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Issue 105 November/December 2015

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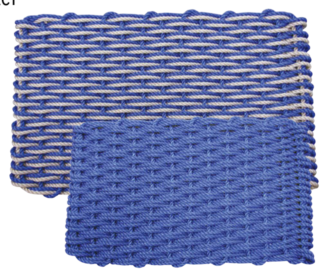

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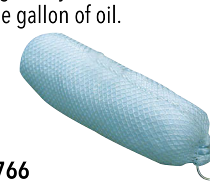

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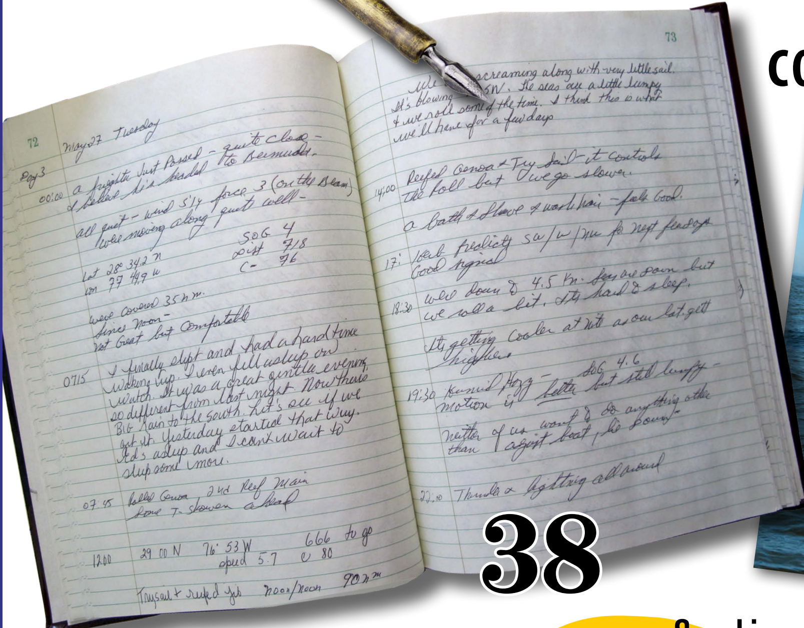

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Just for fun

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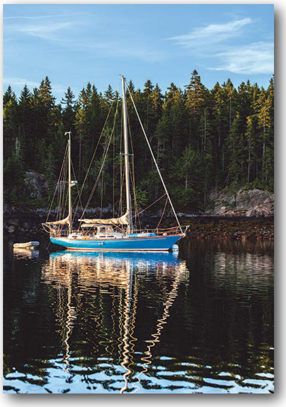

On the cover …
When Paul Rezendes captured this photo of *Mug Up*, a Bowman 46 yawl, in Cookie Bite Cove on Bartlett Island on the coast of Maine, he caused a whole series of events that resulted in a feature article by Gary Miller about *Mug Up* and her owner, Mark Lacey. See page 10.

What's more

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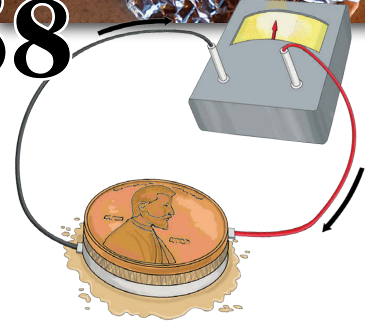


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GOOD OLD BOAT

FOUNDER/EDITOR
Karen Larson
karen@goodoldboat.com

FOUNDER/TECHNICAL EDITOR
Jerry Powlas
jerry@goodoldboat.com

PUBLISHER/ADVERTISING SALES DIRECTOR
Michael Facius
michael@goodoldboat.com • 612-605-8319

SENIOR EDITOR
Jeremy McGeary

MANAGING EDITOR
Tim Bauernfeind
timb@goodoldboat.com

ASSOCIATE EDITOR
Pat Morris

RESEARCH EDITOR
Dan Spurr

CONTRIBUTING EDITORS
David Lynn | Rob Mazza | Cliff Moore
Gregg Nestor | Allen Penticoff
Tom Wells | Ed Zacko

DESIGN DIRECTOR
Nancy Koucky

CLASSIFIED ADS AND FINANCIAL MANAGER
Karla Sandness
karla@goodoldboat.com • 701-952-9433

DIRECTOR OF CIRCULATION/RETAIL
Mark Busta
mark@goodoldboat.com • 701-952-9433

WEBMASTER
Jerry Stearns
www.goodoldboat.com

TROUBADOUR
Tom Wells

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Phone: 701-952-9433 | Fax: 701-952-9434

BUSINESS OFFICE:
1300 Evergreen Dr. N.W. | Jamestown, ND 58401-2204
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Spruce up your boat for spring

Maybe it's time to give your boat a holiday gift of some new cleaning essentials so you'll both be ready when spring arrives. Our affiliate Aurora Marine (www.auroramarine.com) has introduced a series of videos to help you make better use of their cleaning products and keep your boat looking her best. All *Good Old Boat* subscribers save 10 percent. Here's how to clean your non-skid and keep it from being slippery: www.youtube.com/watch?v=W-CYvHhTFk8.

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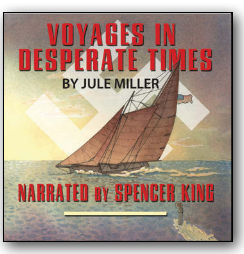
If you're missing any back issues of *Good Old Boat*, now's the time to fill out your collection as another year draws to an end. Have you noticed that our articles never grow old? They're timeless because our good old boats are timeless. You can order full-year collections as well as individual issues in pdf format from our downloads site, www.audioseastories.com.



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Sailing with ice

Lettuce and cold drinks — the frosting on the cruising cake

BY KAREN LARSON

This past summer, for the first time in 15 years or more, we had ice in *Mystic*'s icebox. In years past, we cruised without ice because our vacation cruising took us too far from ports where resupply was possible. Our shorter weekend cruises could have started out (and finished) with ice, I suppose, but we really didn't *need* ice for just a couple of days. Nothing could spoil that quickly.

So *Mystic*'s icebox — a cavernous space that a small person could easily hide inside — became the place for stowing all kinds of canned food, including jars and jars of meats we had canned ourselves. The top layer held my cameras, keeping them fairly close to the cockpit and yet off the seats, where they could slide from one side to the other or wind up bouncing off the sole when we tacked.

Our veggies hung in nets. I soon learned which ones lasted the longest: onions and potatoes, Napa cabbage, broccoli, and cauliflower. Fruits such as oranges, grapefruit, and apples could also make it for a couple of weeks. Eggs don't need to be refrigerated but do need to be protected from banging about, and were kept in a safe storage place beneath the galley sink.

In the summer of 2015, we skipped the long wilderness cruises and went instead for five-day weekends in the Apostle Islands near our home port. The reason for this was that we had two boats in the water. How could we spend any time at all on *Sunflower*, our trailerable C&C Mega 30, who was at Lake Minnetonka nearer our home, if we took a three-week Lake Superior vacation and any number of other shorter trips on *Mystic*, the C&C 30 we've sailed for decades?

Juggling boats, as it turns out, is not for the fainthearted and we won't repeat that madness next summer. We needed additional time to test and tweak *Sunflower* before taking her on winter road trips, so we launched her close to home. But we couldn't live another summer without *Mystic*, who sat out the summer of 2014. What to do? Launch both and start juggling: five days in the Apostles then a week at home with daysails aboard *Sunflower*. Repeat.

As a result of these shorter, more civilized, and less-wide-ranging voyages aboard *Mystic*, we rediscovered the true function of the icebox. What a breakthrough! Suddenly we had cold drinks, delicate lettuce varieties available for salads, and perishable fruit at the end of a long weekend that could never have held up for more than a day or two before. We had yogurt. Previously we made our own on board, but we had to eat it in its entirety within a day.

We had no-guilt meal leftovers! Previously, those had gone into omelets the next morning or into a soup by lunchtime. It required at least a bit of skill and planning . . . and sometimes some overeating. We had real meat, not the canned type that has the consistency of boiled beef that results from the canning process.

There's a lot to be said for living with ice. As the newly reconverted, we're noisily extolling the virtues of something every other sailor already knew.

That cavernous icebox is no longer filled to the brim with heavy cans and cameras. I found a new (not nearly as convenient) safe location for the cameras in the V-berth. The icebox contains just a few blocks of ice and a few days' worth of food way down there at the bottom.

Most amazing of all, no longer outfitted for weeks of wilderness cruising, a newly lightweight *Mystic* floated on her lines once more.

Classified insanity, parrel balls,

Classified insanity

I just received the latest edition of *Good Old Boat* and when I got to the classifieds section started kicking myself for not listing my boat with you. My wife and I caught the "bug" and bought a bigger boat, requiring us to sell the Grampian 26 we'd lovingly restored over six years. I posted an ad for the boat in "free" online classifieds and it almost cost me my sanity.

After the first week, we started writing down the questions prospective buyers asked us about the boat. These were our favorites:

10. Can I trade you my '99 Chevy for the boat? If you rebuilt the engine, it'd run great.
9. Is there a pole for towing water skiers?
8. I only get two weeks of vacation. How long would it take this boat to sail to England and back? (Note: the boat is in Maryland, not Scotland)
7. Can I live on the boat while I make payments for it?
6. Will I have to take the mast off if I want to tow it home with my Honda Civic?
5. Will you give me a refund if buying a boat doesn't make my girlfriend take me back?
4. My friends and I can't afford plane tickets to California. Will we have to pay a fee to take this boat through the Panama Canal?
3. How often will I need to detach the keel?
2. I'm in Michigan — can you bring the boat to me?
1. How many times have you rolled the boat over?

We eventually found a chap who was serious about buying a sailboat, but we had to sort through hundreds of emails, dozens of phone calls, nine people coming to look at the boat, and three test sails before we found him — all during time when we could have been sailing our new good old boat. Needless to say, if we ever have another boat to sell, we will be placing an ad with you instead. Keep up the good work with the magazine.

–Matthew Gayle, North East, Md.

Just common sense

I own a 33-foot gaff-rigged, wooden Atkin schooner. The day I received the July 2015 issue and saw "how to keep the parrel balls on the gaff" (see "The Gunter Rig 101"), I was on my way to the boatyard. The first thing I did when I got there was implement Don Launer's idea of knots on the inside of the yoke. I saw the picture and muttered to myself, "Why didn't I think of that?" In 20 years, I have never lost any parrel balls, but have come way too close when the gaff was 30 feet in the air. Thanks for the great work.

–Jim deReynier, Middletown, Conn.

ILLUSTRATION BY TED TOLLEFSON

John Larson took this photo of the *tourelle de danger isolé* (isolated danger mark) named la Fourmigue for the rocks where it's located. The city in the background is Golfe Juan between France's better-known Mediterranean port cities of Cannes and Antibes. Send karen@goodoldboat.com a high-resolution photo of your favorite aid to navigation. If we publish it, we'll send you a Good Old Boat cap or T-shirt.

and the Stone Horse Derby

Über-high-tech, you say?

The editors fell in love with a series of photos sent by Ron Albert of his QuickStep 24. They were taken by Larry Houle following a fundraising auction for the Wolfeboro, New Hampshire, Boat Museum. Ron says, "I bid on and won a photo shoot of my boat by a local amateur photographer. The conditions were about as perfect as you could want — the kind of conditions an atheist would pray for — and the photographer did what I think was a superb job. The setting is Lake Winnipesaukee, New Hampshire."

Unfortunately, the editors are very cautious about publishing photos of traditional-looking boats on the cover. Karen wrote to Ron: "I ran a batch of potential cover images past Jerry (my husband and partner in crime) and he nixed your photo because the traditional tanbark sails will confuse people who are unfamiliar with *Good Old Boat* and make them think we're about wooden boats. I didn't think about that but I have to admit that Jerry's right. We've had this happen to us when handing out magazines at boat shows. If the cover boat has a lapstrake hull, they will hand the magazine back to us and say, 'I don't have a wooden boat.' It's happened many times. It doesn't matter if that cover boat is a fiberglass Nor'Sea 27. If it looks like a wooden boat, people assume that they know what a good old boat is and we don't get past that with them. I'm as disappointed as you are. I love the look of those big red sails in the photos. But they may send the wrong message about us to the masses."

To this Ron replied (in part): "Would it matter at all if we told Jerry that the sails aren't tanbark? They are really a very new, über-high-tech/high-performance PMS 3573-2 BS Red. The idea is that the color excites UV photons, causing a micro turbulence across the surface of the sail that lubricates the wind flowing across it, cutting friction and increasing lift. This is why, in the photo I sent, you see the 4,000-pound, full-keeler ghosting along at 4.5 knots in a breeze barely strong enough to ripple the water."

–Editors

2015 Stone Horse Builder's Cup

Iconic Stone Horse sloops raced off of Padanaram, Massachusetts, for the fifth consecutive year with stiff competition between reigning champion Dave Kane of Newport, Rhode Island, and newcomer, David Neumeyer of Lynchburg, Virginia, sailing Bob Gleason's Hull #002, *Metaphor*, out of Wareham, Massachusetts.

It was a spectacular day on Buzzards Bay, where Dave Kane sailed *Able*, Hull #101, to first place in the 2015 Stone Horse Builder's Cup. David Neumeyer, aboard *Metaphor*, passed *Able* on the first leg, seriously challenging the champion until the final leg of the race. The wind was strong and steady out of the southwest, blowing 6 to 9 knots at the start

and increasing to 17 knots for most of the race. The course was 5 nautical miles over 4 legs.

After the race, skippers, crews, and guests gathered on the lawn of the New Bedford Yacht Club for a post-race barbecue, cocktails, presentations, and conversations with old and new friends. The winning skipper, Dave Kane, and his crew were presented with a half-hull model of the Stone Horse made by Edey & Duff alumnus Ed Pavao of New Bedford.

The Builder's Cup is a "one design" race for the Sam Crocker-designed Stone Horse built by Edey & Duff of Mattapoisett, Massachusetts.

–Tom Kenney, South Dartmouth, Mass.

continued on page 69

Mug Up,

A fine example of English lines and lineage

BY GARY MILLER

In the retail publishing business, it's the cover photo that sells a magazine on newsstands. "Lose 25 pounds in one week!" screams the cover blurb, alongside a photo of a slim young movie star. The cover of this issue of *Good Old Boat* is similarly beguiling, except our readers are smarter. They know the boat on the cover, no matter how big or small, represents what they, given enough time and energy, could accomplish on their boats. So when photographer Paul Rezendez captured Mark Lacey's *Mug Up*, anchored in a picturesque Maine cove, the resulting photograph is not only a work of art, it represents a key element of a complex chain reaction in boatyards and backyards everywhere.

Mark's 12-year refit of the British-born 46-foot Holman & Pye-designed 1972 Bowman yawl is not only stunning, it's critically connected to the magazine you have in your hands.

"I had the topsides all finished, sanded and prepped, waiting for paint, when the contractor who agreed to do the Awlgrip part of the job backed out," the 59-year old carpenter from Gloucester, Massachusetts, told me. "I was then faced with the prospect of finding someone else to do the painting or do it myself. I remembered seeing an article in *Good Old Boat* about painting the topsides with a roller and, after rereading it, I thought, why not give it a try? The worst that could happen is I'd have to give it another final coat."

Considering the number of sailors who have complimented Mark on the paint job, both he and the magazine are bona fide heroes. The photos attest to the dedication, hard work, and skill Mark applied throughout the boat. From proverbial stem to stern, *Mug Up* is a yacht worthy of a closer look.

Even in her least favorite conditions, light air, *Mug Up* strikes an eye-catching stance in Gloucester Harbor, above. Give her some heavy air and sea room, Mark says, and she's off like a thoroughbred. The name is appropriate to the hailing port, at right. "Mug up" was the Gloucester fishermen's break for coffee — perhaps with a dollop of rum on cold days.

Let's begin with the name. "Mug up" has a variety of meanings in different regions and cultures, but in Gloucester's historic fishing industry and, more important, in Mark's carpentry business, "mug up" is that long-awaited break in the morning's toils when the laborer opens the Thermos and pours a "cuppa" hot brew. It would be interesting to know the number of mug ups that took place during Mark's work on this boat. Undoubtedly it's in the thousands.

A long courtship

Mark and his wife, Sue, first fell in love with this boat in the Bahamas during the winter of 1990-91. They were sailing north in an Alberg 30 along with another couple in the Bowman. It turned out Mark had gone to high school with the owner's wife. During the few weeks of sailing, the Laceys had plenty of opportunity to see the yawl in action, fiddle about belowdecks, and generally get to

a 46-foot Bowman yawl

know her. They were very impressed, to say the least.

That winter, the owner called Mark and offered to sell her. Mark declined. The next winter the phone rang with the same offer. Mark politely turned him down. This went on for a few years until, finally, Mark's cash flow and the owner's expectations coincided and the deal was done.

What Mark hadn't counted on was that the boat had been virtually abandoned in Florida and as a result was the worse for wear. A lot! The owner adjusted his price and Mark adjusted his expectations.

Despite the boat's rough shape, Sue still remembered falling in love with her as she had been in the Bahamas, not as she was in her abandoned state in Florida. Mark clearly had his work cut out for him.

"It was a mess. It was filled with dirt, dog hair, everything. The fuel was unusable. The hull was roughed up from rubbing against barnacle-covered dock pilings. But underneath it all there was a boat with, as they say, good bones. It *is* a pretty boat. Even with all that mess, as I sailed it up north people would come up to me and say, 'Wow! What a beautiful boat!' and that's saying a lot, considering what shape she was in."

Piece by piece

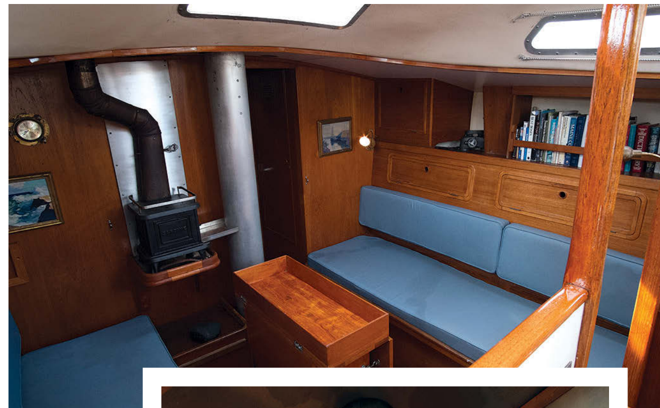
When asked what one thing stands out in his memory as the most memorable part of the overhaul, Mark is hard-pressed for an answer. "It's not one thing," he freely admits, "it's everything. The little table we're resting on (in the cockpit), the pedestal itself that I completely built. I overhauled the entire hydraulic system. Some of the stuff I had to farm out. For example, the galley sink I sent out and had welded because I'm not a welder. But I came up with the idea for a one-piece sink and countertop surrounded by teak.

"If I had thought ahead of time how much work was involved," he says, "I probably wouldn't have done it. But by taking each project or system one at a time and working carefully until it was fixed or overhauled, it became doable. Everything, every system on this boat, has my thumbprint on it. I feel comfortable taking her out in virtually any weather, either alone or with a crew. She's an unbelievably safe boat."

The most traumatic part of the refit was cutting holes in the hull or deck with a Sawzall. "I thought I should have my head examined!" Mark says. "That was by far the most difficult part of fixing up this boat. There were areas of decking, for example, where I had to cut away and replace waterlogged plywood and reglass over it. That was hard."

Mark removed all the wood and hardware from the deck, then filled, faired, and painted it. He installed all new wood: teak toerails, cockpit coaming, Dorade boxes, name boards — the list goes on. He also installed new Plexiglas deadlights and the trim around them.

Mark fitted a new anchor roller, electric windlass, hatch cover, and Dorade on the flush foredeck, above center. The blue hull makes *Mug Up* a striking sight. The center cockpit of the Bowman 46 rides low, at left, so the motion at sea is easy. Sissy bars at the mast, new stainless-steel Dorade vents on new boxes, and the Charlie Noble for the wood-burning stove create a purposeful look on deck, at right.



The conventional saloon offers solid handholds everywhere, at left. The low passageway to the aft cabin is just visible. Settees face a centerline table, upper right, and the wood-burning stove, lower right, takes the chill out of foggy mornings.

Looking at the deck, however, reveals no evidence of any repairs. In fact, Mark's high level of craftsmanship has resulted in a boat that looks relatively new, rather than an old boat that has been fixed up. That is testimony also, he admits, to being a faithful reader of *Good Old Boat*.

Although *Mug Up* has a center cockpit, the cockpit sits so low you feel safe, secure, and snug regardless of the weather. In addition, Mark built a beautiful, wrap-around hard dodger that makes complete sense given the boat's home port and frequent cruising grounds — foggy, cold, rainy Downeast weather off Gloucester and Maine where he spends much of the summer.

Conventional and classic

About 60 Bowman 46s (also known as the Bowman Corsair) were built and Mark has one of the few fitted with a centerboard. *Mug Up* draws 5 feet 6 inches with the board up, 10 feet 5 inches with it down. Mark replaced the centerboard sheaves and cable but, since it takes 190 rotations of the crank to lower or raise the board, Mark more often than not leaves it in the up position unless he's doing some heavy going-to-weather work. The keel version of the Bowman 46, incidentally, draws 7 feet.

The interior layout of the boat is very conventional. It was never intended to sleep eight or 12 people, and Mark thinks the design is perfectly suited for one or two couples at most. As proof of that, he removed the head from the aft cabin to make room for bicycles and an oversized berth. The main cabin has a beautiful sea galley to port, a refrigerator/freezer (powered by a wind generator atop the mizzen) that serves as a nav table to starboard, a centerline table, settees, and a Sardine wood stove that Mark installed.

Forward, Mark fitted a new composting toilet and shower in the head compartment to port. A hanging locker is to starboard opposite the head and a V-berth occupies the bow. It's all about as standard as layouts go, but finely executed in an assortment of fine woods (the new cabin sole is Spanish cedar) and in tip-top shape. The photos show the beautiful work Mark has done to make *Mug Up* the showpiece she is.

In the aft cabin, Mark widened the port berth. The mizzenmast's support post and wiring are aft of the rudder stock extension.

On deck, with the exception of the hard dodger, the design is also very standard, from the new stemhead fitting, anchor rollers, electric anchor windlass, and deck washdown system Mark installed at the bow all the way to the stern pulpit, traveler, and davits standing on the stern. He led much of the running rigging into the cockpit so he can control the sails without having to leave the wheel, replaced all the old winches, and fitted an electric winch for reefing, as the big jib is hard for one person to handle. He fitted new stainless-steel Dorades and a new self-tailing winch on the mast for the main halyard. "Sissy rails" port and starboard

Mark designed the galley countertop with its integral sinks, near right, and had it custom welded in stainless steel. He sculpted the teak surround. The composting toilet in the newly refinished head, far right, eliminates the need for a holding tank and its associated odors.

of the mast provide security in heavy weather. A Bimini covers the cockpit and handholds on the hard dodger give crew something solid to grasp when stepping in and out of the cockpit.

Mark purchased all new sails, rigging Dutchman-style sail-furling aids for the main and mizzen, and replaced much of the standing rigging. Deck freight on *Mug Up* normally consists of a pair of kayaks so he and Sue can explore nooks and crannies in the shoreline Downeast.

Major moments

One of the most dramatic phases of the topsides renewal involved delamination around the chainplates, which are attached to fiberglass knees with bolts tapped into mild-steel backing plates glassed into the knees. When Mark took delivery of the boat, ooze was seeping from cracks in the hull where it covered the chainplates. He had no choice but to take out the Sawzall and do some remedial surgery, cutting out the hull outside the knees and rebuilding the area. It looks like new today. He covered the shroud turnbuckles with automotive strut boots.

After trying to keep the original, but troublesome, Perkins 4-108 going, Mark finally gave up and replaced it with a similar but newly rebuilt engine. He would have liked a few more horsepower, but that would have meant extensive work to the engine beds and shaft log, so he stuck with the same power plant design but renewed all of the associated wiring and controls. It was easy enough to remove the cockpit floor, hoist out the old 4-108, and drop in the replacement. At the same time, he lowered the engine's raw-water through-hull and soundproofed the engine room. He also installed a new water heater, inverter, and Robertson autopilot.

The total result of Mark's efforts is a strong and capable sea boat that's easy to singlehand. Sue doesn't enjoy long ocean passages, so he will often sail *Mug Up* alone from Gloucester to Maine, where she will join him. The 32-foot waterline, 23,500 pound displacement, and sleek underbody design make those passages enjoyable rather than hard work.

The color of *Mug Up*'s topsides — marlin blue — is so unusual that, together with the high quality of the paint job, her 46-foot hull presents a jaw-dropping vista. With her long overhangs, 13-foot beam, and low freeboard, she is indeed one good-looking boat.

"I'm proud of this boat. It's been a lot of fun," Mark explains as we walk away from the slip. A small crowd stops to admire *Mug Up* and, as they do, he smiles — ever so slightly.

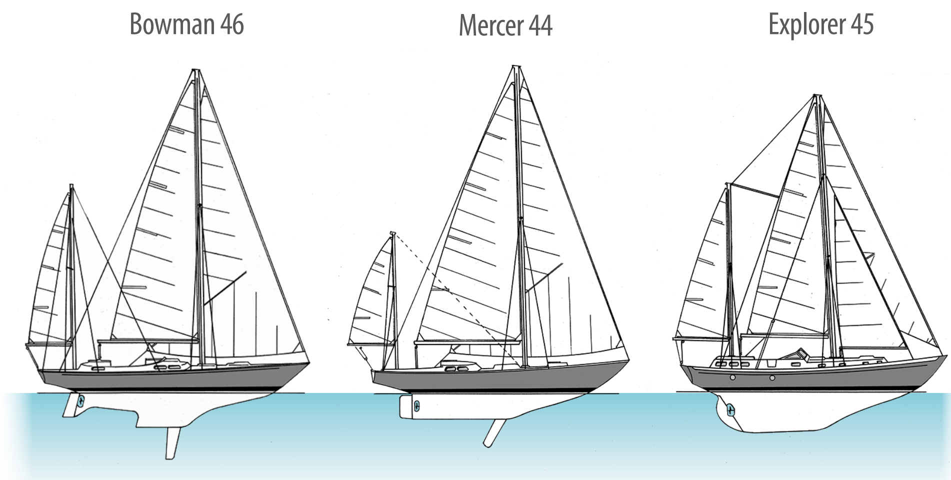
Gary Miller is an author and photographer. He grew up on Long Island Sound sailing a 23-foot wooden sloop. After college, a stint with Motor Boating & Sailing *magazine provided him with experience on a variety of boats all over the world. His last boat was* Viridian, *a totally restored, 1969 35-foot Pearson sloop.*

Mark points out some of *Mug Up's* features to the author's wife, Ann, among them the steering console that he made from scratch out of plywood and fiberglass.

The Bowman 46 . . .

. . . and partners from the era of split rigs

BY ROB MAZZA



	Bowman 46	Mercer 44	Explorer 45
LOA	46' 0"	45' 0"	45' 0"
LWL	31' 11"	30' 0"	34' 2"
Beam	12' 11"	11' 9"	13' 2"
Draft (CB up/down)	5' 6"/10' 6"	4' 3"/9' 0"	6' 8"
Displacement	23,500 lb	27,000 lb	32,000 lb
Ballast	9,500 lb	8,600 lb	10,000 lb
LOA/LWL	1.44	1.47	1.32
Beam/LWL	0.40	0.39	0.38
Disp./LWL	323	446	358
Bal./Disp.	.40	.32	.31
Sail Area (100%)	814 sq. ft.	885 sq. ft.	990 sq. ft.
SA/Disp.	15.9	15.7	15.7
Capsize Number	1.8	1.6	1.7
Comfort Ratio	33	46	42
Year introduced	1972	1959	1977
Designer	Holman & Pye	William H. Tripp Jr.	Stan Huntingford
Builder	Tyler Boat Co. Ltd.	Cape Cod Shipbuilding	C & L Marine (Taiwan)

The Bowman 46 was designed originally with a deep-draft fixed keel and the majority of the boats built from that tooling retained that configuration. *Mug Up*, however, is one of the few built with a shoal-draft keel housing a high-aspect-ratio centerboard. Quite often in production sailboat building, interchangeable inserts in the hull mold are used to allow keel sumps of different lengths. The centerboard is usually housed in a keel with a longer chord length to add some area to partially compensate for the reduced draft, as well as to accommodate more ballast to achieve equal stability with the higher center of gravity. That does not seem to be the case with the Bowman 46, where it appears that draft has been reduced 18 inches without adding area other than with the centerboard. The original keel had plenty of area to begin with, so this reduction may not be that critical. I found no evidence that the ballast weight was increased to compensate for the reduced draft, so I have used the original ballast weight in this analysis.

One of the boats I chose to compare to the Bowman 46 is the Mercer 44, a Bill Tripp design from 1959, one of the first production fiberglass sailboats built and the subject of my very first design comparison in the July 2012 issue. It is also a centerboard yawl, but with a full-length keel common to the CCA designs of the period. The second boat is the Taiwanese-built Explorer 45 of 1979. Although this boat has a fixed keel and no centerboard, I included it for three reasons: it has a split rig, it has a center-cockpit layout like the Bowman, and I think it deserves attention as it is a very attractive boat. It was designed by the late Canadian West Coast designer Stan Huntingford, whose work should perhaps be better known.

All three boats have split rigs. The Mercer and the Bowman are CCA yawl rigs, perhaps the most useless rig configuration ever devised. Yawls date to the 19th century, when the term referred as much to the type of boat as the rig. The yawl rig as we know it became popular in yachting in the early 20th century when a lot of aging racing sloops and cutters added the diminutive mizzen to achieve a more favorable time allowance. The mizzen could be easily added to the deck aft of the rudder with only a slight shortening of the main boom and minimal alteration of the sail plan. Some boats had a mizzen added as a cruising amenity, along with a shorter mainmast and a whole different suit of sails, but the rig received new momentum under the CCA Rule, when it was discovered that a large mizzen staysail incurred no rating penalty. The Mercer's handkerchief of a mizzen is an egregious example.

Since its mizzen, although aft of the wheel, is stepped right above the rudder, the Explorer 45 could technically be called a ketch. It has the largest mizzen of the three relative to the size of the main and a much more workable sail plan as a result, especially with its double headsails and self-tacking staysail. You can picture this boat sailing in heavy weather under just the mizzen and staysail.

While its overall length lies between those of the other two boats, the Explorer 45 is the largest of the three, with a waterline 4 feet longer than the Mercer's and a displacement 8,500 pounds greater than the Bowman's. I question the 23,500-pound published displacement of the Bowman, though, since I have seen it listed as high as 26,000 pounds in brokerage literature. Using this lighter displacement gives the Bowman the lowest displacement/length ratio of 323, compared to 358 for the longer-LWL but heavier Explorer, and a whopping 446 for the Mercer. However, the larger sail area of the Mercer results in almost equal sail area/displacement ratios for all three boats of about 15.7, which is quite acceptable for a cruising boat of this type.

A discussion of the relative performance of the three boats must include the three distinctly different underwater profiles. The Bowman, with its separate keel and rudder, would certainly have the lowest wetted surface with resulting better light-air performance. On the other hand, the deeper-draft Explorer, despite having greater wetted surface, may well have the edge upwind in a breeze due to the increased stability and sail-carrying ability imparted by its higher displacement and lower ballast center of gravity. The longer waterline would certainly give it an advantage as boat speeds increase, especially on a heavy-air reach.

