated. The \$900 price tag started to look a little high, considering the boat’s true condition.

Creative financing

Since the jobs I was working at the time paid just a hair above minimum wage, I had to be creative with how I earned money to acquire parts. My boat came with only a 135 percent genoa and no furling unit, so I was going to need a working jib. As there was no way I could afford a new jib, I contacted Michael Chasse in Freeport, Maine, who owns Northeast Sailboat Rescue. Michael travels all over the East Coast picking up unwanted sailboats, then fixes them up and finds good homes for them. As a result, he has a lot of extra sailboat parts kicking around in his barn. I sent him an email offering to



It took considerable elbow grease to buff her oxidized gelcoat back to its original powder blue.

help around his boatyard in exchange for a used working jib. This started a great relationship. I could trade work for boat parts, as proposed by the T-shirt sold by *Good Old Boat* that states, “Will work for boat parts.”

I also needed an outboard, and with this I got lucky. A family sailing friend offered to give me a 1980-something Mariner 4-hp long-shaft that came off one of his first boats. There was one stipulation, though. He told me the motor hadn’t been started for close to 20 years and, if I took it, I couldn’t return it. This was music to my ears. I showed up the next morning and grabbed the motor.

That evening, with some fresh gas in the tank, the little outboard roared to life in a 55-gallon trash can. But while the engine purred like a kitten, there wasn’t much cooling water coming out. That meant it probably needed a new impeller. The local marine mechanic wanted more than \$100 to do the job, so I did some research at the library. I found books on outboard motors but the information on how to replace an impeller was vague. A librarian suggested I try the library’s online small-engine database. There, I found a complete 1980 Mariner 4-hp shop manual in PDF. It provided precise



By the time Kegan had removed all the decayed wooden parts, the boat was looking rather bare, at left. At last reconstruction began, with the base for the main bulkhead, at right.



Kegan spent an entire summer working on the boat and launched her the following spring, by which time she was gleaming, at left. The venerable Mariner outboard, at right, was a gift — Kegan just had to get it working. All it needed was gas and a water-pump impeller.

instructions for replacing the impeller. Problem solved. I found the part online for \$16, and after an hour of somewhat stressful engine work, I had an outboard that pumped water the way it should.

As summer came to an end, my boat project was 99 percent done. I had replaced the upper and lower bulkheads, the cockpit seats, and the cockpit support beams. I had redone all the wiring and installed a new compass, automatic bilge pump, solar panel, and electrical panel. (The list may not look like much on paper, but you have to remember that projects take four times longer than originally expected). All that was left was to put on some trim pieces, apply bottom paint, and install a battery. My father helped me build a winter frame to shed the 7 feet of snow we were about to get that season and *Occam's Razor* was zipped up until late April 2009.

Winter and doubt

My senior year of college felt like the longest school year I've ever had to endure. All I wanted to do was get the boat in the water and go sailing. After the summer occupied with working on the boat, I began asking myself a lot of questions about my life and what I wanted to do with it. I spent that school year wondering where my place was in the world of graphic design and whether I even wanted to commit to design as an occupation. A feeling in the back of my head told me I wasn't going to be happy sitting at a desk staring at a computer screen all day.

In spite of my misgivings, I made some of my best work ever. I won a beer logo design contest, built giant cardboard letter-form furniture, wrote my thesis, did my senior independent project, had my heart broken, and got into great physical condition . . . all while surviving on saltines and hummus. I don't want to live another year like my senior year at Maine College of Art but, when pushed to my maximum, I started to see things differently. Even though I was making decent work, I was learning that design wasn't my calling.



With new cockpit seats and the sole refinished, *Occam's Razor* began to look like a proper yacht once more.

In early spring, I began my search for a summer job. I knew I should look for a job with a future, but soon realized there really aren't many jobs in the area other than washing dishes. One day, I came across a sailing-instructor job on Craigslist. I sat down and wrote out all the pros and cons of staying in Portland and washing dishes or taking the job at Linekin Bay Resort teaching sailing on their fleet of 20 Rhodes 19s. I chose to sail. I had just one stipulation: they had to give me a mooring for my Corinthian, and this they did.

Post-launch stress

Occam's Razor was launched May 2, 2009. I was incredibly excited. I was so excited, in fact, I forgot to bring clevis pins, so I couldn't raise the mast on launch day. One thing I've learned through this whole good old boat restoration thing is that while you can try to be prepared for everything, on launch day, something will always go wrong. In my case, things went wrong for a few weeks after launch day.

First, I fell off the boat while motoring to a mooring. That day, I also ran the boat aground. The following day, I decided I was going to try to bend on some sails and maybe go sail a bit. I had attached the foot of the mainsail to the boom and was raising the main when I heard a little "ping." The next thing I knew, my main halyard was at the top of my mast. In addition to that, my electric bilge pump was malfunctioning. I knew this because

it wasn't pumping out the seawater that was coming into my boat through a small mystery leak.

I was becoming very frustrated. How could a project into which I'd put so much blood and sweat be giving me so much trouble? I had been imagining for so long how the first few days of sailing my own boat were going to be that I somehow overlooked how little I actually knew. My knowledge was secondhand; I had always had someone with much more experience nearby watching out for my mistakes. Now *I* was in charge and it was scary.

Things started to improve, though. I found a faulty float switch in the bilge pump. As it was still under warranty, I just switched it out. The mystery leak was small and came through the motor well. It really leaked only when I was sailing on starboard tack or when I had three or more people in the cockpit. I retrieved the main halyard with some help from my father and a family friend and replaced the halyard fitting with a \$25 hunk of stainless steel that would survive the Apocalypse. I also started to be very careful while walking on deck so as to not fall off again.

I had that job in Linekin Bay, 40 miles away, and I had to get my boat there. The passage from Portland to Linekin Bay is pretty exposed, especially for a 19-foot boat that had recently been restored by an amateur boatbuilder. My father suggested that he take his Catalina 34 and I follow him. That way, we'd have an extra boat if there was a problem with mine.

We picked a day with moderate winds and set out under power from Portland at 6 a.m. At 6:07 we ran into dense fog that socked us in until we reached the entrance to Linekin Bay at 4 that afternoon. Keeping up with my father was difficult. At $\frac{3}{4}$ throttle, I was only able to hold 4½ knots or so while my father, with his Universal diesel basically idling in gear, was walking away from me. We arrived safely and I instantly fell in love with Linekin Bay. It's absolutely beautiful. I couldn't wait to start my summer job at the resort.

Summer and certainty

Work started at the resort in mid-June. I spent the next couple of days rigging boats, fixing small problems, and taking occasional "staff training cruises." The days were long with few days off,

but I loved the work. I met some amazing people from many different countries including Ireland, Slovakia, Russia, and England. On our evenings off, we often went out for night sails into Boothbay. It was a summer I'll never forget.

Into everyone's life will come a few days that he or she can honestly say everything was perfect. I experienced one of those days toward the end of that summer. All the sailing instructors had the same day off and we decided to go sailing. I hopped on my boat with a special girl from Ireland. One of the other sailing instructors took out one of the Rhodes 19s with another group of people. We spent the day sailing and rafted together in the late afternoon for music, swimming, and snacks. When the wind died later, I towed the Rhodes back to the resort in the late-evening sun. It was a day I'll never forget.

When summer ended, I had to return my boat to Portland, and this time I was going to do it without an escort vessel. I invited a friend from high school to join me. We motored for only an hour before catching a nice 10-knot breeze.

“I learned that working on boats and being on the waterfront isn't just a hobby for me; it's my life.”

I put up the main and genoa and we sailed all the way to Portland at 5 to 5½ knots. I was feeling a lot more confident than when I first launched *Occam's Razor* in May.

As I write this, I'm working at a sail loft in Falmouth, Maine, learning to do custom canvaswork. This is a nice way to combine my interest in design and my passion for boats. While restoring the Corinthian, I learned that working on boats and being on the waterfront isn't just a hobby for me; it's my life. If I hadn't bought *Occam's Razor*, I'm not sure I would have applied for the sailing-instructor job and I might still be sitting at a desk.

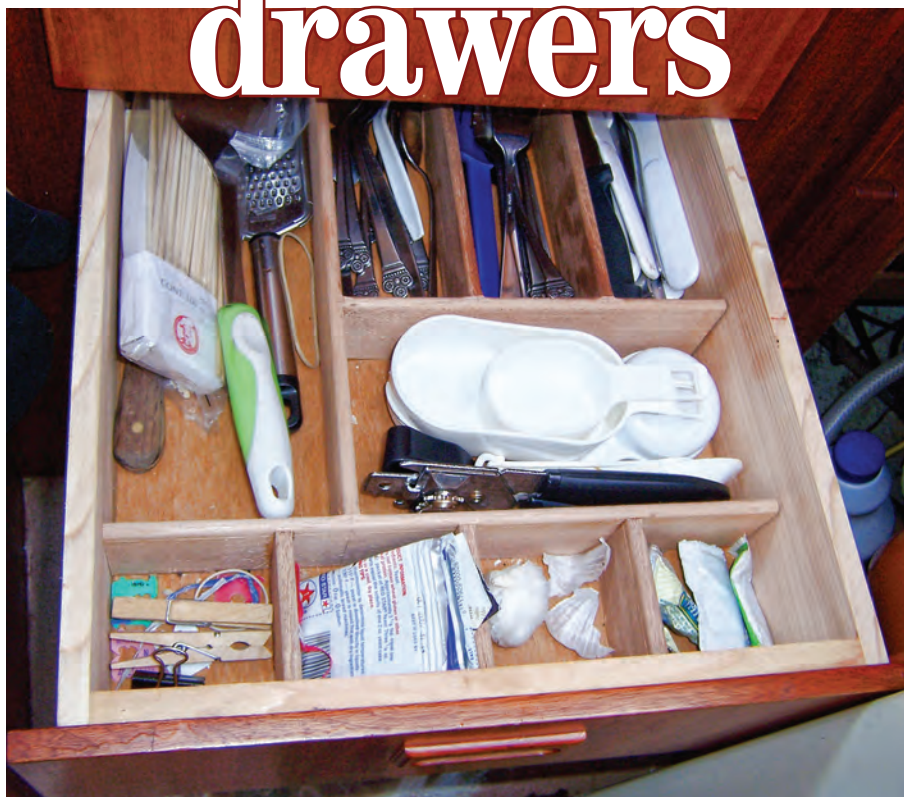
I could make the argument that the leaf-infested, faded-blue disaster I bought in March of 2008 might have saved my life. At the very least, it taught me what I loved. *▲*

Kegan Ambrose grew up sailing with his family on the Maine coast. He graduated from Maine College of Art in 2009 and is now restoring a good old Pearson Commander.



On a breezy spring day in 2009, *Occam's Razor* hitched a ride to the launch ramp. Her gleaming brightwork and polished gelcoat highlight the work Kegan put into her restoration.

Fixing dysfunctional drawers



Expanding storage and improving their function

by Tony Allport

One of the rewards of owning good old boats is overcoming the challenges they inevitably present. It helps to prioritize and pick your battles though, to avoid being overwhelmed. One project I took on recently was to deal with a number of dysfunctional drawers, making the most of their organizational and storage potential.

Our 1973 Albin Ballad was originally built with plastic drawer boxes faced with mahogany plywood drawer fronts. They are of two sizes: shallow and deep. The deep drawers are very successful, really more like bins than drawers. Sturdy and capacious, they slide in and out under the settee berths, supported by a flat plywood panel beneath them.

Below the plywood, however, was a fair amount of dead space I wanted to access for extra storage, inspection, and ventilation without compromising the function of the drawers or the outward appearance of the boat's joinery.

I accomplished this quickly and easily by making a simple plywood pattern of the drawer-compartment bottom and cutting a square hole with rounded corners in the center. The perimeter margin is about 2½ inches wide, which still gives plenty of support for the drawer. Using this pattern and a small router fitted with a pattern-cutting bit, I made short work of opening up the four plywood bottom panels since they're all the same size. It was kind of like using a cookie cutter. Working with

Drawer contents can quickly get shuffled on a moving boat but custom organizers keep everything in place.

drawers can often be a series of repetitive processes that, if well organized, can be very productive and satisfying.

Because the drawers have to be removed completely to get at them, we use the hidden spaces for storing things we don't need very often. On one side, we store extra bottles of wine, rolls of paper towels, and bags of pasta. On the other side are spare fuel filters, pump-rebuild kits, and engine parts that I hope to never need but would regret not having if I do.

Old faces, new boxes

The shallow drawers were another story. Some of the bottoms were cracked from the weight of winch handles and snatch blocks being thrown into them over the years and the slide mechanisms were flimsy plastic channels stapled to the inside of the carcass. It frequently took some jimmying and selective language to get these drawers back into place. There are four of these drawers, three in a stack under the nav station and a utensil drawer in the galley.

I decided to replace all four with nice new wooden drawer boxes running on wooden slides dadoed into their sides. I reused the original drawer faces to preserve the character of the Albin Ballad's Danish modern interior. I milled to a ½-inch thickness some nice scraps of clear-cedar fence boards I'd been saving. Once more the production-line efficiency of making multiple similar boxes came into play. The drawer slides are simply ¼-inch x ¾-inch sticks of mahogany the same length as the drawer cavity. The dadoed drawer slide is a nice reliable mechanism that minimizes the material and structure needed to support the drawer and maximizes the size of the drawer. It provides a distinctive touch but is hardly ever used in production work because some care is required to position the slides properly.



Using a pattern, Tony cut openings to gain access to the dead space under the drawers in the saloon, at left. In the galley and nav areas, he built new drawers, re-using the original faces, center. He made a stop for the galley drawer with a piece of dowel glued into the runner, at right.

A crafty stop

The three drawers under the nav station are oriented fore and aft, so they don't need the stop/lock mechanisms typically used on boat drawers to keep them from flying open when the boat heels. The galley drawer, on the other hand, opens athwartships and needs a stop to keep it closed when we're sailing on starboard tack.

I devised an effective drawer stop by inseting a thin cross section of a 1/2-inch dowel into the drawer slide in such a way that it engages the drawer side when the drawer is closed. The beauty of it is that it's very easy to build by simultaneously drilling a shallow hole in the side and the slide to accept the dowel. This ensures perfect fit and registration between the two pieces. The best drill bit for this is called a Forstner bit. It makes very clean flat-bottomed holes with precision and should be used in a drill press. The bottom edge of the dado on this drawer needs to be widened by a bit more than the distance that the dowel protrudes from the slide so the drawer box can lift up and ride on top of the dowel as it opens.



By fitting the runner into the drawer side and drilling the two simultaneously, he ensured the stop was perfectly aligned.

A place for everything

The plastic organizing trays we'd been using in the drawers up to this point had to go because they looked tacky and didn't efficiently use all the available space. That is the danger of raising the bar in one area. High standards tend to insinuate themselves into other areas or you become a snob, depending on your point of view.

For the galley drawer and the flip-top compartment under the companionway steps, I made custom sets of dividers to make the most of every available inch. I mocked these up using all the actual items to be housed therein.

I made the compartments by fitting a 1/8-inch-plywood door skin closely to the bottom of the drawer box and attaching 5/16-inch mahogany partitions to it with glue and brads. The drawer box itself forms the perimeter and the compartmentalized board can be lifted out for cleaning.

Our eight drawers and related spaces are firing on all cylinders now and pulling their weight in our quest to make the most of our 30-foot sloop. At a time when many production boatbuilders are eliminating as many drawers as possible (and almost everything else made out of real wood) to cut costs, good old boats, well maintained and thoughtfully appointed, may begin to look luxurious by comparison. *▲*

Tony Allport is a SAMS marine surveyor. He lives on Anderson Island, in southern Puget Sound, and sails extensively with his wife, Ann, and children, Alden and Claire, on their Swedish classic 30-foot Albin Ballad sloop, Pleiades. He is also known on the island as a skilled cabinetmaker and for his excellent pies. See <www.marinesurveyor.com/allport>.



While restoring order to the drawers, Tony also made an organizer for the tray under the companionway top step, at left. The dividers are attached to a thin plywood base and the whole piece can be lifted out for cleaning, above.

Bamboo for the sole

Leftover home flooring brightens up a boat

by Bill Sandifer

When I bought my Eastward Ho 31, her cabin sole was delaminated teak-and-holly plywood. The first project I took on was to remove that splintery eyesore and clean up the fiberglass base on which it had rested for 20 years. The plywood had been attached with contact cement to the sanded fiberglass of the liner pan and it came up rather easily. I ground down the entire area thinking I'd replace it in the near future. That was 10 years ago. For a decade, we lived with the liner pan until a friend volunteered some pre-finished bamboo flooring left over from a job in his home. He, too, was tired of looking at the ugly liner, apparently.

