GOOD OLD BOAT™

The sailing magazine for the rest of us!

www.goodoldboat.com

Issue 104 September/October 2015

8^{00} (Canada 8^{00} CDN)

10

0 62825 97035 7

PLEASE DON'T STEAL OUR FILES!

We make our living selling good content to fellow sailors. If you give our files to others, you are stealing that content from Good Old Boat.
Don't think of it as "sharing." It is theft.

We try to be fair and honest in all things we do on your behalf.
We hope you'll treat us fairly and honestly in return.

Our issues are copyrighted. Please respect that.

7340 Niagara Ln N • Maple Grove, MN 55311-2655 • 701-952-9433 • www.goodoldboat.com

HAMILTON MARINE
BOATERS' STORE™

dickinson Newport Stove

4000 - 6500 BTUs
7.88"W x 10"D x 15.63"H

Solid fuel heater uses charcoal briquets, wood, fire logs, and other solid fuels. Stainless steel construction, Dutch tile fire-view door and draft control, 3" flue vent.

$437.99

DMF-00-NEWSF
Order# 108944

Cozy Cabin Propane Heater

9900 BTUs
16-1/2"H x 7-3/4"W x 7"D

Bulkhead mounted, dry radiant heat propane heater. A deck cap is included, with required 1" flue pipe, sold separately.

$494.99

F10-10000
Order# 113810

Kanberra™ Odor Eliminator Gel

Uses the power of Tea Tree Oil to leave your air odor free and clean while working to prevent and inhibit mold, mildew, fungus, and bacteria in the air and on surfaces of the room.

Part#	Order#	Size	SELL
KBA-KG02MAR	**741107**	2 oz	18.99
KBA-KG04MAR	**741108**	4 oz	29.99
KBA-KG08MAR	**741109**	8 oz	47.99

TARPS

3 GRADES, 27 SIZES!

- Lightweight Blue
- Premium White
- Super Heavy Duty Silver

Moisture Absorber

MARYKATE

Dries air in cabins, lockers, closets, rooms, basements, & other enclosed areas. Super-dry, concentrated pellet formula absorbs up to 50% more moisture than flake formulas.

MK-6912
Order# 144114
$6.39

Optronics Rechargeable Spotlight

100 watt quartz halogen bulb. Includes both 12v quick charge & 110 v chargers. Operates from 12v cord or internal battery.

$34.99

Color	Order#
Black	**146561**
White	**145858**

2 Million Candle Power!

Rapid Shrink Heat Gun Tool Kit

Ideal for wrapping pallets, small to mid-sized machinery and boats up to 26', including pontoon boats. Includes 25' propane hose, adjustable regulator, training DVD, safety glasses, gloves & plastic case. 70,000 BTUs

$302.99

DRS-DSRS70
Order# 736252

Oil Change Pump Kit

JOHNSON PUMP

Lightweight, portable kit includes a 5-gallon bucket with sealed lid, pump assembly, dipstick tube, heavy-duty alligator clips, and easy pour spout.

$179.99

JPA-65000
Order# 745234

Fuel Additives

Gas or Diesel

Huge Selection In Stock!

Oil Absorbent Sheets

Each sheet absorbs 13 to 25 times its weight in oil, fuel and other hydrocarbons. Great for engine work, winterization, and cleaning spills. Can also be used for waxing and polishing.

Size	Order#	Weight	Each	Bale	#Bale
15" x 19" x 3/16"	**123472**	Single	0.59	89.99	#200
15 "x 19" x 1/4"	**123422**	Medium	0.79	59.99	#100
15" x 19" x 1/4"	**145762**	Double	0.89	71.99	#100

Gill Yacht Rain Gear

Waterproof, breathable, durable. High performance.
SEARCH# DGU-

Atlas™ Coated Seamless Knit Gloves

Seamless grey cotton/polyester knit gloves with natural rubber or nitrile coating for excellent grip. Nitrile gloves are chemical resistant. By pair or dozen.
SEARCH# HMG-PF

Net & Twine Knife

The "Little Vicky" is the best inexpensive rope knife there is. 3.25" serrated blade, high carbon stainless steel.

SAB-40603
Order# 165434
$5.99

STANDARD HORIZON

HX-290 VHF

5 watts. 12v DC and AC wall charger. 1140 mAh Li-Ion battery. Submersible.

FLOATS!

MAP $129.99
-$10 Instant Rebate

$119.99

STD-HX-290
Order# 737042

PORTLAND ROCKLAND SEARSPORT SOUTHWEST HARBOR JONESPORT MAINE

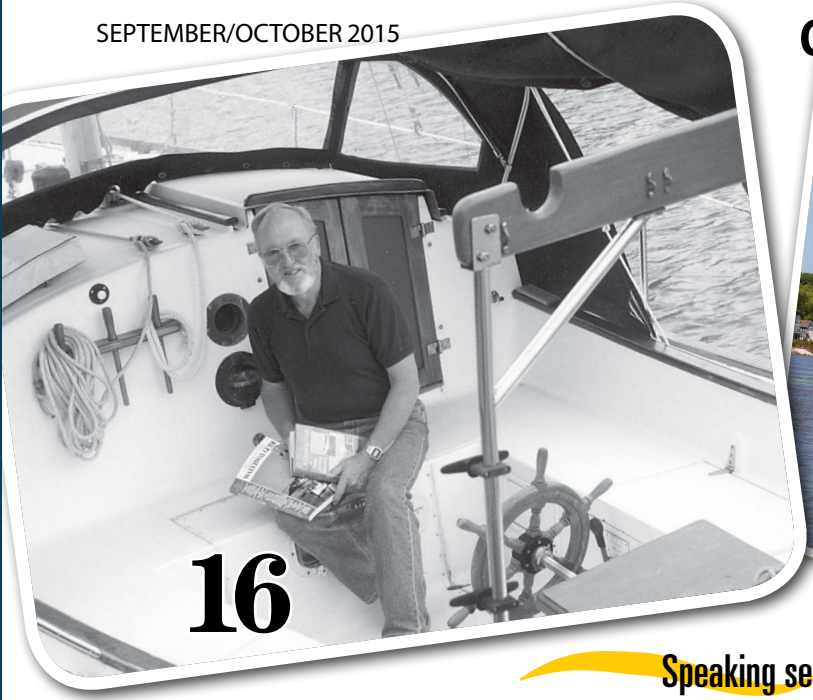
Typographical errors are unintentional and subject to correction.

GOOD OLD BOAT

SEPTEMBER/OCTOBER 2015

ISSUE 104

CONTENTS



GOOD OLD BOAT

ISSUE 104 SEPTEMBER/OCTOBER 2015

CONTENTS

TOP TWO PHOTOS BY PENNY DEWEERD

49

What's more

Just for fun

On the cover …
Morgan Wade checks the set of the whisker pole on her family's good old 28-foot Cape Dory, *Zephyr*. Chesapeake Bay photographer and proud father David Wade caught this scene while sailing with Morgan and her sister Molly off the Turkey Point Lighthouse.

64

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
Gregg Nestor | Allen Penticoff | Bill Sandifer
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

104 – VOLUME 18, NUMBER 5
GOOD OLD BOAT (ISSN 1099-6354; USPS 019327)
PUBLISHED BIMONTHLY BY
Partnership for Excellence, Inc.
EDITORIAL OFFICE:
7340 Niagara Ln. N. | Maple Grove, MN 55311-2655
Phone: 701-952-9433 | Fax: 701-952-9434
BUSINESS OFFICE:
1300 Evergreen Dr. N.W. | Jamestown, ND 58401-2204
Phone: 701-952-9433 | Fax: 701-952-9434
www.goodoldboat.com

Periodicals postage paid at Osseo, MN 55369,
AND AT ADDITIONAL MAILING OFFICES.
POSTMASTER: SEND ADDRESS CHANGES TO:
Good Old Boat
8810 27th Street Ct. N.
Lake Elmo, MN 55042-9473

SUBSCRIPTION RATES (1, 2, 3 YEARS):
U.S. AND CANADA – $39.95 / $74.95 / $110 US
OVERSEAS – $49.95 / $95.95 US

Find us on Facebook
www.facebook.com/goodoldboat
Follow us on Twitter @GoodOldBoat

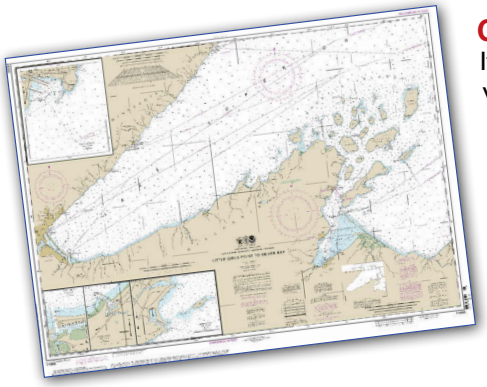
Minnesota Magazine & Publications Association

News from our websites

GoodOldBoat.com

Picture your boat in our magazine

How are photos selected as winners of the Editors' Choice Award and featured in our Mail Buoy section? Those sailors sent photos to our webmaster for posting on the Boat Photos page, www.goodoldboat.com/reader_services/reader_photos.php. An editor chooses a favorite. It has to be sent to us as a high-resolution image in order to be published. The winner gets a ball cap or a T-shirt along with the fame and glory that comes with publication.

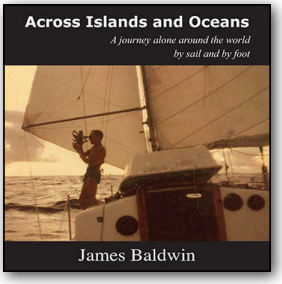


Ours is a site to see!

It's not a nautical chart, but it is very useful to sailors just the same. Have you ever clicked the "Site Map" text in the top right corner of our webpages? It will take you places you've never gone before, guaranteed! www.goodoldboat.com/site_map.php

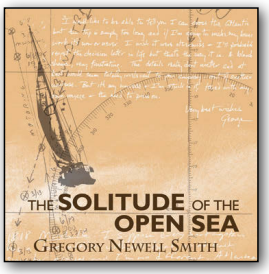
AudioSeaStories.com

Travel *Across Islands and Oceans*



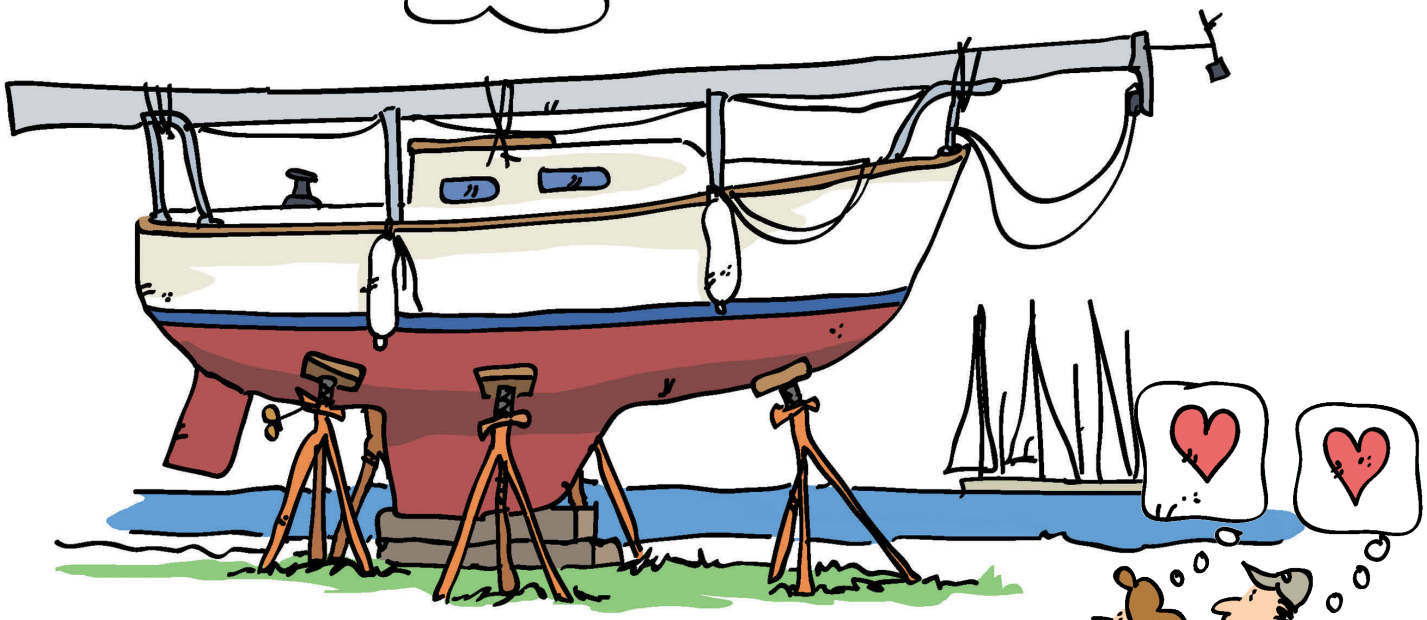
We've produced 15 audiobooks over the years. Come travel on *Atom* with James Baldwin during a two-year circumnavigation that he began with $500 in his pocket and a boatload of enthusiasm. As a young man in 1984, James was determined to climb every mountain (literally) and ford every stream. His travels took him into the heartland of many islands and into the hearts of the locals he met along the way. This downloadable book, narrated by Spencer King, offers 13 great hours for $25: www.audioseastories.com/audiobook-downloads/across-islands-and-oceans.html.

Experience *The Solitude of the Open Sea*



Another young and solo circumnavigator, Greg Smith, tells an entirely different tale of his travels and encounters in rich port cities and third-world coastal villages. Narrating his own tale, Greg supplies the accents and the voices that take you along on his boat and inside his head as he experiences the unexpected joys, bureaucratic hassles, beauty, and loneliness of global cruising. This book runs 10.6 hours and can be downloaded for $25: www.audioseastories.com/audiobook-downloads/solitude-of-the-open-sea.html.

GOOD OLD BOAT™



What every *Good Old Boat* subscriber knows:

it's a **magazine** • *it's about* **sailing**
it's about **trailersailers** and **globe girdlers**
it's about **daysailers** and **coastal cruisers**
it's about **fixer-uppers** and **all-fixed-uppers**
it's about **the people who love, cherish,** and **baby their boats**
it's about **doing stuff yourself** to the **boat you own**
it's a **resource** • *it's a* **community of sailors**
it's **everything a sailboat owner needs!**

it's Good Old Boat

SUBSCRIBE TODAY!

For your **FREE** trial copy, go to:
http://tinyurl.com/GOB-Poster

Spread the word! Please post this page at your marina.

There's no place like home

Familiar waters feel like a fond hug

BY KAREN LARSON

We had just seen a favorite kid play the role of a Munchkin in *The Wizard of Oz* when we untied our docklines in late June for a 75-nautical-mile delivery back to where we started. The refrain, "There's no place like home," featured prominently in my thoughts. Many times aboard *Mystic*, our C&C 30, we've made the trip from Bayfield, Wisconsin, to the twin ports of Duluth/Superior in Minnesota and Wisconsin. Many times we've made the return trip. This time was different; we were going home.

Thinking it was a good investment, we purchased a slip in 1996 at Roys Point Marina near Bayfield. Brand-new at the time, this marina proved to be a good home for cruising in the Apostle Islands and beyond to Isle Royale National Park and the remote Canadian shores and provincial parks to the north. With these wonderful destinations, we considered most of our longer voyages to be "wilderness cruising" — take what you need for a three-week voyage; do not expect to find ice, groceries, fuel, water, electrical hookups, or pumpouts; do not expect to get weather information once you've left civilization (cell service and WiFi had yet to be widely available).

Much of our shorter sailing adventures in the Apostle Islands, however, were within a day's range of grocery stores, fuel supplies, and secure marina slips. This part of our sailing time was very social as we frequently anchored with friends we'd known since buying *Mystic* in 1992. After we started the magazine in 1998, if we didn't know the people in the anchored boats, we often paddled a copy of *Good Old Boat* over to them as a way to introduce ourselves and the magazine. Whether it was a wilderness experience or a social one, I loved every minute.

Jerry says I got wanderlust. That is probably the best explanation. Eventually I told him I wanted to go farther afield, to Lake Huron's well-known North Channel. He wasn't interested. One day, as a joke, I told him that if *he* didn't want to go to the North Channel I'd find a husband who *would*! Those highly effective words have been quoted with great good humor many times since then.

We spent two summers (2005 and '06) cruising in the North Channel only to discover that we preferred our wilderness experiences on Lake Superior. In the meantime, we had rented our home slip to another boat. When we returned to Lake Superior from Lake Huron, we spent three summers ('07 through '09) cruising out of Thunder Bay, Ontario, on the far side of the lake, bringing the wilderness closer to our base of operations.

During the summer of 2010, we cruised for three solid months and had no home base whatsoever. A shorter version of that followed in 2011 through '13. During all this time we referred to ourselves as "homeless." We wintered in Duluth/Superior at Barker's Island Marina. We summered on the lake.

We didn't launch *Mystic* at all in the summer of 2014, that being the summer to launch and learn about *Sunflower*, our trailerable C&C Mega 30.

This year, 10 years after leaving our slip at Roys Point, *Mystic* would be coming home. As we rounded the top of Sand Island, the westernmost island in the Apostles, a loon flew by. We relaxed. Here, as nowhere else, we have local knowledge. While we have paper and electronic charts on the chart table at all times, we have been in every nook and cranny here. We know where the fishermen routinely set out their nets and where the sand spits extending from some islands are particularly worthy of respect. We know which anchorages have a lot of slash or rocks and which have great holding in sand. There's no place like home.

As we sailed home through the Apostles, we called the islands by name as they came into view. They are not Matthew, Mark, Luke, and John as you might expect. What's more, someone couldn't count: they number nearly two dozen. We were thrilled to recognize the shapes of Bear Island, York, and Devils! Rocky, Raspberry, Otter, and Oak! Manitou, Stockton, Hermit, Basswood! We were *home*!

Things were quiet at Roys Point when we arrived on a Friday in mid-afternoon. Where were the marching bands, sirens, and balloons? No fire hose salutes? Where were the little girls in white dresses with bouquets of flowers? No "All hail the conquering (and returning) heroes" signs? Nothing?

It was just as we had remembered it, and it felt great to be home again.

Musical boats, a page

You bought a what?

I couldn't resist sending you a favorite sailing image of a truly wonderful, terrific sailing good old boat — a magnificent design inside and out. This is my previous boat, a Tartan 33 (#161, 1982), above, designed by Olin Stephens himself. We have sold her to a good friend, but when this image was taken by another very good friend, Bill Benett, we owned her as *Andantino*. That's kind of a joke on Olin, since he is most famous for designing race-boats, including America's Cup boats. *Andantino* is a musical term that means a little bit faster than slow!

My sailing friends were aghast when we sold *Andantino*. They said, "You sold the Tartan, and bought a *what*, a *Catalina*?" (Said with a look of disgust.) But we did it. I spent the first eight years of retirement restoring the Tartan to better than new. But we sold it . . . for one boat buck more than we paid for it!

We had started to do more serious ocean cruising and really got a bad case of "10-foot-itis." Our newish boat is a Catalina 42 Mk II (#863, 2004). We want to cruise, not restore, now. This boat sails even better than the Tartan! Hard to believe, but true. It was originally designed by Nelson/Marek in the late 1980s as an ocean racing sloop before Catalina bought the rights to the molds and design. Nelson/Marek also designed winning AC boats (for the Stars and Stripes Syndicate, I think). The Catalina 42s have been all over the world and are strong, fast, and easy to sail for the typical cruising couple. And they have no exterior wood!

Our Catalina 42 is named *Allegretto*, which means a little slower than fast. Well, it is a "cruiserized version" . . . and a wee bit overweight.

–Steve Swierkowski, Livermore, Calif.

A page turned

Here is a subject seldom mentioned, and that's a good thing! Good old boats, properly maintained, virtually never wear out. However, their owners do. Here's my story.

I was standing on the foredeck of my beloved Catalina 27 a couple of weeks ago and suddenly, for less than two seconds, reality vanished. I held on to the mast and remained on board and vertical and almost immediately things were OK again.

After securing the boat to her mooring, I was standing on the dock looking back at her and thinking, "I must never again step on board unless someone else is there too."

Now, understand that I have spent the past 50 years sailing solo on Lake Tahoe during the winter months and now, at age 84, a page has turned. That night, I made a decision: "I will sell the boat and find something else to do." That was the hard part. Two weeks later, I handed the pink slips for the boat and trailer, along with a bill of sale for $1, to my very close friend and constant crew, Erik Vindum. She will be in good hands, better than mine in fact. The first thing he plans to do is take her home and replace all the woodwork. It wouldn't surprise me if he included an inlaid tabletop as per the article in the March 2015 issue of *Good Old Boat*! So, dear readers, when the time comes, recognize it and take immediate action according to your own best judgment.

–Jim Hildinger, South Lake Tahoe, Calif.

Vineyard Vixen comparison

I certainly enjoy Rob Mazza's articles on the evolution of the modern yacht form and design assessments. I'd like to add a couple of comments to his article on the Vineyard Vixen in the January 2015 *Good Old Boat*. Rob discusses the ballast ratios of the three boats being compared, noting the significantly lower ballast/displacement ratio of the Southern Cross. I don't think you would want your readers to draw conclusions from that single number about the relative stability of these vessels without also bringing depth and beam into the discussion. The two designs draw about the same amount of water, so depth is moot, but the Southern Cross is almost a foot wider, and as stability increases with the square of the beam, the additional form stability mitigates the low ballast ratio.

Also, in the discussion of displacement Rob mentions the performance advantages of the lighter boat (I'm thinking maybe tenths of knots in light air, maybe none at all as conditions build), but I think there is also the question of why Tom Gillmer would invest this additional 5,000 lbs in structure in

turned, and Canada Day fun

the Southern Cross versus the Vixen, knowing that his boat would be much more expensive to build and would incur a performance penalty relative to a lighter design. What he must have gained, given that these boats are built with the same materials and construction techniques, give or take a little Airex foam, is a massive increase in structural strength and just plain physical robustness. So we have boats for different purposes: the Vixen, a solid coastal cruiser with offshore capability, versus a vessel with the redundant strength to challenge Cape Horn. And the Pacific Seacraft seems to fall somewhere in between.

–Rich Morrow, Herring Cove, Nova Scotia

Rob's reply

Rich, you raise some interesting points, especially with regard to what contributes to stability in a sailboat, as well as the question of initial stability vs. ultimate stability. These subjects are far too complex to be adequately covered in the Mail Buoy section of the magazine, but should be addressed in an article in its own right in a future issue. Stay tuned!

–Rob Mazza, Hamilton, Ontario

How to sail a Rhodes 22

Thanks, *Good Old Boat*, for the second Rhodes 22 review (Don Launer wrote the first some 10 years ago) with Tom Wells' great pictures and *almost* perfect coverage. (*See the May 2015 issue* ***–Eds.***) For the sake of your readers, we would like to be able to drop our "almost" by correcting a vital oversight during Tom's test sail.

Tom writes: "We sailed to windward with the reefed configuration (winds were extreme) and pointing angles were not optimum." Of course not! Rex, the owner, tells me that he forgot to point out to Tom that the Rhodes has three lead positions for the jibsheets: outside the upper shroud to clear the spreaders when using the huge 175 percent genoa, inside the upper shroud for greater pointing with a windward-sized genoa, and inside the upper and aft lower shrouds for a further-reefed jib for unbelievable pointing. During the entire trial sail they only used the far outside sheet leads, even with the genoa greatly reefed. We have to give Tom credit for managing 55-degree pointing with this completely incorrect lead configuration. We would love to hear his comments on pointing ability had owner and reporter had the reefed genoa trimmed with the handy third set of jibsheet leads on the cabintop. Another test sail anyone?

–Stan Spitzer, General Boats, Edenton N.C.

Solar chargers

In response to Jim Heuman's Simple Solutions article, "Battery Catch 22" (July 2015), it is true that most (though not all) solar charge controllers will not charge a dead battery. However, it is possible to jumper around the controller so the solar panel is hooked up directly to the battery(ies) in order to charge them. Of course, you will need to go back to the original wiring, with the controller in place, after some period of time to avoid over-charging. Monitor the voltage and, when it reaches about 14 volts, reconnect the controller.

–John Gambill, Tarpon Springs, Fla.

Lost in transposition?

We ran a letter in the July 2015 Mail Buoy about Dale Denning, the designer and builder of the gorgeous Oxford Dinghy featured in our July 2014 issue. We also printed a note Dale sent in response when we sent him the original letter. After receiving the July issue, Dale wrote us again to advise us his first wife was named Kaye and the custom-designed trawler he built was 54 feet, not 45 as we printed. Our apologies to Dale.

–Editors

continued on page 68

Alex McCarthney's favorite aid to navigation is the Barnegat Light marking the south shore of the inlet to New Jersey's Barnegat Bay. 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.

PRECISION 23

A quick trailerable that does the small things right

BY ALLEN PENTICOFF

R. K. "Kim" Hogan, a retired airline captain, and his wife, Karen, have been sailing their 1996 Precision 23, *Willow*, on the St. Lucie River, just off the Intracoastal Waterway near Palm City, Florida, since May 2011. A longtime resident of Florida's Treasure Coast, Kim daysails and races *Willow* singlehanded for the most part. He apologized for not being able to show me the Precision's performance at its best, which is when the wind gets up to 12 knots, but we had a great sail on a wide place in the river nonetheless.

Kim owned a West Wight Potter 19 before he bought the Precision 23 from racing-sailboat designer, Paul Lindenberg. *Willow* was Paul's personal boat and he had modified her to suit his own performance needs. Kim has carried on that tradition and enjoys sailing with fresh sails and putting the rail down. He keeps *Willow* on a dry-storage rack when not out sailing and maintains her in sparkling condition.

Design and construction

Brothers Richard and Bill Porter founded Precision Boat Works of Palmetto, Florida, in 1978. Precision continues to produce small sailboats of 15 to 23 feet and has outlasted dozens of other builders of boats in this size range. The largest boats the company has built are the Precision 27, the Precision 28, and the Colgate 26. Richard and Bill pride themselves on building fine small boats that are sold through a nationwide dealer network. Precision also builds molds for other boatbuilders.

The Precision 23 is not inexpensive; the 2015 base price is $36,985. While many used 23-foot boats can be bought for less than $5,000, the Precision 23 appeals to the sailor who wants a well-designed and well-constructed boat. It is certainly both. Award-winning naval architect Jim Taylor designed the Precision 23, and it has been in production since 1986 with 600 sold to date.

The Precision 23 is not revolutionary. Its claim to fame is in doing all the small things right. This it does with few exceptions. It is well thought out and practical, which results in a boat that is comfortable and handles well. The sheer has a nice sweep to it while the ends seem just right for the boat's size. The transom-hung retractable rudder is appropriate, as the shoal-draft fixed keel with centerboard draws less than 2 feet with the board up. The long narrow keel contains 850 pounds of internal lead ballast and, with the wide 8-foot 6-inch beam, keeps the Precision 23 stiff and tracking well. The centerboard provides extra lift to windward, yet reduces drag downwind when retracted. The keel arrangement eliminates the centerboard trunk from the cabin, making it remarkably roomy. Also, a fiberglass beam in the overhead supports the deck-stepped mast and removes the need for a space-limiting compression post.

The hull is solid fiberglass hand-laid with vinylester and polyester resins throughout, with ⅜-inch PVC foam core where it sits on trailer bunks. The deck is cored with the same foam. The transom is reinforced with plywood where the outboard motor and rudder are mounted. The hull-to-deck joint is an outward-turning flange glued with 3M 5200 and temporary #10-32 bolts that are removed after the adhesive cures. The flange is capped with a rubrail. A structural furniture base/liner is employed in the cabin.

On deck

One feature that makes a big first impression is the large cockpit. The seats are more than 7 feet long, with nice backs, chamfered front edges, and a "just right" bracing distance between them. While plenty long for napping, they are a bit narrow, earning them a PNI rating (Penticoff Napability Index) of 4 out of 5. Wider cushions would help.

Twin drains at the aft end of the cockpit remove water quickly but — this is a warning to those who store their boats outside — the cockpit should be covered and the drains kept

Kim Hogan shows off the sharp lines and sparkling flat-water performance of *Willow*, his Precision 23, on the St. Lucie River on Florida's east coast, top of page.

free of debris, as the bridge deck is quite low and could easily be topped by heavy snow melt or a hard rain.

The laminated tiller is attractive, as are the teak companionway slides and handrails on the cabin trunk. Excellent molded-in non-skid and a molded-in toerail add to on-deck security. Stainless-steel bow and stern pulpits are standard and the lifelines are at a realistic height. The sidedecks are wide enough to allow easy access forward for handling sails or the anchor that is stowed in a bow locker.

Cleats and other hardware are first-rate — no plastic is used. For ventilation, there is a forward hatch above the V-berth and two opening portlights. Two fixed ports let light into the saloon but the real cabin ventilator is the extra-large companionway hatch. It is exceptionally wide and slides well forward, creating a very roomy standing space that makes entering the cabin easy. Three synthetic dropboards close off the companionway. Kim has modified the top board with a port and screen. On newer boats, Precision has done away with teak on deck, replacing it with HDPE synthetic wood to cut down on maintenance.

The two halyard winches mounted on either side of the companionway, coupled with rope clutches, are standard, but the coaming-mounted winches for the genoa and spinnaker sheets were optional before 2000. A large sail locker under the starboard cockpit seat opens to the interior, while an open-sided fuel-tank locker is to port. An outboard-engine mount and a stainless-steel swim ladder are standard on the Precision 23.

Rig

The Precision 23 has a seven-eighths fractional sloop rig. The shrouds, uppers and lowers, are fastened to beefy chainplates that penetrate the deck inboard of the sidedecks, allowing for very tight sheeting angles. Tracks for the jib are standard while genoa tracks are optional. Kim has full-length battens in his three-year-old Mack Sails mainsail. His jib and 155 percent genoa are also fairly new but the storm jib and asymmetrical spinnaker are original to *Willow*.

A stock Precision 23 has a split in the backstay to clear the tiller. The mainsheet is normally attached to the end of the boom and the backstay split plate. From photos I've seen, it appears the cam cleat end is mounted on the boom. I've never much liked this arrangement, and apparently neither did Paul Lindenberg, as *Willow*'s mainsheet is close to the helmsman's hand on a small traveler mounted between the cockpit seats forward of the tiller. Kim constantly uses the traveler to fine-tune mainsail trim. Paul also modified the backstay so he could adjust it with a block-and-cam-cleat arrangement. Roller furling on the headsails is another addition that aids the singlehanded sailor.

***Willow*'s sail-handling gear has been modified over the years. A boom vang, at top, helps adjust mainsail shape, and the twin headsail tracks and lead blocks allow better headsail trim. A mainsheet traveler fitted in the long cockpit, above, puts the sheet within easier reach for the helmsman and improves mainsail control.**

Cabin

Entering the cabin via the large low companionway is a piece of cake. There is one step — onto the teak step on the 48-quart cooler — and then the sole, which has the same non-skid as the deck. The cabin, with its abundant teak trim and panels, is very roomy for a 23-foot trailerable boat. Although it's advertised as having four berths (V-berth, two settees, and a quarter berth to port), Kim thinks it's comfy for one. Two would be very cozy. The other two would have to be children, even though the berths are long enough for adults. As with many trailer-sailers, the extra berths are good places for gear and supplies, but there is plenty of storage space below each of the settees and beneath the V-berth.

