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# Good Old Boat

*Inspiring hands-on sailors*

Issue 149: March/April 2023


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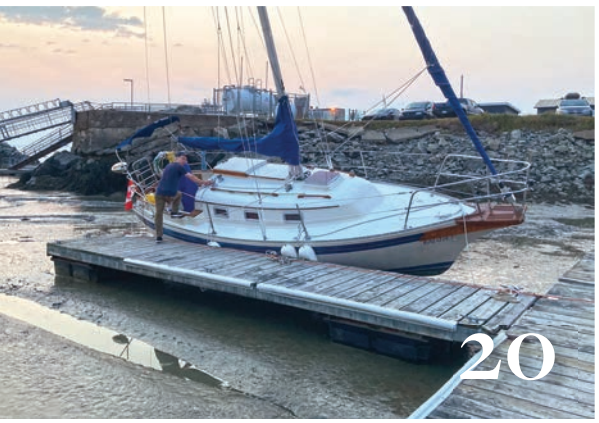




# Good Old Boat

Issue 149: March/April 2023

## BELOW THE WATERLINE ISSUE



## DEPARTMENTS




**On the Cover**

Jonathan Bresler's 1967 Alberg 30 *Constance* sails downwind under spinnaker from Annapolis, Maryland to the southern end of Kent Island, steadily making over 6 knots. In "Anatomy of a Bottom Job" on page 51, read how Jonathan restored *Constance's* bottom to make this once cruise-only classic into a competent racer-cruiser.

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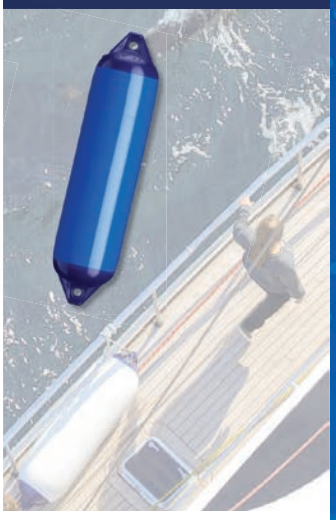

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# Contributing Boats

## *A few boats behind the stories in this issue.*

### ***Azimuth*, 1979 Pearson 365**

"*Azimuth* was built in the old Herreshoff yard in Rhode Island, trucked to California, and is currently in Colombia after transiting the Panama Canal in 2022. The word *Azimuth* refers to the direction of a celestial body and the position of the viewer relative to the stars. We liked the idea that armed with your azimuth and enough skill and experience, you can find yourself anywhere in the world."

ILLUSTRATIONS BY FRITZ SEEGERS

**Designer**: Bill Shaw
**Owners**: Ashley Gremel and Scott Racette
**Home Port**: Oakland, California
**Fun Fact**: "When we look around, nearly every inch of our boat holds a memory of maintenance or adventure (or adventurous maintenance!)."
*The Hull Story on page 24.*

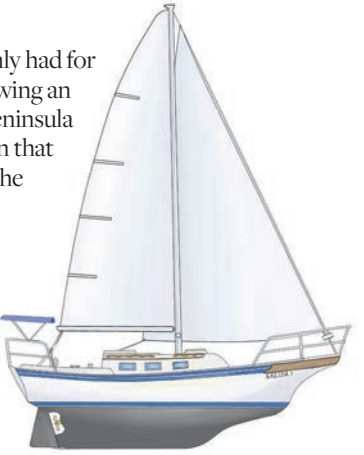
### ***Njord*, 1990 Catalina 30 Tall Rig**

"*Njord* is our third boat together; the first was a Catalina 22, the second a Noelex 30. While we loved those boats for what they were, *Njord* feels like a luxury yacht in comparison — hot water, roller-furling jib, shower, stove/oven, dodger, and, importantly for a 33-year-old boat, replacement parts and technical expertise are still just a phone call away."

**Designer**: Gerry Douglas
**Owners**: Larry Beneway and Trish Brantingham
**Home Port**: Brockport Yacht Club, Hamlin, New York
**Fun Fact**: Over its design lifetime, more than 6,400 Catalina 30s were built — more than the cumulative production of the next 10 most popular 30-foot sailboats in the U.S. In 2001, the Catalina 30 was even inducted into the American Sailboat Hall of Fame.
*An Unlucky Trip on page 39.*

### ***Salida 1*, 1988 Bayfield 25**

"*Salida 1* was intended to be a temporary boat that I've only had for two seasons so far, yet we've grown much attached, following an 1,100-nautical-mile adventure in 2022 along the Gaspé Peninsula to the Gulf of Saint Lawrence. I am now much less certain that a bigger boat is needed to take me far from home where the sailing is both interesting and breathtakingly beautiful."



**Designer**: Ted Gozzard
**Owner**: Benoit Fleury
**Home Port**: Pointe-Claire Yacht Club, Montreal, Canada
**Fun Fact**: *Salida 1* must be one of the last Bayfield 25s built since the factory burned down in 1988. Puzzlingly, several websites claim that B25s were only built between 1975 and 1984.
*River Roaming on page 20.*


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photo by @mikeydetemple

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# The Boat That Got Away

BY ANDY CROSS

With the mainsail hoisted and our 6-hp Mercury pushing us toward Lake Michigan, we scooted out of Pentwater Lake Inlet with high hopes. My 15-year-old brother, Matt, hanked on the headsail and was ready to hoist. From the helm, I (21 at the time) looked at the wind waves ahead and liked what I saw — a 10- to 15-knot southwesterly. Perfect conditions for sailing north up the Michigan shoreline.

Our plan was to sail overnight 80 miles to the Manitou Islands, but plans aren't always straightforward or easy on a sailboat. Shortly after dark, the wind died and then did something sailors know well on this big body of water. It completely changed. In a forecast-defying shift, a strong northerly breeze was suddenly kicking up steep waves that we had no interest in fighting aboard our family's 1987 Hunter 23.

Instead, we turned around and plotted a new destination in a completely opposite direction — toward Chicago. After an overnight stop and then a night sail, we arrived in the Windy City on a hot summer afternoon and docked our seemingly diminutive craft on the seawall next to the Chicago Yacht Club (see photo). Dwarfed by skyscrapers and much larger yachts, we weren't where we thought we would be, yet as young sailors, we felt accomplished to have made it so far. Heck, we never imagined we'd be doing this when the boat came into our lives years earlier.

When I first saw the new-to-us sailboat that my dad had purchased sitting in our driveway, perched atop its trailer, it looked massive through my 8-year-old eyes. I couldn't wait to climb aboard. In 1991, my parents and three siblings and I began sailing the Hunter on lakes in Iowa (yes, there are lakes in Iowa). We spent most weekends driving to the boat, heading out for a sail, eating a packed lunch aboard, and then driving back home, sometimes two days in a row. And when my parents asked how I'd like to celebrate my 11th birthday, all I wanted was to go out for an overnight cruise with my dad and a couple friends, anchor in a cove, and sail back. That's what we did. And that is how lifelong cruising and sailing dreams get started.

When the Hunter, which by this time had accrued the moniker *Crosswinds*, (though it was never officially put on the boat), was brought to a marina in Pentwater, Michigan, near our family's new home, we couldn't wait to get her out on bigger water. Matt and I started small on Pentwater Lake, only venturing out when the winds and seas allowed. Little by little, mile after mile, we pushed our boundaries farther up and down the Lake Michigan shoreline, gaining experience. We learned at what wind speed the boat liked to be reefed. Then we had a sailmaker friend put a second reef in the main so we could sail in more wind. We fiddled with the finicky outboard. We slept aboard at the dock and pored over chartbooks under lantern light in the cockpit. All of it, now, is a collection of memories that I'll carry with me forever.

As happens, though, I moved on to bigger boats and bigger waters. My dad and other family members sailed the Hunter from time to time. Matt made voyages across the lake to Wisconsin and pressed her into service whenever he could, with friends or solo, day or night. Soon, the inevitable bug of a bigger boat crept in and our family's beloved sailboat was sold 21 years after my dad first parked her in the driveway — replaced by a larger version, a Hunter 39.

But this past summer, with all of us gathered back at the lake again, we told sea stories and reminisced about the good times we'd had on that old Hunter 23. About where it had taken our family and the sailors we'd become since. To all of us, the consensus was simple: "Man, we should have never let her go."

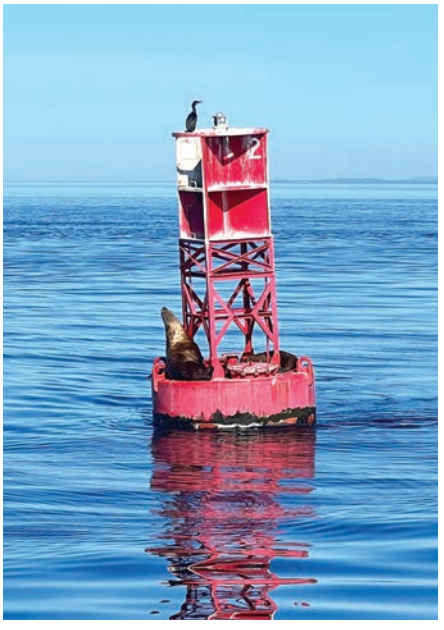
Whatever boat you own and are working on now, remember, it might be that one too.

# Crafty Cunningham, A Sturdy Dodger, and One Last Trip Up The Mast

## Cunningham Clarity

Very nice article on the Cunningham and some good points on its rigging in the January/February 2023 issue. I would like to add info that was somehow omitted. First, the inventor was Briggs Cunningham of car and sailboat racing fame. He won the 1958 America's Cup driving the 12 meter *Columbia*. In his quest for maximizing mainsail area, he noted that it was common to have the main cut a little shorter than the allowed luff length to allow luff tensioning using the halyard. So he ordered his main to be cut full length and added that cringle (Cunningham) a ways up from the tack to allow pulling down from that point to gain luff tension for upwind performance. I'm guessing he gained some 30 square feet of sail area for offwind performance!

**—Howard Riley**
Detroit, Michigan



**While motoring down Puget Sound toward Seattle on a windless day, I captured this buoy with a resident sea lion basking in the summer sun.**

**—Ken Monaghan**
**Seattle, Washington**

## Last Trip Aloft

My wife, Amanda, was kind enough to grab a picture or two of my recent trip to the masthead on our beloved Allied Seawind II ketch. It was my second trip up there in the last few weeks and both times I returned to the deck utterly spent. I remember what it felt like only a while ago scampering up the stick with a camera just to snatch a photo looking down upon our lovely *Wind Ketcher* while she was making way. And now I can't get a relatively simple job done up there with calm winds while tied to the dock without being completely done in. It's official, folks: 58 is NOT the new 40!

Meanwhile, I just hired a mobile rigger to come out in a few days and go up there to accomplish that which I no longer will. I told Amanda that I'm not going back up there again, unless there is an emergency underway and I have no option. I'm glad I did it one last time. The view and feeling up there when you have owned your boat for over 20 years and sailed her thousands and thousands of miles is indeed worthwhile and unique.

**—Ed Verner**
Apollo Beach, Florida

## Rationing GOB

My copy of *Good Old Boat* came in the mail yesterday — thank you so much. I always look forward to *Good Old Boat's*

arrival and love sitting down and reading it cover to cover as soon as it gets here. But since it only comes out every other month, I try to ration my reading so that it lasts about a month. I guess I'm a bit like a kid on Christmas morning. I mostly ignore the electronic version and wait for the print version to arrive.

**—John Overstrom**
Sunderland, Maryland

## Letting Go of a Classic

The November/December 2022 issue of *Good Old Boat* just arrived and on my first scan I noticed the sailing photo winner and related emails. I feel bad that I did not submit photos of my Dolphin 24, *Marionette*!

We've recently had to sell *Marionette* and though it took a while for this to settle in, her parting words were, "Why didn't you send in pictures to *GOB*?" So here are a few. Thanks.

**—Ron Breault**
Essex, Connecticut

## A Durable Dodger

I liked the article in the November/December 2022 issue about the construction of a rigid dodger. My canvas dodger needs to be replaced and I thought of doing the same thing. However, my first (and only) mate didn't like such a contemporary look on our 1967 Morgan 34. But I had a problem. I had designed and had built for me a new mainsail cover that contained the sail as it fell (like many commercial versions that are available), zipping up on top when it was packed into the "purse." Unfortunately, this made the top of the dropped sail much higher off the deck, and I'm not that tall. I found it very difficult to reach the top of the sail cover to pack down the sail so that the zipper would close. I thought if I could stand on top of the dodger, I could reach those spots. But you can't stand on a canvas dodger.

My solution was to have a welder add a stainless steel lip to the inside-facing surface of the two top tubes of the dodger frame. I then cut and painted a panel of plywood (just scrap for this experiment) and screwed it into the strips along the dodger frame. The existing zippers on the dodger wouldn't close, but I just sewed them in place to see if the system would work.

It does work, and very well indeed. See the photo of me standing on top of the dodger. This winter, the new dodger will be made to fit the plywood panel, and I'll probably cover it with matching canvas.

I'll also add two supporting struts to the dodger frame because when I'm standing on top, there is a light fore-to-aft wobble. Someone heavier than me would need thicker plywood and more lateral support, but for me, I get the benefits of a rigid dodger with the appearance of traditional canvas.

I thought you might want to share this with your readers. Happy holidays and keep up the great work on *GOB*.

**—Mark Branse**
Mystic, Connecticut

*continued on page 57*


# Southern Cross 28

## *A small, handsome double-ender with offshore potential*

**BY JOE CLOIDT**

The 1970s was a transitional period in sailboat design, as CCA (Cruising Club of America) rules that had guided design for the previous 30 years were giving way to the new IOR (International Offshore Rule) ratings. Narrow beams, full keels, graceful sheer lines, and heavy displacement hulls were evolving to more modern designs that featured wider beams, fin keels, and lighter displacements. However, there were still designers and builders who produced traditionally styled salty-looking sailboats such as the Thomas C. Gilmer-designed Southern Cross 28 (SC28) cutter.

Perhaps it's those salty lines that attract many owners to a Southern Cross, and Terry Ryan was no exception when she rescued her father's neglected SC28 from the back corner of a boatyard in Oriental, North Carolina. Terry's family is from Georgia, where she got her first taste of boating as a teenager helping her dad build Dolphin Senior sailboats in the garage and learning to sail them on Lake Lanier.

In the late 1980s, her parents, Allen and Margarete, were looking to broaden their sailing horizons and bought a 1978 Southern Cross 28 (Hull #5) in West Palm Beach, Florida. Renaming the boat *Alamar*, they sailed it to Oriental and enjoyed local sailing in the Neuse River for several years before moving back to Georgia and leaving *Alamar* in the marina.

After surviving several hurricanes, the boat was put on the hard in the boatyard, where it remained until Terry had it trucked back to Florida in 2011 for a refit. Terry renamed the boat *The Flying Lady*, a nod to her 32 years as a commercial pilot flying 737s. Terry and her wife, Lauriann's, long-term goal is to bring this little cutter back to Bristol condition, and although they have no plans to cross oceans, *The Flying Lady* will certainly catch attention while daysailing on the Indian River Lagoon (IRL).

## History and Design

Gilmer attended the U.S. Naval Academy, graduating in 1935, then served in the Navy for several years before returning to the academy as an instructor in naval engineering. In 1962, he designed the 30-foot Allied Seawind ketch, the first fiberglass yacht to circumnavigate the globe. After his retirement in 1967, Gilmer founded his own naval architecture firm in Annapolis, Maryland. He went on to design 17 sailboats along with working on historic reproductions of classic sailing ships such as the *Pride of Baltimore*, a 90-foot topsail schooner.

Southern Cross sailboats were built in Bristol, Rhode Island, by the C.E. Ryder Corporation, founded by Clarke Ryder in 1969. The company initially started off as a manufacturer of fiberglass industrial parts, but in the early 1970s Ryder saw how popular the Westsail 32 was in its kit form; he contacted Gilmer to design the Southern Cross 31, which was launched in 1975 and was also available as a bare hull. The boatyard closed in 1990 after building more than 280 Southern Cross yachts.

In addition to Southern Cross boats, Ryder also built boats for Sea Sprite and Eastward Ho. Ryder offered the Southern Cross product line as fully completed boats and also at several levels of completion for the do-it-yourself sailor.

The SC28, first built in 1978, is a classic-looking cutter with a long bowsprit, pleasing lines, and a double-ended stern. In the 1980s, the SC28 kit boats were designated as the Gilmer 28 to distinguish them from factory-finished models. There were 66 SC28s built, along with six Gilmer 28s, although many kits were sold before the name change. The factory-finished boats usually had a bronze builder's medallion in the cockpit.

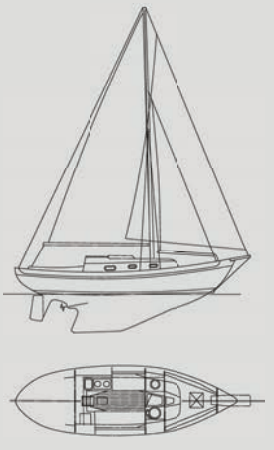
For its size, the SC28 proved to be a capable bluewater vessel that could cross oceans if properly prepared. In 2005, Donna Lange circumnavigated on a SC28 that had gone through an extensive refit but even so, had serious hull-to-deck joint issues.

## Construction

C.E. Ryder produced what many owners consider a heavily built boat that has few blister problems. The hull is composed of a 1-inch fiberglass laminate sandwich with an Airtex foam core, while the deck is cored with balsa wood. Foam core has an advantage over balsa wood as it is less water permeable. But it comes with higher construction costs.

The hull-to-deck joint is an outward-turned flange design that is fastened with ¼-inch stainless steel bolts on 8-inch centers with the deck side of the joint forming a 4-inch-high bulwark. A teak cap rail covers the flange. The joint is sealed with a rubber gasket, but over time and cyclic loading the gasket may harden and lose its sealing capability, allowing leaks along the joint as reported by some owners, including Terry. Part of *The Flying Lady*'s refit included caulking the joint and rebedding stanchions, chainplates, and other deck hardware.

### Southern Cross 28



LINE DRAWINGS BY FRITZ SEEGERS

| | |
|---|---|
| Builder | C.E. Ryder |
| Designer | Thomas C. Gilmer |
| LOA | 30'5" |
| LWL | 20'2" |
| Beam | 8'6" |
| Draft | 4'67" |
| Displacement | 8,500 lbs |
| Ballast | 3,400 lbs |
| Sail Area | 362.5 sq ft |
| Sail Area/Displ | 15.99 |
| Ballast/Displ | 40% |
| Displ/LWL Ratio | 462 |
| Comfort Ratio | 32.67 |
| Capsize Screening No | 1.67 |


**With the round transom, spoon bow, bowsprit, and cutter rig, the Southern Cross 28 looks ready for serious voyaging.**

While the SC28 has been described as having a fin keel with a separate rudder, looking at the underbody line drawings, with its long cutaway keel, it's not hard to imagine this boat had its roots in a full-keel design. Several owners stated that

The deck plan is clean, with few obstacles or tripping hazards.

the keel design makes the boat very maneuverable, with a tight turning radius, while also allowing it to track like a full-keel boat. Lead ballast is encapsulated inside the keel. The rudder skeg is molded as part of the hull and has a lower bearing for support, but the rudder extends below the skeg and is prone to catching lobster pot lines, according to an owner who sails the coast of Maine.

The pros and cons of a double-ended stern are still debated today, with many theories on why they are better than a flat stern (mostly in a following sea). But even Bob Perry, designer of the Valiant 40, which helped rejuvenate interest in double-ended sailboats, states that while the design may help balance the boat, it doesn't necessarily make the boat more seaworthy by parting following seas (the so-called "Moses effect"); Perry says he just plain likes the look of them. Disadvantages of this type of design are generally less storage room in cockpit lockers, pinched cockpit seating at the helm, and fewer options for mounting cruising gear.

## Rigging

The SC28 rig is configured as a masthead cutter with twin forestays and a single backstay. Terry replaced the original hanked-on Yankee with a Harken furler for ease of sail handling. The staysail is mounted on a boom, which gives additional control over the self-tending sail but becomes an obstacle when you're moving around the foredeck and prevents a dinghy from being stored there.

Lateral rigging is a single upper stay with fore and aft lower stays at the spreaders. The shrouds lead to chainplates that are mounted just inside the bulwarks. The chainplates are through-bolted to fiberglass ribs that are glassed into the hull and are easily accessible from inside the cabin.

The aluminum mast fits into a stainless steel mast step that is bolted to a solid fiberglass section of the cabin top; this solid construction avoids the problem of leaks and core rot in the step area.

The SC28 doesn't utilize an interior compression post to support the mast. Instead, it relies on the cabin bulkheads fore and aft of the mast, along with the reinforced cabin top, to provide structural strength. The bulkheads are bonded to the hull, with the joint glassed over with a layer of fiberglass cloth.

The mainsheet hardware is mounted at mid-boom and leads to a cockpit-mounted traveler. All three halyards along with the mainsail reef lines are controlled at the mast by a pair of Barlow 16 winches. The sheets for the headsails are trimmed with Barlow 20 winches mounted on the cockpit coamings. The headsail and mainsail sheets are all within easy reach of the helm, making the SC28 a good choice for those who singlehand.

## On Deck

With its narrow beam, rounded stern, tiller steering, and mainsheet traveler, the SC28 cockpit can best be described as snug. This is not necessarily a bad feature, as a small cockpit with tall coaming helps to keep water out and the crew in when the seas are up. The coaming curves up along the cabin top to the aft end of the sea hood and helps protect the cockpit from water coming over the cabin top. There are three small lockers built into the benches

The sculpted cockpit provides high backrests and good stowage in the three lockers.

and a hatch in the deck to access belowdeck equipment.

Going forward from the cockpit, the sidedecks are easy to traverse due to the full-length handrails on the cabin top and the bulwarks that help keep feet inboard when the boat heels over. *The Flying Lady* does not have lifeline gates or a boarding ladder, which is a safety concern, so a portable ladder has been added to the ship's inventory. A Danforth-style anchor is hung on bow pulpit brackets with the anchor rode passing through a deck pipe to a chain locker in the forepeak. Since starting her long-term refit, Terry has replaced the standing rigging, installed a Mack Pack sail cover for the mainsail, added the roller-furling headsail, and painted the hull, topsides, and interior with white Interlux Perfection.