I had some laminate left over from when I redid my living-room floor and had toyed with the idea of using that. However, the manufacturer told me the laminate wouldn't work due to the "floating nature" of the floor and the rate of expansion and contraction. A cabin sole must be capable of being glued down and surviving in the marine environment.

The first question, therefore, was whether the bamboo flooring would stand up to the marine environment. My friend tested it by soaking it in

water for several weeks and, when it did not show any signs of failure, figured it was good for a boat sole.

Once I decided the material was suitable, I next had to determine if there was enough of the bamboo flooring available to cover the sole in my boat. Although the area to be covered was not large, it is full of angles — and the bamboo pattern and color were no longer available from the manufacturer.

The number of hatches in the sole also needed to be minimized. I eliminated the hatch over the keel as the ballast keel is internal and the hatch was placed there only so the builder could lower the ballast into the keel cavity. As the ballast is never coming out again, I had no need for the hatch. I also have hatches over the bilge pump and one that offers access under the engine, although this latter one does not affect the sole. I thought of using a plastic hatch over the bilge pump but was outvoted by my wife, who wanted a wooden hatch to match the sole.

We determined that 35 square feet of flooring plus a scrap factor of 40 percent, making 49 square feet, would get the job done. It appeared we had enough flooring with some to spare.



“Step one was to clean and level the surface of the liner pan that had been serving as our cabin sole.”

The flooring was called Crescent Bamboo from Crescent Flooring. Each piece was 30 inches x 4 inches x ½ inch. I had about 72 square feet of material and ended up using most of it. The scrap factor worked out to be much higher than we had estimated.

Leveling the base

Step one was to clean and level the surface of the liner pan that had been serving as our cabin sole. The mast column had depressed the fiberglass surrounding it and now rested on the top of the keel. Furthermore, the corner between the liner base and the vertical faces of the molded-in furniture is radiused. These problems would have to be dealt with. Either the flooring panels or the fiberglass would have to be trimmed back to fit.

Grinding the fiberglass pan would weaken the boat's structure. The better choice would be to level the fiberglass surface and raise it a little, even though this method would be time-consuming and difficult.

I had considered using urethane glue to stick down the sole, but since I first had to level the surface, I settled on epoxy, which I mixed with high-strength microfiber filler to the consistency of soft peanut butter. In the places where the area to be filled was too deep to use just epoxy, I cut shim material to fill the space and submerged the shims in epoxy. I then used thickened epoxy to bridge the remaining gaps. Before it was over, the entire cabin and I were covered with epoxy dust.

Pattern and dry-fit

The next step was to make up patterns for the various areas of the sole. I was hoping I could work on the project at home and avoid some unpleasant weather. Even though it's very cool in southern Louisiana in February, it turned out that working on the dock was the only practical solution. I did cut the V-berth sole at home and I brought it to the boat for a trial fit. This worked, but the other areas were too big and complicated to be easily patterned.

The boat's interior has no symmetry; each side of the sole has different curves and angles.

To lay out the flooring, the first thing I did was mark a centerline for each section of the cabin sole — V-berth, head, main cabin — making sure the centerlines corresponded to that of the boat. Starting from each centerline, I fitted the flooring pieces toward one side until I reached a vertical berth front or a bulkhead. I then set the flooring pieces in place temporarily to be sure everything fit together. Once they were fitted, I removed the pieces in sequence, troweled epoxy on the subfloor, and re-laid the final sole. When it had cured, I moved to the other side of the area and repeated the process.

Tools for the job

I found I could not work precisely enough with the portable small tools I had thought to use and realized I'd do better with my table saw, a 50-pound “portable” device. I set up shop on the dock in front of the boat. Every night,



Bamboo flooring made for homes might not have a traditional “yachty” appearance but it looks great just the same, on facing page. The pattern for the sole in the V-berth cabin was the only piece small enough for Bill to conveniently make at home, at left. After a trial fit, at right, he was ready to cut the bamboo boards.



Interior improvements

I put the saw on a two-wheeled dolly and pushed it to my car. In spite of its weight, it was a blessing. With the table saw, it was possible to make accurate cuts and angles to fit the configuration on board.

If I had had a band saw, I could have made a closer fit, particularly in the area

outside the head. Here, the shapes are complex and the surface had to be filled, leveled, and laid as in the V-berth area.

The main cabin was another difficult area as the bases of the settees curve inward slightly. I cut the wood to meet a long taper. Although it made sense to work at the boat, where I could test fit

every piece immediately after cutting it, I still spent a lot of time commuting from boat to dock and back again.

However, I managed to get most of the pieces to fit on the first or second try, so there was little wasted time. As is usually the case with boat projects, the cramped working space was a problem.



Working in tight quarters, Bill prepares to lay the sole next to the head compartment, at left. Bricks weigh down the boards while the epoxy sets, at right. Genie marks the boards after Bill has cut them to fit, below left. Bill applies epoxy to a board prior to setting it in place, below right.




It's hard to lay the sole panels in place while occupying the same space. I found I could kneel on one half of the sole while fitting the other half.

After some areas of the sole were laid, a space remained between the outboard edge of the bamboo and the fiberglass liner along the berth faces. I considered using tan 5200 to fill these gaps, but the softness of the material deterred me (and cost was also a factor) so I used an almond-colored caulking. Since the caulking was designed to be paintable, I thought it would harden quickly but it was slow to harden. Although, given enough time, it did harden and could be painted, I should have paid attention to the caulking manufacturer's caveat that "joint size should not exceed 1/2-inch wide by 1/2-inch deep." My joints were about 1-inch wide by 1/2-inch deep.

A satisfactory conclusion

As often happens with boat projects, I made a couple of false starts and learned some tricks along the way. I ended up doing much of the cutting on the dock because moving parts between the boat and home wasn't practical, and I brought in the table saw after the battery-powered tools didn't work out. By underestimating the scrap factor, I found myself working with barely enough material. In the end, it took the best part of six days working six hours a day to complete the project. I invested about \$200 in epoxy and metering pumps.

The sole looks great and feels solid. As the bamboo was intended for home flooring, it has a non-skid finish and is safe to walk on.

A new cabin sole greatly improves the appearance of a boat's interior, and as long as you have the time, material, and equipment, it's well worth doing it yourself. Allow enough time to do a careful job, then double your time estimate. Oh, and be sure to find someone willing to donate some excess flooring to the project. 

Bill Sandifer started sailing at age 8 or 9, and through high school and college taught sailing at Sagamore Yacht Club in Oyster Bay, New York. He has cruised the Far East, the Mediterranean, and the East Coast of the U.S. and has had a boatbuilding business. Bill and his wife, Genie, currently sail an Eastward Ho 31 cruising sloop.



Once the tongue-and-groove pieces of flooring are in place, a tap with a hammer ensures a tight fit, above. Bill wipes up errant epoxy with vinegar, below.





Rode show

*Coming to
an anchorage
near you*

by Karen Sullivan

During a 2010 cruise to Barkley Sound on the west coast of Vancouver, we found ourselves anchored for two days in a tree. Not *tied* to a tree, but *anchored* in one. It held us tight in a tiny cove in the Stopper Islands. We only discovered the fat cedar when we hauled it up from the bottom. It was the first time we'd ever heard of anyone having to chop a tree off their anchor. That was when we learned what bow recoil looks like. Although it was a change from the usual ho-hum, "The anchor's up!" we don't recommend it.

The best thing about anchoring badly is the re-telling, which of course is generally done by spectators, not the spectatee. Since very few sailors, myself included, have *not* entertained a whole anchorage at some time or another with a "learning-curve moment," I always feel a little tweak of empathy for the folks on another boat trying

unsuccessfully to get a good bite, unless they are to windward of me ... at which point they become nincompoops.

Anchored late one evening in a (thankfully) deserted bight behind Dungeness Spit near the Strait of Juan de Fuca, my partner, Jim, and I argued about whether we were dragging. We *couldn't* be! Not with 200 feet of rode out in 20 feet of water! Besides, we're experts! But we *were* dragging. A nice ball of gooey kelp and mud let our anchor slide over the bottom like a greased pig at a county fair. It was humbling.

Ready for prime time?

Once in a great while, someone puts on such a spectacular show that it makes me wish there was an ESPN channel for anchoring. I, who in my early days could have been a star, am going to pitch this idea to ESPN because they are literally missing the boat.

We'd sailed our Dana 24, *Sockdolager*, into Barkley Sound's Effingham Bay, where we anchored after trying unsuccessfully to catch a fish for dinner. We were planning to cook fish and chips, but it's pretty hard without fish, so we went for a hike before trying to figure out what to do with some leftover "effing ham." While we were hiking, a large motor yacht anchored quite close to us in an otherwise empty bay.



An essential skill

Anchoring your boat securely is one of the most basic and vital skills in boathandling. Make sure your anchor is the right size for your boat and the right design for the bottom you most often anchor in. If your rode is not all-chain, have a length of chain attached to the anchor that is at least the length of your boat. Have at least one spare anchor and rode. Plenty of good books have been written on anchoring techniques. Practice your skills in uncrowded areas and learn to visualize not just where you'll drop the hook but where your boat will ride, especially if the wind shifts.

Returning to *Sockdolager* in the dinghy, I saw how close it was, heard the generator, smelled the exhaust, and uttered a string of salty epithets about big powerboats outnumbering the small sailboats and then anchoring on top of them. Why, those so-and-sos, now we have to listen to their generator all night, etcetera.

Jim was the epitome of wily patience. He noticed the motor yacht's crew cleaning fish — lots of fish — on the stern deck, so he rowed us over there to ask them where they'd fished and what bait they'd used. The first thing they did was yell, "YOU WANT SOME HALIBUT?" Whoa! Things were looking up! We yelled of course we do, and they passed us a nice chunk, enough for fish and chips.

As we reached *Sockdolager*, I turned to Jim and said, "I guess they're not so bad," at which he guffawed, causing me to add, "Am I that cheaply bought off?" But stay with me, there's more.

They were too close and they knew it. While dinner was cooking, we witnessed a feat of anchoring that can only be described as impossible to exaggerate. First we heard the twin VROOM! VROOM! of their big engines rumbling to life. Hooray, they're moving!

But wait, nobody's on deck and the anchor chain's still down. The boat angled itself in an odd direction, stern away from us. Suddenly, DOUBLE LOUD **VROOOOOM!** Engines gunning in reverse, they dragged their entire anchor and chain 200 feet, going 7 or 8 knots across the bay stern first. The anchor jerked and tugged as if through rocky Jell-O. They finally idled the engines, but the boat's momentum kept it racing astern until we thought they'd crash into shore. Just in time they stopped, close alongside a rocky reef. Grateful we were not in their way, we ate dinner with a weather eye out for their next move. Nobody could top that.

But someone did.

Put out more decibels

The next afternoon, we were on deck getting ready to sail out of Effingham Bay, in which about a dozen sailboats and three motor yachts had arrived. A very large sport-fishing yacht came into the bay towing a smaller sport-fishing yacht that was larger than *Sockdolager*. It lumbered around the anchorage looking for a good spot. A loud "DROP IT!" boomed from its loudhailer. The command echoed rather godlike across the water . . . our dog, Jack, dropped the snack he was chewing.

The anchor plunged into 50 feet of water and the crew let out about 30 feet of chain.


"IS IT ON THE BOTTOM?" thundered the Captain from his tower.

The crew shrugged. The boat went into reverse. Further announcements followed, including, "IS IT DRAGGING?" Nods.

"LET OUT ANOTHER 50 FEET!"

Suddenly, still reversing through the attentive anchorage at 4 knots, the Captain said, "CHICKEN?" which puzzled us. "Hey!" we bristled, "who you callin' a chicken?" Then we realized he'd said "stickin'?" as in, "Is the anchor stickin'?"

It wasn't, and he declared, "THE BOTTOM IS CRAPPY AND MUDDY. LET OUT ANOTHER 300 FEET OF CHAIN!" This created quite a stir among the boats anchored behind him.

Nobody could top that, we thought, as we headed for a small cove where we anchored in a tree. 

Karen Sullivan and her partner, Jim Heumann, are not likely to snag a cedar tree in Mexico, where they are preparing to set off across the Pacific in Sockdolager in early 2012. Follow them at <<http://karenandjimsexcellentadventure.blogspot.com>>.



Davits —

their ups and downs

Davits provide the ultimate system for launching, retrieving, and stowing a tender while offering a few bonuses beyond their designed intent. When hauled up into davits, for example, a tender becomes a great place to stow errant fenders that rarely find a real home under way and, in the event the tender becomes a lifeboat, their flotation will never be regretted. An advantage for those who enjoy fishing is the “self-draining kill-pit” potential of a tender in davits. It is ideally situated for landing struggling fish that can thrash around in containment without sliming the mother ship. Once the fish are scaled, cleaned, and stowed in the freezer, the tender can be hosed or bucketed clean with the assistance of the washing-machine action of the sea.

In spite of their attributes, davits do not suit all vessels; the size and type of the tender and the mother ship are dictating factors. There are no hard and fast rules regarding what’s appropriate. Some large trailersailers have enough reserve buoyancy aft to hang a small tender while some larger craft — such as those with a counter or canoe stern — lack sufficient buoyancy aft or have a transom too narrow to

accommodate the structure. One more factor is that, regardless of size, most yachts with auxiliary-rudder or servo-pendulum self-steering systems cannot be fitted with davits at all.

Assuming your vessel has the buoyancy and space to fit a set of davits, take potential destructive forces into consideration when reviewing their design and fabrication. Many existing davit arrangements are inadequately braced against the sometimes-violent reverse-pendulum action of a beam sea as well as the fore-and-aft jerking of a vessel hobbyhorsing into sloppy head seas. Such forces can only be offset by adequate bracing and sound footings.

How and where

A modern trend is to incorporate davits into the Targa bar. We use this term in Australia. It’s borrowed from the rear wing of the Porsche Targa of some decades ago and refers to the over-cockpit tube frame, seen on many cruising sailboats, that supports antennas and other equipment. This is a sensible arrangement on a catamaran because it can be easily attained by angling the whole structure out over the rear of

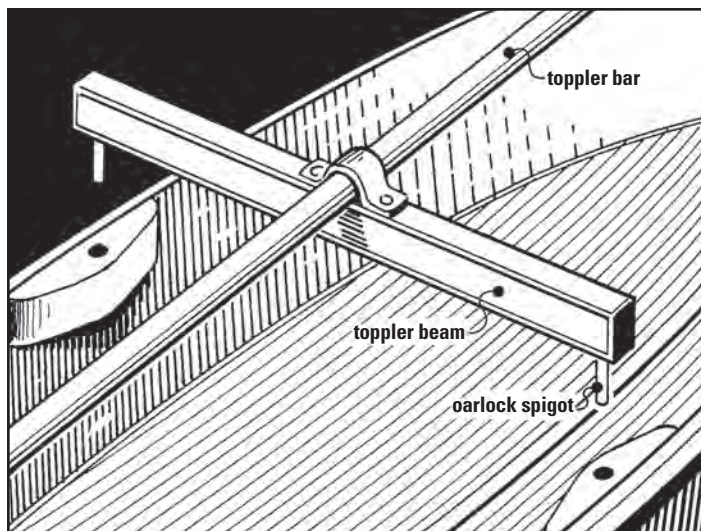
A safe and reliable installation takes thought

by Alan Lucas

The bigger the boat, the less fussy the engineering involved in davit design and fabrication. The davits on this Stuart 47, facing page, have an abrupt angle and use large-diameter stainless-steel tube braced fore and aft. The great aft beam and buoyancy of *Soleares*, Alan's Chesapeake Bay Skipjack, at right, allows simple engineering to be used to lift big tenders, but the simple design of this type of davit may be adapted to smaller craft and narrower transoms. Note the lateral-plane angle bracing in each corner. Double-ended hulls do not lend themselves to davits, but this Fisher's apple stern, below, has enough buoyancy to do the job, thanks to her very full aft sections.



Davits of excessive height keep their tender clear of breaking seas but need to be very well braced on the vertical and horizontal planes. With a heavy tender, these davits would almost certainly suffer from reverse-pendulum motion.



A better toppler beam might be fabricated from aluminum and incorporate two spigots that home into the tender's oarlock holes.

the bridge deck between the hulls. It's adaptable to monohulls as long as the paraphernalia of radar, aerials, solar panels, and wind generators do not push the limits of outboard foot-pounds.

An alternative is to extend the davit arms back from a fully inboard Targa bar, using extra bracing where needed. Otherwise, davits can marry into the stern rail from which they angle out over the stern or they might be attached directly to the transom. Because transoms are so much stronger than decks, this can prove an ultimate method, depending on the transom in question.

Because the tender is always hooked onto or unhooked from the davit-tackle across the mother ship's stern, access through her stern rail is vital. If this access can incorporate a stern swim ladder that hinges up to become a secure gateway, a number of good outcomes can be achieved with a single modification.