Models built between 1986 and 1995 had no opening ports, just solid full-length deadlights. Boats from 1995 to 1999 had two opening ports, and since 2000 Precision has fitted six Lewmar opening ports with screens. With two opening ports in the saloon, plus the opening forehatch and large open companionway, it was fine on a sunny, 90-degree Florida afternoon.

The cloth-covered settees are comfortable with appropriate backrests and fiddled shelves behind them. A wooden pedestal table with fiddled edges can be mounted in a socket in the cabin sole. A small galley with a sink, a 5-gallon water tank, a stove, and a trash container resides to starboard aft while an electronics area is to port.

Owners praise the generous volume of the interior, at left, which is achieved in part by the use of the arch and bulkhead instead of a compression post under the mast. Although in a compact space next to the companionway, at right, the galley has room for a two-burner alcohol stove, a sink, a trash receptacle, and stowage for plates and glasses. The port-side settee has ample stowage beneath, below.

Comments from owners of the Precision 23

"The boat has a lot of interior space, with a very open layout and a bit of privacy behind a curtain for a Porta Potti. The cockpit is roomy and comfortable, with good-sized seats you can stretch out on and a good distance apart for foot-bracing, the right angle for back support, and plenty of storage space in lockers. It's a little long for singlehanding if the lines are led to the cabintop, but I've done it with the aid of a tiller extension. Trailering the boat is easy with a vehicle that can tow around 4,000 pounds, and launching and retrieving the 2,500-pound boat is no problem at most ramps."

–**Jeff Mirus**, Manassas, Virginia

"Likes: Pleasant to sail, generally good mannered, reasonably quick for its size. Spacious cockpit. High overall build quality. Interior size is good for a boat of this length. Good trailering with a suitable tow vehicle and the mast-lowering/raising system on the trailer.

"Dislikes: Open locker to cabin on starboard side. A more useful layout would be a shelf about 5 inches up from the present and the whole compartment sealed off. Original mainsheet attachment to backstay. It also helps to add a backstay tensioner. Use of rigid PVC in scuppers, especially in the anchor locker scupper. Low spot in starboard cockpit seat near transom accumulates standing water and then stains. Molded toerail. I would prefer slotted aluminum (for snatch blocks, etc.)."

–**Sam Trickey**, Gainesville, Florida

"Likes: enormous, minimally obstructed cabin volume thanks to the compression arch. The trailer incorporated a handy mast-raising system. Quite weatherly for a keel/centerboard configuration. Good build quality. We never experienced any structural flaws despite sailing her often and hard in season.

"Dislikes: the end-boom mainsheet configuration. It keeps the cockpit clear, but the boat was not provided with a vang and I can't imagine sailing this boat without one. We installed a vang and boomkicker, which allowed us to remove the topping lift."

–**Christopher Allen**, Port Angeles, Washington

"The one major downer I can think of is the cockpit drains. They should be true through-hulls, not just PVC stuck out through the transom. It's known in the Precision community they require constant monitoring and resealing."

–**David Coughlin**, Baltimore, Maryland

Kim has upgraded the lighting to LED bulbs. A portable toilet is situated under the V-berth to port. Using it requires the removal of a large cushion but there's no good place to put it. The overhead is a white fuzzy fabric and the finish on the cabin sides is the gelcoat of the inner liner. I saw no exposed rough fiberglass.

Under sail

In light winds with occasional strong puffs, the sail on the St. Lucie River was a pleasant exploration of the Precision's handling. As we sailed close to the wind, I found the tiller pressure to be a tad on the heavy side, but there was no undue weather helm. *Willow* pointed quite high and came about quickly enough,

The V-berth is spacious, at left, but the cushion must be removed whenever anyone needs to use the portable toilet. This is fine in the daytime but inconvenient at night. In the saloon, at right, good use is made of opportunities for providing stowage spaces: behind the settees, behind the padded backrests, and on small shelves. The opening port, fixed ports, and companionway let in light and air.

though not dinghy quick, to show the Precision 23 has the weight to carry through a tack in light air. The long stub keel keeps her going straight.

In lighter winds, Kim does not lower the centerboard, as the keel provides plenty of lift without the drag of the board. In the puffs, there was not much need to dump sail; with good form stability and plenty of ballast she's quite stiff. Heeling did not change how she handled and she was stable sailing downwind. On a reach, she accelerated quickly in the puffs, as she should with her generous sail area/displacement ratio of 21.8.

The seating was comfortable and the visibility forward quite good. I felt no need to leave the seat near the tiller to find a better view or more comfortable spot. I did find the modified mainsheet a little close to the end of the tiller, and getting around the tiller during a tack was a bit cumbersome. A tiller-mounted autopilot frees Kim to do chores while singlehanding.

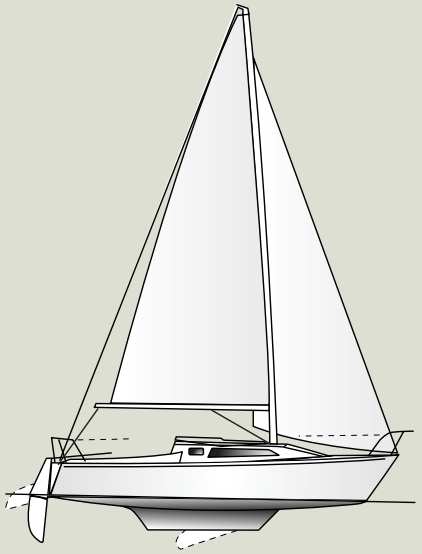
Under power, there was a small but not uncomfortable amount of helm pressure from prop wash against the rudder. In all, we had a great time. I can see why a person would be tempted to race the Precision 23. It's simple, stable, predictable without being stodgy — and fast. Its PHRF number is 228 in most fleets. A Compac 23 is around 260, and an O'Day 23 is between 237 and 273.

Conclusion

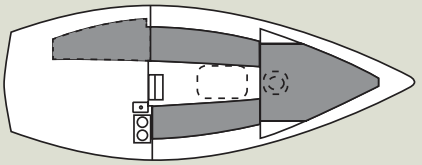
If you are moving down in boat length, no longer cruising, lost your crew and singlehanding, or just tired of the cost of big-boat maintenance and fees, the Precision 23 is a proper little yacht that may be what you are looking for. While certainly capable of a pocket cruise on a weekend, perhaps even much farther, its real forte is just simple sailing fun. Shoal draft will get you into the quiet coves and make for easy trailering from any decent ramp.

The quality of the design and build leave you little to fix up or modify. Good boats command good resale prices, and you'll be paying a bit more for the Precision 23 than most other boats in this size range. But you'll not be disappointed. Prices range from a 1988 listed for $5,000 to a 2008 at $24,900. The highest asking price online was $27,000 for a 2006 model — and of course you can buy a brand new one, but that's not a good old boat . . . yet!

Precision 23



Builder	Precision Boat Works
Designer	Jim Taylor
LOA:	23 feet 5 inches
LWL:	20 feet 0 inches
Beam:	8 feet 6 inches
Draft board up:	1 foot 11 inches
Draft board down:	5 feet 4 inches
Displacement:	2,450 pounds
Ballast:	850 pounds
Sail area:	248 square feet
Sail area/disp. ratio:	21.8
Disp./LWL ratio:	137



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

Resources

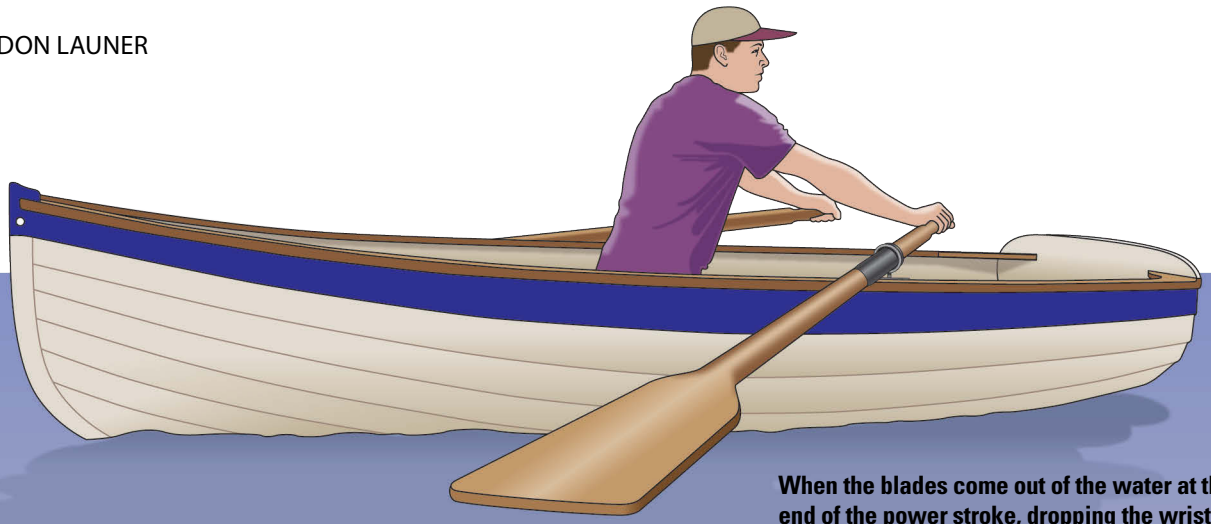
Parts are available through the builder, Precision Boat Works
www.precisionboatworks.com

Precision owners group
www.precisionowners.com

Rowing a Hard Dinghy 101

Exercise that gets you somewhere on the water

BY DON LAUNER



When the blades come out of the water at the end of the power stroke, dropping the wrists feathers them for the return stroke.

LAYOUT AND ILLUSTRATIONS BY TED TOLLEFSON

For many of us, our very first boat was a rowboat — in my case an old and leaky one — so every outing is a trip down memory lane. But rowing is a rewarding activity that can be learned at any time of life.

Oars

If you look closely at oars used with hard dinghies, you'll find that their blades are often not solid wood but three pieces glued together (laminated). Oars made this way don't have the life expectancy of the more expensive solid oars cut from a single piece of wood. The higher cost of one-piece oars is due to the waste involved. While the shaft of a laminated oar can usually be made from 2- x 2-inch lumber, one-piece oars are made from more expensive 2- x 6-inch boards, and what is cut away is wasted.

Once you have decided on the type of oar construction you want, length is the next consideration. The rule of thumb is that the length of an oar should be at least 1.5 times the beam of the dinghy. For a 4-foot beam, an oar should be at least 6 feet long. A few rowers (usually those who grew up rowing racing sculls) prefer to row with the grips of the oars overlapped. In that case, add 6 inches to the above figures.

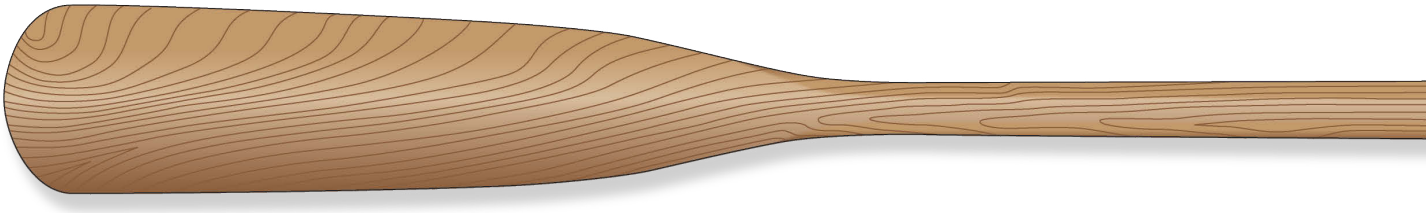
A dinghy with very high freeboard will also need slightly longer oars. An important point to consider is that the oars should be stowable inside the tender. For this reason, some long oars are made in sections.

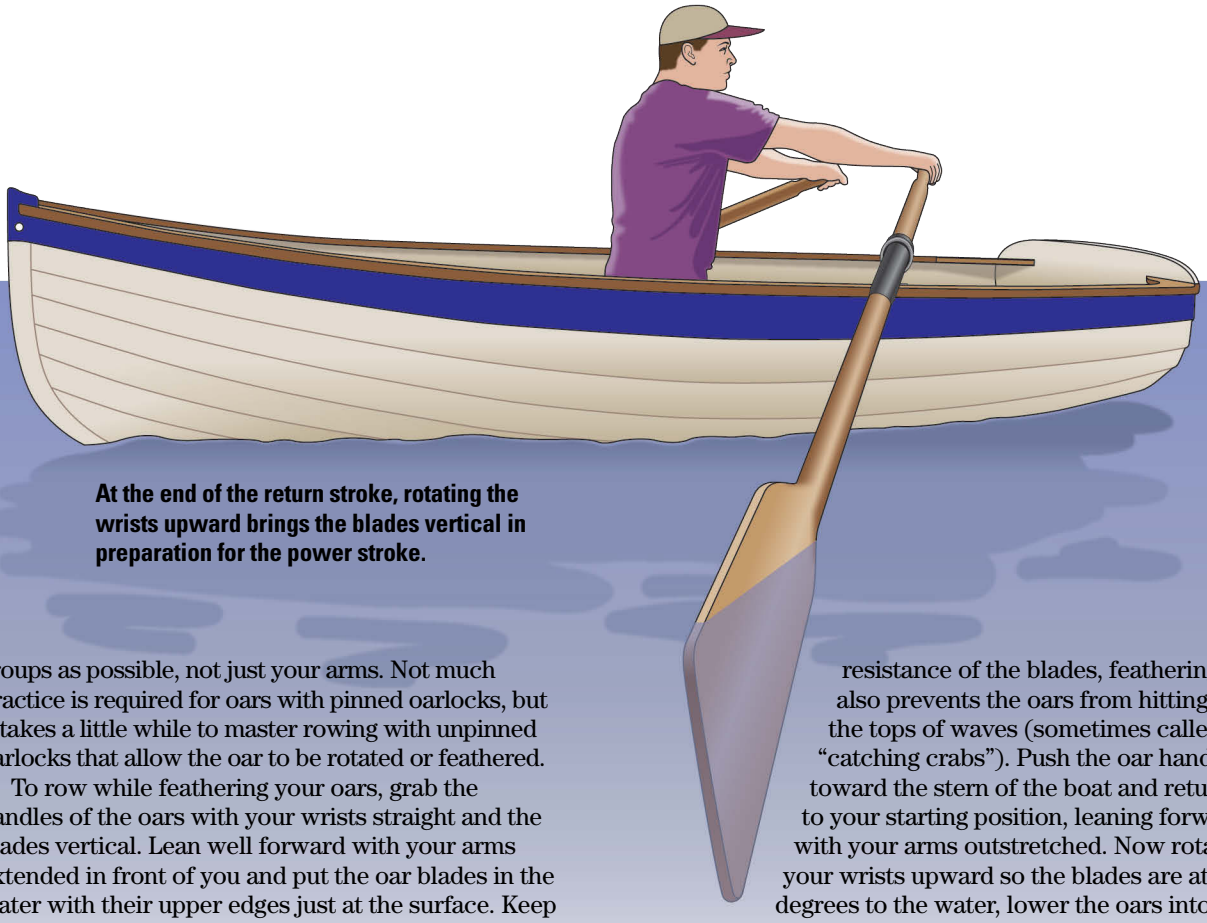
Oarlocks (or rowlocks)

Many types of oarlocks, or rowlocks, are available. For children and rowing novices, the U-shaped, or "horn" oarlock, with a pin through the oarlock and the oar, sometimes called the North River Horn Oarlock, is the most common and the easiest to use. (The term "horn" is usually applied to U-shaped oarlocks that resemble the horns of a bull). The pin keeps the oar and oarlock together and holds the oar's blade vertical. However, a blade that is always vertical is not ideal, especially when rowing into a wind or chop and having the ability to reduce wind resistance by feathering the blade makes rowing easier.

Rowing technique

Even when you have the ideal dinghy and the best of oars and oarlocks, your success at rowing all comes down to technique. (*See Don's "The Gentle Art of Rowing," May 2003* ***–Eds.***)
Good rowing technique requires that you use as many muscle





At the end of the return stroke, rotating the wrists upward brings the blades vertical in preparation for the power stroke.

groups as possible, not just your arms. Not much practice is required for oars with pinned oarlocks, but it takes a little while to master rowing with unpinned oarlocks that allow the oar to be rotated or feathered.

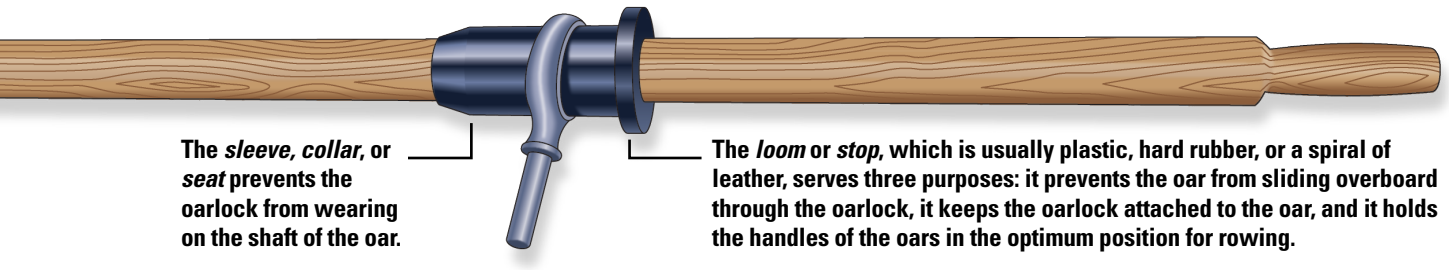
To row while feathering your oars, grab the handles of the oars with your wrists straight and the blades vertical. Lean well forward with your arms extended in front of you and put the oar blades in the water with their upper edges just at the surface. Keep your arms extended and pull on the oars by straightening up your body using your back muscles. Keep your hands level and push with your legs to prevent you from sliding off the seat. Near the end of the stroke, pull your arms up to your midriff to extend the length of the stroke. During this power stroke, the blades should not come out of the water or dip too far below the surface. This will happen if the blades are not vertical.

When you have completed the power stroke and begin the recovery, feather the oars by rotating your wrists downward so the blades are nearly parallel to the surface of the water. As well as reducing the wind resistance of the blades, feathering also prevents the oars from hitting the tops of waves (sometimes called "catching crabs"). Push the oar handles toward the stern of the boat and return to your starting position, leaning forward with your arms outstretched. Now rotate your wrists upward so the blades are at 90 degrees to the water, lower the oars into the water, and begin your next power stroke.

The rate of the rowing stroke is proportional to the oar length. The longer the oars, the slower the rate, because of the longer sweep made by the blades. A comfortable stroke rate that will have you rowing your dinghy at a good speed is 20 to 30 strokes per minute.

Don Launer, a Good Old Boat *contributing editor for many years, is now in Fiddler's Green (see page 16). Don, a master of virtuallly everything he attempted, built his two-masted schooner,* Delphinus, *from a bare hull, held a USCG captain's license for more than 40 years, and wrote five books. His 101 articles through November 2011 are available as a collection from the Good Old Boat download website. Look under Archive eXtractions at www.audioseastories.com.*

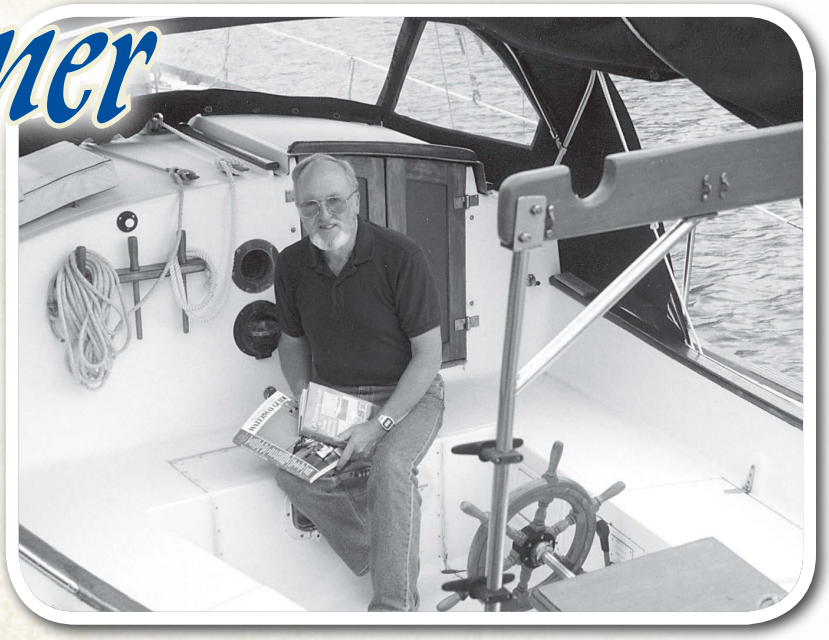
The round oarlock



The *sleeve, collar,* or *seat* prevents the oarlock from wearing on the shaft of the oar.

The *loom* or *stop,* which is usually plastic, hard rubber, or a spiral of leather, serves three purposes: it prevents the oar from sliding overboard through the oarlock, it keeps the oarlock attached to the oar, and it holds the handles of the oars in the optimum position for rowing.

In fond memory of Don Launer



The editors learned in late June that Don Launer had passed over the bar on June 15, 2015, at the age of 89. We cannot express the depth of this loss to Good Old Boat *and to sailors everywhere. After informing our readers, they spoke up. Some of their comments are included here. For more about the remarkable man who was Don Launer, please visit his website, maintained by his granddaughter, Jennifer: donaldlauner.com. Two more of Don's Sailing 101 articles will follow in the issues ahead before the light goes out completely. But now it is our readers' turn to offer their thoughts and memories.*

Don Launer was an extraordinary human being. I don't say this lightly. If you ever had a moment to explore the depth of his knowledge, you would agree. Fondly, I look back on many of those moments. Many a time, while I was traveling up and down the Eastern Seaboard, it took only a phone call and his home was opened up and we spent many hours over a bottle of wine contemplating the excitement of going to sea, be it in a small dinghy, or sailing *Delphinus* on Barnegat Bay.

Don truly lived a cruiser's lifestyle. As we all plow our traceless furrows through life, we would occasionally anchor alongside, exchange exciting observations and stories, just to pick up anchor again until the next time. Whatever your spiritual inclinations are as to the consequences after death, for us, the living, it still hurts a lot to lose someone we have come to love. As for me, I will truly miss Don.

–Chris Bauer

Chris is the founder of Bauteck Marine, the maker of Bauer Boats. He was a near and dear friend of Don's. ***–Eds.***

Good old sailors, like good old boats, always have the best stories associated with them. These emerge from their hearts, capture our imaginations, and take us to places we would never venture otherwise. The sea is a bit emptier with the loss of this soul.

–Randy Kanipe

Back in the mid-1990s I had the good fortune to encounter Don Launer in *Delphinus* at Tice's Shoal on Barnegat Bay. I had no idea until many years later who he was, but my memory was of a kind, energetic, enthusiastic man. And, of course, I have since become a fan of his writing. He will be missed.

–Paul Follansbee

I am deeply saddened to learn of Don's passing. It's as though a family member has left, which — not surprisingly — is true for the sailing community in general and for owners of good old boats specifically.

Capt. Launer possessed an uncanny ability to choose topics relevant not only to sailboat maintenance and improvement but also to the art and science of "sailoring." During the 15 years I've been a *Good Old Boat* subscriber, Don, through his excellent articles, has contributed more to my knowledge and understanding of sailing than perhaps any single published individual I can name. His ability to approach a wide field of topics and describe them in a clear, concise manner has resulted in a virtual academy of sailing nuts and bolts.

Don could convey the essence of a simple item like a telltale or the "zen" of a sail's aerodynamics arguably more articulately than many established sailing courses and schools. He tackled issues as ubiquitous in a boat owner's lexicon as electrical connections, but from a perspective always guaranteed to elicit an "aha! moment" in the reader. That was one of the things I'd look forward to with each new issue of the magazine.

I'm going to miss reading Don's pearls of wisdom a great deal. But I have both Don and the fine publication he wrote for to thank for a treasure trove of knowledge I have carefully tucked away in my *Good Old Boat* library.

Fair winds, Capt. Don Launer. Thank you for all you shared with your students of the art, science, and mechanics of sailing and boat ownership.

–Dan Goodman

What a great loss. I'm really saddened to hear about Don Launer's passing. It is hard to overestimate his contribution to the knowledge of *Good Old Boat* readers. Everything from repowering to the feature story about *Delphinus*, his Lazy Jack 32, brought me into *Good Old Boat* like a family with open arms. (Was it really 10 years ago?)

Thanks, Don, for your wealth of knowledge and for sharing it with others in our beloved forum.

–Walter Gaines

Don shared a photo of *Delphinus* with me after we met at Annapolis. We got into a wonderful discussion of the Lazy Jack Brewer design in comparison to the Allied Seawind II by Thomas Gillmer. I must admit to being drawn to the Lazy Jack and I always wished he and I lived closer to each other for possible sail day swapping and so on. Don's articles and contributions to the body of sailing heritage and knowledge cannot be overstated. His book, *Lessons From My Good Old Boat*, is a treasure now a tad poignant and sad as I absorb his being gone.

–Ed Verner.

There's never an easy way to say goodbye . . . especially to a legend like Don Launer. I devoured his articles and books because — like a curious cat — I'm always looking for ways to exercise the semi-dormant synapses between my eardrums. Don, and his particularly effective way of getting his point across, will be sorely missed.

–Bill Huesmann

I am beyond sad to hear this news. The articles that this multi-talented man wrote were some of my favorites. I couldn't wait to see what he, and also Ted Brewer, had written to contribute to each magazine. The two were also connected through the Lazy Jack schooner since Ted Brewer did the final designs on this boat. I also felt a connection to Don through my own boats. I own a Hermann 19 and a Hermann H20. I remember as a kid visiting the Hermann boatyard in Seaford, New York, and climbing around on some of the schooners Ted Hermann was building. My dad came within inches of buying one. Also, like Don, he considered buying a bare hull. I would love to see *Delphinus* someday. Don's photo of *Delphinus* on the September 2010 issue is still my favorite of all the cover pictures that *Good Old Boat* ever printed.

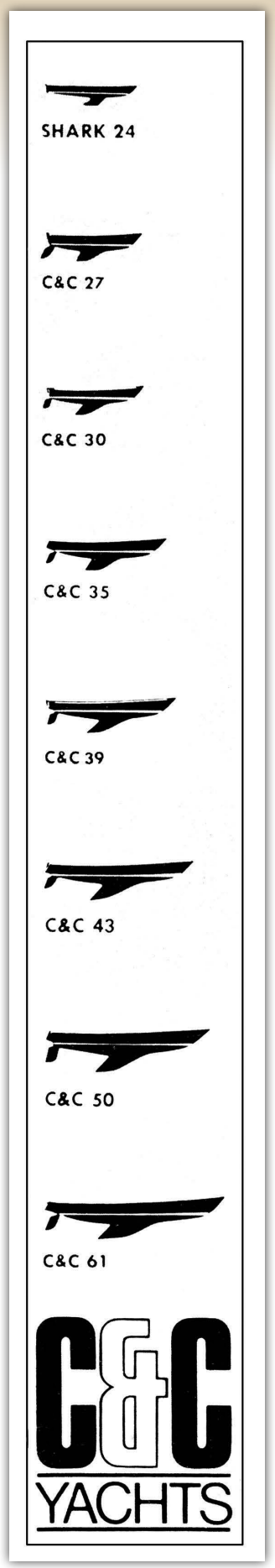
–Matt Formes

While I never met Don, over the years I've read many of his fine articles. Such a sea salt as he will be greatly missed. I'd like to think we all end up sailing on a great sea somewhere up there.

–Fritz Seegers

Readers may wonder what will become of Don's beloved Delphinus. *His son Tom wrote, "Today I went to the marina where Dad built the* Delphinus *so many years ago. I had not been there in some 25 years. We do plan to spruce her up and sell her to someone who can offer her an opportunity to make more magical memories. It was a bittersweet afternoon."*

–Editors



Keel evolution,

PHOTO COURTESY OF MARK BRUCKMANN OF BRUCKMANN YACHTS

C&C YACHT GRAPHIC COURTESY OF BOATBROCHURE.COM

BY ROB MAZZA

In Part 1 (May 2015) and Part 2 (July 2015) of this narrative, we explored the evolution of the keel from a longitudinal structural member in wooden boat construction to a separate appendage that provides stability while at the same time generating lift. This was not a straight-line evolution, since the development of the fin-keel in 1891 by Nathanael Herreshoff was quickly discouraged in 1906 with the implementation of both the Universal Rule in North America and the International Rule in Europe. That is not to say that yacht designers fought this restriction. Most, in fact, agreed with it; even Norman Skene, in his original *Elements of Yacht Design*, discouraged the use of a separate rudder as being too inefficient, operating, as he thought it would be, in the wake of the keel.

For more than 70 years, therefore, little meaningful development took place in hull and keel hydrodynamics. This is quite a compliment to the rating rules in effect at the time, since their goal was to restrict development and promote "wholesome" seakindly boats. The argument as to whether this is design stagnation or design stability could be debated easily from either position.

It's intriguing to look at the evolution of the wing and fuselage in aircraft development during the same timeframe. *No Ordinary Being*, Llewellyn Howland's recent biography of Starling Burgess, gives us a glimpse into the development of flight early in the 20th century and the development of hull and keel design in the same period through the eyes of designer Starling Burgess, who was heavily involved in both.

If you equate the aircraft fuselage with a boat's hull and the keel with the wing, you get some interesting comparisons. Early aircraft were all wing and no fuselage; the pilot sat right on the lower wing completely exposed to the elements. Early sailing craft, as we saw in the first part of this series, were exactly the opposite: all hull (fuselage) and no defined keel (wing). It's fascinating to see the fuselage develop in aircraft with wings attached, almost in parallel to the development of keels (wings) in sailing craft attached to a separate "canoe body." It is the keel becoming a defined lifting foil that is critical to this study, with the result that a lot of aerodynamic research soon was applied to keel design, similar to what Manfred Curry did for sail and rig design in the 1920s and '30s.

We should not take this analogy too far, since there is really no serious limitation on the span (length) of a wing, but severe restrictions limit the span (draft) of a keel, most notably cruising range and rating rules.

The moderately swept second generation of the C&C fin keel can be seen here on the C&C 61, *Grampus*, at her launching in Bronte, Ontario, in the mid-1970s, at top. Her builder, Erich Bruckmann, wearing a white windbreaker, is standing by the crane. C&C Yachts featured the distinctive hull profile with its highly swept keel in its sales literature, at left, which made it a little awkward to easily abandon this approach to keel design even after more effective shapes were developed.