## Belowdecks

The main cabin has been described as large by one owner and cozy by another. Headroom is listed at just over 6 feet, which is true at the aft end of the cabin, but I found myself (5'10") having to duck my head when going forward; the head and V-berth were a tight fit for me.

With factory and DIY options, along with design changes, there are probably few SC28s outfitted exactly the same down below. *The Flying Lady* was built with white laminated plywood for the bulkheads and cabinetry. The fiberglass overhead liner is also white, which, along with the light-colored bulkheads, helps brighten the interior but can make the cabin feel a bit monochromatic. Teak trim and cabinet doors along with a teak-and-holly laminated plywood cabin sole help add some contrast.

Hull #5 came equipped with a minimal galley, a pressure alcohol stove to port, a small sink with a manual water pump under the companionway opening, and a small icebox to starboard. Later models have a more user-friendly galley layout. During *The Flying Lady's* engine refit, the galley cabinetry was removed and rebuilt, which gives better engine access, but Terry decided not to reinstall the sink and stovetop as she uses the boat primarily as a daysailer.

**The companionway hatch is protected by a sea hood to keep out rain and boarding seas — an important offshore feature. Notice that one Dorade vent faces forward for air intake and the other aft for exhaust.**

While the settees measure 6 feet long, most crewmembers will find their feet tucked into cubbyholes in the galley bulkhead when they stretch out for a nap. There is storage in cabinets above and below the settees but no hanging locker. Lighting in the saloon is provided by two old-school fixtures that give the cabin a vintage look. Going forward, the head occupies a narrow space between the main cabin and the V-berth, with a door to close off the saloon but not the forward cabin. The head is laid out with the marine toilet and a locker to starboard and a vanity with a sink and storage to port. The SC28 was built without a holding tank, so the head discharges directly overboard, which now violates federal and local laws. A small holding tank could be added, but Terry has decided to remove the old head and replace it with a portable toilet.

The forward cabin is compact, but a filler between the V-berth cushions adds some elbow room. A shelf runs along each side of the cabin with additional storage lockers beneath the berth. The forward cabin has a padded vinyl liner on the hull sides, which provides some insulation in cooler weather. Ventilation through the boat is provided by a large hatch over the V-berth, six opening ports, and two Dorade vents in the saloon, along with a DC fan for when the breeze dies. Bronze ports and deck hardware were an expensive option ($645) at the time, so Hull #5 was ordered with the standard plastic port lights.

On left, above, **looking forward from the main cabin. Bulkheads are white with varnished wood trim for the classic New England treatment.**

Below, **there's not much galley counter space and getting close to it isn't easy, given the companionway ladder, which is removable.**

**Engine access is from the front and above and makes servicing reasonably easy.**

## Mechanical

Several sources list the SC28 as having a Universal 11-hp diesel engine with a three-blade prop, but *The Flying Lady* came with a 12-hp Yanmar YSM12. One owner felt the SC28 was underpowered with the 11-hp engine when driving into a strong current or head sea. The original engine was replaced in 2021 with a Yanmar 2YM15, along with having a dripless prop shaft seal installed. The front of the engine is accessed by removing the companionway steps; however, the aft end of the engine is difficult to reach from the cockpit floor hatch. A 15-gallon fiberglass fuel tank is molded into the hull on the port side of the engine compartment and would be a challenge to repair or replace.

The SC28 was designed with a minimal electrical system that includes one small DC switch/fuse panel to provide power to the nav and interior lights. Terry replaced this panel with one that has eight circuit breakers and also installed an AC shorepower circuit for a battery charger and outlets. A GPS chart plotter/depth finder and VHF radio round out the electronics. Two Group 24 batteries are adequate to power this setup.

The fiberglass water tank holds 47 gallons, which is substantial for a boat of this size. The tank is molded into the hull below the cabin sole. An access port in the galley floor allows for inspection and cleaning. *The Flying Lady* had hand pumps in the galley and head, but a water filter and 12-volt pump were added later.

On right, **the toilet can be closed off for privacy.**

Far right, **looking aft from the forward cabin, the head sink is opposite the toilet, with an opening portlight for ventilation.**

## Underway

My first sail on *The Flying Lady* was on the IRL just west of Merritt Island, where Terry keeps the boat at Harbortown Marina. I noticed when I stepped aboard the boat that it heeled over more than I expected, owing mainly to its hull shape and narrow beam. The new Yanmar powered us at 6 knots through the Barge Canal to the IRL, where we raised the main and Yankee; the staysail was out for repair. The wind was blowing from the southeast at 10 to 15 knots with a fair chop. We had some rigging and hardware issues, so we only got a few tacks in before calling it a day. I'm used to sailing heavier, beamier boats, so my first impression was the SC28 was a bit tender as the boat wanted to put the rail in the water. I didn't think it was a fair test, so we planned another sail later.

After some rerigging, Terry and I got out for a nice sail on the Banana River, with the launch towers of Kennedy Space Center off on the horizon. The wind was light and variable, around 10 knots with a few higher puffs thrown in. We raised all three sails and headed north with the wind on the starboard stern quarter. We cruised along at 5 knots on this point, and I suspect we might have gotten a bit more if we dropped the staysail, since it was blanketing the jib. The boat accelerated nicely when we got a gust and tracked well with little effort on the tiller. (An owner who sails on the West

Coast says his boat sails easily over its calculated hull speed going downwind.)

When it was time to tack and head back upwind, rolling in the Yankee first made coming about much smoother, otherwise it would hang up on the staysail. We didn't have a wind indicator at the masthead and my lack of experience with a cutter rig had me tweaking the sails trying to find the sweet spot. The gusts would heel the boat over to the rail as before, and I found myself working the mainsheet more like a sailing dinghy than a keel boat — which actually was fun. With variable winds and lack of the Windex, I couldn't put a number on how well the SC28 points, but with proper trim it seemed to sail well close-hauled. The sail trim on the cutter rig takes time to master, but I found the SC28 quick, responsive, and easy to handle.

## Conclusion

The Southern Cross 28 is a salty-looking, traditional cutter with pleasing lines, and while it's not a fast passagemaker, many owners feel that with its long keel, ample ballast, and conservative but versatile sail plan, the SC28 makes a good coastal cruiser. With its compact size, it is more suited to sailors who singlehand or couples who like to snuggle up in close quarters.

As with many older sailboats that had short production runs from builders now out of business, finding information for the SC28, as well as the boats themselves, can be challenging. A good place to start is the Southern Cross Owners Association. An internet search shows very few SC28s for sale, with a price range from $19,000 to almost $30,000 for an updated and well-equipped model. For an owner such as Terry, it is the love of the design and a desire to sail that make updating and maintaining the SC28 worthwhile.

*Joe Cloidt is a retired electrical engineer who lives and sails on Florida's east-central coast. When he isn't out cruising on his Pearson 31 or racing on a J/30 at the local yacht club, he can often be found in his shop tinkering on his latest project or simply messing about in boats.*

## Owners' Comments

With a small budget and a little work, the Southern Cross 28 can be the ideal budget-conscious bluewater cruiser that anyone can handle. Just ask Donna Lange.

—**Joe Hudgen**,
San Francisco, California

I have owned a Southern Cross 28 since 2011. For the first six years I sailed along the coast of Newfoundland, including a circumnavigation in 2015. The hull design makes her an excellent boat (for her size) in heavy and rough seas. I was never concerned about the seaworthiness of the boat, whatever the conditions.

The rigging is strong and conservative, with a relatively short but heavy mast that is well-stayed. I operate my SC28 cutter-rigged. With the options provided by three reefs in the main, plus jib and/or staysail, her sail area can be kept balanced as winds increase.

The modified full keel means she holds her course well, under windvane steering or (sailing upwind) simply by balancing the sails. At the same time, the less-than-full keel makes her quite maneuverable under power in tight quarters.

While she is tender and heels readily, she firms up at around 25 degrees and strongly resists extreme heeling. She is relatively slow because of her large wetted surface area, heavy weight, and low sail area. The modified full keel means she does not point as well as a boat with a fin keel.

My only problem was some leaking at the hull-to-deck joint. This I have resolved with assiduous caulking.

The SC28 is a great boat for exposed coastal areas or shorter bluewater cruises. I prefer to sail with one other person, but she can be readily sailed solo.

—**Malcolm Rowe**,
Bath, Ontario

We've owned our 1979, Hull #20, since 2008. The SC28 is extremely maneuverable; the sail configuration allows for balanced sailing with minimal effort. But it's a cruiser, not a racer, and doesn't sail well into the wind.

The 28 is a well-constructed boat with an insulated double hull — no condensation. The hull-to-deck joint seems to be the chronic design flaw, but sealant application every couple of years seems to work well. Access to the bilge and bilge pump is tight.

We love the boat; it's seakindly, very forgiving, and easy to sail.

—**Kevin Brown**,
South Dartmouth,
Massachusetts

I've only owned this one boat. Even with little intimate experience, it does seem well founded and put together. The SC28 is extremely reliable. I've always known when I've been out in bad weather that if something bad were to happen it would most likely be due to my failing, not the failing of the boat. A bit more speed would be lovely, but obviously not possible with this hull size and configuration.

—**Gary LaRue**,
Harbor Springs, Michigan

I have Hull #51, a 1981 SC28. I love the boat. I singlehand mostly and the boat is easy to handle at sea or in the marina. It sails nice, with a comfortable motion. You can carry a lot of sail if you like, but when you reef the boat straightens up nicely and can give you a respectful 5 to 5.5 knots. I have seen as high as 7.5 knots on a breezy day. On light wind days you can tie off your tiller and she just tracks along on her own. She can be hard to tack in very light winds.

I love the look of the boat. My boat was factory-finished and I like the setup below. I do wish for more room with guests aboard, but she is fine for a couple. I have been out for a week by myself and found her very comfortable. She has been repowered with the Beta Marine 16 by a previous owner. I am pleased with the engine — plenty of power.

—**Derrick MacKenzie**,
Rogues Roost, Nova Scotia

# A Revamped Sun Shower

## *How to transform that lukewarm solar shower into heated comfort*

BY MARK BRANSE

Like many sailors, I have a sun shower solar hot water heater. Over the years, I've found that it works well in bright sun and light winds, but there are two problems with it: First, if there's a lot of wind, the sun shower loses heat faster than it can absorb it. Second, if the sun is blocked by a cloud or it's late in the day, the sun shower won't gain any heat but will lose it to the surrounding air, especially if there is a breeze. The plastic bag the sun shower is made of has no insulation and can't retain the heat.

Since we usually want to shower after coming back from the beach or bicycling, the temperature of the water is often inadequate for a comfortable shower, and I have to add boiling water. This is frustrating, since I know that the water in the sun shower *was* hot earlier in the day but lost that heat as the sun got lower or the breeze kicked up.

I found a partial solution by taking a piece of Plexiglas about 6 to 8 inches wide by about 5 feet long and drilling a hole at each end. I fasten the ends together with a harness clip to form an oval, and place that around the sun shower. This wind shield deflects the breeze and helps to keep the sun shower warmer on windy days. When I'm not using the shield, I unclip the ends and put the Plexiglas strip under a berth cushion where it's out of the way.

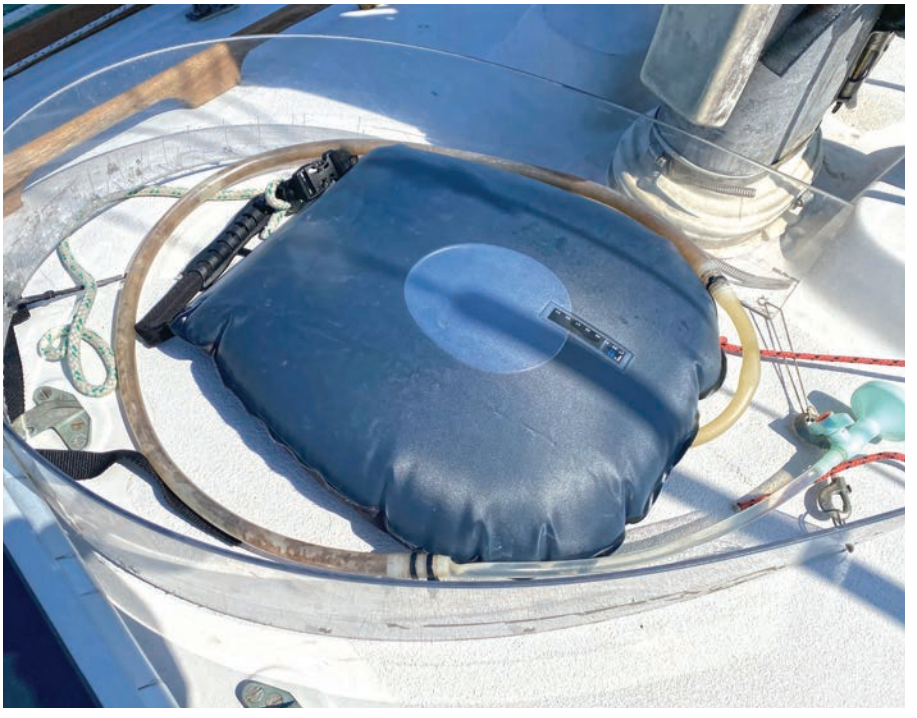
This, however, doesn't help much when the sun is obscured by passing clouds or gets lower in the sky at the end of the day. I felt that there had to be a better way.

My latest attempt uses 20 feet of ¼-inch ID clear plastic tubing, some connectors, and a piece of closed-cell foam about 1 foot square. I used the interior foam from an old boat cushion and painted it black. I then connected two lengths of the plastic tubing with connectors and formed the tubing into a double spiral glued down to the square of black foam. This required making one length of tube longer than the other because the outer coil of the spiral has to go farther than the inner coil. I then put a square of clear Plexiglas over the glued-down tubing to make a sandwich with the black-painted foam on the bottom, the spiral of plastic tubing in the middle, and the clear Plexiglas on top. After initial testing showed that the system worked, I glued the sandwich together to make it easier to handle and store.

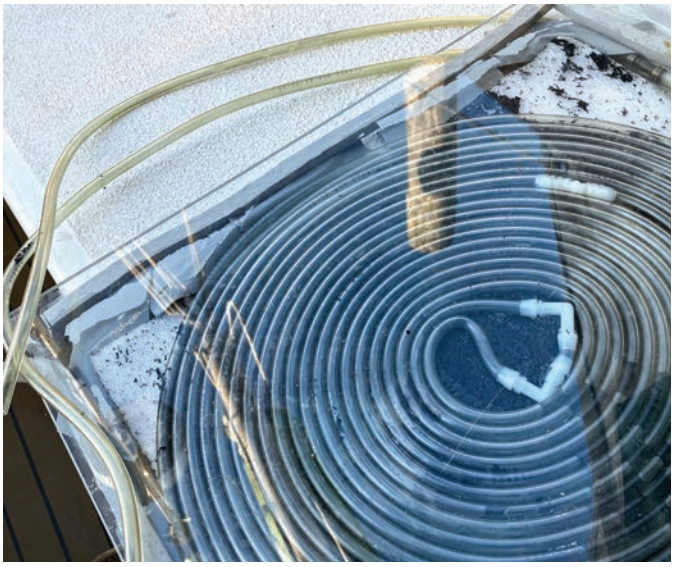
Next, I bought a small solar-powered water pump, the type made for outdoor ornamental fountains. It cost around $20, has a solar panel about 6 x 6 inches, and the pump is submersible. I also bought a 1-gallon insulated jug to store the hot water. The one I found was perfect, since it has a large screw-on opening through which the pump body will fit, and also a smaller spigot with a screw-on lid through which the tubing and wire will fit.

I had to cut the wire between the pump and its solar panel because neither would fit through the small spigot opening, and I wanted the larger lid to remain closed when the unit is in use. Instead, I used a standard wire plug connector for the wire that could be fed through the small spigot opening.

To use the system, I put the pump inside the



**An initial solution involved creating a wind shield around the shower to protect it from wind.**



Above left, **the new system uses tubing sandwiched between foam and Plexiglas for heat retention.**

Above right, **a 1-gallon insulated jug with a pump inside stores the hot water until it is used.**

jug and feed the wire plug up through the spigot. I feed both tubes down through the spigot, connecting one of them to the outlet of the pump (the discharge end) and leaving the other one for returning the heated water into the jug. I then connect the wire to the solar panel using the plug.

I fill the jug with water, which is circulated via the pump through the spiral tubing, where it is warmed by the sun and protected from heat loss. Then the water is directed back into the jug to be stored until it's used.

The first time I used the system, the water in the jug reached 120 degrees, which was as high as my thermometer could measure. This was after only a few hours of sunlight. When the sun is blocked or gets too low, the pump stops and the insulated jug keeps the hot water from losing heat even on a windy day. I bought a black jug without much thought, but discovered that on a sunny day, the jug itself gets hot.

When we're ready for a shower, we pour that hot water into the sun shower or more commonly, save it to wash dishes after dinner. The water stays hot for hours. When not in use, the whole system goes in a bag and fits in a locker. I haven't yet tested the system during the cool autumn days, but it should certainly work better than the sun shower.

I've often wondered why boats aren't designed with a built-in system like this that connects to the boat's hot water heater tank. A flush-mounted solar water collector and matching photovoltaic panel mounted into the deck would provide hot water when the sun was shining and reduce the need to run the engine or a generator to make hot water.

Maybe some boat designer will eventually do that, but meanwhile, my system works just fine.

*Mark Branse bought his first boat, a rowboat, at age 12 with money he saved from his allowance and odd jobs around the neighborhood. He and his wife, Linda, bought and restored a neglected 32-foot steel sloop but lost it in Hurricane Gloria in 1985. They now sail their 1967 Morgan 34,* Rigoler, *which they have extensively refitted, out of Mystic, Connecticut.*

# Going Sideways

## *What started as a joke between sailing partners became a transformational DIY bow thruster project*

BY BILL KOEHNE AND CONTRIBUTING AUTHORS JOAN KOEHNE AND DAVID JOLLY

David Jolly and I are partners on *Kindred Spirit*, a 1985 Bayfield 32C that we bought in 2020. We've spent enough time on the boat to know that this is the boat for us. We love its cutter configuration, stability, and its double pole setup for jib on jib. Because it's THE boat, and we're not going to upgrade to the next best thing, it really motivates us to do a lot of work. We restored the teak and built a custom, vacuum-formed HDPE boot with poured-in blocking for the mast. We also added a rigid boom vang, Mack Pack, dockside air conditioner, and a new mainsail.

After all those upgrades, our little joke was, "Maybe a bow thruster." It was funny at first, but as time went on, the idea became more attractive.

***Kindred Spirit* before some of its recent upgrades.**

When we bought the boat, we noticed that a board was broken on the starboard side of the bowsprit. We had no idea why. But we found out, through our own experience of backing up, that reversing a full-length keel boat is no treat. The previous owner probably whacked something when leaving port. The biggest challenge of sailing a Bayfield 32C is backing up, because the awful prop walk brings your bow to starboard, and the sailboat is difficult to control. It's just the nature of the boat — once you're sailing, there's so much the sailboat can do.

**Drilling that 6-inch hole through the boat was the scariest part.**

With the type of sailing we do, from point to point, we're in harbors a lot. Some docking situations are far from ideal, with boats in close proximity, and we really don't want to put our boat or any other boat in peril. We just wanted to make our lives a lot easier. So we decided to install a bow thruster on our 32-footer. It seemed like a project we could take on ourselves to save thousands of dollars.

David and I work well together — our personalities, skills, and ways of thinking mesh well. David is a retired owner of a prosthetics company who restores classic cars on the side. My background is in home construction and professional walleye fishing.

With limited space on a 32-foot boat, the first thing we had to determine was if a bow thruster would fit. We wanted a through-hull, not an add-on under the hull, to reduce the chances of the thruster bumping something. Plus, if your bow thruster is properly designed with raised fairings that look like eyebrows, you reduce cavitation and drag on the boat.

Given the daunting task of cutting a huge hole in the hull of *Kindred Spirit*, we did a lot of research before we started. After watching YouTube videos, we were shocked to see the ways people installed bow thrusters. We certainly learned what *not* to do. We read literature and technical data on bow thruster manufacturer websites and various forums before we made the decision to, if possible, install a through-hull Lewmar 140 TT 12-volt bow thruster.

We purchased the unit, plus a 6-inch Lewmar fiberglass thruster tube. Although now committed, we allowed for the possibility of returning the items based on the results of our confirmation of fit and location. Having the physical components in hand seemed like the best way to proceed.

In order to see the amount of space we had to work with, we removed the blackwater tank — something that shocked a lot of Bayfield boat owners because it's notoriously difficult to remove. Thankfully, removing the tank was possible. We

**Bill and David used a template to determine the height of the bow thruster, based on the waterline and bottom of the hull.**

discovered that we could take out four screws to remove the cabinet located aft of the tank, creating just enough wiggle room to pull out the tank. Of course, one project often leads to another. With the cabinet and tank removed, we decided it was the right time to replace the 35-year-old hoses and totally rebuild the head — a bonus project that will save us from dealing with bathroom issues down the road.

I credit David for coming up with a major breakthrough that helped us determine if the bow thruster would fit — an interior hull/bow section 3D model of *Kindred Spirit* and prototypes of the 6-inch tube and bow thruster unit. His model showed the space where the bow thruster potentially could be positioned, both below the surface of the water and from the bottom of the hull of the boat. From the model, we could determine how far back the bow thruster would fit and still leave space for the holding tank. We found out that we had only about an inch tolerance up, down, forward, and aft. We were also going to have to angle the thruster motor precisely so we could have access to service the motor while not having it protrude into the top of the front V-berth deck. So we needed very accurate placement of the 6-inch thruster tube.

Another big breakthrough came when we confirmed the position of the bow thruster using rare earth magnets. With me on the outside of the hull and David on the inside, we pressed our magnets to the hull. The magnets locked into each other. Referring to the center hole locations projected onto the interior hull, I dragged the magnets to where we thought the bow thruster would go. On the inside of the boat, David's magnet moved along with my magnet, matching the locations he identified through using the model.