Gaining height

On small boats, a compromise must be struck between davits high enough to hang the tender clear of the waves yet low enough to maintain structural integrity without unnecessarily heavy bracing.

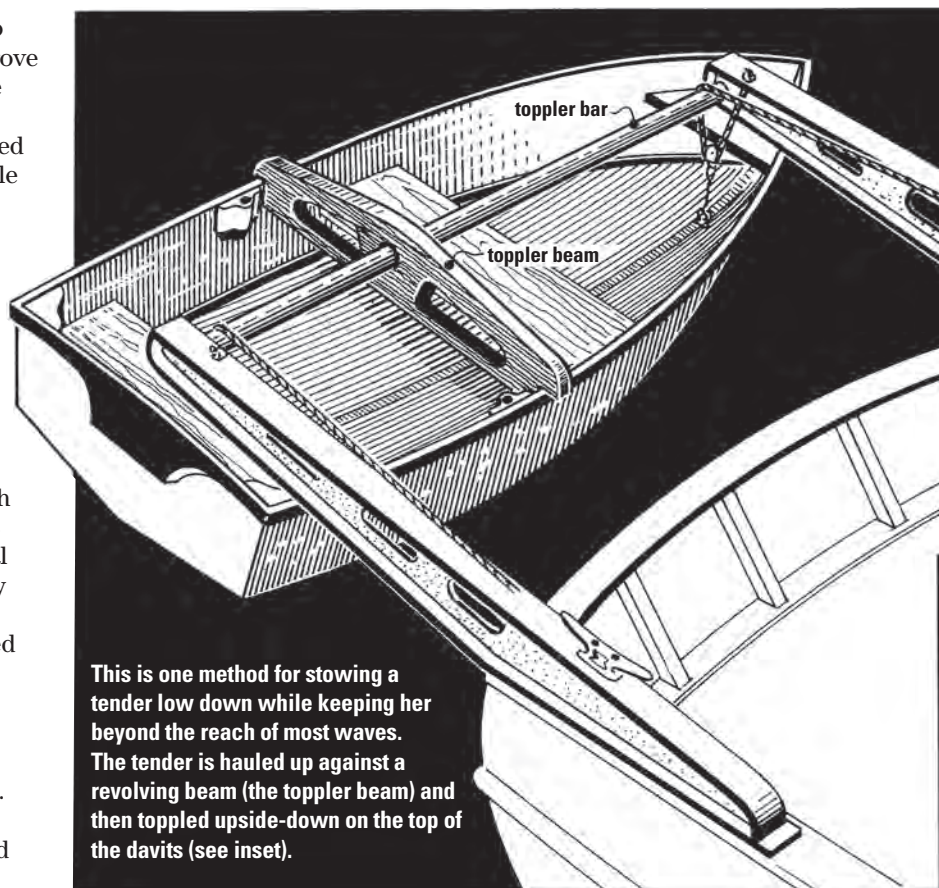
On *Renee Tighe*, the ketch we sailed in the 1990s, I replaced the traditional davits with strong, tapering H-section aluminium beams angled out over the stern, and hoisted my rigid tender up against them (see illustration at right). *Renee Tighe* was a fat 30-footer from the boards of Angelman and Davis and built by the Willard Boat Company in

California. (**Note:** See Alan's article on her restoration in the January 2003 issue. —Eds.)

The system was entirely self-braced and worked well for the first few thousand miles of coasting until one miserable night, while lying ahull in a gale, *Renee* rode back on a few rogue waves and drove her tender hard down onto the sea. The tender's buoyancy responded by trying to lift the davits off the boat and take a few timbers with it. To survive the night, I cut the dinghy free and trailed it astern. Soon after, I developed what I called the Toppler Effect.

To achieve the Toppler Effect, I fabricated a laminated plywood fore-and-aft beam that would rotate around the lateral tube that connected the outer ends of the davits. Thereafter, the tender was hauled up to this beam then lashed and toppled upside down on the top of the davits. This not only increased the dinghy's height above sea level but also denied its buoyancy to oversized waves. Furthermore, in port, the upside-down flat-bottomed tender proved to be a marvellous outdoor table, although this was at the loss of an ideal site for a solar panel.

It was my intention to improve the system by matching the oarlock holes with two pegs fitted into the beam (see illustration at left). This would have simplified the lashings and produced greater stability during its toppling and upside-down stowing, but I never got to that as we sold *Renee* soon after and began work on building another yacht.



This is one method for stowing a tender low down while keeping her beyond the reach of most waves. The tender is hauled up against a revolving beam (the toppler beam) and then toppled upside-down on the top of the davits (see inset).

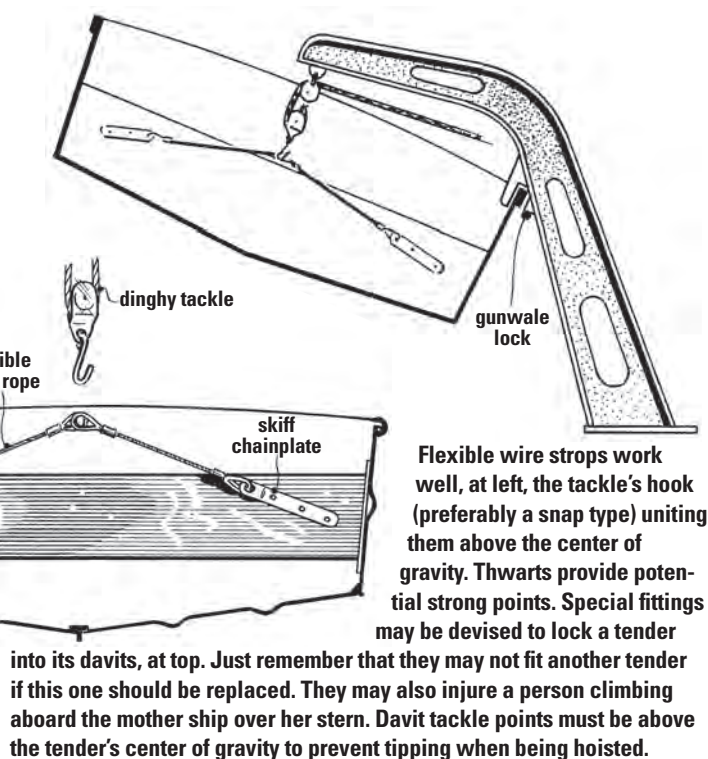
Davit details

Returning to the subject of normal davits, the best types are of medium height at a distance apart, preferably no less than three-quarters the length of the tender. Their outreach must be at least half the beam of the tender and clear of all fittings beneath. When fully hoisted, rigid tenders — and a few RIBs — are eminently suited to being locked into dedicated fittings on the davits to prevent movement at sea (see illustration at top right). If such fittings are impractical, good old-fashioned lashings work fine as long as they include cross-bracing lines that are periodically sweated up during long passages.

The tender's lifting bridles and eyes must be above her center of gravity (including the outboard motor) to prevent her from tipping when suspended (see illustration at right). If lifting points are not already incorporated into your tender, you can attach a bridle below the center of gravity near the stern and the bow tackle to the forward cleat or other suitable fitting.

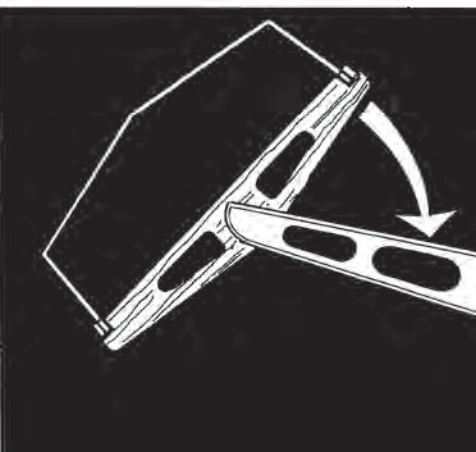
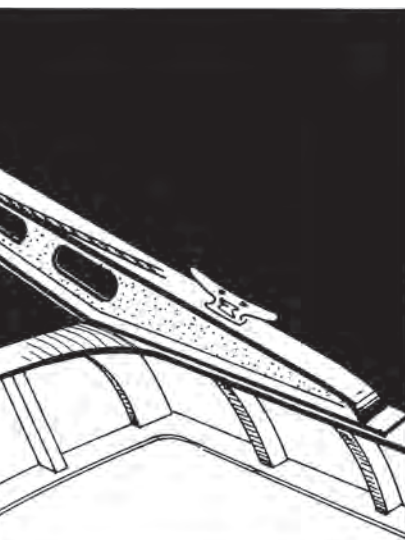
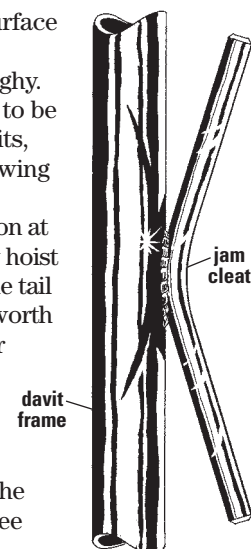
Tackles employing two double blocks (the fixed one having a becket) are adequate for most tenders. Electric winches are an option. Runabout trailer winches are ideal, as they simplify things with their single-cable action and require no hardening-up once the tender is fully hoisted. Bear in mind, however, that should the tender be needed in an emergency, nothing beats cutting rope lashings with a sharp knife. It is a good habit to keep one or two knives permanently sheathed near the davits.

On a smaller yacht with a lightweight tender, there may be no need for a top block in the davit's tackles. The tails can

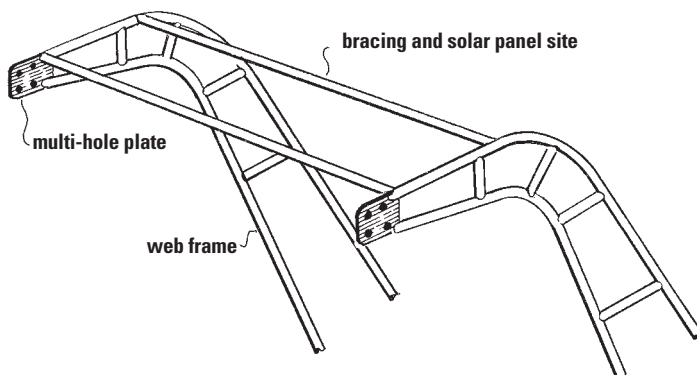


instead be led over a rounded smooth surface (such as in the center illustration) after passing through a single block at the dinghy. Eliminating the block allows the tackles to be sweated up harder and closer to the davits, thus reducing the dinghy's tendency to swing while under way.

A jam cleat on each arm (see illustration at right) allows one person to incrementally hoist the tender's bow and stern by jamming the tail temporarily at each increment. It is also worth using multi-hole plates at the davits' outer ends instead of eyes. These allow for future add-ons such as shade awning tie-downs, a wind generator post, and solar panel supports. A solar panel here has the opportunity to articulate to the sun's varying angles through one plane (see illustration below).



Davits' frames may terminate according to taste and specific needs, but multi-hole plates promise versatility for unpredicted future needs, at right.



When designing davits, take into account the deck structure under the feet. If the feet land on a major under-deck member, consider single through-bolts and large circular plates (see illustration below).


Safe use

Stern davits — as opposed to traditional side davits — are obligatory for small vessels. This is inconvenient when the mother ship is anchored in a strong tidal stream that sweeps the tender away the minute it hits the water (when launching) or loses way beneath the davits (prior to hoisting). These are dangerous moments if not handled carefully (see illustration at center right).

When a tide or current is running, you should board the mother ship over her side. Then, from the safety of the deck, warp the tender around the stern by its painter and stern line and secure it temporarily athwartships under the davit's falls (see illustration at bottom right). With the tender now firmly restrained from being carried away on the tide, it's safe to board it to connect the tackles. When it's thus captured, the dinghy can be hoisted into the davits and its painter and stern line untied and used as part of the lashing system.

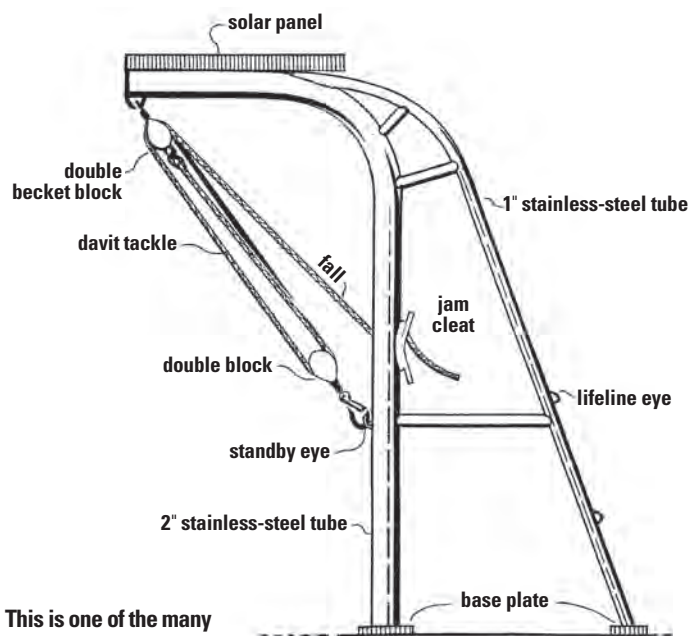
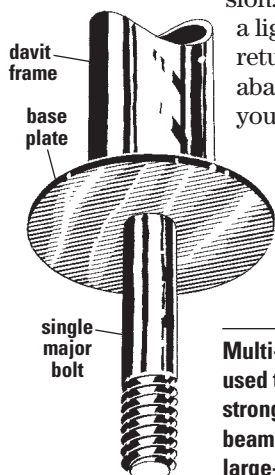
When lowering the tender into a strong tidal stream, reverse the operation, pre-tying the stern line and painter and adjusting them as the tender descends. Once the tender is afloat, secure the two lines so you can safely board the tender to release the falls, then warp it alongside the mother ship.

When a tender is stowed in davits, always keep its drain hole open; the bigger the aperture the faster it sheds deluge-strength rain or breaking waves. Only when catching rain (after a preliminary rainwater rinse) should the bung or a hose be inserted into the drain hole.

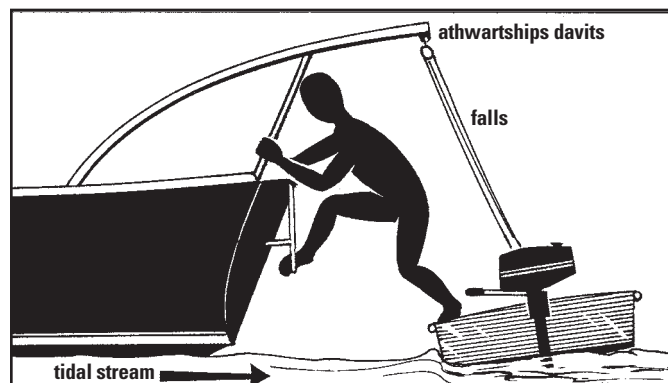
Davits are a life-changing addition that makes handling and stowing a tender absolute child's play. However, before committing to their design and fabrication, try this simple test: lift your tender onto the stern of your vessel, add a normal complement of crew to the cockpit, then assess her aft immersion. If it's extreme, you may only need a lighter tender. If that change doesn't return your boat to her lines, you should abandon any thoughts of fitting davits to your little ship. 

Alan Lucas, an Australian from New South Wales, has been cruising for 50 years, primarily south of the equator. He is the author of several Australian cruising guides.

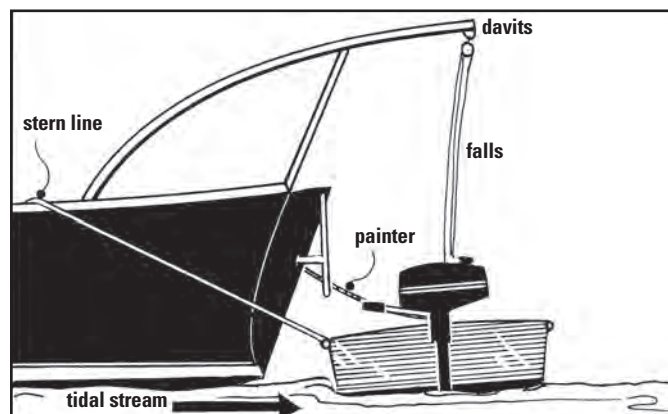
Multi-hole, broad-based plates are commonly used to mount davits on deck. However, if a strong point belowdecks — such as a deck beam — can be used, a single major bolt with a large-diameter sealant plate is ideal.



This is one of the many davit variations. It minimizes bracing by using 2-inch stainless-steel tube for its main arms with 1-inch tube bracing. Regardless of design, standby eyes are great for securing the tackle when out of use and eyes to take the lifeline ends are worth considering.



