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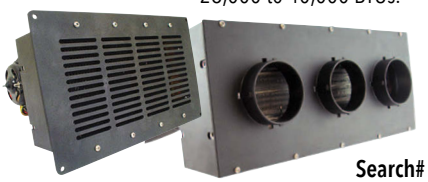

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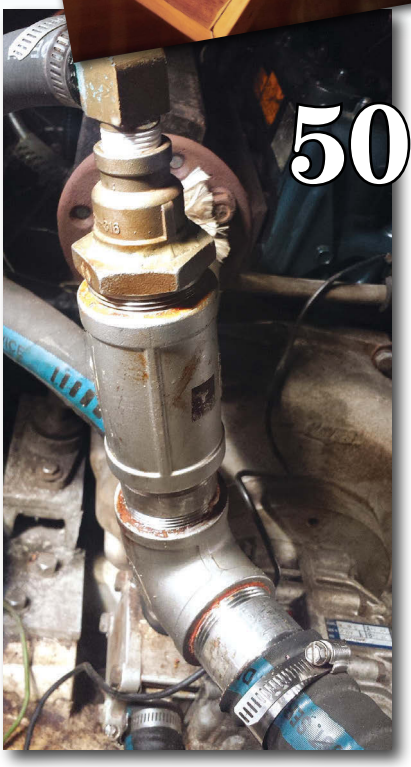

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Speaking seriously

For the love of sailboats

Spotlight on ...

Archive eXtractions

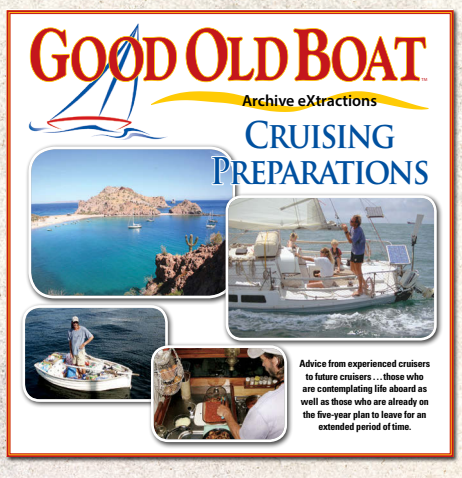
Articles compiled for you from the *Good Old Boat* archives

INTRODUCING

BOAT BUYER'S COLLECTION

We've culled a collection of 51 articles from 17 years of *Good Old Boat* to help guide you toward the happiest day of your life. Yes! That's the day you buy the sailboat with which you'll fulfill your dream, whether that's daysailing, coastal cruising, or voyaging in your bluewater-capable home. The collection covers every facet of the boat-buying process, from weighing your options, to the role of the broker, to the pre-purchase survey, to taking delivery of your chosen vessel by land or by sea. For added value, we've included articles about boat partnerships and preparing a boat for sale.

CRUISING PREPARATIONS



If you're on the path to casting off the lines and voyaging afar, you're likely eager for information and perspectives shared by successful cruisers. Let us help. We've handpicked from *Good Old Boat* contributions by writers who have made the leap. Their articles describe boats that make good voyagers, assess the costs of cruising, and review the equipment that earned its keep (or, just as important, that didn't). They'll help you to decide what spares to carry, how to catch rain, how to do laundry, how to handle the big life transition, and much more.

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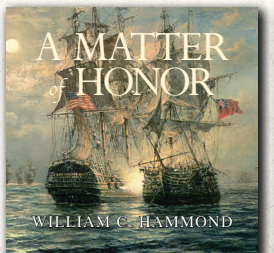

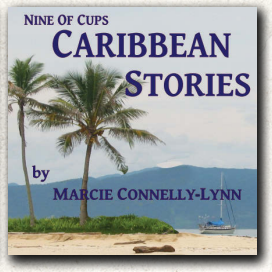

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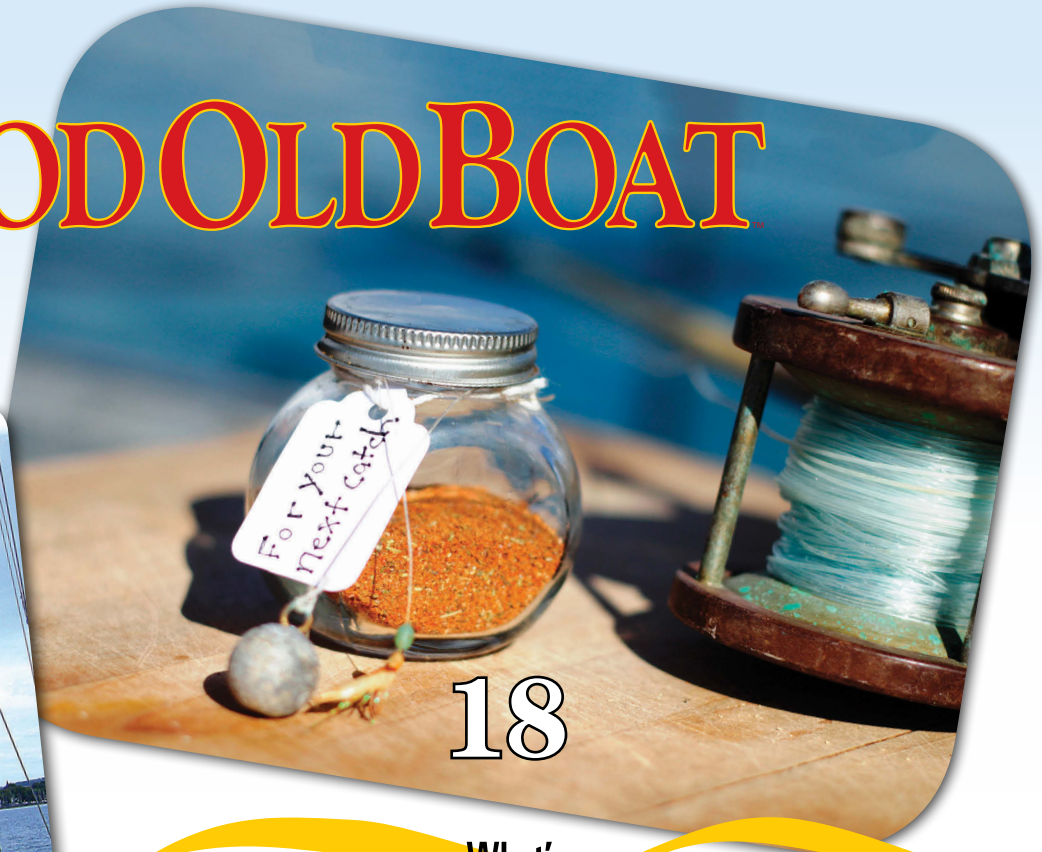

Just for fun

On the cover …

Ever see a raven before a glacier? This *Raven* is Kurt and Nancy Lorenz's 1985 Fairweather Mariner 39 idling in Johns Hopkins Inlet in Southeast Alaska's Glacier Bay National Park while Kurt cruised around in the dinghy looking for the perfect shot. *Raven* and her 24 sister ships were built in Taiwan from the original molds for the Westsail 39. She and her owners are now back home in California.

What's more

A sailboat needs love and attention

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Happy Holidays from the *Good Old Boat* family

Our crew is looking forward to 2017 — literally! In fact, by the time you read this, we'll be most of the way through the January 2017 issue and partway into the March issue. On tap for the coming year is more of what you expect from the sailing magazine for the rest of us. Not reviews of half-million-dollar boats. Not a focus on racing, chartering, and products you'll never need. In 2017, we're keeping our focus on what we do better than anyone: step-by-step DIY articles that educate and help you keep your boat ready to cast off. Along the way, we'll bring you tips for improving your sailboat. And if we get it all right, we'll also inspire, with stories from fellow sailors: some reflecting on the pastime we all love, some recounting lessons learned on the water. It's going to be a good year.

Thank you for subscribing,

The *Good Old Boat* family

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FOUNDER/EDITOR
Karen Larson
karen@goodoldboat.com
FOUNDER/TECHNICAL EDITOR
Jerry Powlas
jerry@goodoldboat.com
PUBLISHER/ADVERTISING SALES DIRECTOR
Michael Facius
michael@goodoldboat.com • 612-605-8319
SENIOR EDITOR
Jeremy McGeary
MANAGING EDITOR
Michael Robertson
ASSOCIATE EDITOR
Pat Morris
RESEARCH EDITOR
Dan Spurr
ELECTRONICS EDITOR
David Lynn
CONTRIBUTING EDITORS
Rob Mazza | Cliff Moore | Gregg Nestor
Allen Penticoff | Tom Wells | Ed Zacko
DESIGN DIRECTOR
Nancy Koucky
CLASSIFIED ADS AND FINANCIAL MANAGER
Karla Sandness
karla@goodoldboat.com • 701-952-9433
DIRECTOR OF CIRCULATION/RETAIL
Mark Busta
mark@goodoldboat.com • 701-952-9433
WEBMASTER
Jerry Stearns
www.goodoldboat.com
TROUBADOUR
Tom Wells

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The good, the bad, the ugly

We at *Good Old Boat* are realists. We love sailing, but we acknowledge there is a yin to the sailing yang, that boats, especially the ones that get used and enjoyed, require time and effort to keep them seaworthy, operational, and looking good. We love the pretty pictures of our readers enjoying their boats under way, but now we'd also like to see the other side so we can feature it in an upcoming spread in the magazine. Send photos of yourself and your crew working on your good old boat to karen@goodoldboat.com. Let us have it. We want to see grime, dust, muck, sweat . . . and smiles!