Now we had both inside and outside proof that confirmed the manufacturer's recommended tube location, and we knew that the interior modifications and access to the bow thruster motor and components would be possible. Before installing the thruster tube, we looked at a lot of installations on YouTube and saw people drilling holes, grinding gaps, and filling them in. It was crazy. We decided to break new ground and go a different route.

The shortest distance between two points is a straight line, and we knew where the through-hull center of the tube would be, thanks to the magnets. The hull angles wider toward the top and narrower at the bottom, creating a compound angle that forms a goose-egg-shaped hole. We had to look at the physics of having a hole parallel to the ground. We drilled two ¼-inch holes in the center of the oval, one on each side of the hull, as determined by magnets, prototypes, and diagrams. Then we drilled a third hole in a 2 x 4 board and stood up the board next to the hull so its hole aligned with the first two holes. The 2 x 4 provided additional stability for the rod we were about to insert.

Above right, **drilling the pilot hole, with the magnet slid out of the way.**

On left, **a 6-inch carbide hole drill was used to cut through the hull.**


We bought a 6-inch carbide hole drill, removed the ¼-inch drill bit, and fastened a ¼-inch diameter, 36-inch-long rod instead. We then slid the rod through the two holes in the hull and the hole in the 2 x 4. Our theory was that the hole drill would have to follow the rod. We hadn't seen anyone do this, but we knew in theory that it would work. We could only drill a short distance, so we cut out pieces of the hull as we went. Our drill bit had a maximum cut depth of 2 ⅜ inches, but in retrospect, a hole saw with more


Two thumbs up after the holes were drilled.

cutting depth would have been helpful, as long as you do not cut the center reference hole out.

Once we had drilled and cut about halfway through the hull, we came back at the hole from the other side of the hull. It was important not to lose the center reference points. We were amazed by how thick the hull was — about an inch. Engineering in 1985 was based upon the supposition that more fiberglass was better. The Bayfield 32C is built like a tank.

Through patience and a lot of drilling, we finally accomplished our goal. We now had a 6-inch hole through *Kindred Spirit*'s hull, and it was a beauty!

Drilling that 6-inch hole through the boat was the scariest part of the project. We were fully committed at that point. We held our breath as we slid the tube into the hole. It fit with less than ⅛-inch of tolerance around the tube.

I don't want to make this seem like some gushy bruh moment, but what a moment! All our research and strategizing paid off. With a huge smile on my face, I thrust out my hand to shake David's. We stood there for a moment and looked at the hole we made — two sailors proud of having the ingenuity to pull this off. A bow thruster wasn't a joking matter anymore; it was becoming a reality.

Once the tube was inserted, we confirmed the position of the tube and the angle of the thruster motor attached to it. This is where the fun with epoxy and fiberglass began.

We performed the initial bonding of the thruster tube to the hull with West Marine G/flex 655 thickened epoxy. This worked perfectly in that it stayed put on the vertical surfaces. Before bonding the tube, we precut and bonded the thruster motor saddle to the tube.

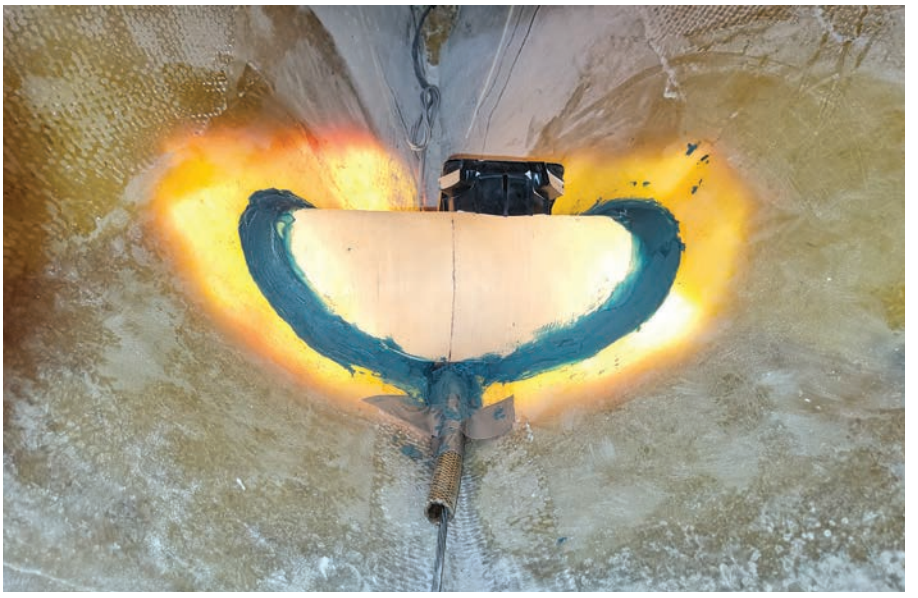
The manufacturer instructions suggest doing this after the tube is fully externally and internally bonded. With our very critical fit and limited working space, we needed the saddle in place. We indexed the tube to maintain the saddle tilt while the external bonding occurred. We then internally placed a fiberglass gusset around the tube to provide a radiused transition for the fiberglass tabbing to follow. We bonded the tube to the hull with West System 105 Epoxy resin and several layers of biaxial fiberglass cloth. We protected the top of the saddle and included the fiberglass reinforcement around this structure.

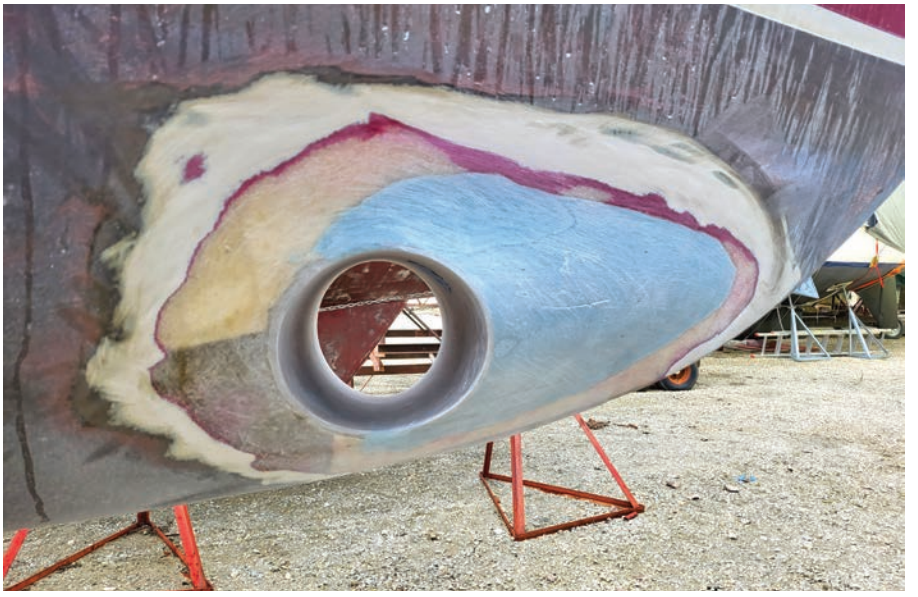

David determining the flare height to create an eyebrow to reduce cavitation.

Above right, **an interior view of the hole placement with the fiberglass tube in place.**

Center, **a carefully measured hole through the hull made for a precision fit.**

Below, **a fairing created an eyebrow on the forward edge to allow water to flow freely over the opening.**






Teamwork was helpful for David, who was wedged into the hull space area while I mixed, saturated, and handed off the materials as needed.

Next, we needed to flare the forward part of the hole with fiberglass to create an eyebrow. The eyebrow allows water to flow freely over the tube opening, reducing drag. The final exterior finishing consisted of fairing and sanding to the hull surface, then painting a barrier coat and a final bottom coat layer, including the inner surface of the thruster tube.

We purchased a third-party wireless control to operate the bow thruster at the helm, plus a portable control that we attached to a lanyard that you wear. Both the sailor at the helm and the one standing at the bow or elsewhere on the boat can operate the bow thruster using the wireless controls. It's so nice to have a backup.

With our new bow thruster, *Kindred Spirit* is much easier to back up and launch, especially in windy or cramped conditions. Docking is much more pleasant, causing a lot less anxiety. And we really turn heads when the bow thruster spins the boat. Watching a boat pivot in place is a sight to see.

The entire project — bow thruster unit, resin, hatch, remote, parts, and pieces — cost us $2,367.90. Because we're partners, we joke about getting everything at half price, so it cost me $1,183.95.

At the marina where we work on *Kindred Spirit*, there's a sign that reads, "Sorry for what I said while docking the boat." Sailors of full-keel sailboats understand the meaning behind this apology. Now, with a bow thruster on *Kindred Spirit*, we can back away from that statement as easily as we back away from the dock.

*Bill Koehne and David Jolly met while volunteering at the local community theater and quickly became friends. As co-owners of* Kindred Spirit, *they enjoy bringing their 1985 Bayfield cutter to better-than-original condition and sailing the waters of Lake Michigan.*

# River Roaming

## *A 600-mile trip on the Saint Lawrence proves an enjoyable test for a smaller new boat*

BY BENOIT FLEURY

Big voyages in small sailboats have inspired me for as long as I can remember, being driven to accomplish more with less by balancing highly subjective trade-offs like simplicity and convenience.

Having recently downsized from a bluewater-proven Southern Cross 28 to a smaller, lighter, and shallower boat, I had the opportunity to exercise that notion on a 600-mile voyage along the mighty Saint Lawrence River between Montreal and Tadoussac. I'd sailed those waters before and knew it would be a good test for *Salida 1*, my newly acquired 1988 Bayfield 25.

The sailing plan was generally straightforward: Pointe-Claire to Quebec City with my brother, Christian, then on to Tadoussac and Rivière-du-Loup with my eldest son, Paul, and back to Pointe-Claire singlehanded. On top of numerous highlights during this four-week adventure, meeting up with friends from two other Pointe-Claire Yacht Club (PCYC) boats, as well as family along the way, added a whole other layer of satisfaction through sharing different aspects of the Saint Lawrence sailing experience.

Christian accompanied me on the first leg from Pointe-Claire to Quebec City, with a stopover in Sorel, a small city in southwestern Quebec. This took four days with very few engine hours, thanks to favorable currents and winds. We were spoiled with fine sailing, great anchorages, excellent meals, and as on previous trips, endless discussions about everything and nothing. Christian is a great storyteller and I almost drowned laughing from one of his stories while treading water at anchor in Trois-Rivières.

***Salida 1* on Lac St. Louis, leaving Pointe-Claire early in the morning.**

Following a crew change in Quebec City and an excellent dinner at Chez Muffy with my parents, who helped with crew transport, Paul joined me for the second leg to Tadoussac and Rivière-du-Loup. A choppy anchorage at Île de Bellechasse (a recurring theme from past trips), followed by strong winds and 6-foot waves the next day, led to a decidedly uncomfortable 24-hour start for Paul, who hadn't yet gotten his sea legs.

Rather than risking an emergency stop at Parc Nautique Saint-Jean-Port-Joli, whose entrance is already treacherous at the best of times, we pressed on to Cap-à-l'Aigle as originally planned. Things started calming down as we approached the Saint Lawrence's north shore, and we were even greeted by a curious beluga that came right alongside our boat.

The next day's sail to Tadoussac was as pleasant as could be, with a 10-knot westerly under cool and sunny skies. It was my third time sailing to Tadoussac and will definitely not be the last. Tadoussac was founded in 1599 as a fur trading post and is

***Salida 1* heads through Canal de la Rive Sud toward a railway lift bridge next to Pont Mercier.**

An unusually busy lock in Basin Louise, preparing to enter Marina du Port de Quebec in Quebec City.

now a quaint village of about 800 residents. Located at the confluence of the Saint Lawrence and Saguenay rivers in Quebec's Charlevoix region, it has become a popular tourist destination for its picturesque setting, village restaurants and nightlife, abundant whale life, proximity to Saguenay Fjord National Park, and historical significance. As a sailing destination it ranks as one of my favorites, not only for all these reasons but also for its navigational challenges. Strong tidal currents and rips, combined with typically strong winds, fog, and busy whale-watching boat traffic, require careful planning and attention while underway. The water being just a few degrees above freezing also adds another element to sailing in this region, which to me is far from unpleasant, with cool days and even cooler nights.

I'd decided to spend more time in Tadoussac on this trip, which proved to be a good call. Paul had never been there, and I wanted to share the town's magic by spending three full days immersing ourselves in its charm. An avid hiker, Paul reveled in the chance to hike parts of the national park. It was worth every effort; the trails were beautifully maintained and the views of the two rivers were breathtaking. And there were plenty of bars, restaurants, and coffee shops to reward ourselves after each hike. We enjoyed freshly made croissants and espressos allongés (espresso with a longer shot than a traditional one) on an outdoor terrace overlooking the bay. One evening we had locally crafted beer on another terrace to celebrate a job offer Paul had just received, and as luck would have it, there were spectacular fireworks right there in front of us. What timing!

We also met up with our friend Maude and her family on their Southern Cross 28, *Exilés* (my previous sailboat), and had a pleasant dinner of fish and chips at the marina's restaurant

***Salida 1*** **stranded in mud at low tide. Luckily, the boat's fenders protected the hull and there was no damage.**

**Fine sailing under the Quebec City bridges, propelled by a strong ebb current.**

overlooking the bay. I enjoyed the very same meal on my two previous trips and was happy to share this emerging tradition with Maude and Guy and one of my sons. Aboard *Salida 1* later with Maude and Guy, I finally opened the 10-year-old Talisker single malt scotch whisky I'd been saving for months to celebrate reaching this iconic destination.

After leaving Tadoussac, we headed southwest to Île-du-Pot-a-l'Eau de Vie (aka Brandy Pot Island) with *Exilés*. This lower Saint-Lawrence anchorage remains my favorite for its postcard-like setting, heritage lighthouse, and an impressive number of birds chirping endlessly — another wonderful experience to share. The next day *Exilés* set sail west to Saint-Jean-Port-Joli, while Paul and I headed for Rivière-du-Loup (RDL), a short 5 miles from our anchorage. As we approached RDL, a half-dozen curious belugas paid us a visit, diving under the boat and nosing around. One would occasionally rub against the rudder, making the wheel turn in response. I've never seen so many that close — a tad eerie at times, but quite exciting. The tide was dropping, so after half an hour of this meet-and-greet we had to get going, otherwise we'd be stuck in mud for hours just before reaching our assigned slip. We managed a dramatic escape and somehow made it in the nick of time.

But not long after tying to our slip, *Salida 1* sat in the mud, tilted at an uncomfortable 30-degree angle. The entire marina is in mud at low tide, but the boats normally just sink straight into the mudhole formed by their keel. Since there were no boats at our slip before we arrived, there was no preformed hole, which caused our boat to lean against the dock when the water ebbed. Thankfully, my fenders did their job protecting the hull and we managed to change slips around midnight on the rising tide. Success.

In RDL I finally caught up with my friend Robert, who was there with his Irwin 31, *Tango 6*. His family was camping nearby and Robert had sailed there from the PCYC. The plan was for Robert and me to each make our way back to Pointe-Claire singlehanded, with Robert accompanied by a family dog. But before our departure, my younger son, Sam, drove from Montreal with his girlfriend, Christine, to spend a day with us and then continue onward to Halifax. We all had a wonderful day, and our mini-putt game was a hit.

During that time, Maude was stuck with her family in Saint-Jean-Port-Joli with engine troubles and no one available to help. So Robert and I left a day earlier than planned to meet up with her, and favorable northeast winds helped us make it in one day. La Traverse Saint Roch is a Saint Lawrence channel known to be treacherous due to its relative shallowness and strong tidal currents. Although the wind was blowing in the same direction as the current,

**Family reunion on *Salida 1* in Rivière-du-Loup, with the author's sons Paul, left, and Sam, with his girlfriend, Christine.**

it was still a surprisingly rocky passage — especially at the marina's tricky entrance, a narrow channel bounded by pillars of rocks that are perpendicular to the strong current and confused waves. Spectators are often perched atop cement walls near the entrance, looking on and enjoying a good show.

For the first time on this trip, all three PCYC boats were finally together. We wasted no time taking a look at *Exilé*'s engine. An electrical short had caused a fire on its approach to Saint-Jean-Port-Joli a few days before. We proceeded to rewire things, bypassing the alternator to keep it simple. As I called out wire colors from the engine's electrical diagram, Robert boldly removed the old cabling bundle and rewired the basic pieces from scratch. A continuous source of rosé wine throughout the entire operation made everything smoother, and before long we had the engine running. Following a proper pizza and beer celebration that chilly evening on the marina's picnic table, the three boats headed west to Quebec City at the crack of dawn the next day.

From Quebec City we proceeded to Trois-Rivières with overnight anchorages in the small towns of Portneuf and Batiscan along the way. While Portneuf is quite far from the river's shore, Batiscan is right on the river and we were able to anchor within view of the town's church steeple. *Salida 1*'s modest little Yanmar 1GM10 single-cylinder diesel engine fought tirelessly against the strong current but persevered without a hitch until I finally dropped anchor in the Saint-Maurice River. That evening we were rewarded with spectacular fireworks almost directly above us. Maude and Guy had to get going the following day due to work schedules, but Robert and I decided to stay in Trois-Rivières for a few more days before continuing west.

I've sailed by Sorel numerous times in the past but never took the time to enjoy the Ste-Anne-de-Sorel islands. Not this time. Robert and I each dropped anchor between Île Plate and Îles aux Sables. I was born in Sorel and my grandfather took me on these waters often in his small motorboat. I was far too young to remember much, if anything, but it felt great being there again. Other than a maddening mosquito invasion one night, I couldn't have asked for a more pleasant anchorage.

Following a 30-minute stop at Marina de Saurel for *Salida 1* to pump out, refuel, and get new ice blocks, we proceeded toward Longueuil by taking our time anchoring at Île Saint-Ours, near the city of Lavaltrie, and Île Deslauriers, near the town of Varennes. These proved to be surprisingly quiet and pretty anchorages, despite being fairly close to Montreal. In Longueuil we both got slips at the old yacht club, where we were greeted by friendly staff. I chatted with one of the members, the owner of a Bayfield 29 whom I had sailed by while heading east a month earlier.

A few club members drove to meet us in Longueuil to accompany us through the Montreal locks and on to Pointe-Claire. My son Paul also joined us, so on that last day of the trip we had more crew to share the homestretch. Both boats arrived at PCYC at the same time on a Saturday in late August. Maude and Guy, who arrived the week before, joined us for cold beers and a lively trip debrief on the club's terrace.

Overall, it was a wonderful trip with fine sailing, great anchorages, and superb company with whom I could share different facets of the Saint Lawrence. Although I had sailed these waters before, I now did so with a very different boat. *Salida 1* proved to be a surprisingly comfortable and solid little coastal cruiser, sailing comfortably in most conditions, and though it is rockier than my previous boat, it felt sturdy in stronger winds and larger waves. I completed a more ambitious, mostly singlehanded 1,100-nautical mile adventure the following season, which reaffirmed the sturdiness of this little good old boat. No doubt there will be many more adventures aboard *Salida 1*.

*Benoit Fleury lives in Pointe-Claire near Montreal with his wife, Liuyuan, and their African Grey parrot, Smokie. During the summer months he can be found sailing* Salida 1, *his good old Bayfield 25, somewhere along the mighty Saint Lawrence River. Over the years he has ventured across all parts of the Saint Lawrence with family and friends, from the Thousand Islands in Ontario to the Gaspé Peninsula and the more rugged Côte-Nord in eastern Quebec. He plans to spend more time exploring the Gulf of Saint Lawrence and many of its shores.*

**Quebec City harbor, with the historic Château Frontenac hotel in the background.**

# The Hull Story

## *New through-hulls and lessons learned during a marathon haulout*

BY ASHLEY GREMEL

I first stepped on a sailboat in 2015 and met my now-husband, Scott, at the helm. A friend brought me along and I was immediately taken by the easeful intensity of operating a vessel as a team around San Francisco Bay. We anchored at Angel Island for lunch and swimming. By the time we returned to Alameda, I was determined to get to know the guy, the hobby, and the lifestyle.

A year and a half later, we purchased our 1979 Pearson 365 sloop and named it *Azimuth*. We were dreaming of distant shores and the first step was to begin living aboard and sailing *Azimuth* as often as possible. The boat had minimal problems at purchase and grew with us over the years. We steadily made upgrades with seaworthiness in mind — new lifelines, installing solar and new batteries, and purchasing new sails. I sewed a stack pack and leecloths. Scott chased down gremlins in the wiring and we got to know the Westerbeke 40. We added an inverter, which unlocked intermittent dreams of sewing and making waffles on anchor.

When Covid-19 confined us to living *and* working aboard, we decided it was time to prepare in earnest to take the big left turn out of the Golden Gate. Our project list overflowed with upgrades and replacements. Some of them were exciting creature comforts, like a new-to-us electric windlass and watermaker, but most were less glamorous efforts to fortify pre-existing systems: rewiring the 110-volt system, replacing the backing plates on the stanchions, swapping out 30-year-old water lines, and more.

We tackled many projects around our work schedules, turning our small living and working space into a construction zone. We became regulars at the chandlery and leaned into the isolation of stay-at-home orders by spending our time increasing the resilience of our vessel and growing our DIY skills. As we got closer to casting off, it became apparent that a large effort out of the water was needed for safety and peace of mind in big seas.

The haulout list included replacing through-hulls, chainplates, standing rigging, propeller, spreader lights, mast wiring, and the original wood mast step with a block of G10, as well as reinforcing the spreader attachment to the mast and putting on a fresh coat of bottom paint.

We hauled our boat out at Spaulding Marine Center, a small yard in Sausalito, California. We were abuzz, learning and finding enjoyable rhythms within the dawn-to-dusk work. The days started and ended in wool sweaters, peeled off in the height of the day. We were surrounded by old boats and experienced folks passing along helpful tips and nudges of encouragement. For all the progress we were making, though, one project loomed large and spanned our scheduled time in the yard — installing 11 hunks of specialty bronze through-hulls.

**Scott Racette and Ashley Gremel before heading to their haulout.** Photo by dock neighbor Jessie Zevalkink of *Alekona*.