It is interesting to note the long overhangs, especially aft, on the Bowman and the Mercer, so characteristic of boats from this period. All three boats have quite acceptable capsize numbers and comfort ratios, as befits their lineage and vintage. For bluewater cruising, I don't think you could go wrong with any of these attractive, larger fiberglass cruising split rigs from the new age of sail.

Rob Mazza is a Good Old Boat *contributing editor. In his long career with C&C and in other design offices, he designed many boats that are now good and old and has thus contributed enormously to the enjoyment of those who sail and own them today.*

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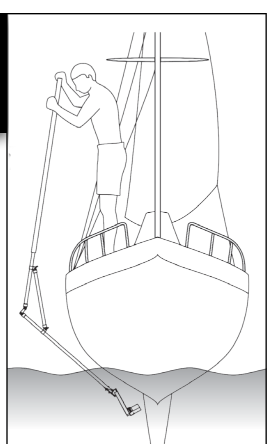
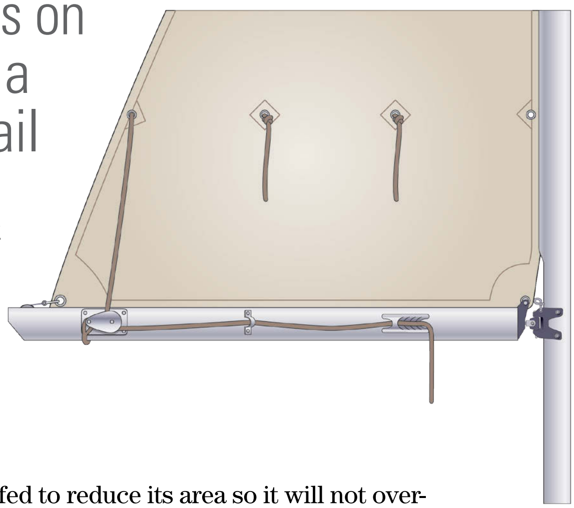
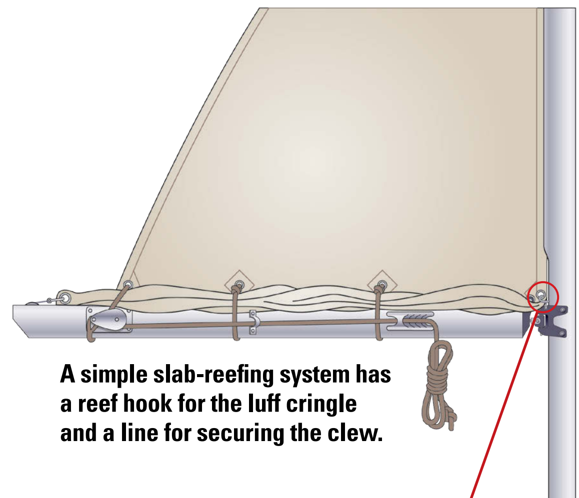


Mainsail Reefing 101

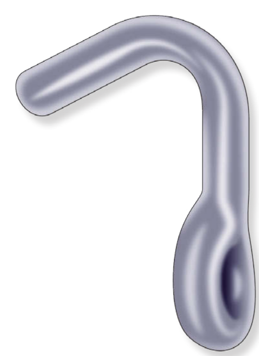
Variations on taking in a slab of sail

BY DON LAUNER

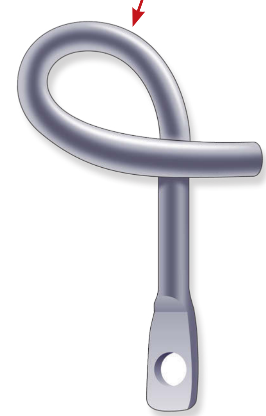




A simple slab-reefing system has a reef hook for the luff cringle and a line for securing the clew.



A straight reef hook can be fastened at the gooseneck, for a two-line system, or used in conjunction with a block to haul down the luff cringle in a single-line reefing system.



A ram's horn reef hook on the gooseneck is more secure than a straight hook.

LAYOUT AND ILLUSTRATIONS BY TED TOLLEFSON

A sail is reefed to reduce its area so it will not overpower the boat in stronger winds. Of the many reefing systems used, *slab* or *jiffy reefing* is the most common and most traditional for a sail set on a boom, like the mainsail on a typical modern sloop. Although at one time slab and jiffy had two different connotations, the terms have become almost synonymous.

Slab reefing

In slab reefing the sail area is reduced along the foot of the sail by pulling the lower portion of the sail down to the boom with lines rove through reefing cringles at the luff and leech of the sail. Separate reefing lines might be used for the luff and leech cringles or, in a variation that first gave rise to the term jiffy reefing, a single line that pulls down both simultaneously. Either system can be set up so the sail can be reefed from the safety of the cockpit. The reefing lines should be low-stretch — not nylon — so the reefed sail maintains its shape under changing wind pressure.

In addition to the luff and leech reefing cringles, it is common for the sail to have rows of *reef points* that extend across the sail between each pair of cringles. Reef points are short lengths of line attached to the sail and used to secure the reefed part of the sail after it has been lowered. Often the reef points pass through small grommets and are held in place by a knot on each side of the grommet. The sail is reinforced in this area with small patches of fabric sewn around each grommet or a strip of cloth, called a *reef band*, sewn from luff cringle to leech cringle along the line of the reef points.

Before a reef is taken in, the boat should be turned head to wind to relieve pressure on the luff slides that would make it difficult to lower the sail. The boom vang and mainsheet should be released for the same reason.

When the sail has been hauled down, the luff and leech lines secured, and the halyard retensioned, the reef points are used to contain the lowered portion of the sail. They should be tied with reef knots, of course, but only tightly enough to hold the skirt — the reef points are not intended to carry any active sail load.

Captain John Smith named the reef knot in 1627. On land this knot is called a square knot.

The reef hook

Sometimes a reef hook, rather than a reefing line, is used to secure the luff cringle. This hook is mounted on or close to the gooseneck and can be either a simple hook or a ram's-horn reef hook, which is shaped like a corkscrew.

Using a reef hook requires someone on deck at the base of the mast. If the halyard is not led back to the cockpit, the crewmember who goes to the mast to lower the sail can easily attach the luff cringle to this hook before retensioning the halyard. If the sail's halyard is led back to the cockpit, then a reefing line for the luff cringle is easier and safer, especially for singlehanders, since it eliminates the trip forward in conditions that are likely to be less than desirable.

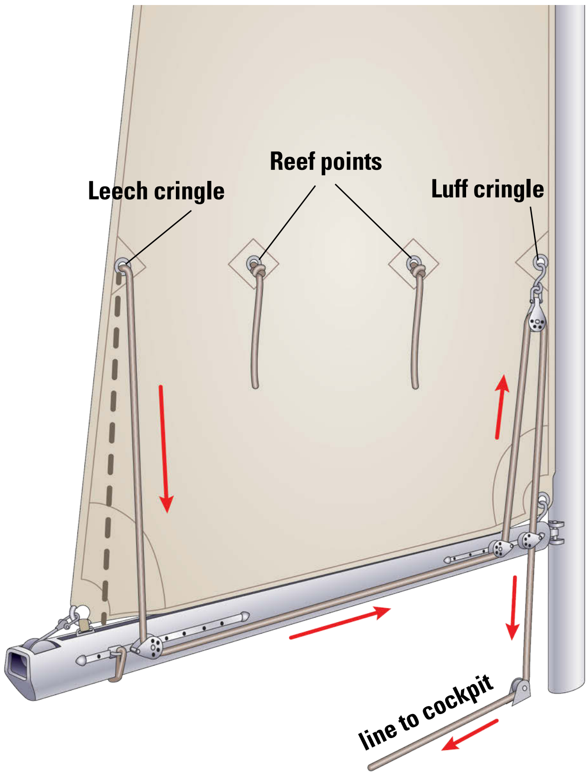
Two-line reefing

In the two-line reefing system, the reefing line for the leech cringle is fastened to an eye near the end of the boom, passes up through the reefing cringle, then back down to a turning block near the end of the boom and on the other side of it. From there it is led forward toward the mast, either outside or inside the boom.

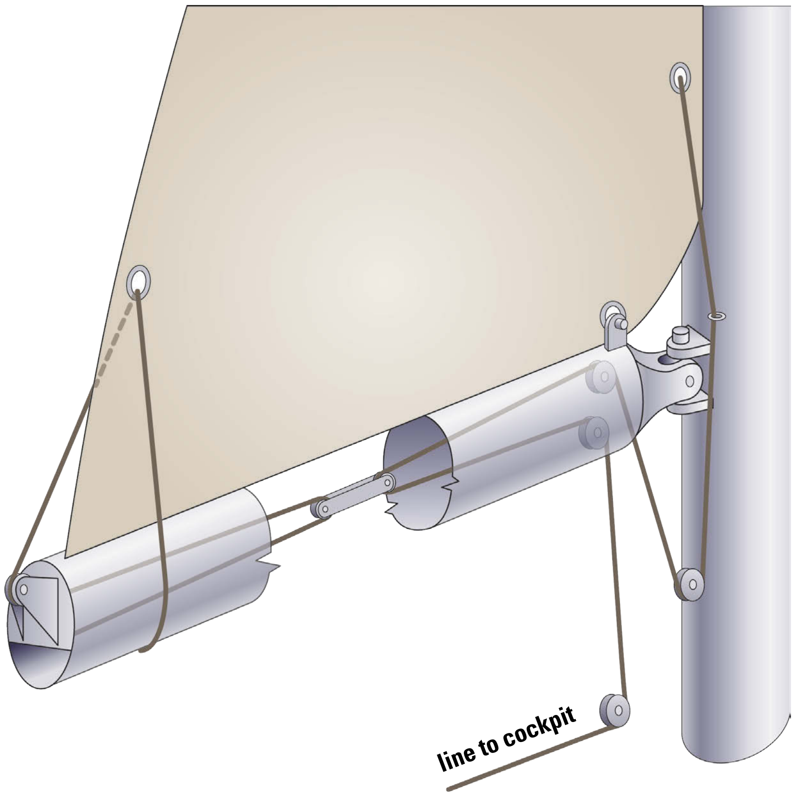
The luff reefing line is led in a similar way from the gooseneck, through the luff reefing cringle, and back down. Both lines can be secured on the boom or led back to the cockpit.

Single-line reefing

Single-line reefing is a bit more complicated and can be accomplished in several different ways. In the most common method the reefing line is secured near the aft end of the boom, then runs up through the leech reefing cringle and down to a turning block, just as with two-line reefing. From there it is led forward, either inside or outside the boom, to a turning block on the boom just aft of the gooseneck, then up through the luff reefing cringle, down to a deck block, and aft to the cockpit.



A single-line reefing arrangement that's external to the boom can be a do-it-yourself project. Using a hook and block to haul down the cringle will reduce the friction in the system considerably. The cringle hook and block can be set up when the sail is raised so the lines are already rigged in case the wind kicks up.



An internal single-line reefing system is fitted on many modern boats.

On larger boats, a single-line reefing system is often employed that uses a shuttle block inside the boom. The principal advantage (and possibly disadvantage) this arrangement offers over an externally led reefing line is that the lines are hidden from view. Although this system may work well for the first reef and possibly a second, the boom on most boats is not long enough to accommodate a shuttle block for a third reef.

Slab reefing enables the sailor to maintain control and continue sailing when the wind picks up; but remember the old sailors' truism: "The time to reef is when you first think about it."

Don Launer, who was a Good Old Boat *contributing editor for many years, passed away this past July (see the September 2015 issue). Among his many accomplishments, Don held a USCG captain's license for more than 40 years, wrote five books, and built his two-masted schooner,* Delphinus, *from a bare hull. His 101 articles through November 2011 are available for downloading as a collection from the Good Old Boat download website. Look under Archive eXtractions at www.audioseatories.com.*

Sail-repair

Don't let wear and tear stymie your cruising plans

While we were anchored in Micronesia, a large well-found yacht arrived in port on a tight schedule. She was bound for the Marianas and then mainland Japan via Okinawa, a passage of about 3,000 nautical miles. The season between winter storms and typhoons when it is safe to cross this expanse of ocean is short and the crew was understandably anxious to push on. Unfortunately, on the last passage, the tack webbing had failed on the only genoa they had aboard and the crew had no way to repair it.

When we laid the sail out to inspect the damage, it was clear to us, and to the crew, that this failure presaged others to come and the sail would require extensive work before the yacht could put to sea. There was no time in their schedule to buy a new sail or to send this one to the nearest sail loft in the Philippines, so the repair had to be done in the marina parking lot with materials on hand.

Gearing up

Every sail-repair project is unique, but most require the same techniques, which are fairly easy to master, and employ the same tools. You can get a head start on acquiring the necessary skills if you can attend a workshop or work under a sailmaker willing to mentor you. We were lucky enough to do both before we set sail.

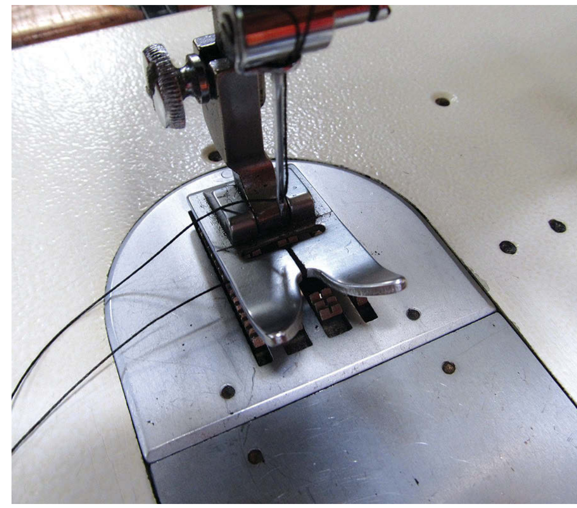
Most sail repair work is done using a heavy-duty industrial sewing machine that can take heavy-gauge round needles and V92 or V138 bonded polyester UV thread. Light-air sails like spinnakers are an exception. You can use smaller needles and thinner thread when repairing them. Home sewing machines are generally not robust enough to handle the heavy fabric and thread used on working sails. Most, though not all, machines used to sew sails are of rotary-hook design. They are usually very heavy and made with a body and gears of steel with few, if any, plastic parts. A monster wheel with a hand crank increases the punching power of the needle. The hand crank is also good for sewing thick assemblies and sewing small areas at slow speed.

Sails are sewn with zigzag stitches except in a few places, such as roller-furling luff tape, so your sewing machine should be capable of sewing straight and zigzag stitches at 6 mm or greater width. A two-point (or one-step) zigzag, which is the usual type, works for most sails. Machines are also classified by how they move the fabric sandwich: a walking foot or presser foot. Either will work, though a presser-foot machine allows you to choose from a greater selection of specialized feet for different materials and projects. Searching the Internet for a machine will yield thousands of potential candidates, though few are set up as portables in cases for carrying aboard. Popular brands include Adler, Bernina, Pfaff, Reed, Sailrite, and Singer.

Industrial sewing machines are made of metal and have few, if any, plastic parts, top of page. Leslie's machine is fitted with a portable motor, cogged monster wheel and hand crank, and a strong wooden case. For sail work, it must be able to sew straight and zigzag stitches, above left. Different materials and fabric assemblies are best accommodated by a variety of presser feet, above right.

essentials

BY
LESLIE LINKKILA
AND
PHILIP DINUOVO



Sail repairs require a number of tools, some of them specialized, at left, but the entire collection (see page 21 for Leslie and Philip's recommended list) takes up very little space on board and they come in handy for all manner of canvaswork. The 12-mm-wide presser foot and feed dog of the Sailrite Sailmaker are suitably rugged for sail work, at right. A stitch is formed when the sewing machine needle drives the upper thread through the throat plate, where the hook takes the thread and loops it around the bobbin thread.

Our Sailmaker model was Sailrite's top-of-the-line zigzag, rotary-hook, presser-foot machine when we purchased it new in the mid 1990s. It is a Brother TZ1-B652 made in Japan and fitted with a small AC motor, cogged monster wheel, and hand crank, all in a rugged wooden case. A later modification involved removing the clutch that would sometimes slip when we pushed the machine to the edge of its capabilities. Parts are readily available, though we have needed to replace few.

One reference says the Sailmaker will sew through 12 layers of 9-ounce Dacron sailcloth. We have sewn at least that much, sometimes a bit more, when sewing the corners of large cruising sails. It will also sew a whopping 12-mm-wide zigzag stitch. Its limitation seems to be the presser-foot lift height when set up as a portable machine. If it were set up on a sewing machine table and fitted with a knee lift, the presser-foot lift height would be greater. Whatever machine you choose, you will find its limitations. This is why sail lofts operate a variety of sewing machines.

In addition to machine sewing, hand sewing is often required when repairing sails. With the proper tools, hand sewing is relatively simple. The most important thing to learn is to handle the needles safely when sewing through thick materials. These very sharp, very thick needles can cause serious injury.

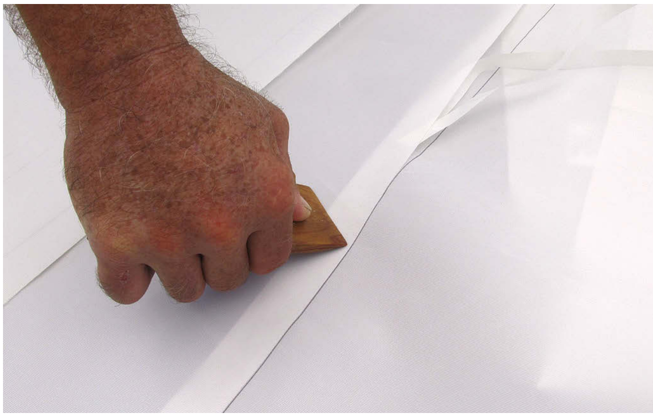
Machine sewing

Sewing heavy sails takes practice. Sewing machines are relatively simple mechanically, but the precise interaction of the parts is critical. Keep your machine well oiled and timed, especially if you keep it on board. Be prepared to stop working and service the machine whenever things go awry. With patience, you'll solve the problem and be back at work again.

A sewing machine has two thread streams, the upper thread and the lower (or underside) bobbin thread, that cross and lock inside the fabric sandwich. The two threads cinch the fabric layers together, so if the stitch is to be uniform, their tension must be identical. The upper thread is continuously fed into the machine off the top of the thread spool. The underside thread on most sewing machine models must be wound onto a bobbin and is of limited length. When the bobbin thread has been used up, sewing must stop and a new bobbin substituted. If your sewing machine can wind a new bobbin from a separate spool of thread as you sew, that will save you some time. Our Sailmaker allows us to do this.

Before beginning to sew, baste your fabric pieces securely using an adhesive or staples. This prevents misalignment of the slippery fabric. Adhesives may

Sewing while simultaneously winding a bobbin saves time but requires two spools of thread.



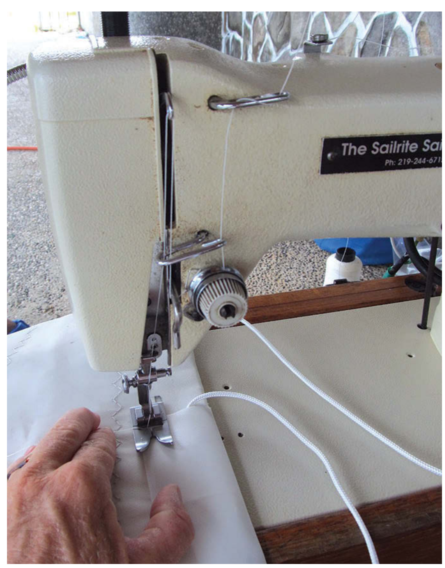
When repairing sails, basting the materials prevents them from slipping out of position. Seamstick tape is a convenient way to apply adhesive, at left, and contact cement is also commonly used. Staples work very well for basting materials together, at right.

be applied in the convenient form of double-sided sticky tape, called seamstick, or as a liquid, such as contact cement. Staples are an efficient way to baste fabric layers because dozens can be applied (and removed quickly afterward) and they leave no residue to attract dirt or mildew, a problem with adhesive-basted seams.

Before starting to sew, test and adjust your machine's settings by sewing a stack of material similar in composition and thickness to your sail-repair project. This allows you to confirm the tension settings and adjust stitch size. Your sewing machine owner's manual should provide instructions for adjusting thread tension.

The size of straight stitches is adjusted strictly by stitch length, but for zigzag sewing you need to adjust the length *and* width of the stitches to closely match those already on the sail you're repairing. You may also wish to adjust the presser-foot tension to facilitate movement of your fabric assembly through the sewing machine.

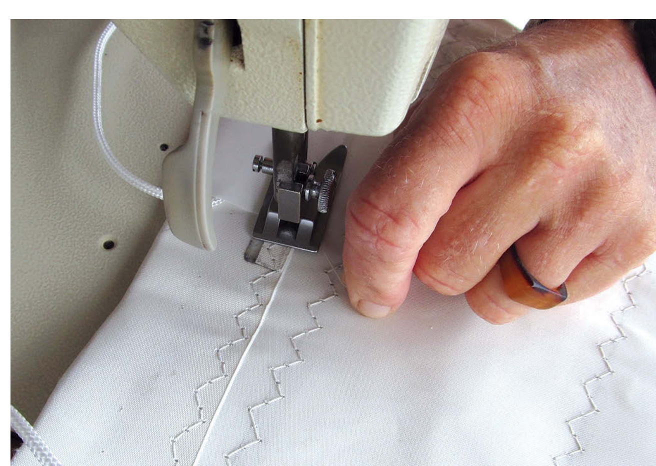
To start a seam, bring the bobbin thread to the top of the fabric. To do this, operate the machine by hand,



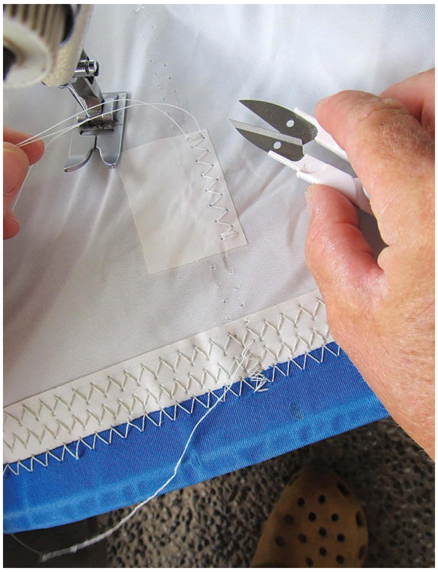
rotating the pulley (or monster wheel) toward you to bury the threaded needle into the fabric sandwich and continue rotating the pulley until the thread take-up lever is at its highest point. Grab the top thread and give it a slight tug. The bobbin thread should pop up through the hole. Carefully guide both threads around the needle and under the presser foot, hold them taut, and begin to sew. Release the threads after a few stitches.

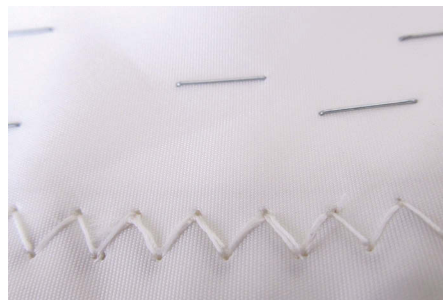
On straight seams, lock the end of the row by making a few stitches backward to the starting point of the seam before proceeding forward once again. Do the same thing at the end of the seam: back up over the last stitches a few stitches, then proceed again to the end of the row.

For single-point zigzag, lock the end of the row by making a bar stitch at the beginning and end of the seam. We do this by setting the stitch length to its minimum and then sewing while



To start, bury the needle and rotate the machine until the thread take-up is at its highest point, above center. Tug on the top thread to pull the bobbin thread to the top of the fabric, at left. Bring both threads under the presser foot and back, hold them taut, and begin sewing, at right.





A bar stitch (just to the left of the point of the shears) is used to lock the ends of zigzag seams, far left. To make a bar stitch while hemming a sun-cover patch, Leslie uses the reverse lever, upper left. Interruptions in a zigzag seam are ideally resumed by locking and aligning new stitches with the old ones, lower left. Hand sewing is used to finish, reinforce, or apply protective elements to a sail, below.

holding down the lever for sewing in reverse. If the bobbin needs to be changed in the middle of a seam on long sail runs, lock the new zigzag stitches into the last few stitches made prior to the interruption. A hand crank helps you go slowly enough to make the new stitches in precisely the same holes.

Hand sewing

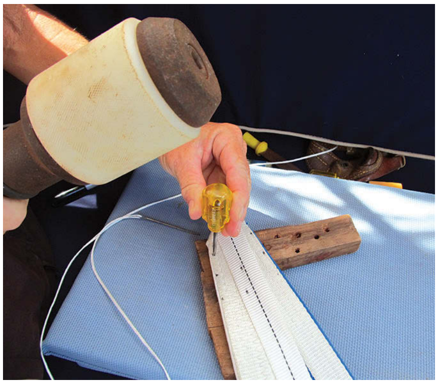
Hand sewing is used to finish, reinforce, or apply protective elements to a sail. The techniques are labor-intensive but simple to master. When at sea, hand sewing replaces machine sewing for emergency repairs, so learning to hand sew sails is valuable for offshore sailors.

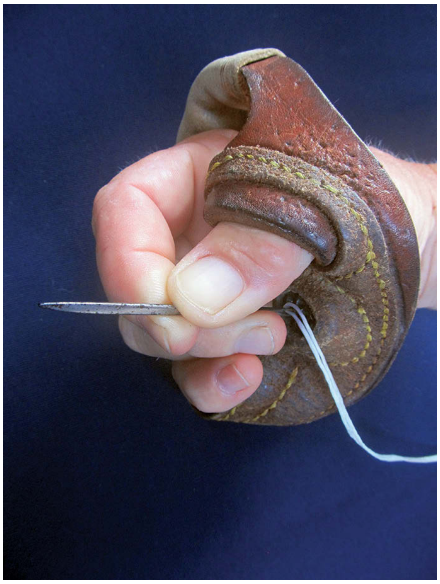
For hand sewing, you'll need thread called twine, large triangular forged-steel needles, and a sailmaker's palm. We use three stitching patterns most of the time: straight stitches for tacking down cloth or leather and for seizing rings and webbing, an X-pattern of straight stitches for securing webbing straps, and baseball stitches to join two pieces of leather or cloth along an edge or to secure a boltrope.

For thick assemblies, we first punch holes with a scratch awl and mallet

Tools and equipment

	Source	Notes
Industrial or semi-industrial sewing machine	Adler, Bernina, Pfaff, Reed, Sailrite, Singer	Zigzag + straight stitches, portable
AC power	Honda EU1000i	
Sewing machine needles	Sailrite or any industrial sewing machine shop	Reinforced-tip needles, such as Serv 7 by Schmetz, #18 to #21
Stapler	Bostitch, Rapesco	Long arm
Staple remover	Bostitch	Single piece, scoop-type
Sailmaker's seam rubber	Port Townsend Sails	A custom item. Many antiques exist.
Thread snippers	Gingher	Rounded blades
Scissors	Gingher, Mundial	
Butane lighter		High-quality refillable pipe lighter
Hot knife	Engel, Sailrite, Weller Portasol,	AC or butane
Sailmaker's palm	Wm Smith & Son	Buy the highest quality available
Needle-nose pliers	Stanley	
Hand-sewing needles	Wm Smith & Son (Sailrite)	Variety pack, #14 to #18
Scratch awl	Bainbridge	Sharp!
Fishhook file	Luhr Jensen (Bass Pro Shops)	
Maul or mallet	Wrising or Tandy Leather, Al Stohlman	~ 3 lb, polyhead
Rubber pad and sacrificial wood	Sailrite	
Colored pencils, waterproof markers, and flexible stainless-steel ruler	Any store that sells office supplies	





Punching holes in a thick assembly using a scratch awl and maul against a sacrificial wooden block, at top, makes hand sewing easier and reduces fatigue. When repairing sails outdoors, waxed hand-sewing thread can easily pick up dirt and debris, middle. A sailmaker's palm, above, should be molded to an individual user's hand so the fingers can grip the end of the needle firmly while bracing it against the metal thimble in the center.

against a sacrificial wooden block to minimize the pressure necessary to push the needle and thread through the material. This makes sewing safer and reduces fatigue. Some sailmakers recommend using a drill to make holes, but the drill bit can bind and rip the sailcloth fibers.

For Dacron sails, reinforcement webbing, and 4- to 5-ounce leather, we use UV-resistant waxed polyester hand-sewing twine, round, in medium weight (V-462 made by Heminway & Bartlett). Wax holds the strands or plies of the twine together and makes sewing easier. Once the stitch is made, the wax helps retain stitch tension. The quality of waxed hand-sewing twine varies, even between lots by the same manufacturer. You can apply wax manually to improve performance if twine plies don't hold together well. The only drawback with wax is that it can collect dirt, an aesthetic rather than a functional problem.

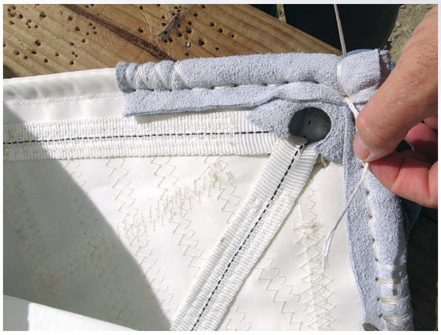
The best sailmaker's hand-sewing needles are made in the UK and are cast and forged. The shanks are triangular and smooth but the tips are very sharp. If you accidentally stick yourself, it will cause a painful puncture wound, so never pull or push a needle toward any body part. Use a fine file, such as a fisherman's hook file, to keep tips sharp. For storage, wrap the needles in a cotton cloth that has been soaked in sewing machine oil and keep them in a plastic cylindrical container to prevent them from rusting.

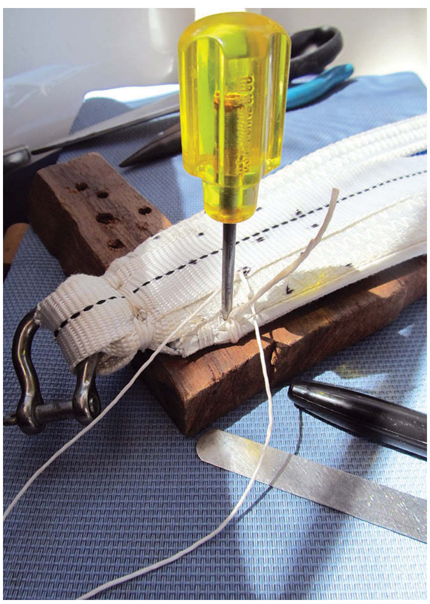
A sailmaker's palm is not a quaint relic of the past — it's a critical tool for repairing sails because it allows you to safely and effectively thrust an ultra-sharp sailmaker's needle through a thick assembly of webbing and sailcloth. In the middle of the sailmaker's palm is a metal base called a thimble, iron, or eye. This metal base has small indents and is secured to a leather strap that wraps around your hand so the eye rests in your palm.

You need a high-quality right- or left-handed leather palm that fits your hand. Don't scrimp here. The best is a medium to heavy sailmaker's roping palm molded to fit your hand. To mold the palm, soak it in warm water until it is soft. Once it has softened, put it on your hand and shape it so you can easily grasp a sailmakers needle between your thumb and fingers and brace the needle eye against the palm's dimpled metal eye. After the palm dries, oil the leather to keep it pliable.