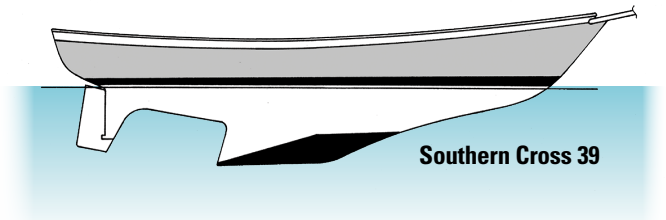
PART 3

Bites, sweep, fins, bulbs, wings, and winglets

Aircraft designers long ago realized that increased aspect ratio (long narrow wings) greatly improved lift-to-drag ratios by reducing the induced drag of the wing tip losses and vortices. Most sailing craft don't have this luxury, so the induced drag due to tip losses is high, and the quest in keel design for many years has been to learn how to best minimize those losses on low-aspect-ratio foils. Keep in mind that aircraft wings employ curvature or camber, as well as angle of attack, to generate lift, while sailboat keels, which have to operate on both starboard and port tack, are completely symmetrical and rely entirely on angle of attack to generate lift.

The experiments begin

By the 1960s, as we saw at the end of Part 2 of this series, designers like Bill Lapworth with the Cal 40 and George Cuthbertson with *Red Jacket* were demonstrating decisively on the racecourse the advantages of reduced wetted surface and improved hydrodynamics achieved by separating the rudder from the keel. At that point, there was no turning back. In the next 40 years, a bewildering selection of keel types would appear. Some were based more on fad than science, but all aimed to rationalize the two primary



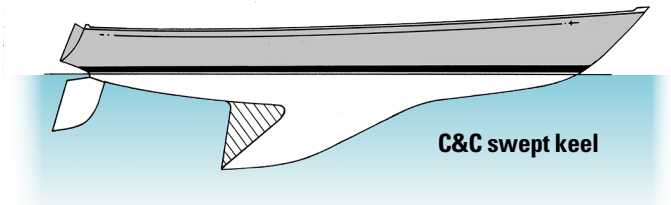
The Southern Cross 39 is an example of a designer, in this case Thomas Gillmer, seeking the performance advantage of a separate keel and rudder on a cruising design while the rudder remains attached to a fixed skeg, the residual trailing edge of the full keel.

requirements of a fixed keel: stability and lift. I specifically say "fixed," since we don't want to get into canting keels, lift keels, daggerboards, bilge boards, or centerboards in this study that is aimed primarily at production keelboat design. However, you will see that 70-odd years of little keel development would be followed by 40 years of rapid advancement of the separate keel, with the two requirements of lift and stability producing some interesting solutions.

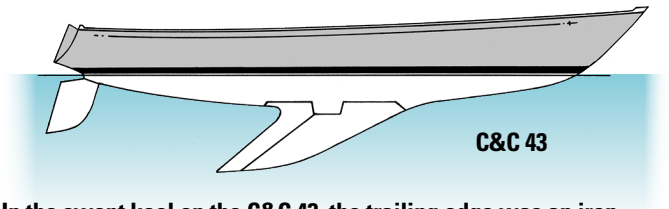
The improved performance of the separated keel and rudder was not lost on the cruising market, and even dyed-in-the-wool builders of confirmed cruising boats started cutting away the aft deadwood to improve performance and maneuverability. The first modest step in this regard was the famous Brewer Bite, employed not only by Ted Brewer himself, but also by builders such as Ted Gozzard and others. More aggressive reduction of wetted surface can be seen in the later designs of Bill Crealock built by Pacific Seacraft, as well as the Thomas Gillmer Southern Cross 39 of as late as 1981.

The C&C "sweep"

Let's resume where we left off from the previous article about this evolution with Cuthbertson & Cassian in 1969 on the verge of the creation of C&C Yachts. *Red Jacket* had just won the SORC in 1968 after winning her class the previous year. George Cuthbertson was still endeavoring to reduce wetted surface without jeopardizing lift or stability. Designers had been attempting to reduce wetted surface by shortening the keel fore and aft — moving the leading edge farther aft and the trailing edge farther forward. With the rudder still attached to this shorter keel — and thus moving forward much closer to the center of lateral resistance — directional control soon became a problem, especially when sailing



The apparent high sweep angle of the distinctive C&C keel of the late 1960s and early '70s derived from George Cuthbertson's desire to further reduce wetted surface by removing the area of the keel that he felt was least beneficial in generating lift.

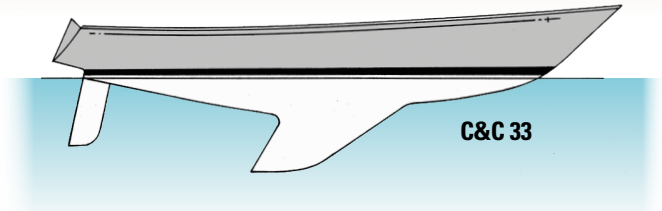


In the swept keel on the C&C 43, the trailing edge was an iron casting that helped support the cast-lead-ballast leading edge.

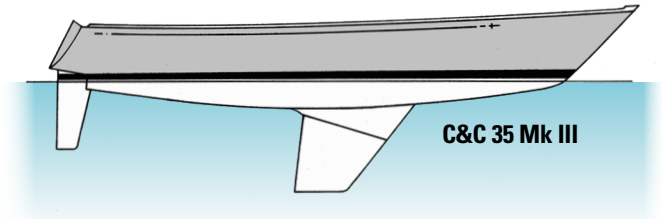
downwind under spinnaker.

The new breed of 5.5 Metres of this period were notorious in that regard, but that direction in design can be seen as far back as the early R-Boats. Even George Cuthbertson, with his 1969 Canada's Cup contender, *True North*, was still going down that road. *True North* soon had a transom-hung rudder installed to overcome her control challenges! Separating the rudder from the keel and mounting it independently farther aft allowed the keel chord to be shortened, reducing wetted surface and improving the keel's "aerodynamics" without jeopardizing control.

When George Cuthberson looked at *Red Jacket*'s original keel, he felt that wetted surface could be further reduced by removing even more of the deadwood. Knowing that lift is generated primarily off the leading edge of a keel, he carved away the upper trailing edge of the keel without shortening the leading edge and keel tip. This created what became the



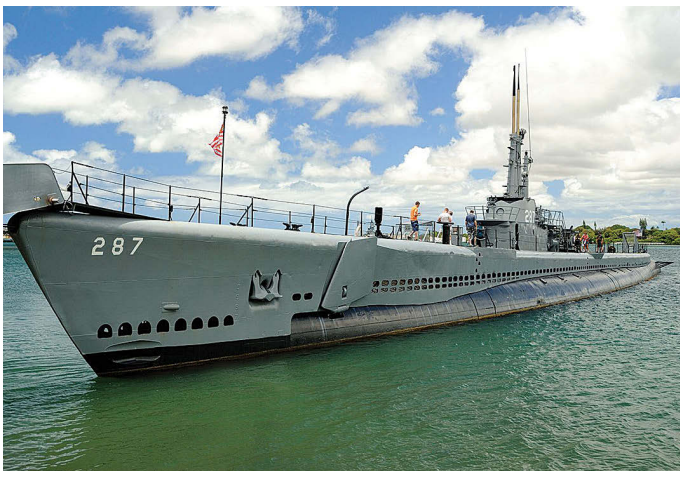
The conflicting design philosophies of pronounced sweep angle in the keel combined with a more vertical higher-aspect-ratio rudder can be seen in the C&C 33 of 1974.



By 1982, as seen here in the C&C 35 Mk III, C&C had resolved the conflict with a better match between the sweep angles and aspect ratios of the keel and rudder.

distinctive C&C swept keel of the 1970s, although the sweep angle itself was secondary to the reduction of wetted surface and not a goal in itself.

Tests in a towing tank confirmed his predictions of improved performance and the swept keel was used on *Manitou*, the successful defender of the 1969 Canada's Cup. This combination of highly swept keel, moderately swept lower-aspect-ratio cantilevered spade rudder, moderate forward and aft overhangs, and an attractive sheerline created a distinctive and very attractive hull profile that became part of the C&C corporate identity and featured prominently in its sales literature.



Data from Navy studies in the 1940s and '50s, long declassified, that led to the optimum planform configuration for low-aspect-ratio diving planes on submarines, were also applicable to yacht keels.

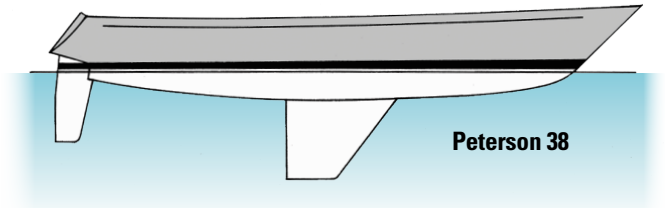
These larger swept keels on the C&Cs of the early '70s, most notably on the C&C 43s and 61s, were still "hybrid" in that the lead was inserted into a cast-iron framework, not dissimilar to a lead ballast casting being "let into" the wooden deadwood of older boats. In the smaller boats, such as the 27, 30, and 35, the keels were all-lead castings bolted to a molded sump that incorporated the keel fillet, still thought necessary for fluid flow and a better distribution of loading and, of course, for collecting bilge water.

Military insights

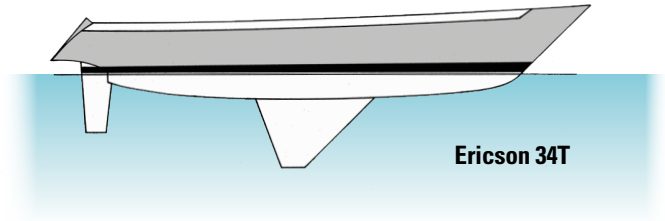
As a young graduate student haunting libraries at the University of Michigan looking for old NACA papers on low-speed aero and hydrodynamics, I discovered a declassified Navy study on optimum planforms for the hydroplanes on submarines. That little gem showed that for a low-aspect-ratio foil suspended from one end only, the optimum planform to create maximum lift and minimum drag was a shape that had, if I remember correctly, a 45 percent planform taper, a vertical trailing edge, and a leading edge sweep of about 45 degrees.

I don't know if Doug Peterson stumbled upon the same data I did. Perhaps he knew it intuitively, but that is precisely the shape of keel, quickly dubbed the "Peterson keel," that he introduced on *Ganbare* in 1972.

Any change in a design rule instantly levels the playing field and new younger designers come to the fore. That is exactly what happened after the International Offshore Rule (IOR) was introduced in 1971. A new breed of designer emerged, led by Doug Peterson, German Frers, and Ron Holland. After that, all IOR-design boats tended to follow their lead.



Doug Peterson is credited with popularizing the tapered straight-line profile, seen here on the Peterson 38, that was to be the norm in IOR racing yachts for many years.



Bruce King took keel taper to extremes in 1978 on the Ericson 34T with a configuration that raised the CG of the ballast and led to reduced stability, which actually helped its rating under the IOR.

PHOTO COURTESY OF MAX SMITH

PHOTOS BY ROB MAZZA

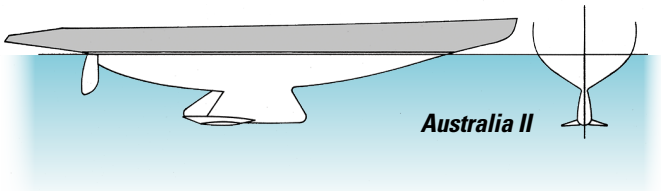
Even C&C adopted wings in the late 1980s, as seen in the "moderate" wings on the shoal-draft keel for a C&C 37/40, at left. The most extreme variant of the wing keel was the Hydrokeel, which could be justifiably described as "more wing than keel." It did certainly lower the CG of the keel and thus increased stability in a shoal-draft boat, at right.

If a moderately tapered keel was good, wouldn't a radically tapered keel be even better? That seemed to be Bruce King's thinking when he designed the Ericson 34T keel, which sported probably the most extreme taper of any production-boat keel of the time. This keel configuration had the adverse result of raising the center of gravity (CG) of the ballast and thus reducing stability. However, under the Center of Gravity Factor in the new IOR, reduced stability lowered the rating and produced a boat that was more competitive in the light-to-moderate wind typical of sailing conditions in North America.

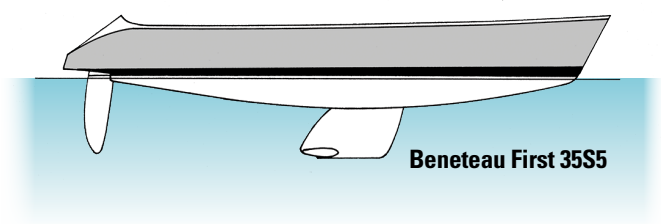
For C&C, whose corporate identity was tied to highly swept keels, this created a dilemma. For a period of time, C&C designers (and I was one) struggled with rationalizing the distinctively swept C&C keel of the late 1960s and early 1970s with the knowledge that less sweep and higher aspect ratio created a more efficient lifting surface. For a period in the early to mid-'70s, we saw the odd juxtaposition of highly swept keels (the corporate identity) with more vertical high-aspect-ratio rudders, as on the C&C 33.

Wings appear . . .

The Peterson keel had good hydrodynamics, but its shape concentrated the center of gravity of the ballast relatively high, where it did not contribute as much to stability. Under the IOR, with its CG factor, that was not much of a problem. However, for boats like 12-Metres designed to the International Rule, which did not measure stability but did penalize draft, such a keel had diminishing returns. Therefore, in 1983, Ben Lexcen turned the keel and the sailing establishment on their respective heads with the introduction of the winged keel on the America's Cup-winning 12-Metre *Australia II*.



***Australia II,* in winning the America's Cup in 1983, started a revolution in keel design, and keels of all configurations on all kinds of sailboats began to sprout wings and winglets.**



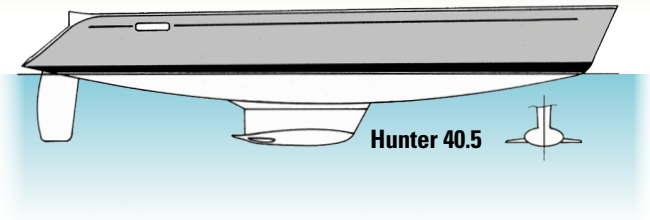
Beneteau imitated the *Australia II* approach with the shoal-draft keel of the First 35S5 in 1988. It's "upside-down" and has wings to reduce tip losses and increase the heeled draft.

Although the introduction of wings had the most impact on keel design, remember that this keel was also upside-down: the chord length at the root, where it attaches to the hull, was about half the length of the chord at the tip. Normally, such a planform would be highly inefficient as a lifting foil because the tip losses or vortices shed from the greatly enlarged foil tip would increase induced drag substantially. Such a foil was as far from the optimum elliptical spanwise distribution of lift as you can get. That is where the wings came in. They greatly reduced the tip losses off this type of foil, while at the same time adding more mass low on the keel, further lowering the CG of the ballast. The wings, canted slightly downward, also actually increased the boat's heeled draft and generated lift to counter leeway when sailing at a heel angle upwind.

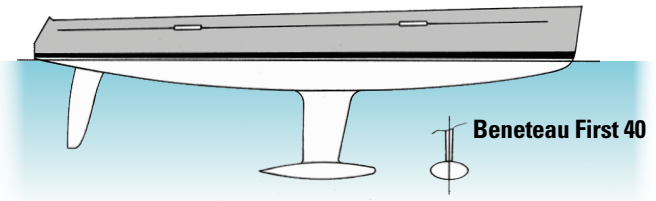
From a marketing point of view, wings became the thing in the mid- and late 1980s, even though the "upside-down" keel did not. Wings were also seen as a means to increase stability on shoal-draft configurations, with the Hydrokeel having wingspans that sometimes exceeded the span of the keel itself. However, most builders that added wings to their keels did so in moderation, locating them close to the trailing edge.

. . . and give way to bulbs

Extensive wings on keels seem to have run their course due to potential problems with groundings, especially on a falling tide, outweighing any benefit derived from increased stability and lift. Fear that the wings will have an anchoring effect in muddy bottoms as well as boats standing on their keels when high and dry have moderated people's enthusiasm for the configuration. Smaller wings and winglets are still seen on shoal-draft keel options from a number of builders, however.

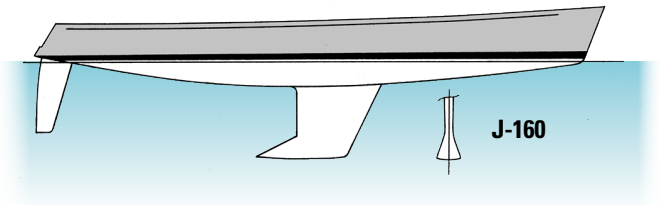


The shoal-draft keel on a Hunter 40.5 has a large bulb that has wings to reduce tip losses from the bulb, which does not project forward of the leading edge of the keel.



The 2007 Farr-designed Beneteau First 40 had a bulb configuration made popular in the America's Cup Class of the 1990s and reminiscent of aircraft wingtip fuel tanks of the 1940s and '50s.

Although the inverted or upside-down keel did not make the transition to the production market, builders started playing with bulbs cast as part of the lead keel in order to achieve a lower CG. They also used bulbs as end plates to reduce tip losses and induced drag. This was a configuration used on the first fin-keelers as far back as 1891 and over the years on a large number of model sailing yachts, but the concept had fallen out of favor in bigger boats with the introduction of the Universal and International rules and the subsequent demise of the fin-keeler.



On many of its models, J/Boats has used triangular bulbs to lower the CG of the ballast while also creating an end-plate effect to reduce tip losses. The keel is sometimes an all-lead casting, but more often than not is a welded stainless-steel or cast nickel-aluminum-bronze fin set into the triangular lead bulb.

Technical research sections of university libraries contain all sorts of declassified World War II and Cold War-era NACA research papers on the best configuration for "tip tanks" used by aircraft to carry extra fuel. Tanks were originally slung under the wings or fuselage, as on P51 Mustangs doing extended bomber escort duty over Europe in the latter half of the war, but it wasn't long before researchers started taking advantage of the tanks to reduce tip losses off the wings. This wealth of data from wind-tunnel tests, primarily at sub-sonic speeds, shows that the best location for a "tip tank" is with the tip of the tank extending well forward of the leading edge of the foil.

While this might be the best location for an aircraft, it presented a problem with sailboats. Sailors avoided this configuration due to the risk of picking up weeds and lobster or crab pots on the protruding bulb. For that reason, the forward ends of most keel bulbs were flush with the leading edge of the keel, but usually projected to a point aft of the trailing edge of the keel. This was almost always the case with lower-aspect-ratio fins, especially those cast as one piece with the bulb.

The size and best location for the tip tanks on the long-range Canadian CF-100 interceptor, introduced in 1952, was determined from wind-tunnel testing. This configuration was echoed in the location of lead bulbs on high-aspect-ratio sailboat fins. The winglets on the trailing tips further reduce the vortices streaming off the tanks, and these, too, were copied on sailboats.

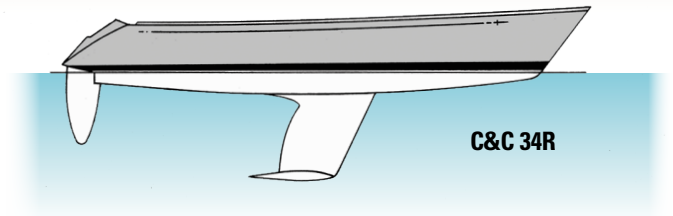
PHOTO COURTESY RCAF VIA LARRY MILBERRY

One of my towing-tank projects at the University of Michigan was to investigate the hydrodynamic advantages of such a bulb on a sailboat tank model. The bulb was, in fact, beneficial. An early example of this "integrated" bulb was the original 1977 lift-keel Mega 30, so dear to the hearts of this magazine's founders. One important secondary benefit of the bulb on the Mega 30 was that it shifted the ballast's center of gravity farther aft so that the keel lifting mechanism could be located in line with the trailing edge of the keel, greatly reducing the bending loads on the mechanism.

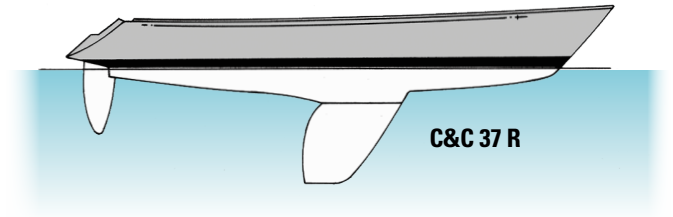
However, as draft and the aspect ratio of the fin increased, and when the fin was often a separate stainless-steel fabrication, the lead bulb started to look remarkably like the tip tank configurations of those World War II and Cold War-era fighter aircraft. This bulb location also had the advantage of reducing torsional loads on these long narrow fins, although you could argue that such loads would increase the angle of attack of the foil and thus increase lift. This keel configuration was popular in the AC Class during the America's Cup racing of the 1990s and early 2000s.

All bulbs need not be circular or oval in cross section. A number of designers have returned to the triangular shaped bulbs of the 1947 Uffa Fox Flying Fifteen, as also employed by George Hinterhoeller in 1959 in the Shark (see Part 2 of this series). Modern examples of this configuration, as used

PHOTO COURTESY OF MARK BRUCKMANN OF BRUCKMANN YACHTS



The 1989 Rob Ball-designed C&C 34R sported a semi-elliptical keel with a small bulb. So it would not catch weeds and lobster pots, the bulb did not project forward of the leading edge.



Rob Ball designed elliptical planforms for both the keel and the rudder of the C&C 37R to better achieve an optimal pressure distribution to reduce tip losses.

The keel of the custom C&C 66, *Phantom,* seen here being launched in Bronte, Ontario, in the early 1970s, has the extreme sweep typical of C&C designs of that period.

by J/Boats and others, employ a deep narrow fin with the integrated triangular bulb merged into the tip.

If wings were good, and bulbs were good, why not combine both? That's exactly what Hunter Marine did with the bulbs and wings on its shoal-draft keels.

The role of the ellipse

We have already discussed the importance of elliptical planwise distribution of lift over the span of a wing in order to reduce induced drag and tip loss. One of the ways to guarantee this type of lift distribution was to have an elliptical planform. This was the reason behind the exceptionally beautiful, but expensive to build, Spitfire wing of World War II.

In my days sailing and designing International 14 dinghies, the elliptical centerboard and rudder shape was the norm, although usually confined to the tip, not the full foil. It wasn't long before the elliptical configuration began to appear on production sailboats, as very well exemplified on the Rob Ball-designed C&C 37R. When the thickness ratio is held constant, at say 8 percent of chord length, more lead can be concentrated lower in the keel in the area of maximum chord length, lowering CG as well as reducing drag. This design philosophy was often mirrored in the shape of the rudder as well.

So, where do we stand today with keel configurations on modern production cruiser/racers? No builder has returned to full keels with rudders attached and all production builders (the few that still remain, at any rate) have opted consistently for the increased performance and production efficiency achieved with separate bolt-on keels and all-movable cantilevered rudders. A few retain the simple fin, but a good many have opted to lower the CG of the ballast by using narrow fins with bulbs, be they circular, oval, triangular, or any combination of those shapes. Some still use wings on shoal-draft configurations but nothing as mammoth as those on the old Hydrokeel.

Certainly configurations have settled down a lot from the 1970s and '80s when new and different keel designs seemed to enter the market every month. It is interesting to observe that, after almost 125 years, we have returned to where we left off with Nathanial Herreshoff and his *Dilemma* of 1891. How's that for progress?

Rob Mazza, is a Good Old Boat *contributing editor. Look for his review of Llewellyn Howland's biography of Starling Burgess under "Reader Services" at www.goodoldboat.com/reader_services/book_reviews/reviews_from_2015.php.*

Bug barriers

High-level protection at a low price

BY HENK GRASMEYER

Sometime before we left — towing our 25-foot Catalina C250 WB (water ballast) — for a yearlong "road and float" 17,000-mile cruise around our continent, someone showed us how to make inexpensive, yet practical and functional, bug screens. This proved to be one of the best additions for comfort aboard.

We were planning to take the boat to remote places that could involve encounters with bugs, mosquitoes, and other nuisances in the cabin. Since we would be living aboard our 25-footer for an entire year, space was at a premium. Adding more "stuff," even if it would be useful at times, was not desirable. If we were going to add screens, they would have to be compact and easy to store, simple to install and remove, flexible but tough enough to withstand some accidental abuse, and low-maintenance or, better yet, maintenance-free.

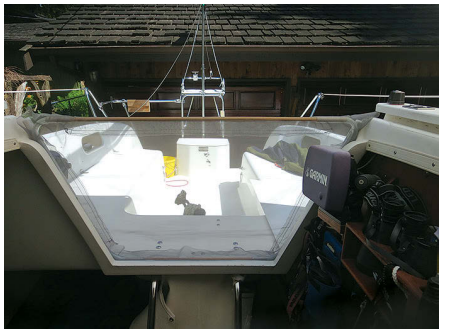
The trick to these screens is that they have frames made with wooden dowels joined at the corners with short lengths of flexible hose. They are adjustable, lightweight, and take up little space when stowed.

We bought ⅜-inch wood dowels, a length of ⅜-inch-ID reinforced water hose, and some good-quality screening material. We chose a poly-type "no-see-um" screen, but later discovered that, although this dense mesh won't let in any bugs, no matter how small, it also restricts airflow somewhat.

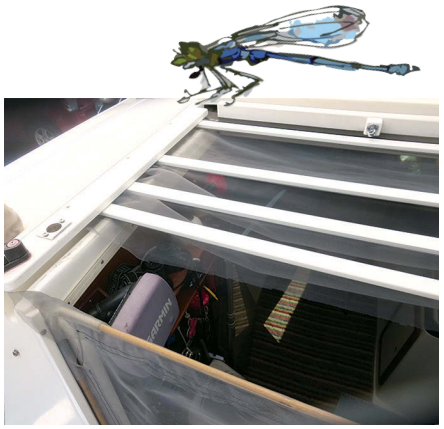
Simple construction

We first traced the shape of the hatch-board onto the screening material, allowing an extra 3 inches on both sides and the top and a generous 6-inch flap on the bottom. Using extra material is better as it can be cut to size later. After some experimenting with the flexibility of the hose, we decided to cut the dowels 2 inches shorter than the actual hatch opening at each connection, both in the vertical and in the horizontal directions. Longer dowels make tighter corners, but under some temperature conditions they may flatten the hose by forcing it to bend too sharply.

A sufficient hose-into-dowel "friction fit" is needed for the frame to keep its shape and conform to the shape of the hatch opening. In our case, a hose length of about 4 to 5 inches at each side of the joint served the purpose. The diameters of hoses and dowels may even vary slightly by manufacturer,



Henk's insect screens, at top of page, are made of inexpensive materials and are easy to install. The dropboard screen, above left, is supported by a frame made of wooden dowels joined at the corners with flexible water hose, center. The excess screen seals the corners. The construction makes the frame adjustable to ensure a snug fit. It's sufficiently rigid to stay in place, at right, and easy to stow.



The screen that covers the top of the companionway opening, above left, is supported by wooden slats Velcroed to the screen material, at top. Tabs made of the Velcro loop side, above right, slide easily on the hatch runners. For stowing, above, the screen rolls up into a compact bundle.

affecting the effectiveness of the joints. Before cutting the hose to length, check the hose-dowel resistance and use a longer length of hose if you need more sliding resistance. Once you have adjusted the frame to the shape of the hatch, you may wish to consider gluing the joints permanently.

We folded the edges of the screening material over, leaving ample room to insert the dowels, and ran two lines of stitching along both sides and the top. We left the corners open so we could insert the dowel frames and left the material untrimmed at the corners to help fill any gaps.

The frame is friction-fit by sliding the dowels in or out of the reinforced tubing to exactly fit the hatch contours. To allow the flexibility to make upward and downward adjustments, we did not sew the 6-inch flap at the bottom.

More of a good thing

Once we had a screen for the vertical part of the hatch opening, we continued the job by adding a horizontal screen so we could also open the overhead sliding hatch. It uses the same screening material and four ½- by 2-inch slats (sold as doorstops at the local hardware store). We cut the screen to the exact width of the hatch opening and attached the screen along the full length of each slat with Velcro.

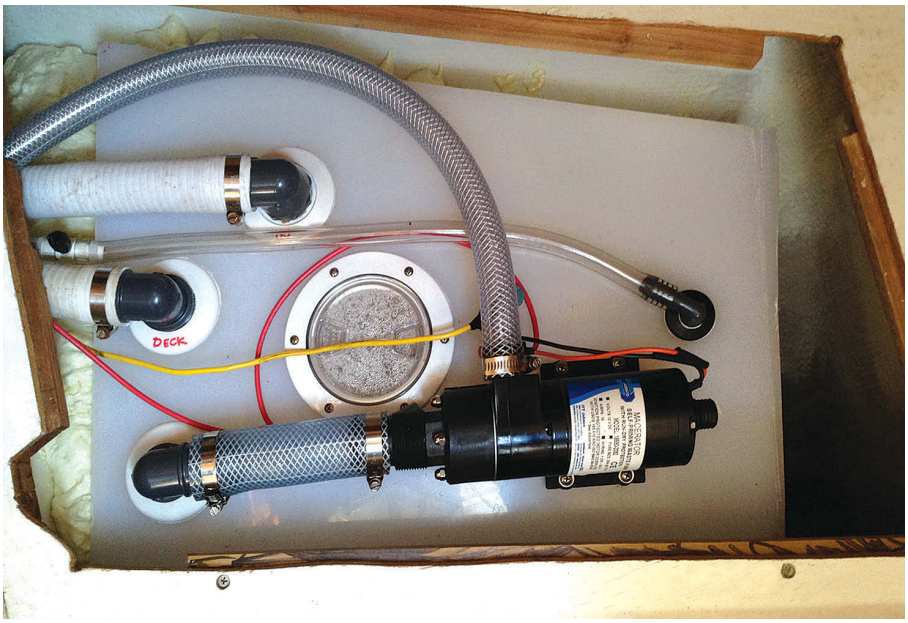
All four slats and the attached screen fit tightly from side to side in the track for the hatch slide. When it's pulled forward into the hatch opening, the screen seals on the bottom rail. The forward slat meets the open hatch slide while the aft end overlaps the vertical hatch screen, sealing the entire area. To make the slats slide easily, we added little Velcro strips cut from the loop side to the bottom of each one.

We can also use this screen when the pop-top is in place. We seal the pop-top entrance by suspending the screen, using Velcro to hold it in place on top of the pop-top.

When not in use, both screens can be stored easily — one rolled up in a small bundle and the other laid flat.

Henk Grasmeyer, a native of Holland, learned to sail at the age of 6 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.

When the pop-top is in use, the companionway top screen, suspended by a Velcro strip, completes the closure of the vertical opening.



Holding

Welding plastic for a superior sanitation system

BY HOMER SHANNON

Our 1978 Bristol 29.9 had been experiencing a number of "holding tank issues." Despite new hoses, we'd been getting frequent bad odors. The macerator we'd installed less than a year before pumped only intermittently. The plumbing, a lash-up that accommodated the many changes made to the system over the decades, was difficult to work on and took up quite a lot of space. To address these issues, I decided to rebuild the entire system over the winter. The objectives were low maintenance, ease of access, and elimination of odors.