***Azimuth*'s pre-existing hardware was in decent condition, but over 42 years old. It was time to upgrade!**

If 11 sounds like a lot, Scott and I agree with you. Two sinks drain overboard via through-hull assemblies; the head has one fitting to empty and another to fill with sea water. The engine and V-drive share a through-hull to pull sea water into the boat to circulate through the systems. Two cockpit drains and four deck drains terminate in through-hulls an inch above the waterline. There's one last one for the watermaker intake. Astute readers will count 12, but the galley sink tees into a cockpit drain.

As seems to be a theme with this haulout work, our through-hull assemblies were original and over 42 years old. They hadn't given us significant issues, but we wanted to front-load any upgrades prior to sailing from California to the Chesapeake Bay via the Panama Canal.

Removing the through-hulls was fairly easy. Some loosened with the step wrench alone and we used an angle grinder to remove the rest. The original through-hulls had some lead content, so it was important to mask up.

**Making backing plates from a sheet of G10 using a turn-of-the-century drill press at Spaulding Marine Center.**

One evening, we were able to use the turn-of-the-century drill press at the yard to make our backing plates out of a 1-inch sheet of G10. The donuts were achieved with two hole saw bits — the larger on the drill press, and the smaller using a hand drill and vice. We later drilled and tapped three bolt holes in each. This tapping work was a nice project to do in between larger projects or while puzzling on how to proceed next.

In the year or so prior to our haulout, Scott had become aware of an issue with the installation of other through-hull assemblies — the pairing of untapered threading with tapered threading. Seacocks typically have a tapered female end, which is often matched with a male straight-threaded through-hull. This incompatibility can lead to a weak connection of only a few overlapping threads, with potentially catastrophic results. The flange base adapters that we used have straight thread on the bottom and are tapered on the top. This enables a secure fitting with the tapered seacock and straight mushroom.

An article on the topic was extremely helpful in understanding the problem, what we needed, and the technique to ensure the replacements were installed correctly. For the new through-hull assemblies and seacocks, we went with a variety of Groco products including the through-hull fittings themselves, both in ¾-inch and 1 ½-inch sizes, tri-flange base adapters, seacocks, several 90-degree elbows for the tighter spaces, a Perko intake strainer, and barb adapters for the hose connections. Our pocketbooks lightened when these were delivered and we admired them gleaming in the sun.


**The lineup of fresh through-hull assemblies and backing plates ready for install.**

Next came test fitting. To determine how much of the threaded portion needed to be trimmed, one of us stood outside the boat with a step wrench and larger wrench

Finishing off the backing plate donuts. One was cut a bit too close and looks like a small bite was taken out of it.

for leverage, while the other threaded the flange base from inside. Once done, we used a bandsaw to cut them down to size. We performed another test fit to ensure the seacock handle would have necessary clearance to open and close. The orientation of the flange bases was marked on the hull and we did another test before adding 3M 4200 sealant and securing them.

The through-hull project marched along slowly with our work on the mast, prop, and other odds and ends. For all the progress we were making, the boat would still sink if launched. We had a back-against-the-wall sort of feeling that was a teaser for some of the problem-solving we'd be doing once we got underway.

For years, my inclination was to dwell on the planning stage, diagramming dependent steps and talking through who does what and when. While in the yard, my approach shifted by necessity. We were only frustrating ourselves by saying, "Today I'll install X,Y,Z," or, "Next Wednesday this will be done." I decided to focus on the inputs rather than the outputs and attuned to the tiny steps that got me moving to a new vantage point.

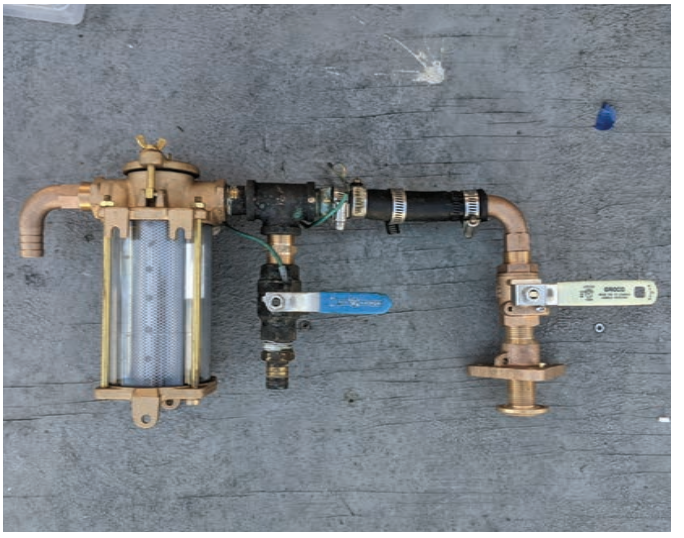
Extraordinarily messy lists became my spell for casting aside analysis paralysis. On large legal pads, I thought through some of the biggest projects and plans for the boat, adding items as needed. My characteristically sloppy cursive added a certain flare that read like incremental progress over perfectionism. Then, when tasks were finished, I scratched them off in the messiest way possible, which was very satisfying.

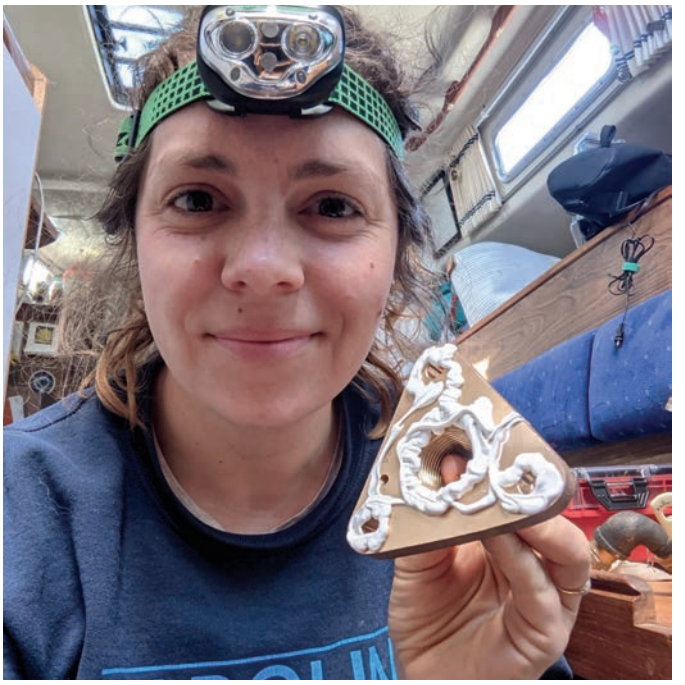
Writing this sort of list activated my brain to go small and steady. This "can-do list" included gathering items and know-how, rather than just the finished product. I added things to research, how-to videos to watch, supplies to order, clearing space to work, advice to request, measurements to make, and other tiny next steps. Drinking water has made the list, and so has taking a break. While in the yard, I was crafting a new list every day. This meant we were making solid progress.

This menu of options boosts my confidence and mood, which is not to be overlooked when completing a marathon DIY haulout. Time in the boatyard taught us about staying on course when the work feels impossible or unknowable. By the end, the repetition of learning new things made each project feel like arts and crafts, reduced to precise measuring and cutting, attachment methods, and creativity for the inevitable unexpected challenge.

At 3 a.m. on the night before we were set to splash, we twisted in the final

New raw water strainer assembly waiting for install.





Ashley taking turns outside the boat with the step wrench and inside with 3M 4200 goop.

through-hull and collapsed into the V-berth. The next morning, we watched nervously as *Azimuth* was lowered back into the water. As the hull slipped from view to the water below, one of the yard workers let out a shout. For a moment, it seemed our worst fears had come to light, but we shortly found out that a dog snoozing on the dock had startled the worker. We stepped aboard, confirmed the watertight seal of each fitting, and gave another sigh of relief. The next day we dropped the mast into place and tensioned our DIY rig.

Our project list was as short as ever. We felt completely exhausted, but invincible. We knew *Azimuth* more intimately than ever before and had done so many things for the first time. We had let go of our slip in Alameda before heading to the yard, so this was our soft opening to casting off for parts unknown, and we sailed up the Sacramento River to decompress in the delta. Looking back, I'm so proud of us bedraggled sailors for piecing together the skills and resources to do the jobs right and get back in the water. Now, 7,000 miles later, we are still meeting new obstacles with that same can-do spirit.

*Ashley Gremel is a writer, maker, and problem-solver. She is currently sailing from San Francisco to the Chesapeake Bay with her husband, Scott Racette, and their salty cat, Cypress. The trio plans to settle down in Richmond, Virginia, later this year. Ashley writes weekly at cloudsformoverland.substack.com.*

## The Takeaway—AG

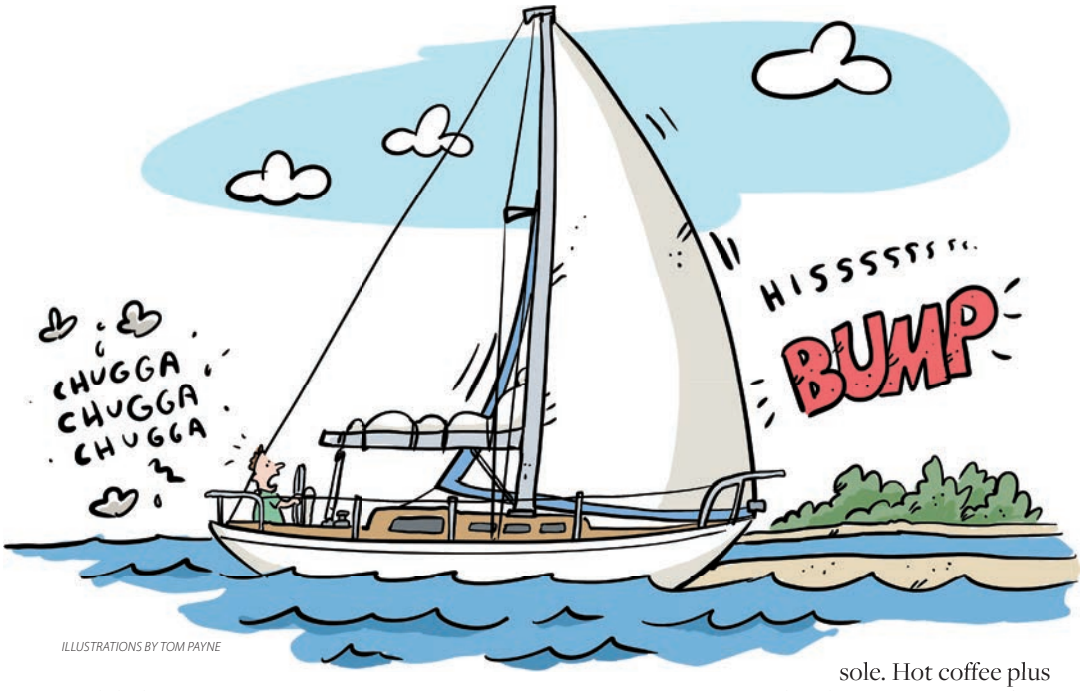
We decided to upgrade the four above-waterline deck drains from a non-marlon plastic material to bronze, knowing that when the boat was heeled over, these should be as strong as the rest. At the time, we felt that it was unnecessarily risky to run rainwater and sea water *through* the boat to discharge, rather than simply draining off the decks with holes in the bulwarks. We decided not to drill more holes and simply work with the system as is. On a recent crossing, the forward starboard deck drain hose detached from the through-hull and gave us a scare 40 miles offshore. We resolved this temporarily with two wood bungs and replaced the hose with a longer length that could bend from the scupper to the through-hull without tension.


Long days and nights with *Azimuth* on the hard in Sausalito, California.

# Stranded on a Sandbar

## *After a coffee mishap led to a grounding, sailing saved the day*

BY DAVID BOND



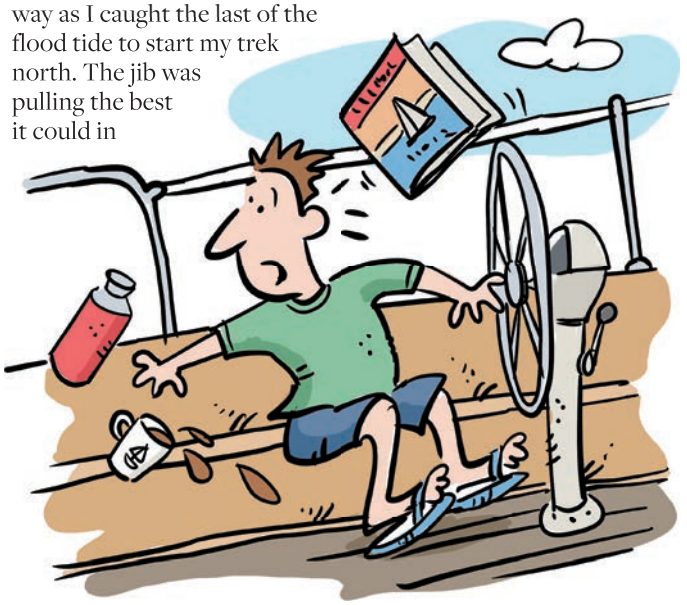

ILLUSTRATIONS BY TOM PAYNE

I'd only owned the boat for about three weeks, but one thing I'd already learned was that this 1968 Cheoy Lee 36 is as agile as a dinghy. It's a full-keel boat, but its cutaway forefoot makes it nimble. It turns on a dime, even with wheel steering. Just a light touch on the wheel and the boat responds instantly. It's a tribute to Bill Luders' design.

But the boat's agility was not a tribute to my navigation, as I discovered during a trip up the Intracoastal Waterway (ICW) about five years ago.

It was dawn on a July morning, and I was in South Carolina at Mile Marker 539 on the waterway. I planned to let the rising sun light the way as I caught the last of the flood tide to start my trek north. The jib was pulling the best it could in such light air.

I rounded a low point of land, my sights set for Mile Marker 538. A red channel marker was up ahead, and I looked down at my ChartKit book to mark it in pencil.



Strong coffee is an integral part of my sailing gear, so I was filling up a thermos in the cool dawn. I poured myself a cup and looked over my notes: *the tidal current here, about one knot on the flood | the tide sets in a northeasterly direction on the flood, opposite on the ebb.* Keep the diesel running at a low rpm and let the big jib do the actual work. That's my version of motorsailing, and that's what I intended to do.

I put down my coffee on the lazarette hatch and picked up the ChartKit. I must have knocked the mug, because the coffee cup capsized and the mug rolled into the cockpit sole. Hot coffee plus flip-flops — not a good combination. Worse: I had also nudged the wheel to port.

The boat's speed was just 2 knots, but it didn't take long for *Traveller* to find its way to a high spot at the edge of the channel. With a slight bump and a hiss, we were aground on a sandbar.

My first reaction was to reverse the engine, but this didn't help. Instead, the prop churned up bottom sand and seaweed, which choked the water filter. I shut down the engine and lifted the portside lazarette hatch. Inside, there's a raw water strainer mounted on a bulkhead. This easy access is one of the few conveniences in the engine room. I could see through the glass that the tall seawater

strainer teemed with bottom debris and seaweed. It has a quick release T-handle on the top, so I loosened it and lifted the strainer off its base. Once it was cleared and put back together, I restarted the Perkins diesel engine. After a beat, I put it into reverse again and tried to pull us off the sandbar.

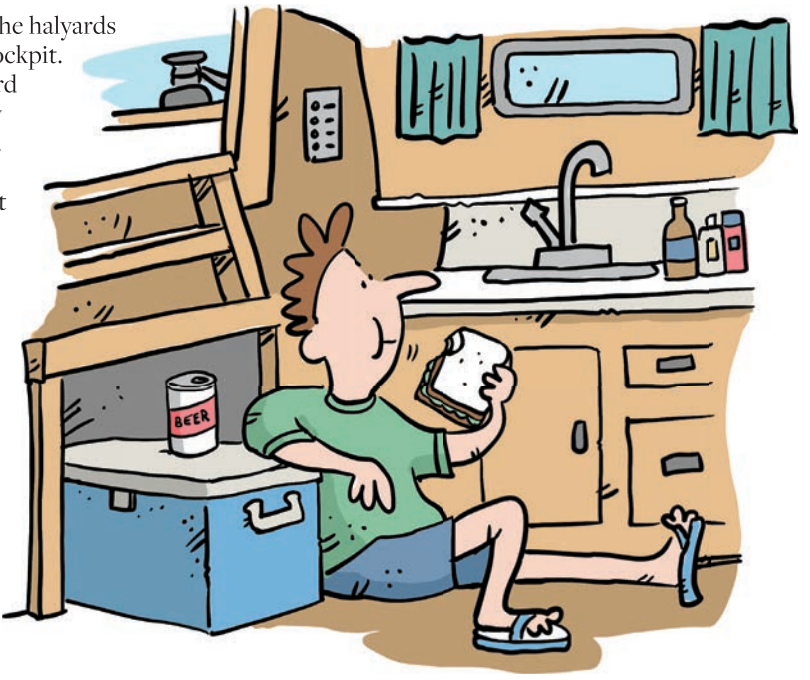
No luck, despite emptying the water strainer three times.

The tidal range along this stretch of the ICW is about 6 feet, which is bad news for a boat that draws a little over 5. The tide had peaked now, and I knew things were only going to get worse. I was running out of ideas.

When I bought *Traveller*, it was still set up circa 1969. The one exception was the Profurl headsail furler. When I embarked on the ICW trip, I was still getting used to the boat, which, at 36 feet, is the largest boat I wanted to singlehand. I didn't install the new gear that makes the singlehandler's life easier. There's no StackPack for the main and no lazy jacks, and the halyards don't lead to the cockpit. It's all done the hard way — the cowboy way, you might say.

*Traveller* was named after Robert E. Lee's war horse, right down to the double l. A big, gray animal with a black mane and tail, *Traveller* had strength, stamina, and courage. Plus, he was ornery as hell.

I'd ridden horses as a kid, and sometimes I talked to *Traveller*. "Whattaya think, boy?"



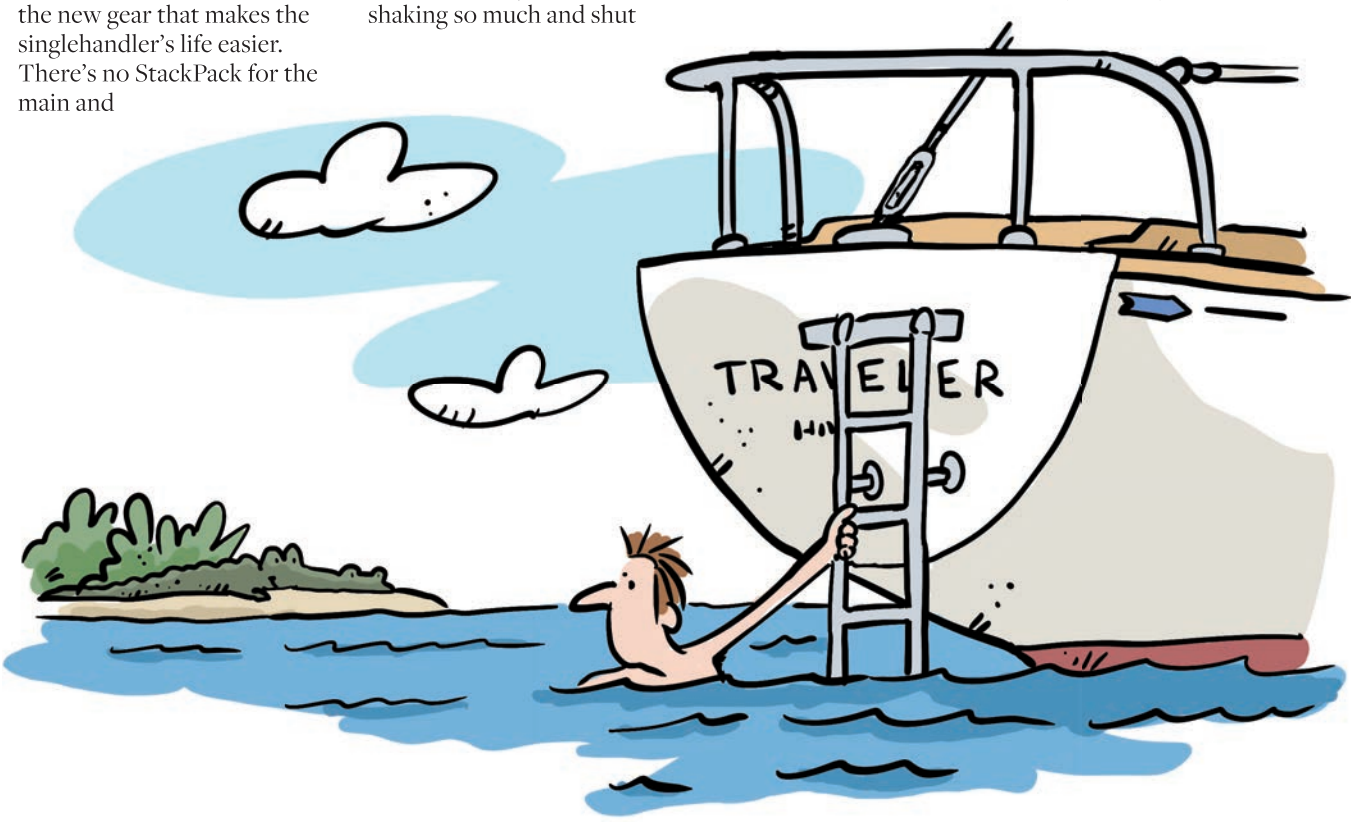

As we sat stranded on the sandbar, the big jib was still up and we were on a listless starboard tack. The two jib sheets were flailing. I pulled them in so they weren't shaking so much and shut down the engine. The situation, if not calmer, was at least quieter. I straightened the rudder to amidship. A slight breeze darkened the flat water to windward.

*Whattaya think, boy?*

I watched, and I felt. I felt the boat twitch to port. Was it my imagination?

No. There it was again.

I pulled in the portside jib sheet just enough to



keep a soft curve in the sail's foot. The bow eased more to port. I sighted along the centerline toward a white house onshore. Yes, the boat was pivoting to port, working its way off the sandbar. *Traveller* was finding its own way into deeper water.