Recommended sail-repair supplies

- Two spools of V92 or V138 UVR bonded polyester thread, white
- Medium weight, V462, waxed polyester hand-sewing twine, right-hand twist
- Dacron sailcloth tape, 5- or 8-ounce in 3- or 4-inch width depending on the weight of the sail
- Adhesive (sticky back) Dacron, 3- or 4-ounce
- Ripstop nylon repair tape
- Dacron sailcloth, 54 inches wide, 5- or 8-ounce cruising grade
- Polyester webbing, tubular, 1-, ¾-, and ½-inch
- 5-ply seatbelt webbing, 2-inch
- Spectra webbing, 1¾- to 2-inch
- Leech line, ⅛-inch
- Sailmaker's leather, 5-ounce
- Continuous-support luff tape (a length and size to fit your roller-furling units)
- Seamstick tape
- Contact cement (or 3M 5200 Fast Cure)





Straight stitches are used to secure leather chafe guard to a mainsail tack, top left. After making a hole, the scratch awl holds down a corner assembly, middle left. Dividing the two strands of twine before piercing the hole helps them lie parallel, bottom left.

Straight stitch

To begin stitching, measure out roughly 8 feet of twine, thread the needle, and double the thread back. Close your hand around the two thread strands at the needle and pull the thread between your thumb and forefinger from the needle to the end a few times to lay the two strands parallel to each other. Measure and mark for stitches. A short ruler and fine-tipped waterproof Sharpie marker work well.

Using a scratch awl and mallet, pierce the assembly against a wooden block. It's easiest to leave the assembly tacked to the block while you fit your palm. Remove the awl, place the eye end of the threaded needle in the center of the palm's eye and, while holding the shaft of the needle with your thumb and all of your fingers so it's perpendicular to the vector of thrust, pierce the hole and push the needle into the assembly with the palm.

Once the needle is securely seated, you can pull against the assembly with one hand as you push using the palm. Take care not to push at an angle to cause the needle eye to slip from the palm's dimple or you could end up piercing the palm of your hand. Once you have pushed the needle as far into the hole as the sailmaker's palm allows, pull the needle the rest of the way through from the other side. If you have a lot of resistance, use needle-nose pliers to pull, but don't pull the point of the needle toward any part of your body.

Once the needle is through, pull the thread through until approximately 1 inch remains on the top side. Don't knot the thread. Make your second hole in the assembly and, using the palm, pierce this hole with the threaded needle from the underside, as you did before.

It's helpful to divide the two strands of twine and put the point of the needle between them as you pierce the hole. This keeps the two strands of twine parallel to each other when the stitch is formed. Now put the thread back through the first and second holes as you did before, creating a loop of waxed twine between the first two holes. Pull hard to firm down this first stitch and then continue on, piercing the assembly and setting stitches snugly in the same way according to the stitch pattern. When you have completed your stitching, go back and cut the 1-inch tail of waxed twine down to roughly ¼ inch. Melt and crush (or rivet) this to flatten it and secure the twine where you began sewing.

Seizing uses the same techniques and knots. However, when seizing a ring to webbing, at the clew for example, use many straight stitches through the same holes, pulling snugly with each pass, to ensure the seizing is strong enough to prevent the ring from moving against its reinforcement webbing.

Resources

Books

Canvaswork & Sail Repair
by Don Casey, International Marine, 1996

The Sailmaker's Apprentice
by Emiliano Marino, International Marine, 2001

The Complete Guide to Sail Care and Repair
by Dan Neri, Beowulf Press, 2002

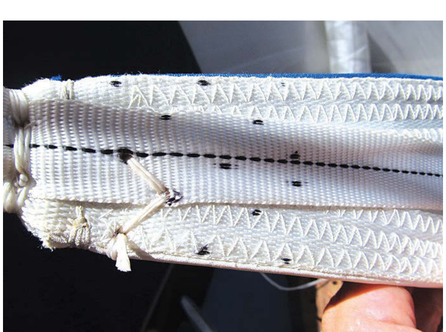
The Art and Science of Sails: A Guide to Modern Materials, Construction, Aerodynamics, Upkeep, and Use
by Tom Whidden, St. Martin's Press, 1990

Sail-repair workshops

Center for Wooden Boats:
http://cwb.org/classes

Port Townsend Sails:
www.porttownsendsails.com/seminars.htm

NW School of Wooden Boat Building:
http://nwswb.edu/workshops



To finish the seizing, at left, the waxed sail twine has been melted and flattened, or "riveted." Hand-sewing twine reinforces webbing on a repair to a staysail hoist, middle left. Marks made with waterproof ink are helpful as a guide when securing webbing with X stitching, bottom left.

If there is play between the ring and the webbing, the webbing will eventually fail from chafe. Straight stitches are useful for tacking down materials used to protect the edge of a sail, such as leather chafe guard along the clew.

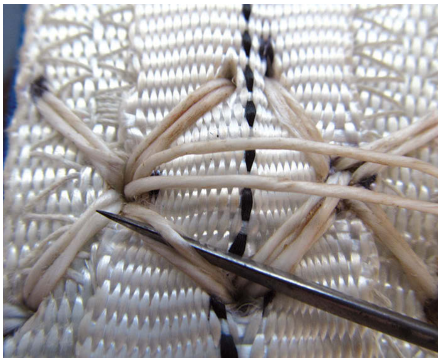
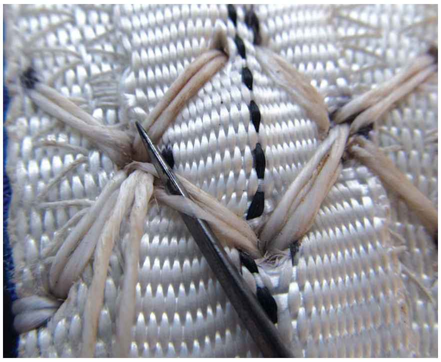
X stitch

An X pattern of straight stitches is used for sewing webbing to sails, particularly for 1-inch tubular polyester webbing. Some sailmakers also make a box pattern around the outside for additional strength. Measure and mark the stitch pattern by putting a dot at all four corners of small squares. Tubular polyester webbing usually has a dark center line; if your webbing doesn't have this guide, make an additional mark in the center of the square.

If the webbing strap to be sewn is near the edge, we generally begin at the corner of the X nearest the edge and wrap one or two tight stitches around the edge of the sail. However, the optimal place to begin an X-stitch pattern is in the center of the first X, closest to the edge of the sail (or the ring). Pierce the center and push the thread through to the other side. Next, make a hole in one corner of the X away from the direction you will be sewing (or back toward the beginning), thread the twine back through to the top side and then back down through the center hole, up through the corner of the X opposite your first stitch and then back down through the center once again. At this point, you have created half of your X-stitch pattern. Pull on the thread firmly to ensure the stitches are tight.

Repeat with the remaining two corners of the X, completing the pattern by pushing the needle down through the hole to the opposite side. At this point, you have the tail of twine on the top side of the sail and the remaining thread and needle on the bottom side of the sail. You may choose to knot your thread and begin the next X in the same way or thread back to the top side of the sail through a hole in the corner of the next X down the seam.

Whether you proceed down the webbing to the next X or make a knot here, the proper knot to use is a flat knot. Begin by inserting the needle under one of the strands of twine in the adjacent X stitch; outside to inside, taking care not to split either strand of twine. Rolling the needle as you insert it helps. Pull the twine through and back toward its standing part. Next, repeat this step, outside to inside, on the opposite strand of twine. Again pull back snugly toward the standing part. Complete the knot by inserting the needle and pushing the twine back through the hole the two strands emerged from, exiting on the top side. Pull the twine smartly until the knot disappears into the webbing. At this point, the tail left at the beginning of your stitching and the remaining thread and needle will emerge from the same hole. Trim the twine ends to ¼ inch, smooth the ends together, then burn and flatten the twine to create a rivet knot. (See also "Seizing Slides


A flat knot is begun, at left, by inserting the needle from the outside to the inside of one strand of the stitch (without splitting the strands of twine). The needle is then inserted from the outside to the inside of the adjacent strand of twine, center. The head of a staysail, at right, has been reinforced with new webbing hand-sewn to the older webbing with an X pattern of stitches.

and Slugs," by Leslie and Philip, in the November 2012 issue.)

Baseball stitch

For a baseball stitch, make the first stitch perpendicular to the edge and one additional stitch through the same hole before bringing the thread over the edge and down the next hole on the opposite side. Continue the length of the seam with this cross-over stitch. Make one or two stitches through the last hole, bring the thread across the seam again, and work your way back up the seam, creating an X stitch between the holes and across the edge. Finish by overlaying one perpendicular stitch in the first hole. At this point, both ends of the thread — start and finish — should exit the same hole. Cut them both to ¼ inch, smooth the ends together, and burn and flatten them to create a rivet knot. Alternatively, make a flat knot (described above) to improve the security of the stitching.

Conclusion

Although some professional sailmakers don't believe sailors can competently repair sails, with a few skills, tools, and supplies and a wee bit of pluck, you can maintain your own valuable sails, especially where there is no sailmaker. The cost, time lost, and sometimes-impossible logistics of sending out for a repair will no longer dampen the dream or soak the pocketbook. Coastal or seasonal cruisers who learn to repair their sails benefit by learning how sails are constructed and also how to differentiate between construction techniques that last and those that do not. This knowledge makes these sailors better equipped to choose quality sails in the first place.

Many years ago in the Sea of Cortez, we helped a family on a 60-foot sloop repair seven panels of their mainsail that were blown out in a chubasco. As they were 400 miles from the nearest sailmaker and it was during the height of cyclone season, there really was no other choice. Their repaired sail looked like "frankensail," but it was a functioning sail rather than a rag. About a week later, they hailed us on an HF radio net to report simply that they had "sailed to weather."


A hand-sewn baseball stitch is used to join two pieces along an edge or secure a boltrope, at left. Leslie, at right, seems to enjoy the challenges posed by sail repairs.

Leslie Linkkila and Philip DiNuovo came to cruising and boat ownership as adults and quickly developed a passion for small-boat travel. In 2003, they quit their professional jobs and left the Pacific Northwest behind to cruise the South Pacific in their Mason 33, Carina*. After giving* Carina *a refit in the Philippines, they sailed to Indonesia in September. Catch up with them at http://sv-carina.org.*

Rollaway square sail

BY ROGER HUGHES

Downwind sailing with a new-tech nuance

Square sails have been used on sailing vessels for centuries. There is little argument that these sails, when the wind is dead astern or a few points either side, are a very efficient way to propel a boat of any size, even today. Anyone with a Bermudan rig knows how tricky it can be to keep the sails filled and to hold a steady course when running before the wind, especially when a big sea is rolling up astern. It's often necessary to set poles and an assortment of lines to hold the sails out, whether they happen to be a boat's basic plain sails or a spinnaker.

When sailing with poled-out downwind sails, the helmsman must keep a keen eye on the wind and the course to prevent the sails from collapsing and refilling with a crack and the accompanying stress on the sail. Another concern with most of these headsail configurations, especially twin headsails, is that they cannot easily be reefed and, as the wind picks up, someone has to go forward to deal with the situation.

With a square sail correctly braced, there is absolutely none of this. The boat becomes very stable yet the course can vary by as much as 30 to 40 degrees to either side of downwind. There's no concern about jibing or broaching and the helmsman or autopilot will have little difficulty holding to a steady run. The boat will also roll less with a square sail set.

However, there is a significant, almost insurmountable, drawback to having a great flat sheet of canvas hanked on a yard high up a mast — furling and unfurling, not to mention reefing the darned thing! This drawback precludes the use of square sails on all but vessels with large crews, such as sail-training ships that have lots of young people able to scale the ratlines and edge out along a flimsy footrope to secure or release the canvas from the yard. Even if they're harnessed to the yard, it's still a dangerous, not to mention strenuous, operation.

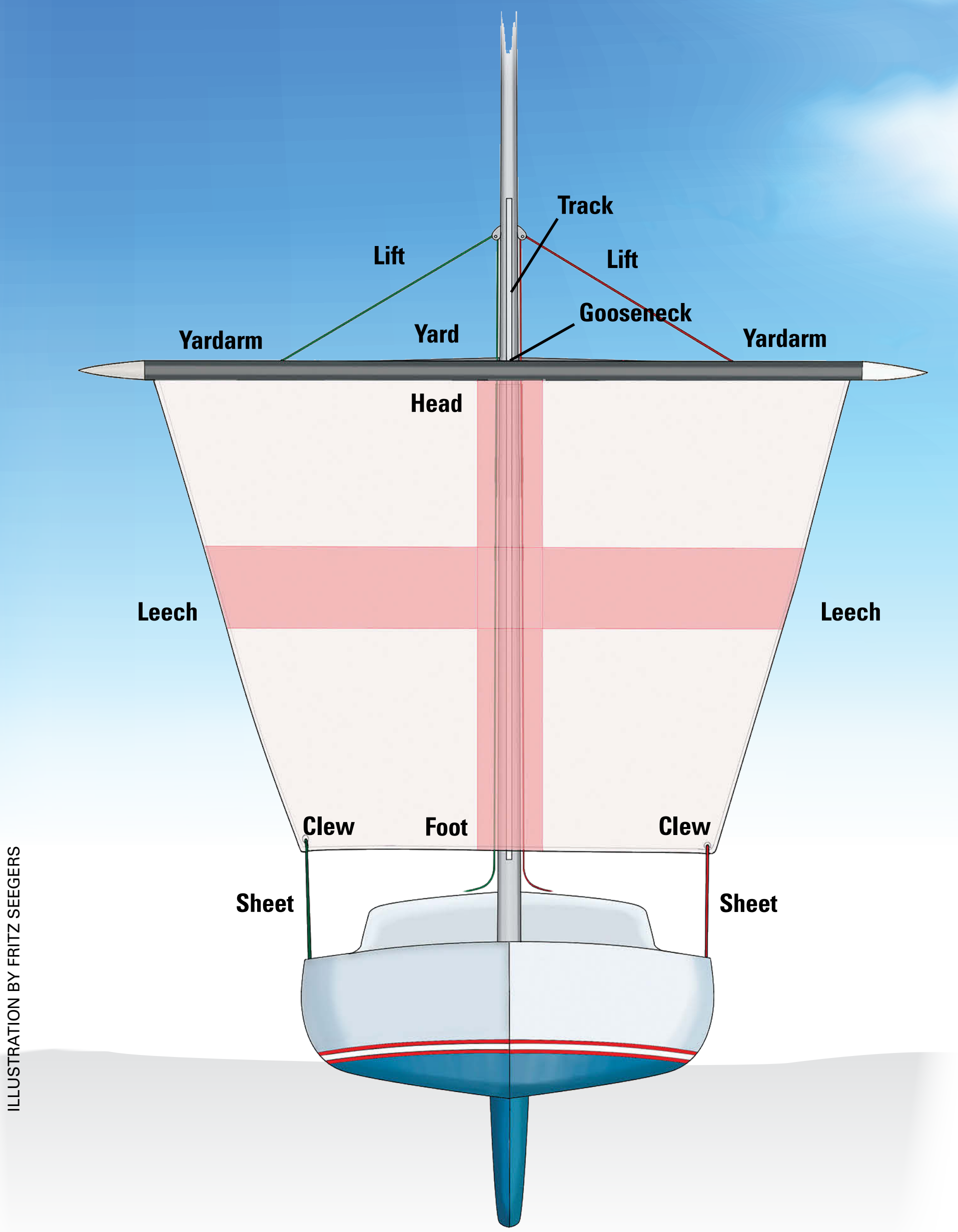
But what if you could easily furl, unfurl, and shorten a square sail from the safety of the deck or even the cockpit . . . without a single person having to go aloft? Now that would bring a completely different perspective to their use on a short-handed sailboat! I had pondered this problem ever since sailing on *Sir Winston Churchill*, the British Sail Training Association's square-rigged schooner, and later on a few other square-riggers. I wanted a system that could be operated from the cockpit of my 45-foot schooner, *Britannia*, that would convert her to a brigantine. Incidentally, a boat doesn't have to be a schooner to carry a square sail. One could be installed on any rig, including a sloop or ketch. But how best to do it?

Not many good choices

I have been on boats with different square sail arrangements. One hauled the sail outward from the mast along the yard on a track like curtain drapes. Another simply hoisted the sail at the outermost ends and in the middle of the yard. Both had a serious drawback in that they could not be reefed. The sails were either up or down, and lowering or brailing them was an on-deck operation, not unlike dropping a large hanked-on genoa on a run.

I considered another method using a regular headsail roller-furling system mounted horizontally in front of a yard. This does allow progressive reefing, but the point loads imposed on the ends of the yard require a heavier spar. In addition, the yard and sail add to the windage aloft and the sail remains exposed at all times.

Sailing downwind driven by her square sail, *Britannia* rules the waves, at top.



- The **yard** is the whole spar.
- The lines leading up from both sides of the yard to the mast are **lifts**.
- The **yardarms** are from the lifts to the ends of the yard, (not the whole yard from the mast out).
- Up the middle of the mast from near the deck is the **track**.
- The yard joins the track at the **gooseneck**, or the old term, **swivel**.
- A halyard up the mast attached to the center of the yard is the **hoist** (not shown on the drawing).
- The **head** is the top of the sail on the yard.
- The two sides are **leeches** (except when close-hauled, when the windward leech becomes the luff).
- The bottom is the **foot**.
- The bottom edges are **clews**.
- **Sheets** come off both clews.

Inspiration dawned from the relatively recent concept of in-boom roller furling. That got me thinking: why not use the same principle, except upside down, to roll a square sail up and down like a blind? Nobody sells such a thing, of course, so I set my mind to designing and making one. My concept might be called “in-yard square sail furling.”

I contacted a number of marine architects and sailmakers, but none could tell me how long the yard should be for my boat nor the stresses on the yard, sail, or indeed the mast. I finished up at the Old Naval Dockyard in Chatham, England, where I found a formula for yards and sails for a British frigate. I don’t have a crew of 300 or any cannon, but the formula was all I found to work with.

It took nearly two years and a lot of engineering and experimentation, but now *Britannia* has a beautiful square sail on her foremast. It’s called the fore course, being the lowest athwart sail on a ship’s mast, in my case the foremast. It has proved to be absolutely fabulous for sailing downwind. All furling and unfurling is done from the cockpit. The sail can be rolled up or down or reefed partway according to the wind strength. When completely furled, it presents little windage and the sail is protected from the elements inside the tubular yard and never gets wet, not even in the heaviest deluge.

First, the yard

In square sail terminology, the complete horizontal spar is the yard, the section outboard of the lifts is the yardarm, and the end of the arm is called the Flemish horse. If you have ever been out there, even in a calm sea, you know why. In heavy weather it is more like riding a wild stallion. However, nobody rides the Flemish horse on my boat nor do I have leech lines, bunt lines, bow lines, clew garnets, or tack lines, all of which are needed to handle a regular square sail. I just have a continuous line marked “sail up” and “sail down.”

Before I could begin to build my design the first question was, where to find a strong 22-foot-long aluminum


An in-yard roller-furling square sail is not a stock item at most sailmakers, so Roger had to improvise. He purchased a length of section for in-mast furling, at left, and trimmed it.

tube with a continuous slot? I did all sorts of searching on the Internet, but the answer came one day as I pondered a boat's in-mast furling system. Why not remove the front section of a roller-furling mast extrusion, leaving only the sail stowage tube with its ready-made slot?

Mast extrusions are available in many sizes, but it was also necessary to find out what diameter tube was needed to accommodate the sail when wound up inside. To achieve this I wound a 19-foot strip of sailcloth around the internal mandrel that winds the sail in and out. This resulted in 20 turns of canvas with a diameter of 5 inches.

Mast suppliers sounded surprised, if not a little nervous, when I asked how much they would charge for a mere 22-foot section. These hefty extrusions are normally supplied as masts three and four times that length. Nevertheless, Charleston-Spar, in Charlotte, North Carolina, had the right section at the right price. This suited me perfectly, as I planned to fabricate the yard at my daughter's printing works in Hickory, North Carolina, only 50 miles from Charlotte.

I had plenty of room to maneuver the spar in the factory warehouse, where I first sawed off the entire front using a circular saw with a 60-tooth blade.

I found a local welder to attach lugs to carry lifts, hoist, braces, and fairleads. I also shaped a couple of yard ends out of cedar blocks. They are removable to give access to the mechanisms at each end.

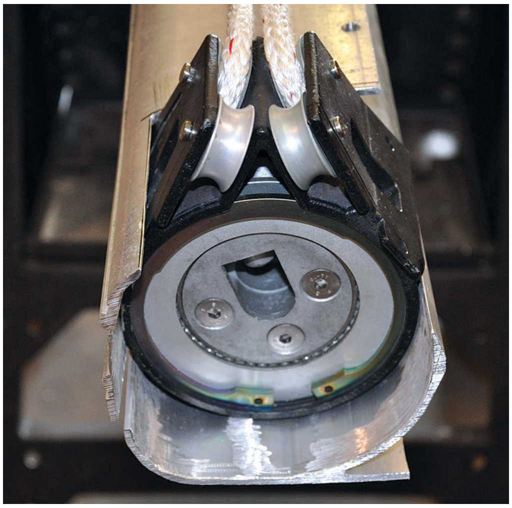
I found a rope winch driver that normally turns the mandrel on a vertical in-mast system. After some grinding, I managed to slide the driver snugly inside the end of the tube so only the furling-line sheaves were exposed. I secured the other end of the mandrel with a large thrust bearing and nut that can be tensioned to reduce sag in the mandrel. Then, suddenly, I had my yard.

A prototype sail

The next essential item in this experiment was a sail. I didn't want to buy an expensive Dacron sail without first knowing if the system worked, so I fashioned one from a cheap plastic sheet and glued the edges. This produced a pretty effective test sail, except that one side was green and the other brown, making *Britannia* look more like the *Son of Town Hall* raft than a modern sailboat.

To prevent bunching at each end as it rolled up inside the yard due to the additional thickness of the leeches, the sail is not cut square. My sail is a trapezium, 20 feet wide at the head but only 14 feet wide at the foot, with a 19-foot drop. When the sail rolls up inside the yard, the leeches barber-pole and don't overlap, so they don't bunch up and there's no risk of jamming.

With my homemade sail rolled round the mandrel and stowed inside the yard, I was itching to test it in some

Roger fashioned yard ends out of cedar blocks and painted them traditional white, at left. They are removable so he can access the rope winch driver, at right, that turns the mandrel inside the yard at one end and the thrust bearing and tension adjuster at the other.

The gooseneck, at left, is a rather intricate affair as it has to allow the yard to rotate in several directions for sailing or stowing in a marina-friendly manner. Roger tested the furling system in his daughter's warehouse, at right, with a sail made from a plastic tarp.

wind. I had my eye on a large wooden telephone pole outside the factory, but my daughter quickly put a damper on that. "You mustn't do that, Dad," she said, "You'll get me locked up!" I saw her point, but I still say that no city ordinance explicitly forbids hoisting a square sail up a telephone pole.

I settled for hoisting it on pulleys to the roof beams in the factory, and used their large electric fans to provide some wind. This worked tolerably well and we were able to wind the sail up and down quite easily. So far, so good.

I now needed a gooseneck to attach the yard to the mast. It had to be a very strong and secure connection at the center of the yard, yet it also had to be detachable in case the traveler jammed or in the case of some other emergency. It had to pivot from side to side to brace the yard left or right according to the wind, and it also had to rotate to permit the yard to cant or tilt when docking in confined marinas. It certainly would be asking for trouble to try to squeeze a boat into a normal slip with a 25-foot pole sticking out the sides. All this was achieved by modifying a spinnaker-pole end and bolting it to a traveler that slides on a track all the way up the front of the mast.

I finally transported the yard 650 miles to *Britannia* in Florida, strapped securely (I hoped) to the roof of my minivan on a wooden framework. I was relieved to finally get it up the mast.

After a lot of trial and error with my makeshift sail, we got *Britannia* sailing at 4 knots in only a light 10-knot following wind with my 11-year-old grandson steering and frequently over-steering as landlubbers often do. This would be quite unacceptable with normal fore-and-aft sails, which require skill on the part of the helmsman to keep them filled and to avoid jibing the main or mizzen.

The real thing

By this time, I was in quite deep financially, but if I was going to continue I was now faced with buying the most expensive item: a proper Dacron sail. This was not that easy either, as I couldn't find any sailmakers who had ever made a square sail, never mind one that would roll up inside a 5½-inch-diameter tube. Scott Lomas, with Doyle Sails in Stewart, Florida, showed the most interest. When the new sail arrived, the last stage of the grand experiment could be undertaken.

On the day of reckoning, the wind was an ideal 10 to 15 knots straight down the Intracoastal Waterway. We steamed upwind for a while, then turned around and cut the engine.

Practicalities

I learned through testing that the foot of the sail must be straight, not concave like a normal square sail. The system also works better with a batten inside the length of the foot of the sail to prevent it from billowing forward too much and to keep it straight when furling. We eliminated any built-in curvature or bunt in the sail so it would roll inside the yard better.

Throughout the project, I was concerned about overall weight aloft, along with the inertia effect such a protrusion might have 27 feet up a swaying mast. I had calculated the theoretical overall weight and was pleased to find, with the actual sail inside the yard, that it was within 5 pounds of my calculations, at 135 pounds. This is less than that of an average man climbing the mast, but the moment of inertia would be greater, since the yard protruded well outside the boat's roll center. To be on the safe side, I increased the foremast rigging sizes, including the two forestays and triatic stay, and beefed it up aft with two running backstays for good measure.

The tarpaulin sail proved helpful when Roger was refining the system on board.

As helpers tended each sheet, I hauled on the "sail down" line and the sail began to unwind from inside the yard. As the wind caught the canvas, it began to unfurl itself, but I controlled that by snubbing the "sail up" line around a cleat. I cautiously eased out more and more sail and soon the whole 340 square feet billowed majestically before us. We winched the sheets in as the boat gathered speed. Within minutes there was a small wave under the bow as we coasted downwind at 5 knots. It was a great sight to see the beautiful white sail filling so well.

Britannia did not heel or roll as she would have done under her Bermudan sails. The motion was more like a catamaran than a monohull and was so steady I felt no trepidation in steering straight through the narrow gap under the Titusville bridge. At least it seemed pretty narrow when our 14-foot-wide boat was suddenly 25 feet wide. A speedboat overtook us with people yelling "fabulous," "great show," and words to that effect.

Unfurling the sail was easy enough, but now came the second and more important test: would it roll back smoothly into the yard? We had experienced problems winding the plastic sheet in and out, as it sometimes overlapped itself and occasionally jammed completely. I was fairly sure this was due to the flimsiness of the material and reasoned that 8.5-ounce Dacron should be much more stable. At this moment I earnestly hoped so, otherwise we might have finished up in Miami, since you can't just turn a square sail into the wind.

There was only one way to find out. As my crew eased the sheets and spilled some wind I hauled the "sail up" line. It was harder than unfurling, but once I got it round a winch it was easy enough, and became lighter as the sail became smaller and finally disappeared into the yard as clean as a whistle. Another milestone passed. What a relief!

Changing courses

Knowing the sail can be progressively reefed — even to the point of exposing just a few feet of canvas — will be a great reassurance as the wind pipes up. I now wanted to see how many degrees we could sail off the wind with the yard fully braced.

After motoring back to our starting point, I steered a zigzag course downwind, bracing the yard first to port then to starboard. Amazingly, the sail never lost wind even when 3 points, that is 34 degrees, either side of the stern. This will allow a great degree of latitude when going downwind with a big following sea. It will also be less demanding on the autopilot.

All in all, the day's trial was a successful conclusion to a lot of hard work and expense. We celebrated with a bottle of bubbly as we steamed back to the marina. And no, I did not forget to cant the yard before entering our slip.

After I've thoroughly tested the system in all seagoing conditions, and once I'm happy with the structural and operational components, it is my intention to build a second yard to be hoisted above the fore course and carrying a sail about half the size. This will be the fore tops'l. *Britannia* will then field more than 500 square feet of athwartships canvas, which will greatly add to her downwind performance. Having a combination of two square sails will provide more flexibility in the same way that a combination of sails on a ketch or schooner permits different sails to be set according to conditions.

By the way, the red cross on the white ground is the English Cross of St. George that forms part of the Union Jack. It is also the Templar's Cross and the emblem of the Red Cross Association. But that ambiguity will just add to the mystery when my little tall ship is spotted on the horizon.

The cost

I had a stiff whiskey on hand when I added up the cost of all the equipment and parts, including sub-contractors' fees for special jobs. Overall it came to $3,736, not counting my labor. Four pieces of equipment represented about three quarters of this. The mandrel driver was $600, the yard and mandrel $400, the gooseneck and traveler $380, and the sail $1,550. Re-rigging with heavier stainless-steel wire was included in the cost of converting the boat from a ketch to a schooner, which is another story altogether.

I have nothing with which to compare this unusual project in order to appraise whether it was expensive or not. The nearest comparison is perhaps an in-boom furling system. Even a smallish in-boom furling system, not including a sail, is more than twice the cost of my system.

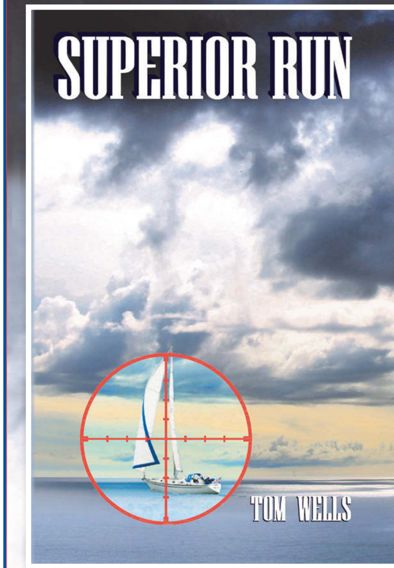
Ultimately it comes down to what you want and what you are prepared to do if you can't actually buy something ready-made. There were times when I was set to quit and my family thought I was quite nuts. But now, when I unfurl my beautiful sail that I designed and engineered . . . when I see it billowing forth, I'm pleased I persevered. My small square-rigger is unique.

All we have to do now is find a following wind, instead of having it on the nose as it is most of the time.

Roger Hughes has been sailing for nearly half a century as a professional skipper, charterer, restorer, and occasional imbiber aboard lots of boats, including square-riggers. His latest project is refurbishing Britannia, *a once rundown Down East 45, and re-rigging her as a brigantine schooner with a unique roller-furling square sail on the foremast and a few other "inventions," like his over-the-top blocks (see January 2015) and a hot tub in the owner's head. Roger's website is www.schooner-britannia.com.*

***Britannia*'s regal square sail billows triumphantly before a moderate breeze.**

Introducing . . .



A suspense novel written for sailors by sailor/author Tom Wells.

Paul Findlay is living his dream, sailing the Great Lakes aboard his beloved sailboat and writing about his voyages to pay the bills. When Paul receives a cryptic call for help from his old college roommate, Rich Perry, the dream quickly turns into a nightmare. A deadly game of cat and mouse across the greatest of the Great Lakes begins . . . and the cat has all the modern advantages.

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.

What readers are saying -

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).
— *Dave, NY*

An imaginative plot and excellent narrative pull the reader in. — *John, RI*

Superior Run is a true sailor's novel.
— *Karen, OR*

**Available through:
Amazon, Kindle Reader,
Barnes & Noble, and Tower Books.**

Taming a

Cliff stows the downhaul line on a stanchion cleat at the cockpit, far left. The downhaul leads through stanchion blocks, inset, all the way to the bow pulpit. He clips it to the head of the sail with a snap shackle, above.

A friend of mine told me about an incident he witnessed in which the jib furler on a 54-foot sailboat jammed. "You haven't laughed until you've been on a big boat in a rising wind with a jammed furler," he said, grimacing with the memory of it.