The key component to the new system would be a new holding tank. Our boat had not been built with a holding tank, but a previous owner had equipped it with an 18-gallon homemade tank built of fiberglassed plywood. The tank, under the port-side V-berth, had never leaked and inspections over the years had shown it to be rot-free. Still, we suspected it was the source of the odors. The tank drained through a hose connected to the bottom in an awkward place, so working on the fitting was difficult and messy. Other desired changes to the system included relocating the macerator pump to a spot where it could be worked on easily, separating the deckplate and through-hull discharges, and moving all the fittings to the top of the tank so areas that could potentially leak would not be hidden.

After thinking about my requirements, I went on a long search for a stock tank that would fit my location, capacity, and budget. I estimated a cost of about $150 to $300 based on what I had seen in a number of marine catalogs. But I was disappointed when I discovered that there wasn't a single tank that would meet my specifications for size, shape, and capacity. Between Jabsco, Trionic, and Ronco, there must be 500 tanks available, but the only one that would have fit and provided the vertical clearance I wanted to allow mounting the macerator pump right on the top of the tank held only 14 gallons and cost $400. I decided to take a different approach.

Homer made his new holding tank to fit under the V-berth with all the fittings accessible, at top. He used polypropylene sheet, which can be cut on a table saw using a carbide-tipped blade, above.

DIY plastic welding

Somewhere in my web searches, I had come upon the topic of plastic welding. I had never heard of plastic welding before, but it seemed an interesting concept. I viewed a few YouTube videos and did some research. Plastic welding is not overly complicated. I learned that both HDPE (high-density polyethylene) and PP (polypropylene) are suitable for waste tanks. They are also the two easiest materials to weld and are sold by Grainger in sheets of various thicknesses and in sizes up to 48 x 96 inches. Both materials are easy to work with and can be cut and shaped using traditional woodworking tools.

Armed with this new knowledge, I headed back to the drawing board and reconsidered my project. I came up with a design that would fit the available space, have a calculated capacity of 18 gallons, and include all the top-mounting and other features I desired. Most important, the tank could be constructed using standard plastic-welding tools in the hands of a rank novice plastic welder. After finessing my design a bit more, I ordered my materials.

Cutting the polypropylene sheets was no more difficult

tank harmony

than cutting pieces of plywood to the same size and shape. A good carbide-tipped blade works best. A radial arm saw would have been useful, but I only have a table saw and a rotary saw, which sufficed. After cutting out the main pieces, I used a router with a 45-degree bit to chamfer the edges I would be welding. A Surform or block plane could have done this job if I hadn't had a router.

Welding technique

I made a few trial welds on some scrap pieces of polypropylene and found there wasn't a big learning curve to it. Pretty much, you just watch the YouTube videos and take your time.

The welder I bought from Harbor Freight does a good job despite being about a quarter of the price of professional-grade welders. It's vitally important to follow the instructions for shutting the welder down as failure to do so will result in the machine breaking. When using the tool, I wore ear protection. The machine is noisy — like a very loud hairdryer — and it's stressful to use it without earplugs.

The welder is sort of a hopped-up hair dryer. It has a heating element, a blower, and a tip that concentrates the hot air — really hot, up to 800 degrees! Welding the plastic requires that you heat the parts and apply the welding rod to the heated surfaces. This can be done by the "pendulum weld" technique, using the tips supplied with the tool. For long runs, you can use the HEJET speed tip that lays down a long continuous bead of weld. I used both techniques depending upon the locations within the tank.

An issue with plastic welding that I didn't anticipate is that the plastic sheets tend to warp as you work on them. My tank is essentially a trapezoidal-shaped box and, with a bit of modest trigonometry, I had been able to work out the dimensions of all the sides. I used these dimensions to cut the bottom and the side pieces. However, after the very first weld, an inside piece to the bottom, my dimensions began to change due to warping. I adjusted as necessary, but the net result was that the tank wound up a bit smaller than planned. I think with enough clamps it might be possible to create a jig that would hold all the pieces except the top. You could then tack weld them so they couldn't flex during the final welding, but I did not have the tools to do this.

With some recutting, I got the four sides and the bottom welded together. For all of these welds I was able to put a bead of weld on the inside and outside, assuring a very tight and strong weld. I also welded in a baffle that

For long welds. Homer used the speed-welding tip. The rip fence on the table saw worked well as a jig to hold the material, but that did not prevent it from warping.

Tools, materials, and cost

Plastic Welder 96712 from Harbor Freight
It's not a high-quality tool. My first one failed in 10 minutes, but it was reasonably priced at $70 with a good warranty and the replacement unit is still going.

Speed Tip from HEJET
This is expensive at $70 but it makes beautiful welds quickly.

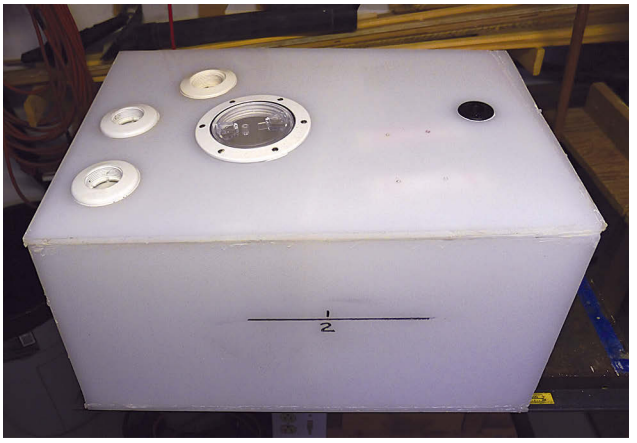
Polypropylene sheeting from Grainger, ⅜ inch.
HDPE could also be used but it is somewhat more expensive than polypropylene. Also, ⅜ inch is thicker than necessary and ¼-inch material is about 30 percent less expensive.

Polypropylene welding rod from HEJET

Various fittings from FlexPVC.com and Grainger

1½-inch flexible PVC hose from Wholesale Marine

The cost for this project came to about $420:
$180 for the plastic welder, speed tip, and welding rods; $145 for fittings and hoses; and $95 for ⅜-inch sheet polypropylene. This is roughly the same price as the only suitable commercial tank I could find and I would still have had to purchase all the fittings and hoses, so building the tank saved me money and left me with a number of side benefits. I still own the welding tools and can use them for other projects. I have a custom tank that fits my needs better than any stock tank could. Perhaps best of all, I have a new skill set and experience with plastic welding that will no doubt be useful in some project not too far down the road.



Before welding the tank top in place, Homer installed the pipe fittings, at left, and the inspection port, at right, that allows a look inside.

runs laterally across the tank to reduce sloshing and give the sides additional (and probably totally unnecessary) strength. Around the top, I could only make a single outside weld. However, top welds don't experience the same loads as the side welds, so I don't think this is an issue. I can tell you that ⅜-inch polypropylene sheeting is really, really strong stuff.

Plumbing

Before welding on the top, I reconsidered all the plumbing connections the tank required and determined their exact locations. There are five openings in the top:

- One 1½-inch bulkhead fitting for the input hose barb
- Two 1½-inch bulkhead fittings for the drain hose barbs
- One ½-inch bulkhead fitting for the vent
- One 4-inch inspection port

I drilled these holes with a drill press and appropriately sized hole cutters. To the two bulkhead fittings for the drains, I attached 1½-inch PVC pipes that extend down to ¼ inch off the bottom of the tank. A test of this method demonstrated that the macerator pump primes nearly instantly, due to the short lift height, and the pump will pick up all but about a quart of the liquid in the tank. I also welded on a small square of PP sheet under the macerator mounting point to allow the use of longer fastening screws.

You might think the short space between the bottom of the tank and the bottom of the pickup tube could become clogged. This is not an issue. Most marine toilets have a valve known as a "joker" that prevents backflow into the toilet and acts as a macerator. In reality, the material that gets into the tank contains only very fine solids. What is in there can easily slip under the bottom of the pickup tube and be ejected from the tank.

With the bulkhead fittings installed, caulked with 3M 5200, and correctly aligned so the barbs would point in the right direction when tightened, I welded the top panel to the tank. The fit was not as precise as I would have liked due to the warping, but plastic welding is forgiving and you can build up an area to bridge any opening.

I tested the tank by putting 2 gallons of water in it and setting it on every side. The side and bottom welds, which were welded inside and out, were 100 percent tight. Four small leaks in the top welds were easily corrected. Before installing the tank, I removed all the hose barbs and the macerator pump so I could more easily maneuver the tank into the opening below the port side of the V-berth.

Assembly

Installing the tank and connecting all the hoses went quickly. A good heat gun was indispensable in getting the flexible PVC hoses connected; they don't stretch well and at 40 degrees are like iron. I used PVC hose material for all of the connections except for the short run from the drain barb to the macerator pump and the run from the macerator to the through-hull. For these sections, I used clear reinforced vinyl hose to allow visual inspection of the hose should I have some future issue with the system.

My system does not have a Y-valve, vented loop, or any of the other parts associated with running the head to a through-hull. This is because the head is connected directly — and only — to the holding tank. I recognize that in a dire situation, either due to overfilling or pumping problems, I may wish I had built this differently. But, legally, you cannot run a direct discharge head inshore and the extra plumbing for a direct discharge just takes up more space and creates more potential for odors. I eliminated it.

The capacity of the finished tank is 15 gallons, somewhat less than the 18 gallons I had calculated based

Resources

Harbor Freight
www.harborfreight.com

Grainger
www.grainger.com

HEJET
www.hejetproducts.com

FlexPVC.com
http://flexpvc.com

Techspan welding equipment
www.techspan.com.au

Techspan training videos
www.youtube.com/results?search_query=tech+span+pedulum+weld

Urethane Supply Company: *The Book of Plastic Repair* (PDF format)
www.urethanesupply.com/_pdf/thebook.pdf

on the design of the tank. Some of this difference is probably due to the adjustments I needed to make after the materials warped. It is also possible that my calculations were not as accurate as I had hoped. We have found that 15 gallons is sufficient for two people for a weekend, but a discharge at sea or pumpout upon return to our home port is always necessary. Rebuilding the tank to enlarge it is a consideration. Cutting and re-welding the plastic would not be a problem, but I would have to rework the space where the tank is mounted. For now, the capacity is acceptable.

Operation

Discharging the system is very easy. I installed a circuit breaker for the macerator under a lockable cabinet to make it legal. To discharge, I turn the circuit breaker on, open the seacock, and depress the momentary on-off switch installed right by the head. The pump primes in just a second and takes about 2 minutes to discharge a full tank. Pumping out from the deck is simply a matter of removing the deck plate and sucking the sewage out with a hose. Because the deck plate and the macerator operate on different discharge ports in the holding tank, there's no chance that an air leak in the deck plate could cause the macerator to fail to prime.

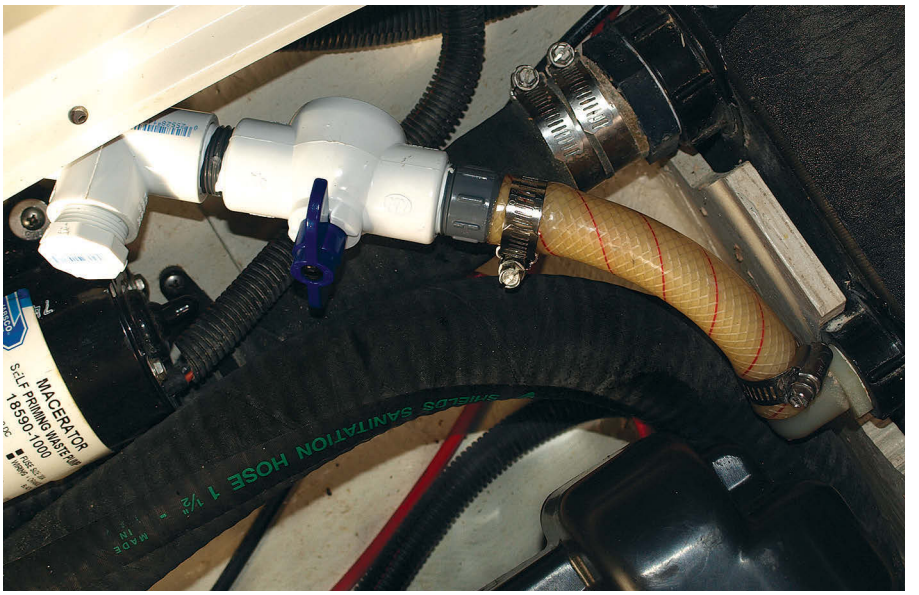
Although nothing has failed, working on the system is a breeze. After moving the mattress off the port side of the V-berth and removing the plywood cover below, I have access to the fittings, macerator, wiring, and inspection port. All the connections are above the tank. Should any hose need to be removed, septic leakage is limited to a few drops. The macerator is in plain view with good access for lubrication or repair.

After a full season with our new system, we're pleased with the results of the rebuild. In addition to installing the new tank and PVC hoses, I replaced the old wooden toilet seat. We already had a home-built carbon filter fitted into our vent line and, with the new changes, we no longer experience any septic odors.

All in all, it has been a wonderful upgrade to the boat and a great education. The project also showed that the obvious solution to a problem is not always the best way to go. Sometimes you need to step back and re-think things to come up with a creative alternative.

Homer Shannon has sailed the New England coast since his youth in Hingham and Manchester-by-the-Sea, Massachusetts. He presently sails a Bristol 29.9 out of the American Yacht Club in Newburyport, Massachusetts.

Heading off odors



A holding tank vent revamp clears the air

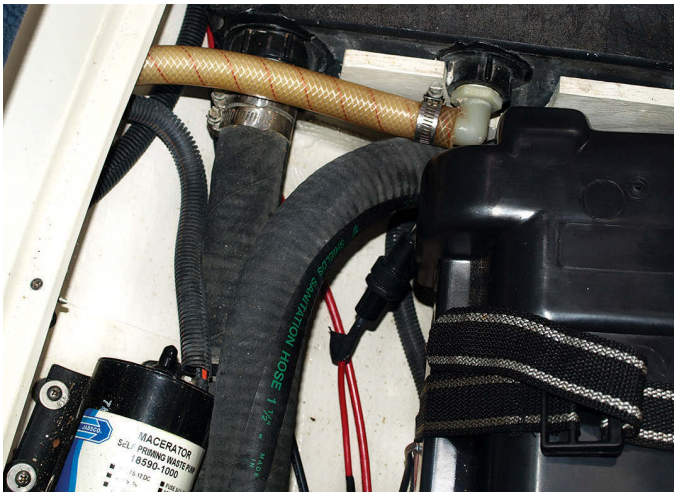
BY CLARENCE JONES

I found an easy, inexpensive way to improve my boat's holding-tank system. It cost $10, the stink is gone, and the catastrophe the original design almost caused won't occur. I rebuilt the tank's vent system, adding a valve and port that make it easy to clean the hose and through-hull fitting, and made a much better through-hull fitting. If a vent hose or fitting gets clogged (as my original fitting did) the system will smell bad and could become a brown disaster.

This project started when I replaced the house battery beneath the port-side cabin settee. The battery sits next to my holding tank and the smell under there was not good. Since the stink had been confined, I hadn't noticed it until then.

The first suspects were the 1½-inch hoses that connect the holding tank to the head and the macerator pump. My boat is 12 years old. In time, even the best sanitation hoses become porous to odors. At the intensity I experienced, the odor would soon have been obvious in the cabin. To test the hoses, I wet a rag in warm water, wiped the sanitation hoses with the damp rag — one at a time — and then smelled the rag. If a hose is leaking odor, the rag will pick up the smell. This easy test told me my sanitation hoses were not the problem.

Next, I looked for a leak, and found none, so I did a lot of research and learned perhaps more than most people want to know about holding tanks and how they work. As it turned out, the culprit was the ¾-inch vent hose. On my boat, that hose is reinforced plastic tubing. It was never designed to shield sewage odor. If sanitation hose had been used for the vent, as it is on some boats, the vent hose would not have become an odor problem, but my plastic tubing was emitting the smell trapped in the holding tank. A more serious problem was that the through-hull fitting for the vent hose was completely blocked.



The ball valve and the tee are close to the holding tank, at top, where Clarence can reach them easily. The original plastic vent hose, which led from the holding tank, above left, behind the furniture to the through-hull fitting in the side of the hull below the rubrail, was so inaccessible Clarence reused it. He had little space to work in. One of the larger sanitation hoses conducts sewage to the tank from the toilet, the other is the pumpout discharge line. The through-hull vent fitting, above right, was completely blocked.

Venting is necessary

Ventilation is a critical part of the holding tank system. Sewage not only smells bad, it produces nasty gases like methane, which is combustible. When you flush the head, the fluid that enters the tank pushes out an equal volume of air through the vent hose. This mixture of air and odorous gas then sits in the vent hose waiting for the next flush to deliver a new batch of nasty smells. In time, the plastic hose walls can become so saturated they begin to disperse the smell into the cabin.

The "good" bacteria that dissolve sludge in the tank need oxygen to do their work. When there is not enough air circulation in the tank, they use up all the oxygen and the "bad" bacteria begin to do their thing and create unpleasant odors.

In an ideal design, a holding tank would have two vent hoses and some way to promote cross-ventilation to supply oxygen for the "good" bacteria. In most boats, however, the only air movement occurs when normal daytime heating expands and expels air from the tank and contraction in the cooler night draws a little fresh air into the tank.

One of the clues that my vent hose had problems was the slow rising of the toilet flush handle when I didn't lock it after use. This is a new toilet. Had the old one done that? I couldn't remember. But I should have explored the possibility that pressure in the holding tank was pushing back. If the vent had been doing its job, there would have been no pressure in the tank.

If the ventilating hose becomes completely clogged at the through-hull fitting (insects love to nest there), flushing the toilet builds up pressure in the tank and can force a leak somewhere in the maze of hoses. At the next pumpout, if air can't enter to replace the pumped sewage, the powerful vacuum system at a pumpout station could implode the tank.

Reinventing the vent

Replacing the entire length of the vent hose would have been difficult in my Catalina 28 Mark II. The hose rises from the tank fitting and disappears behind the back of the settee and icebox, then re-emerges to connect to the through-hull fitting in the space behind the electrical panel.

I had to come up with some other easy and inexpensive way to improve the system, and I devised a modification that will make it easy in the future to clean the vent hose and flush or back-flush the through-hull fitting.

Clarence placed this PVC valve and tee inline on the vent hose to create a way to flush and back-flush the hose without putting the flush water in the tank.

My first step was to install a PVC ball valve and a tee near the tank. With the valve closed, I can now use a garden hose to clean and flush odor from the vent hose and clear any obstructions at the through-hull or tank outlet. I can back-flush from outside the boat and choose whether I want that water to go into the tank or not.

In a bind, with the valve open, the assembly can also serve as a vent if the vent hose or fitting should be clogged when the tank needs to be pumped out.

I tested the ball valve before buying it. Some are much easier to turn than others. Because this valve will be in line on a flexible hose, I didn't want to struggle with opening and closing it. In addition, some valves are smaller than others for the same size of pipe. Since I didn't have much space to work with, I chose the smallest I could find.

The ball valve, tee, and barbed nipples are threaded and sized to fit the ¾-inch hose. I used Teflon tape on all the threads. During the installation, I cut about ½ inch off each barbed nipple to better fit the crowded space. I used a section of the original hose instead of new ¾-inch tubing to connect the assembly to the tank. After I soaked it in bleach to remove any odor, it made the 90-degree curve without crimping better than the piece of new hose I had bought for the connection.

To begin the installation, I cut a tiny slit in the original vent hose just beyond the barbed nipple at the tank. This was to release the air pressure inside the tank. The smell was overpowering, but cutting the hose without doing this could have resulted in sewage spraying all over the cabin (and me) if the tank had been full or nearly full. Once the pressure was released, I found the hose had taken a "set" to the barbed tank nipple and couldn't be pulled off. I slit it and peeled it off.

At the other end of the assembly, I cut the length of the original tubing to fit and used petroleum jelly to help slip the tubing onto the new barbed nipple. I secured the tubing connections with all-stainless-steel hose clamps.

I positioned the assembly so I can easily turn the valve. I can also use the tee as a port to flush or back-flush the vent hose and through-hull fitting.

Flushing and back-flushing

To flush the vent hose and through-hull fitting, I close the ball valve, remove the tee plug, and screw in a ¾-to-garden-hose adapter. I attach a garden hose to that adapter and turn on the water. If the through-hull has been clogged from

Clarence modified a plumber's sink plunger so he can connect a garden hose to it and back-flush his holding tank's vent system, at right. The valve in the line, below right, is normally open. Closing it prevents the back-flush water from going into the holding tank and a hose on the tee directs the water to a bucket.

the outside (probably by dirt daubers) the water pressure from inside should blow out the clog.

The valve and tee assembly also provides an easy way to back-flush the vent if the clog is from the inside. Most through-hull fittings have screens to prevent insects from entering the vent hose. But removing the through-hull fitting to clean a clog on either side would be a major project on most boats. After installing the assembly at the holding tank exit, I adapted a plumber's sink plunger for the back-flushing.

I removed the handle from the plunger and used a hole saw to cut a ¾-inch hole into the inside of the rubber plunger. A short threaded ½-inch plastic nipple screwed into the plunger makes a watertight connection. On the outside (where the handle used to be), I screwed a PVC female garden-hose fitting onto the nipple.

To back-flush, I close the ball valve on the vent hose assembly. (If this valve is left open, the back-flush water will go into the holding tank.) I replace the tee plug with the garden hose adapter, then run a length of hose from the assembly to a bucket or plastic jug. If I want to clear the fitting at the tank, I just leave the valve open and the tee plug in place.

Outside the boat, with the water running, I hold the plunger against the hull over the through-hull fitting. A lot of water will escape during this process, so I can't tell if the clog is cleared. If there's water in the bucket, that means I've succeeded.

Parts and materials

Parts used to assemble the vent system:

- threaded PVC ball valve to fit the original vent hose
- threaded PVC tee
- threaded close nipple to connect the valve and tee
- threaded plug for the PVC tee
- 2 threaded-to-barbed hose nipples
- stainless-steel hose clamps
- pipe strap

Parts used for flushing:

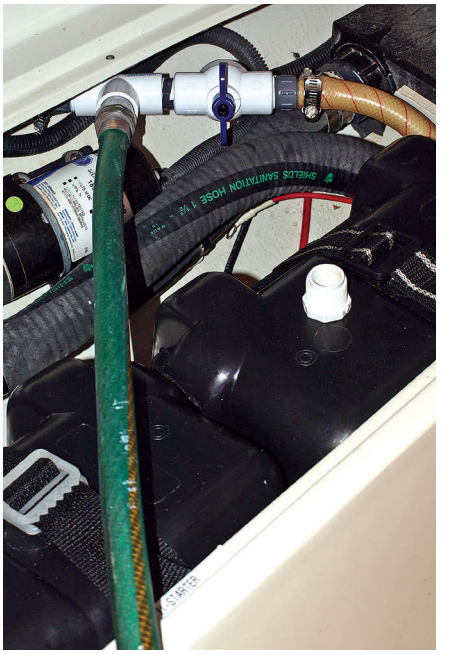
- plumber's sink plunger
- short ½-inch PVC nipple and female garden hose adapter (to back-flush from the outside)
- threaded male pipe to male garden hose adapter for the internal assembly (to flush or back-flush the vent hose)
- short length of hose to reach a bucket or jug for back-flushing

New through-hull vent fitting:

- ½-inch PVC elbow, female to female
- ½-inch PVC elbow, male to female
- ½-inch PVC nipple, 2 inches long
- screened hose washer
- ½-inch PVC close nipple (if needed to fit)
- plastic nut for ½-inch electrical conduit (if needed to fit)

A better hull fitting

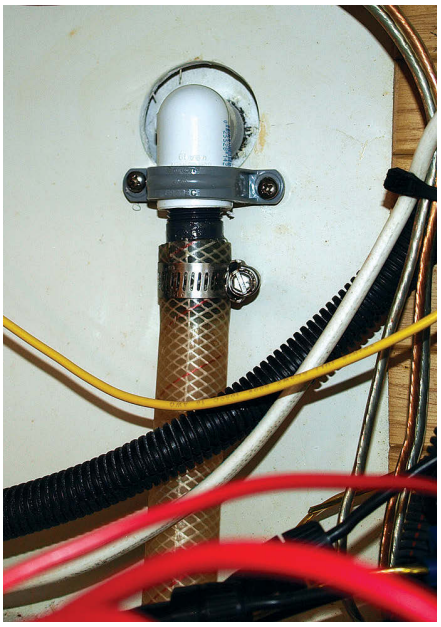
Back-flushing should clear the clog if it's on the inside of the through-hull fitting. But my fitting was so clogged neither flushing nor back-flushing would work. I discovered when I removed the fitting it that its inside

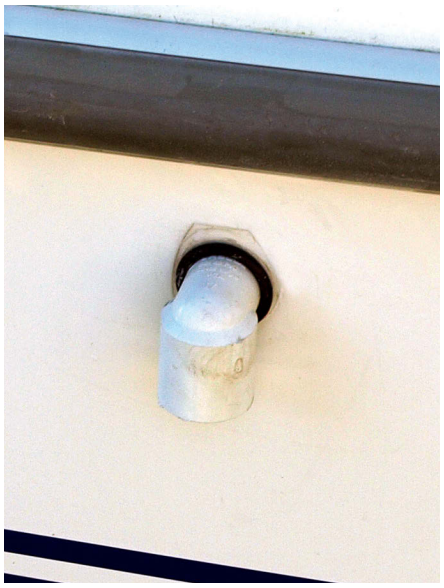


diameter was only ⅜ inch. This is far smaller than the ¾-inch hose and clogs more easily, so I made a new fitting with two PVC elbows.

As it turned out, the hole through my hull was slightly less than ¾ inch in diameter. Almost perfect for my project! I used a Dremel tool to enlarge it just a bit so a threaded ½-inch PVC nipple would go through the opening with a tight fit.

On the inside of that hole, I used a ½-inch PVC elbow, female-threaded at both ends. I screwed a 2-inch-long nipple into one end of the elbow and then lubricated that nipple and pushed it into the ¾-inch flexible plastic tubing. A stainless-steel clamp secures the tubing on the nipple. A 1-inch pipe strap





The vent hose leads up from the holding tank and is connected to to a PVC elbow, top left, that forms the inside part of the through-hull fitting. A pipe strap holds the female-threaded elbow in place over the hole in the side of the hull so the outer fitting can be easily screwed into it. The outside part of the fitting is another PVC elbow, middle left. A screened hose washer can be trimmed to fit nicely inside the outer elbow and keep insects like wasps from nesting inside and clogging the fitting, below. The O-ring makes the fitting watertight. The upper end of the elbow can be male- or female- threaded to screw into or onto the inner elbow. Depending on the distance between the inner and outer elbows, a short nipple may be needed for a good fit, with a plastic electrical-box nut to bring the fitting up snug on the outside, bottom left.

fastens the elbow in place centered on the hole in the hull.

On the outside of the hull, I used another ½-inch threaded elbow, male on one end and female on the other. Because the elbow inside the hull was held in place by the pipe strap, it was easy to screw the male end of the outer elbow into the female elbow on the inside. An O-ring against the hull made the fitting watertight.

As it turned out, the space between the inside and outside of my hull was exactly what was needed for a tight fit. If this distance had been either longer or shorter, I could have drawn the outside elbow and O-ring tightly against the outside of the hull using a plastic nut (made for electrical conduit) inside the hull on a close-threaded nipple between the two elbows.

Before installing the outer elbow, I trimmed a screened garden-hose washer so it would fit inside. A threaded elbow is better than a smooth, "push" fitting designed for PVC glue as the threads will hold the screened washer more securely in place. The stainless-steel screen prevents bugs from nesting inside, it won't rust or corrode, and can be easily and cheaply replaced if necessary.

I felt very lucky to have discovered the clogged vent before pressure in the system caused a major leak or my holding tank imploded during a pumpout. I'll be more careful in the future. It's just one more critical item on my sailboat checklist that I'd never thought about before.

Clarence Jones began sailing in a 12-foot dinghy 40 years ago, then sailed through a series of trailerable boats — two MacGregors, then two Precisions. The big change occurred in 2007 with his 28-foot Catalina, which he moors behind his canal-front home on Anna Maria Island in the mouth of Tampa Bay. Part of the joy of sailing, Clarence says, is inventing modifications for his boats. He has published almost two dozen magazine articles about them, and two books: Sailboat Projects *(2012) and* More Sailboat Projects *(2015).*

Replacing a water tank

BY ALAN WILSON

Out with the old . . . er, not so fast!

Why was there water in my normally dry bilge? Rain, I suspected. I checked all the hose clamps on the deck drains and the portholes, the stanchions, and the chainplates. Nothing was awry. So where was this small amount of non-salty water coming from?

My clues were that it was wet just about all the time and no more than a very narrow band was wet at any time. It couln't have been rain; even after several dry days and nights the wet trail remained. Was there a leak in the boat's pressure water system? There are no plumbing fixtures forward of the beam, yet the stain ran aft from forward of the beam. Wait! That's where the two freshwater tanks are!

I pulled out drawers and lifted covers to inspect the tank. I saw no sign of leaks at fittings or the gauge and no punctures on the tank top. Peeking through the opening where I'd removed a drawer gave me a limited and inconclusive view of the tank front. But the tank was clearly the culprit, based on the slim silvery stream flowing through the weep hole in the bulkhead. I use the word "stream," but it was not visibly flowing . . . more like a snail's mucous trail marking the path from the tank to the bilge.

My boat is a 1997 Packet Cat 35 built by Island Packet. The tanks, 70 gallons each, are custom-fabricated aluminum with welded seams and holding brackets. The tanks lie beneath the forward berths, one in each of the Packet Cat's hulls. A quick check of the port hull showed no "snail trail" in the bilge, so I confined the project to the starboard side.

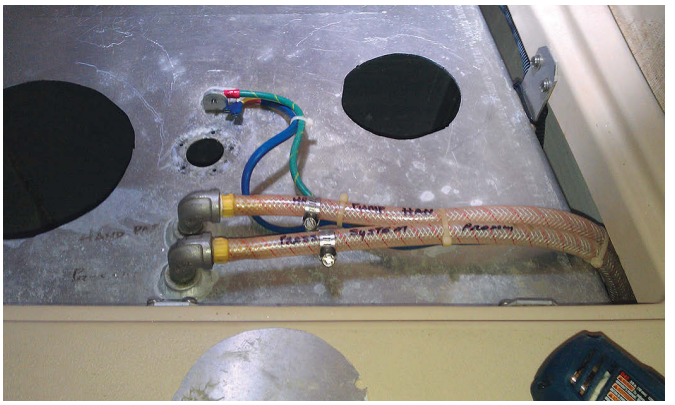
Seeking a cause

Some likely causes for a leak in an aluminum tank are a stress failure in a weld, metal fatigue, or corrosion. Or, if the tank is loosely fitted, vibration could cause abrasion of the tank wall. The small amount of water I observed in my boat was not from a ruptured or punctured tank. It was more likely a result of abrasion or corrosion. But where and how did it happen?