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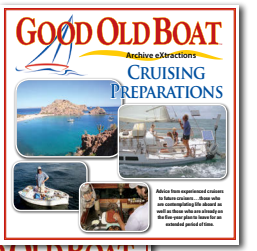

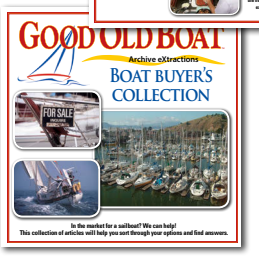

More article collections

Our collections of *Good Old Boat* boat reviews, articles about designers and builders, refit articles, galley-related articles, and the late Don Launer's Sailboats 101 column have been so popular we've just added two more. One is a collection of all the articles we've published on buying a boat, the other has everything we've published about preparing for long-term cruising. Each is just $25. Find all our article collections under Archive eXtractions on www.audioseastories.com.

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Coming home from the sea

Dreams fulfilled, sailors return to an unsteady terra firma

BY KAREN LARSON

Odysseus, I was recently reminded, eventually got so fed up with his sea travels that he wanted to walk inland carrying an oar on his shoulder. When someone asked what the thing on his shoulder was, he'd stop and make that place his home. Or so the story goes. I've also heard tales about carrying anchors inland until they are no longer recognized. Having raised many anchors manually, I would choose to carry the oar.

All world cruisers eventually come home from the sea. It's understandable. No matter how luxurious a cruising sailboat may be, long-term cruising brings associated hassles and discomfort. Living in a small space. Limited storage. Bureaucracy and paperwork. Availability of groceries. Obtaining fuel, water, and other supplies. Climates that are too hot. Or too cold. Rolly anchorages. Doing laundry. Making repairs in exotic places. Longing for a hot bath or a luxurious shower. We can all deal with some hassle and discomfort some of the time. But having to launch a dinghy and land it in the surf just to go ashore can get tiring. Waiting to for a necessary boat part to be cleared through customs is like being held hostage. The ongoing combination of these small things can make any sailor weary.

> "When salty sailors come home from the sea, remember that they are not abandoning their dream. They have lived it."

Yet I have long thought that to experience the most remote and beautiful locations, one must earn that opportunity, perhaps with a long or uncomfortable passage or months of excessive heat, bugs, or breakdowns. After all, if getting there or staying there wasn't somewhat arduous, would that location be remote and beautiful? In the end, we all must invest in some way to achieve our dreams. That is perhaps the nutshell definition of the human condition. Achieving any dream comes with some cost, and that cost is more tolerable to some than to others. What is worthwhile is never easy or free.

But when the dream is over, it's time to come home. Some plan for this eventuality. Some are surprised by it. Lin and Larry Pardey planned for it. They frequently said they'd continue cruising as long as it was fun. Before they'd been under way very many years, they chose a home base on New Zealand's Kawau Island and invested a lot of time and money in improving that site for their future. They are ashore now and *Taleisin* has new owners.

The Pardeys are just one example. Many legendary cruisers have gone around the world once or twice — or as Jerry likes to say, around *in* the world — for a few years or many years before putting down roots . . . sometimes back where they started, sometimes in a place along the way that called to them.

I am completely understanding when a cruising couple or family decides they have been there, done that, and will welcome a change, even though the transition back to land is often an unpleasant shock. When salty sailors come home from the sea, remember that they are not abandoning their dream. They have lived it.

Jerry says he won't cruise without a shop at home to support all those modifications and repairs that a sailboat inevitably requires. I say it's nice (OK, it's mandatory) after many weeks aboard, to return to the comforts of home. Both of us agree that we breathe easier when we're warm and dry and secure in a house that can withstand a blow and won't drag anchor. Perhaps we coastal cruisers have the best of both worlds. We come home from the sea when we need to, we return to the sea when we need to. We'll never be driven to carry an oar inland.

Cool advice, a Slipper


Lifeaboard

Icebox management

A hierarchy that puts the coolest at the bottom

BY PAUL CLEGG

When sailing our 1978 Hughes 26 up and down the Strait of Georgia between Vancouver Island and the mainland, we rely on ice in our icebox to keep our fresh food edible. Refrigeration is a wonderful thing, and I sometimes envy sailors who have it, but we like sailing the boat, and running the engine to power a cooling system seems counterproductive. Also, cooling systems are expensive and can require costly repairs.

Some issues arise, however, when cooling with an icebox. Food quality can sometimes be suspect, the drain can plug, items get lost in the bottom, and the bilge is always wet. With a little care and planning, you can eliminate these concerns.

Begin with the box

As a first step toward improving our icebox I lined the bottom of the box with foil-covered insulation from a building-supply store. I taped over the cut edges of the slabs to prevent bits of insulation from falling off. As well as adding insulating value, the foam protects the fiberglass box if I should happen to drop a heavy block of ice into it.

To do away with a wet bilge and stray odors, I extended the icebox drain hose to the top of a lidded plastic box I installed in the bilge. A drain hose in the bottom of the box leads to a pump that empties the meltwater into the sink drain, from where it drains overboard. A vent line fitted to the top of the box ensures the icebox will drain efficiently. Because there is no pressure in the system, almost any plumbing hardware will work. Our modest-sized container holds about 12 hours' worth of ice melt. It was easy to make activating the pump switch each morning and evening part of our shipboard routine.

So nothing nasty grows in the melt-water container, I occasionally pour a cup or two of bleach down the icebox drain, followed by a fresh water blast from a dock hose.

Milk is a necessity for us, but it was a real pain returning the container to the icebox. Invariably, some other items would fall into the space vacated whenever we removed the container. To prevent this, I fashioned a cage out of galvanized tie straps from a building supply store. The cage is fastened together with stainless-steel nuts and screws. Situated in the front corner of the icebox, the cage is robust enough to withstand being bumped and squeezed by heavy ice blocks. The metal also conducts the cold to the milk very efficiently.

No wet labels

We do not want any labels getting wet from being in contact with the ice; it takes a very small amount of debris to start a blockage in the drain. We remove all items from their original packaging and seal them in plastic bags with zip-closures. Where possible, we remove labels from containers or transfer the contents to generic containers. We inspect fruit and vegetables for the little sticky labels that are so very clever at finding their way to the drain hole. Even labels that appear very secure will begin to disintegrate after a few days' contact with wet ice.

A packing order for packing

We have learned over the years that where and how foods are stored in the icebox affects their useful life. We also pack the box in a way that allows us to find everything quickly.

To extend the life of fresh meats, we freeze ahead of time all but what we will use in the next day or two. These frozen portions extend the life of our ice. We usually freeze an extra container of milk and one of butter for the same reason.

To load the icebox, we place all the frozen items at the very bottom where they will stay frozen the longest. It's a good idea to make a mental or even a written note of where each item is placed — it makes it easier to dig out the pork chops four days later. We place the main blocks of ice on top of these items.

Next in are foods that must be kept very cold. This includes the mayonnaise, the meat for the first night's supper, the milk in its cage, and perhaps the cold cuts for sandwiches. Cold cuts store nicely if they are placed flat in zipper bags and slid down between a block of ice and the side of the icebox, where they stay cold but are still accessible. Any leftover ice chunks can be strategically placed around these items.

Finally, we have three inexpensive plastic-coated shopping bags with the handles cut off. We pack them with items that are not as temperature-sensitive. These include barbecue sauce, mustard, butter, jam, leftover corned peaches, vegetables, fruit, and so on. We could probably fit all these items into one bag, or even scatter them on top of the previous layer, but separating them into three smaller bags makes it easier to fit them into open spots and keeps the contents from getting lost among the ice blocks.

Our bags are different colors. We know, for example, the red celery sticks are in the green vegetable bag and the jam is in the black condiment bag. Also, when the time comes to remove those pork chops from the bottom of the icebox, it's a simple matter to remove the bags and set them aside, rather than removing numerous individual items. We also store our eggs in the top layer, in a plastic campers' egg box for protection. Many seasoned sailors do not refrigerate their eggs, but we feel better keeping them cool.

Top up with ice

It's best to fit in as many blocks of ice as you can at the beginning. You don't want so much ice that your provisions won't fit, but neither do you want a large volume of empty space.

Avoid ice cubes except as a filler because they don't last very long. While cruising, add a block of ice wherever you have the chance. An icebox works most efficiently with a full load of ice.

Arlie and I have been sailing on Smooth Moves for almost 20 years. We can very well live on the icebox. Food cost very little upscale is virtually non-existent, the bilge is dry and odorless, and maintenance is minimal. ⚓

Paul and Arlie Clegg sailed their Hughes 26, an Georgian Bay Custom, Thatches 26, on Georgian Bay. Currently for several months in Vancouver Island, across the country to Vancouver Island, bringing Smooth Moves with them. They have since been selling out of their home port of Nanaimo, British Columbia.

Paul and Arlie place frozen meats on top of the insulation in the bottom of the icebox and load block ice on top of them, at left. The milk cage is in the front corner because the icebox drain slopes that way. They then lay food items that must be kept very cold in direct contact with the ice blocks, center. The plastic bags go on top to fill the air space, at right. The bags contain smaller packages and items that need not be kept icy cold. Paul and Arlie pack the bags according to a color code — look for the celery in the green bag.