This was all academic to me until I got my next boat, *Pelorus*, a 26-foot Paceship with an old-fashioned hanked-on genoa. Because that was what I was used to on my previous and smaller boat, I thought the only difference would be that it was larger. However, I discovered that a larger sail can be a handful when it's lowered. (Now that I think of it, it was a handful on my smaller boat as well.) Fortunately, the halyard led to the cockpit, so I could raise the sail without going forward.

I kept *Pelorus* on a mooring and routinely sailed off it and on to it. I have long considered that to be a minimum standard for seamanship. That, and not hitting anything. I'd gotten into the habit of dropping the headsail first, then sailing in under the mainsail, slowly and completely under control in any kind of wind, when picking up the mooring or dropping the hook.

Pelorus had a 135 percent deck sweeper for a genoa and, even though it was an old sail, I used it most of the time, preferring to reef the main first. If I was going to windward in winds above 15 knots, I dropped the big genoa and replaced it with the 115 percent headsail that was flatter and usually OK up to 30 knots. Thinking back on that, it was a lot of work. Also, it was hard to see under or around the big sail, especially as I usually sail singlehanded.

The 135 destroyed itself one day right after I had anchored in advance of a squall that ripped through. I was below at the time. The first gust was well over 35 knots. It took the unsecured sail halfway up the forestay, shredding it before I could get on deck to secure what was left. Fortunately, the 115, which was as old as the 135 but not so blown-out, worked pretty well during the rest of the summer except in the lightest wind, when I flew a drifter instead.

> "It took the unsecured sail halfway up the forestay, shredding it before I could secure what was left."

I was able to replace the blown-out 135 with a new 110 from Cruising Direct. At first, I thought that might be a little small but, surprisingly, the 110 worked just fine. It was slightly heavier than the sailmaker suggested for a sail of that size, but I wanted it to last. The extra weight made it so stiff that wrestling it into the sailbag was almost like folding plywood, but it had the virtue of keeping its shape well in light wind and it pointed closer to the wind.

hanked-on headsail

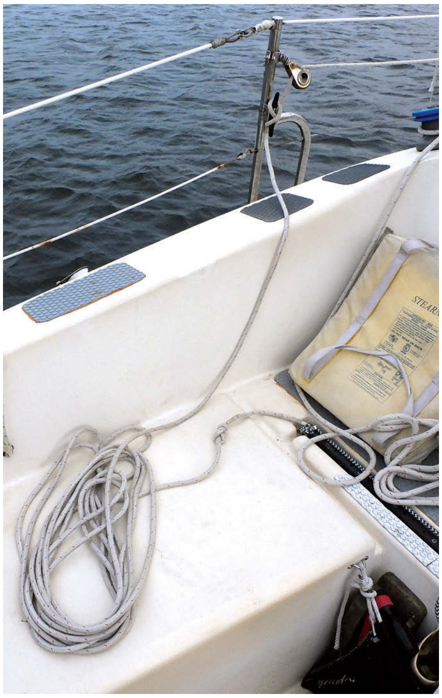
A downhaul is a singlehander's foredeck crew

BY CLIFF MOORE

By then I'd grown used to the hazards of handling the old sail, among them getting hit in the face by the clew while trying to pull the sail down on the foredeck . . . or standing on the foredeck with the bow dipping into the sea while hauling the sail down only to have the halyard jam and having to run aft to clear it. In a fine example of the perversity of inanimate objects, halyards have a knack for kinking into knots too big to pass through a jammer.

A blast from the past

Eventually I had a thought: why not do what the old-time sailors did and rig a downhaul that I could use on whatever headsail I happened to be flying? At the next Annapolis boat show, I visited the Garhauer booth and bought four SB25 stanchion blocks. Their online catalog has them at $40 each, but I got a boat show discount.

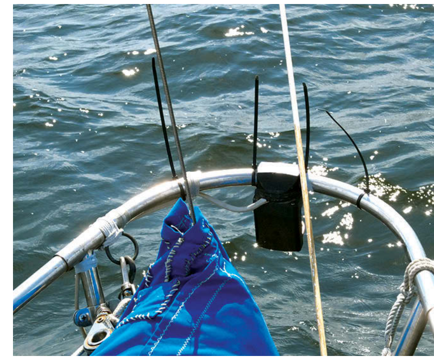


The next time I went to my boat, I mounted a block on each stanchion, one on the bow pulpit, and a stanchion cleat next to the cockpit where I could reach it without going forward. I then ran enough 5⁄16-inch line to reach from the masthead, down the forestay to the first block, and aft to the cockpit, with a snap shackle at the working end. It works like a charm.

Now when I need to lower whatever happens to be flying from the jib halyard, I fake out the halyard in the cockpit, loosen the downhaul from its cleat, bring the boat directly into the wind as if tacking, then quickly throw the halyard off the winch and haul on the downhaul. Generally, the genoa falls on the foredeck right where I want it.

When preparing to hoist the jib, Cliff sets the downhaul tail on the cockpit seat, above center, so it will run free when he raises the sail. A stanchion block on the pulpit leads the downhaul aft, at left. Before dropping the jib, Cliff fakes out the halyard in the cockpit, at right.





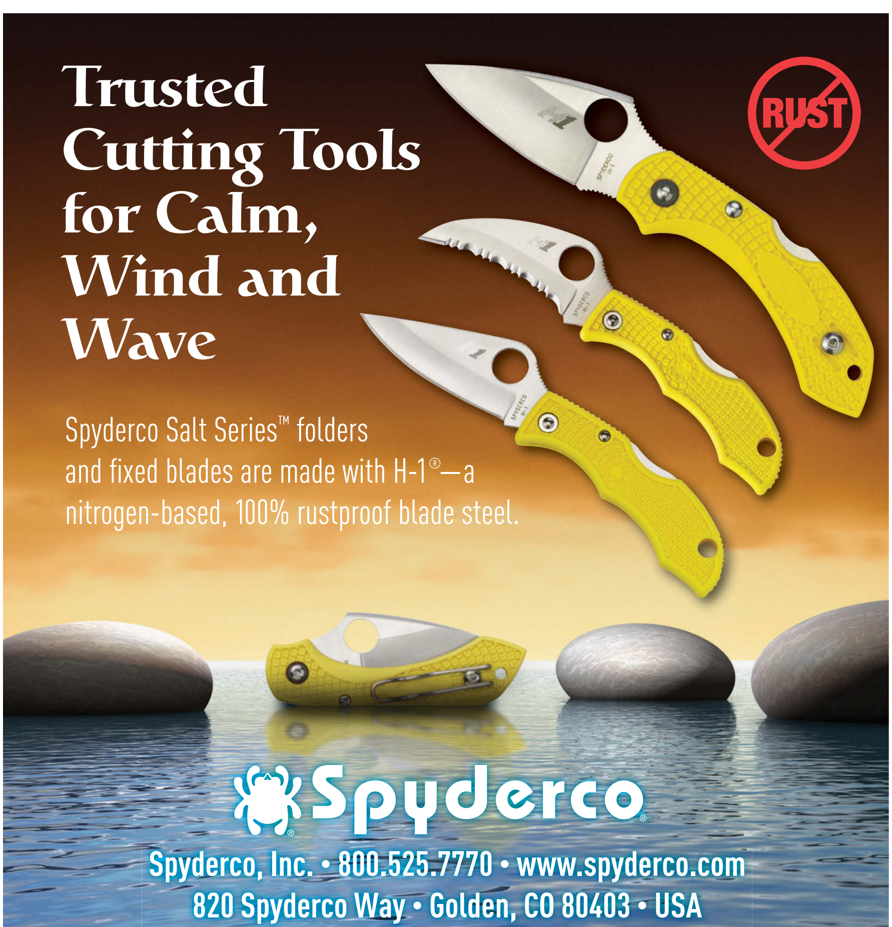
Most of the time, once the downhaul is made fast in the cockpit, the sail will stay where it dropped on the foredeck, at left. Cliff can then secure it to the pulpit and lifelines at his leisure, center, and stow it in its bag, at right. (The wire ties help keep terns off the pulpit.)

If there isn't enough sea room to go directly into the wind, I point up as high as I can and then lower the sail. Sometimes it falls partly in the water and gets wet, but so what?

It takes very little effort to lower any headsail, including the drifter. Although I do have to keep some tension on the downhaul so it doesn't slap against the sail, after four or five years I have so far detected no chafe on any sail.

Once the genoa is down, the boat slows immediately while remaining completely controllable. Fortunately, *Pelorus* has the virtue of sailing reasonably well under main alone, even in light air. I first secure the tiller to keep her going where I want her to, using either a tiller lock or the autopilot, then go forward with sail ties and secure the genoa in the usual way. Sometimes in very light wind while motorsailing, for instance, I'll just let it remain as it fell on the foredeck. But no matter how hard it blows, the downhaul keeps the sail from heading up the stay.

Cliff Moore is Good Old Boat's *newest contributing editor — see facing page.*



Meet Cliff Moore by Karen Larson

With possibly more miles under his keel than Long John Silver, Cliff has probably earned his second parrot. We can't tell from the photo whether or not he has the two wooden legs to match.

Join us in welcoming Cliff Moore, Good Old Boat*'s newest contributing editor. Since this issue carries three of his articles, a brief introduction seems to be in order –**Eds**.*

Without making it a goal or thinking of it exactly in that way, Cliff Moore has nearly completed a novel sort of "circumnavigation."

"I cruise each summer, mostly single-handed these days, all July, up the East River, inside Long Island Sound to Block Island and Martha's Vineyard and back," he says. "When I can, I stop at Mystic, Newport, Cuttyhunk, New Bedford or Nantucket, and Sag Harbor, depending. I once calculated that I sail about 700 miles a year, including weekends, all north of Cape May and south of Cape Cod. Over the past 35 years that totals 24,500 miles, which is about 400 miles less than the circumference of the earth."

It doesn't take a mathematician to figure out that Cliff will wrap up a straight-line and purely fictional circumnavigation sometime in the summer of 2016. No matter how you count them, Cliff is putting in significant hours of singlehanded cruising time on his 26-foot Paceship, *Pelorus*. While out there, he makes improvements to his boat and gear, takes stunning photos, writes articles for publication, and plans the next leg of his travels and, perhaps, the one after that.

Cliff didn't start cruising with *Pelorus*. He purchased his PY26 in 1991. The bow along with much of the starboard hull-to-deck joint "had been chewed off during Hurricane Bob," he says. "I had it towed to my home, spent the winter on it, and splashed it in the summer of 1992."

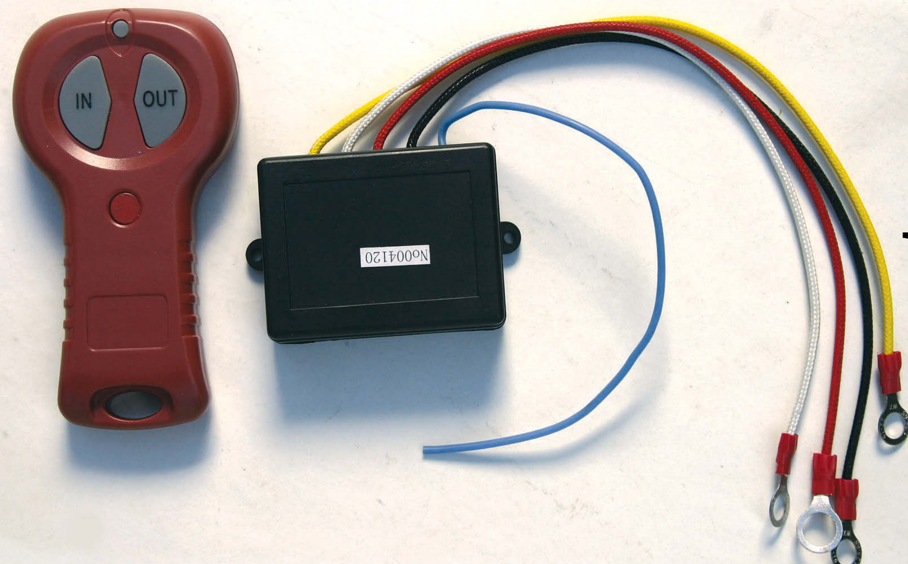
There were other boats before that, of course. In 1976 someone gave Cliff part of a Snark: the foam board and a mast. He came up with a replacement sail and rudder and set about learning to sail with the attitude, "How hard can this be?" The next boat was a 20-foot Pennant sloop, of which he recalls, "I never managed to entirely sink it." A 22-foot Seawitch with bilge keels was the last boat before Hurricane Bob delivered *Pelorus* for a Cliff Moore refit.

We had to ask about the name he gave his PY26. The short version is that Julius Caesar's navigator was named Pelorus. "This name lives on," Cliff notes, "as that of a dumb compass used to take bearings off the bow of a ship. In addition to being the name of my boat, it's a great crossword puzzle reference."

Cliff says he was greatly influenced by books, especially those of Don Street and the Pardeys, all three of whom he feels lucky to have met, and oddballs like Tristan Jones, whom he saw flogging his books at boat shows, and Francis Dye, who used to make amazing voyages in an open 14-foot dinghy. Cliff met Francis Dye at Sandy Hook when he anchored overnight while sailing from Florida to Maine. He also admires Francis Chichester and Joshua Slocum, and says all these great characters "made me think that anyone could learn to sail well, and cruise, and if you had to, drown like a gentleman without making too much fuss about it. Quickly I learned that self-reliance, quick thinking, and handiness were virtues for sailors, more so than money."

Cliff is the editor of a community newspaper centered on Montgomery Township and Rocky Hill, New Jersey. He holds a 100-ton six-pack license from the U.S. Coast Guard but says he only used it once, "when I ran the Great Salt Pond (Block Island) water taxi while my rudder was being rebuilt. That was a moment of glory."

Good Old Boat contributing editors aren't exactly knighted by the queen/founding editor/yours truly with a sword tap to the shoulder, so perhaps this new title doesn't represent a true "moment of glory." But we invite only a small number of our many authors to accept that title, and we do so primarily because they write often and we publish their articles with great regularity. It's our way of showing how pleased we are to have them as members of our crew. Welcome aboard, Cliff, as our newest contributing editor.



Anchor windlass remote

Marital harmony restored at a bargain non-marine price

BY DARREN BOS

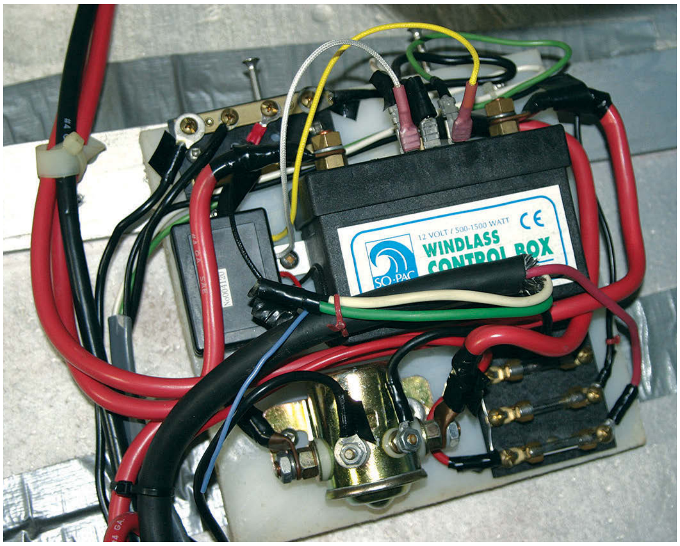
After our first summer in our Benford 40 schooner, one of the items high on the refit list was upgrading the control for the windlass. Although raising the anchor with the electric windlass was luxurious compared to hauling it manually, the only control for it was a switch located beside the companionway inside the pilothouse. I hardly need say that the road to marital bliss is not paved by trying to communicate, along the entire length of the boat, the intricacies of lowering just the right amount of rode.

Foot-operated switches or a remote control both looked like viable options for controlling the windlass from the bow of the boat. Because every hole in the deck is another place where water will eventually get in, I favored a remote control over deck-mounted buttons or a hand-held remote that plugs in. Recovering from sticker shock after looking at the remote controls offered by the manufacturer of our windlass, I wondered if the remote controls sold for use with truck winches might also do the job. After an evening of searching online, I ordered a remote designed for off-road trucks that was waterproof, had a recessed on/off switch, was compatible with 12- to 36-volt power, had 50-foot range and was one twentyfifth the cost of the units designed for marine use.

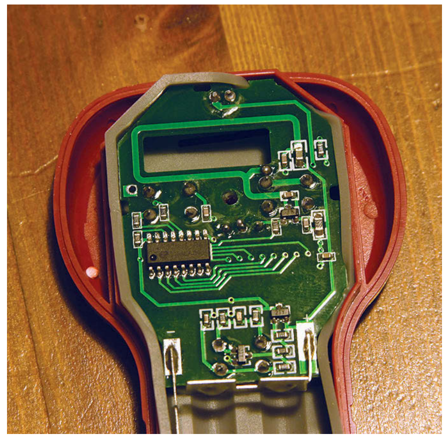
Installing the remote took no more than 20 minutes, including the time I spent searching for tools to replace two ring connectors with spade connectors to match my windlass control box. I connected the ground wire to an existing negative bus, the positive wire to a 3-amp fuse on the positive bus, and the two control wires to the windlass control box in parallel with the existing wires from the companionway control switch. I matched the "in" wire from the remote box to the "up" wire for the windlass. When I tested the remote control, it functioned exactly as the switch in the pilothouse had, but I could now stand anywhere on the boat and operate the windlass.

Float test

The remote controls offered by windlass manufacturers float, so I decided to test mine and also see if it was waterproof as claimed. Although the



The remote control Darren ordered came as two components: the hand-held transmitter and a control box to mount beside the windlass controls, at top of page. Darren liked that this remote had a recessed on/off switch (red button) and an indicator light that shows it is on. The small control box for the remote fit neatly to the left of the larger windlass control box, at right. The yellow and white control wires that pair to the original green and white wires from the windlass control switch are easy to see.



Darren stores his windlass remote near the fixed windlass controls, where he can easily see if the remote has been left on, far left. The isolator switch is normally left off and the windlass can't be inadvertently operated unless it and the remote (or the fixed switch) are activated. The bungee-cord wrist strap on the remote reduces the chance of it falling overboard. As delivered, the remote was not watertight, as the gasket that seals the remote was pinched under the circuit board, at left. After Darren refitted the gasket, the remote passed his immersion test, although he says he considers it to be rain-resistant rather than waterproof or submersible.

remote did float, it was not waterproof. Opening the unit revealed that it leaked because it had been assembled improperly. After thoroughly drying the circuit board, I reassembled the unit and added a drop of Goop glue on each of the two screws that secure the case (the gasket was very narrow around the screw holes). The remote passed my home-brew waterproof test of leaving it floating (mostly submerged) in water for 15 minutes.

For very little cost and effort this remote has given us a lot of flexibility in how we control our windlass. The remotes I looked at from windlass vendors were waterproof up to 1 meter during a 30-minute test. I doubt this remote would pass such a test or continue to do so reliably after every battery change. However, leading a sheltered life in the pilothouse and allowed to dry after being soaked in rain, it will, I suspect, last a very long time. Should it fail, we still have our companionway windlass switch and I could buy 24 more of these remotes before reaching the cost of a marine unit.

Darren Bos, an aquatic ecologist and stay-at-home dad, lives on the West Coast of Canada. After spending a decade exploring the Strait of Georgia aboard a Hurley 20 with his wife (and eventually two sons), he is now refitting a Benford 40 schooner as they prepare for a circumnavigation.

Resources

I ordered my remote from eBay, although the same control box seems to be available from truck suppliers with a variety of styles of remote handsets. The units cost very little (I paid $12 for mine including delivery) and can be found if you search "winch remote" on eBay.

The transmitter uses batteries that seem to be popular in small remotes: a 23A size. Although they are common in camera and big-box stores, you may not find these little batteries off the beaten track and it is worth having some extra ones on board.

The Ship's Log

A daily duty records a lifetime of memories

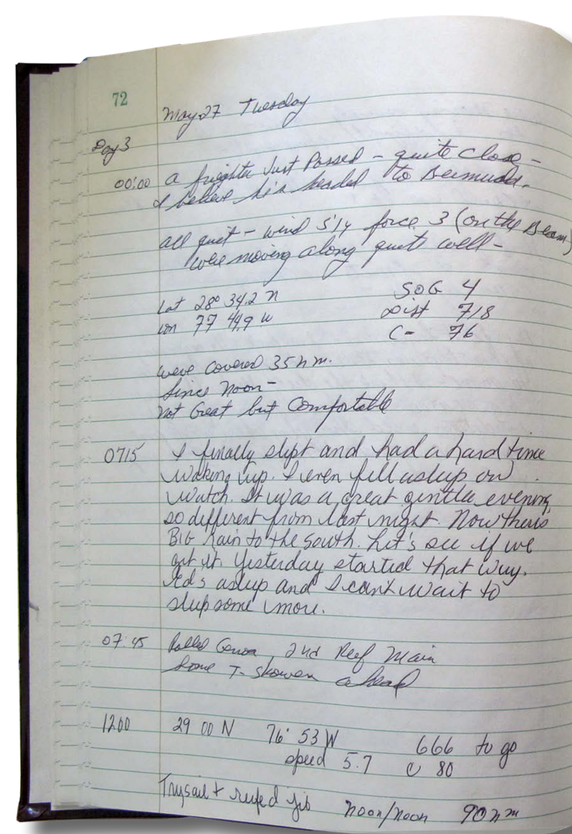
BY ED ZACKO

I am sitting in front of the fire doing research for an upcoming ocean passage. I like to study the passages of others. What routes did they take? Which months? Did they make good choices and, more important, did their planning result in a good passage? I am lost in this book . . . fascinated. I have made this passage several times, but the account I am reading bears little resemblance to what I remember. Yet it is our very own log of *Entr'acte* from 2005, our passage from Gibraltar to the Azores. It is our boat, our book, our writing, but these words seem to have been written by someone else. Seemingly innocuous entries trigger the memory. The blanks fill in and the past comes alive as the scenes become once again familiar. I look up to the bookshelf and smile. *Entr'acte*'s log, which began on her launch date April 1, 1980, and has continued uninterrupted to the present day, now fills 37 beautifully bound volumes.

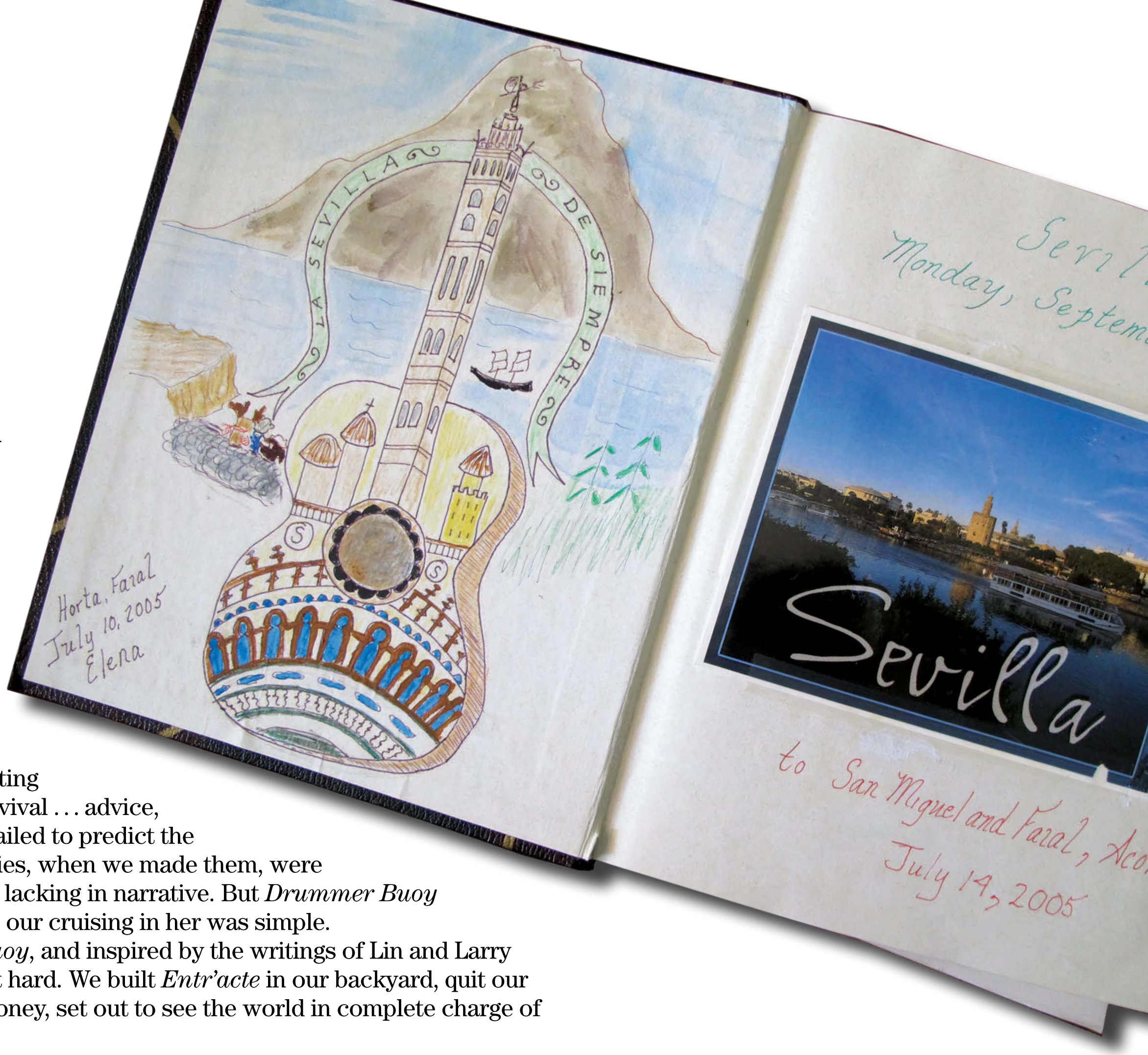
At first glance, these books seem to be a useless compilation by someone with an obsessive/compulsive disorder, or perhaps simply the affectation of a romantic. We were in our mid-20s when we began the Log of *Entr'acte* and we joked that these journals would be fun to read by the fire when we "got old." Well, we're approaching 70 now and we, along with *Entr'acte*, are still under way. I pause to think about logs. What are they really? What treasures do they hold? What should a log contain? Are they really necessary?

Modest beginnings

The log from our first 18-foot catboat, *Drummer Buoy*, was a simple all-in-one book, each page an identical form with columns for every



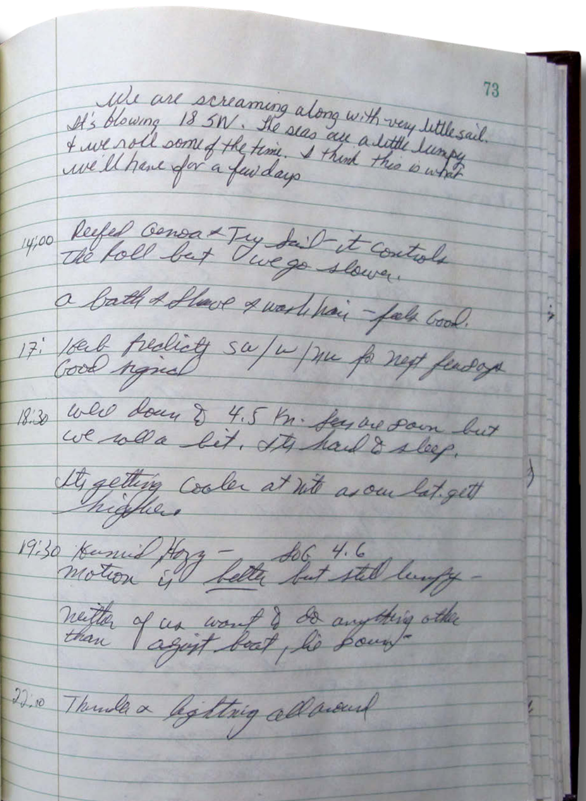
Thirty-something years of cruising fills a yard or so of bookshelf in Ed and Ellen's pied-a-terre in Arizona, at top. *Entr'acte*'s ship's log is a simple 10½ x 8, hard-bound, lined office journal. Ed and Ellen buy several at a time to ensure uniformity and make certain they do not run short. Their inside pages, at right, are filled with details of every day that passed on board.



Each volume's cover page is a work of art depicting the destinations covered in that particular book.

conceivable phase of boat operation, maintenance, and navigation. Just fill in the blanks as you sail on. Included in this book was a guest log, basic piloting instructions, a Beaufort Scale to judge the wind, barometer instructions for predicting weather, and hurricane survival . . . advice, presumably, for when we failed to predict the weather properly. Our entries, when we made them, were simple and to the point but lacking in narrative. But *Drummer Buoy* was a very simple boat and our cruising in her was simple.

Thanks to *Drummer Buoy*, and inspired by the writings of Lin and Larry Pardey, the cruising bug bit hard. We built *Entr'acte* in our backyard, quit our jobs and, with very little money, set out to see the world in complete charge of our boat and our destiny.



A Nor'Sea 27, *Entr'acte* may have been a more sophisticated boat, and our goals were certainly more ambitious, but we still did not take log-keeping seriously.

I select volume one and open to 10 August 1981, departure day when we set out from Haverstraw, New York, to see the world: 0700 — "Left right on time!"

We have laughed a lot about that entry over the years. Just *what* were we on time for and why was it so important to leave "on time?"

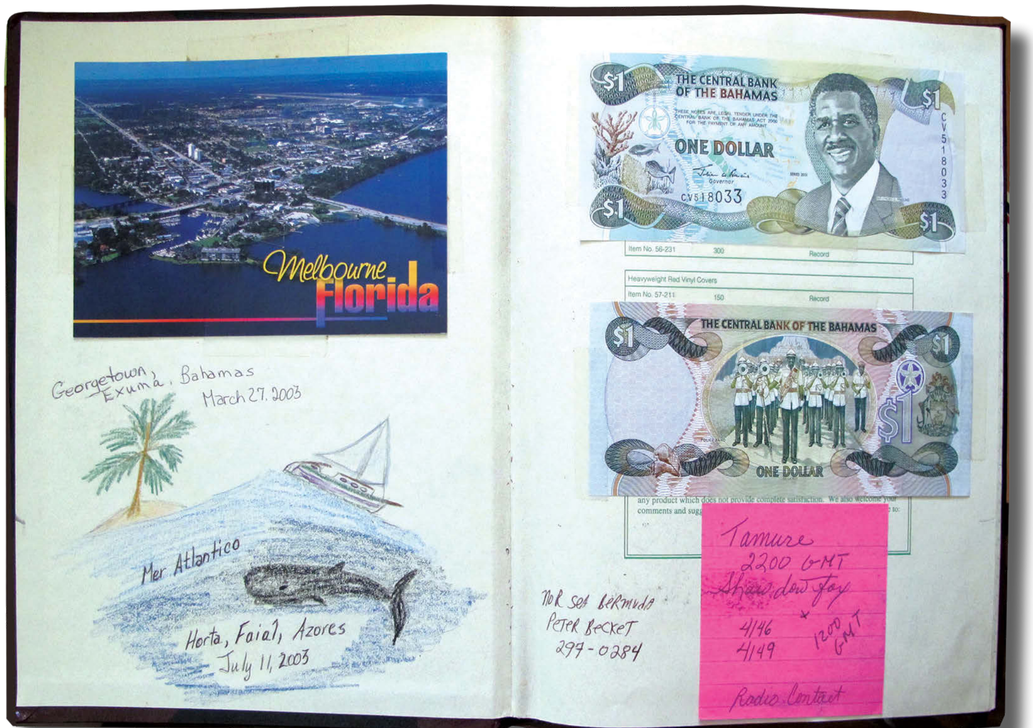
One week and a hundred miles east on Long Island Sound, we made our next entry. In our defense, we were excited, completely exhausted from our preparations, and very familiar with Long Island Sound. Still, in retrospect, the lack of log-keeping was irresponsible.