Abrasion was unlikely, as when I unbolted the tank and attempted to remove it for inspection, it wouldn't budge. It was held solidly in place with no evidence of looseness to allow chafing or wear.

That left corrosion or metal fatigue. Metal fatigue was not evident in the sides of the tank or top. Nothing looked like it had failed.

When the leaking aluminum water tank rebuffed Alan's attempts to remove it, he placed a new polypropylene tank inside it.



Once he had determined that the trace of water in his bilge was coming from the freshwater tank, at left, Alan cut holes in the top, at right, so he could inspect the inside to see if there was any chance of repairing it *in situ*. The baffles made that impossible.

Chlorine attack on aluminum is well documented. A web search on the subject revealed that even the level of chlorine in city water can spell trouble for metal tanks. I've seen chlorine removal filters on dockside water supplies and have read cautions about using bleach to sanitize drinking water in tanks for fear that sodium chloride deposits will plug filters and screens in the boat's water lines. Can chlorine truly etch its way through the wall thickness to cause a leak?

Digging deeper

Following this deductive path — fresh water in the bilge, no visible damage to the tank, and the unanswered questions associated with a leaking tank — I decided to remove the tank for a closer inspection.

As mentioned earlier, the tank's installation was first-rate. Nine 2-inch-wide tabs welded to the tank are fastened to the surrounding berth flat. Furthermore, the base of the tank is contoured to the hull shape and sits on solid fiberglass. After removing the screws, I expected to be able to lift the tank out of its hole. But it would not move. I later found out from the factory that the tanks are bedded in polyester-based putty that is strong and very adhesive. It was still holding very well.

No amount of persuasion on my part would move the tank. I considered options like trying to get a lifting strap around the tank and using a come-along rigged to a beam laid across the deck above and through an overhead hatch. That should do it. However there was no way to get the strap around the bottom of the tank. Then I tried a variety of "persuaders" or pry bars to apply pressure from the side. Still no luck. It became evident that continuing along this path would only result in a damaged tank or hull. I wanted to salvage the tank and repair the leak, not destroy it during removal.

After some consideration, I devised an inspection plan. I would cut holes in the tank top and find the leak. Then after inspection and repair, I could close the access holes with deck plates like the Beckson BEC-DP40B4 that have a gasket-fitted base with a screw-in inspection cover. Or I could use aluminum plates cut larger than the hole and screwed to the tank with gaskets between them.

I marked out my spot, drilled a pilot hole for my saber saw blade, and cut into the tank. The first thing I noticed was the thickness of the tank material. It was fully 3⁄16 inch. The saw buzzed and the cutout dropped into the tank with a thunk.

Even with the inspection hole cut, I couldn't see much due to the baffled chambers. Looking at the walls and corners that I *could* see, I noticed a collection of yellowish-brown sludge in a bottom corner and along the welds, but not much else. The welded seams on the tank's outer skin and along the center baffle were smooth and solid. I saw no evidence of a leak site.

Because the baffles divided the tank into four sections, I could not see anything in the other three sections. I cut another access hole and, upon getting the same results, decided I needed another approach. I began to think of replacing the tank.

Replacement options

I contacted Island Packet and they provided drawings of the tank. The fabrication company, Ezell, replied to my call as well. It's always good to receive support from the original equipment makers. Their suggested solution was to replace in kind. Other options were standardized prefabricated tanks made of plastic or polypropylene, a wood-framed fiberglass-lined tank, or a rubberized bladder. After sifting through these options while considering serviceability, installation issues, and price, I chose

To make way for the new tank, Alan had to cut the top off the old one, cut out the baffles, and cold chisel away the remains of the welds.

After cutting inspection holes in the tank top, Alan saw signs of corrosion. Cutting off the top revealed more evidence.

to use a custom-fabricated polypropylene tank.

The concerns of serviceability are threefold. First, I didn't want to replace this tank again, so it would not be made of aluminum. Second was the question of keeping weight in a catamaran balanced. Third was the goal of maintaining the cruising range. I needed a tank that would have a capacity close to that of the original and be secure in the same position in the vessel.

There was also the installation issue involving access in the starboard stateroom. Armed with the factory's drawing, I could see that the tank would not fit through the stateroom doorway. I suspect the tanks were installed before the deck was joined to the hull. This meant the old tank would have to be cut up for removal and the new tank would have to be smaller than the original. An in-kind replacement was not going to work.

Another consideration was the cost of each option. Custom fabrications from either material would be about the same, around $900. While standard prefabricated plastic tanks or conformable bladders cost much less, they miss the mark in serviceability. They can be installed easily, but in my case would require re-plumbing and weight balancing, thus adding to the lower initial cost.

Weighing my options and requirements, I chose custom fabrication from the poly material. Using the Internet, I located Dura-Weld, a tank fabricator in Lake Worth, Florida, with an impressive résumé. It builds tanks for a local utility company, for use in architectural applications, and has an excellent reputation in the marine market for tank design and construction. The owner of the company took my call and we discussed my project. I provided a copy of the factory tank drawing for reference and we continued the conversation the following day.

Resources

Dura-Weld
www.dura-weld.com

Beckson
www.beckson.com

Wema
www.wemausa.com

The plan

My plan called for reducing the size of the original tank by ½ inch on all outside dimensions. This would allow me to get the tank into the stateroom and install it inside the existing tank. More on this later.

Dura-Weld recommended an internally baffled design fabricated from polypropylene with the best weldability and strength. The material is USDA-approved for water tanks. He also suggested a wall thickness of ⅜ inch for added durability.

The plan was to construct a tank with the new reduced dimensions, with fittings placed to match the original setup, and a new tank-level indicator from Wema USA (model #SSS flange-mount style with a 23-inch-long shaft). The completed tank would have the original capacity minus a small percentage due to the reduction in overall size. I placed the order.

I went aboard to prepare for the new tank. Unfortunately, the existing tank was still firmly in place — apparently the sea gremlins had not deigned to

remove it while I had been working on the tank order. I started by removing the entire top of the tank. This was not a straightforward process of simply cutting the material. Some tight corners required hand sawing because electric tools would not fit into the cramped confines and because the baffles were welded to the tank top and the side walls. It took some fancy saw work, but finally the top and baffles were all removed. I could now see where the leaks were located.

The sludge I had seen through my earlier inspection holes was drying out and turning into a white powder. It was noticeable along the welded seams of the tank and, when swept away, revealed where the leaks were. The welds had been attacked by chlorine, leaving them porous and weeping water.

My next step was to prepare the inside of the tank so I could insert the new tank. Using a cold chisel and hammer, I removed all the raised weld material from the internal baffle sites. I also drilled several drain holes in the tank so no water could accumulate in the liner.

The hitch

The new tank was ready for pickup. I got to see the shop, meet the owner, and collect a few pieces of tank material to use during the installation. When I got to our boat, I proudly carried the tank aboard and came to an abrupt halt. The new smaller tank would not fit through the companionway to the starboard stateroom. I rotated, angled, and swung it in every direction, but no-go. It didn't miss by much but it would not pass through the opening. After contemplating my options, I removed a ¾-inch piece of molding from one side of the companionway and, as I held my breath, the new tank slid through the opening and into the stateroom.

I lowered the new tank into the old tank which, with just five of the previous six sides, made the perfect perch for the replacement. All the hose fittings and the gauge wiring were correctly aligned, so I set out to complete the installation.

Using some lengths of the tank material, I placed four equally spaced strips on the bottom of the old tank. I then laid a heavy bead of expanding urea foam between each of the spacer strips, quickly lowered the new tank into the expanding foam, and held it down as the foam filled the voids under the tank. The next day, I injected the foam around the remaining sides of the tank, adding 3- to 4-inch-deep layers at a time and letting it expand before applying more foam. The cured and finished foam provides a rigid but conformable packing on five of the tank's sides.

To hold the tank down, I devised a crossbar made from red cedar and attached it to the sides of the old tank with self-tapping screws. I then made up the hose connections, connected the new float gauge, and added water.

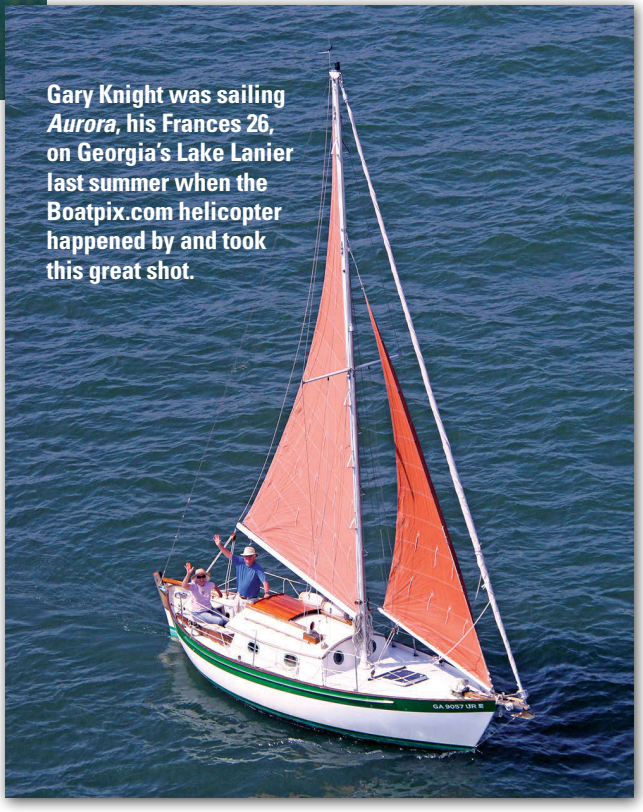
In summary, my old tank had exhibited a slow, weeping type of leak. Traditional repair methods were unlikely to solve the problem because the site or sites of the leak were hidden. Wanting to keep the capacity and functionality of the original Island Packet design, I had a new, slightly smaller tank made from a lifetime material that would not be subject to chlorine attack, and I used the old tank's rigid attachments and well-bonded structure as a holding tank for my new tank.

Alan Wilson began boating in childhood in wooden-hulled skiffs and lobster boats on the New England Coast. He holds a U.S. Coast Guard Vessel Master's Rating for Steam, Motor, and Auxiliary Sail. As a freelance writer, he has had several articles published on navigation and boat maintenance. He enjoys boating on Biscayne Bay, the Florida Keys, and the Bahamas.

Readers' favorite boat

Milo, 6, and Lizah, 3, above, are up-and-coming crew for Grandpa Fred McCarthy on his Catalina 25, *Small World*. This gleeful summer sail was in the Saratoga Passage off Langley Marina on Whidbey Island, Washington.

By spending three months aboard at a time, Lorne and Colleen Shantz are able to travel far and wide along the coast of British Columbia on their 27-foot LM, *Shaunsea*, (with the blue trim) taking absolutely stunning photos everywhere they go, above.



Gary Knight was sailing *Aurora*, his Frances 26, on Georgia's Lake Lanier last summer when the Boatpix.com helicopter happened by and took this great shot.

Benoit Fleury has surely discovered the pot of gold at the end of the rainbow: *Exiles*, his 1981 Southern Cross 28, at left. This shot was taken near Montebello, Quebec, following a romp from Montreal in a mix of wind, sunshine, and rain. "What more can one ask?" he says.

pictures

How good does that feel? Gary Herzig says, "This is my Cape Dory 22D on Otsego Lake at Cooperstown, New York, after four years of disassembly by the previous owner and three years of reassembly by me." Otsego Lake was the Glimmerglass in James Fenimore Cooper's Leatherstocking Tales.

Mike O'Shurak calls this favorite photo "Winds of Freedom." The shot was taken aboard *The Betsea O*, his O'Day 25, while sailing on Moraine State Park's Lake Arthur in Pennsylvania.

Peg and Dan Sheer sail *Pegathy*, their 1980 C&C Landfall 38, near Baltimore, Maryland. David Furman took the picture, above. The Francis Scott Key Bridge, historic Fort Carroll, and Dundalk Marine Terminal are in the background.

Frank Belchamber sent this photo, at left, of three generations: grandma Pat Belchamber with daughter Leslie Lunstroth and her daughter Claire on *Thrumcap II*, Frank and Pat's 1987 CS30, on Ontario's Lake Simcoe.

Troubleshooting

Find the fault with a multimeter and a flowchart

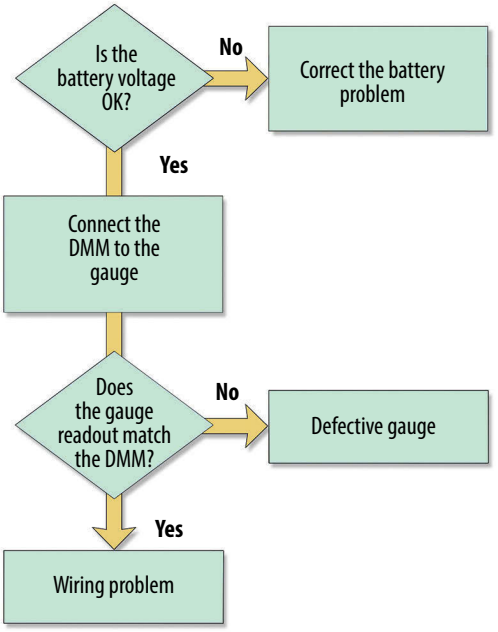
BY DAVID LYNN

When one of your engine instruments stops working, it's good to be able to diagnose the problem yourself. If you know how to use a digital multimeter (DMM), it's not hard to troubleshoot and identify problems you're having with any of the usual gauges: temperature, oil pressure, voltage, fuel, and tachometer.

Voltage gauges

Voltage gauges are the easiest to troubleshoot. First check the voltage at the house and the starter batteries. Depending on how your boat is wired, either one might be connected to the voltage gauge . . . and it would be embarrassing to spend a lot of time attempting to track down a gauge or wiring problem when the culprit is a dead battery.

Troubleshooting a voltage gauge



If the batteries are good, switch your DMM to the appropriate DC voltage range and connect the leads to the V+ and ground terminals of the gauge. When the ignition is switched on, the DMM should read the same as the voltage gauge. If the voltage gauge reading is significantly different from the DMM reading, the gauge is defective and should be replaced.

If both are reading low or zero volts, the problem is in the wiring. Try putting a jumper between the V+ terminal of the voltage gauge and the positive terminal of another gauge that is working, then switch the ignition on. If the voltage gauge now works, the problem is in the wire between the V+ terminal and the ignition switch. If not, put the jumper between the ground terminals of the two gauges and once again switch the ignition on. If the gauge starts working, the problem is in the ground wire.

Gauges with senders

Engine-temperature and oil-pressure gauges use sensors (or senders) that screw into the engine somewhere. These sensors are nothing more than variable resistors — the resistance changes as either the temperature or pressure changes. Likewise, most fuel gauges use a float inside the tank that is connected to a variable resistor. The resistance changes as the float moves up and down with the fuel level. The gauge provides a small current that flows through the sensor, then measures the voltage across it. As the resistance changes with increasing temperature, pressure, or fuel level, so does the voltage across it.

In all three types of gauges, a few different standard sensors are used by different manufacturers and in different parts of the world. All have resistances that vary from about 30 ohms to a few hundred ohms as the temperature, pressure, or fuel level varies through the normal operating range.

These gauges have three inputs: V+, ground, and the sensor input. V+ may be labeled "+" or "I," ground will be labeled "Gnd" or "-," and the sensor or sender input will be marked "S" or "In." There may also be another one or two connections for the lamp.

Testing the gauge

First, check power to the gauge by switching your DMM to the appropriate DC voltage range and connecting the leads to the V+ and ground terminals of the gauge. When the ignition is switched on, you should see 12 volts.

If the voltage is correct, move on to the next check. If not, check the power and ground connections, wiring, and fuses. If the alarm horn and other gauges are working, the problem is probably between the ignition switch and the gauge or in the ground connection. Use the same technique as described in the voltage gauge section to determine which wire is the cause.

Second, disconnect the sensor input from the "S" or " In" terminal and switch the ignition on. With most gauges, the needle will stay all the way to the left side of the gauge face. Next, short the input terminal ("S" or "In") to the ground terminal. If you have a jumper, great, but a screwdriver will do the trick (as long as your arms are long enough for you to hold the screwdriver in place while looking at the front of the gauge without shorting the ground and power terminals). On most gauges, the needle will deflect to full scale. Some gauges, depending on the manufacturer or model, will work the reverse of this.

Be sure the gauge goes to both ends of the scale when the sensor input is switched from open circuit to ground. If the gauge does not pass this test, it is most likely defective and should

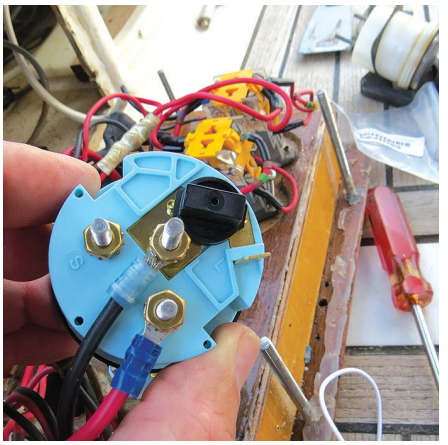
engine gauges

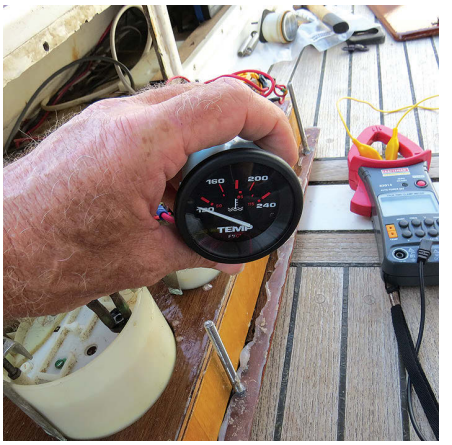
be replaced. If it does pass this test, continue to the next step.

Third, with the sensor wire disconnected from the gauge, switch the DMM to the resistance scale and connect the leads between the sensor wire and ground. You should see a resistance reading of somewhere between 30 ohms and a few hundred ohms. If not, move down to the engine room (or fuel sender), remove the wire from the sensor, and repeat the resistance check there by connecting the DMM leads to the sensor terminal and ground. If the resistance reading is within the acceptable range, the problem is with the wire between the sensor and the gauge. If not, the sensor itself is defective.

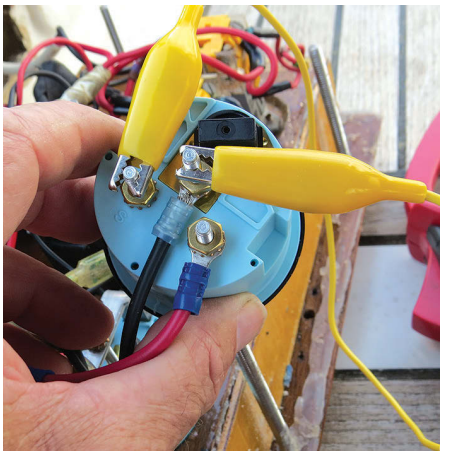
By the fourth step, if everything checks OK, things start getting mysterious. It could be a mismatched gauge and sensor — did you recently change one or the other? It could be an intermittent connection — try starting the engine and wiggling all the wires leading to the gauge to see whether it starts working again and, if so, which wire or connector appears to be causing the problem.

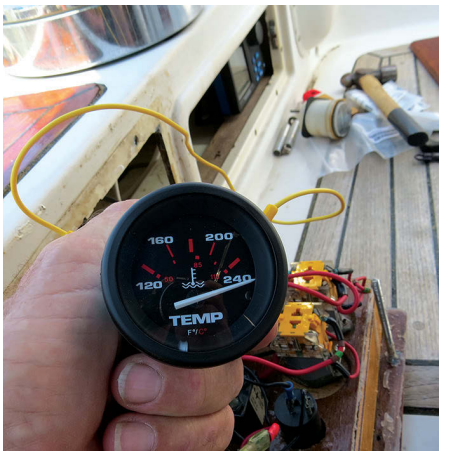
If you do replace the gauge, make sure it matches the old sensor, and vice versa if you replace the old sensor. If you aren't sure whether they are a match and can't figure it out, replace both the gauge and the sensor.





With the sensor terminal open, at left, most gauges with senders will read zero, at right.





With the sensor terminal shorted to ground, at left, the needle will go to full scale, at right.

Tachometer types

Despite the fact that different tachometers are made for use with different engines — outboard two-stroke and four-stroke engines, inboard gasoline, and inboard diesel engines — they all basically work the same way; they all convert the number of pulses per second on the input terminal to engine rpm.

Different types of engines generate these pulses in various ways. Some engines generate the pulses electronically, one pulse per engine revolution. Many inboard diesel engines use the alternator output as the tachometer input, and the number of pulses per revolution is a function of the number of alternator poles and the ratio of the alternator pulley size to the engine pulley size. Other engines use a magnetic pickup mounted next to the flywheel and generate one pulse for each gear tooth, in which case there are two or three hundred pulses for each engine revolution.

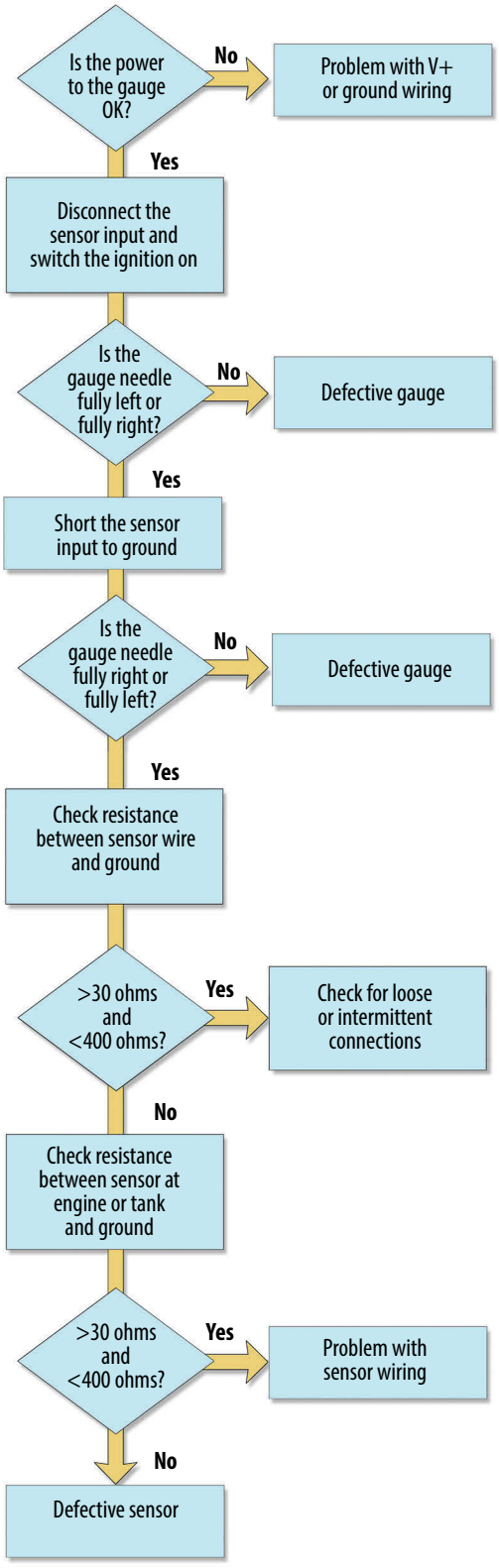
Size, shape, and color aside, tachometer manufacturers usually have different models available for different engine types. One option is the full-scale range. The old Ford Lehman engine on our boat, *Nine of Cups*, has a maximum rpm of 2,800. I don't want a tachometer that indicates a red line at 6,000 rpm and a full scale of 7,000 — my idle speed of 800 rpm would barely deflect the needle. Another option is the "pre-calibration" of the tach. Most manufacturers have models calibrated for the more common engines, thus avoiding the necessity, in most cases, of requiring specialized equipment and an hour or two of time to calibrate each tachometer when it is installed.

Tachometer troubles

There are typically four problems that can occur with a tachometer: it is totally inoperative and always displays zero, the needle is stuck or permanently pegged, the needle is erratic, or the revolutions per minute are consistently off — either low or high.

Like a temperature, pressure, or oil gauge, tachometers also have three

Troubleshooting a temperature/pressure/fuel gauge



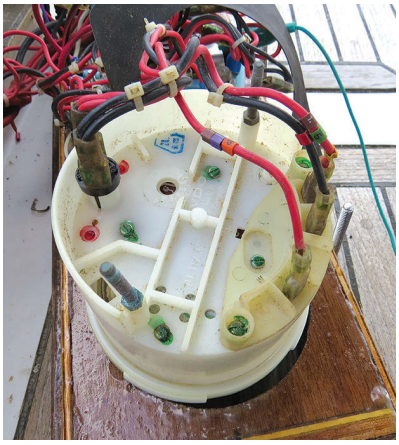
inputs: V+, ground, and the sensor input. V+ may be labeled "+" or "I," ground will be labeled "Gnd" or "-," and the sensor or sender input will be marked "S" or "In." There may also be another one or two connections for the lamp.

Inoperative – Check the obvious first. Switch the DMM to the correct DC voltage range and connect the leads to the V+ and ground terminals. When the ignition is switched on, there should be 12 VDC between the terminals. If not, use the same technique as described in the section on voltage gauges to determine whether the problem is in the wiring on the positive side or the ground side.

If the voltage is correct, the next step is to check the input signal. Remove the signal wire. Set your voltmeter to AC volts and connect it between the signal wire and ground. Start the engine and set the speed to idle. You should get a reading on the multimeter that varies with engine speed. If the tachometer is connected to the alternator, this reading should be a minimum of about 5 VAC, otherwise it will be more like 0.3 VAC. My tachometer uses an alternator connection and measures 8.6 VAC at idle and about 9.8 VAC at 1,800 rpm. If you get any indication of a pulse stream, reconnect the signal wire and, if the problem is still evident, the culprit is most likely the tachometer itself.

If you get no indication of a pulse stream, disconnect the tachometer signal wire on the engine and repeat the test there. If you detect a pulse stream at that end, the problem must be in the wiring. Otherwise, the problem is in the signal generator.

Needle is stuck or pegged – The needle could be stuck in one place or permanently pegged for a couple of reasons. One is that the tachometer case is tightened down too much and has distorted due to heat or vibration. Try loosening the clamps holding it in place, then tapping the front face gently. If the needle frees itself, tighten the tachometer clamps just enough to hold it in place.



The back of *Nine of Cups*' tachometer, which David calls an oldie but goodie.

Another possible cause of a stuck needle is over-stressing it electrically. This could happen if the battery cable was disconnected while the engine was running, if the tachometer was subjected to large radio frequency noise from a badly tuned or poorly grounded HF radio or from a lightning strike. It is sometimes possible to correct the problem by placing a magnet on the faceplate over the needle and "pulling" the needle free.

Erratic reading – An erratic reading is usually due to a poor connection somewhere. Start the engine and wiggle each wire leading into the tachometer to try to isolate the culprit. Have someone watch the tachometer while you wiggle the wires on the engine side.

Another possible cause of an erratic reading is electrical noise. Does the problem only occur when the autopilot is running or when sending emails via your HF radio? The problem can sometimes be corrected by putting a resistor in the signal wire. It should be placed on the tachometer end of the wire. You may have to experiment with resistor sizes. A 10k ohm ¼-watt resistor will often correct the

problem without affecting the calibration. If it doesn't, try a 1k ohm ¼-watt or a 100 ohm ¼-watt resistor.

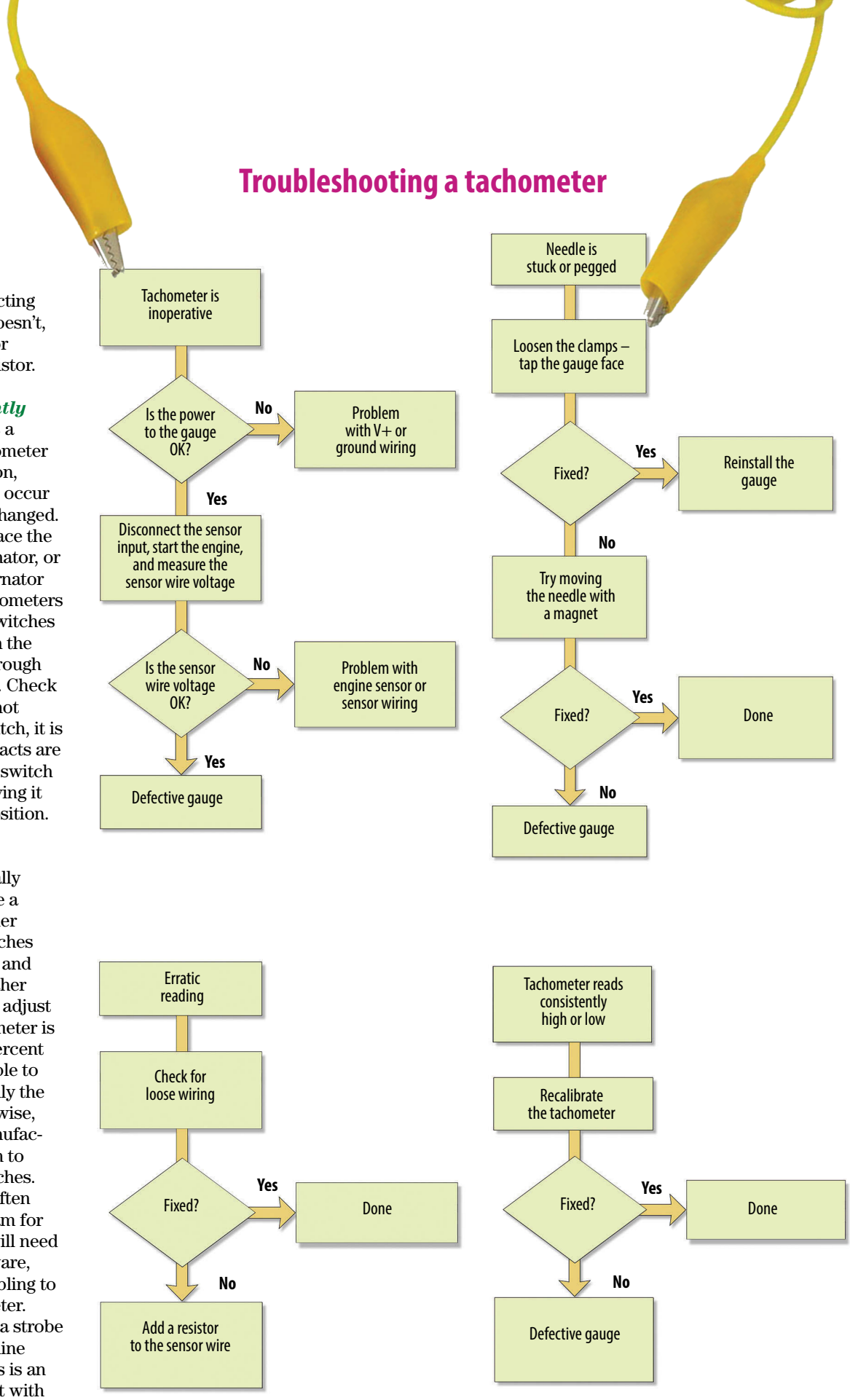
Readings consistently low or high – This is a symptom of the tachometer being out of calibration, which usually doesn't occur unless something is changed. Did you recently replace the tachometer, the alternator, or the pulley on the alternator or engine? Some tachometers have multi-position switches or jumpers located on the back or accessible through openings on the back. Check that the jumpers are not loose. If there is a switch, it is possible that the contacts are dirty. Try rotating the switch a few times, then moving it back to its original position.