I shifted to the side deck and pulled in the jib sheet a little more. Luck was with us. The wind was holding. It was just a zephyr, but it was enough. The forefoot pulled loose, and the boat pivoted on its keel. A couple of slight jogs with the wheel, another tightening of the jib sheet, and within moments the depth gauge read 5 feet, then 7 ... then 10 feet.

We were back afloat. We were heading in the wrong direction, but we were afloat. We reversed our course and continued on our way north.

*Traveller* had done well, and I realized that singlehandler or not, owning this boat was going to be a partnership. This boat could teach me a lot if I was willing to listen, willing to observe.

I think ol' *Traveller* gave a little snort of approval.

One thing I'll say about the ICW — it's easy to go aground. I don't mean that it's not difficult to go aground. I mean that since the bottom is mostly mud and sand, it rarely hurts the boat if you do. This is the opposite of my home state of Maine. Going aground along the Maine coast means hitting ledges — hard, toothy, granite rocks — that can do damage.

The old scoundrel who'd sold me *Traveller* took advantage of the local sandbars. He owned a pontoon catamaran. "I just slide it up on a high spot and let the tide go out," he smirked over a ketchup-y hot dog sandwich. "Cheap way to clean the bottom."

A good, practical idea. Just watch out for alligators.

I'd seen alligators in the ICW, and believe me, a 6-footer was on my mind when I dove into that 84-degree, not-so-clear water to inspect *Traveller*'s rudder and prop after running aground. Fortunately, there were no alligators, and thanks to the soft mud and sandbars in that stretch of the ICW, no damage to the boat. The only thing dinged was my pride.

*David Bond is a writer and artist from Maine. He currently teaches English in Germany while* Traveller *rests ashore along the Chesapeake. They will continue their adventures together soon. Before wading into teaching, David operated a sailboat chartering business in Kennebunkport, Maine. His book,* Adventures in the Charter Trade, *is about those crazy times and is available on Amazon.*

## The Takeaway—DB

It sounds fundamental, but knowing the shape of your boat's underwater profile is important. Not just the draft — the shape. I know that *Traveller* draws 5.25 feet, but it's also important to visualize exactly *where* the deepest draft is located. This boat has a full keel with a cutaway forefoot, meaning that the stem angles down and the underwater body continues to swoop back at an angle until it reaches the bottom of the keel where it reaches the deepest draft. So, the section of the keel that is 5.25 feet is aft of amidships.

So what, you ask?

Well, as I found out, that means that it's pretty easy to slide up onto a mudflat or sandbar if you're only watching the depth sounder. A previous owner had mounted the depth transducer amidships, and I plan on moving it a little further forward to provide a little advance warning.

Knowing the shape of your underwater profile and using your sails help determine your plan of action if you go aground. Sawing forward and aft was just getting us more stuck. In the end, using the headsail to pivot the bow sideways and free that cutaway forefoot eased us off the sandbar.

Finally, and I can't stress this enough: *Sail* the boat. All the thought, lines, and calculations that went into creating the boat make it more efficient under sail. It's designed for sail power. Engines are just an auxiliary ... and sometimes a headache.

I'm tempted to pull out that wretched old Perkins, fill in the propeller apertures in the sternpost and the rudder, and see how well the boat performs. Then I'll put an ice chest where the engine beds were and fill it full of beer and sandwiches. I think I'll be a lot better off.

# The Seven Stages of Life on the Hard

*The emotional roller coaster is an inevitable part of the boatyard journey*

BY DAMON GANNON

I have complicated feelings about boatyards. Strolling among the jack stands, with the boats and their rigging towering overhead, is like walking through a magnificent cathedral. I love to look at the secret, hidden parts of boats, the parts you never see when they are in the water. Racing yachts, heavy cruisers, daysailers, powerboats, and workboats; I love them all.

The activities taking place in the boatyard are as riveting as the boats themselves. I have witnessed remarkable feats of mechanical brilliance and craftsmanship, as well as a few catastrophes. And I like chatting with boat owners as they lovingly care for their vessels. You meet the most interesting people in boatyards.

So it's ironic that I abhor having my own boat in a boatyard, any boatyard. During yard periods, the boat is torn apart. Its systems are dismantled or unusable, the contents of every storage locker are scattered from stem to stern, and dirt is tracked everywhere, despite extreme efforts to keep it off the boat.

Beyond the physical discomfort and frustration of having to play boat Tetris every time you need to retrieve a screwdriver, the main reason I dislike having my boat in a boatyard is the emotional roller coaster accompanying every haulout. Working on your boat in the boatyard brings a predictable pattern of emotions. Anticipating these emotional stages and learning to recognize them will help you get through them.

So for you, dear reader, here are the Seven Stages of Life on the Hard:

Top right, **the author admiring his progress on a fiberglass repair job on *Fulmar*, his 1982 Pacific Seacraft 37.**

Bottom right, **fairing the bottom after chemically stripping paint from the hull of the boat.**

## Hope

This stage occurs during the weeks leading up to the haulout and is characterized by a naïve, optimistic outlook. Boat owners in this phase spend much of their energy trying to create a foolproof plan for accomplishing an entirely unrealistic amount of work in the allotted time. How-to videos are watched on YouTube and parts and supplies are ordered.

## Awe

Seeing your boat fly through the air as the travel lift picks it up and

A hot day in Cortez, Florida, when the author vowed to never sand the bottom of a boat ever again.

whisks it away is awe-inspiring. This stage is fleeting.

## Surprise

Upon inspecting the hull below the waterline, you discover myriad unanticipated structural/safety issues that need to be corrected immediately, adding a dozen major items to the top of that already unrealistic to-do list. Over the coming days and weeks, you will invariably notice more problems that were initially overlooked. Don't fly off the handle. Before taking any drastic measures, spend a couple of days carefully examining each problem and formulating the simplest solution. Many of the issues you initially thought were problems may turn out to be false alarms.

## Depression

The first stretch of hard work in the boatyard is characterized by making relatively minor problems much worse. To fix things, you must first do some damage: grinding, blasting, sanding, stripping, drilling, or cutting. You know it must be done, but it is emotionally painful to pick the scabs and excise the diseased tissue.

It is during this stage when you realize that your planned launch date is a pipe dream. Getting through this phase and advancing to the next is the most crucial part of the yard period. This is the point at which many sailing dreams die and countless boats are abandoned. The remote corners and backlots of every boatyard are littered with rotting derelicts with half-finished fiberglass repair jobs. Each of these dead boats is tangible evidence of someone's lost sailing dreams.

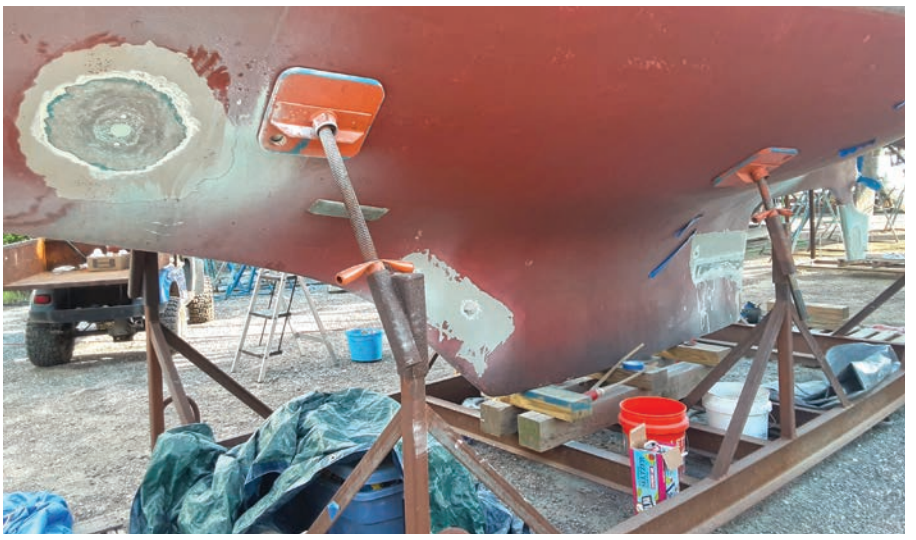
To avoid this fate, you must keep pushing ahead, putting one foot in front of the other. Break up each project into a series of small, achievable tasks. Celebrate your victories, however small. Find support and inspiration from your fellow sailors who are also working in the boatyard. Having a large bank account helps, too.

## Pride

A sense of satisfaction slowly builds as you progress from demolition to reconstruction. The more you accomplish, the more positive your outlook becomes. But beware of mission creep. It is tempting to say, "Now that we have done X and have access to Y, we might as well do Z while we are here."

"Z" may well be a worthwhile project, and it may be more efficient in the long run to tackle it now when you have easy access to it. But you can spend the rest of your life performing a long string of projects, each one logically leading to the next. That's fine if you really enjoy working on your boat, but it can also keep you landbound. Is doing Z necessary for safety? Does the boat have to be on the hard to accomplish it? Were you already planning to do that project within the next two years? Will doing it now increase the amount of sailing you could do before your next haulout? If you didn't answer yes to at least one of these questions, you should put it off until a later date.

This is also the point at which others in the boatyard, taking note of your progress, will try to distract you from your goal. They will offer advice when none is needed, offer libation before the day is done (sometimes before it has begun), and try to impede your progress, intentionally or unintentionally. My wife and I have a strategy for dealing with well-meaning distractors. We call it "block and parry." When a visitor approaches, one of us will engage that person and distract the distractor while the other continues working. It allows our progress to continue while not being rude.



The fourth phase of a boat project, when you realize your planned relaunch date is a pipe dream.


**The author's wife, Janet Gannon, making final modifications to the skeg of the couple's boat before reinstalling the rudder.**

Of course, we all need social interaction, and for many reasons it is good to cultivate relationships in the boatyard, given the likelihood that you will eventually need technical assistance or additional brawn at some point during your work. Just don't forget your priorities.

## Panic

As launch day approaches, you work like mad to finish all the projects that absolutely must get done before splashing. The end is in sight. But do you have enough time to finish everything before your appointment with the travel lift? You will do anything to add work hours to the day — rising early and wearing a headlamp to work late into the night. But rushing the application of epoxy barrier coat or bottom paint will cause problems down the road.

## Relief

After the boat has been launched (and you confirm that the sea is staying on the outside of the hull), you sail away from the dock and exhale with a sigh of relief. You can finally enjoy watching a sunset on the water, knowing your bottom is clean and your boat is shipshape. The misery of the past several weeks has all been worth it. Soon you will forget those emotional lows and begin planning projects for your next haulout.

As awful as life is in a boatyard, it is a necessary part of being a sailor, especially for those of us who own good old boats. Knowing up front that your journey in the boatyard will pass through some dark valleys can help you reach the next peak.

Once you've made it through these seven stages, raise a glass to the humble boatyard and to the people who keep boatyards operating. We need to cherish them even as we curse the need for them.

*Damon Gannon is a marine biologist who has conducted research on marine mammals, fishes, and seabirds from the Gulf of Mexico to the Bay of Fundy. He is assistant director of the University of Georgia Marine Institute on Sapelo Island. He and his wife, Janet,* sail Fulmar, *their Pacific Seacraft 37, out of Brunswick, Georgia.*

# Easy Access

## *Why sweat and contort yourself if you don't have to?*

BY DINI MARTINEZ

"Every part of the hull should be easy to access!" I'll forever remember those words from one of my offshore training courses decades back. Since then, I have crewed on countless boats both in- and offshore, as well as owned four boats myself, and have yet to find a vessel where that ideal is put into practice.

I currently live with my three kids and husband on our second Moody. While we love the English brand for its Bill Dixon design and perfect mix of comfort and safety, the focus is on sleek appearance, not practical access. When things go south, it happens regularly that we must drill, cut, or grind to gain access to fix our 29-year-old lady's ouches.

### Accessing Chainplates

As such, when the starboard chainplates needed re-embedding, moving away the settee cushions wasn't enough to be able to attack the internal access with epoxy and fiberglass. This being a structural issue, it wasn't an option to simply hope that what I would be able to stuff up through the tiny existing access hole was going to be enough to address the problem. I needed to see with both eyes and work with my arms at a functioning angle.

The solution was simple. I enlarged the hole with a grind cutter, which made access easy. The work was done quickly. Plus, now I can check up on it whenever I feel the need. Any other time, the settee cushions' hard back neatly covers the access hole.

### Holding Tank Switch

Another contortion issue almost cost me my shoulder joint. The divert handle for the holding tank was buried at least 3 feet forward of the already small cabinet door under the forward head's sink. Just being able to grab it was one thing, but actually moving it when it seized up became impossible.

We cut a 12 x 10-inch rectangle in the fiberglass cover next to the toilet. This allowed us to solve the seized handle issue with some simple lube, though we have been left wondering how the whole mechanism had been installed in the first place. To keep access easy, we drilled a round hole in the cutout fiberglass rectangle for the divert handle to be able to poke through.

For aesthetics, we cut out some timber found in a back street in town to create a frame. After varnishing it, we glued it around the cutout rectangle with epoxy. Once dried, we drilled a hole in each corner and repositioned it in its initial place. For the divert handle to poke through the hole, we had to place an old slingshot from our kids behind the pipes to push the handle slightly more out of the cabinet. That done,

On left, **a small hole behind the settee was enlarged to provide better access to the chainplates.**

On right, **the framed, cutout rectangle with holding tank hoses in the background.**


Above, **the author working on the holding tank diversion access issue.**

Below, **the cutout rectangle shown from above with the timber frame epoxied on.**

the framed and holed rectangle was screwed on.

Now diverting to the holding tank takes just seconds, and if we ever need access to the adjacent piping — like when our 8-year-old decides to flush a pencil down the toilet and breaks the whole thing — it's a matter of unscrewing four screws to be at least able to work in relative comfort while rejoicing in the glamour of raising boat kids.

## More Access Ideas

Another idea to gain better access is still on my to-do list, inspired by a customization on a sister boat. Our aft walk-through on the port side is a bunk bed converted into storage, like on most Moody 44s, given that bunks are plentiful (eight in four cabins!) but storage is not. The aft 20 inches or so of the bunk space designed for the feet, which extends into a closed-off cabinet in the aft cabin, is a valuably sized storage area. However, access from the walk-through is tricky. It's generally not possible without unhuman bodily twisting. Moreover, following Murphy's Law, the spare engine oil or whatever other item one is looking for tends to be buried in the very back. In other words, a ton of other stuff needs to be pulled out first.

Simply cutting out a door in what already appears to be an aft cabin cupboard should turn access to those items from a time-intensive, sweaty task into the simple and quick opening of a door. The equivalent space on the starboard side is already a cupboard, so we can use its door as a template. And should the walk-through ever be used as a bunk again, 20 years down the road when the potential hordes of grandchildren may come along, this could be the perfect access to give a lucky one of them a nighttime foot massage in bed.

In summary, most boats don't allow easy internal access to all parts of the hull or to some valuable storage areas and systems. We often found that rather than contorting ourselves, we are better off creating the needed access by cutting big enough holes where necessary. If access is required regularly, we fit a door, flap, or hinges, or a screwed-on panel for quarterly check-ups. That way we keep the yoga twists on the mat and the swearing and sweat to other occasions.

*Dini Martinez has lived on boats on and off for most of her life, including work on superyachts, three years with a baby and a toddler around the Mediterranean, and years of coastal cruising around her homelands Down Under. Since 2021 she has been sailing the Caribbean with her family on a Moody 44, running yoga and tantra retreats. You can find out more about her on Instagram @Dini_Martinez and at DiniMartinez.com.*

# Your Rudder Matters

## *When the surprise of a bad rudder comes to light, there's only one direction to go — forward*

BY ANDY CROSS

I have to start this story with a few warnings. Your rudder matters. Don't take care of it and you may be inviting disaster. Disregard key warning signs and you may become a desperate sailor trying to lash a piece of cabin sole to your spinnaker pole or attempting to steer with a web of lines and a bucket, or towing a drogue.

Don't be that sailor. Take care of your rudder and it will take care of you.

My typical steadfast optimism usually precludes me from being such a brash bearer of the negative or trying to drum up fear, but rudder failure stories are all too common and seemingly becoming more so. And I can't help but think that our 1984 Grand Soleil 39, *Yahtzee*, might have joined that cadre had we not discovered a problem with our rudder and fixed it immediately instead of letting it sit.

When it comes to rudders, the bottom line is that far more boats — especially old ones — have issues than their owners are aware of, and I can now be added to that group of boat owners. The cautionary tale starts here.

### The Discovery Phase

A couple thousand miles were put behind our rudder in the spring and summer while sailing from the San Juan Islands down to the Columbia River and up to Portland, Oregon, then back north with the Pacific Northwest Offshore Race to Victoria, British Columbia, before circumnavigating Vancouver Island. All the while, we began to notice a small amount of salt water collecting behind our engine. But where was it coming from?

After several intense sessions of boat yoga, I found a small weep coming through the fiberglass above the skeg near the rudder tube. Accordingly, I scheduled a haulout in Seattle immediately and we pointed *Yahtzee*'s bow south. What I naively expected to take a week or 10 days then morphed into a nearly two-month-long skeg and rudder makeover that involved many hours, lots of fiberglass work, and a hefty bill to match.

The rudder portion of the saga began when I noticed water dripping from it days after a surveyor tapped it during haulout to see if any soft or delaminated spots could be found. It checked out fine then, and had for the previous four years that we'd owned the boat.

There were no clear signs as to where the moisture was coming from and when we took a grinder to some suspect areas next to the collar that attaches the rudder to the skeg, we didn't find anything. Before dropping the rudder to work on the skeg issues, which is an entire story in and of itself, we ground down the leading edge of the rudder and found a hairline crack in the fiberglass. That was it.

We then dropped the rudder and laid it on a pallet while the skeg repair commenced. Shortly after, I moved the rudder and thought I heard water sloshing around inside. I could hardly believe what I was hearing, so I moved it a few more times and sure enough, the rudder sounded full of water. Wielding a drill and quarter-inch bit, I drilled a hole in the bottom of the fin, tipped it up, and watched in absolute horror as thick, black water oozed out and created a large puddle on the cement.

Standing over the rudder with drill in hand, I didn't know if I should scream, cry, vomit, or faint. This was not good, and certainly not what I imagined when we found the crack. But what ended up coming from it all is an immense appreciation for our rudder, how to go about fixing and caring for it, and what I can do to keep it in top shape.

**On its deathbed, *Yahtzee's* condemned original rudder showed signs of wear and moisture.**

### The Decision Phase

The full gravity of our situation struck me while standing next to our rudder with our fiberglass guy, Ethan, listening to his immediate and blunt assessment: "You're lucky. You could have easily lost this thing offshore. I bet it's hollow."

That hit me hard because despite regular checks when hauling out, I had no idea something was amiss. As a full-time cruising family with two young boys aboard, we made *Yahtzee* our home, and it pained me to think I might have been putting us in harm's way with a bad rudder that had gone undetected. From that point on, I was determined to make everything better than it ever had been. No matter the cost.

Making it better meant this wasn't a project I was willing to tackle alone, so I decided to get quotes for fixing the

On left, **as expected, a crosscut of the rudder revealed that it was indeed hollow.**

Below, **though the rudder was bad, the stock and internal grid were still usable.**

rudder in Seattle or getting a new one made elsewhere. Surprisingly, through this process I came to learn that in many instances, getting an existing rudder repaired is comparable in cost to having a new rudder custom built. And it's far more bulletproof, because fixing a bad rudder is a complicated science that if not done properly, can turn into a massive failure later.

Going with a new rudder ended up being the best route for our situation, as a repair was quoted at $2,850 and a new rudder came in at $3,000, plus $600 for shipping to and from Florida. The decision seemed like a no-brainer, and when Ethan said he'd rather condemn the old rudder than touch it, I knew we were all in on a new one. Essentially, trying to fix what we had would be a waste of time and money.

## The Fix-it-Now Phase

Ethan recommended Foss Foam Products, which has hundreds of rudder molds at its Florida facility. Had a Grand Soleil 39 been one of them, it would have reduced the price of our new rudder by almost half. Instead, they had to build a new mold for ours and to do so, needed the old rudder shipped their way.

Onto a truck went our mess of a fin, and in a week's time their shop had it ground down and cut open. It was no surprise when the first email came across my screen and the opening line read, "Your rudder is hollow inside! It is also very wet." Sigh.

By a stroke of good luck, our existing stainless steel rudder stock was in good shape and they were able to salvage and weld it to accommodate the new blade. The process of building a new rudder started by creating a mold for each side, laying up the fiberglass, and fitting and glassing the new rudder stock and flange in place. Next, they filled the rudder with 20-pound per cubic foot closed-cell urethane foam and the whole thing was clamped together. After coming out of the mold, it got a trim before they glassed the seams, faired it down, and then gelcoated the whole thing.

I received images of our rudder throughout the build process, and it was an interesting procedure to watch unfold. In total, shipping and building the rudder took slightly over three weeks, and when the new one arrived back in Seattle, it felt like Christmas morning. Ethan met me at the boatyard and together we unwrapped the new beauty and did a dry fit to see how she looked. Gorgeous.

He took it from there, and after applying an epoxy barrier coat and bottom paint, the new rudder and freshly repaired skeg had *Yahtzee* up and running again far better than when she hit the water in 1984. My goal had been achieved. I was a happy sailor.

## The Feeding and Care of a Rudder

In going through this ordeal with our rudder, I tried to learn about what went wrong, where it went wrong, and how to keep it from happening again. In doing so, I sought the advice of several seasoned fiberglass professionals and experts. The

Above right, **the initial section of the new Grand Soleil 39 rudder mold is crafted in the shop.**

Below, **a cross section of a good rudder made with closed-cell urethane foam.**

first question I posed to all of them was about the warning signs that a rudder has gone or is going bad. What had we missed?

They all agreed on the warning signs, It is a bad sign if you notice rust-colored water dripping out of the rudder. Most older boat manufacturers used mild steel in the rudder core/shaft system. Rust-colored water dripping out of the rudder can be a sign of corrosion. This corrosion can cause the rudder's internal plate to break away from the shaft. An early sign of this happening is that the rudder moves on the shaft.