Icebox meltwater collects in a container in the bilge, far left. The drain hose and vent line are fitted so the top of the box, the pumpout line is connected to the bottom. The block tape keeps the lid firmly in place. Three plastic-coated or nylon bags, at left, don't absorb water and keep smaller items organized so they don't get lost in the icebox.

Cool advice

The article "Icebox Management" by Paul Clegg in the July 2016 issue of *Good Old Boat* saved me a bundle of money. My wife and I have been having the refrigeration discussion for years. She wants ice cubes. I say that's fine, but we would need additional means to charge batteries, which adds cost and complexity.

This summer, we followed several suggestions from Paul's article, mainly keeping the icebox full of ice. I made my milk bottle cage from lobster trap wire. We just returned from our annual three-week Downeast cruise on our Morgan 323 and were thrilled with how well the icebox worked out. The contents were noticeably colder and nothing went bad. A bag of cubes would last about three days.

I've been making my own ice blocks using a battery box for a mold. Once they are frozen, I sit them in the sun for 30 minutes to loosen them from the mold, then put them in large locking plastic storage bags. I can stack three blocks in a small chest freezer.

When we loaded the icebox, we started with the three blocks I made, then added as many store-bought ice blocks as would fit and kept the icebox filled for the entire trip. Thanks to Paul and to you for sharing the article. I think the refrigeration issue is put to bed for good. Articles like this are the best thing about *Good Old Boat*. Keep up the good work.

–Alan Kelly, Kittery, Maine

His rescued Slipper is a perfect fit

The boat review of the Slipper 17 in the September 2016 issue was right on. I bought my 1985 Slipper for a mere $400 from a marina on the Hudson River after it had been abandoned due to Hurricane Sandy. The trailer it sat on needed tires and lights, and the boat had been stripped of rudder/tiller, sails, and electronics, and had no title. But it had a registration sticker and numbers and I was able to contact the original owner to get a duplicate title. I picked up some used sails and constructed my own rudder and tiller. It truly is a great boat for me to singlehand or bring guests aboard without fear of capsize, as Allen Penticoff mentions in his review.

–Bryan Terhune, Blairstown, N.J.

Green light for the Bluenose

Having owned and restored B193 for over five years, I read with great interest Peter Thelin's excellent article "Irresistible Bluenose" (January 2016). What a wonderful magazine for those of us on lean budgets. Our Bluenose is a beloved family member and affordable with her absence of complexity. Here she is off Maryland's Eastern Shore outside of Rock Hall.

I must admit, however, I am bemused by fellow sailors who warn of her tenderness. That is by design, is it not? Comfortably, although rather wet, I have sailed *Whisper* in 20-plus-knot winds but have always been mindful to reef the main at the expectation of whitecaps. That is a standing rule. She is lovely under sail in heavier weather with the shortened main and blade jib. In fact, she lifts her skirt and runs! With her rail safely above the water when she heels, her length at waterline has reached its optimum and her hull speed maximized. I believe that is appropriate, and is inherent to yachts of classic design with substantial overhangs.

As purists, we sail *Whisper* off a mooring without a motor; that is also possible due to the light-air prowess of these boats. Their ample sail area and light displacement make them peculiarly reliable when the wind is but a whisper (hence her name), albeit at speeds that are coveted in tenths of a knot.

We must admit, as insurance we keep in her lazarette a set of oars that fasten to the winches. We have used them twice.

Our hope is that your magazine continues its promotion of affordable boating for many decades to come so that someday we may look back at the fabled Colgate 26 or Melges 24 and remark accordingly.

Thank you for giving these beautiful boats their due. They are treasures.

–Anthony Tomassetti, Plymouth Meeting, Pa.

is saved, beloved Bluenose

Good product, great service

I want *Good Old Boat* readers to know about the service I received from two companies on a broken part on a Railblaza product I purchased more than two years ago.

I use a 1-inch rail mount for the iPad I use as a backup navigation device. I love Railblaza products, as they are very well designed. On a Friday, I filled out a web request for a replacement part. On Saturday, Ross Pratt from Railblaza contacted me and said I would be contacted by the distributor nearest me. On Monday, James Baldwin, manager of customer service for Western Marine Company of Vancouver, emailed to obtain my address. Tuesday morning before 9 a.m. the replacement part arrived, couriered to my doorstep.

Railblaza (www.railblaza.com) makes aftermarket rail-mounting solutions for nearly every use imaginable. Western Marine Company (www.westernmarine.com) is a wholesale recreational marine supplier. The service and warranty/replacement part shipping was incredible from both the company and distributor. *Good Old Boat* readers should know where to get great service and support those who offer this service.

–Harvey Hall, Nanaimo, B.C.

Canal-boat memories

My wife and I loved your article on narrowboat cruising ("Narrowboat Adventure," July 2016). We have a Cape Dory 25D and have been sailing Long Island Sound for many years.

About seven years ago we rented a canal boat on the Erie Canal with friends. The canal boats are 40 feet long and very easy to operate. The fellow who rented us the boat asked if I had any experience with boats. I told him about my sailing, so he assumed I could handle a 40-foot iron barge. We were supposed to get a lesson on operating the boat and locks, etc. Instead, I was told "That's the square end, that's the pointy end, and you have a nice day."

The difference between the narrowboat in the article and our boat was that we had bow thrusters, making it very easy to maneuver. I couldn't imagine pointing a 65-foot boat at a lock without a lot of "banging around."

–Linda and Jeremy McCue, City Island, N.Y.

Talked-about table

Reading Jack Wolf's article on his steering wheel table ("Extending Cockpit Hospitality," July 2016), I was immediately reminded of the automobile version sold on Amazon (http://amzn.to/2clNQwA). Read the reviews for a good laugh.

Humor aside, I think Jack has a great concept to alleviate crowding in the cockpit.

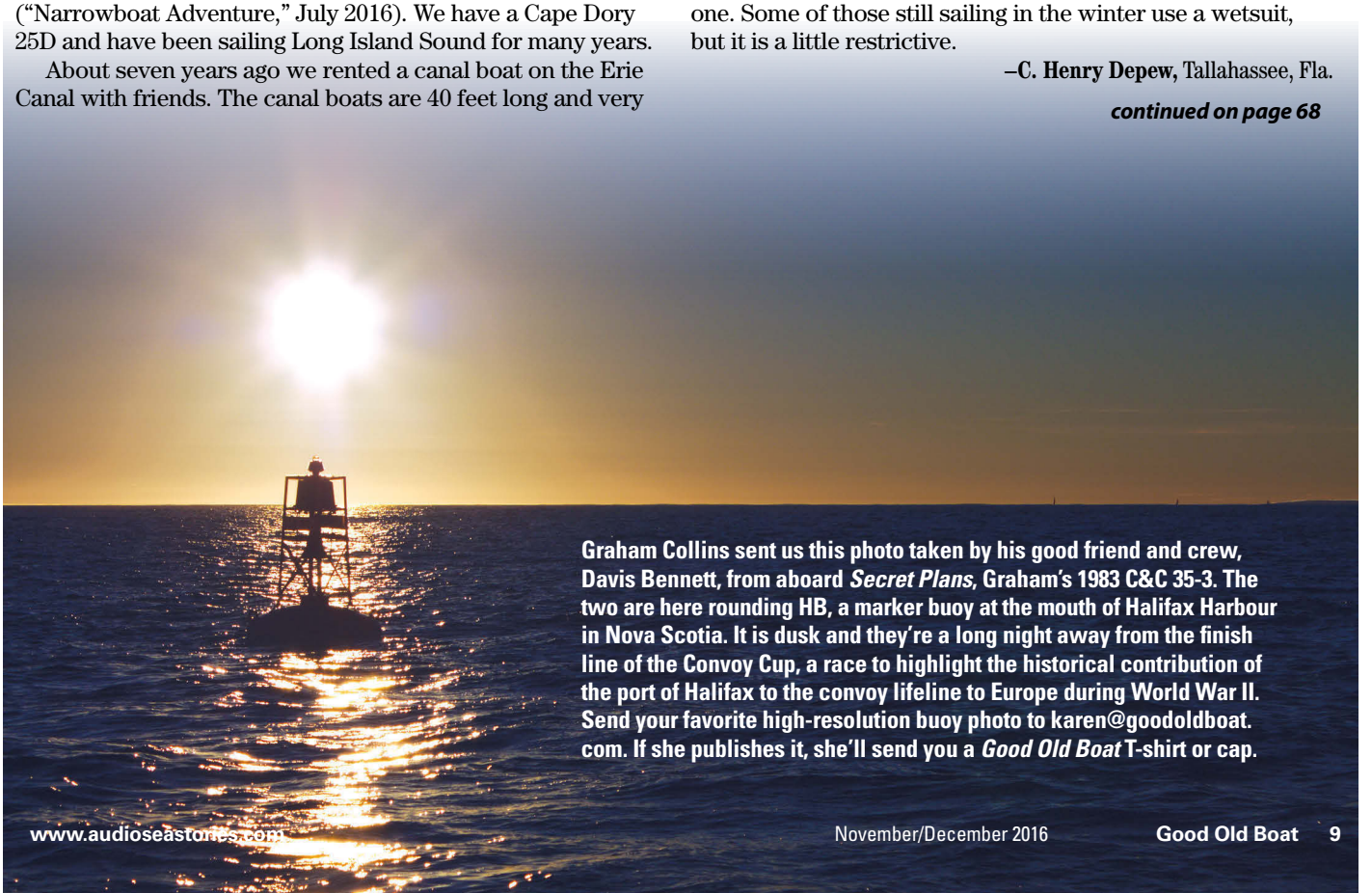
–Bo Garrison, Reading, Pa.