Recalibrate

If necessary, it is usually possible to recalibrate a tachometer. Many older tachometers use switches to set the gross range and a potentiometer to either fine-tune the range or adjust the gain. If the tachometer is off by only 10 to 20 percent or less, you may be able to recalibrate it using only the potentiometer. Otherwise, you will need the manufacturer's documentation to correctly set the switches. Newer tachometers often use a software program for calibration and you will need a computer, the software, and any necessary cabling to calibrate the tachometer.

You will also need a strobe tachometer to determine the engine speed. This is an adjustable strobe light with a digital readout. They used to cost hundreds of dollars,

ILLUSTRATIONS BY FRITZ SEEGERS



but can now be found online for less than $50. I have also seen apps for smartphones that simulate a strobe tachometer. While I can't vouch for their accuracy, they are probably good enough to calibrate your tachometer to within 5 percent or so. You can rent, borrow, or buy a good strobe tachometer, buy a cheap one, or try one of the apps. Then you need to put a mark on the big pulley on the front of the engine. This can be a small piece of tape, a line drawn with a marker, or a dot of paint . . . just as long you can see it easily when you shine a light on it.

Start the engine and increase the engine speed until its tachometer displays about half of the engine's maximum rpm. Set the strobe tachometer to the same rpm setting and aim the strobe at the marked pulley. If the engine tachometer is exactly in calibration, the mark on the pulley will appear to be frozen in place. More likely, the mark will appear to move. If it slowly drifts around the circumference of the pulley, your tachometer is only slightly out of calibration. If the mark appears randomly all around the circumference of the pulley, your tachometer is very much out of calibration.

Adjust the frequency of the strobe tachometer until the mark on the pulley appears to slow down and eventually stop. The digital display of the strobe tachometer will now show the correct engine rpm. Adjust the potentiometer on the back of the engine tachometer (or adjust the tachometer using the software) until it reads the same as the strobe tachometer. Check the calibration at ¼ throttle and ¾ throttle. In a perfect world, the engine tachometer will now match the strobe tachometer at all three engine speeds. More likely, you will need to adjust the calibration until the error is minimized throughout the engine range.

The next time one of your engine instruments starts misbehaving, pull out your trusty digital multimeter instead of calling an electrician or technician. Finding the problem and fixing it yourself isn't all that difficult.

David Lynn was an electronics technician in the U.S. Navy for six years before getting his BS and MS in electrical engineering. He and his wife, Marcie, have lived aboard Nine of Cups, *their 1986 Liberty 458 cutter, since purchasing her in Kemah, Texas, in 2000. They have since sailed her more than 90,000 nautical miles in their ever-so-slow world circumnavigation and in early July were in Namibia. Find them on their website at www.nineofcups.com or their daily blog at www.justalittlefurther.com.*

To sew, or not to sew

A stitch in time can extend the life of a sail

BY LESLIE LINKKILA AND PHILIP DINUOVO

The monsoon season was upon us. Each day we spoke by high-frequency radio to friends clawing their way toward Palau aboard a 50-foot sloop. Plagued by multiple failures, including their autopilot, radar, and throttle cable, they remained remarkably cheerful despite making only 20 nautical miles to the good after two days at sea. Dead calm and steamy heat was interrupted by violent squalls that sometimes brought 50-knot winds and boarding waves. They were often over-canvassed and caught unaware by squalls that arrived at night.

When they made landfall, their stay-sail was in tatters, their furling line was broken, one genoa sheet was broken, and the other was badly chafed. Hours after arriving, they were absorbed into the fleet of cruisers who commiserated with them and toasted heartily to their safe arrival. They would assess the damage in the morning.

Makeshift sail loft

To assess sails and plan for repairs, you need plenty of room, preferably in a shoreside location protected from the weather, clean, and big enough to spread out a sail. In some places, finding such a spot is a challenge. Avoid dragging the sail across concrete or gravel as this will abrade the cloth. Grass can leave stains on the sail, but that's better than spreading it out on tarmac or gravel. Use a large table only if the ground or floor is dirt or dirty.

Once a sail is laid out, you can figure out whether it can or should be repaired. We're talking about repairing failures — rips, tears, chafe, and broken or lost hardware — rather than correcting flaws of draft or a wrinkle or two.

Condition survey

Of primary importance in such an evaluation is the overall condition of the sail, including the stitching and, in particular, the sailcloth. Does the sailcloth have sufficient service life left to justify the repair? If it does, it makes sense to proceed. Of lesser importance is the hardware: grommets, slugs, slides, rings, hanks, and the webbing used to attach them. These parts can be replaced as long as the foundation remains serviceable.

Once the overall condition is known, it's a question of economics. How does the estimated cost of repair compare to the cost of replacement? This is assuming that replacing it is possible at your location and within your time-frame constraints.

Sometimes, even if the sail is in poor shape, if it is critical for moving the yacht, then trying to repair it may be worth the effort. In that case, you'll need to make a more thorough evaluation and a plan for doing the repairs.

Cloth and panels

If there are no obvious tears or holes, remove your shoes and inspect the entire sail for chafe and small holes by crawling over it on your hands and knees. Mark places where the fabric has failed with colored masking tape.

Repair small holes by applying two identically sized layers of adhesive Dacron, one to each side of the sail. Use a seam rubber to make sure the patches are well adhered, then stitch the patches down using zigzag stitching.

Large patches will likely require that new material be applied with an adhesive to keep it solidly in place while sewing. Adhesives can darken over time, promote the growth of mildew, and tend to collect dirt. When we must use adhesive (rather than staples, which we use for some jobs), we prefer two thin layers of contact cement. We were once asked to repair a cruising sail where the captain had used 3M 5200 to repair a tear. Perhaps a judicious amount of this adhesive might have been appropriate, but the sail had such a thick layer of 5200 that it was impossible to repair.

When designing a patch, try to match the fabric weight and orientation (warp/weft and bias) to the sail in its present state. Make the patch as big as necessary to ensure that it extends to good solid cloth. If you plan on cutting away the damaged fabric and you're using adhesive, apply the adhesive to

For inspecting and repairing sails, a clean, dry work area and a sewing machine (or a friend with one) make all the difference.

a seam allowance along the edge only. Once you've applied the patch and sewn around its perimeter with zigzag stitching, flip the sail and cut away the damaged cloth, leaving a seam allowance. Sew one or two additional rows of zigzag stitching to ensure the patch is firmly sewn to the sail.

From the top: first assess whether the sail is even worth repairing. Small holes can be covered with adhesive patches applied front and back, then stitched through. Larger areas of damaged cloth can be cut out once the area has been patched.

Check all panel seams for chafe or rotting stitching. Remove any failed panel stitching and restitch. Long panel seams that have failed completely will require basting with double-sided Seamstick Basting Tape (or a similar adhesive) to keep the panels aligned while you're sewing. Restitching panel seams generally involves rolling up the sail so it can be fed through the arm of the machine.

Corner patches

Check for damage at corner reinforcement patches. Layered reinforcement patches at the clews of headsails are frequently abraded. Remove any damaged thread and mark areas to be restitched with small pieces of colored masking tape.

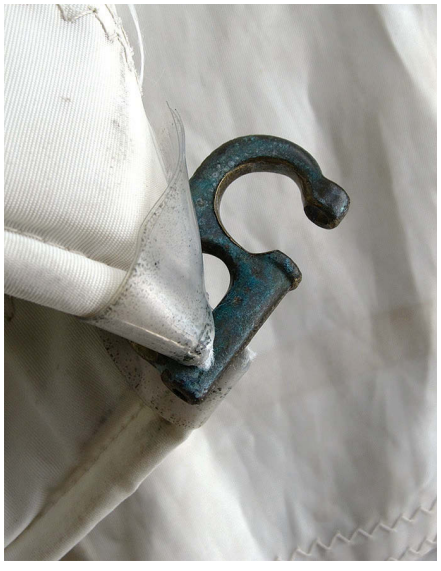
Chafe patches

Replace torn or abraded chafe patches. For heavy chafe areas, you may wish to use alternative materials to protect the sail such as Top Gun, a tough woven-polyester material. Patches that have come away from the sail should be reattached with staples or adhesive prior to sewing or their positions will inevitably shift during re-stitching. Don't forget to remove the staples when you have finished sewing.

Luff

Inspect the continuous support tape of roller-furling headsails and in-mast mainsails for damage. Chafe or damage that exposes the small boltrope can generally be patched with a thin strip of adhesive Dacron and sewn down. Do likewise for damage at the head or tack ends where lightweight adhesive Dacron is folded over the cut end of the luff tape and sewn down. If the boltrope of the luff tape is broken, a sticky material patch is only a stop-gap measure and the continuous support tape should eventually be replaced.

Inspect mainsail slides or slugs for structural integrity, as well as the webbing and twine used to seize them. Webbing at the headboard is



From the top: support tape on the luff of a roller-furling sail can be patched but not the boltrope inside it. Webbing on sail slides can decay and fail. Sail hanks can cause damage at the luff, especially if they are loose or are missing their pistons.

particularly subject to chafe due to the sharp edges of the headboard. Replace rings or grommets that have become separated or torn away from the sail.

Check the headsail hanks for excessive wear from the wire rope rigging and to make sure the pistons are functioning. Seized pistons can generally be freed with such products as PB Blaster or LockEase. If the hanks are the pressed-on type, examine the boltrope. If wear is evident, you may wish to insert and sew on a small piece of leather, since attempting to remove the hank is likely to break it. For sewn-on hanks, tug hard to determine whether the hanks remain securely seized to the sail's boltrope. They should not move independently.

Leech

Carefully examine the whole length of the leech for chafe or tears to the leech tape and leech line. Areas of wear on the sail should be overlaid with folded Dacron tape of the appropriate weight and width. If the leech line itself appears abraded enough to make breakage likely, replace it. You can use the existing leech line as a messenger or remove the stitching along the entire leech to remove and replace it.

On a roller-furling headsail, also check the fabric and seams of its sun cover, particularly along the edge where it is exposed to UV when furled. Wear in the sun cover can be patched with matching Sunbrella or a more durable material in a similar color. We have used Top Gun and Sur Last for areas where abrasion is severe and chronic and where it is impossible to keep Sunbrella intact.

On mainsails, pay careful attention to the batten pockets, especially the stitching and the integrity of features designed to retain the battens. Address any abrasion caused by contact with standing and running rigging.

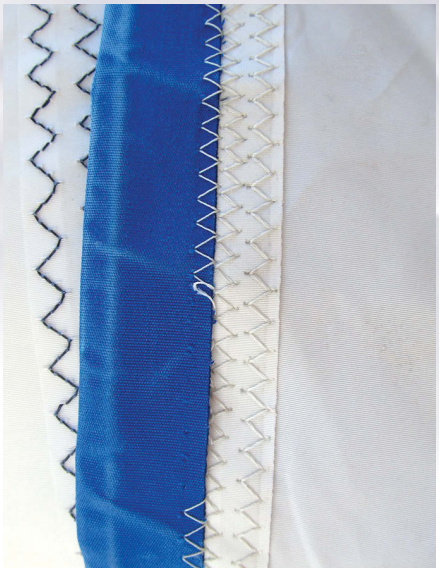
Foot

On headsails, examine the area near the tack where it chafes on the bow pulpit and lifelines. The other problem area is closer to the clew where the foot drags across the wire rope shrouds during tacks. The Sunbrella sun covers of roller-furling sails commonly suffer damage in this area.

On mainsails, inspect for damage from hardware such as reefing hooks or outhauls. Also inspect and repair as needed the seizing, webbing, and hardware of the slugs or slides as you already did on the luff.

Sun cover

Since it is continuously exposed to UV, the stitching securing a sail's sun cover is likely to be weakened. This applies to roller-furling headsails as well as mainsails. Inspect the entire sun cover (leech, foot, and clew patch) for areas where the stitching has failed and remove any loose thread before re-stitching with zigzag stitches.



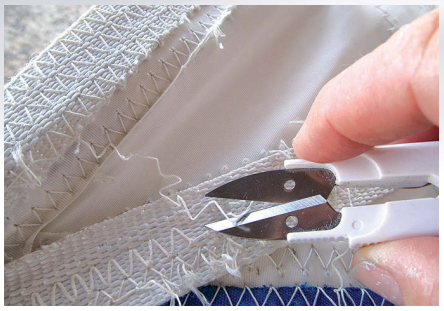
The stitching on a roller-furling headsail's sun cover is vulnerable to damage.

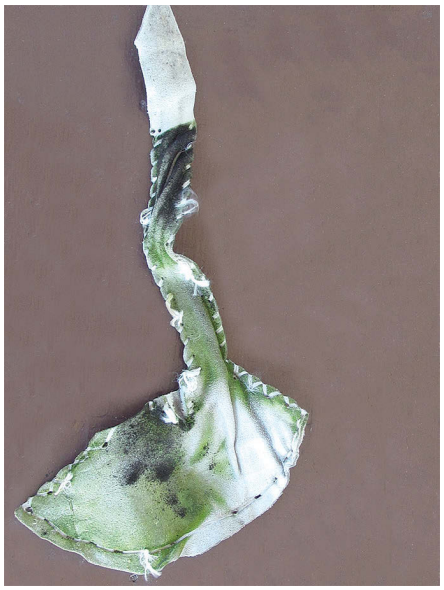
If long panels in the sun cover were not originally tacked down with diagonal seams, you may wish to add these if it appears the sun cover and sail are not rolling together synchronously. Also inspect the cover for torn areas that require patching.

Corners, hardware, and webbing

Check the stitching of all reinforcing patches, particularly for abraded thread. Appraise the condition of protective leather. Brittle, cracked, or torn pieces should be carefully disassembled so you can use them as patterns for replacements. You may want to remove the leather anyway so you can make a thorough inspection of the condition of the webbing that secures the corner rings.

Look for damage along the leech, where chafe on rigging can expose the leech line.





Carefully inspect corner rings, particularly if they have welds. Replace any ring that is distorted or cracked. Replacement involves removing the old webbing and sewing in new webbing. If your sewing machine is not capable of sewing through webbing and the clew reinforcement patch, hand sewing is the alternative. Once the webbing is sewn down, seize the "throat" of the webbing to the ring using hand-sewing thread so the ring cannot move and then design a cover, to be made with sailmaker's leather, to protect the webbing against UV and chafe.

Check the integrity of the small cleats (or hook-and-loop fasteners) that are often used to secure the leech and foot cords. Cleats are often sewn down with hand-sewing thread that will eventually break down in the sun. Hook-and-loop fasteners for leech and foot cords tend to fail with age.

Most roller-furling headsails we've repaired were originally delivered with corner webbing attachment points that had no protection from UV radiation. In some cases, the entire length of webbing, plus the stitching that secured it, was not covered. The critical attachment points of sails made this way are degrading from UV exposure every day the sail is on the furler. Such corners can be reinforced by adding one or two pieces of additional webbing, sewing it down to the corner reinforcement patch, and seizing it to the original webbing. However, if the webbing is no longer serviceable, it is better to pull it all off, clean up the thread nits, and re-web the corners. After re-webbing, protect the replacement webbing from UV exposure by covering it with shade cloth and leather.

With age and use, your sails will eventually fail. By periodically inspecting them critically and comprehensively and performing necessary maintenance, you can prevent profound failure while in use and avoid a failure that could endanger yacht and crew. Even if you have no desire to make your sail repairs yourself, it's always good to know how they should be done so you can talk effectively to the sailmaker who will perform the work.

Look for damaged stitching, at top, and cut it off with a thread snipper. If leather protection, at left, is brittle, remove it, center above, but use it as a pattern for a replacement. Webbing on a clew ring can fail for many reasons, above, and the ring should be replaced if the welds show signs of cracks. Unprotected webbing at the tack or head, top right, needs to be replaced before it can fail.

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*. They recently gave* Carina *a well-earned refit in the Philippines. Catch up with them at http://sv-carina.org.*

A new (old) boat comes home

Karma and kind strangers made it happen

BY BRIAN JONES

One desk-bound afternoon in May, as I juggled two phones, carrying two calls to two different area codes in a foreign country, while frantically typing an email to a third party, I realized that "The Plan," more than six months in the making, likely wasn't going to end in success. Here's the back story.

My wife and I bought our first sailboat together in April 2008 and I promptly launched the search for our Next Boat. We had a plan. I hadn't sailed in more than three decades and my wife's sum total sailing experience amounted to three hours in a small boat during a company retreat. We knew we wanted to sail and knew we didn't know what we didn't know. We needed a boat big enough to be stable, but small enough to be easy to handle, one with a comfortable cabin for weekending and a private head. The rest were wants: wheel, furling foresail, lazy-jacks, inboard diesel, autopilot, weather canvas . . .

All these wants and needs were met with *Whiskeyjack*, our Georgian 23. Our plan was to spend a couple of seasons learning to sail aboard *Whiskeyjack* while we discovered what we liked, disliked, and would change with our next boat. *Whiskeyjack* was so close to perfect (for us) it took more than five years to find the boat that would succeed her.

We needed more space. During the last few summers, we were aboard more nights than not and realized that two people, a compact sports dog, and a mid-sized utility dog were fighting for space in a 23-footer. But our dock had the best sunsets in the marina and we were often the only inhabitants after dark. Port Dover, Ontario, is one of the hidden gems of Lake Erie's north shore and our dock was one of the hidden gems of Port Dover.

This dock is the "small boat" dock in our marina. It has no services and low dockage rates but there is a maximum length limit. To keep that slip, we could go a little bigger, but not much.

By the fall of 2011, we knew we needed a really small center-cockpit boat with all of the amenities and benefits of our Georgian 23. That narrowed our options to precisely . . . one: an S2 8.0C, the smallest "walk-through" center-cockpit production sailboat ever built in North America and a perennial top-five finisher on every "ugly boat" list.

Locked onto a target, I began webcrawling the usual Internet sales sites with no success. Not a whole lot of 8.0Cs were built, so there's never more than a handful on the market. The candidates fell into three categories: too far away, beyond our ridiculously tight budget, too rough to consider. Or they were all of the above.

PHOTO BY PENNY DEWEERD

As Matt and Penny, Brian's volunteer delivery crew, set out early on the morning of day two, the weather on Lake Erie looked ominous.

Photographs of the S2 8.0C taken by the previous owner prior to Brian's offer show a boat that had seen some wear but was not worn out.

A likely candidate

In November, 2013, karma smiled. With *Whiskeyjack* hauled out for the winter, I dealt with boat withdrawal by deferring household chores to chat with fellow sailors on the web and to boat shop. On craigslist, I found an S2 8.0C for sale — in New Jersey. It was more than 500 miles away . . . in a different country . . . but it didn't look too bad in the pictures and the asking price was only twice our ridiculously small budget. I emailed the seller and asked for more photos. The boat was a little worn, a little scruffy, but she felt . . . possible.

Not real possible, however. She was 500 miles away. I had just started a new job (no vacation time), my beloved mother-in-law in New York had just been diagnosed with terminal cancer, and my wife was spending as much time as possible with her. No way could I consider a boat-inspection road trip.

Chatting with fellow boatnerds on Sailnet.com, I mentioned this boat, and Chip, one of the chatroom kibitzers, mentioned that his boat was slipped in the marina next door. Would I like him to take a look at the subject boat in person?

"Well, sure!"

Within a week I received an email with almost 100 pictures and a three-page report. Chip's inspection confirmed my initial impression that the boat was a little worn, but not worn out. The fact remained, however, that the boat was priced well above our ridiculously tight budget.

A quick phone discussion with my wife let me know I was on my own for this decision. Her focus was on her mother. "If you can make it happen, make it happen. If it doesn't, it doesn't," she told me. I may have been a little self-absorbed, shopping for a new boat while my wife's mother was dying. I hate cancer because I can't do anything about it. I fix things, build things, tinker, and putter. But I can't fix cancer. All the pink bracelets on the planet cannot cure a woman I love and admire. That makes me angry. I dealt with my anger through the distraction of boat shopping.

An offer

I made an insultingly low offer via email. The sellers countered with an amazing reduction from their asking price, a counter that put the price just north of our ridiculously tight budget. The boat was still 500 miles away, however, and it was late November, a bad time to transport a boat over land and an impossible time for a delivery by water.

Should I wait until spring and the possibility of another S2 8.0C closer to us, geographically and economically? Should I wait a while longer, add to our boat purchase kitty, and counter the sellers' counter in the new year? Or should I just get it over with now, get the rejection out of the way, get this darned boat out of my system, and move on?

I went all in. Within a day, I offered a figure that represented our budget ceiling. OK, a little north of our ceiling, in the low part of the attic, between the joists really, but I was sure they'd say no anyway, so why not? The sellers accepted.

Hooray! We owned a boat . . . 500 miles away . . . in another country . . . in winter . . .

Imagine this scenario: winter is close at hand, buyer and sellers have never met. Sellers want to make sure they get paid. Buyer wants to make sure the boat is not a bigger hole in the water than suspected. How to prevent an impasse?

Karma smiled again. The sellers explained that winter storage had already been paid until April, the boat was hauled out and winterized, and there was no hurry to move it. We agreed on a down payment with the balance due upon survey and satisfactory sea trial in April when the winter storage period ended.

Both parties wanted to keep things legal; we needed a document that would protect everyone's interests and lay out the terms of sale. I discovered the kindness of strangers on the Internet once more. A fellow cyberspace boatnerd is a lawyer, who provided me with the purchase agreement he had used in the past for long-distance boat purchases. Thanks, Jim.

Purchase price set, money exchanged, t's crossed, and i's dotted. Now I had to find a way to get *Take Time*, as she was named, from there to here. While our purchase budget was ridiculously tight, our delivery budget was ludicrously small.

A matter of logistics

I identified four options for getting *Take Time* to her new home port:

- Delivery by water from the New Jersey coast to Port Dover via the Hudson River and Erie Canal

As *Take Time* took leave of the U.S.A. bound for Canada, at left, Matt, at the helm, enjoyed flat water on Lake Erie, rare in mid-May, at right.

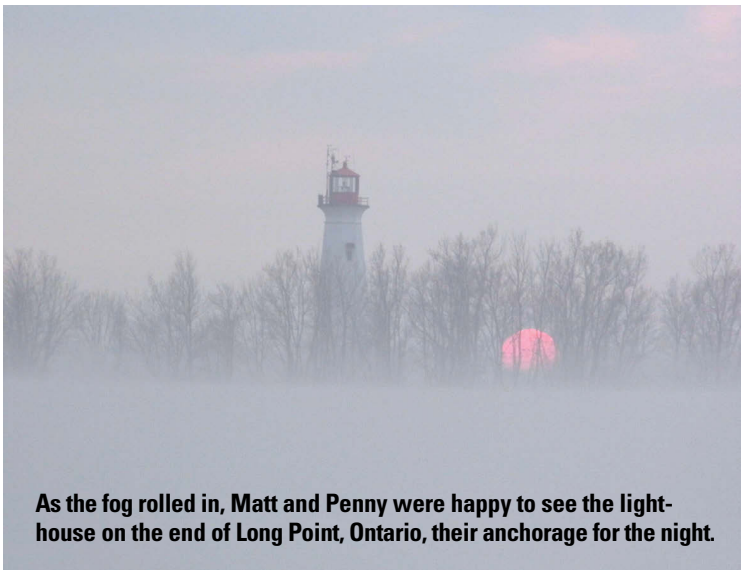
PHOTOS OURTESY PENNY DEWEERD

- Delivery by truck from the New Jersey coast to Port Dover
- Delivery by truck from the New Jersey coast to Erie, Pennsylvania, 45 miles south of Port Dover, then somehow getting ourselves across Lake Erie to collect the boat and bring her home
- Some other combination of the first two

In early January I started getting shipping estimates. The second option quickly fell off the list. The lowest estimate equaled the cost of the boat. The first option looked like the winner, as the simplest solution with the fewest moving parts. It could happen in about 10 days. If we couldn't spare the time, we could certainly find a delivery crew to handle the job in late April.

I was kind of proud of myself. I'm a habitual procrastinator, but I had a plan in place long before the date the aforementioned plan had to be executed. Then Old Man Winter dropped the other shoe. As January 2014 rolled into February, I realized we were well and firmly stuck in the Winter that Wouldn't End. By the end of March the Great Lakes were frozen solid. That meant a late opening for the Erie Canal.

Back to some combination of the two. Assuming our boat surveyed well and passed the sea trial and assuming I could find a hauler to do the job for our ludicrously small delivery budget, I still needed to get the boat from Erie to Port Dover. I had kind of overlooked that part. While Erie is only 45 miles south of Port Dover as the seagull flies, you cannot get there directly by car. You have to travel around the eastern end of Lake Erie, an 8-hour round trip. The options included drive over, sail back, and find someone to drive me back to retrieve my car; have someone take us over then drive back while we sailed across; or catch a ride over on another boat making the trip to Erie and sail back. All options would mean time spent organizing, while *Take Time* sat unattended in a transient berth racking up a bill.



As the fog rolled in, Matt and Penny were happy to see the lighthouse on the end of Long Point, Ontario, their anchorage for the night.

A solution?

Again, karma smiled. I outlined this dilemma in the Sailnet chatroom, once again looking for opinions, and one of my fellow chatters offered to deliver it.

"Really?"

"Yeah, it'll be fun."

"Er . . . but don't you live in Missouri?"

"Yeah, but it'll be fun. My wife likes roller coasters, so we'll stop at Cedar Point in Sandusky, go to the Rock and Roll Hall of Fame in Cleveland, then roll into Erie and deliver your boat. You deliver us back to our car and we'll stop in Niagara Falls along the way. Vacation and delivery all rolled into one."

The Plan was starting to come together in earnest. I needed to find a hauler and the clock was ticking. On April Fool's Day, I clicked to www.uship.com, a shipping auction site. You list your shipment and haulers bid on the job. The lowest bid or the bid that the shipper likes best, wins. Just as eBay has a "Buy it Now" option, uShip has the "Name Your Price" option, allowing a shipper to name the price he's willing to pay to have his shipment completed. I entered my ludicrously small figure as my "Name Your Price" price and clicked "Submit."

And karma once again smiled. Four days into the two-week auction, I got an email from uShip, informing me that my shipment was booked. A hauler had accepted my

ludicrously small price! Maybe karma was only smirking this time. I had a lot of plates starting to spin. I needed to survey and sea trial this boat, which meant having it splashed, the sails bent on, and a quick systems check performed. Then the boat had to be hauled, the mast dropped, and the boat loaded onto the hauler's waiting trailer. I would have to coordinate my schedule with the trucker's schedule and the marina's schedule. As early April became mid-April and then late April, the hauler had become very silent. No emails and no telephone calls.

Then it became apparent that no surveyor in New Jersey would be available until mid-June at the earliest. I opted to forgo the survey and sea trial. Now the boat wouldn't need to be splashed and I wouldn't have to make the trip to New Jersey. I decided to focus on the system that would be a deal-breaker: the engine. If the sellers could send me a video of the engine starting and running, I decided, we could waive the sea trial and finish the deal. Two days later I had the video: the Yanmar YSM8 cranked up and chugged along with no smoke and good water flow out of the exhaust.

I got in touch with Matt, my volunteer delivery skipper, to tell him I assumed the boat would float, not take on too much water, and safely make the crossing, letting him make the go/no go choice.

"Yeah, we're still in. It'll be fun."

This world needs more Matts. But still no word from the hauler. I finally reached him only to learn that his trailer was broken and he wouldn't be transporting anything for a couple of weeks at least. One plate crashed to the floor.

I cancelled the bid and started a new uShip auction. And karma granted me a do-over. Within two days another hauler accepted my price and the plate was back in the air.

Countdown

To recap: I have a boat in a boatyard in New Jersey that needs to have the mast dropped and be loaded on a truck. This can't be scheduled until the boatyard knows when the truck will arrive. Meanwhile another boatyard in Pennsylvania is waiting for the boat to arrive so they can remove it from the truck and raise the mast. At that point, a delivery crew from Missouri will step aboard and deliver it across the lake. My boat must be out of the yard by the end of April, and it is now . . . April 29. I throw myself on the mercy of the boatyard and get a two-week reprieve.

Tuesday: The hauling company says they will be picking the boat up next week. I email Matt and Penny in Missouri to firm up their schedule.

Wednesday: The New Jersey yard wants to know when the truck will arrive. I pass on the hauler's details to them to directly coordinate the schedule. I contact the yard in Erie to

In her new home, and with a new name, *Karma* is rigged and ready to sail, at left. It doesn't take much wind to get *Karma* moving, at right.

arrange mast stepping and launch. I'm told to call back when the pickup date in New Jersey is firm and they'll be ready.

Friday: The hauler says the truck will pick up Tuesday or Wednesday. The marina says Tuesday won't work, it must be Wednesday. The hauler confirms a Wednesday morning pickup.

Tuesday: The New Jersey marina says they cannot load the boat on Wednesday; they're behind schedule, I must postpone. I cannot postpone, the truck is on its way, allegedly. The yard will have to move boats to get to mine, at my cost. Sigh. Budget now blown.

Wednesday morning: The truck driver is really sorry, but he's running behind and still in New York. He can't pick up until Friday. Too late at the yard. The boats have been moved at my expense.

Friday: The trucker says he will pick up Tuesday. Erie says they will be able to step the mast and launch the boat sometime in the next couple of weeks. I stifle a scream of frustration.

Saturday: Matt and Penny leave Missouri.

Sunday: In a stunning flash of brilliance, I come up with a new plan bypassing the Erie boatyard. The mast is deck-stepped and the shoal-draft boat can be launched from the trailer. The trailer must have a winch to permit the mast to be stepped. We don't need no stinkin' boatlift! I text the truck driver with a new destination: the public boat ramp in Erie.

Monday: Matt and Penny arrive in Erie and promptly want to leave, but must wait for the boat to arrive.

Tuesday: My boat is picked up in New Jersey.

Wednesday: She arrives in Erie. The trailer has a winch but it doesn't work. Matt decides to secure the mast to the deck and make the crossing under power. He and Penny load *Take Time* with gear and provisions, start the engine, ensure everything is working and nothing is leaking, and depart Erie. A storm warning is issued, but they're out of cell-phone range.

Wednesday night: The storm blows through. *Take Time* comes through unscathed.

Thursday morning: Matt and Penny arrive in Port Dover. The boat is sound. The crew is safe. Matt admits he has never sailed a boat this large and has never sailed on a lake this large. He does not stop grinning for several hours. I step aboard the boat I purchased six months before and 500 miles away. She is better than I expect, better than described. Karma is grinning.