Secondly, it is a good idea to sound out the rudder whenever the boat is hauled. Use a small hammer or even a screwdriver handle to tap over the entire surface of both sides of the rudder. In the areas where the glass is well bonded, there will be a pinging sound. In the areas where the fiberglass is delaminated, it will make a thud sound. Delaminated areas should be cut out, dried, and re-fiberglassed.

I then wondered what steps sailboat owners can take to ensure their rudders are properly maintained. For instance, how often should a rudder be dropped and serviced?

It is recommended that your rudder be dropped (with the steering loosened, which allows the rudder to slide down) every time the boat's bottom is painted. You only need to lower it a few inches so you can inspect the top of the rudder and area around the shaft. Keep an eye out for electrolysis and crevice corrosion, which usually occur right where the shaft exits the rudder. If your rudder has a groove at the shaft/rudder intersection, consider sealing it with 5200 for a watertight seal.

One of my big quandaries throughout our ordeal was how long water had been in our rudder and what I could have done had I known about it sooner.

What I came to learn is that the only place water can hide in rudders is between the fiberglass and the foam in an area that is delaminated. Old rudders like *Yahtzee*'s are typically built with outdated and inferior core materials that can be very difficult to dry out, thus making water intrusion a significant problem.

In general, the lower-density foams that some manufacturers use inside their rudders, such as 2- and 4-pound foam, are nearly impossible to dry out once the entire core becomes saturated. You should drill an inspection hole to determine the core material used in your rudder and what condition it is in, then take steps to repair and fill it with the appropriate material.


Top, **the first dry fit of the new blade showed a near perfect fit.**

Middle, **primed and ready for the final fitting and bottom paint.**

Bottom, **fully installed, *Yahtzee*'s new rudder and bottom are ready for splash day.**

## Looking Toward the Horizon

For boat owners now wondering about their own rudder, it might pay to have a professional take a thorough look at it next time you haul out. Though the warning signs for our rudder issues were minimal, it did take some exploratory grinding to reveal the cause of the problem. Part of me wishes that we'd dropped the rudder sooner and gone through it with a fine-tooth comb. That said, finding and fixing rudder problems isn't easy, and no two problems are exactly alike. In the end, it's a matter of figuring out what you've got hanging from your stern.

Another key point prudent sailors need to consider, especially those who are heading offshore or even sailing coastally, is what you would do if you lost your rudder at sea. How would you steer? What equipment do you have aboard to help you get back to port? Have you used it? One bright spot in all this for us is that we have a Hydrovane self-steering unit fitted on *Yahtzee*'s stern, and in the event of a rudder loss or failure, its rudder would act as a perfectly capable backup that could steer the boat thousands of ocean miles.

While the overall experience of fixing our skeg and finding our bad rudder and then going through the process of getting a new one wasn't something I'd wish upon any sailor, it certainly was a learning opportunity. And now that everything is fixed to a standard far better than when we bought the boat, we're sailing away with peace of mind that we took care of our rudder and now it's taking care of us, and that's priceless.

*Andy Cross is the editor of* Good Old Boat. *The* Yahtzee *crew is currently cruising the Caribbean and their adventures can be followed at SailingYahtzee.com.*

# An Unlucky Trip

## *When a plethora of boat problems bedevil a two-week cruise, fellow boaters come to the rescue*

BY PATRICIA BRANTINGHAM

On a brisk Saturday morning in August, my husband, Larry, and I set off on our 1990 Catalina 30, *Njord*, for our annual Brockport Yacht Club Cruise with four other boats. We planned to cross Lake Ontario from our club just west of Rochester, New York, to Cobourg, Ontario, and travel east through the Bay of Quinte, on the lake's northern shore. Our friends planned to sail for a week, then we would continue by ourselves on to Kingston, Ontario, at the northeastern end of Lake Ontario before slowly wending our way back home — a leisurely two-week sail.

We set sail, notwithstanding a stiff wind from the wrong direction. We raised sails (one reef in the main, full 143% jib) but had the engine running as we made adjustments for the 22- to 25-knot winds and 6-foot seas. One of our friends radioed us to say that there was no water coming from our engine — bad news. Larry turned the engine off and I tried to hold course while he went below to diagnose the problem. But we were slamming into the waves and bouncing from side to side, and he couldn't do it while underway.

At that early juncture in the trip, we had our sails trimmed to our intended course, and briefly considered continuing to sail across the lake. We could deal with what was likely a bad impeller after we arrived at the marina in Canada. Good sense quickly prevailed. No engine meant no maneuvering in the tight quarters of a marina, the wind might well die halfway across the lake, and it was a holiday weekend in Canada, so we might not be able to get parts if we needed them. We had no choice but to return to the yacht club.

We were only about an hour from home and the wind that was on the nose going out was in our favor going back, allowing us to sail right up to the guest dock at the club. By postponing our start for a day, we avoided a nasty crossing with daylong 6- to 8-foot seas and 25- to 30-knot winds. Larry was able to pull the impeller (which was indeed the source of the problem) and we had a spare. It could have been worse.

That night we stayed on the boat at the club. I was not quite finished cooking dinner on the stove when the flame under both burners went out. The propane tank, a large tank that feeds both the stove and the rail-hung grill, was empty. No propane meant no way to prepare meals on our two-week voyage. To complicate matters, the tank and its fitting are obsolete, and no one would refill the tank. It was then approaching 8 p.m. There was nowhere to purchase the right tank and fitting that night, and we could be delayed for days if we ordered one.

A good friend at the yacht club has a sister boat to ours, but with the newer propane system. He had Covid-19 and therefore couldn't go on his own scheduled cruise, and his boat was sitting at the dock. After a quick phone call, he agreed to let us use his tank. Fortunately, his boat is secured by a combination lock, so we could get into it without


Above, ***Njord*** **sailing on Lake Ontario.**

Top right, **the author, middle, with her husband, Larry Beneway, left, and friends Judy Hartman and Gary Hartman on a day of respite in Cobourg, Ontario.**

making the hourlong trip to his house and back for a key. After some struggle, the old tank came out and the borrowed tank went in. Good to go! It could have been worse.

We headed out again on Sunday, this time with too little wind in the wrong direction, but relatively calm seas and clear skies. Though we couldn't sail, we had an uneventful 35-mile crossing. We met up with our friends and enjoyed a delightful evening and a day in Cobourg. The next morning as I was cleaning up the dishes, we unaccountably ran out of water, having just filled the two large tanks on board before we left the yacht club. The bilge pump went into overdrive and a veritable gusher erupted from the outflow. Clearly there was a leak, and the water tank was emptying into the bilge and out into the harbor. But where was the leak? And how would we fix it on a holiday in Canada?

After tracing the plumbing pathway and brainstorming with one of our fellow cruisers, Larry found that a clamp securing two sections of plumbing had come apart. We had no spares (make a note to self). But our friend did, and kindly gave us one and helped make the repair. The bilge pump had been up to the task, so there was no water where it didn't belong. Add water to tanks; no harm done. It could have been worse.

After another day in Cobourg, two of our companion boats turned for home and our now-reduced fleet set off for Trenton, about 34 miles east. The light wind was not quite in the right direction, but at least we could motorsail. We arrived at one of our favorite marinas, Trent Port Marina, without incident and spent a couple of days enjoying the facility and the town. But something was telling us not to press our luck and continue east on our own. The other two remaining boats were ready to head home, so the three boats headed back to the Murray Canal to get to Lake Ontario. Our intention was to split off from the others and go west of our home port and then on to a yacht club at Wilson or Niagara-on-the-Lake; if we had further problems, we would at least be a relatively easy drive away if someone had to come get us.

The next morning, we set out under bright sun with hopes for some wind from the right direction once we got to the lake. We were motoring to the canal with Larry driving while I sat next to the companionway. I turned my head and caught a whiff of something electrical. Larry headed down to check the engine and a cloud of smoke suddenly billowed into the cabin. I turned off the engine. Larry explored the source of the smoke and determined that a bearing in the alternator had probably gone bad. Once again, we had no engine, and

this time no spare part on our boat or anyone else's.

However, we always carry a towline, and one of our companion boats was able to tow us the mile back to the marina. The marina had quick and competent dockhands at the ready to catch us, and the Trent Port Marina is, as I said, one of our favorites — staff are helpful, the grounds are lovely, and the shower rooms are the best anywhere on the lake. Larry determined that the problem was not just the bearing — it was the alternator itself, which was toast. There was an auto parts store within walking distance. No luck there, but Larry is without peer when working the phone to solve a problem, and after an hour following a trail of tips (try this guy, try this place), Larry found an angel in Kingston at Auto Electric Rebuilders. More remarkable, this angel had the needed alternator in stock, was going to be driving by our marina the next morning (a Sunday!) on his way to Toronto, and would drop it off. It could really have been worse.

Larry can fix anything mechanical. Electrical, not so much. He expressed his concerns to the angel, who assured him it could not be simpler to install and couldn't go wrong. He was sorry he had to be on his way, but he had places to go, people to see. But of course, it could go wrong, and it did. When we tried starting the engine with the new alternator installed, black smoke filled the cabin. With the engine off, Larry pulled it all apart again; this time a fuse had blown and the starter had fried. Now we needed a new starter.

Another call to our angel turned up the likelihood that the needed starter could be found Monday morning and shipped overnight. The new starter went in without much stress. The blown fuse was a problem, but as Larry was sharing our tale of woe with a boater down the dock, the boater said, "Wait — I'm sure I have extras." (Another note to self.) And he did. In the meantime, the ever-responsive marina staff brought a portable pump-out machine to our boat (desperation had been setting in). Problem solved. It was not good, but it could have been worse.

As Larry was hooking everything back up, he connected the fuse and the engine suddenly started to turn over. He had inadvertently hot-wired the starter. The engine key was clearly in the off position. The starter button did not start the engine. He could find no way to wire the new starter without starting the engine.

Hot-wiring the engine did, in fact, work — the engine started right up and purred happily. There was no reason we couldn't start the engine that way the next morning and head out across the lake. If we were so lucky (ha!) as to be able to sail, we could turn off the engine by shutting off the fuel and we could restart it by hot-wiring it again. And so we did. By now, we had given up any thought of visiting other ports and wanted nothing more than to be at home on our own dock. The wind was extremely light and in entirely the wrong direction. We never put up a sail, but nine hours later we pulled up to the dock at our club. It could have been MUCH worse.

Was this the trip from hell? Well, maybe the trip from heck. No one was hurt, we were never in danger (if smoke had turned to flame, we had fire extinguishers at hand), we found a knowledgeable and astonishingly responsive parts source, and we were with resourceful, kind, and helpful fellow sailors.

We may have been plagued with bad luck and even bad judgment, but we were somehow protected from ourselves and the ill winds of fate, and we are very grateful. It could have been so much worse.

*Trish Brantingham came to sailing in her 50s when she married Larry Beneway, who had been sailing all his life. They started with a Catalina 22, detoured to a Noelex 30 for a few years, and came back to a Catalina 30 in 2015. They race a little but mostly love cruising Lake Ontario.*

**A cloud of smoke suddenly billowed into the cabin.**

**Larry enjoying a well-earned beer.**

# Unpacking Communications Protocols

*Marine communications protocols can be confusing, but it's important to understand the various systems*

BY MATTHEW PARSONS

If you have upgraded or dealt with marine electronics in the last 30 years, you've probably seen NMEA 0183 and NMEA 2000 mentioned, and maybe even Signal K or CAN bus. Figuring out the differences between various communications protocols can be daunting, but it's important to know how our electronics are interacting with one another. I'll try to explain what each of these terms means so you can understand how your marine electronics talk to each other.

## The Basics

Much like people, different brands of electronics have different "languages," or standards, that they use to talk to each other. If each piece of electronic equipment isn't speaking the same language, they can't communicate. In the past, this created problems for consumers, who were trying to buy instruments that worked with each other, but also for manufacturers. Who wants to buy an expensive instrument that can't talk to anything else?

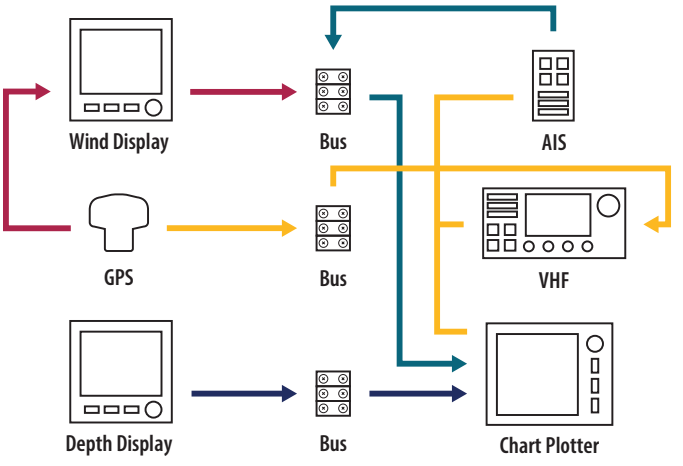
To solve this problem, an industry organization called the National Marine Electronics Association (NMEA) in 1983 developed a standard called NMEA 0183, which replaced earlier standards. This established a common language that all marine electronics could use, meaning — in theory, at least — that your wind instrument could talk to your chart plotter, which could talk to your autopilot, and so on. This was followed by NMEA 2000 in 2001. These are the two main standards used today, but you might also see Signal K and CAN bus mentioned. Here is a brief rundown of each standard.

## NMEA 0183

This was the first standard to get widespread use in the industry, coinciding with a boom in marine electronics, as modern chart plotters with GPS started to become available.

NMEA 0183 is a protocol in which each device sends out and receives information on separate wires. Each of these wires needs to be connected directly to another device (although you can "stack" a couple of devices onto an output wire using a bus bar), matching the receive wire to the other device's output, and vice versa. This means that a device can often have upward of four wires, each of which needs to be connected to the correct opposing wire or it won't be able to communicate. If you've ever scrabbled around in the bilge trying to join what seems like dozens of teeny tiny wires together, NMEA 0183 is likely the reason. This reliance on wires directly connected to each device limited the number of devices that could communicate in a network.

**NMEA 0183 Connections**




## NMEA 2000

NMEA 0183 worked fine when there were only one or two instruments talking to each other, but quickly became unmanageable once multiple networked devices became the norm. For this reason (and others, such as network speed) a new standard was created — NMEA 2000.

Instead of working on a peer-to-peer system, in which each device connects directly to another device, like NMEA 0183 does, with NMEA 2000, all devices connected to the network could share information with all the other devices. They did this by connecting to a single shared network cable (or backbone) instead of relying on individual wires to communicate. This allows multiple devices to hook up easily and painlessly, and the connecting cables are just one push-in multipin plug from the device to the backbone. No more crimping tiny wires! It's much more of a plug-and-play system than NMEA 0183 and can handle a lot more data.

One slightly complicated factor is that several manufacturers created their own versions of the NMEA 2000 standard (if you're wondering if that defeats the purpose of having a shared standard, you'd be right). Luckily, these all conform to the underlying NMEA 2000 standards, so

systems like Simrad's SimNet or Raymarine's SeaTalk$^{ng}$ can be connected to a standard NMEA 2000 network using adaptors and work just fine.

NMEA 0183 and NMEA 2000 can't natively talk to each other, but there are devices on the market called multiplexers that can translate one protocol to the other. These are either standalone devices, like the Actisense NDC-4, or are often built into a device like the Vesper XB-8000 series AIS or most modern chart plotters.

## Signal K

A (relatively) new kid on the block is Signal K, an open-source format designed to be used with applications that run on phones or tablets. The aim of Signal K was to facilitate an inexpensive way to get NMEA data from boat instruments and onto your phone. To use Signal K, you buy a small piece of hardware that translates NMEA 0183 and NMEA 2000 data into Signal K, which can then be used by apps on your phone or tablet. It also categorizes, renames, and filters the individual signals — for example, creating a category named "engine" and passing through all the information relating to rpm, fuel tank level, etc.

This makes it easier to create apps and programs to handle this information, since not only does the app writer not have to pay to use the NMEA standards, but all the data is neatly labeled and sorted. It makes it very easy to write information into a database or create your own display programs.

## CAN bus

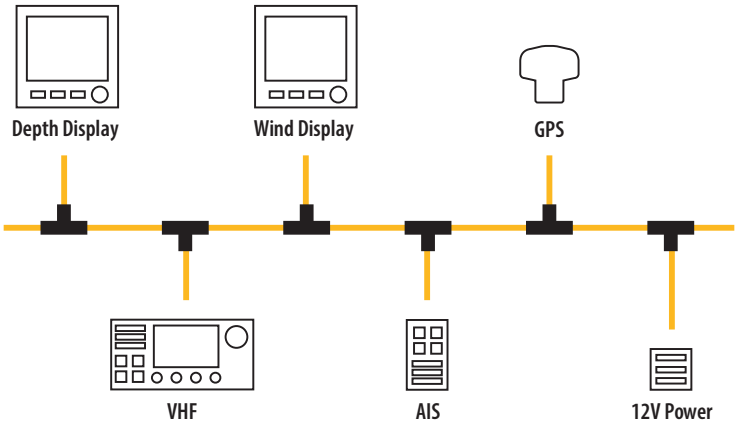
This is a bit different, since the term CAN (Controller Area Network) bus covers a range of individual protocols; in fact, NMEA 2000 is a form of CAN bus. The standard was designed for automobiles, and in the marine world it's mainly seen in relation to battery management systems for LiFePO4 (lithium iron phosphate) packs and a few other devices, like alternator regulators (for instance, the Wakespeed WS500). Victron also has a couple of CAN ports on its Cerbo GX monitoring device, which monitors a range of devices such as batteries, tank monitors, and chargers.

Because a CAN bus device can be one of several flavors, it's always best not to assume a device will talk to another and instead contact the manufacturer directly and see if they have any additional information.

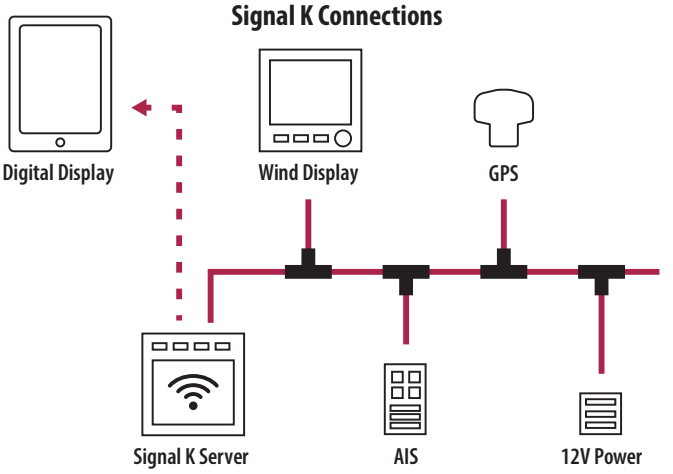
As boats now are typically equipped with more electronics than in the past, often from different manufacturers, understanding the various communications protocols is important. Though it's a dry topic, having a basic knowledge of what each protocol is, how to create the appropriate network, and how to troubleshoot communications issues is part of the process of becoming a better and safer sailor.

*Matthew Parsons has lived aboard and sailed since 2014. He sails his newest boat,* Sooner, *out of Victoria, British Columbia, and can be found on Instagram at sail_dive_fish or at saildivefish.ca.*

**NMEA 2000 Connections**




**Signal K Connections**



# An Ocean-Friendly Paint

*Determined to reduce his environmental impact, a sailor seeks an alternative to ablative-based antifouling paint*

GINO DEL GUERCIO

Several years ago, my wife and I were cruising the Bahamas when I decided to go for a dip. In the crystal-clear waters, I could easily see my hull needed a cleaning. I had applied two coats of copper ablative paint a year before and by now the bottom was beginning to look like my hair at the height of the Covid-19 pandemic — pretty bushy.

Being a thrifty cruiser, I usually do this nasty job of scrubbing the bottom myself, but a fellow sailor told me of a local guy who does an excellent job at a remarkably reasonable price. So I called him, and the next day he showed up in a leaky skiff with nothing but a snorkel, mask, and fins. As he began to scrape away the growth, I peered over my lifelines and was horrified and embarrassed to see enormous clouds of bottom paint billowing around my boat and drifting downcurrent.

When I scrub the boat bottom in my home waters of New England, the effect is not nearly so obvious, since the waters are generally opaque with green algae. But in the clear waters of the Bahamas, the results were striking. I know antifouling paint is designed to kill barnacles and other sea life — it's a poison — and here I was releasing clouds of it into these pristine waters near some of the most beautiful reefs in the world. So I decided to learn more about antifouling bottom paints and their effects on the world's oceans. I discovered that what I was doing, what many of us boaters are doing, was much worse than I suspected.

## A Deadly Problem

It's not easy to find experts on this topic, and it appears that not much research is being done on it. But after several calls, I found Dan Rittschof, Ph.D., a professor of environmental science at Duke University and an expert on barnacles, fouling, and marine toxicology. Most modern bottom paints use copper compounds as the primary agent to keep organisms from adhering to our boats. Rittschof explained that copper bottom paint creates an extremely thin layer of copper ions in the water surrounding boats, which kills the free-floating larvae of marine organisms, also known as plankton. The seabed under boats moored in areas with little current, Rittschof said, will typically be a circle devoid of life such as marine worms, sea stars, shellfish, and other animals that have no interest in attaching to our boats. The bottom paint has killed everything. Now imagine the typical harbor containing hundreds and sometimes thousands of boats. Each of these owners is essentially slowly pouring several gallons of poison into the harbor.

> I want to be part of the solution, not the problem.

It's not as bad as it used to be. Back in the 1970s, most bottom paints contained tin, which was found to severely impair the reproductive systems of marine organisms and was banned in the United States and many parts of the world. Tin was replaced with copper compounds. Washington state and parts of Europe have now banned copper-based antifouling paints, and many more places are considering bans. But since there are no widely accepted alternatives, most bans are not being enforced.