Dry suit envy

Drew Frye wrote an interesting and informative article on the dry suit ("Splash Test Dummy," September 2016). If I still raced small boats in the winter months, I would look into one. Some of those still sailing in the winter use a wetsuit, but it is a little restrictive.

–C. Henry Depew, Tallahassee, Fla.

continued on page 68



Graham Collins sent us this photo taken by his good friend and crew, Davis Bennett, from aboard *Secret Plans,* Graham's 1983 C&C 35-3. The two are here rounding HB, a marker buoy at the mouth of Halifax Harbour in Nova Scotia. It is dusk and they're a long night away from the finish line of the Convoy Cup, a race to highlight the historical contribution of the port of Halifax to the convoy lifeline to Europe during World War II. Send your favorite high-resolution buoy photo to karen@goodoldboat.com. If she publishes it, she'll send you a *Good Old Boat* T-shirt or cap.

Bayfield 29

A well-crafted cruising boat with character

BY FERD JOHNS

John and Nancy Butte began their sailing adventures in a West Wight Potter 19 on blustery San Francisco Bay. Although Nancy, a retired teacher, enjoyed sailing, she was less fond of heeling, so the first step in their boat selection process was always from dock to gunwale, to test a candidate's initial stability. They trailered their stiff little Potter to their waterfront retirement home on Lopez Island, in Washington's San Juan Islands, in 1999, and soon realized that the rich cruising grounds of the Pacific Northwest could be better explored in a larger boat.

In 2002, they discovered *Kabloona*, a 1979 Bayfield 29, in North Vancouver, British Columbia. John, a builder, describes her as a project boat, although she was structurally solid and had no blisters. He feels fortunate to have "touched" every inch of her during her restoration, and even contacted Ted Gozzard for advice. He knows his boat.

One thing John and Nancy didn't change was her name, as they discovered *kabloona* is an Inuit word with a meaning similar to *gringo* in Mexico or *haoli* in Hawaii. John's father had been a Hudson Bay fur trader at one time, and was doubtless referred to as a *kabloona* by the native population, so the name stuck.

John and Nancy have put many miles under *Kabloona*'s keel since the restoration, crossing the Strait of Georgia four times and venturing northward to Princess Louisa Inlet and Desolation Sound. Her broad beam and heavy construction give her the stability Nancy sought, and the cutter rig allows the flexible and easily managed sail plan that John wanted. They feel her accommodations and handling characteristics are perfect for a couple, and enjoy her shallow draft and the fact that she can be easily singlehanded, while admitting that she does not go to weather particularly well.

Neither of them likes complex systems, so they replaced the original pressurized-alcohol stove with an Origo (but would have preferred a gimballed stove with an oven), and use a simple Force 10 propane heater to warm the cabin. A handheld VHF suffices for communication, and for navigation they use a Garmin 160C depth finder and a West Marine 276C chart plotter.

The view forward from the helm is good, as long as the dodger window is clear, upper photo. The steering pedestal is the most prominent feature in the cockpit, which, although small, is comfortable, at right.

Bayfield Boat Yard

Ted Gozzard earned his journeyman's license in carpentry, masonry, and boatbuilding in England. After moving to Canada in 1959, he built houses during the week and spent weekends building and then sailing a Thunderbird sloop. After a few years, he sold the boat and the home he built for his family and

The traditional-looking profile, with the clipper bow and trailboards, draws sailors like *Kabloona*'s owners, John and Nancy Butte, to the Bayfield 29.

they moved to the Bahamas, where they stayed for two years. While there, Ted was introduced to multihulls, and after they returned to Ontario he designed and built a 40-foot trimaran in his spare time. His craftsmanship and boat-building skill led to commissions for the construction and repair of wooden and steel boats, and he founded Bayfield Boat Yard in 1970.

Ted designed using half models. A design study for a diminutive traditional-style sloop caught the eye of Gary Ferguson, who promptly sold 10 Bayfield 23/25s at the 1972 Annapolis boat show.

With Ted at the helm, Bayfield created a line of solidly built, well-crafted fiberglass boats that included the 23/25, 30/32, 29, and 40. (The successor company designed and built the Bayfield 36). Ted sold his interest in Bayfield in 1981, but was soon busy again in partnership with his sons, Mike and Ted, designing and building the Pilgrim 40 trawler and the entire line of Gozzard Yachts. (See "Gozzard Magic Lives On," November 1999, for an interview with Ted Gozzard.)

Design and construction

The B29, like all Bayfields, is a beamy shoal-draft full-keel design with a pronounced clipper bow. It has 3,000 pounds of ballast encapsulated in the keel. A displacement/LWL ratio of 308 puts the boat in the moderately heavy category but the sail area/displacement ratio of 18 supports owners' reports of decent sailing performance. Many owners, including John, refer to the B29 as a comfortable passagemaker that's capable of good daily runs.

> "Many owners … refer to the B29 as a comfortable passagemaker."

The hull is a solid laminate built up with alternating layers of hand-laid fiberglass mat and woven roving, while the headliner, hull liner, and deck are cored with ⅜-inch end-grain balsa. The cockpit hatches, companionway slide, sea hood, and anchor locker have marine plywood cores. Several owners of early models, including John, note that the forward bulkhead is not securely attached to the coachroof and squeaks badly in a seaway.

The aluminum fuel tanks are located in the deep bilge, which has led to many owners having to replace or repair them. John says that is not a particularly difficult job as the tanks are readily accessible. The holding tank in earlier models is a different matter. John had to do extensive fiberglass surgery and repair to replace and replumb the tank in *Kabloona*.

Some later boats were fitted with two-cylinder diesels and convenient engine access hatches in the cockpit sole, but *Kabloona* is definitely underpowered with her 1-cylinder Yanmar 10. John added a cockpit hatch, and considered repowering, but found the space for the engine so limited that he just rebuilt the original diesel.

The cockpit is small and is dominated by the standard steering wheel and pedestal. There is a fitting in the cockpit sole for an emergency tiller, although its proximity to the pedestal might make it difficult to use. A raised helm seat and wide sidedecks allow

Good non-skid and inboard lower shrouds allow for easy passage between the cockpit and the bow along either the sidedecks or the cabintop, at left. The two furling headsails are easy to control, at right, but the narrow slot between them makes tacking the Yankee difficult. A grating above the beak of the stem is a good place to stow an anchor, and a locker in the foredeck accommodates the rode.

an acceptable view forward past the rather tall cabin trunk. One shallow and one deep cockpit locker are accessible under the comfortable bench seats.

A previous owner installed narrow aluminum davits on *Kabloona*'s stern. John and Nancy found them useless for a dinghy but perfect for their propane tank and the solar panel that keeps the batteries topped off.

Two winches on each side for handling both Yankee and staysail are conveniently located forward on the cockpit coaming, and a traveler for the mainsheet spans the wooden taffrail aft of the helm seat.

Excellent non-skid creates good footing on the deck and cabintop, while full-length perforated aluminum toerails provide additional security as well as convenient attachment points for everything from flag halyards to fenders.

Rig

The Bayfield 29 was rigged as a cutter, with an inner forestay attached at the stemhead and a headstay attached to the beak of the clipper bow. Some boats also have a bowsprit, which pushes the tack of the Yankee farther forward. This wooden bowsprit is an integral part of the rig but presents an ongoing maintenance problem. Many have rotted out and have been replaced.

Kabloona has the standard sail plan with a Yankee jib set on the headstay and a staysail on the inner forestay. Roller furling on both sails makes the rig easy for an experienced couple to handle, even in the changeable winds of the Northwest. Some owners of boats without the bowsprit comment that the two stays are so close together it is difficult to get the Yankee through the slot when tacking.

The single-spreader keel-stepped mast is very sturdy. It's supported by a backstay, upper shrouds, forward and aft lower shrouds, and the headstay. There are no running backstays, so the mast's stiffness alone resists tension in the inner forestay. The chainplates for the upper shrouds are at the gunwale. Those for the lower shrouds are bolted through the cabin trunk, and one owner reported the cabin trunk panting under the loads they imposed.

Accommodations

Ted Gozzard's fondness for clever design touches and beautifully crafted wood is evident in the belowdecks layout and furniture of the Bayfield 29. The companionway leads into an apparently conventional interior with wide quarter berths tucked under the cockpit port and starboard, a small galley to

At first glance, the cabin arrangement looks conventional, at left, but panels pocketed in the midships bulkheads can be raised to the overhead, at right, to make separate private cabins of the saloon and the area aft of it.

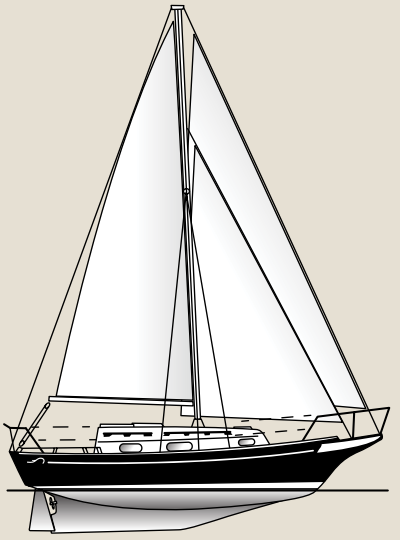
Quarter berths port and starboard with full headroom at their heads provide a spacious sleeping area aft.

starboard, and a generous navigation station to port. In the saloon, port and starboard settees flank a centerline drop-leaf table. The starboard settee converts to a double berth, and the port-side settee backrest hinges up, turning the seat into a wider berth.