Our first serious offshore passage from Block Island to Chesapeake Bay was chastening. Being a bit cavalier with our navigational entries, we mistook a lighted drilling ship for the New York City skyline and wasted hours in frustration and confusion. These were the salad days before GPS and all navigation was a combination of coastal piloting and celestial navigation using the sun, moon, stars, and planets. We learned in dramatic fashion the absolute necessity of maintaining a good, *written* DR (dead reckoning).

As we traveled farther, we met the serious cruisers, those "long-timers" with tens of thousands of miles under their keels. We were "the kids" who clearly needed some help and we absorbed all the advice that was offered. Foremost of their suggestions was the obligation to "keep a proper log."

Inspecting the logs of these pros was impressive, not only for their regularity but for the detail. Hal Roth's entries were those of a military vessel and the rest of the book a veritable time capsule.

I select volume three and begin a delightful walk through *Entr'acte*'s history and our life with her. I open to a random page



***Entr'acte*'s log pages are filled with postcards, stamps, local currency, receipts from restaurants with prices, quotes from friends along the way, and any other information Ed and Ellen deem of interest and might wish to remember for future reference.**

and am reminded what it was like to cruise on a shoestring: a "night on the town" in Spain when we split one beer and one tapa (60 cents) between us. We stretched it out for three hours before drinking up and going home. The entry also mentioned how happy we were. In another volume, we are suddenly in Tonga playing with The Hausia Brothers Band before the King of Tonga. I move to another that details a particularly vile night beating up the coast of Panama and still another that, in one short paragraph, has captured the absolute wonder of our first celestial island landfall: "Perhaps this was not wasted energy after all!"

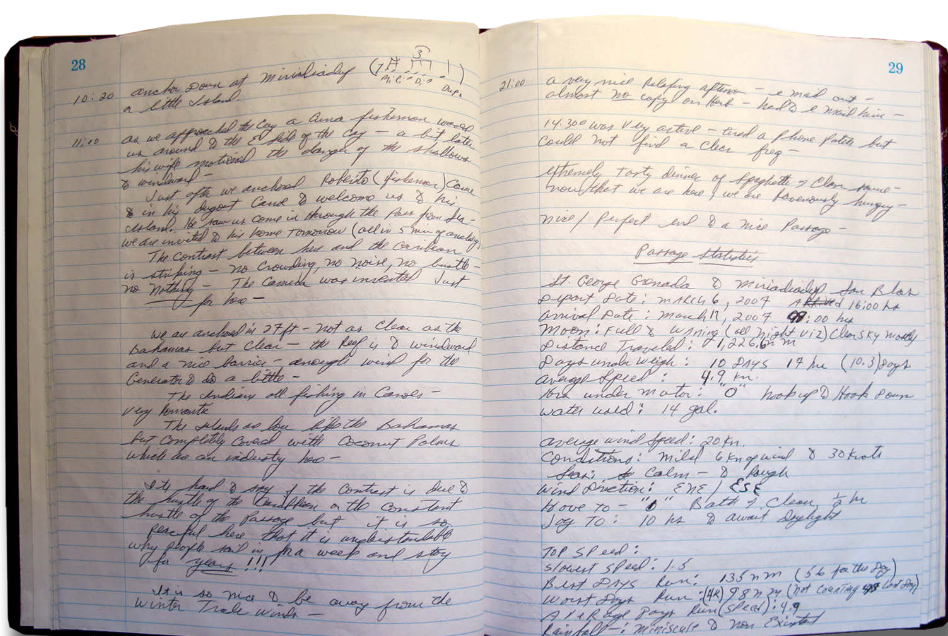
As we sailed on, we gradually matured into responsible sailors and our log evolved as well. It bears little resemblance to that all-in-one book from *Drummer Buoy*.

Logs for everything

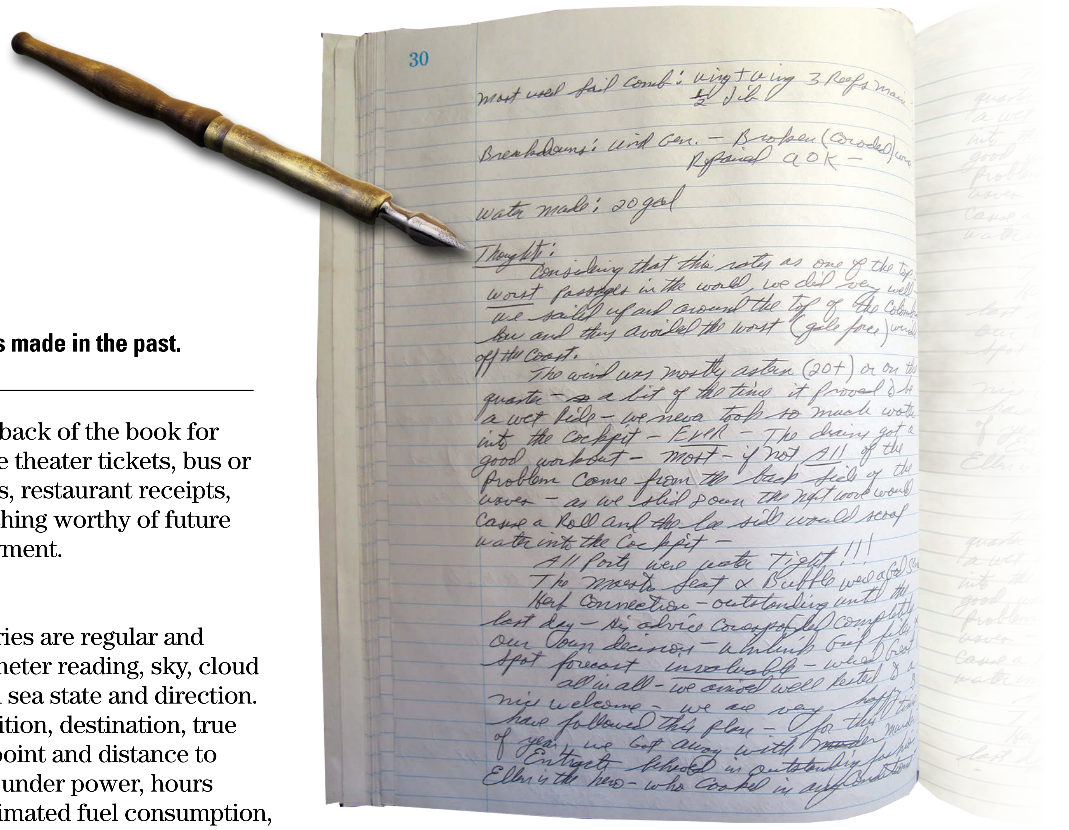
Entr'acte's log now comprises three separate books. The primary volume is the actual ship's log. The second book is a dedicated engine log. The third is a maintenance log. At first, all of the information was in one book, but it proved far too difficult to find critical information when we needed it. Two years into our voyage, we met with a container ship officer and discovered the benefits of separate, dedicated logs. Now, finding critical information is a snap.

Without fail, we make a log entry every single day that we are on board. Each entry represents a day in the life of *Entr'acte*.

The morning entry begins with a weather synopsis, harbor conditions, and overnight events. The next entry usually outlines the plan for the day on board or ashore. The evening entry is made just before bedtime and summarizes the day on board as well as significant activities ashore such as social events, concerts, and sightseeing. If an official comes on board, we always request that he sign the log noting the date and time. This book also serves as our journal to record thoughts and impressions on where we are, how we got there, what we did that day, and locals we met and their contact information.



The summary written at the end of every passage is extremely useful, even years later, for planning future passages.



It is so much fun to read about passages made in the past.

Several pages are reserved at the back of the book for "significant postings." These could be theater tickets, bus or train schedules, program cover pages, restaurant receipts, menus, marina bills, and almost anything worthy of future reference, memories, or proof of payment.

Passage entries

When under way, our navigation entries are regular and complete. For weather, we list barometer reading, sky, cloud cover, wind direction and speed, and sea state and direction. Navigation information includes position, destination, true course, speed, distance to next waypoint and distance to destination, sail combination, rpm if under power, hours accumulated while under power, estimated fuel consumption, and estimated hours of fuel remaining.

We keep proper watches and make log entries during the watch. These entries begin with our current position at the start of the watch and include true course, course to steer, barometer reading, weather, wind strength and direction, sea state and direction, and taffrail log reading. Headsail changes and reefing changes are also noted, as are sightings of ships, whales, or anything else of interest.

Our DR is constantly maintained, updated, and plotted on a paper chart. Every significant course change is logged and plotted along with the time of change. Despite the use of GPS, experience has taught us that electronics fail suddenly and without warning at very inopportune times, so it is vital to have written down the compass course you are trying to steer. We note changes in wind speed and direction as well as sea state and direction. If we take in or shake out a reef, we note it in the log along with the time.

At the conclusion of each watch, the watchkeeper writes a summary of the watch along with specific instructions for the new watch, such as cautions pertaining to events past and instructions for resolving present events like ships on the horizon or impending landfall. Verbal instructions are not remembered well by the new watch coming out of a sound sleep; written instructions are best.

Once the anchor is down and secure, we note the exact position along with bottom conditions and a brief description of the effectiveness of the anchorage in case we choose to visit it again someday.

At the conclusion of each passage we write a passage summary. What went well? What went wrong? Did our tactics work? What percentage of time did the wind blow from each direction and what point(s) of sail were we on? What percentage of the time was under power? How much fuel was used? How much remains? Which sail combinations did we use and which were most/least effective? What would we do differently? Anything of significance is noted while it is still fresh in our minds.

With the above data, we can reconstruct the entire passage, either while under way or years later. These pages have proven extremely valuable in planning future passages.

The engine log

The engine log is dedicated solely to the maintenance and operation of the engine. This has been the subject of good-natured ribbing over the years. ("You keep an *engine* log?")

Yes, we have a small hardbound journal that documents the engine from its initial installation in 1994 to the present day. The inside front cover shows the engine's make, model, and serial number along with the date and place of installation; the transmission brand, serial number, and gear ratio; the shaft size; propeller size (diameter and pitch) and brand; and the size and part number of the Cutless bearing.

The inside back cover lists various settings: valve clearance, torque settings and notes, specifications, and pages of the service manual most commonly referred to.

The final pages list commonly replaced parts by name along with their catalog number. These include fuel filter, oil filter, water-pump impeller, belts (brand, size, and number), thermostat, and so on. This format minimizes a lot of digging through the manuals when it's time to do maintenance.

The body of the engine log details actual engine events. Every part installation, belt change, and repair is documented by date and hour-meter reading, and every part number with place of purchase, address, phone number, and cost.

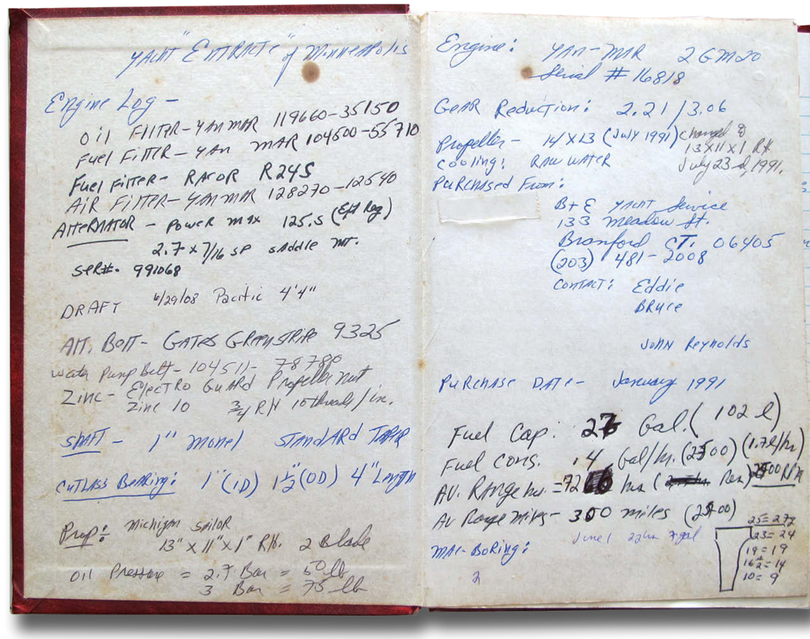
Fuel is logged according to engine hours with hourly consumption noted and compared to past runs. Likewise with oil: the weight and brand are noted and consumption or lack thereof is compared to previous runs. We log how much battery water was added and how many hours elapsed between battery top-ups.

If any of the above figures show a marked change, that's a reason to look into things to avoid surprises.

Thanks to these records, we know exactly how much fuel we use at various rpm settings and conditions. We can accurately gauge our consumption throughout a passage, reducing the chance of running out of fuel before we arrive in port.

Maintenance log

This book is a simple tabbed journal. Each section is dedicated to various items on board: watermaker and survival watermaker, galley, rig, dinghy and outboard, sails, winches and deck gear, charts (which are on board and which are needed), computer, life raft, and ditch bag. The maintenance log holds a record of repairs due to breakdown and also documents dates of preventive maintenance.



The engine log's inside cover is a trove of data . . .

An irreplaceable reference

Nostalgia aside, there are other less obvious uses for a log.

Research

Perhaps you wish to repeat a passage or return to a harbor you visited some years ago.

Before departing for Europe in 2003, we read our log from the 1983 passage, which helped us correct our past blunders and have a much better trip. We knew exactly where we were going and who we wanted to see when we arrived. Where was the Bermuda Customs office? It is in many ways like having our own personal cruising guide.

Memory is inaccurate. Promises made at sea are soon forgotten in harbor. Many times we spoke of a passage where "nothing happened," yet after reading the log of that passage we were surprised to find that it was not quite as uneventful as we remembered it.

Buying or selling a boat

When buying or selling a boat, a set of detailed logs will invariably be an asset. I would want to inspect the logs of previous owners, especially the maintenance logs. Here you will discover how and where the boat was used and how she handled and performed under various conditions. Detailed accounts of her passages show how the vessel was sailed and treated. By reading the comments in the log you gain important insight into the actual performance characteristics of a vessel. Were her miles easy or hard? The maintenance logs speak for themselves. No log, no proof, and possibly no maintenance.

Legal

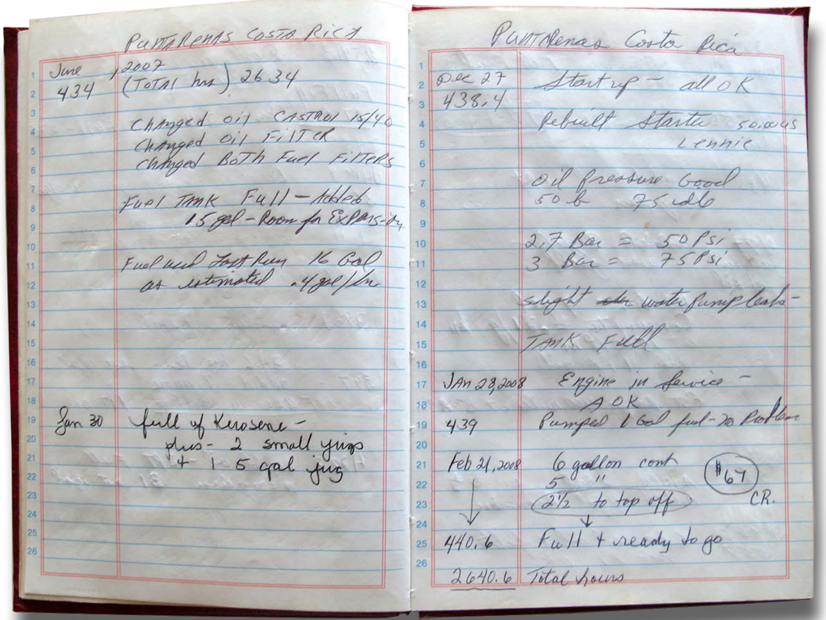
The ship's log provides legal documentation of events. A U.S. Customs officer tried to charge us import duty on a new engine that was installed in a foreign country. The burden of proof was on us and our engine log saved the day.

Fiji Customs actively prosecutes boats that anchor in Fijian waters before officially clearing into the country. The day we arrived, three boats were fined and our officer was out for blood. "Did you stop and anchor anywhere along the way before you arrived here?" I presented our logbook. He looked at it carefully, smiled, and said, "Thank you."

A yacht collided with a tugboat and several people were killed. The port officials decided that our friends had caused this collision, but their detailed log proved that they were hundreds of miles away from that location at the time the incident occurred.

A yacht is allowed to stay in Europe duty-free for a maximum of 18 months. Sail over to Morocco and return to Europe and you get a new 18 months. Likewise, if the crew are in Spain for more than 183 days, they become liable for income tax. With Europe being by and large a free-travel zone, passport stamps into and out of each country have become a thing of the past, so your log might well be the only proof that you did not overstay your time. Passports and clearance papers are sometimes not enough. As one official cautioned us, "Sometimes you can never have enough proof."

Will your log actually be believed? The more regular, consistent, detailed, and professional your entries, the more likely it is your log will be accepted.



. . . and the inside pages detail every maintenance task performed and the date.

Our anchor windlass is an example. The aluminum warping drum is mounted onto a steel shaft. Dissimilar metals combined with endless saltwater dunking present a real danger that the drum could become permanently corroded to the shaft. With the drum seized to the shaft, I would be unable to dismantle the windlass for repair and it would become a total loss. After a few close calls, I concluded that to take 10 minutes each year to remove, grease, and remount the drum is good insurance. It helps to be reminded to do it.

The same goes for aluminum cleats fastened to the mast with stainless-steel machine screws. These screws should be removed and re-installed periodically to prevent them from becoming permanently welded to whatever they touch.

When was the emergency watermaker last serviced? What is the expiration date on the flares? When did we last fill the tank for our cooking fuel or end-for-end the anchor rode? The list seems endless. With hundreds of things to maintain, how does one keep track? Time passes swiftly, and the timing of events and routines gradually blends together. Without a written record, these small but vital jobs can be neglected.

Treasured memories

Thanks to our logs, all of our adventures are documented. Now, as we approach the golden years and can manage a little time to sit by the fire, we read the stories to each other. We are reminded of the wind in the sails, the landfalls, and the excitement of arriving in a new port and meeting locals who became dear, lifelong friends. These volumes are real books, not a virtual computer or tablet file. We tried to keep an electronic log, but as we made the same entries, they seemed to disappear. No, we prefer books we can see, touch, feel, and smell . . . complete with the occasional old saltwater stains. Or might they possibly be tears? Our logs remind us of what cruising should be. Each page is a day in the life of *Entr'acte*.

If you maintain a log for your good old boat, it will be a treasure.

Ed Zacko is a Good Old Boat *contributing editor. He and Ellen met while playing in the orchestra of a Broadway musical. They built their Nor'Sea 27,* Entr'acte, *from a bare hull and since 1980 have made four transatlantic and one transpacific crossing.* Entr'acte *is now based in Seville, Spain, where Ellen and Ed are happily sailing in and around the Mediterranean and playing in the jazz clubs of Spain, France, and Morocco. When not on board* Entr'acte, *they heave-to in Phoenix, Arizona, where they maintain a busy concert schedule throughout the Southwest U.S. Follow them on www.enezacko.com.*

When a

BY
DIANE SELKIRK
AND
EVAN GATEHOUSE

Outsourcing and insourcing assure the best results

With just a few days left until landfall on our 2,800-mile passage from Mexico to the Marquesas, we noticed the steering felt funny. Looking over the side, we saw that the starboard rudder of *Ceilydh*, our 40-foot Woods Meander catamaran, was missing. It had broken off at the hull. We had a replacement rudder fabricated in Tahiti and air freighted to us in the Marquesas at considerable expense.

Our remaining rudder was, by association, suspect, though it did get us to Australia. We emailed the boat's designer who admitted that the original rudder stock was probably a bit undersized. My husband, Evan Gatehouse, did some of his own naval architectural engineering calculations and confirmed this opinion.

A second new rudder was in our future. We could have had it built professionally in Australia, but we chose to do it ourselves, subcontracting out a few parts of the job that required the skills or equipment of specialists.

While having a rudder break off is an obvious reason to seek a replacement, it's not the only reason a sailor might want to build a new rudder.

Age – Fiberglass rudders tend to fill with water, eventually leading to failure of the wet core or failure of the stock or internal framework due to corrosion.

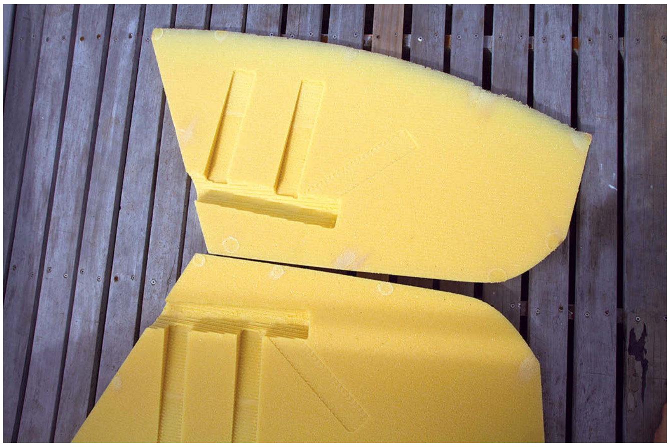
Poor engineering – The original stock or internal metal structure may have been undersized and become deformed in use.

Poor shape – You want a more modern rudder shape for better performance.

If you are replacing "like with like," as in the case of an aging but otherwise adequate rudder, you can probably do this yourself without any outside design advice as long as you stick to the original specifications for the shape, the stock material, and the laminate. In any other case, we advise consulting a naval architect before proceeding.

Be prepared for some extra costs if the rudder stock diameter must be increased to achieve the necessary strength. That would mean that the rudder bearings and the quadrant might have to be changed as well. Before you go that route, however, you might ask the naval architect if, by specifying a higher-strength metal for the stock, you can avoid an increase in diameter.

Keep in mind as you start to plan your new rudder that fiberglass boat rudders have three basic elements: the rudder stock with the internal



Diane and Evan had the core for *Ceilydh's* new rudder shaped by numerically controlled machining, at left. The process included cutting the rebates on the insides of the two halves, at right, which were a perfect fit for the the rudder stock and its webs, at top of page.

rudder needs replacing

After adding a few layers of carbon fiber (to add stiffness below the stock) Evan applied glue to both halves of the core and fitted one side, at left, then the other, at right, to the stock.

reinforcing webs attached to it, the core, and the skin.

The stock

The rudder stock transfers the torque from the steering system to the rudder blade, usually through metal webs or tangs welded to the stock that push against the core. (*In a spade rudder, the stock must also withstand very high bending forces –**Eds**.*) Instead of solid round bar, some stocks are made of heavy-wall pipe (of larger diameter) to save weight. If your existing stock performed adequately, replacing it with the same material and size makes the most sense.

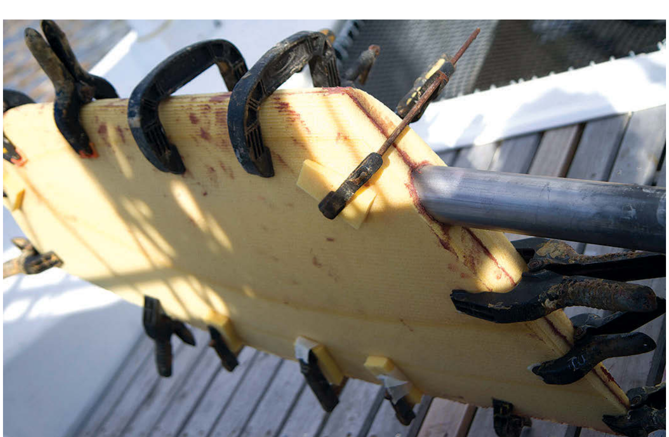
Metal webs welded to the stock transfer the torque to the core, which in turn transfers it to the skin. You could weld webs made of a less expensive stainless steel to a higher strength stainless-steel stock as long as the two alloys are galvanically similar.

We selected 2205 stainless steel for its higher strength (see "Rudder stock materials," page 47) and increased the size from 1½-inch to 2-inch schedule 80 nominal pipe size. This new stock has about 4.5 times the bending strength of the original. Because our rudder stock is attached to the transom externally, we avoided the issue of fitting the larger rudder bearing into the hull.

The core

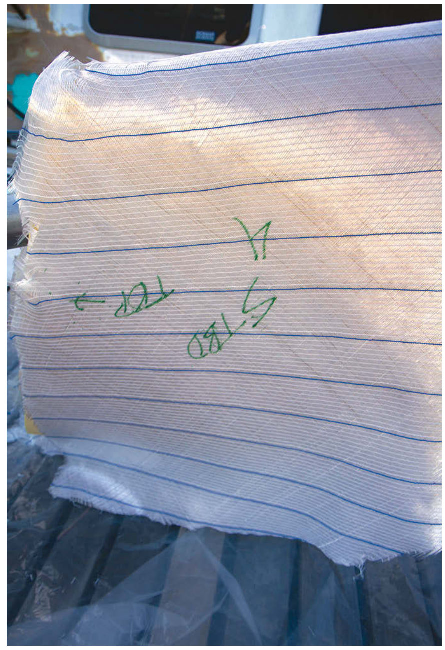
The core forms the shape of the rudder, ideally creating a low-drag foil and providing the lift forces that turn the boat. Solid wood, plywood, expanding foam, and PVC/SAN foam blanks have all been used for rudder cores.

Solid wood is inexpensive and was often used on older boats. If replacing a solid wood core, use epoxy to glue together solid pieces of a maximum width of about 2 inches. Rip the wood from a larger piece and, when gluing up the blank, end for end the grain pattern on alternating pieces to minimize warping. Wood is harder to shape than foam.



Clamping the rudder core halves together, at left, was a little delicate because the core could be crushed locally by too much pressure from the clamps. The machining process left tool marks on the rudder core, but these were easily removed with a longboard, at right.

Evan and Diane pre-cut the fiberglass fabric and marked each piece, near right, to ensure they were used in the correct sequence. Trimming the fabric around the rudder stock, below, made for a tidy laminate. Rather than work with wet fabric, they found it easier to drape dry fabric over the dry core and work the resin through the fiberglass with a squeegee, far right.



Plywood is less commonly used but can be found in some rudders. Water can easily wick through plywood, so even a small leak into the rudder will lead to deterioration. Given the availability of modern foam cores, we suggest avoiding plywood as a core.

Expanding two-part foams are often used in production rudders that are molded. They're harder to use in replacement rudders built in two pieces because the outside skin must be constructed before the foam is poured in. It's also easy to distort a rudder shell by using just a little too much foam. If you go this route, choose a foam with 5 pounds per cubic foot or higher density to give sufficient strength. Typical flotation-type expanding foam will have a lower density.

Resources

Profili
www.profili2.com

Instructions for manually lofting wing sections can be found in the free Gougeon Brothers Publication 000-448: *How to Build Centerboards and Rudders*

***Good Old Boat* articles**
Nurdle's New Centerboard, July 2015
Levity's New Rudder, July 2014
The Inside-Out Rudder, March 2010

Awlfair
www.awlgrip.com/products/fillers/awlfair-lw.aspx

Standard boatbuilding foam cores, including cross-linked PVC foams like Divinycell and Klegecell or Corecell SAN foams, are often the best choice. Use a minimum density of 5 pounds per cubic foot, or 7 to 8 pounds per cubic foot for boats larger than 40 feet. Thin foam is usually easier to find in full sheets than thick foam, but it's easy enough to glue pieces together to build up the desired thickness for each half of the rudder. We used Corecell M-Foam.

The skin

The skin provides the structural strength for the rudder blade. For a small cost increase compared to woven roving, use stitched double-bias (biaxial) fiberglass fabric with the weave running at +/- 45 degrees to the fabric length. It drapes much better over curved rudder shapes and has higher strength for a given thickness. We used Ampreg 22 marine epoxy resin for its higher strength and better waterproof properties compared to polyester resins.

When rebuilding an existing rudder, measure the thickness of the old skins and duplicate them. A single layer of 9-ounce double-bias fabric will be roughly 0.02 inches thick when laid up by hand, so a ¼-inch-thick skin will need 0.25/0.02 inch = 12 layers. If you choose a heavier fabric, say 12 ounces, then you'll need 9/12 ounces x 12 layers: nine layers. Our relatively small rudder needed five layers. You may wish to apply a final layer of woven 6-ounce cloth for a smoother outside skin.

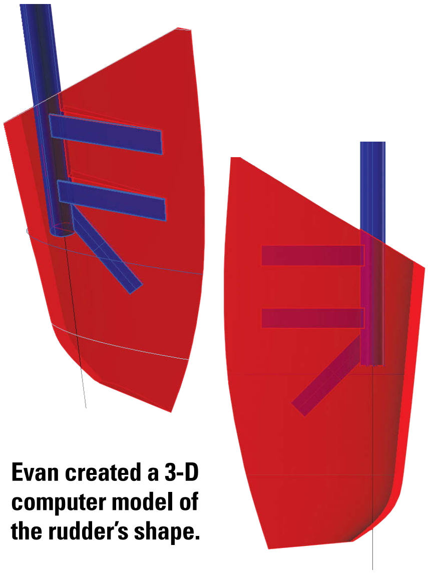
The rudder's shape

Perhaps the most intimidating part of rebuilding a rudder is shaping the core. It's best done with templates taken off the original rudder. If the shape is a regular trapezoid, use one template for the top, one in the middle, and one for the bottom of the rudder. For an elliptical shape, use a few more.

If you don't have the original rudder, or if you are redesigning it for any reason, the low-cost software Profili (15 euros or about $17) can provide scaled templates for airfoil-shaped rudders with trapezoidal and elliptical shapes. You'll need to specify the airfoil name, the height of the rudder, and the chord length (fore-and-aft dimension) at the top and bottom of the rudder (see "Drawing Airfoils," page 47).

Preparing the core

To fit around the stock and webs, the core must be made in two halves. Depending on how you construct your rudder, the process may change a bit, but the steps are roughly the same. For our rudder, Evan created a more sophisticated three-dimensional shape in a CAD program and included the inside cutouts for the rudder stock and webs. We sent the file to an NC (numerically controlled) milling company that milled the foam on a 3-axis computer-controlled milling machine.



Evan created a 3-D computer model of the rudder's shape.

The machined surfaces required about 15 minutes of light surface sanding to remove the tool marks, but it saved hours of sanding work and allowed for a more complex shape than we could have created by hand. The cost for this machining was about $400. A naval architect can probably create a similar shape for you and save you considerable time in the construction . . . but with the addition of design fees and the cost of milling.

If you are shaping the rudder core by hand, after you cut the rough outline of the rudder for the left and right core halves, you'll need to cut out the recesses for the stock and webs. A router works well for the thin recesses for the webs and roughly cutting out the shaft recess. You might do the final shaping with a die grinder or more slowly with a rotary tool like a Dremel.

Preparing the stock and core

Check with your metal supplier or a welding fabricator for advice on which welding electrodes should be used with which alloy for the webs. You'll also have to have the shaft machined for a keyway for a quadrant and/or a tiller connection at the top. Take the old stock if you still have it so the machine shop can copy the required machining directly.

Most machine shops also have the ability to weld the webs to the rudder stock. We had a machine shop cut the

Rudder stock materials

AISI 316L austenitic stainless steel – This inexpensive, moderately corrosion-resistant alloy is the most common stock material. It will corrode in stagnant (oxygen-poor) environments such as inside a wet rudder core. This is often the cause of failure in old rudders. The "L" notation stands for low carbon. It is important to use this grade as the resulting welds are more corrosion-resistant than plain 316.