Small boat davits must, of necessity, be deployed over the stern. When the mother ship is lying fair to a strong tidal stream, disembarking and boarding becomes dangerous, above, and is best done over her side. To offset a strong tidal stream, the tender is best restrained across the mother ship's stern with her painter and stern line before being boarded to attach or detach the davit tackles, below.



Sigfrid's boarding ladder

How a piece of flotsam became an asset

by Richard Toyne

One side effect of continually making improvements and upgrades to *Sigfrid*, our 34-foot 6-inch steel ketch, is that my partner, Magali, and I have become inveterate collectors of good-quality hardwoods. We have recovered mahogany from construction sites, teak from boatyard dumpsters and on one occasion, in Gibraltar, a stray plank that we found floating in the harbor. As is often the case, we picked this plank up without any particular purpose in mind; it simply looked too good to be allowed to drift past.

A closer inspection of our prize, once we had it on board, revealed that it was a length of hardwood decking that was being used to make walkways for a property development. This led to an idea: the non-slip surface machined on one side of the plank made it ideal for a boarding ladder.

In the past, we've tried several boarding ladders for *Sigfrid*. When we bought her, she had a rather beautiful traditional one, with wooden steps jointed into lozenge-shaped end pieces. It was practical to use, but unfortunately did not roll up and was inconvenient to stow. We also experimented with an all-rope ladder, but although the rungs were of a diameter large enough to be comfortable underfoot, it hung so close to the hull that we felt as if we were climbing on our toes. Some yachts we visited had ladders made of stainless steel, but when we climbed out of a dinghy with wet feet, these always seemed slippery. For several years, we managed without any ladder at all, and simply took a big step up from the dinghy to *Sigfrid*. This worked for us, but it was not always so easy for visitors.



Richard transformed a plank retrieved from the harbor and a couple of lengths of three-strand rope into a practical and effective ladder.

What we decided to make from our salvaged piece of timber was a rope-and-wood ladder based on the pilot ladders I had seen used on commercial vessels when I worked in the North Sea.

Design

The pilot ladders had wooden treads, about 14 inches long and 2½ inches wide, supported on each side by a pair of ropes. Between the treads, the ropes were seized together. When they reached the treads, they separated and passed through holes in the wooden steps. Small wooden triangles fitted top and bottom between the final seizings and the treads held the treads in place and ensured they could not twist when stepped on.

From our point of view, this design had a couple of drawbacks. When the ladder was in use, the wooden treads would be in direct contact with the hull. This would inevitably damage the paint on the topsides. Furthermore, if the ladder were left deployed at anchor, it would tap the hull when the boat rolled. And although it could be rolled up, it did not form a very compact bundle.

In view of these shortcomings, we modified the traditional design slightly. Each side of our ladder would still be made from two lengths of rope, seized

together between the treads, but instead of passing through holes, the ropes would be located in shallow notches cut into the sides of the treads $\frac{3}{4}$ inch from their ends. Now, when the ladder was in place, the rope, rather than the wooden steps, would be against the hull.

This design change would hold the ropes farther apart at each tread, so the wooden triangles would need to be larger. We decided to dispense with the triangles above the treads on the assumption that the lower ones would now provide sufficient stability. This modification would make the ladder more flexible and easier to stow.



Making the treads

As our salvaged piece of hardwood decking already had a suitably machined top surface, very little work was required to prepare the treads. We simply cut off three 15-inch lengths and made small notches in each side about $\frac{3}{8}$ inch deep and $\frac{3}{4}$ inch from each end.

I cut these notches by hand. I first made a small vee with a handsaw, then used a gouge to shape each vee to a semicircular hollow. Then, on the sides of the treads that would be next to the hull, I used a spokeshave to dish them out just slightly between the notches. This was to ensure that, despite the hull's curvature, the ropes, rather than the steps, would always touch the vessel's side. I sanded the treads and rounded off their edges slightly to prevent splintering.

I cut the small wooden isosceles triangles from the same salvaged piece of wood. They are 4 inches long and $3\frac{1}{2}$ inches wide to match the width of the treads. To ensure that the triangles would be held securely in place by the ropes, I hollowed out their two longer edges to form long channels with a semicircular cross section. To form these channels, I made an initial shallow cut down the center of each face with a circular saw, then hollowed them out with a gouge. I finished them with sandpaper wrapped around a drill bit to make a sort of circular sanding block.

Take great care when using a circular saw to cut small pieces of wood like this. Never push the wood across the blade with your hand; always push it with a stick to ensure that your fingers will be out of harm's way.

Assembling the ladder

The sides of our new ladder are made from two 8-foot lengths of $\frac{3}{4}$ -inch three-strand rope. We found the

Crafting the ladder's several parts took a little labor, above at left. A "dry" assembly indicates how the ladder will look, at left. When seized into the grooves, the rope will hold the parts firmly together, below.



centers of these lengths and applied a flat seizing with light eight-plait nylon line to create a small eye with two 4-foot tails.

Taking one of the ropes, we laid the two tails side by side and seized them together again after another 4 inches. Then we separated them to pass around the wooden tread, fitting them into the notches I'd cut.

Next, we placed one of the wooden triangles with its short side against the bottom of the tread. We led the tails of the rope around this, fitting them into the channels formed in the long sides, and applied another seizing just beneath the tip of the triangle.

We carefully adjusted the position of this seizing until the tread and the triangle were held firmly together. Then we repeated this process using the other rope at the other side of the tread.


As long as the seizings are tight and correctly positioned, they will hold the two pieces of wood securely together without the need for glue or any other fastening.

We secured the remaining steps the same way. As we had decided our ladder would be 20 inches long with three steps, we positioned the seizings to hold the treads 10 inches apart. This left us with 4½ inches of rope between the bottoms of the triangles and the seizings above the lower tread. This spacing has turned out to be just about sufficient. If the treads were going to be any closer together, it would have been a good idea to make the triangles shorter to ensure that the ladder would roll up satisfactorily.

Before fitting the final tread, we joined the ends of the tails together with a short splice. This created a small eye on each side of the ladder beneath the final seizing. We use these eyes to attach a two-rung rope extension that allows us to use our boarding ladder when we're swimming as well as for climbing aboard from a dinghy.

Finishing off

The final step was to attach two 4-foot-long lines to the loops left at the top of the ladder. We made these of the same three-strand rope and joined them to the loops with eye splices. We use them to hang the ladder in place by tying them to two of the turnbuckles on the mizzen shrouds.

Our boarding ladder has lived up to our hopes. It stows away neatly, is quick and easy to set up and use, and the shrouds above the turnbuckles form useful handholds as we come aboard. The grooved surface of the treads ensures that we do not slip on wet steps and the triangles are effective at keeping them horizontal. 

Richard Toyne and his partner, Magali Bellenger, live aboard their steel ketch, Sigfrid, cruising the western Mediterranean, supporting themselves with Richard's carpentry work and the sale of jewelry Magali makes on board. They tested their new boarding ladder while exploring Portugal's Algarve coast.



Sigfrid's boarding ladder looks salty, is easy to climb, and its rope risers don't clunk on the hull or abrade the paint.

The flat seizing

This is one of the simplest seizings to make and is suitable for work like this where the strain is not very great and the load on each rope is the same.

To begin the seizing, take a length of light line (we used nylon) and form a small loop in one end by tying a bowline. Then pass the other end of the nylon line around one of the tails that form the sides of the ladder, put it through the loop, and pull it tight, attaching it firmly.

Hold the two tails side by side and wrap the light line around them to bind them tightly together. The turns of the seizing should lie neatly next to each other and be pulled as tight as possible as you go. We put on 10 turns, creating a seizing about 1 inch long. When the seizing is long enough, complete it by putting on frapping turns: take the end of the nylon line between the two tails and wrap it tightly around the seizing.

We applied two frapping turns, pulling them tight, and finished off with two more turns tied as a clove hitch. As a final precaution, to ensure that the seizing could not work loose, we tied an overhand knot as close as possible to the last tuck of the clove hitch, cut off the nylon line, and melted the end with a lighter flame to seal it.



Coordinating coordinates

Degrees, decimals, and the synthesis of cultures

by Devin Ross

As we go about our daily rounds, whether on land or sea, it's critically important that we be able to identify and describe exactly where on earth we are, where we're going, and what places we'll pass through along the way. We improve the odds of doing that successfully by using latitude and longitude to pinpoint any location on earth ... the more accurately the point is identified, the better.

Machines, such as GPS receivers, report this information very accurately. But, strangely, the format used to report latitude and longitude is not standardized.

You are quite likely to encounter a mix of formats as you research your next trip. If you misread a format, you can induce a large and potentially dangerous error (see "A caution on coordinates," page 47). Make sure you know what format you are looking at so you read and plot positions correctly.

The three most common formats look like this:

Degrees Minutes Seconds (DMS):
N 43° 32' 12.66" W 076° 54' 19.26"

Decimal Degrees (DD):
N 43.53685° W 076.90535°

Degrees Decimal Minutes
(aka GPS coordinates):
N 43° 32.211' W 076° 54.321'

Each set of coordinates identifies the same location, so why have we developed three systems of expressing it?

Sumerian sums

A very long time ago (about 6,000 years) the Sumerian culture evolved in Mesopotamia, in present-day southern Iraq. The Sumerians used a base-60 numbering system (base-60 in shorthand) in which a unique symbol represented each of the first 60 integers (just like we have unique symbols to write the first 10 integers of our base-10 number system: 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0).

Base-10 allows 10 items to be easily divided into 2, 5, or 10 piles. To break 10 things into 3, 4, 6, 7, 8, or 9 piles takes fractions (which weren't yet invented). This can be a real problem when dealing with the division of things not easily broken apart, such as jars, workers, or livestock. Using base-60, however, allows 60 items to be easily divided into 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, and 60 piles. Here, the first six divisions are perfect and there are enough initial items that, with a little creativity, most other divisions can be made to work with minimal waste (leftovers). For example, withholding only 4 items allows the remaining 56 to be broken into 7 equal piles. Most historians say that the advantages of using base-60 for trade, particularly for the division of goods, is so great that this fact alone would explain its frequent use in the ancient world.

The Sumerians built huge cities, developed irrigation systems, formed an administrative structure, supported a legal system, and even invented a postal service. Yet we know relatively little about the origin of the Sumerians

and even less about the culture that preceded them. A popular theory holds that two earlier peoples merged and formed the Sumerians. The theory proposes that one group used a base-5 numbering system and the other a base-12 numbering system. When the two groups traded together, they evolved a system that used base-60 (also called a sexagesimal numeral system) so both groups could easily understand it (just like getting common denominators before adding or subtracting fractions). It seems easy to believe that a base-5 numbering system evolved from counting the fingers and thumb on a human hand. J.J. O'Connor and E. F. Robertson of the University of St. Andrews in Scotland propose that a base-12 numbering system comes about by counting finger segments: 3 segments on each of 4 fingers ... while ignoring the confusing 2-segment thumb.

Regardless of exactly why the Sumerians adopted base-60 for their math, it is fairly clear that the Babylonians inherited it from the Sumerians, although another culture, the Akkadians, may have had a role in all this too. Around 2300 B.C., they invaded the Sumerian Empire, held power for a couple of hundred years, invented the abacus, and were eventually overthrown.

Within a hundred years, the Sumerian influence waned, and by 2000 B.C., Babylonian invaders were in solid control of the region. The Babylonians are famous for their astronomical observations and calculations that were greatly aided by the

“... in reality, educated ancient people knew the world was round in all directions (a sphere).”

invention of the abacus. Babylonians also invented writing and recorded their findings in an alphabet known as cuneiform by using a wedge-tipped reed stylus to make marks on soft clay tablets. They hardened the tablets in the sun, creating a permanent record. Some of these tablets still survive today.

Days of the heavens

When the Babylonians observed the skies, they noted that every 360 days the heavens repeated themselves except for a few “omen stars,” which we now know to be planets, comets, and the very rare supernova. This was a huge finding for them, as 360 is divisible evenly by 60, and we have already noted how easy it is to divide 60. One can imagine that this all seemed perfect and divine to the Babylonians. They formed a calendar as far back as 2400 B.C. that divided the year into 12 months of 30 days each: 360 days total. One may wonder why they didn’t choose 6 months of 60 days each. Most historians credit the long-recognized four seasons for this, into which 12 months, but not 6 months, can be evenly divided.

After the Babylonians noticed the circular track of the sun’s annual path across the sky and discovered that it took 360 days to complete one circuit, they invented a 360-degree circle representation to record and describe their astronomical findings with each degree representing one day. This told them what had been observed and allowed them to predict very accurately what would occur. Considering the instruments of the time, the division of a circle into degrees was very detailed work indeed. Remember, this all happened more than 4,400 years ago.

Later, the Egyptians determined that the Babylonians were off by five days when counting a full year.

So entrenched was the convention that 360 days equals a year and so easily does it divide the seasons, the Egyptians chose to have a five-day holiday once a year and otherwise ignore the problem. But the Egyptians did worry about a different problem.

Around 1500 B.C. (900 years after the Babylonians divided the circle into degrees), Egyptians divided the day into 24 hours. Originally, the hours varied with the seasons. Later, Greek astronomers made the hours equal. Then, between 300 and 100 B.C., the Babylonians subdivided the uniform hour using base-60: 60 minutes in an hour and 60 seconds in a minute. Originally, the term minute was just a description of one small piece created by dividing something into smaller parts (60 parts when your numbering system is base-60). Seconds were a second division into even smaller parts. The thing being divided could be a pile of wheat, a stack of coins, a length of rope, an hour of time, or a degree of a circle. So, while the degree and the hour were invented hundreds of years apart, they were ultimately divided in the same manner and inherited the same names of division: minutes and seconds.

Degrees of separation

A more subtle association occurred too: angles (divisions of a circle) became associated with locations on earth and travel east or west: longitude. This tied together the ideas of using degrees, minutes, and seconds to describe where you were (longitude) as well as where you were heading (angles). While we are repeatedly taught that New World explorers following the Medieval Period (Christopher Columbus, for example) feared sailing off the edge of a flat world, in reality, educated ancient people knew the world was round in all directions (a sphere). In fact, many early scientists made efforts to measure its size based on their local observations of the earth’s curvature. Aristotle (384-322 B.C.) wrote that a round earth was common knowledge among the educated, and Eratosthenes of Cyrene (276-195 B.C.) calculated the circumference of the earth to less than 1 percent error. It is likely that the earth’s spherical shape was known much earlier.

Knowing the earth was a sphere meant that travel north or south could be measured in the same degrees, minutes, and seconds of a circle as one used for travel east and west, since a sphere cut in half results in a circle whether cut along the equator or cut north to south. A circle that goes through the north and south poles is called a meridian, or line of longitude.



Saying it correctly

Despite careful planning and rigorous training, nature and circumstances have conspired against you. In a wholly deflating moment you realize you need outside help. You pick up your radio mike, glance at the navigation console, and prepare to send your first Mayday. Adrenalin shakes combined with marginal lighting force you to squint to read the digital readout and you begin: "Mayday, mayday, mayday..." Right after you identify your boat, you start to read off the coordinates that will bring help to your exact location. But what words do you utter into the microphone?

Your readout could be in three different formats, and each of those, in turn, can be spoken a variety of ways. Each of the following readouts is for the same location:

Degrees Minutes Seconds (DMS):
N 43° 32' 12.66" W 076° 54' 19.26"

Decimal Degrees (DD):
N 43.53685° W 076.90535°

Degrees Decimal Minutes
(GPS coordinates):
N 43° 32.211' W 076° 54.321'

Common spoken variations involve saying "north" and "west" before the digits instead of after them, not saying "north" and "west" at all, adding in a "by" between reading the north coordinate and the west coordinate, using the word "point" instead of "decimal" to indicate the start the fractional part of numbers, calling out by name any leading zeroes in the coordinates, and saying compound names instead of calling out each digit's name in proper turn.

BoatU.S. Trailing magazine reports that the U.S. Coast Guard prefers GPS coordinates for mayday communications but with the minutes reported to just two decimal places instead of the more commonly displayed three decimal places. Your position is:

N 43° 32.211' W 076° 54.321'

The Coast Guard would like to hear this position read as:

*Four three degrees three two decimal two
one minutes North
Seven six degrees five four decimal three
two minutes West*

A location along a meridian tells you how far north or south of the equator you are (your latitude). Lines of equal distance north or south of the equator (lines that run around the globe due east and west) are called lines of latitude. Knowing where you are along one of these lines tells you how far east or west you are of a special meridian, the Prime Meridian, and tells you your longitude.

While the equator, midway between the two poles, is an obvious choice for the starting line of latitude, the choice for the first line of longitude has never been as clear. That line, called the Prime Meridian, has been placed in various locations throughout history. Today we use a meridian that passes through the Royal Observatory in Greenwich in southeast London, United Kingdom. But it could run through any point on earth and be just as accurate and useful.