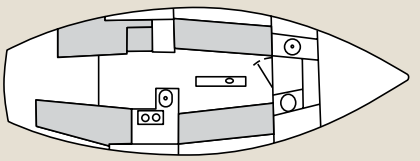
The cabin is spacious and airy, and can be transformed into two private sleeping areas when panels pocketed in the bulkheads forward of the galley and nav area are raised to the overhead. A curtain completes the division.

The galley is compact, as expected on a boat under 30 feet LOA, but it's workable.

Bayfield 29

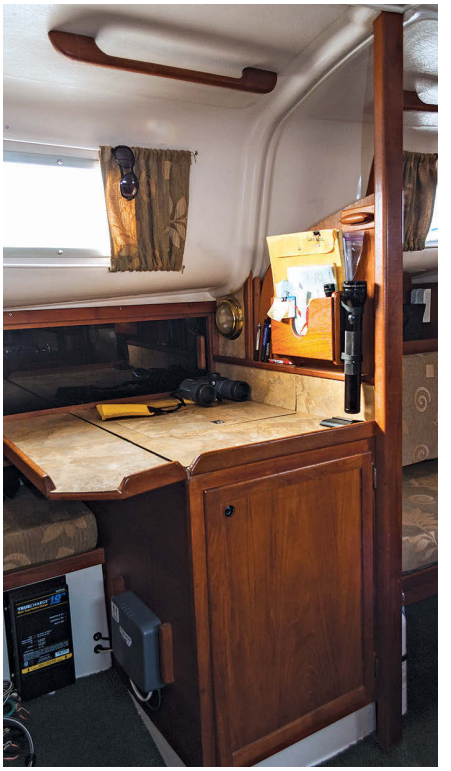


Designer	Ted Gozzard
LOA:	29 feet 0 inches
LWL:	21 feet 9 inches
Beam:	10 feet 2 inches
Draft:	3 feet 6 inches
Displacement:	7,100 pounds
Ballast:	3,000 pounds
Ballast/disp.ratio:	.42
Sail area:	420 square feet
Sail area/disp. ratio:	18.2
Disp./LWL ratio:	308
Water	20 gallons
Fuel	20 gallons



Many owners say the best feature of the interior is forward of the saloon. Instead of a V-berth, Ted Gozzard fitted a huge athwartships head compartment, complete with a large vanity and sink, a toilet, an upholstered seat, and lots of storage. Behind doors in the forward bulkhead are an easily accessible hanging locker and a commodious stowage area in the forepeak.

Every owner we contacted said the Bayfield 29 was a very comfortable cruising boat for a couple or two. While



The nav desk with its folding extension becomes part of the galley when needed.

some commented about the size of the galley and lack of a private master stateroom, they all felt the designer had done an excellent job of setting priorities in a 29-foot boat.

Under way

Under a gray Pacific Northwest sky, John and Nancy motored *Kabloona* out of the narrow, twisting entrance to Fisherman Bay in 10 to12 knots of breeze. They raised full sail and close reached across San Juan Channel toward Griffin Bay as I snapped photos. When John hove to, the boat remained solidly well-mannered and steady while I transferred on board for a sea trial.

After a short stint tending the Yankee and staysail sheets, I realized I don't have a lot of experience trimming a cutter rig, so I turned *Kabloona* back over to John and Nancy. They were an absolute pleasure to watch (and listen to) as they worked together to get the most out of their boat. They soon had her speed back above 6 knots.

Although owners agree that the Bayfield 29, like most shallow-draft cutters with relatively high freeboard and windage, is not close-winded, *Kabloona* showed herself to be a solid and steady performer on a reach and well capable of clicking off the miles.

Once the sails were furled, it was just as evident that the little one-lung diesel, despite the nostalgia its exhaust note might arouse, would not be up to the task of stemming a strong current or of driving the heavy boat into a head sea of any size.

Owners speak highly of the unorthodox layout that places the head forward.

Conclusion

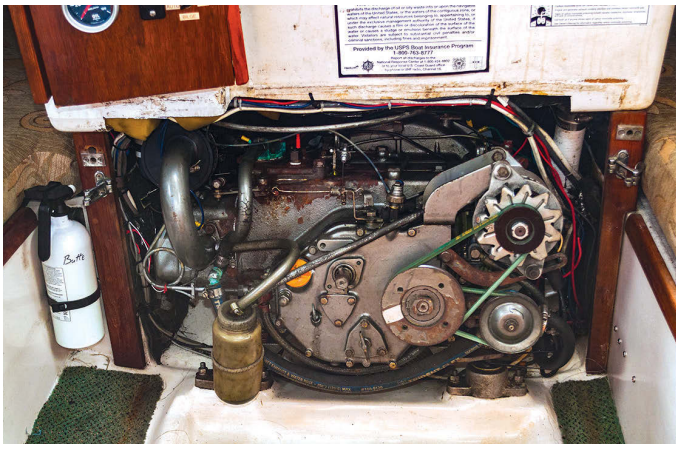
Bayfield 29 owners are consistent in their praise for the solid construction and fine craftsmanship, the arrangement and flexibility belowdecks, the predictable and solid performance under sail, and the aesthetics of the classic design. A few complaints were noted of leaks at fittings and the hull-to-deck joint, as well as plumbing and systems issues, but nothing unexpected for boats now more than 30 years old. There is little on these boats that cannot be brought back to life or upgraded by a persistent owner. The most commonly mentioned model-specific problems were the unsecured forward bulkhead, tank failure, rotting of the wooden bowsprit, and poor windward ability.

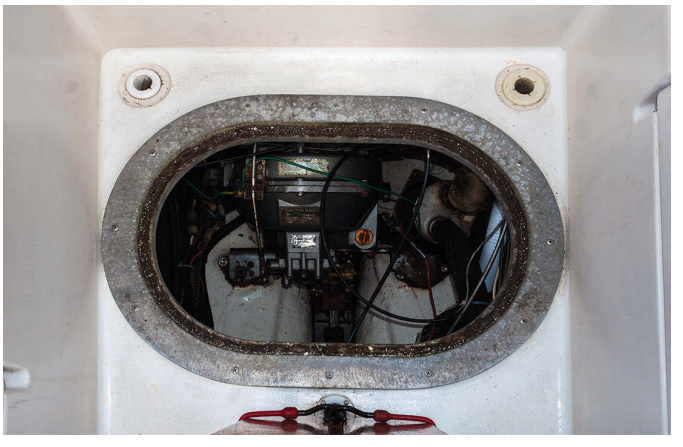
Bayfield Boat Yard, under Ted Gozzard and his successors, built more than 350 Bayfield 29s between 1978 and 1988, when the company closed. An online search found several listed at prices between $13,000 and $26,000, depending on year, location, and condition. The combination of traditional aesthetic appeal, quality construction, good cruising accommodations, and adequate performance for coastal passagemaking makes the Bayfield 29 a natural and affordable choice for many cruising sailors.

Ferd Johns and his wife, Beth, live on Whidbey Island, Washington, and cruise the Pacific Northwest, Chesapeake Bay, and Florida Keys. Ferd, an architect, cannot count how many old fiberglass cruising boats he has owned (Beth, also an architect, can!), but the fleet is currently down to two trailerable sailboats and one mini-trawler.

Resources

A Bayfield owners group is at www.groups.yahoo.com/neo/groups/bayfieldyachts





There is not a lot of room around the single-cylinder engine for service, at left. John installed a large hatch in the cockpit sole so he could reach the top of the engine, at right. Some Bayfield 29s were fitted with two-cylinder engines and factory-installed hatches.

Comments from owners of the Bayfield 29

The hull is solid and the rigging is strong. The interior is beautiful teak, but the storage is marginal.

–**Jerry Olson**, Pepin, Wisconsin

We may, as several have done, raise our boom. There is space above the mainsail to raise it by 6 to 8 inches, which would allow a bimini to help with sun protection (we would have it be easily removable).

–**Dan Randolph,** Victoria, British Columbia

The cockpit is small for more than four people, so it's not a party boat or daysailer for large groups. High freeboard makes it a difficult swimming or diving platform and also means it wanders around quite a bit at anchor in windy conditions.

–**Steve Simpson,** Tampa, Florida

The available space for a bilge pump is small. Only the smallest pumps will fit and the depth of the bilge requires a big lift. Ours has a manual pump at the helm and it is a must. Gate valves all over; replace as many as possible.

–**John Jenkins,** Arcadia, Michigan

If my body could tolerate the abuse, I would sail my B29 across the North Atlantic in a heartbeat. One really neat thing about the Bayfield stock interior is the forward head instead of a V-berth. It is something that everyone talks about — a luxury bathroom in a little boat. But what I don't hear mentioned is the space in that head for storage. As I write this, we have all of our clothes, all the bathroom spares, all the engine spares, three cases of water, and 11 cases of beer.

–**Rob Cole**, Trenton, Ontario

The ample stowage behind the settee-back cushions in the main saloon allows us to keep down clutter when guests are aboard. Personal belongings can be securely tucked away, even including a guitar. Gear hammocks hanging behind the settee-back cushions increase stowage flexibility. The main bilge is a problem.