Faith restored

It's easy, in our era of cynicism, to think the world has become a meaner place, that people are less willing to help each other, that everyone is out only for themselves, and any luck one has is likely bad. This project got us more than just a boat that we love, it reaffirmed my faith in the kindness of strangers.

My mother-in-law passed away in early March. She loved boats and the ocean. The weekend before *Take Time* was picked up in New Jersey, her ashes were committed to the ocean to be carried by the Gulf Stream home to her native Norway. Fair winds, Bjorg. Thank you for any influence your spirit had on the good luck we had with this adventure.

Brian Jones started sailing at the age of nine. His wife, Louise, grew up in a boating family. Together, they have sailed Lake Erie for eight seasons, most of them successfully. Brian and Louise summer aboard Karma, *their S2 8.0C, in Port Dover, Ontario.*

Brian wonders, "How come the only time people take pictures of our boat, we're not really sailing?" She's lot of boat in a small package, he says, and she sails better than she looks.

DENIM SHIRT WITH LOGO

MEDIUM-WEIGHT,
LONG-SLEEVED
S, M, L, XL, XXL

$35.00

GOOD OLD BOAT BALL CAPS

STURDY AND DURABLE

DEEP BLUE
$18.00

DENIM
$16.75

FRONT DETAIL

MAROON,
LOGO IN
GRAY AND WHITE

DEEP GRAY HEATHER,
LOGO IN
BLUE AND WHITE

DEEP
NAVY BLUE
POCKET T-SHIRT

HUNTER
GREEN

S, M, L, XL, XXL $20.00 EACH

To order Good Old Boat gear, call 701-952-9433 or visit www.goodoldboat.com

GOOD OLD BOAT™ GEAR

HOODED ZIP-FRONT SWEATSHIRT

7.75 OZ. 50/50 COTTON POLYESTER BLEND.
FRONT POUCH POCKETS.
STRETCHY ATHLETIC RIBBED CUFFS AND WAISTBAND. AVAILABLE IN RED, ROYAL BLUE AND BLACK

S, M, L, XL, XXL

$45.00

A drop-in refrigerator delivers the cold

BY RIC MAXFIELD

Cool package

Whether to have an icebox or a refrigerator on a sailboat has always been a difficult choice, especially on a small boat with limited space and power. While wanting to keep things as simple as possible with the rebuild of my 27-foot 1975 Albin Vega, *Blue Max*, I was pretty sure I wanted refrigeration if I could figure out how to make it fit.

I have no experience with refrigeration, so it had to be easy to install. In looking at the options at boat shows and online, it seemed that I would have to hook up a bunch of parts. I wasn't sure what I'd end up with. I could have hired someone to install it, but the price would double at a minimum. I also considered using a portable refrigerator that didn't have to be installed, but where could I store it?

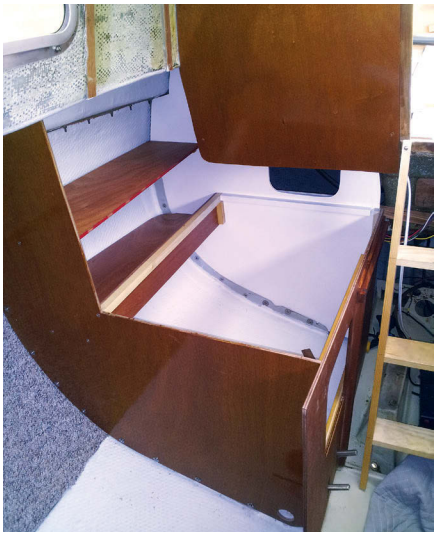
While researching the portables made by Engel, I came across the MB40 Drop-In model with a 42-quart capacity. It had the simplicity of a portable but was designed to drop into a hole cut in the countertop. That seemed very appealing and, at at less than $1,000, so did the price. I decided to give it a shot.

The Engel Drop-In comes with the condensing unit attached to the bottom of the box with sheet metal screws. The Engel website shows models with this unit either attached or detachable. I couldn't tell the difference between the two from the pictures. The model with the detachable condensing unit has two coiled copper lines inside a single insulated cover between the condensing unit and the box. These can be uncoiled, so the unit can be up to 6 feet from the box. Of course, they don't tell you how stiff the copper tubing is and how easy it would be to kink or that the condensing unit has to remain in the same "top up" position no matter where you mount it. That last piece I had to confirm with a technical support representative because it would have made things so much easier had that not been the case.

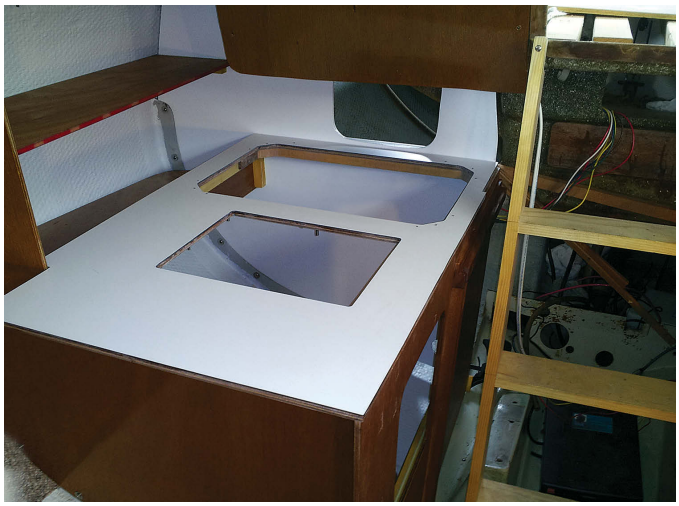
In spite of those two difficulties, the Engel unit offered a lot of advantages. It works with 12 or 24 volts and power consumption is comparatively low at between 0.7 and 2.8 amps, even at startup. It can also be inclined up to 30 degrees and handle vibrations in extreme conditions . . . you know, a typical day on a sailboat.

More "slide-in" than "drop-in"

On *Blue Max*, the companionway divides the galley. The sink and icebox are to starboard. I considered putting



The finished galley counter with the fridge installed is a compact workspace, at top. To begin, Ric installed the forward and aft bulkheads and fitted shelves along the hull, at left. The cabinet front is just tacked in place. After cutting the plywood countertop to size and cutting out openings for the sink and fridge, center, he dropped the Engel MB40 in place to work out the supports. He then built supports around the opening to keep the lid in place and provide a good seal, at right. The aft lid support creates a lip for the lid to slide under.



Ric sealed the countertop with penetrating epoxy, above left, then epoxied Formica to it, above right. The countertop and front are not yet installed. He fitted the Engel into the countertop hole, built out the lid supports, then eased the whole assembly into place, below.

the refrigerator in a different location, but I would have lost precious space. That meant using the existing icebox space. Unfortunately, it wouldn't be as simple as taking out the icebox and dropping in the Engel. However, I had gutted the interior of the boat and was replacing all the bulkheads and counters, and that did make installing the Engel somewhat easier than it might otherwise have been.

The countertop to which the icebox was connected sits partially below the cockpit with roughly 12 inches of space above the counter. While access to the icebox was easy enough, dropping the Engel through the counter cutout with the new counter already in place would have been impossible. To complicate things, the counter was about 2 inches too low to allow me to leave the condensing unit attached to the bottom of the box.

In building out the new counter, I went with a slightly smaller sink, giving me a little added room for the wider Engel. As the first step, I installed both new bulkheads and the cupboard above the counter. That gave me the back and both ends to support the combined countertop with the Engel installed as I maneuvered it into place. Having the countertop separate from the galley framework allowed me to suspend it between a couple of sawhorses while I configured the four corners where the Engel is screwed to the counter. To provide more support, I epoxied wooden stiffeners around the cutout on the underside of the countertop.

Securing the lid

The one really quirky thing about the Engel Drop-In is that the lid isn't attached in any manner. It just sits on top without a good seal. This requires that, after installing the box, you have to install a support system on all four sides for the lid. You also need to come up with some type of fastening system to hold the lid in place in rough conditions or the occasional knockdown.

When I designed the lips around the lid, I cut the aftmost lip, which is under the cockpit, so that a section of the wood extended about ½ inch over the lid for the length of that side. The overhang requires that I slide the aft portion of the lid down first, then push it aft so the forward portion of the lid can slide into place. A small semi-circular cutout in the forward lip provides a way to grasp the edge of the lid and lift it back up. The lips create a firm contact point for the seal that surrounds the edges of the lid and make a nice tight fit. The final touch was finding some teardrop-shaped flat acrylic pieces about 1 inch long that could be screwed to the top of the forward lip. These are easy to turn so they overlap the lid and keep the front edge from coming open in rough conditions.

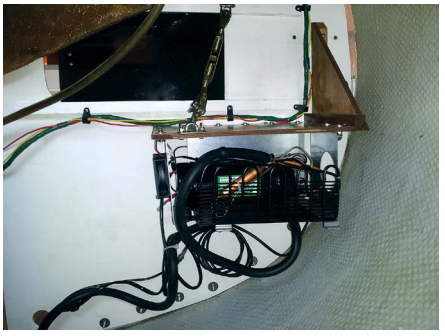
Resources

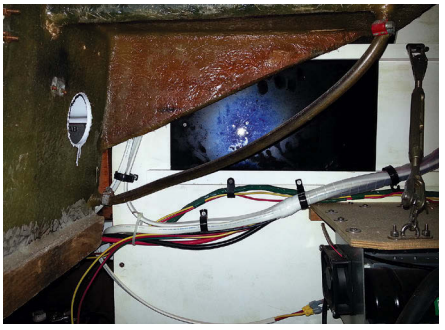
Engel
www.engelcoolers.com

A delicate maneuver

Once I had the Engel attached to the countertop, the next big challenge was to get the countertop in place with the box hanging from it. At this point I needed some additional help. I could have done it by myself, but it would have been a major ordeal, especially as I had to disconnect the condensing unit.

On my Vega, the aft bulkhead sits between the galley and the cockpit locker and extends to the companionway opening. While I would later build additional supports and panels to enclose that area, it was still open with enough space for me to slide the condensing unit past the aft bulkhead so it could be mounted in the cockpit locker against the aft bulkhead. Slowly unbending the copper tubing and moving the condensing unit around the bulkhead while remaining stuffed in a small, cramped space was an exercise in patience and slow, deliberate





Ric sealed the lid supports and painted them with Interlux Brightsides to match the Formica, at top. He attached the condensing unit to a shelf on the bulkhead inside the cockpit locker, center. A three-inch hole drilled in the cockpit in front of the condensing unit's fan, above, provides the air needed for keeping the unit cool.

movements. Perhaps I should mention that I'm 6-feet 2-inches tall.

As noted earlier, the condensing unit, if separated, has to be mounted in the same orientation as it was when attached to the box. Well, the only provision for attaching the condensing unit to anything is on the top. Had I been able to mount the condensing unit on its side, I could have bolted it directly to the bulkhead. Furthermore, the condensing unit is air-cooled, so it needs to be in a location with good air circulation.

A sliding door is built into the bulkhead just above the counter in the galley to give access to that area of the cockpit locker. This meant I had to create a shelf that didn't block the sliding door on top or the airflow around the condensing unit below. I also didn't want to drill any holes into the fiberglass, so my options were limited. My solution was to attach a piece of plywood in the shape of a right triangle to the bulkhead as an attachment point for the outer end of the shelf. For the inner end, I used a turnbuckle connected between the shelf and the bulkhead to provide upward pressure against the wooden strip between the shelf and the cockpit seat. This design allowed me to create a very sturdy shelf without drilling holes into the cockpit or blocking the airflow around the condensing unit.

Once I had dealt with the condensing unit, I slowly moved the countertop and box into place, taking care not to kink the copper tubes. Once it was in place, I connected the Engel to the battery to confirm that it still functioned properly. It did.

Having a box that large provided some challenges when installing the sink and connecting it to the discharge through-hull, but the biggest was the confined space I had to work in. I was able to add a small shelf and cubby behind the through-hull that should help keep stuff from piling around the through-hull valve and ensure that it will be accessible.

Engel claims that the MB40 Drop-In provides "efficient cooling independent from ambient," along with being solar compatible. While I'm not sure how I'm going to test the first part, I can say that the box cools down quickly, maintains the cool temperatures for a relatively long period of time after the box is powered off, and does a six-pack proud. One more on my long list of projects is complete as *Blue Max* takes shape.

Ric Maxfield started sailing in 1970 when he was in the Marine Corps stationed at Kaneohe Bay, Hawaii. He now lives in Southern California and got into larger boats in the late 1990s while sailing at Orange Coast College School for Sailing and Seamanship and Club Nautique. He has delivered boats up and down the west coasts of California and Mexico, from the British Virgin Islands to Florida, and across the South Pacific. The Vega is the first sailboat he has owned outright and it should see some long-distance cruises of its own.

CAPE DORY 27

BY TOM WELLS

A thoroughbred at home on rivers, lakes, and oceans

Phil Bills began sailing in 1960 when he was 15. He grew up in Delaware, Ohio, north of Columbus, and sailed the Douglass & McLeod Highlander among other boats. After earning his college degree from Eastern Kentucky University, he embarked on a successful career in planning and engineering, but sailing was always present in his life. He berthed his first "big" boat, an O'Day 23, at Limestone Bay Yacht Club on the Ohio River east of Louisville, Kentucky, and named it *Scotch's Too*. The name came from a beloved dog named Butterscotch, or "Scotch" for short. The dog loved being aboard, and Phil's wife, Phyllis, remarked, "The boat is Scotch's, too."

Phil replaced the O'Day with a J/29 named *Scotch's Too II* and began racing in the active sailing community on the Ohio River. That lasted until 2001, when a website listing caught his eye. A beautiful Cape Dory 27 was for sale on nearby Lake Monroe in Indiana. He was fascinated, and before long the boat was his. Phil renamed her *Scotch's Too III* and has sailed her from Limestone Bay Yacht Club since that time. In April 2015, Phil invited my wife, Sandy, and me to take a good look at *Scotch's Too III* and try our hand at Ohio River sailing.

Cape Dory Yachts

Andy Vavolotis began building the Cape Dory 10 to his own design in East Taunton, Massachusetts, in 1963. The boat was essentially a rowing dinghy with a cat rig for sailing. His initial success was boosted in 1967 when he introduced the 18-foot Carl Alberg-designed Typhoon (see *Good Old Boat*, July 2015).

Cape Dory Yachts began producing larger cruising yachts in the early 1970s. It introduced the Cape Dory 27, another Carl Alberg design, in 1977 and built 277 examples over eight years.

The company continued to expand its line of cruising sailboats until the late 1980s, producing models ranging from 25 to 45 feet, and in the late 1970s also began building powerboats. Production ceased in 1991 and the name was sold to a New York company that intended to continue building the powerboats. That company ceased operations in 1996.

Andy Vavolotis moved to Maine, taking with him the company's Spartan Marine Hardware division. He also retained the molds for some of the larger models, and sold the boats as the Robinhood 36 and 40. The Robinhood Marine Center in Georgetown, Maine, remains in operation today.

Construction details

If you absolutely had to hit something with your sailboat, owning a Cape Dory 27 would be an asset. The hull is a thick hand layup of solid fiberglass, and that includes the full keel with its encapsulated ballast, an Alberg design

The Cape Dory 27 *Scotch's Too III*, sailed by Phil Bills on the Ohio River, shows off the low sheerline and balanced overhangs, today considered "classic," that are characteristic of the designs of Carl Alberg.

Cape Dory 27 hull-to-deck joint and chainplate

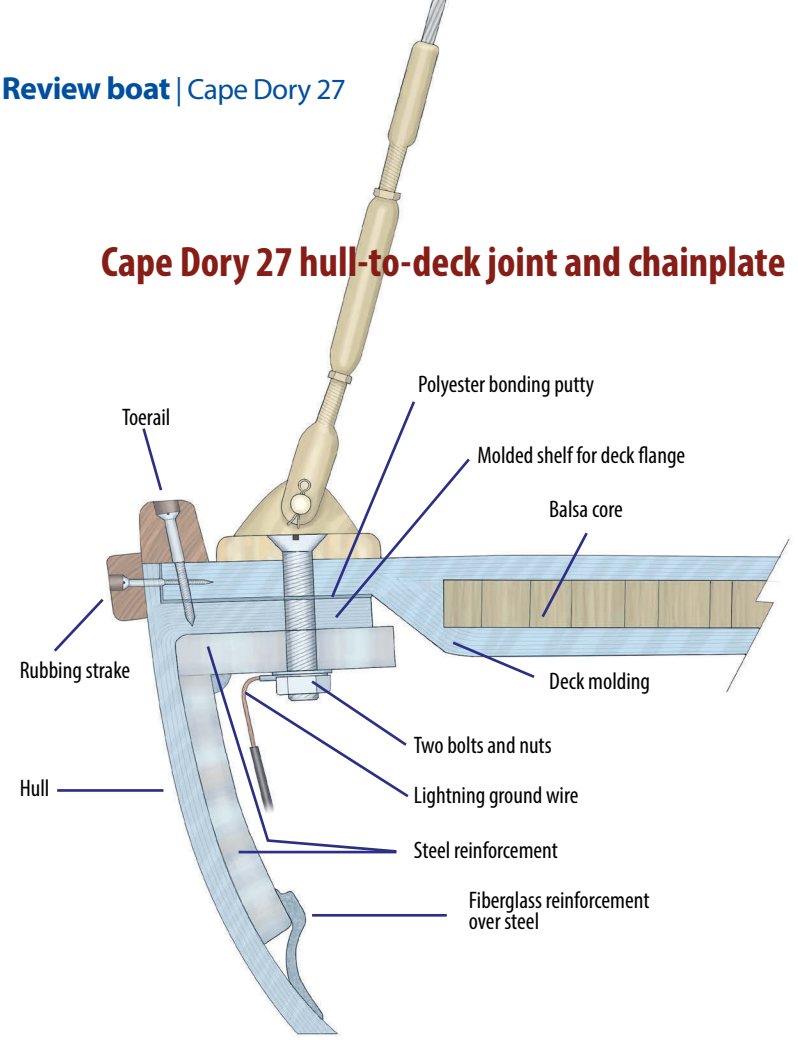


ILLUSTRATION BY FRITZ SEEGERS

standard. The solid hull and the absence of vulnerable keel bolts mean that, even in a grounding, any damage will most likely not be catastrophic and might only be cosmetic. Osmotic blistering has occurred on a few hulls, but most owners report no major problems.

The decks were hand laid using end-grain balsa core. For the hull-to-deck joint, Cape Dory employed an inward-turned flange on the hull to support the mating outer edge of the deck. The hull extended above this flange to match the thickness of the deck, thus leaving no exposed entry for leaks. The hull and deck were joined using polyester bonding putty and screws through a teak toerail into both sections. A matching teak rubbing strake was installed with screws through the short portion of the hull that extends above the flange and into the deck edge. The result is an attractive and fairly trouble-free joint.

The chainplates are manganese-bronze castings through-bolted to steel backing plates that are augmented with lateral steel stiffeners along the hull. The backstay chainplate is similarly built, as is the stemhead fitting. Like most bronze fittings on the boat, they were produced by Cape Dory's Spartan Marine Hardware division.

Cape Dory did make heavy use of gelcoat and some owners have found crazing and cracking in areas under high stress. The balsa-cored decks are also prone to occasional water intrusion and should be watched for any developing soft spots, including the area where the rudder stock penetrates the cockpit sole

The rudder tube is glassed into the hull and the cockpit sole, which is reinforced locally with heavy laminations. The rudder stock is capped by the tiller head on most boats, although pedestal steering was an option.

Rig

The Cape Dory 27's aluminum mast is deck-stepped above a compression post and supported by single upper shrouds, double lowers, and single spreaders. The single backstay attaches to the bronze chainplate centered at the stern.

The mainsheet is attached to the end of the aluminum boom and leads to a single-line traveler that spans the aft end of the cockpit.

Barlow #23 bronze self-tailing primary winches are mounted on the sidedeck outboard of the teak cockpit coamings, which are protected from line chafe by stainless-steel rubbing strakes along their top edges. Aluminum T-tracks mounted on the toerails allow the genoa sheet leads to be adjusted. A small utility winch on the starboard cabin trunk serves halyards led aft through rope clutches.

On deck

When you step aboard the Cape Dory 27 you notice that it has the solid feel of a much larger boat. That's due to the boat's heavy displacement, nearly half of which is made up by the encapsulated ballast.

The foredeck is a fairly narrow but clean working space. Chocks with retainer pins lead docklines to a pair of cleats inboard and centered about 3 feet aft of the stem. There is no anchor roller or anchor locker. Some owners have added a roller, but chain and rode would need to be stowed elsewhere and connected when anchoring. *Scotch's Too III* has a pair of solar vents installed on either side of the cleats, but they are not standard. The stainless-steel bow pulpit provides security. Single lifelines supported by stanchions mounted just inside the teak toerail extend aft to the stern pulpit, where they are attached with pelican hooks so they may be removed for dockside access.

A sizable hatch is fitted at the forward end of the cabin trunk where it's over the V-berth and a single dorade vent lies to port of the mast step. Short T-tracks with standup blocks on the cabin-trunk edges provide tight sheeting angles for a small jib.

Aft of the mast, the sea hood for the sliding companionway hatch rests on teak trim that forms the hatch slides. Halyards are led from the mast through

Resources

The Cape Dory Sailboat Owners Association is an active organization and an excellent resource. Specifications, manuals, literature and other information for all Cape Dory models may be found at www.capedory.org.

No serious provision is made on the foredeck for anchoring, at left, but the cleats and fairleads are adequate. The blue non-skid has held up fairly well on *Scotch's Too III*. The toerail and rubbing strake are attractive and useful. Teak cockpit coamings, at right, are indicative of the quality of materials Cape Dory Yachts employed. There's good stowage beneath the seats, which are long enough to lie down on.

a deck organizer to starboard and aft to the rope clutches. Teak grabrails are installed on each side of the aft part of the trunk, but do not extend far enough forward to double as toerails for work at the mast. Three bronze opening ports on each side of the cabin trunk assure good ventilation and light below.

The sidedecks are uncluttered and are wide enough for crew to pass easily between the lower shrouds and the cabin trunk. They extend past the cockpit, where they join the aft deck. A hatch in the aft deck gives access to a storage locker.

In the large and comfortable cockpit, the 75-inch-long seats are suitable for napping or reading while at anchor and the teak coaming provides a short backrest. A full bridge deck adds security in a seaway and both cockpit seats have lockers beneath them. The tiller may be stowed vertically to clear space when in port. The engine controls are on the port side of the cockpit well.

Belowdecks

The Cape Dory 27 has a traditional interior with plenty of attractive teak. Standing headroom in the saloon is a full 6 feet at the centerline. Teak grabrails are located to port and starboard. The overhead is finished with a fiberglass liner that conceals wiring. Acorn nuts cap the exposed ends of a few through-bolts that secure cabintop fittings. Teak-and-holly cover plates in the sole, which is part of the fiberglass pan, allow access to the bilge.

Some of the boats were equipped with a bulkhead-mounted folding table, but *Scotch's Too III* has a table that mounts on two removable stainless-steel posts. Sockets in the sole and on the underside of the table are offset from the centerlines of both, so the table can be mounted to extend close over the port settee to serve as navigation space or turned 180 degrees to be on the centerline between the settees for dining.

The electrical panel and electronics are located to port over the small galley, which has a two-burner alcohol stove with a teak cover plate that makes extra countertop area when the stove is not in use. A small icebox is behind the stove and some owners indicate it requires more insulation.

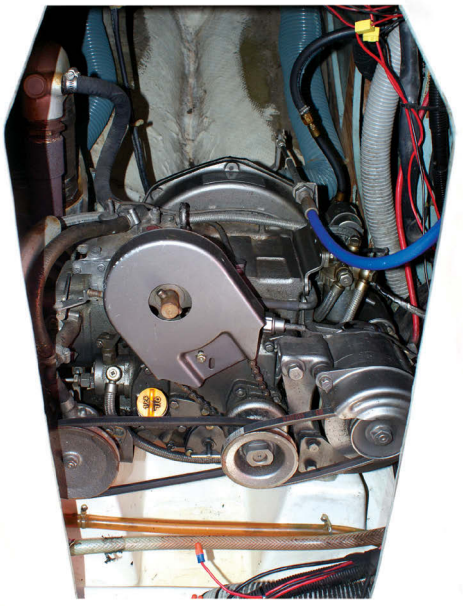
A small stainless-steel sink is fitted to starboard of the companionway and storage compartments are built in below the sink and outboard of it. When the top companionway step and the main step panel are removed, the engine is readily accessible for service.

The galley is partially under the bridge deck and spans the cabin, at left, and the electrical panel and basic electronics fit tidily on the bulkhead. On *Scotch's Too III*, the table fits on stainless-steel posts, either close over the port settee, at right, or centered between both.

Divided by the companionway, the compact galley has an alcohol stovetop to port, at left, and a sink and icebox to starboard. The 6-foot by 6-foot V-berth, at right, is even more commodious with the filler cushion. Teak ceilings covering the hull sides look and feel shippy.

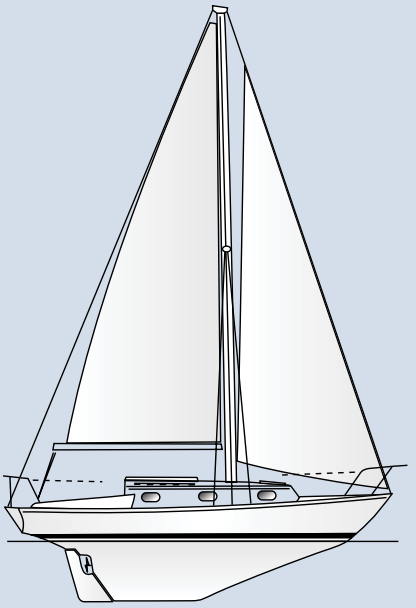
A teak door in the the forward saloon bulkhead provides privacy for the head and the V-berth area. A small head compartment to port is just large enough for the marine toilet, which is mounted facing inboard, but no vanity sink is provided — the galley sink is dual-use. A large hanging locker opposite the head drains to the bilge and can be used for wet gear.

The V-berth is a full 6 feet long and 6 feet wide at its aft end, and a removable insert makes the full width usable for sleeping. Teak ceilings on both sides lend a finished appearance and there is a small storage compartment in the forepeak with a louvered teak cover.

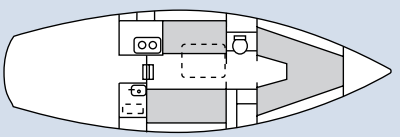


The single-cylinder Yanmar diesel is under and behind the companionway steps. It's a little loud, but it can be started with a hand crank in an emergency.

Cape Dory 27



Designer	Carl Alberg
LOA:	27 feet 1 inch
LWL:	20 feet 0 inches
Beam:	8 feet 6 inches
Draft	4 feet 0 inches
Displacement:	7,500 pounds
Ballast:	3,000 pounds
Sail area :	354 square feet
Sail area/disp. ratio:	14.8
Disp./LWL ratio:	419
Water	10 gallons
Fuel	25 gallons
Holding tank:	6 gallons



Under power

Scotch's Too III is powered by a single-cylinder Yanmar YSB8 diesel. A connecting fitting allows a hand crank to be used to start the engine in an emergency. The engine is a bit noisy, as are most one-lungers, but it starts and runs reliably and powers the boat adequately. Phil says it has been relatively trouble-free.

The helm is neutral when powering ahead, when the long full keel keeps the boat tracking straight with little need for corrections with the tiller. There is some prop walk to port in reverse and throttling back doesn't begin to correct it immediately. With some practice it is possible to back under control.

Under sail

We scrubbed our first attempt to go sailing due to a combination of strong winds, spring flooding, and an associated strong current on the river, but the second date proved ideal. We headed out of Limestone Bay Yacht Club onto a gentle Ohio River into winds that varied from 7 to 10 knots. John Kiesel, who sails his Catalina 25, *Naiad IV*, on the river, skippered the chase boat for the under-sail photography, a center-console Carolina Skiff.

After the photography session, I transferred to *Scotch's Too III* to experience the helm. Wind in the lower ranges is not ideal for this boat, but she proved to be a bit quicker than I expected. Going to windward through several tacks we averaged 4 to 5 knots and were able to sail to an apparent

The head has a marine toilet to port and hanging locker to starboard. A privacy door in the main bulkhead closes it off from the saloon but not from the V-berth.

wind angle of around 35 degrees. It appeared to be closer on one tack than the other, but that was likely due to some current effect. The tiller has a nice solid feel and the influence of the full keel is noticeable. Letting the tiller go did not result in any sort of wandering or abrupt course changes. The boat tacked smoothly and came through the wind easily.

Easing the sails and falling off onto a beam reach produced slow but steady acceleration. Our GPS showed a maximum speed of 5.5 knots going across the slight current. We eased sheets a little more and dropped down onto a run, even sailing by the lee with the sails set wing-and-wing for a brief time. The boat was steady and well under control at all times. On each point of sail, the helm was solid and crisp and the boat never showed any sign of tenderness. It's a solid, comfortable sailboat.

Cape Dory 27s are not widely raced, but they should perform to the PHRF rating of around 243. That compares favorably to the Tartan 27 centerboard boat at 243 and to the Pearson Triton, another Alberg design, at 252. Phil races *Scotch's Too III* in the charity regattas and does quite well.

Price and availability

A search found five Cape Dory 27s currently on the market at asking prices from $7,500 to $15,800. The average, $12,420, is a good price for a solid, capable boat. With 277 built, it is likely there will be at least a few on the market at any given time.

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,* HigherPorpoise.

Comments from owners of the Cape Dory 27

"I owned a CD 27 from 1978 until 2009. The build quality was a solid B/B+. The interior fiberglass liner pan made any changes to deck hardware complicated. Electrical wiring was simple, with fuses, not breakers. The hull seemed very solid, the rigging and mast were simple and solid, but the winches were undersized for the 120 percent jib. It was totally underpowered with a Yanmar YSB 8. I always felt confident that the boat could handle any trouble that I got myself into and I loved her salty New England look — a beautifully proportioned boat."

–**John Buchbinder**, Point Judith, Rhode Island, and Brooklyn, New York

"I love how solid she feels. She can stand up to anything that we are going to run into in the Midwest. With winds above 15 knots, we put one reef in the main and still fly the 150 percent genny. As the wind picks up, the genny gets rolled in a bit. What do I like the least? Backing up. With a cutaway full keel, backing up depends more on wind direction than rudder position."

–**Tim Roberts,** Harbor Point, Missouri

"We would tuck in a reef above 20 knots and an occasional second reef above 30 with a few turns on the jib furler, but we always felt in total control and very confident in the boat's ability to stand up to the conditions. Although we had plenty of sails, the only ones we used were a mainsail with lazy-jacks and two reef points and a 120 percent Yankee on a roller furler. Although the CD 27 did not point as high as the fin-keel/spade-rudder boats because of the full keel and the inability to trim the headsail close, we would regularly hit 6.5 knots or more close reaching and could go to windward pretty well."