Difficulty of degrees

While degrees and minutes work reasonably well to identify or record a given angle, heading, or location, doing basic math (addition, subtraction, multiplication, or division) with them can be a confusing mess: 40 seconds plus 40 seconds isn't just 80 seconds, it's 1 minute and 20 seconds; 2 minutes minus 10 seconds requires an awkward carry to yield 1 minute and 50 seconds; and so on.

On the other hand, basic math is comparatively easy using base-10 (like decimal degrees). While this is true for human mathematicians, the real payoff comes when one uses base-10 numbers with a computer.

This simplicity is even more important when computers perform complex calculations, like trigonometry functions, for which they use a mathematical formula called an infinite series. If you need lots of decimal places of accuracy, then a large number of terms in the series need to be calculated, each involving a rapidly increasing number of simple calculations. Soon, the computer is doing a huge number of simple calculations just to calculate one accurate trigonometry result. It takes time

and computer memory to do this in base-10. It becomes almost impossible using base-60.

In reality, the computer is also converting back and forth between base-2, called binary, and base-10. Binary just isn't human friendly no matter how basic it is to computer operations, so input to and output from a computer program is designed to be in base-10 format. The computer can be programmed to further convert input and output into other formats (like degrees, minutes, and seconds), but this takes additional computer time and resources, so there is a fair amount of resistance to making these additional conversions.

Digital divisions

In summary thus far: degrees, minutes, and seconds can be traced back to the Babylonians and why and how they divided up a circle. They also originated the idea of using the divisions of circles to describe where on earth things were and figured out how to record such data (the invention of writing).

Much later, the routine use of decimal degrees resulted from the routine use of digital computers. While limited use of decimal degrees may have existed before, common sailors didn't see this format in use until electronic navigation equipment containing computers showed up in their own cockpits.

More recently, a third system has come into favor: degrees and decimal minutes reported to thousandths of a minute. Since most modern GPS receivers use this format, these are commonly referred to as "GPS coordinates." In an odd twist, it wasn't sailors who established the popular use of this format but airplane pilots, who borrowed an earlier nautical system.

After altitude, pilots worry most about heading, which is basically an angle (the angle between north and where one wants to fly). Headings were originally followed using a compass. Later, navigation was refined by having ground-based radio transmitters send out signals that instruments on the plane could use to figure out where they

were and, with multiple readings, where they were heading. The basics were developed during World War II but have been much refined as computing power, electronic precision, and radio-frequency use have improved.

One common system is called VOR (short for Very High Frequency Omnidirectional Radio Range). The direction from the station to the aircraft, in degrees from local magnetic north, is called the radial. The “intersection” plotted on a chart of two radials from different VOR stations provides an approximate position of the aircraft. This process is called triangulation. Originally, the instrument looked a lot like a compass dial and could, at best, be read in full degrees.

Then the LORAN system came into use. This system was developed for mariners but quickly became the standard of pilots. Unlike VOR, LORAN doesn’t offer distance and radials to triangulate one’s position, but instead reads out latitude and longitude coordinates directly. The earliest units reported in degrees and full minutes (no decimal minutes yet). Knowing where you were by reading a point displayed on an accurate instrument was a great deal simpler than working out triangulations on a map based on multiple VOR sites.

LORAN is similar to GPS except the signal transmitters, instead of

space-based, are ground-based. While this makes it easy to know where the signal came from (unlike with satellites, which are in motion), it leaves signal dead zones. Since LORAN was developed for nautical use, dead zones originally included the entire middle of the United States. Additional transmitters helped remove many, but not all, dead zones.

LORAN instruments could keep track of readings and read out direction and speed of travel. Given a destination, they could provide lots of information, such as headings, drift, and arrival times. As more stations were established and electronics became more accurate, so too did the information LORAN provided. Before long, units could provide readings accurate to tenths of minutes. They didn’t use seconds because counting tenths of minutes in seconds is quite awkward: 0, 6, 12, 18, 24, 30, 36, 42, 48, and 54 seconds.

Later, the accuracy improved to hundredths of minutes (about 61 feet or better). Hundredths of minutes (100 divisions per minute) offer almost twice the accuracy of seconds (60 divisions per minute). At this point in history, the instrument field might have been able to return to the ancient degree, minute, second format. However, it would have nearly halved available accuracy, taxed computers to make another level of conversions, and produced a non-decimal format that didn’t favor hand calculations. In practice, few practical hand calculations deal with distances so long that they require dealing with degrees.

A caution on coordinates

by Sean Mulligan

The GPS is a modern marvel that has opened up the world to many of us. At the touch of a button, we can know where we are, where we’re going, how long it will take, and what way we should go. The list of available information goes on and on. What GPS does *not* do, though, is *think* for us. To use it effectively, the operator must have a firm grasp of the principles involved. This requires the understanding of basic navigational concepts and the discipline to stick to them. Not only must you know *how* to navigate, but you must *do* it. Your GPS is one tool in your navigational toolbox. It’s not the only tool.

A few years ago, I was involved in a trip that, when looking back at it, was a real learning experience for all who were involved. We learned the hard way that things like inputting GPS coordinates in the wrong format can make a huge difference in the outcome of your day. Combine bad data input with some dense fog, one of the world’s busiest shipping lanes, a lack of appropriate charts, a healthy dose of “get-there-it-is,” some poor decision-making, and we found ourselves taking needless risks. One of our group nearly met with disaster that day.

With the permission of those involved, I wrote an article about our experiences. Collectively, many of us in the group made some questionable decisions that day. Most of us came through our experience initially with no problems and unaware of the mistakes we made, but one of us was not so lucky. While we waited to hear word of our missing friend, the gravity of the situation descended upon us. In the end, we were lucky . . . all of us. But it was hours and hours before we were sure the outcome would be positive and it was not a good day for the one who paid the price.

You can find our story, “Sailing in a Fog,” on the *Good Old Boat* website at www.goodoldboat.com/pdfs/SailingInAFog.pdf. This article was originally printed in *Small Craft Advisor*.



Most involve only a few minutes and the decimals of minutes.

Airport and facility directories offer critical airport information to pilots, since pilots typically fly from and to airports. One critical piece of information is the airport's location. By the mid-1990s, this information was dutifully reported in degrees and decimal minutes to hundredths of a minute.

Heavenly bodies

The LORAN system might have simply been improved indefinitely, but the U.S. military wanted something less susceptible to being switched off or destroyed. The solution was simple: use LORAN technology but have the transmitters in orbit where they would cover the whole world, be out of reach of most countries, and be in motion so even low-coverage areas would be periodically covered.

In 1978, the first experimental Block-I GPS satellite was launched. By 1985, 10 more experimental Block-I satellites had been launched to validate the GPS concept. In April 1995, full operational capability was declared (about the same time that LORAN started routinely using hundredths of a minute).

Initially, the highest quality signal was reserved for military use only. The signal available for commercial and civilian use was intentionally degraded. This was called Selective Availability (SA) and limited the accuracy of civilian GPS units to less than that of LORAN. It changed when President Bill Clinton ordered Selective Availability turned off at midnight May 1, 2000. This improved the precision of civilian GPS from about 1,000 feet to about 65 feet (about a hundredth of a minute, which is what LORAN had been using).

Turning off Selective Availability made GPS the overnight favorite for navigation for groups as widely different as pilots, boaters, and hikers, but these groups routinely needed still more accuracy.

The Wide Area Augmentation System (WAAS) is an air-navigation aid developed by the Federal Aviation Administration (FAA) to augment the GPS. Its implicit goal was to improve accuracy, integrity, and availability of GPS. WAAS was intended to enable aircraft to use GPS for all phases of flight, including

precision approaches to any airport within its coverage area.

WAAS uses a network of ground-based reference stations to measure small variations in the GPS satellites' signals. Measurements from these reference stations are used to determine corrections to offset the GPS errors. WAAS-enabled GPS receivers then use these corrections while computing their positions to improve their accuracy.

On July 10, 2003, the WAAS signal was activated for general aviation, thus covering 95 percent of the United States (less Alaska). Actual WAAS system performance measurements have shown that it typically provides better than 3-foot 3-inch accuracy throughout most of the contiguous United States and large parts of Canada and Alaska. In preparation for this improved accuracy, manufacturers of civilian GPS receivers added another decimal place to the degrees, fractional-minute format: thousandths of a minute (about 6 feet).

Today pilots, boaters, hikers, automobile drivers, surveyors,

and many more commonly use GPS coordinates: degrees and decimal minutes reported to thousandths of a minute.

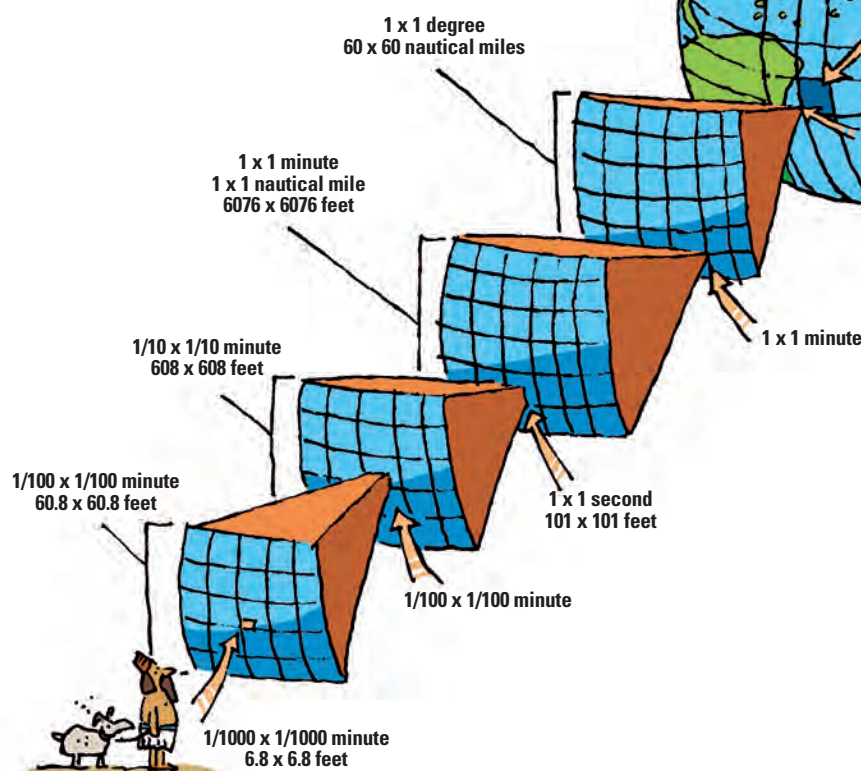
But anyone who frequently uses maps, charts, and other navigation aids (even older GPS receivers) will also

encounter the

decimal degrees (DD) that computers like and the degrees, minutes, seconds (DMS) that

ultimately stretch back to when writing was invented. The need to convert between these formats arises as well ... and it all started because 6,000 years ago traders needed to divide goods into even piles. ▽

Devin Ross sailed his O'Day 25, Huguenot, on Lake Erie for three years before moving her to Lake Arthur in Moraine State Park, Pennsylvania, to allow him to make easy day trips (and get in many more sailing days). Huguenot is the latest in a progression of boats: a Hobie 16, an Erie 17, and a South Coast 22.



A large, white sailboat with a dark blue hull is sailing on a body of water. The sail is fully deployed and has the number '35.5' on it. The boat is moving towards the right, leaving a white wake. The background shows a line of green trees on the shore under a blue sky with light clouds.

Adena, a Bristol 35.5

*In Bristol condition
and a fine place
to be*

by Bill Jacobs

Her dark blue hull laid down to a building breeze funneling through the Mississagi Strait, one of three entrances to Ontario's North Channel. *Adena* was on a roll, beam reaching in a 35-knot wind as if she were on rails. If Glen and Marilyn Kinsey Brown didn't already know they had found the ideal boat, it was perfectly clear to them at that moment.

It's a 150-nautical-mile trip across the tops of lakes Michigan and Huron from the Browns' home port of Escanaba, Michigan, to the North Channel. But, like many other sailing couples, the Browns have become mesmerized by the incomparable beauty of this pristine cruising destination. It's a trip they've made 10 times in the past 25 years . . . and in three different boats.

What made this sleigh ride all the more memorable was that they had never before been so comfortable while moving at such speed in a sailboat. To make the trip safely and comfortably, a strong and solid sea boat is best. The most northern reaches of these two Great Lakes can dish out all imaginable conditions. Glen and Marilyn had looked for two years before deciding on the 1989 Bristol 35.5, designed by Ted Hood.

Solid credentials

It would be difficult to appreciate the importance of this particular sailboat without reflecting on the long pedigree it inherited from its builder and its designer (see "Marblehead's finest kind," page 51). Clint Pearson, a pioneer in the building

Glen and Marilyn Brown chose their Bristol 35.5, *Adena*, because she had the attributes they sought.



Bristol Yachts finished the interior of the 35.5 in teak and did not stint on cabinetry. Note that the centerboard trunk is entirely beneath the cabin sole, at left. Fixed portlights and the Browns' custom companionway let in plenty of light, at right.

and marketing of fiberglass sailboats, founded Bristol Yachts in 1966. When the company filed for bankruptcy in 1997, it had built more than 4,000 boats. The 35.5 was built beginning in 1977 and more than 180 boats were completed before production ceased in 1997. Although a full-keel version of the 35.5 was offered, most were built with the centerboard configuration as buyers chose the limited draft for gunkholing.

The hand-laid-up hull is constructed of alternate layers of mat and woven roving. The deck is laid up of mat either side of a balsa core and is attached with stainless-steel fasteners to a 3-inch

flange molded to the inside of the hull just below the sheer. The fiberglass centerboard is weighted with lead ballast and controlled by a stainless-steel cable led over bronze sheaves and through a stainless-steel tube to a reel winch located on the cabintop to port of the companionway. The balanced fiberglass rudder is molded around bronze plates welded to a bronze rudder stock supported by a bronze rudder shoe at the base of a partial skeg. During the 35.5's production run, Bristol used several diesel engines for auxiliary power including Universal, Westerbeke, and Yanmar.

Ted Hood took delivery of one of the early Bristol 35.5 hulls for his own use. "We won quite a number of races right out of the box," he told me, "and although she was a good sea boat, I remember my son Bobby, who was around six at the time, losing his lunch below while we were taking some huge head seas."

Adena, hull #181, one of the last Bristol 35.5s, was built in 1989. Marilyn and Glen purchased her in 2004. Several years before, they had sold their Wauquiez Pretorien 35 and switched for seven years to a classic Jarvis Newman 46-foot lobster boat. "But we decided we really preferred sailing," Marilyn says, "and we missed the chuckle when you turn off the engine and the wind fills the sails." Both Glen and Marilyn had grown up in sailing families. The tradition continues with their children, Ian and Laura.

A careful search

Before they began their search for a sailboat to buy, they prepared an extensive spreadsheet with more than 50 features they wanted in their next boat. The list covered everything from size to seaworthiness, draft, comfort, storage, interior layout, and cruising speed. They looked at centerboard models from Tartan and Sabre before remembering their good friends Jack and Pat Martin, who had a Bristol 35.5 across Green Bay in Wisconsin. It had just been sold.

The Browns contacted the Martins and discussed their 28 years of experience with the 35.5. As a result, they added the Bristol to their list of potential



The interior layout is standard for a boat of the era and functional, with the galley to starboard of the companionway, at left, and the head, at right, forward of the saloon.

sailboats. Eventually, they settled on the Bristol 35.5 as the clear choice.

At the time, three of the boats were listed for sale across the country and they visited all three. They chose a boat in Charleston, South Carolina. Although the boat had been well cared for and had under 1,500 hours on the engine (a Yanmar 3GM30F), none of the key systems (hoses, plumbing, sails, or rigging) had been replaced or upgraded. They realized there was work to be done. It was July. They didn't want to work in the heat and humidity of South Carolina, so the Browns had their new boat trucked to their home yard in Escanaba.

So they could launch their boat in Big Bay de Noc and enjoy what remained of the short sailing season, they wanted to complete a few jobs

quickly. They replaced the engine exhaust hose and lubricated the seacocks (and attached softwood plugs to them all). They christened her *Adena*, a name derived from the Indian vernacular referring to Eden, or a wonderful place.

A slew of improvements

As they sailed their new boat into the fall, the maintenance/replacement list grew longer by the week. From the fall of 2004 through the spring of 2011, Marilyn and Glen completed more than 70 projects. Among them are new Doyle sails, running rigging, standing rigging, lifelines, traveler, anchors, and portlights. They also repaired the centerboard and fitted a feathering prop, custom companionway

Marblehead's finest kind

Ted Hood, who continues a prodigious career in yacht design well into his 80s, is a living legend. His influence on cruising sailboats puts him in a class with Nathaniel Herreshoff, John Alden, Philip Rhodes, Olin Stephens, and other great designers of the past century. His contribution to sailing is not limited just to design but includes sailmaking, yacht construction, development of complete yacht-service facilities, world-class racing credentials, and rig developments, such as the twin-groove headfoil system and the Stoway mast.