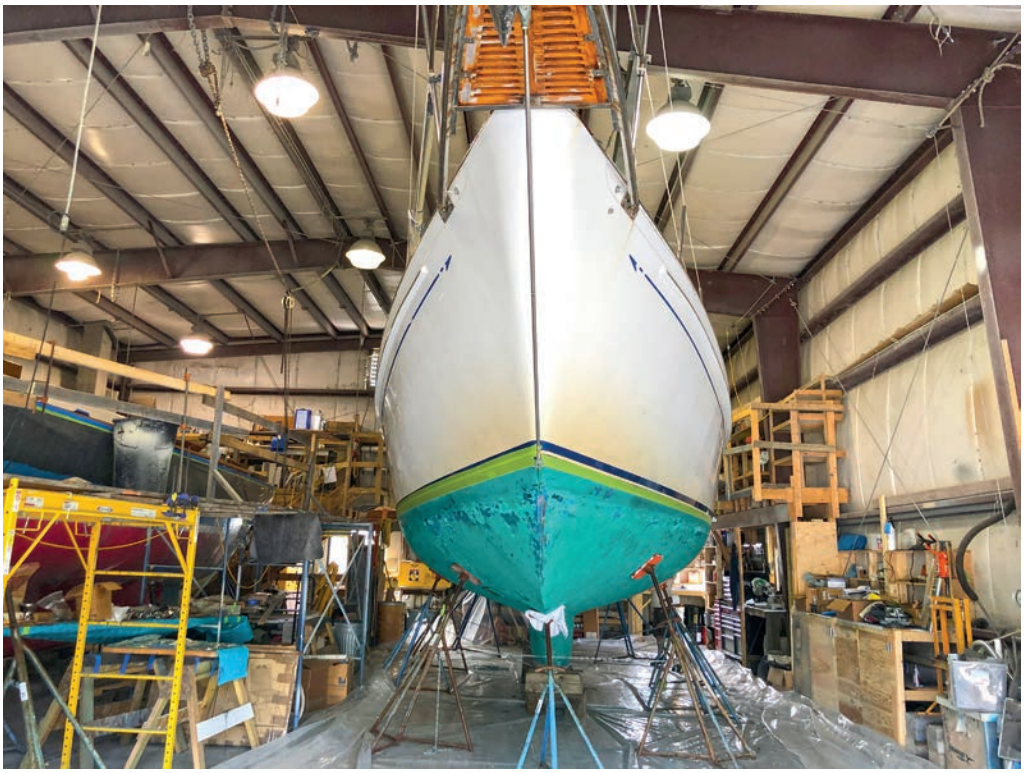
Rittschof says the safest solution is not to use bottom paint at all, but rather to pull your boat out of the water after every use, which, although common among many small powerboat owners, is just not feasible for most of us with larger cruising sailboats.

I discovered that the problem is much bigger than just our harbors, since plankton are critical to the survival of our planet. Howard Dryden, Ph.D., chief scientific officer of the Global Oceanic Environmental Survey, explained that plankton extract more carbon dioxide from the atmosphere by far than any other means, including trees. The overwhelming majority of carbon dioxide removed from the atmosphere each day is removed by plankton, which we are inadvertently killing with our antifouling bottom paints. Research shows that the world's oceans have already lost more than 50% of all plankton since the 1950s; that's not just due to bottom paint, of course, but we boaters certainly are not helping.

I vowed that the next time I applied something to the bottom of my boat, it would be a less environmentally damaging solution while still being affordable and effective. I want to be part of the solution, not the problem.

## Possible Solutions

There are several alternatives to heavy metal antifouling paints. Most bottom paint companies have come out with



***Andiamo* with her old peeling ablative bottom ready to be soda-blasted.**

formulas that don't contain copper, but as Rittschof points out, very little research has been done on the environmental effects of these chemicals.

One category of products creates a super-slick surface using silicone so the organisms slide off when you rub them off or drive through the water quickly. But if you're not cleaning your boat regularly or moving it often, more growth forms on the bottom and after a while, it's a lot of work to get off.

Another new product mimics a technique that sea urchins use to prevent hard growth. Called Finsulate, it is a material with a fine hair-like structure that is glued onto a boat's bottom. I've never met anyone who has tried it, but as Rittschof points out, Mother Nature is ingenious and there is no product known to man that some organism hasn't found a way to stick to. Yet another solution uses ultrasonic sound waves to discourage growth. That sounded high-tech and more complicated than I was willing to deal with, and according to some cruisers who have tried the product, such as the crew of SV *Delos*, it is not 100% effective either.

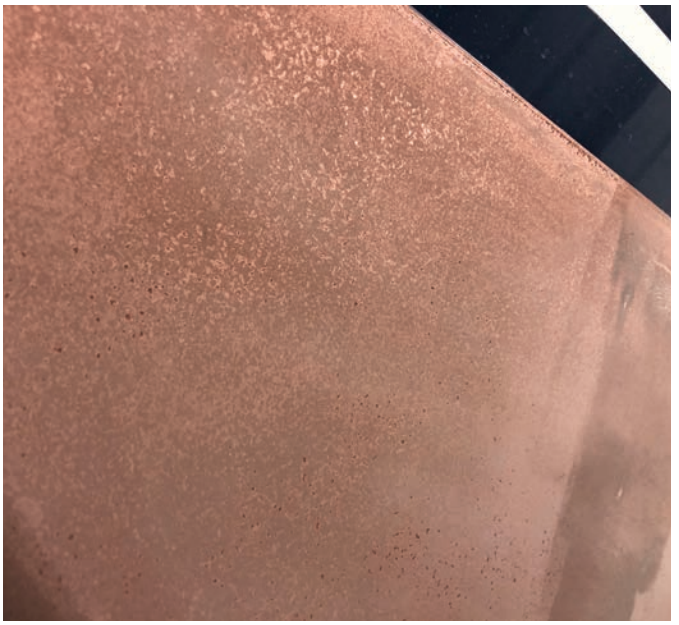
Coppercoat antifouling paint has been on the market since 1991 and is recommended by several people I know, including *Good Old Boat* contributor Ed Zacko. He recently wrote a piece about the refit of his boat, which included Coppercoat application. He's been happy with it so far and recommends having the product applied by a yard that has experience with it.

Ironically, Coppercoat involves applying copious amounts of pure copper to boat bottoms. The practice harks back to the days of the British sailing warships, when the British Navy applied copper plates to boat bottoms to prevent shipworm penetration into wooden hulls and discourage growth. Unfortunately, copper plate is too heavy and expensive to be used on modern boats.

To accomplish essentially the same outcome, a British company developed Coppercoat, a mixture of 99% pure copper powder and epoxy. Once cured, Coppercoat is sanded to expose the copper embedded in the epoxy. According to the manufacturer, the product has a leach rate well below the most restrictive standards worldwide. An additional benefit cited by the company is that application does not release volatile organic compounds (VOCs), which have adverse health and environmental effects. And the product uses water-based epoxy, making cleanup simpler.

Coppercoat claims its product will last 10-plus years before a touchup is needed, which means fewer plastics going into the ocean — epoxy is a plastic and plastic is a major contributor to plankton dying. Touchups don't require removing old Coppercoat, but simply sanding off the surface and adding a couple of extra coats to areas that have worn thin.

**The bottom after being soda-blasted to remove 30 years of old bottom paint.**



Using the wrong rollers created an orange peel surface that had to be sanded down.

This all sounded good. However, a quick search for "Coppercoat problems" on YouTube turned up a distressing number of people reporting failures with the product. There are also other issues to consider. For one, Coppercoat is only designed to repel hard growth, versus slime and other soft growth. Using the product requires cleaning your boat bottom regularly to prevent any hard growth from using the soft growth as a base.

Cost is another issue. Applying Coppercoat requires first removing all previous bottom paint, usually via soda-blasting or some other method. My boat had 30 years of old bottom paint, which was peeling off in sheets (especially bad for the oceans), so I needed to do this anyway. Additionally, the product is pricier than some other bottom paints — it cost me $2,173 to cover the bottom of my 44-foot cutaway keel cruiser. And Coppercoat is applied over the course of a week or more, which increases yard and labor fees. On the other hand, if the paint lasts a decade or more, you may break even or even be a bit ahead in the long run.

## Our Experience

It's not easy to find boatyards in the United States that have much experience with Coppercoat. I found one in Rockland, Maine, that was highly recommended. Its paint manager said he had no experience with the product but was willing to give it a try if I supervised. I knew I was taking a risk, but given what I had learned about the effects of antifouling paints on plankton, I felt I needed to try it. One advantage of this yard was that my boat would be in a climate-controlled shed for more than a month while a new engine was being installed and the boat's topsides were painted with Awlgrip. I figured if we followed the directions to the letter, I'd probably avoid any disasters.

## The Headaches Begin

The project began in fall 2020, and there were problems right from the start. The yard hired a subcontractor to soda-blast the bottom, but the decades of paint on my boat required more time and materials than anticipated, exceeding my budget. Worse, the soda-blasting revealed a significant number of blisters, which had to be sanded and filled, further increasing costs. None of that can be blamed on Coppercoat or the yard; as most boat owners know, boat projects almost invariably turn up additional problems that need to be addressed.

Coppercoat can be applied without a barrier coat, but the company recommends using a ceramic-based coating called CK426, typically used to paint potable water tanks. That part of the project went well. The manufacturer recommends that Coppercoat be applied at a temperature above 50°F and in low humidity. Since the epoxy in Coppercoat is water-based, rain, dew, or even just high humidity can apparently cause it to cure improperly. Though my bottom-painting project started in early September, the weather was cool and rainy, so the yard turned up the heat in the shed to dry things out and keep the temperature at 72°F.

Mixing and applying Coppercoat is not complicated, but it must be done quickly and precisely. Two experienced painters rolled on the product while I mixed and supervised. The company estimated that I would need 12 kits, which contain the epoxy, a hardening agent, and a bag of copper powder. After the epoxy and hardener are mixed together, the copper is slowly and carefully poured in to avoid creating bubbles. The painters

The hull was a little patchy after the author had to sand and repaint it.

*Andiamo* after the Coppercoat application, before the surface was burnished smooth.

went to work while I stirred the paint to keep the copper suspended, refilling their trays as needed. That part went smoothly.

The literature recommends using ⅛-inch nap foam rollers. We couldn't find those at nearby chandleries and hardware stores, but we found rollers that were pretty close, and since time was running short, we decided to go with them. Big mistake.

In reading horror stories about Coppercoat, I identified two main types of failure. The first is that the paint does not adhere. I assumed that was because the wrong barrier paint was used, the sublayer was not cleaned well enough, or the temperature or moisture was wrong. I was confident I had gotten those things right.

The second mode of failure is that the Coppercoat is not smooth enough after curing, leaving nooks and crannies for critters to hang onto. After Coppercoat is applied, it takes a couple of days for the epoxy to harden; it must be hard enough not to gum up sandpaper, but not so hard that it is difficult to sand. The yard workers kindly agreed to come in over the weekend to sand so that we got the timing window right.

But when we started to burnish the Coppercoat, we discovered that the rollers we used created a light orange peel surface. We needed to sand that off, but when we did, we also started sanding through the Coppercoat to the white barrier coat below. My heart sank. This was starting to look like one big, expensive mistake. I called the company and was told I could buy the correct rollers from them, so I ordered rollers and a couple of more kits to cover the places that we had sanded through. My wife and I applied the additional paint with the new rollers, which worked much better. Then I spent the next five days sanding off every area of orange peel I could find. In the end, the bottom looked patchy, but I was hopeful all my effort would pay off.

The crew at Johanson Boat Works, with the boat looking like new after two months of work.

## Results

Despite all the complications, I figured if the product worked as advertised it would still be worthwhile, but I wouldn't know for sure until I had the boat in the water for at least a season.

It's now almost a year out from the Coppercoat application, and in that time we've sailed *Andiamo* from Penobscot Bay in Maine to Ragged Island, the southernmost point in the Bahamas, and back. Every few months I've been diving the bottom, inspecting it, and scraping off any growth with a metal paint scraper. I've found soft growth that's easy to scrape off and a few barnacles here and there, but nothing too bad. The real test would be when I pulled the boat out and could give it a close inspection.

We did that in September 2021 in Maine's Rockport Harbor. Since we'd been cruising in colder waters since the previous May, I hadn't done much to inspect or clean the bottom. This would be the true test of my Coppercoat bottom

*Andiamo*'s bottom after about six months with Coppercoat. A light layer of slime is visible.

job. As the boat came out of the water, I saw a moderate amount of growth that was clearly more than just slime. There were multiple places where more advanced growth had taken hold. I was a bit disappointed. It was not terrible, but definitely not perfect either.

It took me a few hours with a scraper to knock off the barnacles, which were small and came off easily. As I removed them, I made sure to also scrape off a thin layer of the epoxy, figuring that the copper likely wasn't fully exposed in those areas. I also noticed that on the very bottom of the keel, where we were unable to apply Coppercoat because the boat was on blocks and instead applied some regular ablative paint before relaunching, there was a thick layer of large barnacles. So while the Coppercoat did not keep off all the hard growth, it did a good job of keeping most off.

I also found two nickel-sized places where some of the paint had chipped off. I'm not sure what was going on there. Perhaps I didn't prepare the barrier coat well enough in these two places. I'm hoping that's the extent of it and that I won't see more flaking in the future.

## Is Coppercoat Really a Better Solution?

I would not say Coppercoat is better at preventing growth than some of the other copper-based paints on the market today, which can do a good job of keeping both hard and soft growth off for a year or two. But they are not good for the ocean.

Is Coppercoat more environmentally friendly? Rittschof points out that solid copper, traditional copper antifouling paints, and Coppercoat all work the same way — they kill with copper ions. He is also concerned about the epoxy in which the copper powder in Coppercoat is embedded, since many types of epoxies contain phenylboronic acid (PBA), which is known to disrupt the metabolism, growth, and development of living organisms.

Discouraged, I reached out again to Dryden at the Global Oceanic Environmental Survey. He owns a cruising sailboat much like my own, and I asked him what he uses on its bottom. His answer: Coppercoat. Dryden goes so far as to say ablative paints, a major source of microplastics in oceans, should be banned. Hard bottom paints are better, he says, but they still leach toxins into the water. So does Coppercoat, but copper in low doses is a micronutrient naturally present in sea water, Dryden says. And since Coppercoat doesn't have to be sanded down to apply another coat, copper entering the marine environment is minimized.

As Rittschof says, there is no free lunch. But for me, at least when I clean my boat bottom with its new Coppercoat paint, I won't be releasing enormous clouds of microplastics and complex chemicals, as happened in the Bahamas. For now, I'll have to live with the environmental consequences or stop cruising until something better comes along. I like to think that our full-time cruising lifestyle is very green, and hopefully that offsets some of the negative impacts of my bottom paint.

*Gino and Carolyn Del Guercio have lived aboard their Brewer 44,* Andiamo, *for the past few years, spending summers in New England and winters in the Bahamas.* Andiamo *is one of very few boats that have twice graced the cover of* Good Old Boat.

The boat bottom after a year of cruising with Coppercoat. The slime and a small number of barnacles were easily removed with a powerwash.

# The Copper Paint Question

## *Regulating copper-leaching rates of antifouling paints may be better than banning them*

BY DREW FRYE

Copper is lethal to many marine organisms. That's why it works. Antifouling paints release a tiny but steady stream of copper ions, which repel barnacles but also enter the environment, potentially accumulating to sufficient amounts in poorly flushed harbors to levels that can affect the local biome. Washington and California have been wrestling with this issue for decades, and it seems, at least from a regulatory perspective, that a compromise has been struck between clean bottoms, environmental risk, and our understanding of the problem. In 2011, Washington state banned copper-based antifouling paints, effective January 1, 2020.

Super-slippery paints have been proposed as an alternative, but in high-fouling areas they are all spectacular failures when applied to sporadically used sailboats; there simply is not enough turbulence to cause the growth to release, and the bottom appears as though no antifouling was used at all. Copper-free paints have been proposed, and in fact, many of them are quite good. I have a test patch of a two-year copper-free paint on my boat right now, alongside test patches of copper-based two-year paints, and at the one-year mark it is among the best performing.

But what about the toxicity of the organic antifouling chemicals used to replace copper, including cybutryne/irgarol, DCOIT/Sea-Nine, tralopyril/econea, and zinc pyrithione? Washington commissioned a review of the alternatives and decided that the risks might just be greater than copper, which is naturally occurring and well understood. In 2015, Washington delayed the ban until 2026, pending a study due in 2019. The study revealed that although copper from boats was measurable, only one marina actually exceeded state water quality targets, and it was not clear to what extent the copper was in a form that was bioavailable and thus toxic. The study further concluded that irgarol should be heavily restricted or banned and that control of copper-leaching rates is probably the best path forward.

Meanwhile, California had been pursuing a different approach, measuring and then regulating the rate at which copper paints leach. It was determined that paints that leach less than 9.5 µg/cm2/day (micrograms per square centimeter per day) present minimal risk to the environment. In 2013, the California Department of Pesticide Regulation proposed that effective July 2018, the maximum allowable leach rates depending on hull cleaning practices would be 9.5 µg/cm2/day for boats that were cleaned no more than once per month using best practices (using a soft-pile


**When working with any bottom paint, remember to protect yourself and contain all materials.**

Drew Frye cleans a four-panel paint testing board.

carpet or something similar) and 13.4 µg/cm2/day for products that prohibited in-water hull cleaning (ablative paints). All registrants were required to submit proof of testing by a prescribed method.

About the same time, the U.S. Environmental Protection Agency proposed that a 9.5 µg/cm2/day copper leach rate limit should be sufficiently protective, but did not have enough data on the performance of the paints in the marketplace to determine which might be acceptable and what the current leach rates were. In fact, past testing suggests that most multiyear copper paints have met this standard for some time, because if they did not carefully parcel out their copper loads, they would never last the expected two to three years. Single-season paints, on the other hand, often release copper more quickly and less carefully.

The use of cybutryne/irgarol has been banned in Europe, California, and Washington, and all the major manufacturers have stopped formulating with it. The environmental impact and regulatory fate of other copper alternatives are unknown.

My recommendation is to use multiyear paints when possible, stretch them as far as possible, and minimize (hard paint) or eliminate (ablative paint) in-water cleaning. Keep your ear to the ground for new technical and regulatory developments. I'm not on the copper-free bandwagon, because the safety of the alternatives is not known, and at least one has been banned because it was worse than copper. Let's not second-guess conservative West Coast agencies.

Most of the major brands have reformulated to the new California limits — check the list to see where you stand. Where does Coppercoat stand on the spectrum? Judging by the copper load, life expectancy, and limited effectiveness in high-fouling waters, it is a low leach-rate product, probably half the 9.5ug/cm2/day standard, but we don't have the data, and performance (and leach rate) appears to be very application- and maintenance practice-dependent.

Good Old Boat *Technical Editor Drew Frye draws on his training as a chemical engineer and pastimes of climbing and sailing to solve boat problems. He cruises Chesapeake Bay and the mid-Atlantic coast in his Corsair F-24 trimaran,* Fast and Furry-ous*, using its shoal draft to venture into less-explored waters. He is most recently the author of* Rigging Modern Anchors *(2018, Seaworthy Publications).*


## Additional Information

**Washington Department of Ecology recommendations to the legislature:** https://apps.ecology.wa.gov/publications/documents/1904020.pdf

**California antifouling paint guidance to boaters:** https://dbw.parks.ca.gov/pages/28702/files/Boaters-Guide-to-Using-Hull-Paint.pdf

**California paint leach rate list.** (I feel sure there is a more recent list, but I could not find it and the paint suppliers I asked have not responded. Note that Pettit has renamed many of its paints, including the Odyssey line, in a marketing change, and the registrations map across, though I cannot find that document.): https://www.waterboards.ca.gov/rwqcb9/water_issues/programs/watershed/docs/swu/shelter_island/final_copper_afp_leachrate_list.pdf

**California Department of Pesticide Registration webpage about antifouling paints.** (They promised a list, but it has not been finalized.): https://www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/antifoulant_paints.htm

Make sure to adhere to boatyard and marina rules regarding sanding, scraping, and washing your boat's bottom.

PHOTO COURTESY OF T2PTV

# Anatomy of a Bottom Job

## *Helping a classic Alberg come to life as a racer-cruiser*

BY JONATHAN BRESLER

Sailing — moving a craft through the water using the wind's energy — is a magical experience. Witness the variety of explanations put forward over the years as to how those curves of fabric above us move our boats in the directions we choose. From a dead calm with the boat motionless in the water, a light air appears and the boat starts to move ever so slowly. As the wind builds, our vessel's speed increases, it begins to heel, we attain the highest speed that the craft's design allows, and then we start to reef. We transition from trying to capture all the energy we can from the wind to shedding the energy in excess of what can be used to move the boat.

Working against our sails is the resistance of water. That resistance is made up of two elements: friction between the water and the hull and wave-making. Both slow us down, stealing a portion of the energy that our sails have managed to capture. Wave-making is mainly beyond our control; the shape of the hull and the nature of water dictate the waves that the boat will make for any given speed. We can shift our position on the boat to maintain proper heel and pitch, but that's about it. Skin friction, however, is where we can take action and substantially improve our lot. The easiest step to take is to clean the hull, to remove all the plants and animals that come to live with us below the waterline. A foul bottom can make a boat with a 23-foot waterline, sailing at 4 knots, a quarter-knot slower than she would be with a clean bottom.

Once the bottom is clean, the next step is to make the bottom both fair and smooth. A bottom that curves gradually throughout from the entry to the stern, without obstructions protruding into the flow of the water, is fair. Sanding a fair bottom to remove surface texture, all those little ridges, bumps, and hollows that you can feel when running your fingertips lightly over the hull, makes the bottom smooth. Clean, fair, smooth bottoms move through the water with a minimum of resistance. Those boats are fast.

The author's first pass of sanding revealed several layers of blue paint and epoxy.

Here's how I created a fair, smooth bottom on *Constance*, a 1967 Alberg 30 that I transformed over several years from a decidedly cruise-only boat, restoring her original purpose as a competent racer-cruiser.