Aquamet – This is a trade name for a variety of stainless-steel alloys that are typically of much higher strength and more corrosion-resistant than 316. (Similar alloys are marketed as Aqualoy.) These alloys are often used for propeller shafts and can be sourced through propeller-shaft suppliers as solid round bar. Choose Aquamet 19 or 22 for best corrosion resistance. Avoid Aquamet 17, which will have pitting problems in salt water. The main drawback of Aquamet is its high cost.

2205 – This a generic term for a family of duplex stainless steels produced by many suppliers. It is much stronger than 316 and offers very good corrosion resistance. The material is available in pipe as well as solid round bar.

Aluminum – Many European boatbuilders have used aluminum for rudder stocks. Probably the alloy most used in rudders is 6082. It's strong as long as it's not welded in high-stress areas, but is a bit vulnerable to corrosion. It is usually harder to find in North America. The 7075 series aluminum is stronger, but very vulnerable to corrosion unless carefully anodized and is usually only found on racing boats.

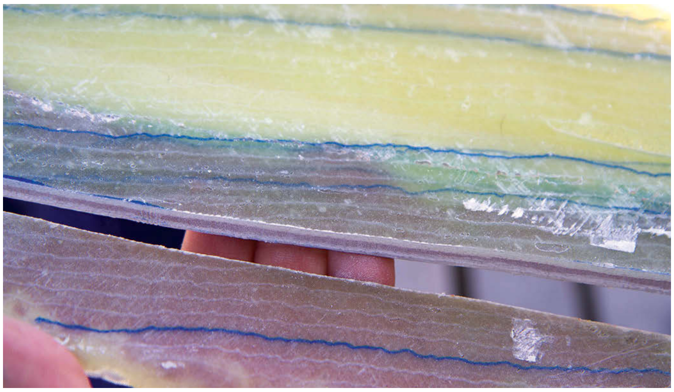
If you're replacing an aluminum rudder stock, make sure you find out from the boatbuilder which alloy to use, as different grades of aluminum have widely varying strengths. As aluminum has different strength characteristics from stainless steel, don't replace a stainless-steel stock with aluminum without consulting a naval architect or professional engineer.

Carbon fiber – This is a great material for high-performance rudders, but the use of carbon fiber is beyond the scope of this article and most good old boats.

Rudder stock materials compared

Material	Typical yield strength (psi)	Corrosion resistance	Relative cost
AISI 316L	35,000	moderate	low
Aquamet 19	60,000*	moderate	medium
Aquamet 22	95,000*	high	high
2205	70,000	high	medium
6082 aluminum	40,000	low-moderate	low

* Aquamet strength decreases as diameter increases. These are the values for 2- to 2½-inch diameter.



Peel ply laid over the final layer of fiberglass, at left, and removed after the resin has cured leaves the laminate with a smooth finish. Clamps and battens hold the trailing edges together helped by epoxy putty, visible as a brown line after the excess glass has been trimmed, at right.

webs for the rudder stock from 316L flat bar and weld them to the stock.

We glued the left and right sides of the cores together and to the stock and webs with an epoxy mixture thickened to the consistency of mayonnaise or peanut butter with colloidal silica and microballoons. We also added a few layers of carbon fiber inside the cores below the metal stock to stiffen the blade (the old core was made of wood, which is a bit stiffer than the foam we used).

For this stage, use ample amounts of epoxy and don't worry about the excess that you squeeze out when you clamp the two halves together; this is no place to skimp on quantities. Clean up the excess and leave it to set overnight.

If your core was NC cut, you can apply the fiberglass skins. But if you are starting with rectangular foam blanks, get out a sander and your templates. Foam sands with little effort. It's easy to cut away too much, so take your time and check often with your foil templates. If you overdo it, fill any hollows with a fairing compound *after* you've laid up and let cure the fiberglass.

Laminating

The easiest way to apply the fiberglass is to support the rudder with the stock horizontal and the leading edge up. Put down a clean plastic dropcloth to catch resin drips.

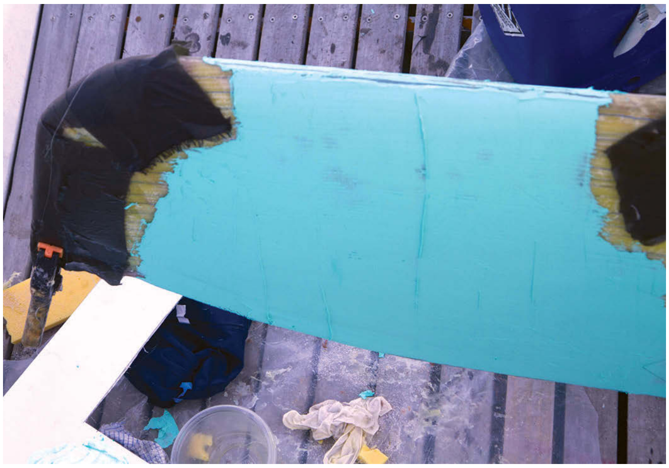
Pre-cut your pieces of cloth to the correct shape. Drape the first layer of cloth on the dry core. While you *can* pre-wet the core and wet out the cloth on a flat surface covered with plastic first (you'll save some resin this way), the wetted out cloth is awkward to handle and difficult to align correctly on the wet rudder. For this job, we applied the cloth dry and wet it out on the rudder.

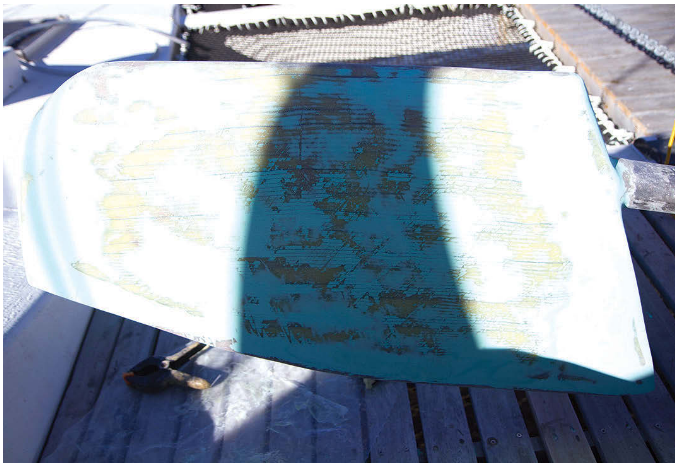
Apply an ample fillet of epoxy resin and some small tabs of glass where the stock meets the core. This is where water typically gets in.

At the end of your laminating session, cover the wet layup with peel ply, which will absorb the excess resin but will not stick to the laminate. It also flattens out the glass cloth. Peel ply is a thin woven nylon or polyester cloth. It's available from specialty fiberglass suppliers, but we've always gone to a fabric store and bought a few yards of cheap ripstop nylon. Apply it over the final layer of fiberglass while the resin is still wet. When you peel it off the next day, after the fiberglass has cured, it leaves a very smooth surface.

It's hard to get the trailing edges of the rudder's two sides to stick together nicely. One trick is to take a few wooden battens, cover them with Mylar packing tape so they don't stick to the laminate, and clamp the edges together.

After the fiberglass had cured, we removed the peel ply and trimmed the trailing edge with a jigsaw. While we've often mixed our own fairing compound, for this job we used a commercial epoxy fairing mixture. (We used Jotafair from Jotun, but Awlfair from Awlgrip is similar and more widely available.) It's





Patches of peel ply covered a few extra layers of glass that were required on the tip, at left, while the rest of the rudder received its first application of fairing compound. Sanding the first layer of fairing compound revealed only some minor humps and hollows, at right.

Evan gave the finished and faired rudder a coat of epoxy primer before the antifouling.

more costly than making your own, but it goes on like butter and speeds up the fairing process because you'll probably have to apply fewer coats to get a great surface finish.

Even with a computer-shaped core, slight imperfections can creep in during the laminating process, so we sanded using a longboard and 80-grit sandpaper. The longboard was a 20-inch-long piece of ¼-inch plywood with a wooden handle screwed to each end. Using a longboard ensures that you're not creating hollows or hills in the final shape. The shape was really good and we spent only about a half hour with the longboard. A light sanding with a 6-inch random-orbit sander and 220-grit paper completed the fairing.

To prevent rudder hum, trailing edges on raceboat rudders are often chamfered at a 45-degree angle to the vertical edge. This is well worth doing on a faster boat. A few passes with a sander held at an angle will achieve this quickly.

The final step is to apply a coat of epoxy primer and then two coats of antifouling to complete the rudder.

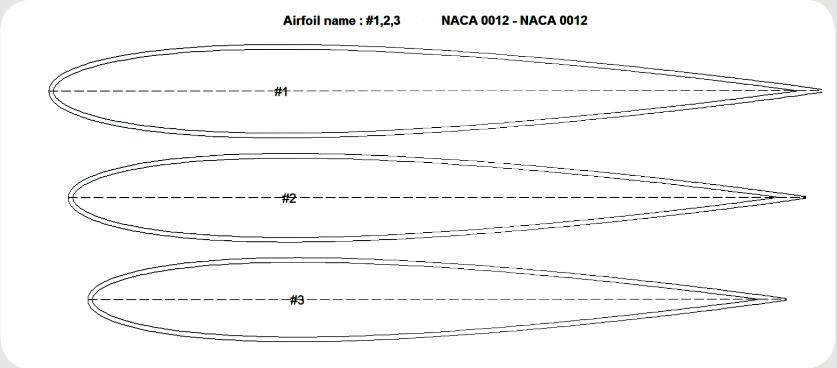
Drawing airfoils

Profili will use the characteristics of the airfoil you select to create a scaled drawing of the required shapes. If you enter the skin thickness, it will also draw to "inside of skin" — the dimensions of the core.

Install a free PDF printer driver, create a PDF file of the template, and take the PDF file to a commercial copy shop with a large-format printer and have them print it out with no scaling. Check the printed templates are the correct length and adjust the scaling if required so your paper templates are the exact chord lengths of your rudder. Glue the paper templates to ¼-inch plywood and cut out the template shapes with a jigsaw. Remember, you will be using the templates on the outside of the foam core, so cut inside the line. Use sandpaper to shape the template to the line and pay particular attention to the nose.

An airfoil commonly used for rudders is NACA 0012, which is a symmetrical foil. The "12" indicates a thickness ratio of 12 percent, so the maximum thickness of an 18-inch cord will be 18 x .12 = 2.16 inches. If this is not thick enough to accommodate your rudder stock and the skin thickness either side, you'll need a thicker foil, such as NACA 0014.

If this procedure sounds too computer-intensive, you can obtain the coordinates for any NACA 00XX foil shape online (see also, "Resources," page 46). Plot them on paper and connect the dots with a smooth curve. Just scale the foil width by the same factor as the chord length.



Profili template output

Time frame

Because we outsourced the shaping of the core, it took only five partial days to build our new rudder.

Day 1 – Smooth out core machining marks and glue to stock.

Day 2 – Apply fiberglass skins.

Day 3 – Fairing compound in a.m., sand in p.m. Apply second coat of fairing compound.

Day 4 – Final sand the fairing. compound, paint with epoxy primer.

Day 5 – Apply two coats of antifouling.

The result exceeded our expectations — a sophisticated rudder shape with a much stronger stock that should be good for many more years of service.

Diane Selkirk is a writer whose work has appeared in many sailing and outdoors magazines. Evan Gatehouse is a mechanical engineer and naval architect who has worked for firms such as Farr Yacht Design, Robert Allan, and Riverside Marine. Currently they and their daughter, Maia, are six years into a circumnavigation aboard Ceilydh, *a modified Woods Meander 40 catamaran. Read about their passages and adventures at http://maiaaboard.blogspot.com.*

Loving Scarlett

Life lessons from an early affair

BY
DON DAVIES

ILLUSTRATION BY
KATERINA DAVIES

There was no name on her hull when I found her, so I called her *Frankly Scarlett* in reference to the closing line of *Gone With The Wind*. That perfectly summed up my attitude at that point in my life.

She stood alone: stark, barren, skeletal — a bone-white hull exhausted upon a scarred, rusted trailer mired past its hubcaps in dark, soupy mud. Alone in the middle of a 2-acre field, she sat on a small island of untouched earth, while all around her neat furrows of freshly broken sod made her look adrift on a choppy, black sea of soil. It was early spring in Hyde Park, Ontario, just north of London, and the owner and I looked out at her with our chins perched on hands resting on the top rail of a split-rail fence.

"I can't sail any more with the arthritis being this bad," said the weather-beaten man painfully. "Now, with the wife gone, it's just a reminder I don't need."

Owning a sailboat was the last thing on my mind. I'd been content to rent J/24s for afternoon sails on Lake Ontario and cruise the North Channel of Georgian Bay on friends' boats. But the man's next words proved seductive. "You'll need to buy a new motor for her. The lads around here swiped that over the winter. I've got all the sails and gear in the barn. If you can get her out of that field, she's yours for a song."

Someone else's dream

I sat alone in the loft of the barn looking through the pictures and documentation. She was a 1975 MacGregor Venture of Newport, 23 feet in length with 7½ feet of beam. She had a 600-pound lead daggerboard that cranked up and down. With it up, she drew 2½ feet; 4 with it down. A pop-top cabin roof lifted to give 6 feet of headroom down the center of the main cabin. A canvas tent covered this extended roof to protect it from the elements.

Easy to rig, easy to sail, and easy to trailer, the sales literature called her the "perfect pocket cruiser." But along with the original sales brochures, I leafed through a thick stack of invoices from various marine stores in the Ottawa area. In all, the total came to nearly $21,000! The original owner had completely redesigned the sail plan. His dream had been to buy a 40-foot sloop and take chartered cruises around the Mediterranean. To test the sail plan and his ability to singlehand a vessel with it, he completely refurbished the MacGregor from the deck up.

Although the length from bow to stern was 23 feet, a 4-foot wooden bowsprit extended her sail platform by more than a sixth of her length. Three roller-furlers on the bowsprit controlled the headsails, their lines all leading to the cockpit. I found the four sail bags and spilled their contents out on the floor of the hayloft. It was all brand-new fabric, pure white with blood red UV trim on the foresails. I gathered everything up and put it in the back of my Toyota 4Runner, then sought out the man rocking on his back porch to ascertain just how much he felt a song was worth.

Resistance

We quickly came to an agreement and, as it turned out, he wound up rescuing me, my Toyota, and the boat when I found I couldn't budge it. He hooked his tractor up to the front bumper of the 4Runner and — with both vehicles under full power — she begrudgingly came out of her muddy grave and finally sat passive, yet angry, upon his driveway. I looked at the rusted trailer, the flattened tires, the mud-splattered hull and could almost hear her saying, "What the hell do you think you're doing? I'm retired . . . I'm finished . . . why didn't you just leave me in peace so I could live the rest of my life as a planter in a farmer's cornfield?"

As I put air in the cracked old tires and replaced bulbs and wiring to make the trailer legal, I felt like a nervous kid who'd summoned a long-forgotten spirit from a genie bottle: "What the hell have I done?"

I checked the thin yellow plastic lines holding her on the trailer. They were old and frayed, but I didn't have anything to replace them. It was quickly getting dark and it would be a long, slow drive down the 401 to Toronto.

I climbed up on her deck and she bounced like a trampoline on the trailer. The yellow rope creaked and strained, but seemed to hold. Then I noticed the triangular anchor hatch at the bow. I opened it to find about 100 feet of coiled, thick anchor line. For no sensible reason that I can think of now, I pulled a length of it up through the opening and tied it to a forward cleat. Then I bounced once more and convinced myself that it would all hold together for the 200-kilometer (124-mile) trip. No doubt, the captain of the *Titanic* had similar convictions about getting through the icebergs of the North Atlantic.

A white-knuckle ride

Driving down the highway at the required hundred clicks per hour (62 mph), I glanced back through the rearview mirror at the bowsprit that was almost touching the rear window of the Toyota. As if afloat upon a gentle sea, the bow rose and fell with a constant rhythm, but never did it rise above the top of the window. It was a cool brisk evening. As traffic sped past me, my knuckles were clenched hard white on the steering wheel. Only 100 kilometers to go.

By the time I was cruising across the top of the city, I had become almost comfortable with the gentle sway of the Toyota and the sharp tugging when we hit a bump. It had been a few minutes since I'd looked back and seen the bowsprit's regular motion up and down in the rear window. But now, at the height of its bounce, the bowsprit passed out of sight above the rear window. The strain on the 4Runner became more urgent, the nape of my neck tingled the way it did before sailing into a storm front, and my gut delivered an unmistakable message to my brain. It was a tough call. Only about 20 kilometers to go until she'd sit safely on my driveway. Pulling over on the eight-lane highway in this heavy traffic would be dangerous. Checking the lines with cars whizzing past me at 120 clicks (75 mph) could be fatal. Still, the bowsprit seemed to stay out of sight above the window for longer periods each time. I gulped hard, flipped on my turn signal, and began to gently pump the brakes. My dim flashlight traced the line of the yellow rope as trucks howled past me six feet away, their backdraft threatening to pull me under screaming wheels. The three braided yellow strands across the bow had become just one thin cord holding 2,000 pounds of boat to the trailer. I wanted very badly to believe that one strand would hold for the rest of the trip. I reached up, grabbed the edge of the deck and, with all my strength, pulled it down. The strain eased on the thin yellow plastic strand and it became loose. I felt the full strength of the forces that were pulling the bow up, threatening to slide the entire boat stern first off the trailer and onto the hard pavement of the highway. I tired and released my grip on the deck. The bow jerked up, and the final strand of yellow rope snapped with a loud ping.

"The bow jerked up, and the final strand of yellow rope snapped with a loud ping."

As the bow was heading skyward, I jumped with both hands to grab the deck and felt stomach muscles that hadn't been used in years get ready to pop. I knew I couldn't hold on for long. Then I remembered the anchor rode I'd left out for no sensible reason. Holding the bow down with one hand, I reached up with the other and groped around the foredeck until I felt the thick round line still wrapped around the cleat. I pulled and it snaked out of the hole in the anchor locker. I quickly switched my handhold on the deck onto the rope. I didn't have the strength to hold it, but somehow managed to get the other end wrapped around the yoke of the trailer. I couldn't pull the bow down to where it had been, but at least I had stopped it from sliding up and back any farther. I secured one knot, then pulled out more anchor line and duplicated the tiedown on the other side of the bow. When it was done, I suddenly felt weak and sat down on the fender of the trailer, my arm, shoulder, and stomach muscles strained and aching, almost oblivious to the steady blur of hurtling traffic before me.

That was the first time *Scarlett* spoke to me, telling me of the danger, letting me know that somehow we'd get through it — together.

Assembling the puzzle

For the next month she sat on my driveway. I took every piece of brightwork off her and refinished it. There was the 4-foot by 18-inch by 2-inch bowsprit, wooden rails with spindles running down both sides of the cockpit, handrails across the top of the cabin, and wooden trailboards that graced her bow. Below, I discovered a propane stove, assorted charts for Bras D'or on Cape Breton Island, and a Porta Potti.

In the V-berth was a tangle of lines, poles, blocks, and swivels, all of which must have had some function. I laid it all out in my driveway and set about figuring it out. The four thick color-coded halyards were obvious: four sails, four halyards. However, there was no forestay on the mast. It took a while for me to figure out that whoever had designed this rig felt that three headsails, each with a wire running the length of the luff, would be more than enough to secure the mast to the bowsprit.

Identifying the mainsail was easy as it had no red Sunbrella, but the remaining three sails had the material running the full length of the leech. It was not until she was in the water with the mast up that I figured out what the designer might have intended. The sail that shackled to the first (sternmost) cleat on the bowsprit was a self-tacking staysail. It was short and ran back to just before the cabin front where its clew attached to a free-sliding traveler. With just these two sails up, tacking was as easy as putting the helm alee: the main would slide around on the stern traveler and the staysail would tack on the front traveler. Somewhat ingenious, I thought. The large headsail turned out to be a genoa that ran back amidships. The smaller headsail was a Yankee meant to fly high and farther out in front, so it secured to the forward furler. Once she was rigged, all the lines came back to the cockpit, where a singlehander could furl the headsails and adjust the sheets.

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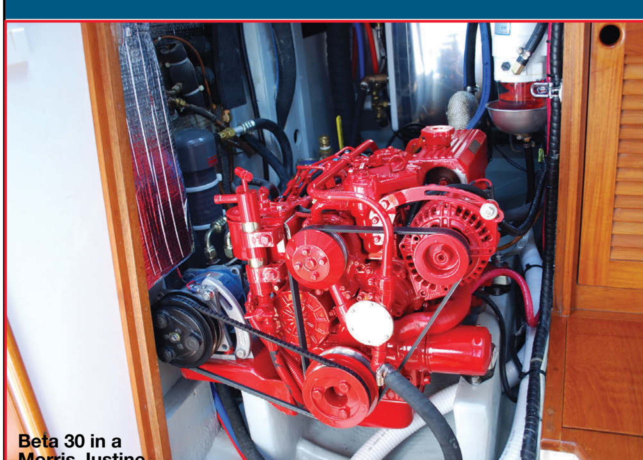

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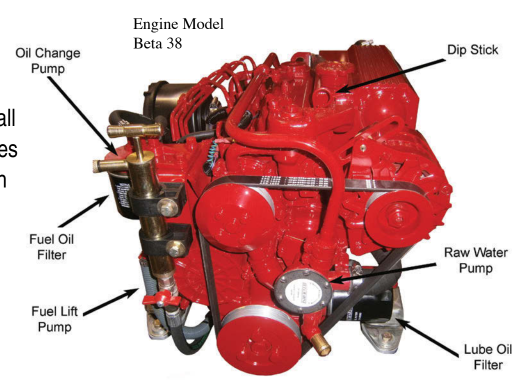

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	Pearson Vanguard
Beta 25	Alberg 35
	Morgan OI 33
	Alberg 37
	Pearson 35

Engine Model	Vessel
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Beta 38	Sabre 38Mk1
	Valiant 37
	Westsail 32
Beta 43	Hinckley B40
	Valiant 40
Beta 50	Bristol 41.1
	Morgan 41 OI
	Morgan 45
Beta 60	CSY 44

Some of our installations

Adventures shared

While at sea, the only problem was that aside from sailing on a beam reach, *Frankly Scarlett* . . . like the fictional character . . . had a mind of her own. She wouldn't point worth a damn and the thin daggerboard meant that on any other point of sail she would respond to the helm pretty much at her whim. Once when we were sailing into Toronto harbor's eastern gap, a very large cruise ship taking tourists around Centre Island signaled loudly that we were in her path. I threw the helm over to the rail, but *Scarlett* being *Scarlett* — together with the dirty air from the huge hull — was dead in the water. With her horn honking and the captain staring daggers at me from his bridge about five stories above, the cruise ship altered course to avoid a collision by no more than 10 feet. The wake almost swamped us, but within a few minutes we were back on course and *Scarlett* was obediently responding to her helm once again.

Later, I was determined to get her home in spite of a 70-mile-per-hour wind right on the nose, a driving rain, and 1½-meter waves. Out on open water, I tacked her back and forth with water to my ankles in the cockpit. After four hours, I had made less than 100 yards headway. It was as if she was laughing at me for my foolishness in being out in a storm like this. Still, her rigging held, she stayed upright, and by nightfall it was all over and I drifted into the darkness of my home harbor in a flat calm sea.

In the years I had her, we had many adventures. *Frankly Scarlett* took me through gales and brought me home safely. She forgave all my mistakes — carrying too much sail, venturing out when all the others stayed in harbor, running aground when the only solution was to crank up the keel and carefully motor out to deeper water — and once she found her way back with only the compass when a wall of fog closed in after we left our dock. I suppose she taught me how to sail, how to endure, how to overcome, and how we are at the whim of the wind gods whenever we set out upon the waters.

After a while, I sought something larger and more comfortable for longer cruises and an enthusiastic young man bought her to sail on Lake Simcoe. As he drove away with a beaming smile on his face, I waved . . . not to him, but to *Scarlett*, knowing she would now embark on the task of teaching this eager young man how to sail. Goodbye *Scarlett*. Fair winds. Safe harbor. And thank you.

Don Davies, after a lengthy career as an advertising copywriter, marketing consultant, and speechwriter, turned his attention to film scripts, novels, magazine articles, and grandchildren. He lives with his wife, Jacqueline, in Toronto and sails his good old Grampian 30 on Lake Ontario. His website is www.dbdavies.com. Don's granddaughter Katerina, who was 14 when she created the illustration, studies art in Toronto. This is her first published artwork.

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Sailing for love and money

A lifelong sailor supports her passion by chartering

BY JOY SHERMAN

It was 2004 when I entertained the thought of a boat of my own. I had just completed the exam for USCG Master. When I took the exam, I had no intention of buying a boat, let alone opening a charter business. I went for my license purely for the end result. I had just come out of a four-year relationship. We had sailed and lived aboard his old schooner. I can say with caution that it was a great experience, perhaps the closest idea to my perception of bliss. But nothing's perfect and, as wonderful as it was, there was good reason for moving on. I had put a lot of time and much effort into that relationship and his boat. At the time of our breakup, not knowing why, I made sure I walked away with a signed record of my sea time.

During this personal transition I was a full-time employee at a local Ivy League university. It was a good job with good benefits, but the everyday lacked the passion I'd always read about others feeling who followed their hearts. Believing that everything happens for a reason, shortly after I got my license my father told me he'd found the perfect boat for me. My thoughts morphed from "Huh, what? I don't need a boat . . ." to "Hmm, interesting."

"Why get your license if you're not going to use it? What's your plan?" he said. (With him, you always had to have a plan.) "Why not start a charter business?"

Why not? I had crewed on private yachts for several years out of college. I'd served wine and well-prepared meals to many a distinguished guest, traveled to exotic destinations aboard fine yachts, and got paid for it. Great customer service was not a cliché; it was imperative for success as it is in any service field. I had accumulated years of sailing and boating and customer-service experience, it's true, but I also yearned for something new and creative, something that would take me away from the long-term predicament of my 9-to-5 job and back to sailing regularly, meeting new people, and experiencing some awesome sunsets. To be clear, I continued my 9-to-5 job. To that, I added long hours doing something I loved to do.

After taking a look at my father's idea of the perfect boat for me — an easy-on-the-eyes, seakindly boat — I cautiously fell in love. She looked to be in great shape, which was a good start. Further inspection, however, revealed she was in need of new decks. The balsa core was wet. Repairing it was a big job, but the insurance company would not let me charter the boat until it was completed, so I made it part of the negotiations. Within a few days I became the proud owner of a sweet 1963 Pearson Alberg 35.

A business takes shape

That was in October 2004. I had most of the winter to take care of the decks and other facets of this new business, including a logo, website, business cards, and marketing. The website was by far the hardest of all the tasks. Writing is easy for me, but thinking

Joy earned her sea time on luxury yachts, used it to qualify for her captain's license, and charters *Hado* on Long Island Sound.

***Hado*, at left, needed a fair bit of work before Joy, below, could put her into charter, but her classic looks and ease of handling make her an ideal platform for showing people the pleasures of sailing.**

about how to fill the pages of a website was a daunting task. In spite of this, the passion unleashed in me by the idea of sailing again and getting paid for it lit up a drive that found me working late into the night on this business venture.

I had to come up with a marketing plan, and I attended many chamber of commerce and other business meetings to tell as many people as possible of my new undertaking. I had decent experience with computers but was no expert, yet with some online instruction and time, I was able to create my own website. At a free small-business meeting, I learned about the technical part of hosting and page rank that proved to be invaluable.

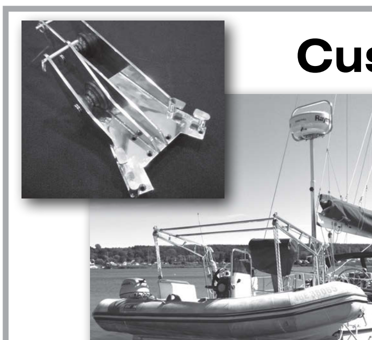
Over the past 10 years, my business, Joyride Charters, has steadily grown. It's been a constant effort to look for new ways to expose the business to different markets and keep up on social media.

I recently redesigned my entire website. I had to make the dream continue to work. Five years ago, I made more room for sailing by switching to a part-time job at the university. Note that I still haven't given up my day job. And further still, I'm in the process of reinventing myself and my captaining gigs yet again. This might include selling my beloved *Hado*.

If you're thinking about becoming a captain and chartering your boat, I highly recommend you do it for the fun. Although you surely won't make a living at it, you should be able to pay your charter business expenses, including upkeep of your vessel. What could be better than having your habit paid for?

It takes lots of patience and sweat equity to maintain a boat and run this kind of business, so do it for your love of sailing. Any sailor will tell you, it's about the journey . . . not the destination.

Joy Sherman learned how to sail and drive powerboats from the age of seven. As a child, she lived aboard her father's 60-foot wooden powerboat in the Bahamas and Miami and was even driven to school in a Boston Whaler. She worked summers restoring wooden sailboats and, after college, signed on to a 130-foot converted Danish hospital ship as a stewardess. For four years she traveled from Maine to Florida and the Caribbean, working aboard large luxury yachts as stewardess, chef, and first mate, experience that years later helped her obtain her USCG Master 100-ton license. Since purchasing Hado *in 2004, Joy has been in business as Joyride Charters (www.joyridecharters.com) in Westbrook, Connecticut,.* Hado *was* Good Old Boat*'s cover girl in March 2015.*



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Battery à la carte

Cooking up volts in the galley

BY CONRAD COOPER

Jones was a large man who said everything with a smile, even if he was insulting you. As I walked into the marina's restaurant and bar, a favorite hangout for boaters, I heard him blurt out with a volume that echoed off the walls, "That's crap! It can't be done."

Scott was a quieter, softer-spoken kind of guy who replied simply, "Hey, I'm just telling you what I saw on the Discovery Channel last night."

Jones noticed me and, without a hello or greeting of any kind, stated: "Doc, help us settle an argument."

It was the quiet time for restaurants; the lunch crowd had departed and the dinner crowd had yet to arrive. I found a comfortable bar stool three seats down from Jones and Scott. Sally, the barmaid, wore her typical Hooters-inspired outfit and instinctively grabbed a cold mug and started filling it with draft beer.

I asked her, "What's the debate today?"

With a thick southern accent that suited her personality well, she replied, "Something about batteries."

Jones looked at me and got back to his original thought, "Did Thomas Edison have an electric boat that could travel 70 miles on a single charge?"

I finished a sip of beer and replied, "It's true and, if I remember correctly, it could carry about 20 people."

I continued with a bit more information, "Batteries were different back in the early 1900s: different materials, different acids. Most of them were what they call 'Primary Batteries.' After they'd go dead you'd throw them away, like your typical AA or AAA batteries."

Scott was curious. "They weren't lead-acid batteries like in my car?"

I responded, "Nope, I forget what these were made from, but you can make a battery out of most dissimilar metals. I saw a guy on YouTube make a battery out of a lemon, a piece of copper, and some steel."

Jones pounced on my comment. "Are you saying you can make a battery?"

The conversation seemed to have turned into an inquisition. "I think so. I could probably make one that can power up a handheld GPS or an LED flashlight or maybe one that can even create a spark to start a fire."

Jones gave a snort of disbelief before giving his less than eloquent response: "Bull****."