He started his career in 1950, at the age of 23, by opening his own sail loft in Marblehead, Massachusetts. During the ensuing 61 years in the yachting business, never was he busier than the era of 1960 to 1980. Ted was involved in four America's Cup campaigns and successfully defended the Cup in 1974 at the helm of *Courageous*. His sailmaking business expanded worldwide with lofts in eight countries. He designed, built, and sailed 37 racing boats to his own designs, all called *Robin* and painted robin's egg blue, winning major international events. How he found time and energy to design production yachts for Bristol, Hatteras, Hinckley, Tartan, and Wauquiez is hard to fathom.

It was from the *Robin* series that Ted developed a concept for hull design known variously as the "whale-bottom," the "delta hull," or simply the "Hood style." The concept is typified by a heavy-displacement, shallow-draft, low-wetted-surface hull with a centerboard. "They are seakindly and good-looking too, the type of yacht in which I like to cruise and race," Ted has said. "In time, they flew in the face of the light-displacement yachts and yacht designers. It was my mission — no, my pleasure — to prove such yachts were fast."



The Browns made a host of improvements to *Adena's* exterior and rig including new companionway doors and running rigging, at left above, and a new mainsail with a full-batten system, at right above. They also followed a tip from *Good Old Boat*, March 2010, for turnbuckle locks, at right.



dropboards, new electronics, LED lighting, solar panels with controllers, water heater, electronic cold-plate refrigeration . . . the list goes on and on. Capable do-it-yourselfers, the Browns took on the vast majority of repairs and installations themselves and have accomplished each task in accordance with the highest standards for yacht maintenance and installations.

Speaking of the original workmanship, Glen says, "There is no 35-foot production boat being built today that compares to this quality of construction and attention to design detail." And it's evident from an inspection of this high-quality Bristol that the Browns have applied a similar approach in all their upgrade and repair projects.

After five years of ownership, and the intimate knowledge an owner acquires only through hands-on involvement in so many upgrades, the Browns remain very enthusiastic about their Bristol. They believe this boat will take them through any conditions they are likely to encounter, thanks to her well-designed hull and her easily handled sail plan, which is made all the more

manageable by a roller-furling genoa and a full-battened mainsail with single-line reefing and lazy-jacks. In addition, her draft of only 3 feet 9 inches with the board up allows them access to almost any anchorage. And with her low wetted surface, she performs well in light air.

Classic for her era

The ample interior of the Bristol 35.5 is laid out in the classic fashion with opposing settees in the saloon, a U-shaped galley to starboard, a navigation station and quarter berth to port, what must be one of the most comfortable V-berths in any boat, and a profusion of drawers and hinged-door cabinets that provide enough storage capacity for weeks of cruising. Glen also points out, "She's so pretty that you can't walk away without turning around for a final glance."

The Browns are also quite honest about a few things a potential owner should understand before buying a 35.5. The cockpit is best described as a very efficient workspace for a crew of two or three, four in a pinch. Marilyn says

about the boat, "It sleeps two, cruises three, and feeds four." It does not have the space that a comparable modern design offers, but it is very secure and well laid out. Docking would be easier with a full-length rubrail. The boat is not easy to handle in reverse, although lowering the board a few inches makes a big difference. The engine installation is tight, so access to either side of the engine is difficult. In boats, as in life, there are always tradeoffs.

The Bristol 35.5 was a design success, an example of a high-quality production yacht and, with the able assistance of Glen and Marilyn, this 1989-vintage good old boat has clearly found a home in the new century. *A*

Bill Jacobs has spent the last 48 years in sailboats and powerboats. He is a recognized marine photographer and has written for boating publications since 2004. Bill winters in Sarasota, Florida, and cruises on a Mainship 34. In the summer he can be found sailing his Cape Dory Typhoon on Lake Michigan off the shores of Door County, Wisconsin.



Adena shows off the classic lines that are a mark of both her builder and her designer, Ted Hood.

The Bristol 35.5 on stage . . .

. . . with two variations on the theme

by Ted Brewer

Note: In an editorial snafu, we didn't make it clear to Ted that the feature boat is a centerboard version of the Bristol 35.5 so his comparison boats are for the fixed-keel version. We expect we'll see the centerboarder in a comparison article in the future. Ted notes that the deep-keel version would probably have the edge over the centerboard boat upwind, but the keel/centerboard boat could prove slightly better reaching and running, particularly in softer breezes. —Eds.

At times, selecting comparison boats can be a problem. For this issue, I chose three boats designed in the 1970s by three top designers to show that great minds do not always think alike. The Bristol 35.5 is a husky cruising auxiliary clearly designed with racing in mind. She has the earmarks of a true Down East boat with generous displacement, moderate sail area, and no condescension to the shoal draft considered so essential by the majority of sailors south of Maryland. She also has her propeller located in an aperture in the skeg, where it is less susceptible to the loving attention of the pot warps on the millions of lobster traps dotting northeastern waters.


Apparently Bill Shaw had similar thoughts when he gave the Pearson 36 a full 6-foot draft. Of course, many sailors like to feel their way into the quiet coves and anchorages that are forbidden to deep draft vessels. I, for one, would prefer the slightly shoaler draft on Bob Perry's Cheoy Lee 35. It all depends on why you sail and where you cruise.

I have to admit that, as the designer, I always argued for the deepest draft my client would accept, as deeper draft contributes so much to weatherliness and reduced leeway. My arguments did not work in the case of one very experienced owner, however. He was a retired U.S. Navy Commander with years of experience cruising and racing on the East Coast and he insisted on a relatively shoal, 6-foot draft for his new 52-foot yawl. As he explained, "With 6-foot draft you stay outside the one-fathom mark on the charts and you know you're safe. With 4-foot draft you can explore inside it and rip your bottom out on an unmarked rock." A word to the wise!

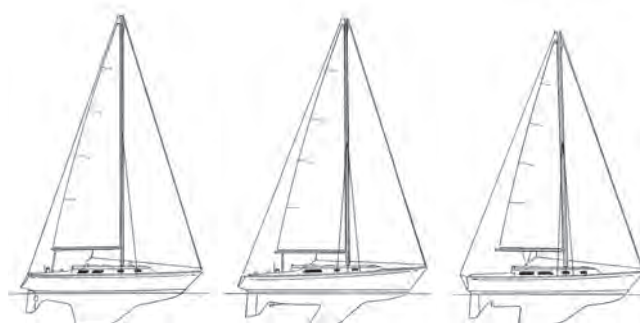
Bill Shaw was thinking of racing when he designed the Pearson 36. She has the narrower stern that was coming into vogue with the IOR and of these three, having the deepest draft, the longest waterline, the lightest displacement, a high ballast ratio, and the highest sail area/displacement ratio of the group, she would be a tough contender indeed. Of course, the final result would depend, as usual, on how well she was handicapped under the rule and the skills of her crew. The Bristol and the Cheoy Lee appear to be on a more equal footing when it comes to performance in medium air, but the Bristol has some advantages in variable conditions: more sail area in light air and a higher ballast ratio for when it blows. A race around the buoys between the Bristol 35.5 and the Pearson 36 would be very interesting indeed and, I believe, a close one.

For general cruising, the heavier Bristol and Cheoy Lee seem to have the edge in motion comfort while their husky displacement should help them maintain speed on a long beat to windward in a steep chop. All three designs show good capsize screening numbers and can be considered highly capable of making long bluewater voyages. Even a Cape Horn rounding is not out of the question given good condition, equipment, sails, and an experienced crew with a taste for adventure.

I rarely comment on the interior layout but I much prefer the U-shaped galley of the Cheoy Lee to the L-shaped galleys in the others. That is a personal thing of course and, usually, the average male buyer will be guided by his better half when it comes to interior preferences. I also like the two pilot berths of the Bristol — the very best place to sleep at sea and great for a racing crew.

In any case, these are three fine yachts, capable of good performance for club racing and comfortable, safe, voyages for coastal and trans-ocean sailors. They will take you there and bring you back. 

Ted Brewer is a Good Old Boat contributing editor. He is one of North America's best-known yacht designers and his passion for his vocation shows in his writing as well as in his designs. Many of the boats he has designed over his career are now good and old . . . and still sailing.



Bristol 35.5

Pearson 36

Cheoy Lee 35

	Bristol 35.5	Pearson 36	Cheoy Lee 35
LOA	35' 6"	36' 6"	34' 10"
LWL	27' 6"	29' 2"	27' 1"
Beam	10' 10"	11' 1"	11' 2"
Draft	5' 9"	6' 0"	5' 4"
Displacement	15,000 lb	13,500 lb	14,300 lb
Ballast	6,500 lb	6,100 lb	5,330 lb
LOA/LWL	1.29	1.25	1.29
Beam/LWL	.39	.38	.41
Disp./LWL	322	243	321
Bal/Disp.	.43	.45	.37
Sail area	602 sq ft	601 sq ft	564 sq ft
SA/Disp.	15.8	17.0	15.3
Capsize Number	1.76	1.86	1.84
Comfort ratio	32.2	26.8	30.0
Years built	1978-96	1972-76	1979-83
Designer	Hood/Empacher	Bill Shaw	Robert Perry

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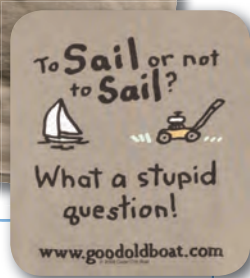
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A new holding tank

Its irregular shape dictated DIY

by Ken Poss

My 1986 Pearson 28-2 had a rubber-bladder waste tank that had seen its day. After being filled and emptied many times since it was installed, it developed creases in its top surface that — when the tank was full — caused weeping, led to bad odor, and necessitated frequent cleaning of the area around it. The waste tank was located in the bottom of the starboard cockpit locker in a molded rectangular fiberglass-reinforced-plastic (FRP) well with a loose-fitted plywood cover. When the bladder was full, the cover popped up, indicating that this type and style of holding tank was not originally intended for my sailboat.

In addition to these problems, I discovered that the holding tank capacity, which I judged to be close to 10 gallons, was not sufficient for a several-day cruise with two or more persons on board.

To make full use of the available space, I wanted the new replacement tank to fit into the well, which would also provide some degree of support for the tank. However, the molded well in the locker follows the curvature of the hull and is a different depth at each of its four corners. That meant no two sides would have the same dimensions, which precluded finding a suitable pre-manufactured rigid tank.

For all these reasons, I decided to fabricate a new waste holding tank. I did not anticipate this project to be a difficult challenge since I've spent more than 30 professional years in resin development and fiberglass composites.

Some of the matters I had to consider before undertaking this project were the configuration of the tank, its capacity, how to construct the mold and the tank, the appropriate resin to use, and how to secure the finished tank in place.



Male or female mold?

My first thought was to make a mold and fabricate my tank inside it. I could have waxed the smooth surfaces of the well and made a male plug using rigid urethane foam (it's available in pressurized cans), and then laminated FRP over this rigid surface to make a female mold. Laminating inside this mold would have resulted in an exact fit inside the well. I elected not to pursue this industry-standard technique for mold-making since the inside walls of the finished tank would have been somewhat uneven and rough. That's in addition to this process being time-consuming and more expensive than the alternative method I eventually chose.

I decided, instead, to follow a method Mark Parker described in an article in the November 1999 issue of *Good Old Boat* about how he constructed a mold for his holding tank. Mark made a male mold using wallboard (drywall) that could eventually be broken up or dissolved inside the finished FRP tank and easily removed.

I decided to make my holding tank in two pieces, an open rectangular tank with a flange around the top and a separate FRP cover. This approach allowed me to insert wooden wedges

between the FRP and the wallboard and easily remove large sections of the wallboard mold that was held together with wood blocks and screws.

The well in my cockpit locker was molded with a slight taper to its sides to facilitate extracting it from its mold. When measuring for my mold, I had to take the width and length dimensions off the well bottom and subtract $\frac{3}{4}$ inch from them to be sure the finished holding tank would fit reasonably into the bottom of the well. I designed my FRP laminate to give the tank a wall thickness of $\frac{1}{4}$ inch. Overlapping the laminates would provide extra thickness at the corners.

To finalize the dimensions for the four wall sections, I added 10 inches to the height at each corner, thus keeping the holding tank's top level and allowing a reasonable estimate of the rigid tank's capacity. Using 231 cubic inches per gallon, I estimated the volume would come to just over 21 gallons, an acceptable capacity for my future extended sailing.

At this point, I assembled the rough tank mold and checked that it would fit through the locker opening and into the molded well ... an important step before proceeding. To finish the

Ken's new holding tank is plumbed and secured in place with webbing straps, on facing page. He made a pattern for each side of the male mold, at right, and placed the mold on a laminate surface from which the laminated tank would easily release, below.

mold, I covered the screw heads with plaster-patching compound and filled the open exterior corners and rounded them by filing and sanding. After that, I sealed the mold with several coats of shellac. Any hard resin coating would be satisfactory for this task. Latex paint, however, will not work as well; it will become soft with the application of the solvent-based wax used as a release agent and will adhere to the interior of the finished tank. I used a minimum of four applications of a carnauba-base wax for releasing the FRP from the mold ... or should I say the mold from the FRP? I waxed the mold and buffed it to a shine between each application and prior to laminating.

Resin options

I gave considerable thought to my choice of laminating resin. Making my holding tank was to be a winter project. Since I would be working in my attached garage, I selected an epoxy-resin system for laminating, primarily due to its low odor. An alternate for a project like this would be polyester resin. However, the reactive styrene monomer of polyester resin can be easily detected at the low PPM level and would certainly be carried in the heating system and linger for an extended time throughout my two-story



house. Although I don't consider styrene to be terribly toxic at this level, it has an obnoxious odor and could cause a problem for anyone who is sensitive to solvent-type chemicals.

A secondary although lesser concern with general-purpose polyester resin, usually identified as an orthophthalic, is its chemical resistance, which is at the bottom rung of the ladder. A composite tank made with it might, over a long period of time, develop blistering in the inside tank wall from waste and treatment chemicals.

A standard epoxy system, bisphenol epichlorohydrin/amine cure type (such as the West System epoxy), has superior chemical-resistance properties by comparison and a tank made from it should have a much longer useful life.

As a precaution, anyone handling epoxy resin and its hardeners should wear gloves at all times. Some people develop severe dermatitis if directly exposed to either component of this type of resin system.

Laminates and laminating

From experience, I was confident that a wall thickness of approximately $\frac{1}{4}$ inch would be structurally sound for the tank's construction and intended use. I achieved this with two plies of $1\frac{1}{2}$ -ounce chopped-strand mat (CSM) followed by a single ply of stitched biaxial roving and a third ply of $1\frac{1}{2}$ -ounce CSM to complete the sandwich. A single ply of 12-ounce woven roving could be substituted for the biaxial roving.

I used a cardboard template for each side plus the bottom to mark off and cut the glass plies. I added 2 inches of width to the plies where I planned to overlap the joints.

I laminated the tank cover separately to $\frac{3}{16}$ -inch thickness using a single ply of biaxial roving sandwiched between single plies of $1\frac{1}{2}$ -ounce CSM (three plies total). I made a cardboard template for this, too, and cut the glass approximately 2 additional inches in each dimension to cover the flange and provide an excess for trimming. I found that placing the finished FRP tank on a piece of stiff cardboard facilitated tracing the flange perimeter.

For a layup table, I used a piece of laminate countertop left over from remodeling a kitchen. I waxed the surface to a shine, positioned the holding tank mold upside down on top of it, and applied molding putty with a wooden tongue depressor to create a smooth radius where the mold met the countertop surface. To configure the tank's top flange, I formed a dike around the mold by screwing $\frac{3}{4}$ -inch wooden strips into the countertop approximately $1\frac{1}{2}$ inches away from the mold. I waxed these wooden strips so the laminate would release from them.

In the actual laminating procedure I used two special metal laminating rollers. One was a large 2-inch-diameter roller, which helped in applying the pressure necessary to wet-out the glass mat by forcing resin up through the glass and, with it, entrapped air bubbles. I used a smaller $\frac{1}{2}$ -inch-diameter roller for laying down glass fibers in the tight radius in the flange area. Poking the wet-out glass fibers with a stiff bristle brush also works well to remove entrained air.

I used acetone to keep my rollers and paint brushes clean for repeated use. They should be cleaned immediately after use. If the resin sets up in the roller, something that can happen



when it's left in the acetone for a long period of time, it's nearly impossible to reclaim it for future use.

I urge anyone working with FRP to follow common safety procedures. Keep any source of flame away from the resin and cleaning solvents and don't smoke while using these products. Keep all of these chemicals in closed containers when they are not in use. Wear gloves when handling chemicals and a dust mask when sanding and grinding cured laminate composites, and remember to dispose of contaminated rags, gloves, and containers in accordance with local regulations.