–**Kathie Robertson,** Bellingham, Washington

Although the boat is well built, they seemed to have forgotten about the rudder. I have seen them actually fall apart when not maintained.

–**Paul Rezendes**, Groton, Connecticut.

Doppler weather radar, part two

Revealing storm structure through scanning strategies

BY MARK THORNTON

In the first part of this two-part series (in the September 2016 issue), Mark explained the basics of Doppler weather radar and described the most common image types created from the data. In this second part, he looks at the behavior of radar beams and radar anomalies, and offers a few guidelines for using radar imagery to help visualize the dynamics and movements of weather systems.

Every National Weather Service radar station has two operational modes — clear-air and precipitation. While in clear-air mode, the station's antenna rotates more slowly than in precipitation mode. This increases the station's ability to detect small targets or targets that reflect radar pulses poorly, such as snow. Precipitation mode, as the name suggests, is used when larger or more reflective targets, such as raindrops, are present. The radar image will usually indicate which operational mode is in use.

Intense thunderstorms may reach altitudes as high as 50,000 feet. To assess their overall structure, the station employs several scanning strategies, called volume coverage patterns (VCP), to collect data from the surface to the upper reaches of the atmosphere. The antenna conducts an initial, or base, scan by making one complete revolution at an elevation of 0.5° above the Earth's surface, alternating between emitting and collecting backscattered pulses. When this base scan is complete, the antenna completes additional scans, repeatedly increasing the antenna's elevation by about one degree until the highest elevation of the VCP is reached. The highest elevation scanned by NWS radar is 19.5°. As a result, the region directly above the radar station isn't scanned and is referred to as the "cone of silence." The collection of individual scans within a VCP is known as a volume scan.

Radar images are not live

Transmitting pulses, gathering backscattered energy, and processing the data from a volume scan takes time. The process takes about 10 minutes in the slower clear-air mode and from 4 to 6 minutes in precipitation mode. As a result, a radar image may be anywhere from a few seconds to 10 minutes old. Fast-moving thunderstorms can travel 6 miles or more between updates, so an approaching storm might be much closer than it appears on the most recent radar image. It's important, when viewing radar images, to ascertain the age of an image by looking at the time stamp.

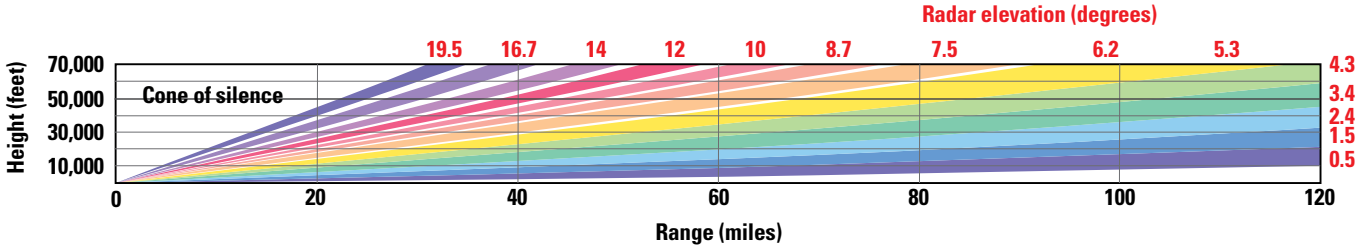
Beam behavior

Due to Earth's curvature, the altitude of a radar beam is greater the farther it radiates from the station — at 120 miles it's near 10,000 feet. Beam width also increases with distance (similar to a flashlight beam) at the rate of 1,000 feet for every 10 miles. In addition, pulses that are reflected or absorbed by targets closer to the station reduce the number of pulses available to sample distant storms. Combined, these beam behaviors progressively diminish the station's ability to effectively scan and resolve thunderstorm features at greater distances. Due to the height of the beam and reduced resolution, distant storms may, therefore, appear less threatening than they actually are.

The best strategy for coping with the troublesome effects of beam behavior is to view the image created by the station closest to the storm you are monitoring. To do this when using a radar app on a device that's equipped for geolocation, such as a cellphone, you might have to override the app's default selection, which is usually the station closest to your location.

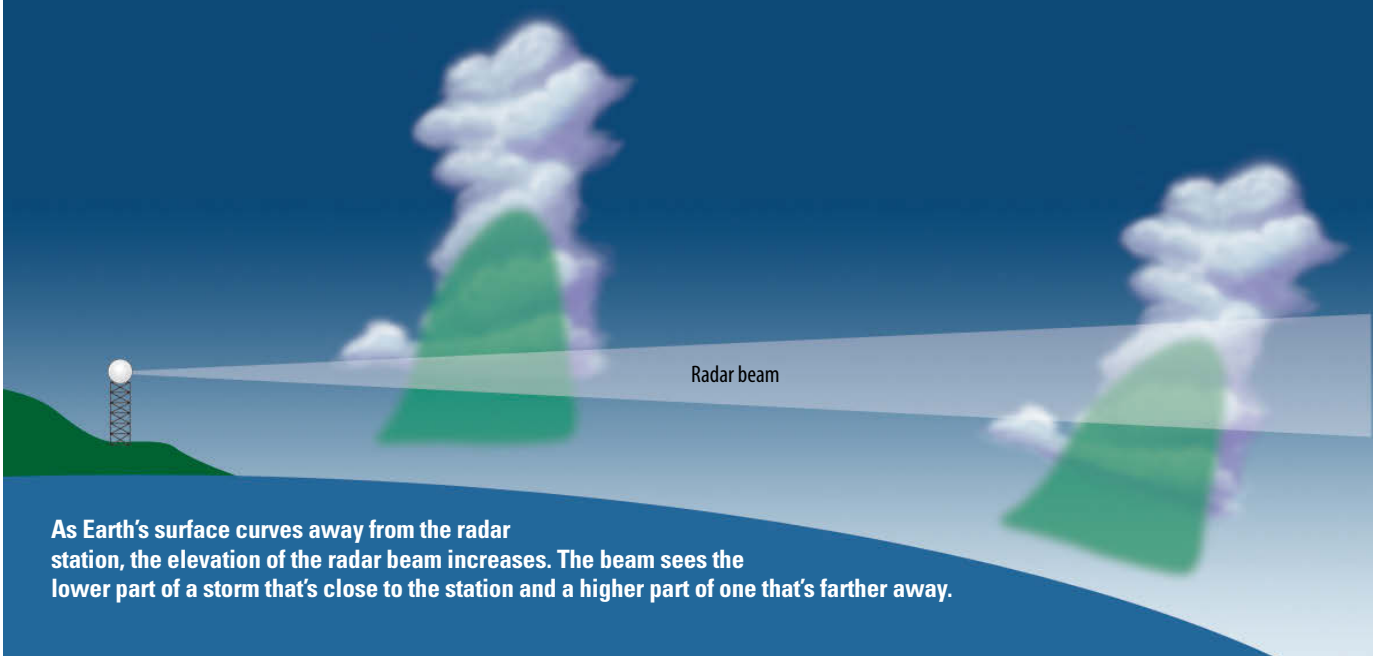
LAYOUT AND ILLUSTRATIONS BY TED TOLLEFSON

NWS volume coverage pattern (VCP)



COURTESY OF NOAA

To create the volume coverage pattern (VCP), the antenna makes scans at successively higher angular elevations.



As Earth's surface curves away from the radar station, the elevation of the radar beam increases. The beam sees the lower part of a storm that's close to the station and a higher part of one that's farther away.

False storms

Not everything that looks like precipitation on radar is actually precipitation. As it passes through the atmosphere, a radar beam can be deflected from its intended path by layers of the atmosphere with different temperature and moisture characteristics. Occasionally, the beam can be abruptly bent toward the ground, an occurrence known as anomalous propagation (AP). When AP occurs, the ground (or the surface of a body of water) becomes the target and results in a strong return of radar pulses. The station, unaware that the beam has been deflected, interprets the strong returns as distant storms.

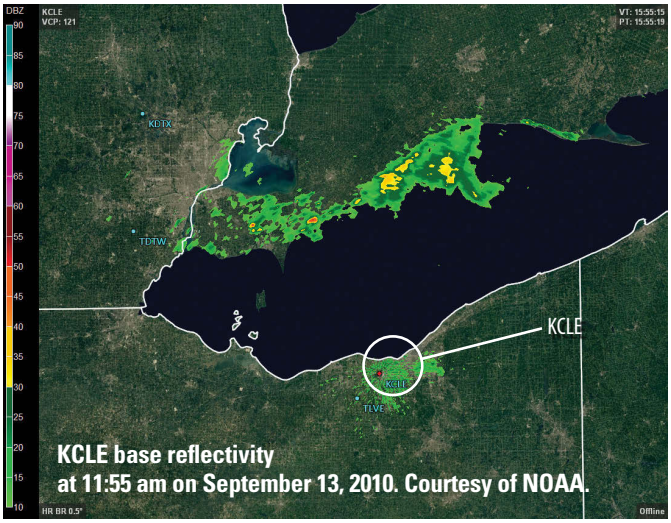
Although they appear quite real, the storms and precipitation in southern Ontario on the Cleveland (KCLE) radar image on September 13, 2010, (upper image at right) are the result of AP. Separating fact from fiction is relatively straightforward. Thunderstorms are rarely stationary. Reviewing a loop of reflectivity will reveal if the areas of highest backscattered energy, measured in dBZ, are moving. The view from an adjoining station can also help. In this instance, the activity over southern Ontario was absent from the Detroit (KDTX) imagery (lower image). Satellite imagery is not subject to AP and can be used to check suspicious storms.