## Sanding Time

Just before I purchased *Constance* in May 2015, the previous owner applied an ablative paint to her bottom. I hauled her in the winters following both the 2016 and 2019 sailing seasons to address various items. Each time, I sanded the bottom, roughening up the existing paint to allow the two coats of new ablative paint to adhere well. *Constance* started racing in 2019 when the skipper of the Alberg 30 I had raced with for 20 years decided it was time to take a break. The experience was more than a bit humbling. Bad starts. Slow at the starting line. Stretched-out sails. Undersize genoa and spinnaker. Excessive rake. Excessive weather helm. There was a lot to fix. Speaking with the other skippers and practicing helped to address some of the problems. Purchasing a full-size spinnaker in early spring 2019, reducing rake while replacing the standing rigging in 2020, and purchasing a new genoa and a nearly new mainsail in 2021 addressed a number of problems. *Constance* had become competitive but not a podium boat. Now that she had the sails to capture the wind, the single major improvement remaining was to stop wasting the energy captured above the waterline on resistance below the waterline.

At the end of the 2021 sailing season in Annapolis, Maryland, *Constance* was hauled out for the winter's work, with temperatures quite often being in the 40s. On the last day of November 2021, I started work. Wearing a Tyvek hoodie/footie suit, T-shirt, jeans, and full face 3M 7800 respirator provided enough insulation from the cold while sanding the bottom that I was comfortable, neither chilled nor sweating. It took six hours of sanding with a 5-inch random orbital sander and 60 grit Diablo 5-inch SandNet discs to make a first pass over the bottom, the equivalent of what I had done in both 2016 and 2019.

This first pass of sanding revealed blue bottom paint, perhaps six coats, below the three layers of red ablative bottom paint that had been applied since 2015. Below the blue paint was a layer of resin. It appears that at some point, a previous owner had removed all the paint, mixed resin and hardener, and coated the bottom. After this initial sanding, the resin

Round two of sanding removed all of the red ablative bottom paint.

Ten more hours of sanding took the bottom down to the epoxy.

and the blue paint appeared in patches. Each of these patches was a spot where the hull surface stood a bit proud of the area around it, assuming that I had sanded the bottom evenly.

Having gotten a sense of the task before me, I spent the rest of December on other jobs. It was not until mid-January that I resumed work on the hull. Fifty hours of sanding later, nearly all the red bottom paint was gone and reasonably sized patches of resin were visible. Two to three hours with a sander vibrating in my hands and a Shop-Vac buzzing away collecting the sanding dust was fatiguing, and quite enough for one day, despite the full face mask and high-quality 30dB NRR ear muffs. One more pass over the hull and another 10 hours of sanding removed the remaining blue paint, exposing the layer of resin everywhere.

*Constance* came to me with a good through-hull depth sounder, but the transducer was mounted on a teak "fairing block" that stuck out of the hull about an inch and a half ... not good. The next task was to remove the transducer and the fairing block, then to grind back and fill the hole. For this job, an angle grinder worked well.

With all the paint gone, it was time to find out just how fair the hull might be. A 24-inch longboard sanding block, dry guide coat kit, and 60 grit sandpaper revealed the amount of variation in the surface of the hull. An alternative to dry guide coat is a carpenter's pencil. Scribble liberally over the area to be faired and then longboard until all the pencil marks are removed. I was quite happy to find that the resin layer had a bit of thickness to it, perhaps an ⅛-inch, so that I could use the longboard to sand away some portion of that ⅛-inch of resin to the extent required to even out the hull. Had *Constance* been lacking this coating, I might have ended up longboarding through the factory finish into the fiberglass of the hull at the high spots to bring them down even with their surrounding areas.

Longboarding away a portion of the resin coating dealt with the high spots. For the lows that remained, I turned to applying filler. The filler I ordered, TotalFair, came with a plastic spreader, which is what I used. Bad move. Despite pressing hard while spreading the filler to the low spots and leaving a minimal amount of filler on the surrounding areas, the lows ended up overfilled. The plastic spreader deformed enough to create a bulge away from the hull in the middle of the spreader. Longboarding these unneeded and unwanted high spots of filler was time-consuming and frustrating. It was the one part of the project that created unnecessary work. In retrospect, I should have used a metal putty knife or putty spatula to spread the filler.

Running a 24-inch longboard over the hull is a bit of work. Very fine sanding dust flies off the board throughout the first hour; maintaining the same rate of progress through the second hour was tough.

**When applied, the filler stood a bit too proud and created extra work.**

**Before and after longboarding the new primer with 80 grit sandpaper.**

Into the third hour of longboarding figure-eights over the hull, I was toast. Two hours of longboarding seemed to be about what I could do well in a day. The color of the Tyvek suit at the end of each longboarding session confirmed the progress being made. Slowly the color turned from reddish, to purplish, to bluish, until finally becoming very fine white shavings rather than dust. By that point, I had removed all the paint from the bottom of the hull and evened out the surface.

## Crafting a New Bottom

After 25 hours of longboarding the hull, the time had come, finally, to begin creating the new bottom. Having chosen the bottom paint based upon recommendations from skippers in the Alberg 30 racing fleet, I applied the compatible primer, Pettit Protect Heavy Duty Two Component Epoxy Primer. Two layers, white over gray, would give me four mils of white primer to longboard before cutting into the gray primer below. The ¼-inch nap roller I

On left, ***Constance*'s hull looking smooth after wet-sanding.**

Below, **bottom paint applied, finished, and ready to burnish.**

used resulted in significantly less texture in the dried surface of the primer than on other boats in the yard painted with ¼-inch rollers. Less texture meant less time spent longboarding the primer and less primer lost to sanding.

Given the texture in the primer from the ¼-inch nap roller, I spent about seven hours wet-sanding the primer using a longboard. Over the course of longboarding, March turned to April, then mid-April. Time was getting short. The season was fast approaching, and other projects needed attention as well.

Finally, the day came to apply bottom paint. After applying two coats of hard paint, Pettit Trinidad Pro, it was time to complete the job by burnishing the paint, wet-sanding using the 24-inch longboard and 320 grit sandpaper. The hull was now fair and smooth enough that I had to be careful when starting the longboard moving to make sure that the sandpaper stayed adhered to the longboard rather than to the hull. It had gotten to the point that the water used in wet-sanding could bond the sandpaper more tightly to the hull than to the adhesive holding the smooth side of the sandpaper to the longboard. It took only a couple hours to longboard the entire bottom with 320 grit.

## Race Ready

*Constance* launched the next day. A few weeks later, the sailing season began in earnest as the Annapolis Yacht Club started its Wednesday Night Series, which runs from late April through September. That race series provided the crew of *Constance* with three practice races before the 2022 Helly Hansen Sailing World Regatta in Annapolis. Each day of the regatta we improved upon the previous day's results. The first day was spent sorting ourselves out, but the second day resulted in a third- and second-place finish. The final day only had one race due to there being no wind at all, followed by rather light air. Light air was just what we needed because it meant slower speeds and less energy lost to wave-making, leaving skin friction as the dominant force of resistance to be overcome. These conditions would demonstrate the fairness and smoothness of the bottom relative to the rest of the fleet. Sail trim would be critical. We had to capture as much energy as the winds would allow.

A kerfuffle at the start resulted in both *Constance* and the previously undefeated Alberg 30 being forced over the line early.

Below on left, ***Constance* on the race course, dangerously close to the windward mark.**

Bottom right, **the author and crew concentrating to get as much speed downwind as possible.**

The two of us dropped back from the fleet to below the starting line, restarted, and chased the fleet. With 5 knots of true wind, *Constance* was hitting the speeds indicated by the ORC's velocity prediction program. The crew worked together remarkably well, allowing both the genoa trimmer and the skipper to focus on their primary jobs of watching telltales and trimming to match. The other crew members quietly relayed positions of the boats in our fleet and the GPS speed over ground readings. After an hour of intense racing, two legs to windward and two downwind, the finish was so close neither boat was sure who won until we asked the race committee. *Constance* finished just ahead of the Alberg that had won every other race in the regatta!

This winter, 2022-2023, *Constance* is staying in the water while I work on some of the creature comforts aboard. My current thoughts are to haul out the winter of 2023-2024, longboard away much of the existing bottom paint, further fair the hull, taper the trailing edge of the rudder, apply two more coats of hard bottom paint, and then longboard with 320 grit again. Hopefully, the result will be a fairer and smoother bottom than this year's. Gaining a tenth of a knot increase on an average of 4.5 knots of boat speed would result in a lead of nearly four boat lengths per nautical mile. To obtain that advantage takes many hours of bottom preparation. To me, though, a fair bottom is worth the effort.

*Changing jobs from downtown Washington, D.C., to Annapolis, Maryland, led Jonathan Bresler to begin racing a variety of keelboats in the summer of 1998. With retirement approaching in several years, he purchased* Constance *in the summer of 2015 and began racing her in 2019. The bottom job of 2021-22 was the last structural systems refit. Next up are the comfort systems to prepare her for racing/cruising the Chesapeake Bay and beyond.*

## The Takeaway—JB

**Where does the wind's energy go?**
One of the miraculous aspects of sailing is that we move through two fluids, air and water, transferring energy from one to the other. Our sails capture energy from the moving air — the wind. The captured energy accelerates the boat until the energy captured balances the energy it takes to move the hull through the water. For a representative 40-foot boat beating to windward at 6.8 knots, the major energy costs are: wave-making (~36%) and skin friction (~34%). Leeway and heel account for ~15%, leaving about 15% for everything else. At slower speeds, skin friction is a larger portion of total resistance while wave-making resistance is reduced. Wave-making resistance becomes significant and rises sharply when boat speed divided by the square root of the waterline exceeds 0.7.

Of these sources of resistance, skin friction is one that is easiest to reduce. Cleaning the bottom is the fastest, easiest way to reduce skin friction. Once the bottom is kept clean, fairing and smoothing are the next steps. Refinishing the bottom greatly reduces the amount of energy needed to move the boat through the water, so the boat moves faster than before for the same wind and sail trim.

A fluid, such as water or air, does not flow over a surface at a uniform speed and direction. The water closest to the surface remains stuck to the surface and moves along with it, and the hull of the boat in our case. That moving water stuck to the hull (a laminar film) drags against the water just outboard and causes it to move along in the direction with the boat but at a slower speed. That slightly slower water drags against water just outboard, causing it to move along but slower yet. And so repeats until the effect is dissipated. As the boat moves faster, the stuck water layer becomes thinner. So long as the surface roughness of the hull is less than the thickness of the stuck water layer thickness, the roughness of the hull surface is hidden within the laminar film, and the hull appears "hydrodynamically smooth." Surface friction is at a minimum, so the amount of energy lost to surface friction is minimal and the boat moves faster. If imperfections of the hull surface stick out through the laminar film, those imperfections disturb the water flow, create turbulence, consume energy, and slow the boat. The goal of bottom preparation is to reduce the size of the hull's imperfections, its roughness, to be less than the thickness of the laminar film.

How thick is the laminar film? The thickness varies with the boat's speed through the water and the length of the hull's wetted surface. The laminar film of an Alberg 30 (21.67 foot waterline, worst case) moving at 6.7 knots, about as fast as the boat can go, is about 0.8 mil. "Smooth" marine paint has a roughness of about 2 mil, about the same as the diameter of a human hair. Per the manufacturer's data sheet, 2 mil is also the thickness of a single dried coat of hard paint. The bottom needs to be fair to within 4 mil or less, two coats each 2 mil thick, over the length of the longboard, before the bottom paint goes on. Otherwise, one runs the risk of sanding through the new paint before the surface is smooth.

Longboarding the "smooth" marine paint to reduce the roughness below the height of the laminar film reduces the skin friction losses by about 10%, or a reduction of about 3% in total resistance. All the above assumes no imperfections in the work and the result ... not the world in which I live. A 3% increase in speed would seem to be unrealistic. In light winds, when boatspeed might be 3 knots, a 3% increase in speed would mean a gain of nearly 200 feet per nautical mile. One percent at 3 knots yields 6 feet or two boat lengths.

So, longboard using progressively finer grit of sandpaper for as long as schedule and time allow. The result will be noticeably faster and smoother sailing. But what really makes a sailboat truly go fast? It's the crew. The crew trims the sails and captures the wind that moves the boat. The better the sail trim, the more wind energy that is captured by the sails. Only after the crew has captured that wind energy through sail trim do other factors come into play.

# Comfort Aloft

## *Padding your mast climbing harness will save your legs and allow you to work longer*

BY DREW FRYE

Climbing harnesses have become increasingly popular for mast work, outstripping the traditional bosun's chair. They are easier to climb in, harder to fall out of, more mobile, and position a person higher when working on the top of the mast. But they are also notorious for putting your legs to sleep. Unless you can get the weight onto your feet and off the harness, as little as 10 minutes of hang time can cause rubber legs on the descent and pins and needles as life returns.

Not only is this uncomfortable and painful, but these are also the warning signs of a potentially dangerous condition — suspension trauma. Stagnant blood accumulates in the legs, and it's a shock to your system when it rejoins circulation. Clots and deep vein thrombosis are known risks, which increase with age. Many riggers prefer specialized harnesses that are designed for prolonged suspension, but they're pricey.

My 50-cent solution to the problem is to cut large thigh pads from firm foam, like that used to make exercise room floor tiles. Cut two ½-inch thick by 11-inch-long by 6-inch-wide rectangles, round the corners, and secure these to the inside of the leg loops of a common rock climbing harness with duct tape or something similar. Test the fit by hanging from a halyard in the harness for a few minutes. Make sure nothing binds when you move your legs and that you have enough freedom of movement to use your legs while climbing and descending the mast.

**For extra padding, use stiff foam such as ½-inch exercise floor tiles. Keep them in the bag with your harness and add them anytime you will be up the mast for more than a few minutes.**

In my experience using this type of extra padding, the harness should now be comfortable for at least 30 minutes of use aloft. That should be long enough for the user to have either finished or want a break for some other reason. And no more stiff "mast legs" when you get back on deck. If your legs start to feel heavy, stiff, or worst of all, numb, return to the deck immediately and finish the work later.

Another safety tip: A rock climbing harness belt must be snug enough around your natural waist that it cannot possibly be pushed down and that you can hang inverted without it coming off. If your waist is not this well defined, you must wear a full body harness.

*Refer to page 50 for Drew Frye's bio.*

For more information on suspension trauma, see the following links:

https://en.wikipedia.org/wiki/Suspension_trauma

https://elcosh.org/document/1662/d000568/Will%2BYour%2BSafety%2BHarness%2BKill%2BYou%253F.html

https://www.wemjournal.org/article/S1080-6032(10)00402-3/fulltext

*Continued from page 7*

## Slow-Motion Dreaming

Just a note to say how much I enjoyed David Blake Fischer's delightful piece in the September/October 2022 issue, especially since I, too, have just purchased an older Cape Dory sailboat. Forty-five years ago I built a Tom Gillmer-designed Aries ketch in Sidney, British Columbia, sailed her to New Zealand and back, then cruised B.C.'s Inside Passage with my wife, Masayo, for many years. We've now sold her, deciding in our old age (I'm 82) to downsize to a smaller boat for cruising local waters, much as described in Bill Gardam's Reflections piece back in the September/October 2012 issue.


Recently we bought a 1984 Carl Alberg-designed Cape Dory 25D on its trailer to reduce moorage and annual haulout costs. A pocket cruiser, *Slow Motion* is a wee bit larger than Fischer's *Delilah* and with an inboard diesel engine. Currently I'm building a hinge/gin pole apparatus to allow Masayo and me to raise and lower the mast ourselves without services of a big city yard or use of a crane. As you can see from these photos she's a pretty little boat, all we need to cruise our Gulf Islands — although as the winter monsoons arrive here on the "Wet Coast," I dream of towing *Slo Mo* 2,000 miles to the Sea of Cortez for sailing under sunny Mexican skies!

—**Bob Hassell**
Salt Spring Island, British Columbia

## Ode to the Sea and GOB

Dear *Good Old Boat*,
There was a time when I thought of the sea
As the only place in the world to be.
To crest each briny wave and slide deep down
Touching the tip of King Neptune crown.
Each year the effort to skirt the sea
To ride the waters of the world to see
Takes more of my strength and ardor
So I'm left to travel from my couch side harbor.
I see the world is running fast with iPods and email blasts
Reminding me that my subscription's past.
But if you know an old mind upon the deck
I'd rather pay by mail with an old-fashioned check.
So here's my discharge for twenty twenty-three.
Please fill my soul with *Good Old Boat* voyages yet to be!

—**Howard Nelson**
Waukesha, Wisconsin

## Beautifully Tame

Years ago, we had neighbors who sailed on Lake Sakakawea. We often camp at Lake Sakakawea State Park and always see sailboats out on the lake. It may be pretty tame to most of the readers of your magazine, but it is a beautiful lake and seeing a sailboat out on the lake in the summertime is awesome. I've attached a picture (right) we took this fall at the Fort Stevenson Regatta. Not a huge regatta, but a decent number of people were there to enjoy a day at the lake watching the boats.

—**Judy Herring**
Bismarck, North Dakota

## New Year's Sails

Today, Jan. 5, was my second day out sailing in 2023. The first was New Year's Day. Today, my longtime friend Scott Logan and I sailed my 1996 Beneteau First 42, *Shutter Speed*, in the Mississippi Sound. This photo is Scott at the helm enjoying a nice beam reach down the Pascagoula Ship Channel. The temperature was in the high 60s.

—**Dick Dixon**
Mobile, Alabama

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## Boats for Sale

### Hinterhoeller Nonsuch 30

1983 classic. Great boat in very good condition. New items include sail, shaft, interior cushions, batteries, solar panel, teak cockpit table. Newer items include custom winter cover, rewired mast w/new cables, stack pack sail cover, dodger, helm cover, cockpit cushions, aluminum fuel tank, plastic water tanks. Equipped w/ Westerbeke 27-hp diesel engine, autopilot, Garmin chart plotter, radar, Standard Horizon radio, electric sail winch, pressurized hot + cold water, electric head, refrigerator, propane stove/ oven + cabin heater. Kittery, ME. $32,000.

**Bob Schwarz**
**978-519-9161**
**lin.schwarz@comcast.net**

### Carter 33

1974. Two-owner vessel:. First owner limited production ¾-tonner racing series hull 5/10, Henry Scheel's boatyard, NY; second owner Chesapeake Bay cruiser. Original papers, all manuals print or electronic. 6' hdrm, spacious, very good condition, fully equipped, she loves to sail. Innovative architect, search "Dick Carter Fastnet." Pics at ritual.piwigo.com. Lancaster, VA. $15,000.

**Jeff Seed**
**804-690-2214**
**jaseed@jaseed.com**

### Pearson 26 Weekender

1976. Great daysailer, exc PHRF racer, heavy-duty gear, spinnaker-rigged. Lots of accessories. Incl LS outboard, car trailer, steel cradle. Plymouth, MN. Boat $2,000. Dinghy $300.

**Michael Barnes**
**763-557-2962**
**granite55446@gmail.com**

### Sea Sprite 23

1980 classic daysailer, C.E. Ryder Corp design. 4 sails and spinnaker. Full keel in great condition, bottom painted with Pettit HRT Premium Multi-Season Antifouling July '22. Yamaha 8-hp 2008 runs well with new carburetor, new fuel-water separator, new fuel line, and new water pump. Nice interior cushions. Sails well and looks good. Edgewater, MD. $6,995.

**Dave Wigglesworth**
**240-429-8256**
**dave.wigglesworth@gmail.com**

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# The Dawn's Peace

## *Quiet morning moments on a boat bestow a tranquil richness*

BY ROBERT BERINGER

Is there any doubt that the best place to be in the world is on a boat first thing in the morning?

Listen: For a few seraphic moments all the world, but for the drift of the tide, is still. My eyes open with the gull's first cry and I clumsily crawl out from the cramped aft cabin, careful not to hit my head on the low fiberglass overhead. In the saloon I can almost believe that I'm on land; motion is barely detectable, just enough to feel the slightest swing of the rode — but the clicking claws of shrimp around the hull betray the ruse.

On deck the air is heavy and dew covers all exposed surfaces. I extinguish and stow the anchor light; the waning moon smiles down from a rose-petal pink and lavender sky. The glassy water undulates slowly.

Cockpit spiders, knowing that light converts them from predator to prey, abandon their carefully constructed cobwebs to seek solace within the many confines of the bimini. Our anchorage, which had been so boisterous last evening, is now the picture of equanimity — as if it too needed to slumber and is just waking up. Something nips at the water's surface; a small fish jumps.

Private conversations are telegraphed from the distant shore: A baby cries, a dog barks, Amtrak rumbles. Prop-fouling crab pots, which can be so hard to spot underway, are now cleanly laid out in a long dotted line, patiently waiting for their owner to arrive. Do the inmates know they are eating their last meal?

The water ripples with the movement of dolphins and manatees, two noncompeting mammals who live in harmony, searching the river for a meal.

The sun cracks the treetops; its warming rays kiss the Windex and slide slowly, steadily, down the mast. When they strike the deck, the boat comes to life: The vent fan spins, the solar panel clicks, a faint evaporative mist forms above the coach roof. The crew, too, comes to life and I hear the pump of the head and the clank of the coffeepot. Soon a delicious smell will waft up from the galley. The fresh air out here magnifies hunger pangs, and my stomach growls with anticipation.

The wake of a distant tug bumps the hull and the halyards rattle. The wake took almost five minutes to reach us, and the tug is almost out of sight. Taking full advantage of the ground effect, a line of hungry brown pelicans silently glides by in perfect symmetrical reflection.

The still, cool of the morning belies the forecast of a hot and humid day: Thunderstorms are coming. Recumbent in the cockpit, I consider the day's options and review the chart. Can we make the mouth of the St. Johns before the storms hit? How long will we have this favorable tide?

Cat's-paws frost the river upstream of us. What a break — we are upwind of today's destination. I'll set the mainsail and pull the anchor, eschewing the engine, which has no place in a moment like this. The sails will fill, just enough to move us without apparent motion. In this way, I will surprise late risers when they stumble on deck to find that we are far from our anchorage and making way.

Soon our little floating world will be a beehive of activity: a meal, a destination, a course, a repair. It's going to be a busy day with a hundred sundry tasks to perform, but for a few halcyon moments, there is the morning and its special peace.

*Robert Beringer is a Florida-based freelance marine journalist and photographer and a member of Boating Writers International. He learned to sail on the Great Lakes in a Hobie 16, holds a USCG 100-ton master's license, and has logged more than 28,000 miles under sail. His first book,* Water Power!, *a collection of marine short stories, is available at Barnes & Noble.*

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