Coping with resin drainage

Whenever laying up FRP on a vertical surface, expect to have some resin drainage from the wetted glass fibers



Almost there ... Ken has finished the tank and its top, marked the 5-gallon fill levels, and fitted the plumbing to the tank top.

until the resin starts to set up. It helps to pre-wet the fiberglass on a separate hard surface covered with a sheet of plastic and then transfer it to the mold surface. Before any laminate is applied to it, the mold surface should be lightly

coated with resin/hardener. Too much resin, however, will cause the glass to slide down the vertical surfaces. Using a heat lamp will help overcome drainage by setting up the resin more quickly.

Normally, manufacturers of polyester resin will incorporate into the resin a small amount, in the 1 percent-by-weight range, of fumed silica to control and prevent resin drainage. This additive (one brand is Cab-O-Sil) can be obtained from a marine supply outlet. I'm not sure what the optimum amount would be for epoxy resin. I guessed at one 8-ounce cup of fumed silica per 1 gallon

of resin and mixed it in with a high-shear paint mixer in an electric drill. It seemed to work, as the resin drainage was next to nothing.

I should also mention that the binder resin that the glass manufacturer

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applies to the dry CSM glass fibers to bond them together does not dissolve very well in the reactive monomers in epoxy resins. It becomes suspended in the resin as fine particles that make the cured composite somewhat cloudy and opaque. By contrast, similar composites made with polyester and vinylester styrenated resins have a higher degree of clarity, which would make the liquid level inside the tank more visible.

Finishing touches

When my holding tank's top was cured and roughly trimmed, I cut out 2-inch-diameter holes for the waste inlet- and outlet-hose fittings and a smaller hole for the vent piping. For the outlet side, I used standard PVC plumbing pipe and extended it down to ½ inch from the deepest corner of my tank. I cut this pipe at a slight angle at the bottom.

The hardest part at this stage of assembly was locating straight-thread pipe fittings that had sufficient flange surface to tightly secure them to the FRP top. I solved the problem when I located Savko Plastic Pipe & Fittings, a company in Columbus, Ohio, that specializes in supplying plastic pipe and fittings to the plumbing industry.

Prior to assembling the tank, I supported it and filled it with tap water up to the flange surface and, to my surprise, found it held exactly 22 gallons. While filling it, I marked the water level every 5 gallons on the largest exterior side as a reference for judging the level when the tank is in use. For those interested in the filled weight, 22 gallons at 8.33 pounds of water per gallon is approximately 183.3 pounds. The added weight of the fiberglass and fittings brought the total weight of the filled tank close to 200 pounds.

With the pipe fittings in place, plus a 5-inch deck plate I fitted as an inspection port, I lightly sanded the smooth sides of the tank flange and tank top cover where they would be bonded together. For this step I used a white epoxy paste, PC11 Marine Grade from PC Products, which is available at Ace and other hardware stores. Then I C-clamped the top to the tank flange. After it had cured, I trimmed the flanged top with a scroll saw and rounded it smooth with a belt sander. As a final step, to obtain a somewhat uniform appearance, I applied a coating of epoxy resin incorporating titanium

white pigment purchased at a local art supply store.

Using a flashlight, I could just see the fluid level as the tank filled. At the suggestion of a sailing friend, I installed a 3-gallon plastic gasoline tank as a freshwater supply for flushing the toilet. Besides keeping the waste odor under control with treatment chemicals, I could also estimate the level of the waste in the holding tank and time the need for emptying it. The same friend also suggested I use two hold-down straps with a ratcheting mechanism plus stainless-steel lag bolts and washers to secure the holding tank in the molded well. This was the perfect installation solution.

This was a satisfying and fun project for me, and it's one that most boaters can undertake. The same procedures can be followed for fabricating any size FRP tank for any purpose. If you're contemplating a potable-water tank, however, note that the fabricating or gelcoat resin must meet FDA and/or USDA regulations for use with food and drink. The finished container must also be free of all chemicals before it's put into service. This is accomplished by post-curing the composite and then washing it with a suitable detergent, rinsing, and drying it. *▲*

Ken Poss retired after 35 years as a polymer chemist and fiberglass technical-service representative for a major resin manufacturer. His experience includes resin applications, fiberglass construction, mold making, and product compounding with polyester, vinylester, phenolic, and epoxy thermal-setting resins. He sails his 1986 Pearson 28-2, Koinonia, from Sandusky, Ohio, into the western basin of Lake Erie.

Resources

Savko Plastic Pipe & Fittings
www.savko.com

PC-Products (PC-11 epoxy paste)
www.pcepoxy.com

Find more suppliers of fiberglass, resin, and other materials at:
www.goodoldboat.com/resources_for_sailors/suppliers_directory

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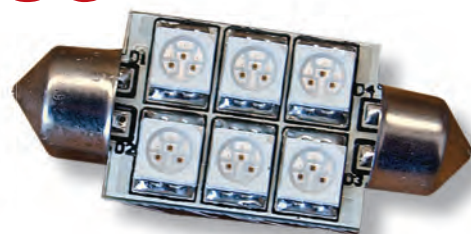
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LED lights revisited



Lightning induces a review of current lighting

by Clarence Jones

To increase the arc of emitted light and make it brighter, Clarence originally glued and wired together two LED festoons, above left. His new panel of six very bright LEDs on a festoon base, above right, emits light through a 120-degree arc and is much brighter than the original two festoons with a total of 18 smaller LEDs. The difference in brightness is quite apparent, below, when comparing the original 10-watt incandescent bulb (left), two festoons with 18 LEDs (center), and the new LED panel with six LEDs (right).

When a nearby lightning strike zapped my sailboat's electronics and lights, I learned a lot more about the implications of converting from incandescent lights to LEDs. And when searching for replacements, I was amazed at how many new LED adaptations are coming to market.

When I bought her a couple of years ago, I replaced all the incandescent light bulbs on *Prime Time*, my 28-foot Catalina, with LEDs (see "New-era navigation lights," May 2010). About half of those LEDs blew out from the lightning-induced current surge. The lightning didn't hit my boat, but a lightning strike induces a brief very high voltage surge (but with very low amperage) in nearby conductors.

The technician who replaced the damaged instruments said it is his experience that LEDs are much more susceptible to this kind of surge than incandescents. This may be because each light-emitting diode is itself a tiny electronic circuit. In my lightning damage, those bulb replacements containing multiple LEDs seemed more susceptible to the voltage surge, perhaps because they have more circuitry. Most of the LED replacements that survived were completely contained inside glass in festoon bulbs.

Manufacturers of lighting fixtures love festoon bulbs because they have 360-degree visibility and

there's no socket cylinder to collect moisture and promote corrosion. Some new LED bulbs have come to market since I did my original conversion.

The biggest improvement for my festoon-bulb navigation lights is an LED panel containing six very bright LEDs with a lighting arc of 120 degrees. That's important because the Navigation Rules require red and green sidelights to be visible through an arc of 112.5 degrees from the bow. To achieve that spread when I did the original conversion, I had to glue together two bulbs (each containing nine tiny LEDs) and wire them to a wooden dowel. Having two bulbs also doubled the brightness.

The price of the new LED panel was \$15, more than the cost of two of the old festoons (\$5 each). However, the panel increased the arc of visibility of the light and required no painstaking work on my part to achieve the brightness I wanted.

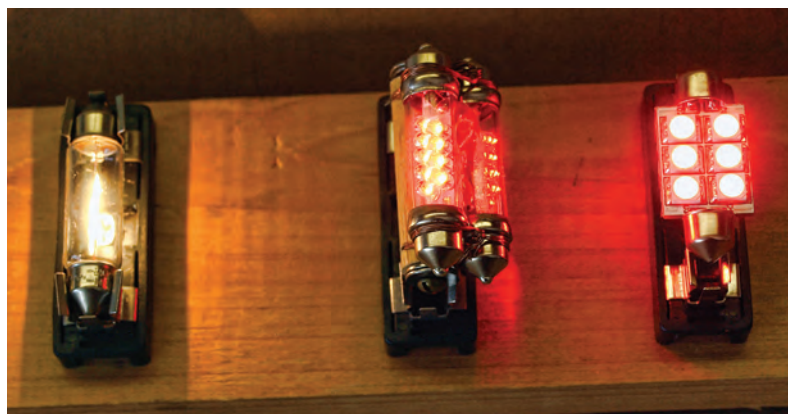
It seems counter-intuitive, but your navigation fixture will be brighter if you put a red bulb behind a red lens and a green bulb behind a green lens. If you use a white bulb, the lens filters out all but the red or green light, so you get only a fraction of the brightness built into the bulb.

Interior lights

Prime Time had fluorescent fixtures in the galley and the head, and the lightning zapped both. Their replacements are a huge improvement. I used a 20-inch waterproof strip of 30 LEDs with self-adhesive backing (\$15) wired to a simple on/off switch (\$2).

Prime Time is fitted with six dome lights, each built to hold two white festoons and one red (to protect night vision). A rocker switch selects white or red. In my original conversion, to achieve the brightness I wanted, in each cabin dome light I used a 360-degree festoon bulb with 12 LEDs. They were zapped by the lightning.

In the forward and aft cabin berths, where less light was needed, I used completely contained LEDs in the original conversion. All but one of those LEDs survived the voltage surge.





A short 31mm festoon with four LEDs, at left, gives 360-degree coverage for a masthead anchor light. Clarence cut a shallow electrical box in half, above right, to hold the light switches to the right of each LED strip in the galley, at right, and the head, far right. Clarence obtained a significant increase in brightness after replacing the 12-LED bulb with the 30-LED panel, below.



In the cabin this time around, I replaced the previous multi-LED bulbs with a new flat-panel type containing 30 LEDs (\$17). The panel plugs into an adapter (\$1) that is available for virtually any light fixture made, including festoons. It's much brighter than the 12-LED bulb was.

Ten-watt incandescent bulbs become too hot to touch 10 seconds after you turn them on. Since LEDs don't get hot, you can just lay the panel on the lens of the dome light or stick it there with double-sided adhesive tape. If your fixture contains two sockets, you can use two panels if you want *really* bright light.

A wide selection

LED fixtures are widely available now but you'll find it's much cheaper to keep your old fixtures and just replace the incandescent bulbs with LEDs. The only fixtures zapped by the lightning surge were the fluorescents in the galley and head.

Most white LEDs come in cool white or warm white and a few are also available in a color called "natural white." If you check the specifications, you'll find slight differences in brightness. The cool white appears brighter to the human eye but may not be. The colors are very similar to those available in household fluorescent tubes.

With the exception of my new masthead anchor light LED, all the new LEDs came from Superbrightleds.com.

My masthead light contained a squat (31mm) 10-watt incandescent festoon bulb. When the technician went up the mast to replace the VHF radio antenna, he also replaced the incandescent bulb with a 360-degree, 4-LED bulb. They're hard to find. I bought the bulb at Yachtlights.com (\$15).

LED replacement lights aren't cheap. They're more susceptible to voltage surges than incandescent bulbs but they have a life expectancy of 50,000 hours and use only one-tenth as much battery juice as an incandescent that's not as bright.

So despite their price and susceptibility to voltage spikes, I still choose LEDs for their brightness and incredibly low power consumption. In my 35 years of sailing, I've always been concerned about lights draining the battery while we're at anchor, which might result in it not cranking the engine the following morning. ⚓

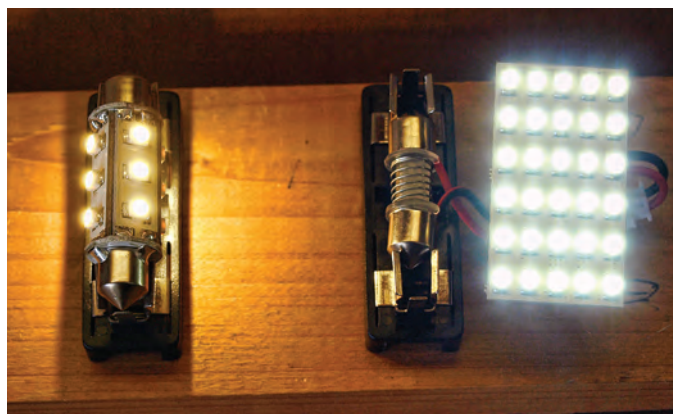
Clarence Jones is a writer, news-media consultant, photographer, sailor, tinkerer, and inventor. He and his wife, Ellen, live and work on and sail their Catalina 28 from Anna Maria Island at the entrance to Tampa Bay. Part of the joy of sailing for Clarence is creating and building inexpensive enhancements for his boat.

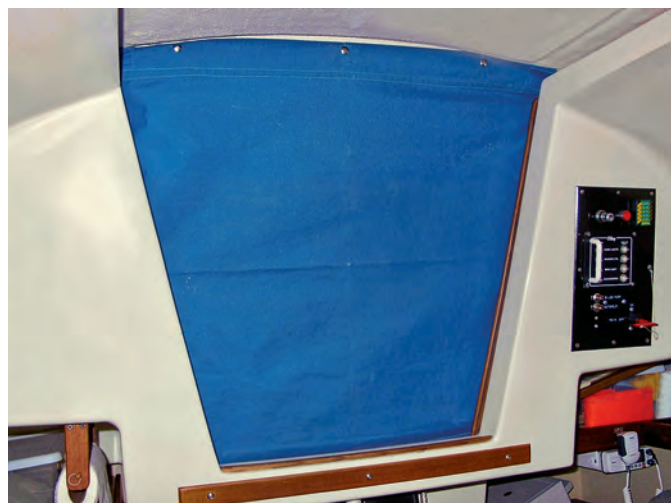
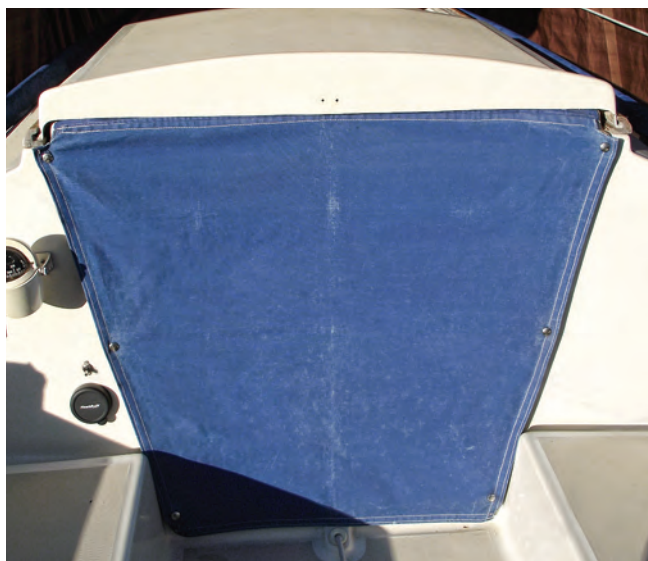
Resources

www.superbrightleds.com

www.yachtlights.com

Find more suppliers of LED bulbs and fixtures at:
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Dan's soft "hatchboard" provides privacy, keeps out rain, and is a lot easier to manhandle than a wooden board.

A sonnet for hatch cloths

*Silent and stowable,
they are easy to love*

by Dan Cripe

Shakespeare said it best: "A hatchboard by any other name would still be a nuisance." Anyway, I think that's what he said.

It's late at night and time for an anchor check. What do you have to do? First you slide the main hatch forward, then one by one you pull out the hatchboards and put them ... where? In the cockpit? Down inside the cabin? There really is no good place.

The next morning, you start to get under way. Do you place the hatchboards on a settee, up forward in the V-berth, under a cushion? Or do you toss them overboard because you're tired of moving them around?

Enter the hatch cloth.

Not long after getting our first sailboat with a cabin and fighting with a one-piece hatchboard — consider that, if you think a two- or three-piece board is hard to stow — we came up with the idea of a hatch cloth: a bit of cloth, a few snaps, and ta-da ... you're done!

Now, at night, all you have to do is unsnap the bottom of the cloth and crawl out — no disturbing the sleeping members of the crew when a hatchboard slips off the cockpit seat and crashes to the deck. You don't even need to slide the hatch back. You can just slip out quietly.

For stowing, nothing could be simpler than just folding the cloth and tossing it below. Yet another advantage is that

when it's raining, the cloth can remain in place to keep the inside of the boat dry, but if you need something from below — like a hot drink on a cold damp day — it's easy for your mate to slip the drink out under an unsnapped corner of the cloth. Try that with the hatchboard in place.

When we purchased our current good old boat, an O'Day 23, a set of wood-framed hatch screens came with it. Not only were these a little cheesy, but we now had two more items that needed a convenient storage location. The screens found one — in the dumpster. There had to be a better way.