Flocks of migrating birds, insect swarms, and bats can also create the impression that precipitation is occurring. The rotating blades of wind turbines often appear as persistent "storms."

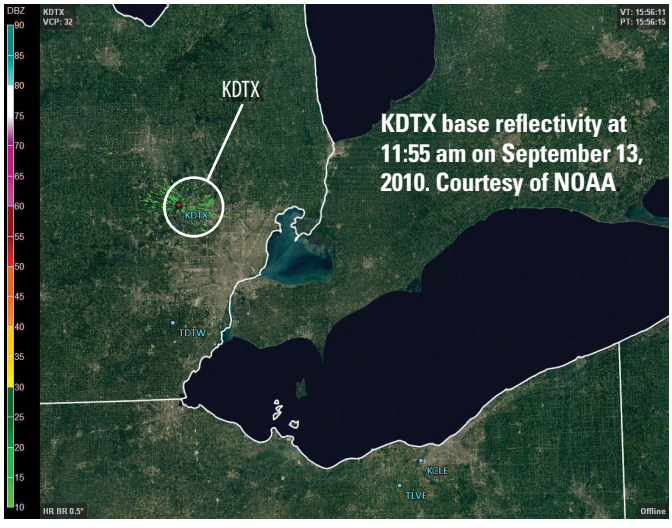
Viewing weather-radar images

Many websites and applications provide access to radar imagery. Regardless of the platform, you are viewing NWS data because the agency operates the only national radar network. For a modest charge, some vendors offer premium services that add overlays of lightning strikes, radar-derived storm tracks, and the boundaries of NWS severe-weather watches and warnings. Premium services are well worth paying for if your goal is to avoid thunderstorms.

Mark Thornton has been sailing on the Great Lakes for more than 20 years and currently owns Osprey, *a C&C 35. His company, LakeErieWX, focuses on providing marine weather education seminars, case studies, and forecasting resources to recreational boaters. See his website at www.LakeErieWX.com.*



This image from the Cleveland radar station appears to show a line of storms over Lake Erie along the coast of southern Ontario.



The view from the Detroit radar station is clear — the "precipitation" seen by the Cleveland station was anomolous propagation caused by the radar beam reflecting off the lake's surface.

A little something

BY FIONA MCGLYNN

While cruising, we receive help from other sailors on an almost daily basis. While a bottle of wine rarely goes unappreciated, it's sometimes nice to say "thank you" with something special and homemade. Here are some of my favorite gifts, all of them quick to make and easy to stow.

Catch-of-the-day BBQ rub

Bottling your favorite spice mix or rub makes a great and easy-to-stow gift. Here is my favorite barbeque rub for freshly caught fish.

Makes about 10 tablespoons of spice mix, enough to fill a small spice jar

- 2 tablespoons ground cumin
- 2 tablespoons brown sugar
- 2 tablespoons dried Italian seasoning
- 1 tablespoon coriander
- 2 teaspoons chili powder
- 2 teaspoons paprika
- 2 teaspoons cinnamon
- 2 teaspoons black pepper
- 2 teaspoons salt

Mix your spices and put them in a decorative jar.

Simple gifts of welcome or thanks

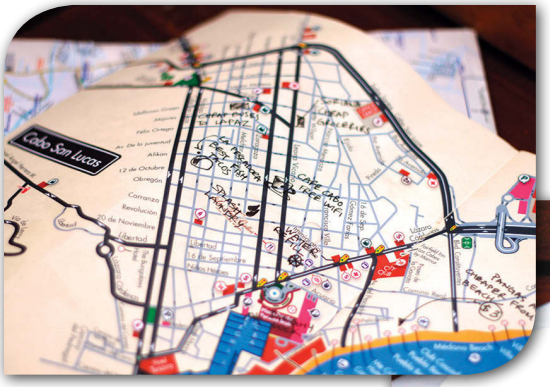
Hot rum mix

If ever there was a beverage for a cold night on the boat, it has to be hot buttered rum. This delicious hot rum recipe is sure to warm the cockles of fellow cruisers' hearts. To add to this gift, you could include a bottle of your favorite rum.

Ingredients

- 1 stick salted butter
- 2 cups brown sugar
- 1 teaspoon cinnamon
- ½ teaspoon nutmeg

Mix ingredients well until blended and put them in a decorative jar. Add a label with mixing instructions (one tablespoon of hot rum mix, one shot of rum, and one cup of boiling water).



Margarita marmalade

This twisted marmalade is great for both sweet and savory cooking and requires only four ingredients, all of which you're likely to have on board. My favorite use for this marmalade is to put a dollop on top of cheese and crackers for a decadent happy-hour snack.

Makes 4 cups marmalade

- 3 pounds limes
- 4 cups sugar
- ½ cup tequila
- 4 tablespoons orange-flavored liqueur (such as Cointreau, or Conroy if you're in Mexico)

Remove lime zest and slice it into 1/16-inch slivers. Juice limes and add water as needed to produce 4 cups of liquid. Coarsely chop juiced limes and tie in a cheesecloth bundle. In a pot, combine zest slivers and the 4 cups of liquid, immerse the cheesecloth bundle, bring to a boil. Reduce heat and simmer for one hour. Remove cheesecloth bundle, return to a boil, add sugar. Reduce heat to simmer and stir until the mixture sets up (about 10 minutes). Remove from heat and stir in tequila and orange-flavored liqueur. Preserve your margarita masterpiece by canning.

A personalized map

Pick up a couple of extra maps the next time you're at the tourist information center. As you explore, mark up the map with information especially useful to sailors: the best place to park a dinghy, a great chandlery, your favorite coffee shop, or the spot with the best fish tacos in town. Personalized travel maps are a fun way to thank a cruiser who's just arrived in a new port or who's sailing in the opposite direction.

A cruising care package

Package some of your favorite goodies for a new friend's next long passage. Items such as sunscreen, ginger chews, chocolate, earplugs, tea, eye mask, and wet wipes are all good things to have on board. Bundle them up in a mesh bag that can later be used for storing fruits and veggies.

Sailboat glamour shots

Sailors love their boats like they love their children. We can really never have enough pictures of our floating pride and joy. Take a couple of glamour shots of a fellow sailor's boat the next time you're both out of the harbor. Print your photo and attach it to cardstock to make a personalized card.

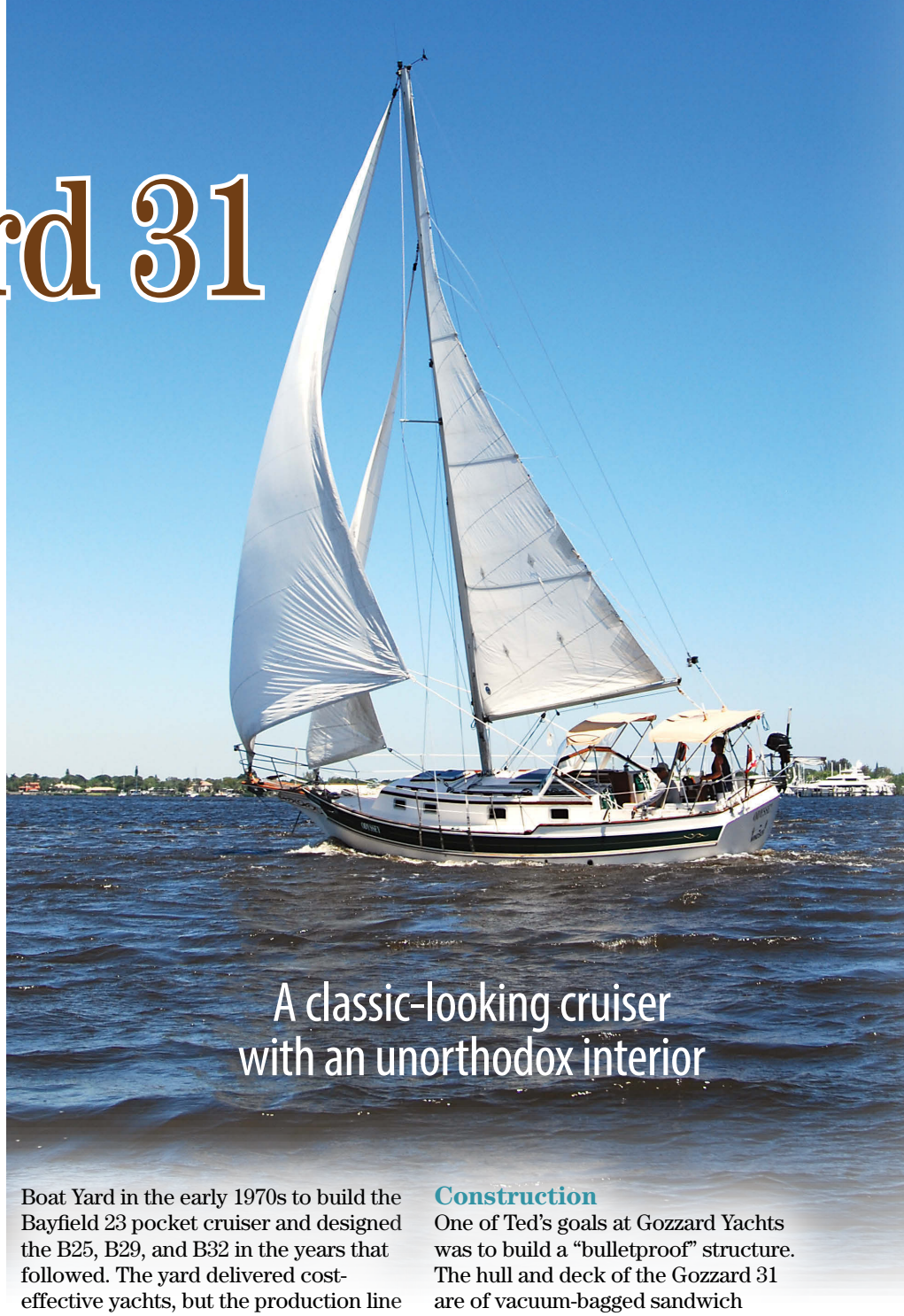
A salty tale

Everyone loves a good sailing story. Give your favorite sailing book as an eBook or audiobook. For inspiration, see *Good Old Boat*'s Audio Sea Stories collection, which contains several salty titles in each format ranging from $15 to $20 (www.audioseastories.com).