The challenge

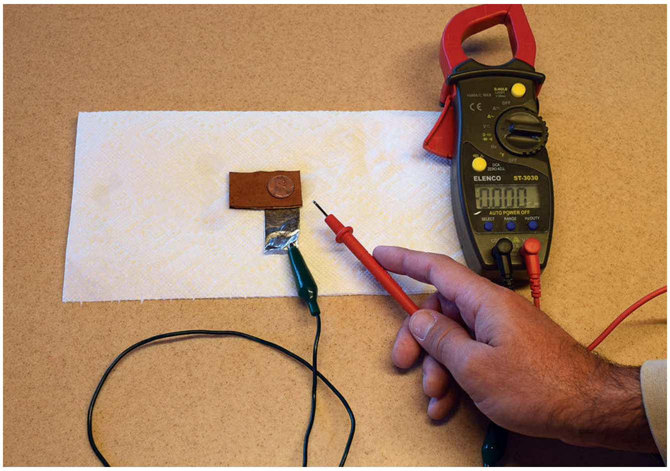
The large windows that usually provide a picturesque view of the marina showed dark clouds on the horizon and rain began to fall. I made myself comfortable on my bar stool, took a sip of beer, and replied, "What's the bet?"

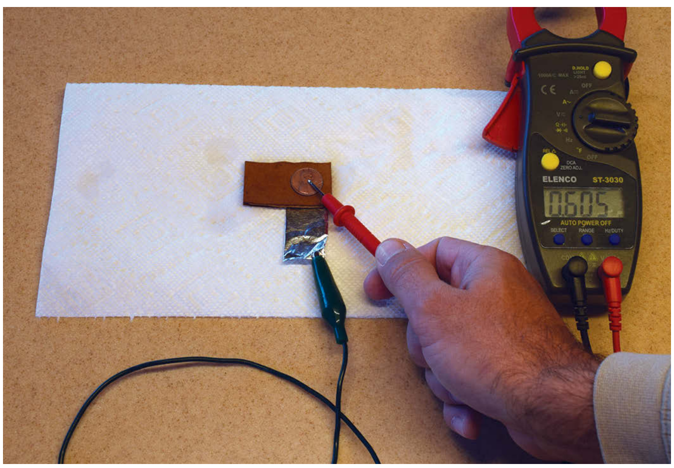
Jones put some thought into it, "OK, MacGyver, you've got to make a battery using only stuff that can be found on a typical sailboat or you owe me a beer."

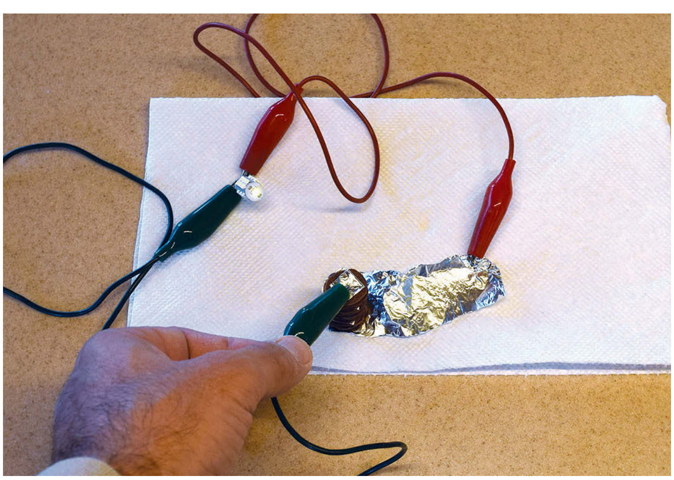
I liked the challenge, but I wanted a little entertainment for my efforts, "Can I attach it to your tongue when I'm done?"

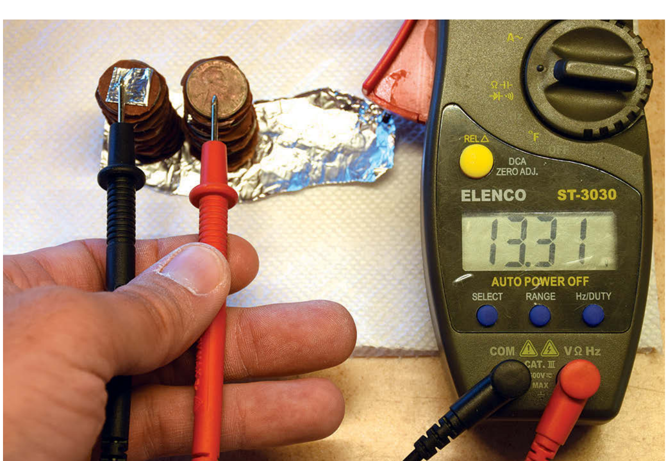
He pondered the proposition for a quick second and responded, "Sure, but when I don't flinch you're gonna owe me *two* beers."

All that's needed to create a homemade primary cell is vinegar, salt, aluminum, copper, and paper towels or cardboard, above. When connected in series, 19 of these cells will form a battery with enough power to light up a 12-volt, 25 LED bulb, at top of page.









At left from top: A simple cell can be made with a piece of cardboard that has been soaked in a solution of salt and vinegar sandwiched between aluminum foil and a copper penny. An aluminum-copper cell will produce approximately 0.6 volts. Stacking several penny cells, as with batteries in a flashlight, will increase the voltage. A small stack of penny cells can produce enough voltage to light up a single LED. A stack of 24 of the little cells made a battery that produced 13.3 volts.

I addressed everybody who was listening, "I will need 20 pennies, aluminum foil, salt, vinegar, cardboard, scissors, and duct tape."

Everybody looked at Sally who, without having to be asked, went about collecting what I needed.

They all watched me closely. I poured vinegar and salt into a bowl and tossed in all of the pennies. Answering the raised eyebrows I explained, "It's to remove the clear coating and expose the copper."

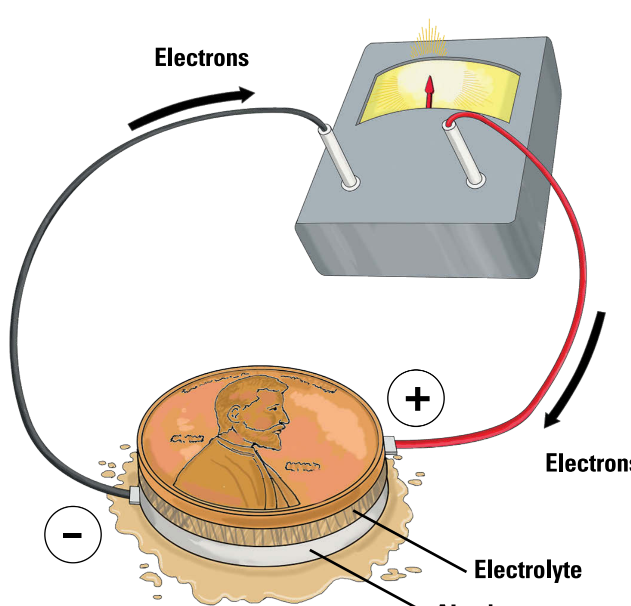
I began cutting out small discs of cardboard and aluminum foil the same size as the pennies, 20 each. I tossed the cardboard discs into the vinegar too.

Scott asked, "What's the plan here, Doc?"

I continued working as I responded, "I will sandwich a piece of vinegar-soaked cardboard between a penny and a piece of aluminum foil and that will create a battery. Most batteries are a form of rusting. When steel turns into rust, it loses electrons. My aluminum here is going to do its form of rusting and lose electrons."

Jones looked at my small battery, chuckled and remarked, "Hurry up, Doc, I'm thirsty for a free beer."

ILLUSTRATION BY FRITZ SEEGERS



Connecting the two metals with a wire allows electrons released by the corroding aluminum to flow to the copper, above. The salt-and-vinegar electrolyte initiates and sustains the corrosion process.

Greater surface area of the same metals can create a more powerful cell. Strip a strand of copper wire and insert one end in a ball of bronze wool, at left. Completely enclose these items in a paper towel that has been soaked in a solution of salt and vinegar, center, and set them on the aluminum foil. Fold the aluminum foil over and pinch the edges together to seal and complete the cell, at right.

I continued, "But electrons have a very strong repulsion to one another like . . ."

Before I finished my sentence, Scott chimed in with a big smile, "Like the female race has to our friend Jones here."

Jones gave Scott a quick disapproving glance as I went on, "These electrons will push against each other like bubbles in a soft drink. When you unscrew the cap of a Coke you hear the bubbles being forced out. Turning on an electrical switch is like unscrewing the cap on a soft drink except you let the electrons escape. When we attach this to Jones, the electrons should be pushed from the aluminum, through his tongue and to the copper, giving him a good jolt."

Jones looked a bit worried as I created 20 of the small batteries and then stacked them together, one on top of the other like batteries in a flashlight. I used duct tape to hold the whole contraption together and rolled aluminum foil into wires to help connect the battery to Jones' tongue.

With my battery complete, I asked Sally for a pinch of steel wool. When Jones began to protest the additional material I said, "It's just for a test."

I touched the two homemade wires to a cotton ball-sized clump of steel wool and — like magic — it began to glow red. When I touched a piece torn off a napkin to it, the paper caught on fire.

Jones looked apprehensively at the burning steel wool in the ashtray, but everybody else was grinning. Sally was almost giddy with delight and addressed Jones, "All right, Big Boy, get your head down here to the bar so we can attach this thing to your tongue."

Jones was more mellow than usual and raised his hands as if he were at gunpoint, "OK guys, I concede."

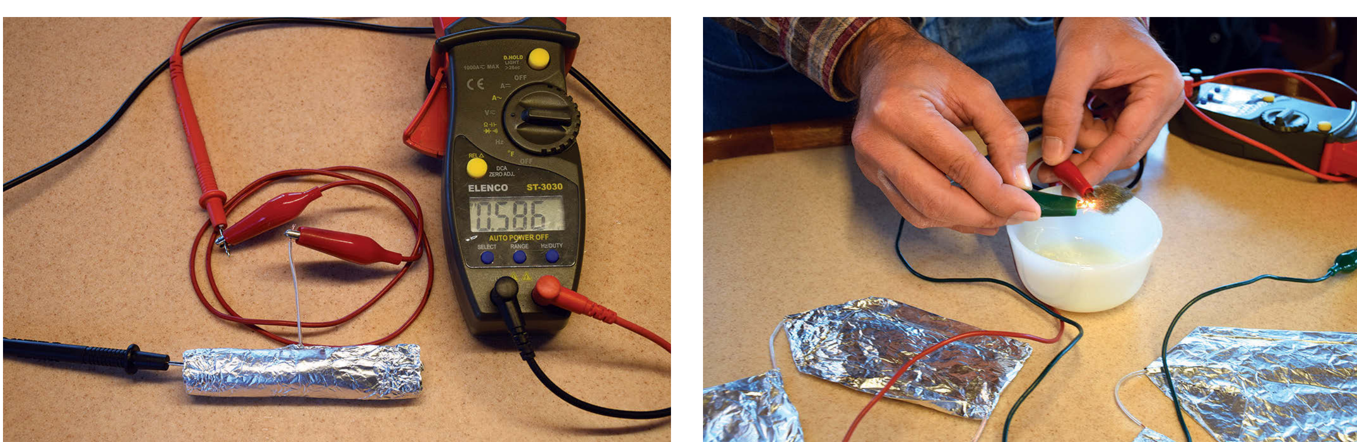
Sally became our spokesperson and in a sharp, but friendly, tone replied, "That wasn't the bet. Get on down here or be prepared to be ridiculed for the rest of your life."

Jones slowly turned his hat around backward and lowered his chin to the bar. Sally moved in closely with the homemade battery. A couple of the regulars got out of their seats and stood next to Sally to watch the show.

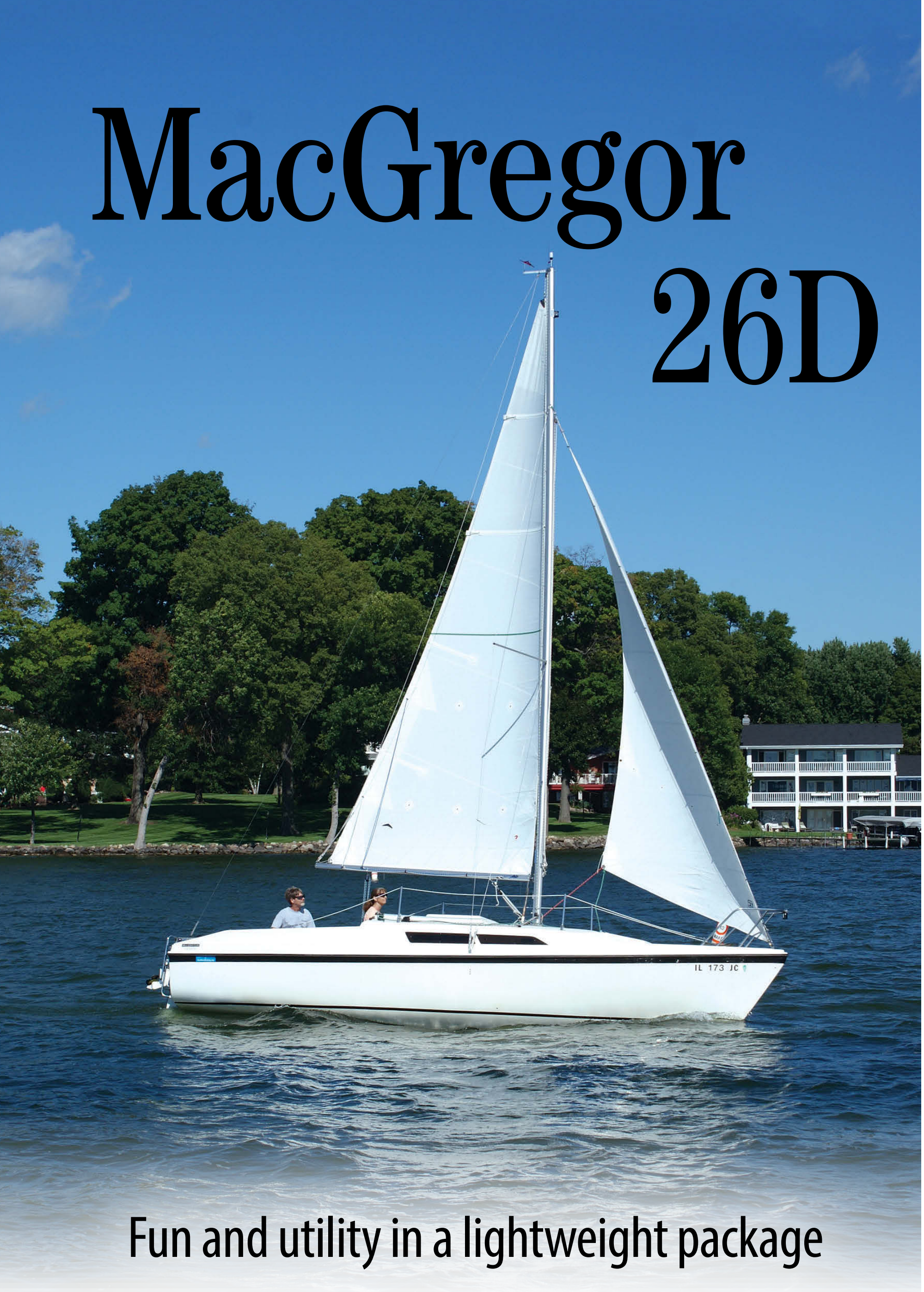
The rain had stopped. As I headed toward the door I heard a strange yelp followed by a lot of laughter.

Just as I closed the door, I heard someone holler, "Shock him again!"

Conrad Cooper is a published author (Own Less & Live More) *who enjoys writing about boats and the cruising lifestyle. Conrad and his wife, Roxanne, are currently refurbishing their third boat and cruising the Gulf Coast. Visit their blog at www.LifeOfLatitude.com.*



The larger cell can be made fairly compact, at left, but no matter how compact or large it is, a single aluminum-copper cell will only produce 0.6 volts. It will, however, take longer to discharge. When connected to a small number of these cells wired in series, a cotton ball-sized wad of steel wool will begin to glow red, at right, and create enough heat to ignite a piece of paper towel.



MacGregor 26D

Fun and utility in a lightweight package

BY TOM WELLS

When we were looking for a MacGregor 26D to review, we found one nearby — a 1989 model that Allen and Ruth Penticoff bought new and named *Thebote*. Allen is one of *Good Old Boat*'s contributing editors but, because it's not the magazine's policy for contributors to review boats they own, I drew the assignment. My wife, Sandy, and I traveled to Lake Mendota in Madison, Wisconsin, to meet Allen and Ruth for a day of sailing and fun.

Lake Mendota lies on the north side of Madison and much of its south shore is home to the University of Wisconsin campus. There is a lot of activity on the lake, including racing fleets and parks with convenient launch facilities around the lake. We met Allen and Ruth at Marshall Park on the lake's west end.

Allen's sailing fleet has included several boats over the years. In addition to *Thebote*, he currently has an American 14.5 and a classic 42-foot Beister steel cutter, *Coppelia*, which currently resides in a large pole barn at their Rockford, Illinois, home under long-term restoration. Winter doesn't stop Allen from sailing as he owns a DN iceboat.

Ruth and Allen like to travel and have taken *Thebote* to a lot of interesting sailing venues, including all of the Great Lakes, Kentucky Lake, Mark Twain Lake in Missouri, and the Florida Keys to name a few. They are often accompanied by their expert sailing dog, Berghie, a miniature Schnauzer.

Allen and Ruth Penticoff sail ***Thebote*, their MacGregor 26D, main picture, wherever they feel like trailering her. One big factor enabling them to do so is the relative ease with which they can raise the mast, above.**

MacGregor Yachts

Roger MacGregor might just be sailing's Henry Ford. From the 1960s until he retired in 2013, his MacGregor Yacht Corporation produced more than 38,000 affordable, easily rigged and handled boats that brought sailing within reach of anyone with the itch to learn.

Roger formed the company in 1964 as a master's degree project and began producing a line of smaller fractionally rigged trailerable sloops, ranging in size from a 17-foot daysailer to a 24-footer with reasonable accommodations for overnight or weekend cruising. The MacGregor facilities in Costa Mesa, California, became a very busy operation.

In 1974, MacGregor introduced a 25-foot swing-keel Venture model with improved accommodations and standing headroom in the saloon under a pop-top. In 1980, the cabin trunk was widened and the sidedecks eliminated to provide greater space below. The Venture name was retired and the boat became the immensely popular MacGregor 25, of which the company produced more than 7,000.

Always looking for ways to improve his customers' experience, Roger ceased producing the MacGregor 25 in 1987 and introduced a 26-foot boat with a similar hull form and nearly identical rig but with a daggerboard and water ballast instead of the heavy cast-iron swing keel. A modification in 1990 gave it a lightweight swing keel/centerboard. The daggerboard version, like *Thebote*, is informally called the 26D, while the swing-keel model is often referred to as the 26S.

Roger kept his costs low, and the base price for the boat and trailer remained at around $9,900 throughout production, which continued until the launch of the 26X in 1995. The new boat was a radical departure from traditional sailboat design, being more of a hybrid sail and power craft developed from an earlier 19-foot attempt at a hybrid boat. (A review of the MacGregor 26X appeared in the May 2013 issue.) A refinement of the 26X was introduced as the 26M in 2002.

MacGregor Yachts also produced a 36-foot trailerable catamaran, a 65-foot race-oriented boat, and a 70-foot racer-cruiser, but the bulk of production was always the smaller trailerable cruising sloops. When Roger retired in 2013, his daughter Laura MacGregor Sharp and her husband, Paul, started Tattoo Yachts in Florida, offering a boat quite similar to the MacGregor 26M. They have since introduced a new 22-foot model.

Construction

MacGregor 26D hulls are a solid fiberglass layup with a gelcoat outer surface. Owners report occasional gelcoat cracking and crazing — as occurs in many fiberglass boats. The layup is not overly heavy, but the hull, fiberglass interior liner, and stringers together make up a fairly stiff composite structure. In earlier boats, including *Thebote*, the deck is cored with plywood, and in later models with balsa, except in high-load areas. The hull-to-deck joint is a through-bolted shoebox lap joint with an aluminum extrusion covering the bolts. A neoprene rubber section snaps into a groove in the aluminum extrusion to finish the rubrail assembly. A dedicated motor well inboard of the transom on the port side eliminates the need for a bolt-on motor mount, but it lacks a fuel-tank locker.

The transom-hung rudder is a fiberglass blade section mounted in an aluminum channel that extends upward to provide the tiller attachment. The rudder is hollow and fills with water to give it negative buoyancy. It is raised and lowered with lines that tie to a horn cleat on the rudder bracket. The hollow daggerboard also fills with water so that gravity assists in lowering it.

The water-ballast system greatly reduces trailering weight. Upon launching, opening the air vent and the main valve located below the companionway ladder allows controlled filling of the ballast tank. Both valves are then closed for sailing. Back at the ramp, the air vent and main valve are opened again to drain the ballast for trailering.

As an added safety feature, the 26D has built-in foam flotation, rendering it unsinkable.

Rig

The MacGregor 26D's aluminum mast is deck-stepped in a tabernacle. The forestay and backstay are attached at the masthead with clevis pins and cotter rings. The only standard turnbuckle provided with the boat connects the forestay to the stem fitting and is used for the final rig tension adjustment. On the shrouds, vernier-style dual-channel fittings at the deck ends can be tensioned incrementally using

Comments from owners of the MacGregor 26D

Dislikes: Poor wiring. It's assembled with lamp wire and cheap automotive splicing. Limited headroom except when pop-top is open. Too small and too few cleats. Very plain. No good place to install a traveler.

Likes: No external wood. Water ballast makes it light and easy to tow. Pop-top for standing headroom. Self-bailing cockpit and dedicated motor well. Light mast is easy to handle. Minimal maintenance required.

–Bud Gates, Ridgecrest, California

This is a low-cost production boat, which puts it in the price range for many who would have to do without a boat otherwise. Being able to move into shallow waters is a big plus with the board up and rudder in kick-up position.

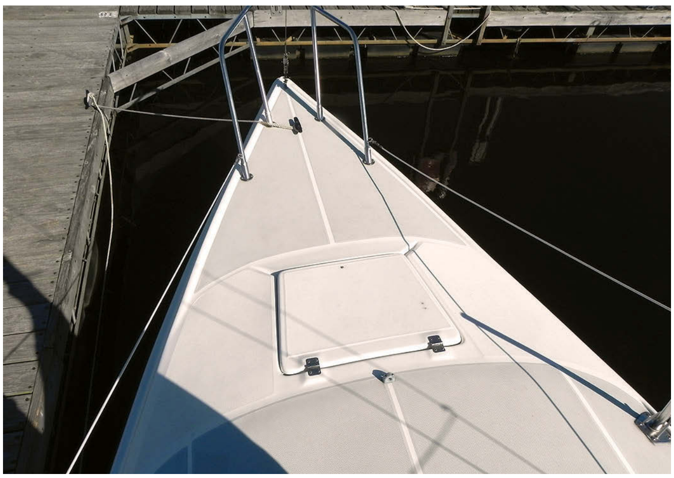
–Dave and Jeanne White, Detroit, Oregon

I do a lot of racing and can beat many larger boats in the bay. It sails up to its PHRF rating very well. It is a light boat with an easily driven hull. In the bay, I use a Honda 2-horsepower outboard and it pushes the boat great. The sail plan is simple and the boat is easily handled by one person with the working jib. I do wish it had more storage space. The interior does not leave many areas to put an ice chest or food for more than a long weekend. The factory rudder is woefully inadequate. Fortunately, a number of manufacturers make aftermarket accessories, like rudders made of HDPE. The best one I have found is from ruddercraft.com.

–Joe Dumbauld, Chula Vista, California

I race the boat against other boats (Catalinas, San Juans, Hunters, S2s, Morgans, Impulse 21) and it has comparable pointing and downwind characteristics. It's fast and light. Leaving the ballast in the lake for trailering is definitely a plus. I will say the build quality is poor, although it has held together in some pretty rough conditions. The cockpit is shallow. It's OK, but would be much more comfortable if it was a few inches deeper.

–Jimmy Harrell, Lake Sinclair, Georgia



The foredeck of the 26D is unusually clean, above left, but could benefit from a larger mooring cleat and chocks to keep the docklines and anchor rode off the molded-in toerail. The nicely sculpted cockpit, above right, has tall backrests, an outboard motor well, and a bridge deck to keep water out of the cabin. The lazarette, below, is a good place to store docklines, a spare anchor, and other gear.

a cotter pin through unequally spaced holes in the two channel sections. *Thebote* has this stock arrangement but some owners have replaced these with standard turnbuckles. The stainless-steel chainplates for the backstay and the upper and lower shrouds are through-bolted onto the hull.

The aluminum boom mounts to a pin attached to the mast and is fitted with a cleat for the outhaul line at the aft end. Stock mainsails have no slides on the foot or luff and are attached by boltropes that fit into grooves in the mast and boom that can also accept slugs or slides. Allen modified *Thebote* by adding slides to the mainsail, as well as two reef points with jiffy reefing, and leading the halyards to the cockpit.

Raising the mast is a fairly simple matter for two people in reasonable physical condition. Only the forestay needs to be detached for trailering, and when the mast heel is moved back from its trailering position and pinned into the tabernacle, the mast can be raised by one person lifting it from the cockpit and walking it forward while the other walks the forestay to the bow. Once the forestay is attached to the chainplate with its clevis pin, the rig is stable. The rig tension can then be adjusted with the turnbuckle.

MacGregor also offered a simple gin pole with a block and tackle that makes it possible for almost anyone to rig the boat. A stock MacGregor 26 had a plate in the forestay for attaching the gin pole, but that prevented the jib from dropping all the way to the deck.

We watched as Allen and Ruth easily rigged and launched *Thebote* without a gin-pole system. They have removed the mast-raising plate from the forestay and added a tensioning lever for quick setup.

On deck

The MacGregor 26D's cabin trunk extends across the beam of the boat, so crew going forward must step up and onto the cabintop. There are no grabrails, but the shrouds and mast are close enough to provide handholds.

Resources

The MacGregor company no longer offers direct support, but many resources are available online.
They include: http://forums.macgregor.sailboatowners.com
www.macgregorSailors.com

For parts and accessories, Blue Water Yachts is a reliable source:
www.bwyachts.com

The pop-top section rests in molded channels that keep water out. The companionway hatch slides in aluminum rails within the pop-top section. There is no sea hood. A one-piece fiberglass dropboard closes off the companionway. Allen has fabricated a clear dropboard and also one with a screen.

The foredeck is uncluttered, with just a single mooring cleat on the centerline. A stainless-steel pulpit provides some security at the bow but the single lifelines are attached lower down on the aft legs of the pulpit to allow a genoa to sweep the deck. This means that crew working forward must take care not to trip on the low lifeline. The molded-in nonskid on the deck and cabintop surfaces is aggressive and effective.

The cockpit is adequately sized with seats well over 6 feet long on which four can sit without obstructing the tiller. The seat surface crosses at the companionway to form a narrow bridge deck and there's a deep lazarette on the starboard side aft opposite the motor well. High coamings sweep slightly upward to the cabin trunk and provide decent back support. (In its first production year, the 26D had lower, flat coamings topped by a stainless-steel rail.)

Jibsheets, for the standard working jib and the genoa, are routed through well-placed fairleads (there are no tracks) to Lewmar 6 winches and cam cleats mounted on the cabin trunk to port and starboard. Trimming is quick and easy, and Allen has set up

Under the flush deck, generous sitting headroom extends out to the hull. The fiberglass interior liner forms the bases for the settees and V-berth and includes a small counter with a sink and space for a portable stove, the battery switch, and the electrical panel. The daggerboard trunk is at the inboard side of the counter.

Thebote so that crew can handle the cleats and winches while sitting in the companionway.

The mainsheet is attached a few feet from the aft end of the boom and leads to a stand-up swivel fiddle block and cam cleat located amidships on the bridge deck. That puts it within easy reach for the helmsman to make quick adjustments to the mainsail.

Belowdecks

Headroom in the MacGregor 26D's saloon is 6 feet 2 inches with the pop-top up. (MacGregor offered a pop-top enclosure for inclement weather.) To port and starboard are comfortable settees with good sitting headroom above and storage beneath. The shorter starboard settee ends at the galley, where the liner forms a small sink and a counter with space for a camp stove on top and storage beneath behind smoked-Plexiglas doors. A hand pump delivers water to the sink from a standard 5-gallon tank. Many owners augment this limited supply.

The simple electric panel is located on the cabinet front. An upholstered panel at the inboard side of the galley is actually the trunk for the daggerboard. Above the galley, the liner forms a foam-filled box beam that stiffens the deck at the mast step. This is often used for mounting auxiliary equipment such as the VHF radio.

Forward of the galley there is a compartment for a portable toilet. Allen and Ruth store onboard supplies in a clear-plastic shoe organizer mounted on the inner face of the door that encloses it. The V-berth lies forward of this enclosure and at the end of the port settee. It is more than 6 feet long and just over 5 feet wide at the entry — a tight fit for two people, especially if both are tall. A large hatch provides ventilation.

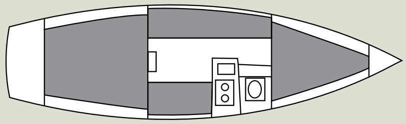
Considerable storage space is available under the berth, and Allen has enlarged the opening and installed hinged covers to make access easier. This is where they keep their primary anchor and its rode.

One of the selling points for the 26-foot water-ballasted model was increased usable space below. The entire area beneath the cockpit was designated as a wide double berth. It's a very spacious area and could be a quite comfortable double, but in practice anyone spending much time aboard tends to use the space for storage.

Ventilation below is adequate with the pop-top up and the forward hatch open, but in inclement weather airflow is limited as there are no deck-mounted vents or opening ports. A rain cover rigged over the forward hatch would be a good investment.

MacGregor 26D

Designer	Roger MacGregor
LOA:	25 feet 10 inches
LWL:	23 feet 6 inches
Beam:	7 feet 11 inches
Draft board up:	1 foot 3 inches
Draft board down:	5 feet 4 inches
Displacement:	2,850 pounds
Ballast:	1,200 pounds
Sail area:	236 square feet
Sail area/disp. ratio:	18.8
Disp./LWL ratio:	98

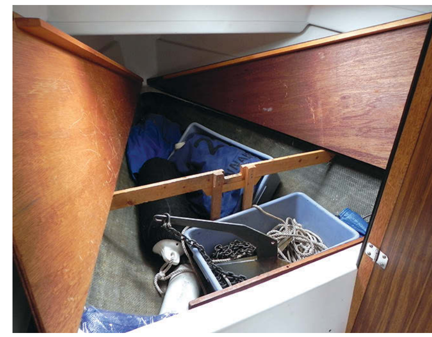


Under power

Thebote has a 6-horsepower Johnson Sailmaster outboard that moves her along quite nicely. It has a longer shaft, but tilts far enough forward on its mount to keep the prop out of the water under sail. Allen and Ruth gave me little opportunity to test the performance as they much prefer to sail.

Under sail

On our day on Lake Mendota, winds of varying strengths gave us a chance to experience how the MacGregor 26D handles in a number of conditions. Sandy and I owned a MacGregor 25 for a number of years, so we had some idea of what this boat might be like. When I first took the tiller, it did feel a bit like coming home to an old friend. She responded quickly to the helm and although her initial tenderness was a bit more than we had anticipated, she stiffened up once she heeled a few degrees. Her light-air performance was



A large area under the cockpit, at left, is intended to be a generously proportioned berth, but it is often filled with sails, personal effects, and other gear. Allen and Ruth store toiletries and sundries in clever hanging pockets on the back of the door that closes off the portable toilet forward of the daggerboard trunk, center. They store fenders and ground tackle in the huge space under the V-berth, at right.

good, even with the standard working jib. We tacked a few times as the wind built, and sailing at 35 degrees to the apparent wind was a snap. We could have sailed closer, but footing off a bit for speed improved the ride. There was not a lot of apparent leeway.