For a couple of years, we did without screens as we cruised the waters of the Pacific Northwest. We stayed in the San Juans and Gulf Island area and found few mosquitoes to bother us. Then, in 2010, we had some extra time on our hands and were able to range farther afield.

We made it up to Desolation Sound in beautiful British Columbia, where there is a serious mosquito presence. If you have, say, 8-inch opening ports without screens, you don't have to worry, as the bugs are too big to get through. However, they can and do come through a 36-inch open hatch. As it was quite cool, we just used the hatch cloth for protection, but we knew that in warmer weather we would need ventilation to sleep well at night.

It was time to get out the sewing machine and make a hatch screen. We made a call to Sailrite for some material



and within a few days were ready to start. This would be my first experience with sticky-two-sides Seamstick tape. In the past, I either pinned the fabric — real fun pinning through multiple layers of heavy material — or just freehandled the project.

I can now tell you that Seamstick tape is the only way to go. Just stick everything together, making sure it's just right, then head over to the sewing machine and, in a few minutes, the hatch screen is done.

Next, I went out to the boat, sitting on her trailer in the front yard, to add the snaps. We now have a nice new hatch screen to go along with our hatch cloth and it's just as easy to stow away.

The next project will be a hatch cover using clear acrylic

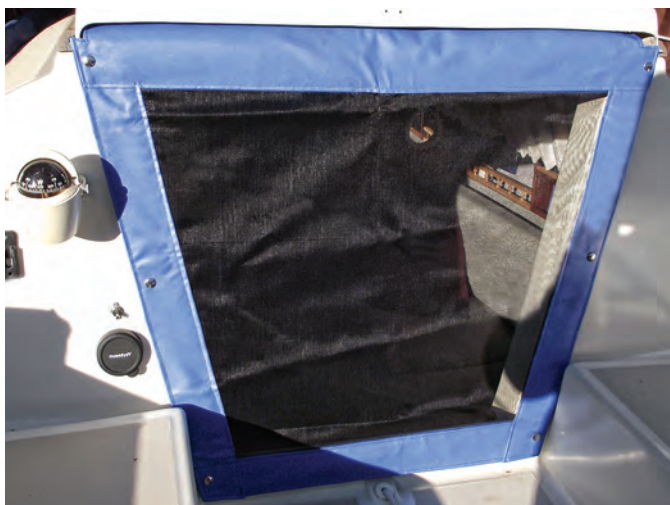
“We now have a nice new hatch screen to go along with our hatch cloth.”



that will add some light on gray, cloudy, and cool days while keeping the cabin snug and warm.

My advice is simple. Put away those hatchboards and add a simple hatch cloth. Then you, too, can sing a sonnet for a hatch cloth. *Δ*

Dan Cripe took “early retirement” from the building industry in 2010 and has lots of time to devote to sailing and writing. He and his wife of 39 years, Teresa, have owned a series of boats, all named Fantasy, which they have sailed with their four children at home in Idaho and also on the “big waters” of the Salish Sea. Their current Fantasy is an O’Day 23.



A great advantage of the hatch cloth is that it's easy to stow, top. The same snaps can be used to attach an insect screen, at left, which can be rolled up, at right, to allow air to flow freely into the cabin when the mosquitoes are bugging people somewhere else.



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Instrument pod facelift

A new faceplate accommodates new gadgets

by Joe Orinko

After more than 25 years sailing, I decided it was time to get an autopilot for *Unicorn*, our Catalina 30. When it came to installing the control head, convenience suggested I use a binnacle-mounted instrument pod.

While shopping for a new pod, I chanced upon a used one on eBay. My winning bid was about 25 percent of the price for a new one ... but I would have to fabricate a new faceplate to accommodate my instruments.

I bought a remnant of clear polycarbonate from a local supplier. Both sides of the material were protected with plastic, which I covered with address labels so I could trace onto them the shape of the old plate and the locations of the mounting screws. I used a saber saw and sandpaper to cut and shape the outside edge of the faceplate.

After marking the horizontal centerline for the instruments, I marked the centers and used the appropriate hole saws to cut the openings. To check my work, I dry-fitted the instruments in the faceplate.

Next, I peeled the protective plastic off the back (inside) of the faceplate and sprayed black paint on the back and outside edges.

Just before final assembly at the boat, I peeled the protective plastic off the front of the faceplate, mounted the instruments, and attached the faceplate to the pod.

The black-painted face is inside, immune to scratches, and the faceplate appears to be made of black plastic. ▴

Joe Orinko has sailed the waters of Presque Isle Bay and Lake Erie for more than 25 years, 20 of them in his O'Day 23, Unicorn, and for seven seasons on his second Unicorn, a Catalina 30. Because the love of his life, Sue, shares his passion for sailing, he says it's easy to find time to sail.



Joe bought a used instrument pod but couldn't use its faceplate ...



... so he made a new faceplate out of clear polycarbonate ...



... to accommodate his autopilot control and sailing instruments.

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Rope in the soap

Running rigging comes clean without tangles


by Gregg Nestor

October heralds the end of the sailing season for northern latitude sailors. Once my boat has been hauled from the water and safely secured on shore, it's time to begin that annual autumnal ceremony we call winterization. In addition to the normal routine of removing foodstuffs and gear, servicing the engine, and draining and charging the water system with antifreeze, I direct my attention to the running rigging.

Winter months are a perfect time to inspect, repair, and clean my running rigging. Since I'm not under any time constraints, I can accomplish these tasks at my leisure. Also, if I need to replace any lines, I can save some money by taking advantage of off-season sales.

Often, the lines require nothing more than a good cleaning. Many years ago, I dumped several docklines into our agitator-type washer along with detergent and fabric softener. The result was a very clean and soft rat's nest of tangled line. I never did that again! The next time, I tried washing a single line at a time. This still resulted in a tangle, but not quite as bad as before. Since then, I've heard from several fellow sailors that a front-loading washer doesn't tangle the line; however, they must still be washed one at a time. I don't have a front-loader, so I had to find a better way. (*Note: Tim Nye tested the pros and cons of washing ropes and using fabric softener. For the full report, see the July 2009 issue. —Eds.*)

I recently purchased a good old boat that had previously been in salt water. While a few of the lines needed to be replaced, more than a dozen halyards, sheets, and control lines were dirty and impregnated with salt. They were in need of washing. As several of them were close to 100 feet long, I could visualize the rat's nest!

Necessity is the mother of invention. While helping with the weekly laundry, I noticed that my wife had several mesh bags into which she placed delicate items before putting them in the washing machine. She said that these "lingerie bags" kept small items from being lost and also from becoming tangled. I figured that if it works for panty hose, why not jib sheets? I tossed four bags, each containing one line, into the washer, along with detergent and fabric softener. It worked! After only four loads, all of my previously dirty and salty running rigging was clean, soft, and tangle-free. 



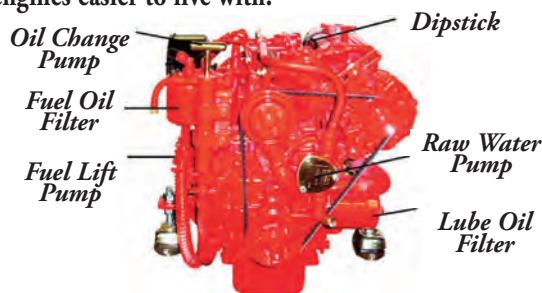
The trick to washing rope is to put it in a bag.

Gregg Nestor, a contributing editor with Good Old Boat, has had a lifelong interest in all things aquatic. He and his wife, Joyce, are currently refitting, upgrading, and sailing a 1994 Caliber 35. It's the one with the bright, clean, salt- and tangle-free running rigging.

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Ranger 28

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boats/1970Morgan-38-
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Cape Dory 28

1977 in very good cond. Yanmar 2GM20F diesel, RF genoa, rigged for singlehanding. In water near Annapolis, MD, and ready to sail. I now own two boats and must sell ASAP. More detailed spec sheet and photos upon request. \$14,500.

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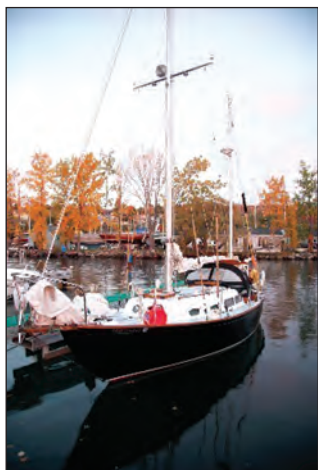
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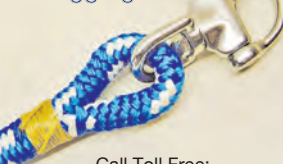


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Wayne Close took this photo early one morning while anchored in Prinyer's Cove on eastern Lake Ontario. The Pacific Seacraft Mariah 31 in the foreground is owned by his father, Ed Close. Send your sailboat photos to jstearns@goodoldboat.com and we'll post them on our website. If we publish yours in the Mail Buoy, we'll send you a Good Old Boat T-shirt or cap.

continued from page 7

Since there was no boating-specific used-equipment marketplace, we built the site and boat owners are already actively buying and selling equipment. To make the site useful for boaters, we created categories for everything from anchors to sails and electronics. Each category has a subset of categories so navigating to the kind of equipment you need is a simple exercise. We also have a "Suggest Category" link so we can keep abreast of demand.

The process of posting an ad is simple. It starts with choosing the category. The next step is to fill out a form that is tailored to the relevant category. All of these features make using the site a breeze and make it search-engine-friendly so your ad has an even better chance of being found.

—Mike Hobson, Annapolis, Md.

Readers looking for used boat parts can also check the listings on our Good Old Boat Consignment Stores web page: <www.goodoldboat.com/resources_for_sailors/consignment_stores.php>.

—Editors

Solar stern light

My wife and I just completed a three-week cruise to Martha's Vineyard and Nantucket on our good old 1979 C&C 36. I've been having trouble with the wiring to our stern light, so a friend suggested I get a couple of solar-powered lawn lights and lash one to the rail if my stern light goes out. They are about three or four bucks at Home Depot . . . so what the heck, I thought, why not? While I was picking them up, I also bought a \$7 spotlight that has a flat solar panel on top and a fitting on the bottom for the ground stake.



The lawn lights worked nicely for evening dining in the cockpit, but the real "find" was the spotlight. After I left the lights out all day while sailing, the spotlight went on after dark and threw more light than the type that need to be recharged and as much as AC lights . . . all for free! After dinner, I used the spotlight until the wee hours, reading and riding out a rough night at anchor.

The least handy boater can fashion a stand or rail clip that will fit the attachment holes for the ground stakes. The only problem is the lights can't be switched off, but that's easily solved by putting them in a locker.

—Jay Castle, Briarcliff Manor, N.Y.

It would seem these garden lights could have many uses on board. They are not marinized . . . but neither are their prices.

—Editors

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Tailing System

Clark Jennings invented the Tailing System to give him an extra hand when he's singlehanding his boat, which doesn't have self-tailing winches.



The Tailing System's key components are a tailing hook attached to a 5-foot length of shock cord. For use, the shock cord is attached to the boat some distance from the winch. After pulling the slack out

of the line on the winch, take at least four wraps around the winch, pull the shock cord taut, and place the line tail in the hook. As you grind the winch (you can use two hands!), the shock cord takes up the tail. Move the hook up the tail toward the winch to take up more. When done, take off the hook and make the tail fast on its cleat.

I found the Tailing System to be of great help aboard my C&C 27 — once I figured out how to lead the shock cord.

The Tailing System package of two 5-foot shock cords, two tailing hooks, two fairleads, and two stainless-steel shock-cord hooks costs \$39.95 plus S&H. The tailing hooks are sold separately for \$14.95 a pair plus S&H. For more information, go to <www.tailinghook.com>. Be sure to watch the short video.

Dan Larson

Spiroll Chafe Guards

We spotted this new product at the United States Sailboat Show in Annapolis this past October. Spiroll Chafe Guards are made of sheet polyurethane that has memory — once bent to a shape, the material will return to that shape. The shape the chafe guards "remember" is a roll with which you can encase your docklines to protect them where they are subject to chafe. Unroll the material, lay it on the line, and let it spring into place. You can loosely wrap your line in the Chafe Guard or snub the material down by winding it tightly and tapping it in position.

Spiroll Chafe Guards come in two diameters and lengths. The smaller Spirolls (15.75-inches long for line up to 5/8-inch diameter) cost \$14.90 a pair. A single larger size (23-inches long for line up to 1-inch diameter) costs \$14.90. Shipping is \$3.90. For more information go to <<http://spirolls.com/marine.html>>. Be sure to watch the short video.

Michael Facius



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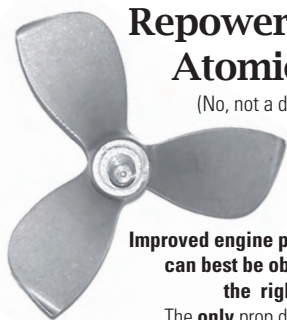


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About the Author -

Author Tom Wells is an engineer, a long-time sailor, and a Contributing Editor and boat reviewer for *Good Old Boat* magazine.

He has a sequel in the works, featuring Paul Findlay and his sailboat in another nautical setting.

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This book is addicting. It practically reads itself . . . [Superior Run] could be the offspring of Tom Clancy meeting Sandra Brown on a Great Lakes cruise . . . Tom Wells' knowledge and passion of sailing and the Great Lakes makes this a richer read, enough to whet your interest in one of the most beautiful spots on Earth. I will be awaiting the sequel(s).

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A law of the sea

Compassion for the lost transcends species

by Mathias Dubilier

all else. Feeling particularly righteous that we had abided by this international agreement, which in this case applied to inter-species assistance, we bid our friend goodbye, coordinated our night-watch schedule, and fetched into the darkness on a broad reach.

I was awakened shortly before 0300 to assume my three-hour watch. As I climbed the companionway and clipped my harness to a tether before entering the cockpit, I discovered the bird was still with us, and still tucked into his wind-sheltered corner.

Being at sea, alone on deck under a black sky with more stars than you can imagine, night after warm night, you undergo a change. It is a change you can only experience when removed from all human influence. I suppose desert walkers experience it, and I've heard astronauts talk of similar feelings. You become aware of how small you are. What a tiny speck you are on the outer skin of this enormous planet in an infinite universe. And yet, this realization is not frightening. In fact, quite to the contrary. You become overwhelmed with a profound sense of appreciation for the good fortune you must have to be part of this world, this existence.

In the midst of this vastness, here comes another life, a tiny bird, and he forms a relationship with us. A relationship he would certainly never choose if we were each among our own. But out here, in the solitude, there comes the necessity to risk dependence on something as fearful and risky as "the other."

You cannot help but feel touched by this vulnerability and the courage it takes, even if driven by desperation, to trust.

And now imagine my awe, as I sat in my corner of the cockpit, watching my friend, when he hopped over and fluttered up to sit in my lap.

The bird sailed with us for another day and a night. He shared our meals and company. And on the third day, more chipper, he flew around the cockpit, then up around the boat, and then was off on his way.

Though it has been many years since, I still think about that bird every now and then. And I hope I always will. I sense there is still much to be understood by thinking about our encounter. *✍*

Mathias Dubilier is a writer. He is cruising aboard his Hans Christian 33 in the Mediterranean and expects to spend this winter in Turkey.

Once, for two nights and a day, in the middle of the Sargasso Sea, I made an unlikely friendship with a castaway bird. He was no bigger than my fist. Gray, mostly. Some black. With his ruffled feathers and seemingly low in energy, he looked a bit travel weary. He landed on our sailboat, hopped around the cockpit, then snuggled himself into a corner between the cabin bulkhead and the cockpit coaming board.

And there he sat, no raven on the bust of Pallas, merely a sparrow in the Sargasso.

The three of us on a Bristol Channel Cutter 28 bound for Bermuda marveled at the little fellow. Was he lost or just taking a break from his regular migration? And if he was migrating, was it normal to be undertaking such a huge journey alone?

We assumed the bird would be with us for a short while and fly off again. But moments turned to hours and he was still aboard. As sailors, who now assumed we had an ailing stranded soul on board, our attention sharpened to nurturing him. We fretted for a while over appropriate food, knowing that rice was deadly but unsure whether crumbled crackers were safe.

We settled on the crackers and a dish of water to wash it down. And indeed, our feathered mate pecked with gusto.

Article 98 of the United Nations Law of the Sea states that any ship shall "in so far as she can do so without serious danger to the ship, the crew, or the passengers . . . render assistance to any person found at sea in danger of being lost."

It is a deeply unifying humanitarian agreement in our world of differing political and religious beliefs, and one that acknowledges the common necessity of survival over

With the help of the Delmarva Ornithological Society, Mathias later learned that his mid-ocean visitor is an American pipit. These birds breed in high-altitude tundras and winter in the southern United States, Central America, and Bermuda.



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