–**Stephen Gaal**, Portland, Maine

"The original icebox is practically useless; ice melts in a short time. With the full keel, trying to back under power is nearly impossible — she has a mind of her own. The original electrical system is insufficient for today's needs."

–**Cliff Gates**, Galesville, Maryland

"The boat is quite tender initially, like most narrow full-keel boats, but will dig in and track well at about 12 to18 degrees of heel. There is a fair but not overwhelming tendency to weather helm, and the tiller is not as light on the hands as some other boats I have handled, but it is responsive and one feels a solid connection to the rudder."

–**Roy Vestrich**, Charlotte, Vermont

Cooking by induction

Heat the food, not the cabin and crew

BY DEAN RAFFAELLI

Dean's single-element induction cooktop lets him keep his cool while his supper sizzles, and it's small enough to stow easily.

I should put this on the table right now: I am a vegetarian. When every other boater in the harbor is preparing dinner on an outside grill, I am inside boiling water and sautéing veggies for pasta primavera. You can imagine the cabin heats up fast, which has led me in search of other, less hot, approaches to cooking.

Carrie Rose has a propane Seaward stainless-steel two-burner stove with an oven. It is a gem. It makes great pizzas and, as anyone who uses propane knows, it delivers a lot of heat. This is a problem on a hot steamy day. For years, as an alternative, I used a butane cooktop — the one with threatening warnings not to cook with it for fear of death that remind me of the caution on chartbooks: "This chart is not intended for use in navigation."

I carefully stored the butane canisters in the vented propane locker. As soon as I was finished cooking, I disengaged the canister from the device, put the cap on it, and placed it outside. The overhead ventilation fan was on whenever I was using the cooktop, but I still felt guilty about cooking with it.

One day, I noticed an article in the *New York Times* about innovative young chefs in Brooklyn, one of whom was shown cooking on three $700 single-burner induction cooktops. This got my attention. Induction cooking has been around a long time in commercial applications but has only recently become affordable for good old boaters.

Induction cooking uses alternating magnetic fields to produce electromagnetic energy to heat ferrous (as in iron) material. If a magnet sticks to the bottom of a pan, the pan will work with an induction cooktop. The classic is a cast-iron pan, but there are pans made of ferro-magnetic stainless steel specifically designed to work with inductive cooktops.

Here is the take-home message: with induction cooking, the only thing that heats up is the pan and the food in it . . . and it heats up fast. Heating occurs when the pan is in contact with the cooktop. Pick it up and the heating stops.

I bought a Salton for about $80 simply because it was the only one available at the Wal-Mart in Smith Falls, Ontario. It came with a cheap, but surprisingly functional, pan (after I fixed the cover's broken handle with a piece of scrap wood, that is). Before you buy one, remember that this device needs 120 volts to operate, so you will need to be plugged into the marina's power, have an AC generator, or a sizable bank of batteries and an inverter.

The control display provides two ways to adjust the heat level: watts and temperature. There is also a timer. The wattage starts at 200 (175°F) and rises, mainly at 200-watt intervals, to 1,300 (465°F). At 200 watts, it is just keeping the pan warm. At 1300, whatever is in the pan is being seared.

The Salton comes in basic black. The cooking surface is glass. It measures approximately 12 x 14 and is 2½ inches high. I doubt it weighs 5 pounds. Though I have not found this to be an issue, if you are concerned about magnetic-sensitive gear, keep it at a distance.

The pan heats up quickly, so there should be something in it before it is turned on. Water boils and oil sizzles fast. At the opposite end of the scale, a frittata has the time to slowly cook through. If you choose the temperature setting, the heating process pulses on and off to keep the temperature constant.

Other than right under the pan, the cooktop does not get hot. The pan gets hot, what is in it gets hot, but everything around it does not get hot. No residual heat is associated with it. Once it's off, it's off. A fan stays on as long as the cooking surface is 120°F or hotter. Finish cooking, take the pan off, and the fan stops within a minute.

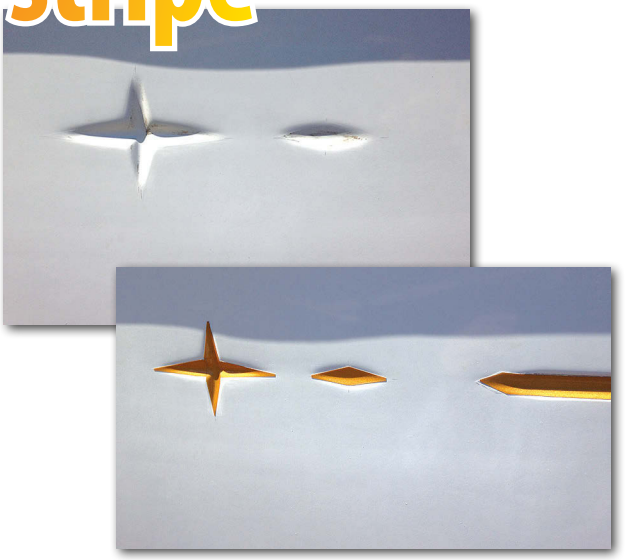
This induction cooktop is fast, precise, unobtrusive, clean, and will not catch your boat on fire. Do not let its looks fool you into thinking it is an electric cooktop. It is nothing like an electric cooktop. These days I cannot wait to get up in the morning and boil water!

Dean Raffaelli started to sail at the age of 11 in Montrose Harbor, Chicago. Later, he sailed a Hallberg-Rassy Monsun 31, and then, with thoughts of doing the Great Loop, bought a 32-foot Nordic Tug. At present he is on Grand Isle, Vermont, preparing to head for the Atlantic.

A bright new cove stripe

Eye-catching reflective tape adds color

BY DEAN HEDSTROM



The reflective cove stripe on our 1981 C&C Landfall 35 had faded badly. To refresh it, we used a type of pressure- sensitive adhesive (PSA) reflective tape that we found gave us the right combination of aesthetics and reflectivity. The gold color we selected complements the brown/copper/varnished-teak accents on *Lothario* nicely, and tests with a flashlight demonstrated a distinct improvement in visibility at night.

We chose Type 1 engineer-grade ASTM D4956 PSA tape, which is rated for all-weather application on vehicles. Steve at the Reflective Tape Store (http://reflectivestore.com) was very helpful and sent samples prior to our placing an order. SOLAS and high- visibility DOT tapes are also available, but we thought these materials were too garish.

We applied the tape to the cove stripe indent while *Lothario* was secured in our slip. Although this not the best place to apply tape, save for a couple of wiggles visible to the applicator and not to the casual observer, the results were remarkable. The badly faded, formerly silver, factory tape just disappeared into the white gelcoat background. The new gold tape adds the intended accent.

I stopped after one side, but once *Lothario* was hauled out, I rigged a continuous scaffold and completed the other side while she was in the cradle. Working from a stationary platform was certainly much easier, although applying a straight line is still stressful. This is definitely a two-person job. The PSA is aggressive and unsupported tape is very flimsy. The instructions admonish one not to stretch the tape.

Star treatment

While admiring the cove stripe from afar (so as not to notice the minor wiggles), I eyed the star and diamond decorations at each end of the cove stripe that identify the C&C brand. These were originally painted gold and had long since mostly weathered away. By experimenting, I developed a satisfactory method to restore these molded accents to new glory. The tape substrate allows considerable elongation and conformed well to the molded detail. I first tried cutting the shape with the release layer still attached and then placing the sticky strip accurately in the moldings, but rejected this method after many attempts. I found it better to cut the tape to length, mold it into the depression then trim to the outline with a razor knife and straightedge. Since only light pressure with a sharp razor knife is required to cut the tape, I didn't harm the underlying surface.

I had to finesse some of the outlines as the molding is not exact. There were "witness lines" to guide me: faint edges where the paint had masked years of topside polishing. I first used painter's tape to flag the landmarks and later made guidelines with fine pencil marks.

Brightening the cove stripes was an inexpensive and relatively easy task that enhanced the look of our boat considerably.

Dean Hedstrom started racing inland scows in 1961 and transitioned to cruising. He and his wife, Sandy Jacobsen, cruise the Apostle Islands on their C&C LF35, purchased new in 1981 and now very much a good old boat. Dean holds USCG Master Mariner credentials and is a Registered Professional Engineer, Master Electrician, and instrument pilot. Woodworking and skiing fill the off-season. Mostly, he likes simply messing about in boats.

Storage in small places

Useless spaces can earn their keep

BY ALLEN PENTICOFF

Our MacGregor 26D, *Thebote*, has a tiny sink area that is relatively useless. For a long time it held the wastebasket. Recently, at the request of the first mate, I installed two small inexpensive storage shelves of the type available at most office-supply and home-improvement stores. Each has three drawers.

I screwed them together with stainless-steel sheet metal screws and fastened the whole thing in place to cover up the cabin liner/sink. I did have to make a small bracket (an inexpensive corner brace) for my particular installation to support the outboard corner at the front of the sink.

I used a piece of small-diameter bungee cord to prevent the drawers from sliding out when under way. I drilled a hole at the top and bottom of the drawers and knotted the cord to hold it in place. The cord can be pushed aside easily when we want to pull a drawer out and it snaps back automatically when the drawer is pushed in. We use a no-scoot-type shelf liner in some drawers to keep things in place and prevent them from rattling.

This addition gives us quick, easy access to those many little things. Through a small opening in the front, we can also reach items (trash bags, dustpan, and brush) we store beneath the shelves in the old sink.

With a little imagination, these simple inexpensive shelves can be put to good use in many other locations on our good old boats.

Allen Penticoff's bio is on page 13.

***Kaila*, an O'Day 27, raced to the lead in the Canada Day events in Sointula, British Columbia, at left. Hats off to Caryl Darling who took this great shot. A proud Joshua Prahl, holding the cup, far left, and his crew, in the red shirt, receive the first-place trophy from Jim MacDougal. Is that a lucky feather in Joshua's cap?**

continued from page 9

Canada Day Regatta

Jim MacDougall wrote months ahead of the event asking for 150 copies of the July issue of *Good Old Boat* to hand out at a new regatta being held in Sointula, British Columbia. Jim said, "Each year, here in Sointula, BC, we have the Sointula Canada Day Regatta. Canada Day is July 1. This will be our fourth year. It has grown from a simple fun idea to a very well-attended annual event. The onshore events now attract hundreds of people. Each year the sailing race gets bigger. You can check out the website at sointulacanadadayregatta.com for more information and photos."

We couldn't resist an offer like that and sent boxes of magazines to Sointula.

After the event, Jim wrote, "The day started off with a pancake breakfast and everyone was geared up for the day's entertainment. We had Dragon Boat events. We had kids' events. We had vendors. We had sailboat racing . . . not to mention food, beer, and more food. The Sointula Choir performed "Oh Canada" and a local bakery dished out a beautiful "birthday" cake. Mother Nature provided a beautiful sunny warm day with 15 knots of west wind for the sailors.

"Each boat was rated using the NCPHRF (Northern California Performance Handicap Racing Fleet) numbers. This leveled the playing field for vessels of all sizes and gave everyone a chance to take home the trophy. The winners based on corrected times were:

1 – *Kaila* of Comox, an O'Day 27
skippered by Joshua Prahl
2 – *Havelock* of Vancouver, a Beneteau 50
skippered by Andreas Naumann
3 – *Annsley* of Alert Bay, a C&C 35
skippered by James Lenoury
4 – *Umiak* of Port McNeill, a ketch rig
skippered by Sam Draeger."

Obviously, a good time was had by all . . . the point exactly of good old boat regattas everywhere.

–Editors

Relaxing

We left Nova Scotia last August on our Tartan 37C and arrived in the Bahamas during December. We were able to collect our mail (especially *Good Old Boat* and *Practical Sailor*) while traveling through Florida. In Governors Harbour, Eleuthera, I tried our new hammock chair and caught up on some reading. My wife, Heather, took an impromptu picture and, of course, I was reading *Good Old Boat*.

–Richard Foy, Pleasantville, Nova Scotia

Proper Typhoon weather

The Cape Dory Typhoon review (July 2015) was of great interest to me as my friend Paul Schwartz had one in the 1990s and I sailed with him on it a few times. I met him in 1992 when he submitted a short story, about sailing his Typhoon in Massachusetts in December, for my publication, *Messing About In Boats*.

I later sailed with him one blustery March day along our rocky north shore coast in 25 knots (he loved to sail the Typhoon in big winds). He had main and jib all up and we were heeling at 35 degrees when we finally took green

Rob Farrell, reading his first issue of *Good Old Boat,* decided to send in this photo of the pirate ship he had built in Michigan for his family. While she's not exactly old, she looks it, has two bunks in the Captain's cabin, a tiny galley, and a bunch of other fun additions for little pirates to enjoy while hunting for treasure. 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.

water over the lee rail, filling the cockpit. Not a problem for him, he thought, until I looked below and saw stuff floating around. The screw-in hatch in the lazarette had been left open and much of the cockpit water exited via that route. We rounded up and, with sails slatting violently, proceeded to bail out below with a big brass spittoon he kept aboard as his "thunder mug," when he found the big old manual bilge pump wouldn't pump as its leather valve had dried out from long lack of use. The return trip was under reduced sail with that hatch firmly screwed in.

Today, Paul sails an 18-foot Fenwick Williams catboat he rebuilt and is a regular riding buddy of mine on a 1975 BMW R75/6 motorcycle that I sold to him when I moved up to my 1992 R100GS Bumble Bee.

–Bob Hicks, Wenham, Mass.

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

Boats for Sale

Dufour 27
1974 fiberglass sloop. Volvo diesel. One owner since 1979. Excellent coastal cruiser, rigged for singlehanding plus many other upgrades. My health and other priorities have her feeling neglected; she needs TLC from a new owner. Well equipped and ready to sail away after foredeck lamination repairs, work on the auxiliary, and fresh bottom paint. Additional details on fixer-upper page at www.goodoldboat.com. Bodkin Creek, MD. $4,000 ($4,500 w/complete fiberglass sailing dinghy).

Jim Caskey
301-770-0385
jimcaskey2@gmail.com

Cape Dory 25
1973 classic cruiser. Trailer available and included in price. Yanmar YSM 8 diesel rebuilt and runs well. Maintenance records available. Interior repainted. Cushions in great cond. Halyards recently replaced. All original parts included: stove, Bimini, galley table, etc. Tampa, FL. $5,000 OBO.

Fenn Giles
813-766-4302
fenn.giles@yahoo.com

Swan 43
1972. Hull #64 out of 67. Fully equipped world cruiser. Fridge/freezer, watermaker. Needs cosmetic work. Call for complete list of upgrades. Powerful sailboat! LaPointe, WI. $50,000 firm.

Gary Krubsack
715-747-2350
Mzlb@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. $20,000.

Kenneth Clark
dianakenclark@gmail.com

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.

John North
585-621-6499
boreas84@aol.com

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. $15,000.

Ford Brockman
fsbrockman@hotmail.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

Columbia 43
1970. Tripp-designed cruising classic upgraded with liveaboard and family friendly comforts. Solidly built, fast, nicely maintained. Expansive flush deck recently resurfaced, comfortable cockpit, totally refit interior w/6'3" headroom, expanded storage. Bright cabins have deck prisms, parquet sole, new cushions. Yanmar 63 hp, radar arch/dinghy davits, 400W solar, wind generator, inverter, HF, mast steps, electric windlass, extensive ground tackle. Cutter rig w/RF genoa. Titusville, FL. $42,000.

Karen Gray
321-289-9956
svserendipity@gmail.com
www.columbia43.com

Ranger 28
1977 (*GOB* feature boat Sept '06). A delight to sail. Fully restored. Carefully maintained. New bottom paint. Many upgrades. Enhanced Atomic 4. Dinghy and davits. All sails in exc cond. On the hard. Atlanta, GA. $10,500.

Walt Hodge
770-498-1678

Most of our classified ads appear on the
GOOD OLD BOAT
website:
www.goodoldboat.com/resources_for_sailors/sailing_classifieds/

Philip & Son 54' gaff ketch
1925. *Senorita*, sister ship to Claude Worth's famous *Tern III*. Listed in UK Register of Historic Vessels. Shipwright owner has spent 8+ yrs restoring her to her current beauty. Well equipped. Many extra parts and sails. Good accomodations for liveaboard or extended getaways. In excellent mechanical and structural order. Email for extensive list of restoration work completed and historical information. Northport, NY. Priced to sell below value. $45,000.

Shaun Welland
910-606-9166
yachtsenorita@gmail.com

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.

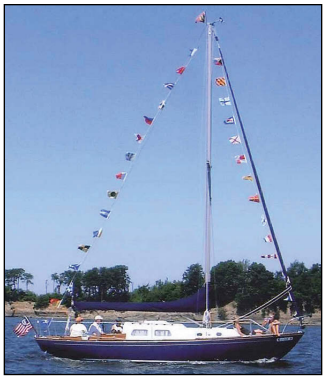
William Winslow
631-325-1138
wcwinslow@aol.com

S&S Pilot 36
1962 sloop. Beautiful, fast, classic wooden racer/cruiser built in Argentina by renowned Astillero Sarmiento is seeking a new caretaker. Interesting history. Carefully and conscientiously restored and maintained. Original plans and building instructions included. Want to separate yourself from the expanse of white fiberglass or to seek extra attention every time you tie up? This boat is guaranteed to satisfy. Belleville, ON. $50,000 CDN.

Gary Magwood
613-849-1976
lattalad@gmail.com
www.garymagwood.ca

L. Francis Herreshoff H-28
1982. Fiberglass, double-headsail ketch. Used for daysailing on Biscayne Bay. Volvo Penta diesel, brand new mizzen and mizzen standing rigging. New bronze chainplates. In sailing condition but will need work in future. $17,000.

Patrick Beck
704-621-9988
patrick.a.beck@gmail.com
www.sailboatlistings.com/view/49944



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. $16,500.

Scott Gardiner
410-544-8477, 410-647-7777
scott@gardinerappelgroup.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

Cape Dory 25D
1982 classic w/custom-fitted trailer. Wheel steering, too many upgrades to list. Leech Lake, MN. $24,000.

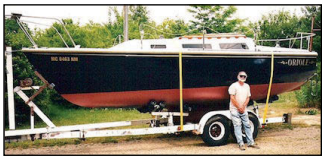
Frank Salomonsen
507-990-9598
salomonsenfb@gmail.com

Legnos Mystic 20
1974. Beautiful boat in v.g. cond. Maintained professionally by Weeks Yacht Yard in Patchogue, Long Island. Stored indoors winters since '06. Yanmar 8-hp diesel. Ready to sail away. Includes 252 sf sail w/double reef points and jiffy-reefing lines, lazy-jacks, boom crutch, sailcover, hatch cover, bronze cage blocks, cushions, and more. Includes trailer. Patchogue, NY. $15,000.

David Park
917-576-9356
dkparkny@gmail.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



3 boats for sale
1985 Catalina 25, $5,900. $11,000 w/V-10 tow truck.
1957 Interlake 18, $950.
Chrysler 15 Daysailer, $150.
All boats are fiberglass w/swing keels. Good trailers. Catalina will be at White Lake Municipal Marina, Whitehall, MI, summer '15. Details and photos available via email.

Michael Murphy
269-624-6583
modalservi@aol.com

Alajuela 38 Mk II
1978. Great offshore cruiser. Strong, fast, seakindly, and beautiful. Best cruising boat. Exc cond. Extensive upgrades. King bed w/new mattress, beautifully varnished teak interior, solid teak-and-holly sole, great storage. Solar panels, wind generator, Aries, AIS, radar, engine, 12V fridge, AP, life raft, SSB, Pactor, water heater, windlass, Force 10 stove, much more. New Dickinson propane heater, painted hull, dinghy w/motor, mast w/standing rigging, batteries, dodger, exterior varnish. Cape Canaveral, FL. $79,000.

John Sokol
845-891-5127

Boats for Sale, cont

Tartan T34C
1969 classic sloop. New sails, newly repowered. Lots of upgrades. CG documented vessel. In St. Pete Municipal Marina, in the heart of downtown St. Petersburg, FL, in a slip w/reasonable monthly rental assumable on a month-to-month basis. OK for livaboards! Great place to live and sail. $22,000.

Ken Fernald
727-251-9662
kfernald@yahoo.com
http://1969-t34c-tartan.com

Wanted

Trailer for C&C 30
The editors of *Good Old Boat* (Karen and Jerry) are looking for a used over-the-road trailer for their C&C 30, *Mystic*. The trailer should be made of steel (so we can weld to it) and capable of carrying its own weight plus 10,000 lb.

Jerry Powlas
763-494-0314
jerry@goodoldboat.com

Real Estate

Lake Superior/Apostle Islands cabins, homes, lake frontage
Attention sailors and power-boaters. We can find you the perfect property for your specific needs and wants. Exclusive buyer's agent. No charge to you for my services if the property is in the MLS.

Sharon Locey
715-779-5757
sharonkrealty@ncis.net

Products - General

Prod - Electrical, cont

Complete Marine Solar Systems

- High performance marine solar panels
- Top-of-pole mount - tilt and rotate for max power
- Dual battery bank charging
- Easy installation

custommarineproducts.com
248-705-8337

TIRED OF HAND STEERING?
GET THE RELIABLE, POWERFUL WHEEL PILOT!

- Quiet & Dependable
- Powerful
- Easy To Install
- Low Power Usage
- Built for Immersion

CPT AUTOPILOT
831-687-0541 (9AM-5PM PACIFIC TIME)
www.cptautopilot.com

Restoration

Paint Stripper That Works!

Restoration made easy

Star 10 Inc
www.starten.com
800-726-4319

Remove 30 coats of varnish and paint in 20 seconds.

No Chemicals
No Sanders
Lead Safe
www.silentpaintremover.com
Ph# 585-924-8070

Boatbuilding

noahs

The Build it/Fix it Warehouse

Marine Plywood, Epoxy, Fiberglass, Varnish, Core, Caulking
Canoe, Kayak & Dinghy Kits

Order online @
www.noahsmarine.com
Free Catalog!

(800) 524-7517
noahs@noahsmarine.com

FIBERGLASS SUPPLIES

Everything You Need To Build and Repair with Fiberglass, Carbon Fiber, and Kevlar!!!

NIDACORE
Divinycell

Technical Assistance
UPS Shipping Daily
Call for Free Catalog
800-231-6537
www.lbifiberglass.com

LBI
973 North Road Rt. 117

Build Your Own Dream Boat!

- 300 Proven boat plans
- Sail/Power/Row 6' to 55'
- Epoxy, Supplies, Hardware
- Trailer Plans, SUP Kits
- Bronze Fastenings

Online catalog:
www.Glen-L.com
Serving the Amateur Boatbuilder Since 1953
888-700-5007
GLEN

www.epoxyproducts.com/marine.html
603-435-7199

Diamond Teak
www.diamondteak.com
TRUE TEAK WOOD
PLANING, SANDING AVAILABLE.
QUARTERSAWN TEAK FOR DECKING.
T & G • VENEER • CUSTOM WORK
ALSO MAHOGANY & SPANISH CEDAR.
HIGHEST QUALITY • WORLDWIDE SHIPPING
INFO@DIAMONDTEAK.COM • 215-453-2196

Sails/Canvas

Minney's Yacht Surplus
www.minneysyachtsurplus.com
949-548-4192
1000's of good used sails, 100's propellers & sheet winches
NOAA authorized chart agent
"We keep boating affordable"©

Your online source for quality pre-owned sails!
NORTH Sail Outlet
Certified Pre-Owned Sails
www.northsailoutlet.com
1-800-SAIL-123. ext.948

NATIONAL SAIL SUPPLY
Best sails for the money

New sails, used sails, furling gear, off the shelf or custom - But always at the lowest price - Try us!

Sailing doesn't have to be expensive
Phone 800 611-3823
Fax 813 200-1385
E-mail:NewSails@nationalsail.com
www.nationalsail.com

THE SAIL CLEANERS
Sail Cleaning
Canvas Cleaning & Waterproofing
Repairs
800-273-8398
sailcleaners.com

Second Wind Sails

1000's of new and used sails
secondwindsails.com
- Repairs
- Sails made to order
- Sail cleaning
- Canvas cleaning and Waterproofing

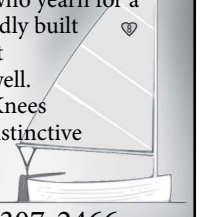
Clean out your limited storage and turn unwanted sails into cash
email: info@secondwindsails.com
Toll free: 800-273-8398

Sail Care *20 Years Of Service To Sailors*
Over 100,000 Sails Cleaned
Call For Catalog (800) 433-7245
www.SailCare.com

Boats

FATTY KNEES

For those who yearn for a classic, solidly built dinghy that performs well. The Fatty Knees is truly a distinctive little yacht.



781-307-2466
www.fattyknees.com
dfoynes@fattyknees.com

Websites

By-The-Sea
An Online Boating Magazine
Boatbuilders • Restorers
Plans • Kits • Supplies
Old boat brokers • Classifieds
www.by-the-sea.com

Books & Videos

Services

Cushions/Bedding

Boat Deliveries

Consignment

Everything you wanted to know about our classifieds

Boat classified ads	Subscriber	Non-subscriber
Text (web only)	*free*	$40
Photo and text (web only)	$20	$60
Text only (magazine and web)	$35	$75
Photo and text (magazine and web)	$55	$95

- Total word limit: 75 words.
- Web ads remain posted for approximately 90 days.
- Send email text to: classifieds@goodoldboat.com
- Or by post to: Good Old Boat, 1300 Evergreen Dr. NW Jamestown, ND 58401-2204.
- Photos may be emailed as jpgs or sent by post for scanning at *Good Old Boat.*
- Payment is made in advance by check or credit card.
- For full details, go to: www.goodoldboat.com/resources_for_sailors/sailing_classifieds or call 701-952-9433.

Display classified ads (boxed product and service ads)

- $40 for black/white and $50 for color per column inch. • Sold in half-inch increments.
- May not exceed 3 inches.
- Column width is 1⅝ inches.
- Classified display advertisers are invoiced following publication of the issue containing their ads.

Good Old Boat Ad Deadlines 2015

Issue	Deadline
November/December	August 28
January/February 2016	October 30

What's in a boat's name?

A new role brings a fresh identity

BY ZACHARY KROCHINA

I renamed my boat. For several years, I've made my home aboard a 1967 Irwin 27 . . . just another narrow-beamed mass-produced vintage sloop with beautiful lines keeping afloat a decaying collection of antiquated systems. For my first foray into the liveaboard subculture, I couldn't have a more fitting vessel. If you can revive an old boat, I think you have a fighting chance of successfully living on the water.

Ariel needed a lot of attention. I enjoyed her out in the bay on those weekends when I had her essentials working, but for long-term cruising she needed a serious refit. Once you start pulling systems apart, "I might as well fix that while I'm at it" becomes your new mantra, and what you thought may take a couple of months ends up taking a couple of years. A couple hundred bucks spent here and there soon becomes a couple thousand spent everywhere.

Even though I updated, altered, or modified everything aboard *Ariel*, I never had a strong desire to rename her. Considering all of the controversy that surrounds this issue, I was reluctant to even entertain the thought. But things do change, sometimes even names.

To most anyone who owns a boat, her name and subsequent alterations can be a very slippery topic. According to nautical folklore, it's bad luck to rename a boat. Traditionally, a boat's name was expected to last the lifetime of the vessel. If the captain is willing the throw caution to the wind and rename a vessel, doing so requires an elaborate ceremony. Although I don't hold to superstitions, I don't heedlessly flaunt them. As this boat is my home and livelihood, the last thing I need is to arouse bad mojo by offending her.

Can a boat even be offended? There's a sense among seafarers that boats are to be treated as living entities with personalities. Rationally speaking, I understand that a boat is an inanimate object with some moving parts, assembled and manipulated to perform a certain function. Furthermore, I know how quick we are to anthropomorphize everything we encounter.

I know my boat is not a person. She's not even alive. I can prove it. But I don't care. If my life can be experienced more acutely or enjoyed with more satisfaction because I choose to engage in the nonsensical, why not? Why not think of and refer to my boat as a living entity? Especially if doing so makes me more comfortable with her operation, makes me feel more intimate and connected with her sounds and movements, inspires me to sail more, or helps me gauge when to push her or ease off. Sure I can think only of cause and effect and reduce everything to quantifiable facts. But life is short and I'm not willing to limit my experiences simply to what can be proved, calculated, or measured. Life is more enjoyable when I remain open to coincidences, risks, karma, faith, magic, dreams, stargazing, and gut feelings.

If you adopt a dog, it's unlikely you'll rename her, because she's accustomed to her name. It's part of her identity. So too, I believe, it is with boats. But after two hard years spent stripping, gutting, and cutting into my boat; of measuring, marking, and calculating; of sanding, building, and sealing; of packing, unpacking, and repacking her holds; of screaming in frustration and laughing at mishap, even crying at completion; of blood and sweat dripped into countless cups of mixed resin; of forming, molding, fitting, and refitting; of waiting for weather windows; of watching wood, feeling its grain, finding its shape; of long nights with work lights and beer-can rejuvenations; of busted knuckles and split knees, and calm nights and ocean breezes; of tangles of wire, jumbles of junk and treasure, and bits of copper, steel, and aluminium; of spilled solvents, leaking oil, scrubbed stains, epoxy gobs, and fresh paint; of drifting thoughts and design attempts; of hours counted and hours lost; of plastic wrap and masking tape; of fights with loved ones, short sharp breaths, counts to 10, and long slow afternoons of nonsense; of money earned, spent, and spent again; of nuts and bolts, crimps and adapters, bushings and filters, reducers, nipples, gaskets, terminals, couplers, and stripped threads; after crawling over, scraping, prepping, smelling, and re-coating every surface of my boat inside and out . . . she was no longer the same boat.

If ever there was an appropriate time to rename a boat, this was it. She had manifested into a character all her own, as if she had shed an old skin and reveled in a fresh new one. Over the course of the entire process, we had grown together and learned from each other. I pushed her through a metamorphosis and she pulled me along with her. We were forever changed, individually and collectively.

Ariel was a fine vessel, but she was someone else's boat, someone else's relationship, not mine. This was the start of something new and needed to be recognized as such. If you do rename an adopted dog, it's not just because she's now your dog but because her former name resurrects a past that no longer applies. And so *Ariel* is no more. In her place, with an avocado-green paint job to match, is *Guacamole*.

Zachary Krochina *is a born-and-raised Alaskan who tends to get his fingers messy in as many endeavors and misadventures as possible. He currently resides in the balmy Florida Keys and, with his Aussie partner, is attempting to outfit a boat capable of delivering them both to the land Down Under.*

The tools, supplies & know-how to take on any project with

CONFIDENCE.

FABRICS / SEWING MACHINES / TOOLS / KITS / SUPPLIES / HOW-TO VIDEOS

SAILRITE

Est. 1969

Equipping you to sew at home & on the water

At Sailrite, you'll find more than just tools, material and hardware. You'll also find all the free how-to resources you need to take on any DIY project you can dream up.

Visit us at **Sailrite.com** or call **800.348.2769**