When we eased off onto a reach, a handheld GPS showed 5.5 to 6 knots as our speed over the ground. With little current in the lake, that's an accurate idea of speed through the water. The wind was indeed building and we saw at least one racing scow capsize, so that gave us confidence in *Thebote*'s stability.

On a run, the boat is stable, although it does roll a little, likely as the mainsail loads and unloads in the waves. We were always under control and, in lighter air, retracting the daggerboard on a run will add a bit of speed. Allen reports that the MacGregor 26D must be reefed early to stay under control. The rudder can stall before being overpowered, resulting in a roundup. While it sails poorly under mainsail alone, with only the genoa set it balances well and is less prone to rounding up. It even sails well under just the working jib, but only in stronger breezes.

The 26D is quick, responsive, and fun to sail. This is not by any means a boat to be taken offshore, nor was it designed for that purpose. It's an easily trailered, easily rigged small weekender intended to get you on the water and sailing, and it does that quite well. Allen and Ruth have safely sailed *Thebote* thousands of miles in the 26 years they've owned her.

MacGregors are raced in several places. They are excellent light-air performers and if properly sailed can hold their own when the wind pipes up. The 26D's base PHRF rating of 216 matches favorably with that of the Hunter 26, another water-ballasted boat, at 219. For comparison, the traditionally ballasted MacGregor 25 and Catalina 25 both carry a base rating of 228.

The MacGregor 26D is an inexpensive boat that has allowed many people to take up sailing on a low budget. It is not to be confused with the later 26X model that can carry a 50-horsepower outboard.

Conclusions

The common hit on MacGregor boats is that they are flimsily built. While the scantlings are somewhat light, the MacGregor 26D has proven to be a simple and sound boat. A large number are acquired by novice sailors, many of whom, as they gain experience, tend to hold onto their Macs as all the boat they'll ever need.

At any time, a number of MacGregor 26Ds are on the market through brokerages at asking prices ranging from $5,000 to $11,000. Most listings indicate that the trailer is included. Many more boats are offered for sale by their owners. When the newer 26S is included in the search, the number of available boats doubles.

Tom Wells is a contributing editor with Good Old Boat *(and he has also earned the honorary title of Troubadour through his musical contributions at boat shows). He and his wife, Sandy, have been sailing together since the 1970s and own and sail a 1979 Tartan 37,* Higher Porpoise.

A portable vise

Turn any flat surface into a workbench

BY CLIFF MOORE

What happens if you find yourself on a sailboat and need a vise for holding either wood or metal while you work on it? I have long admired those boats, generally much larger than my 26-foot Paceship, that had an actual workbench. One major feature of a good workbench is a decent vise.

Owners of small boats have to make do, sometimes the old-fashioned way, by bracing the work piece with a knee while sawing, drilling, or hammering. However, there's a better way.

On a trip to one of the big-box stores, I found a number of vises for sale, some at reasonable prices. Most had a footprint that could easily fit on a 2 x 8 board.

With a little work and some lag screws, I secured a woodworking vise on the side of a 2 x 8 and a metalworking vise, designed to go under a drill press, to the other end of the board. If I was to going to bang on it with a hammer, it should be able to take some abuse. I added wooden jaws to the woodworking vise to limit damage to work pieces.

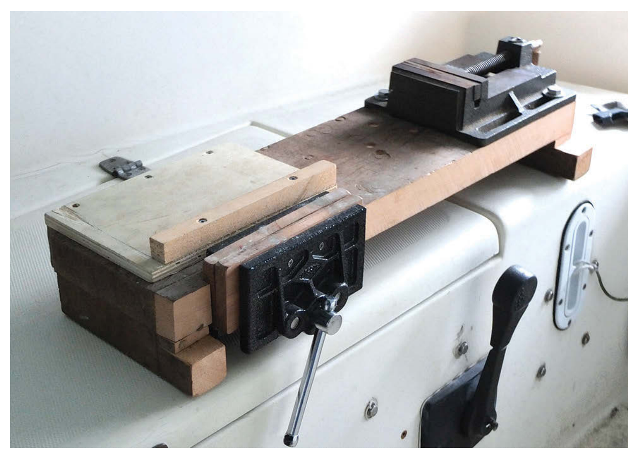
The base needed feet to accommodate the woodworking vise that's mounted on the bottom of the board. I trimmed the feet so any plank in the woodworking vise would also rest on the tops of the feet for additional security. For large work pieces, the base can be clamped to something more secure, such as the table in the cabin or on deck.

The area of the board clear of the vises comes in handy when I need to hammer a grommet into a sail.

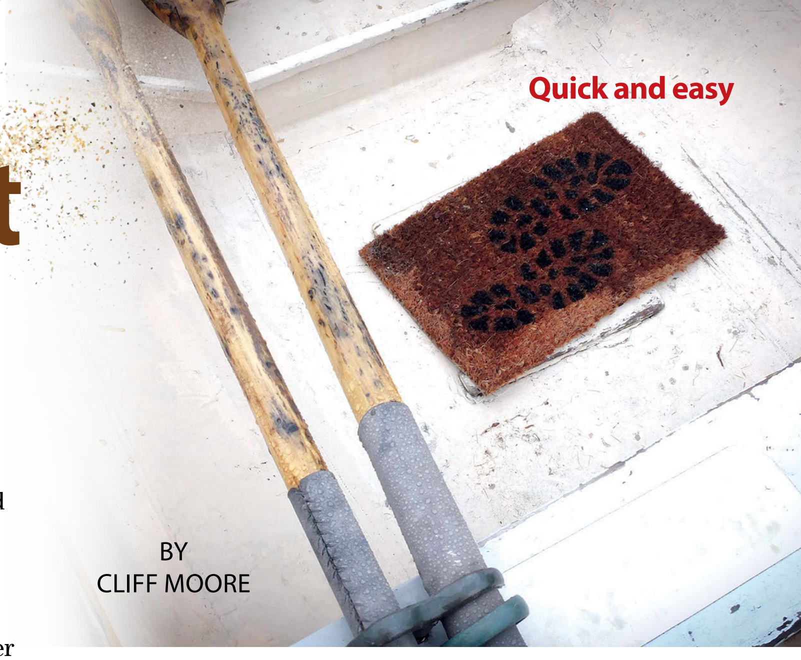
While I was at it, I also made a bench hook, which is very helpful when cutting square to a line. It lives on the portable vise, stowed out of the way when not needed.

The board is 2 feet long and the entire workbench fits in a space about 2 feet by 10 inches wide by 6 inches high. It has some weight, but weight is a virtue with vises.

Cliff Moore's bio is on page 35.



Cliff's portable vise is actually two vises mounted on a length of 2 x 8, top of page. The bench hook, above top, provides a cutting surface with a back for bracing the work piece and is stowed on top of the vise board, above.



Dinghy doormat

Trap dirt and sand before they get on the mother ship

BY
CLIFF MOORE

My sailboat, *Pelorus*, sits on a mooring about a third of a mile offshore. I get to her by dinghy, a plywood Phil Bolger design, that I keep in a boatyard. The yard, like a lot of boatyards on Raritan Bay, took a big hit in Superstorm Sandy. Before Sandy, the launch ramp at the boatyard ended in deep rich black muck. Sandy changed it to sand washed off the beaches and redistributed by monster waves. Some of this sand ended up at the bottom of the launch ramp.

Over time, I got used to it. If I thought of it, I would take off my shoes and wash off the soles in salt water, but a fair amount of muck or sand — sand lately — usually ended up in the bottom of the dinghy. From there, I tracked it onto the deck of my boat.

Then I got an idea. At a local hardware store, where home-style porch floor mats were on sale, I bought for $8 a mat with a heavy scruffy weave, much like that of a scrub brush, capable of scraping off nearly anything up to chewing gum. Well, maybe not chewing gum.

The base is a flexible rubber substance that looks like it wouldn't hold much water. Best of all, it was way too big. I cut it into three parts, so when the first one wears out I will just replace it. The cut size is a perfect fit in the bottom of my dink. When it's full of sand, I rinse it in whatever water is handy, salt or fresh.

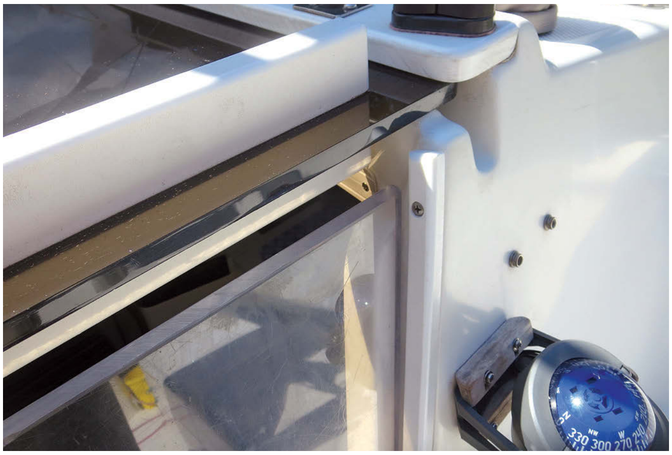
Cliff Moore's bio is on page 35.

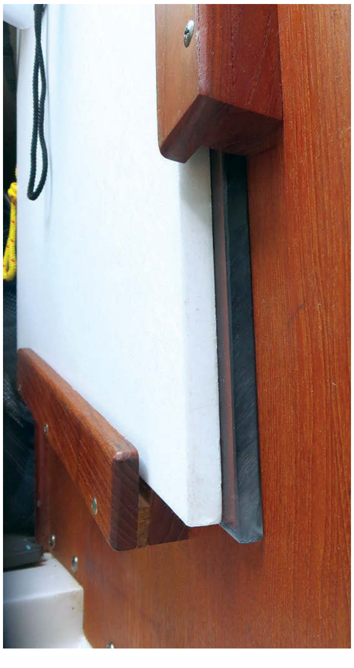
Quick and easy

A see-through hatchboard

Let there be light, even in the cold and wet

BY HENK GRASMEYER





The piece of clear Plexiglas that Henk used for the hatchboard was short by two inches, at top, but that proved to be a good thing as the gap allows for ventilation but, most of the time, does not admit rain. For those occasions when the wind and rain are from aft, a teak strip closes the gap, above. After expanding the storage space a little, Henk is able to stow the Plexiglas board alongside the normal hatchboard, at left.

Before we left home for a year-long land-and-sea cruise around the continent, during which time we would live aboard our 25-foot Catalina, it occurred to us that life inside the cabin would be more pleasant if we could somehow exchange the existing hatchboard with something that would let in light while keeping out the cold. After all, we would spend much of our time below. It would not only brighten the inside of the cabin and give a roomier feeling, but it would also provide an unobstructed view from inside a closed cabin into the cockpit and beyond the stern.

We started looking around for transparent material that would be suitable for making a hatchboard without a frame. It had to be tough to withstand frequent use, easily stored and readily accessible, and require little or no maintenance. It just so happened that a stair railing framework with ⅜-inch clear Plexiglas panels was being taken down at my place of work. Seeing the material, I knew at once that, if it could be shaped to fit the companionway opening, I would have exactly what I was looking for.

Although the available material was sufficiently wide, it was 2 inches shorter than the height of the companionway opening. Nevertheless, using the existing hatchboard as a template, we placed our pattern on the Plexiglas for scribing. I cut it to size using a standard table saw and smoothed the edges and corners with a wood plane. It slid perfectly into the hatch opening while leaving a 2-inch "vent" at the top.

On the day I test-fitted the Plexiglas hatchboard it rained, and I observed that the water that dripped from the horizontal sliding hatch fell onto the Plexiglas just below the 2-inch opening — no water splashed inside.

Since our summer weather in coastal British Columbia includes a fair number of rainy days, having a vent in an otherwise closed-up boat is not a bad thing. However, we needed to add a "vent closure strip" for when the wind drives the rain from astern.

To close this area effectively when it rains, is windy, or is miserable and cold outside, we made a 2½-inch-wide by ⅝-inch-thick teak strip with a ¾-inch Plexiglas overlap. We also added a spacer so we can store the Plexiglas hatch alongside the regular hatchboard in its storage slot. Since it is not a problem to drill Plexiglas, we could add a hasp lock for security if we felt the need.

Smoked/stained ⅜-inch Plexiglas would be a good alternative, but ¼-inch Plexiglas might be a little too loose and likely to rattle unless it's placed in a frame and reinforced in the center. To prevent the Plexiglas hatchboard from slipping when we place it upright in the cockpit, we split and fitted a length of ⅜-inch-ID pressure-water hose to its bottom.

Henk Grasmeyer, a native of Holland, learned to sail at the age of six in a rowboat with an oar and a bedsheet. Later, when living in British Columbia, he owned a Hobie Cat for years. Now retired, he and his wife, Johanna, sail and trail their Catalina 25 all over North America.

continued from page 9

Source for parts and materials

Once again, *Good Old Boat* has published a very timely article, in this case the one by Clarence Jones on his holding tank vent in the September 2015 issue. Can you provide me with the name of the supplier of the parts and materials used in his article?

–Pete Winters, Deltaville, Va.

Clarence replies

Every single item in our list of parts and materials is available at any hardware or home-improvement store. I meant to include that in the article.

–Clarence Jones, Holmes Beach, Fla.

Note: Pete reported that he was able to find suitable parts at a big-box store. **–Editors**

No one noticed?

Photos in Cliff Moore's story about the differing weight of the two Paceship 26s in the July 2015 issue show that the other "Paceship 26" is an O'Day 25. No wonder they float differently. How come no one on your team noticed?

–Roy Kraus, Toms River, N.J.

Now we see it

Good eye! The topside proportions appeared identical, so more fool me. Both were designed by John Deknatel at C. Raymond Hunt Associates. Flipping back and forth between the line drawings at SailboatData.com (www.sailboatdata.com), I see little if any difference in the profiles. The O'Day is a centerboarder at 24 feet 7 inches LOA and the Paceship is 26 feet 6 inches. Also, below the waterline, the Paceship rudder is balanced, but not the O'Day's. There are Paceship PY26s that were built with an outboard option, but I've never seen one. Most have diesels.

On the other hand, my point is the same: both were designed to clear the waterline at the transom just below the turn of the bilge. Because there is so much junk in my Paceship (batteries, tanks, cruising gear, and so on) the transom is immersed a few inches.

–Cliff Moore, Rocky Hill, N.J.

The Paceship 26, above, and the boat Roy spotted as an O'Day 25, at right, do bear a strong resemblance to each other.

Magic under sail

I hope you had a good Labor Day weekend. The weather was absolutely fantastic here and I thought I'd share a great shot of *Magic* under sail. *Magic* is happy to be back in the water for her second season since the rebuild (see November 2014 and January 2015) and the whole family has been having a great time cruising the Cape and Islands aboard her. My 15-year-old son, Jacob, who was bored, rigged the bosun's chair to the spinnaker halyard and made a swing. He hung out over the water for about an hour as we sailed and took this photo along the way.

–Matt Bowser, Canterbury, N.H

Suncor Stainless shines

Two years ago, I purchased a set of DIY lifeline kits with gates for my Dufour Arpège. The pelican hooks had a slight flaw that would allow the retaining/locking pin to shoot out if the ring got pulled out. This happens when someone unfamiliar with the hooks pulls the pin at an angle other than what was intended. Thus, over time, the two I had were rendered unusable as the pins were launched overboard.

I made some email inquiries with Suncor and they were very helpful in offering new Pelican hooks with a newly designed non-removable pin. I offered to purchase them, but they sent them free of charge! I received them in a matter of a few days.

A shout out to Suncor's customer service manager, Loretta Rose-Smolic, for being so helpful. They have a great product and fantastic customer support.

–Doug Birch, Anoka, Minn.

On the Fourth of July, 2015, Lenny Reich's J/32, *Watermusic*, paused to reflect awhile in Long Cove on the west side of the island of Vinalhaven in Maine. Send your high-resolution sailboat photos to jstearns@goodoldboat.com and we'll post them on our website. If we publish yours here, we'll send you a Good Old Boat T-shirt or cap.

Holding-tank harmony

I read, with increasing surprise, in the September 2015 issue, about the efforts some go through to solve head and holding-tank issues, odors, and leaks when there is a simple alternative. The best thing I ever added to my boat (my wife argues it was the propane heater) was my composting head.

Now we have no waiting for pumpouts, no odors, no hauling close to 200 pounds of sewage in the bow, no blocked vents, and a newly available locker — just right for my asymmetric chute — that previously held a 20-gallon holding tank. I also eliminated at least 10 feet of smelly hoses, 18 hose clamps, and two Y-valves.

After one full and successful season using our Air Head in 2014, we have been living aboard (during the working week) in Boston since mid-May 2015, vacationed on board for a full week, and it is still nowhere near full as I write this in late August. I do carry a second urine reservoir for continuity/ease of use. A good friend has the very similar Nature's Head on his boat and loves it as I do my Air Head.

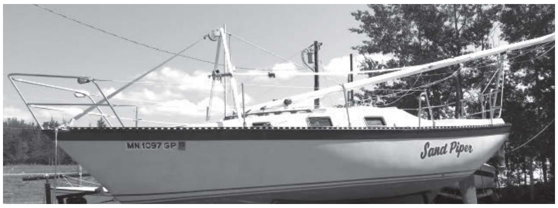
–**Ed White,** Nantasket Beach, Hull, Mass.

Note: Connie McBride described installing an Air Head in "Zero-Discharge Solution" in the September 2011 issue.

–**Editors**

Send questions and comments to *Good Old Boat*, 7340 Niagara Lane North, Maple Grove, MN 55311-2655, or by email to jerry@goodoldboat.com.

Twin Arm Gin Pole with Winch



TAG Pole
218-547-1188
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- Simplifies the task of stepping and un-stepping the deck-stepped mast.
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- MSR $525 (*subject to change*)

Boats for Sale

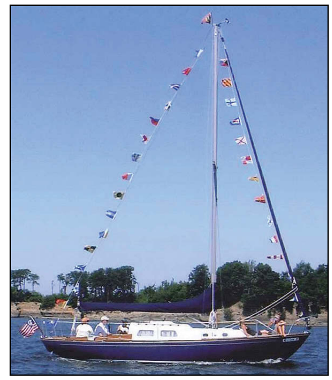
Cornish Crabber 24
2000 sloop. Classic British cruising boat in exc cond. Full keel, great stability, very seaworthy even offshore. Extra security w/2 RF headsails. Bimini, basic electronics. 18-hp Yanmar diesel. Enclosed head, 2-burner propane stove, sink. Sleeps 3. Only 2 owners. Many extras. Yard maintained. Ready to sail. Eastern Long Island, NY. $27,000.
William Winslow
631-325-1138
wcwinslow@aol.com

CS 33
1983. *Forest Dream* is the much-sought-after quarter-berth model by Canadian Sailcraft, renowned for building seaworthy, comfortable, cruising sailboats. Clean, well-maintained. $10,000 in upgrades. New main and 140 genoa, RF, Sailpack, new 12" chart plotter, Autohelm 3000, knotmeter, VDO sumlog, radar, new DSC VHF. Too much to list all. Toronto, Canada. $45,000 CDN.
Steve Smith
647-294-9599
stevesmit@gmail.com

Camper & Nicholsons 8.80m
1972 motorsailer, 29'. Twin keel, shoal draft. Recent 50-hp Perkins w/2,000 hrs. Dinghy w/2 OB. Recent sails, new standing rigging, AP, 2 chart plotters, SSB receiver, new VHF, new bottom. Life raft, MOB gear, 3 anchors. Ready to go to the Keys/Bahamas/Cuba. $17,000.
Kenneth Clark
dianakenclark@gmail.com

Cal 28 by Jensen
1966. A true good old boat. In same family since 1969. Late-model Atomic 4 with FWC, new KiwiGrip paint on deck and cockpit, Porta Potti, custom mahogany table. Many extras. Dinghy not included. Anacortes, WA. $9,000.
Chris Ackerman
360-299-3231
fidalgo91@yahoo.com

O'Day 37
1979 center cockpit. Featured in the Jan/Feb '13 issue of *Good Old Boat*. Great sailing boat, formerly owned by Annapolis Sailing School. Currently on the hard at Herrington Harbour North in Deale, MD, just south of Annapolis. For sale through Midcoast Yachts, Tom Aga. $23,500.
Philipp Theune
philipp.theune@gmail.com
www.yachtworld.com/boats/1979/O'day-Center-Cockpit-2754385



Alberg 30
1966. Harken RF jib, Harken mainsheet traveler, Anderson #2 self-tailing cockpit winches, new toilet in head, new thru-hull fittings, all new deep blue cabin cushions, electric fuel pump and upgraded fuel filter on reliable Atomic 4. Main beam rebuilt. Full survey '12. All necessary docklines included. Danforth anchor w/chain and 200' rode, winch handles, and more sailing gear. Sailaway cond. Matching 9' Dyer Dink also available. Annapolis, MD. $14,500.
Scott Gardiner
410-544-8477, 410-647-7777
scott@gardinerappelgroup.com

Nimble 30
2007. Classic Brewer double-ender yawl. Custom built, epoxy, foam-cored FG. Excellent, like-new cond. 3-cylinder Yanmar diesel w/low hrs and excellent service. North sails, Forespar aluminum spars, Harken hardware. Mexico cruising veteran currently in San Diego, CA. Original owner is looking for someone who will appreciate a quality built Nimble 30. $59,900.
Tom Ybarrola
619-223-2595
tomybarrola@sbcglobal.net

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website:
www.goodoldboat.com/resources_for_sailors/sailing_classifieds/

Quickstep 24
1985. Classic pocket cruiser designed by Ted Brewer, built by Shannon Yachts. Reconditioned to beautiful cond. Sailaway cond w/complete inventory. Great daysailer, overnighter, and/or weekender. On small lake in Carbondale, IL. Includes up to $1,000 credit for transport to your location. No trailer. $15,000.
Robert DeFilippis
618-942-4039
bdefilippis@gmail.com

O'Day 222
1984. 25th Anniversary Edition. Nice small boat, very forgiving to anyone learning to sail her. Looking to find a good home for her as I have other boats to sail. Lake Eufaula, OK. Boat only for $1,500 or $4,400 for all the goodies. All offers considered.
Paul Meistrell
918-484-2216
sbp@crosstel.net

Southern Cross 35
1983-1988 Airex-cored. New '04 40-hp Yanmar, 5/16" wire, Sta-Lok terminals, Merriman ½ turnbuckles (like new), bronze Bomar ports and Barient ST winches, Force 10 propane stove. Strong, great sailing, bluewater boat, daysailed on fresh water all its life. Lovely wooden interior needs a little finishing. North sails: main, staysail, and Yankee, all original,

in OK cond. 135 genoa (like new). Running rigging, original, in OK cond. Marlboro, NY. $48,000
John Milici
845-255-8123, 845-417-6044
clairemilici@yahoo.com

Murray 33
1984. Ted Brewer design. Cutter-rigged, steel-hulled ocean cruiser. All sails in good to fair cond: 120 genoa, 100 jib, Yankee jib, staysail, main, storm jib, and storm main. Yanmar diesel, solar panel, wind generator, inverter, watermaker, self-steering, SSB, Corian countertops, much more. On mooring in Salt River Bay St. Croix, U.S.V.I. Marriage and relocation forces sale. $25,000 OBO.
Todd Booth
313-790-5486
toddjbooth@yahoo.com

Pacific Seacraft 31
1989. 4' draft. Excellent cond. On the Bohemia River near Chesapeake City, MD. $61,000.
Eben Bramhall
302-368-8674

Hunter 37
1981 cutter. Classic John Cherubini design. Sleeps 5 comfortably. Fully equipped w/ Yanmar 30-hp diesel, head w/ shower, hot water, alcohol oven/ stove, Garmin chart plotter, VHF, full set of sails incl. spinnaker. New barrier coat '07, transmission, Bimini, and dodger '09, interior varnished '13, deck and cabintop painted w/4 coats of 2-part epoxy '14, and most blocks and running rigging replaced recently. Forked River, NJ. Would consider equal-value trade for shoal-draft 30' sailboat. $30,000.
Mark Halprin
732-616-4217
mhalprin@verizon.net

Bill Boyd Catboat 23
1979. 23' x 10' x 27" draft (5' CB down), 6,000 lb. Wm. Garden design. Pretty, roomy, heavily built, stable, environmentally friendly with lots of character. Will go about anywhere. Folding mast, new sailcover, good sail. New cushions, Porta Potty, new canvas cockpit cover. Triple-axle King trailer. Electric Yacht IB. She's a joy to sail! Williamson, IA. $12,000.
Ford Brockman
fsbrockman@hotmail.com

R-Class 40
1924. Universal Rule R-Class sloop, *Fantome*, R18. Lovingly owned and maintained by the same owner for 35 years. Bristol cond. 3-yr-old aluminum mast, rod rigging, taffeta main, 155 genoa, 145 and 100 jibs, R-Class spinnaker, PHRF spinnaker. New forestay and chainplates. The right price for the next caretaker of this historic boat. Sodus Point, NY. $35,000.
Victoria Piersig
416-605-5016
redheadwbiceps@yahoo.ca

Precision 18
2005 by Precision Boat Works. Mainsail w/battens, jiffy-reef system, and mainsail cover. 150 genoa w/factory furler option, new halyards and sheets. Cabin cushions, tinted Plexiglas forward hatch, pop-open side portholes, 2 cockpit storage lockers under seats, extend[illegible] keel and stern boarding [illegible] pocket cruiser. [illegible]xc cond. [illegible] King trailer [illegible] 4 [illegible] long-shaft [illegible] Sailing Marin[illegible]andria, V[illegible] 8,500.
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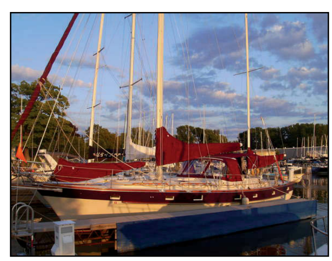

Irwin 41
1983 center-cockpit staysail ketch. Original owner. 13'4" beam, 6'6" draft. Sleeps 6. Two heads w/ showers. Exc cond. Many recent upgrades. Dealer-installed chairs in saloon. Owner's cabin aft w/queen berth and private head w/shower. 3 new sails '05. New upholstery '09, burgundy paint '10, canvas '13. 200 gal water, 100 gal fuel. Very comfortable cruiser easily handled by 2 people. On Lake Ontario, Rochester, NY. $70,000.
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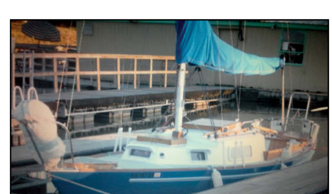
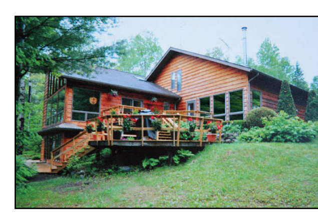
boreas84@aol.com



Kittiwake 24
1974 sloop, *Blue Moon*. Completely restored and comes w/custom-fitted trailer, 4 sails, 6-hp Johnson OB, solar panels, new running rigging, Tiller Tamer, 2 anchors w/rodes, marine stereo, all new cushions, and much more. She's a real head turner and a blast to sail but has to go. I have a new project boat. Princeton, KS. $8,000.
Greg Mohr
785-214-9887
mohr_greg@yahoo.com
LadyAMohr.Webs.Com

Pearson Alberg 35
1962 Classic. Aluminum RF main boom, original spruce spinnaker pole, solid-fuel fireplace, sails, docklines, fenders, and ground tackle. Propane cookstove. Rebuilt original Universal Atomic 4 with 3-blade prop. DeTour Village, MI. $10,500.
Rich Ross
989-732-9576
rbross@freeway.net

Real Estate



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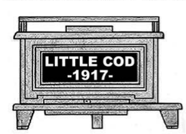

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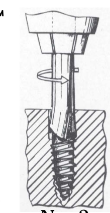

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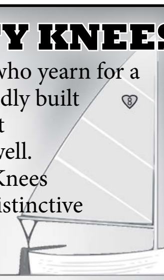

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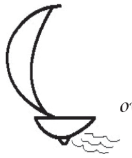

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A eulogy to Johnson

BY ALAN KEENE

A loyal, uncomplaining member of the crew

We lost a treasured sailing companion several years back and sailing hasn't been quite the same since. By all appearances that August morning, Johnson felt fine. He seemed strong and fit and ready to go, just as he had every sailing day for the past 15 years. There were no complaints or coughing spells that would have hinted at a serious health problem.

In spite of his advanced age, he had a spark for life that kept him looking and feeling young. Many of our dockmates couldn't believe his age. Some guessed he was 15 years younger. Johnson displayed the strength and endurance of a youngster. He loved to run and often would run for hours at a time without the slightest complaint. The more he ran, in fact, the stronger he seemed to get. He hated being idle.

We were proud of his appearance and how he behaved as we'd maneuver through the marina fairways on our way out to open water. And I could always count on him. When we were out on the Chesapeake sailing for the day, I was confident that he was there, at the ready, if we needed him. I never had to ask twice. He could get our 25-footer moving when nothing else could. Sadly, his passing has changed all that.

Johnson wasn't a living, breathing human being. In spite of drawing in his fair share of oxygen over the years, he wasn't alive in the biological sense. But to us, it sure felt like he was. He sat there on his motor mount, like a member of the crew, ready when needed. Johnson was our 1981 Johnson Sailmaster outboard, one of the finest two-strokes ever to push a sailboat.

Our relationship started in the mid-1990s when my wife, Peg, and I decided to buy a 1982 Capri 25 that we happened upon while walking the docks of an upper-bay marina. The "For Sale" sign taped to her hatchboards that summer evening opened a whole new world of sailing for us. *Tackful*, as we renamed her, came equipped with Johnson — 7.5 horses of power and the heart of a lion.

I learned from the previous owner that the Sailmaster, while clearly well maintained, was the original engine and had logged many hours over its 14 years. So, as we signed the papers the following afternoon, it was with the knowledge that we'd probably have to replace our new boat's motor within a year or two.

We spent our first few months of sailing *Tackful* familiarizing ourselves with her tendencies and idiosyncrasies. Part of that "getting to know you" process was learning about our outboard and how it behaved under various conditions. I learned quickly that it was very, very predictable. It started on the third pull virtually every time, regardless of how long it'd been sitting. It liked the choke open full when cold, but closed quickly after firing up. After it had been started for the day, one gentle tug on the starter cord was all it needed. And once running, it didn't want to stop, taking more than a light touch of the kill button to shut it down.

I'm not quite sure when "it" became "he," but our Sailmaster's dependability began to feel like loyalty early on. It might have been the time when we were sailing at hull speed across the narrow shipping channel of the upper bay and the fickle Chesapeake wind suddenly died, leaving us dead in the water and looking up at the enormity of a fast-approaching container ship. I should have known better than to try and race across in front of that massive ship, but there was no time for self-recrimination. I handed Peg the tiller, dropped Johnson into the water, and yanked, bringing him immediately to life and us out of harm's way.

Since Johnson's passing we've had two imposters in the form of four-stroke engines that we hoped would fill his shoes, but neither could. The latest, a brand new 6-horsepower, is light and easy on gas but unpredictable. It has let us down twice so far and left me to wonder when the next time will be. Old friends don't let you down. They're there whenever you need them.

We miss you, Johnson.

Alan Keene, a freelance writer, lyric poet, and boating columnist for Upper Bay Boating, *sails his Capri 25 (sans Johnson) and his Oxford Dinghy on the Chesapeake Bay. His sailing poetry can be seen upon request at keenesofqueens@yahoo.com.*


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