Whether it's a card, gourmet galley provisions, or a cruising care package, these thoughtful, easy-to-stow gifts are sure to leave your fellow sailors smiling. Happy gifting!

Fiona McGlynn started sailing dinghies at age 6 in British Columbia's Deep Cove, North Vancouver, where she spent most of her time bobbing in the water because she enjoyed capsize drills more than sailing itself. In 2015, Fiona and her partner, Robin Urquhart, left Vancouver in their Dufour 35, MonArk, *and plan to sail to the South Pacific. Read about their (mis)adventures and "boatsteading" tips at www.happymonarch.com.*

Gozzard 31



A classic-looking cruiser with an unorthodox interior

BY JOE CLOIDT

Viewed alongside the sleek cookie-cutter yachts of today, a Gozzard sailboat may look like a throwback to a past era, but the clipper bow, graceful sheer, and cutter rig have never lost their appeal for sailors who favor boats with a traditional appearance. The Gozzard lineup of a half-dozen models from 31 to 50 feet shares the same lines, and the boats are known for the quality and detail built into them. These seakindly yachts were designed for those looking for something more than the standard production boat.

It is for these very reasons that Jamie and Miriam Garnier were attracted to the Gozzard 31. Like many sailors, they started out sailing smaller boats before settling into a larger cruising sailboat. Jamie learned to sail on a Hobie 14 at the family cottage on Lake Erie. He moved on to a Sea Fury 20 and eventually commissioned a Bayfield 25, *Hobbit*, after meeting its designer and builder, Ted Gozzard, at a boat show.

In the early 1980s Jamie met Miriam, who had been taking sailing lessons on a Tanzer 22. They married, raised a family, and spent summers co-captaining *Hobbit* on the Great Lakes. When the kids were grown and retirement was on the horizon, they decided it was time for a bigger sailboat that could take them to distant ports. They had always been impressed with the Bayfield, so looking at a Gozzard was a natural choice for them, and they soon purchased the 1990 Gozzard 31 *Odyssey*.

History

The first boat Ted Gozzard designed was a trimaran, so one has to wonder how he went on to build monohulls of such traditional appearance. But building that boat got Ted thinking about what makes a good liveaboard cruising boat and led him into the boat-building business. He founded Bayfield Boat Yard in the early 1970s to build the Bayfield 23 pocket cruiser and designed the B25, B29, and B32 in the years that followed. The yard delivered cost-effective yachts, but the production line didn't lend itself to customization.

By the end of the decade, Ted was ready to move into the semi-custom side of the business and sold his interest in Bayfield. In 1982 he formed Gozzard Yachts so he could design boats and build them for individual customers, rather than on a production line. The first sailboat he designed under the Gozzard Yachts name was the Gozzard 36. The G41, G31, G44, and G37 followed over the next two decades. The common lineage of the Bayfield and Gozzard yachts is very apparent. Although Ted passed away in 2014, the family-run yard is still active updating and repairing Gozzard yachts.

Construction

One of Ted's goals at Gozzard Yachts was to build a "bulletproof" structure. The hull and deck of the Gozzard 31 are of vacuum-bagged sandwich construction consisting of knitted double-bias E-glass skins each side of a foam core. Critical and high-stress areas are reinforced with additional layers of fabric. Full-length rubrails protect the hull during docking maneuvers. The molded deck non-skid has the texture of sand. The hull joins the deck at a 4-inch-high bulwark. The joint is sealed with 3M 5200 and fastened with 5/16-inch stainless-steel bolts on 6-inch centers.

Gozzard Yachts settled on a modified full keel with a skeg-mounted rudder as the best solution for a cruising sailboat. The 4,800-pound external lead ballast takes the impact in the inevitable grounding while the large cutaway

Jamie and Miriam Garnier's Gozzard 31, *Odyssey*, carries full sail on Florida's Indian River Lagoon, facing page. *Odyssey*'s foredeck is neatly arranged with two anchors on the bowsprit, an electric windlass (that Jamie added), chain stopper, chain pipe, and locker, top left. The combination chocks and cleats port and starboard are "big boat" gear. A traveler for the self-tacking staysail spans the cabintop in front of the mast, top right. All the sail-control lines are within reach of the cockpit behind the fixed windshield. The helm pedestal incorporates the steering, compass, engine instruments, and a table, above right. The winch is a leftover from the original mainsheet setup. A door in the transom pivots down to allow convenient access for swimming and using a dinghy, at right.

section at the trailing edge reduces wetted surface. The skeg supports the bottom of the rudder and also protects the propeller.

On deck

The G31 feels like a larger boat. This is partially due to the teak platform bowsprit that extends its overall length to 36 feet. *Odyssey*'s 35-pound CQR primary anchor and Delta 22-pound plow secondary fit side-by-side on the platform, and the two rodes stow in a large locker under the foredeck, along with a spare anchor, fenders, and other deck gear. Jamie installed a Maxwell RC8-8 windlass for the heavy lifting (the main rode is 90 feet of chain and 150 feet of nylon). Custom beefy bronze combination chock-cleats are located forward, amidships, and at the stern. Pairs of teak handholds on each side of the cabintop, along with the bulwarks and outboard standing rigging, make for secure passage along the sidedecks.

Aft, just forward of the cockpit, the sheerline and sidedecks take a little step up, a classic touch that allows more headroom in the aft cabin A fixed windshield was a standard feature and blends nicely with the lines of the boat. The companionway doors open neatly inside the recessed entryway.

A pair of screen doors and a screened sliding hatch allow fresh air into the interior but not bugs.

Moving around in the comfortable cockpit is easy, even with the large

One of several unconventional features in the Gozzard 31 is the double berth that's formed when the saloon settees, far left, are swiveled inboard, at left. In the spacious galley, on facing page, Gozzard Yachts found clever ways to create and use stowage, far right.

pedestal that carries the instruments and the 28-inch spoked teak wheel. To avoid the problems inherent with fasteners, the teak cockpit sole is secured with adhesive and a minimum of screws.

A vented propane locker is built into the aft end of the starboard bench. An interesting cockpit feature is the helm seat that flips outboard to make a small boarding platform. *Odyssey* carries her dinghy on factory-installed davits.

The rig

Between the mainsail, headsail (which Gozzard Yachts calls a topsail), and staysail, the G31 carries a total of 782 square feet of sail on its 46-foot-tall aluminum deck-stepped single-spreader mast. The cutter rig offers choices in sail combinations for varying wind conditions. Forward and aft lower shrouds and the upper shrouds terminate at large stainless-steel chainplates bolted on the outside of the hull, where they can be easily inspected. All the running rigging is led aft along the cabintop to Spinlock stoppers and Lewmar 16 self-tailing winches.

Odyssey has a soft boom vang that can be disconnected from the mast base and moved to a pad-eye on the sidedeck for use as a preventer when sailing downwind. The topsail sheets lead back to Lewmar 40 two-speed self-tailing primary winches. The self-tacking staysail sheets to a traveler just forward of the mast. Both headsails are on Schaefer roller furlers.

In the standard configuration, the mainsheet leads from the end of the boom via a block mounted on the cockpit pedestal to a Lewmar 16 self-tailing winch for trimming. This precludes fitting a continuous bimini and enclosure over the cockpit. When *Odyssey* went back to the Gozzard yard for some upgrades, she was fitted with a stainless-steel cockpit arch for the mainsheet, which now leads from the arch, forward to the mast, and back to a winch on the cabintop.

Belowdecks

Gozzard Yachts favors an interior design that puts the saloon forward and eliminates the usual V-berth. When the table is lowered and the settee benches pushed together, they form a large double berth, and the saloon becomes a stateroom. With its varnished American cherry interior, nicely contrasted by white laminate on the overhead and cabin sides, the cabin feels warm and cozy. The joinery is top-notch and the craftsmen at the yard have made the most of the space with numerous built-in storage cabinets and drawers.

The nav station has a seat and chart drawer. A panel outboard houses the

Comments from owners of the Gozzard 31

Despite her weight, she sails surprisingly well in light winds and points well. She has a thick fiberglass hull, top-of-the line running and standing rigging, quality winches, a reliable Westerbeke diesel, and admirable attention to detail. I did need to do a peel and delaminate for blistering on the hull. The teak and other types of wood in the cabin and on deck do require regular care. The boat is excellent for a cruising couple, but would probably be cramped for a foursome.

–**Paul Delay**, Rose Haven, Maryland

My wife and I bought a new Gozzard 31 at the Annapolis boat show in 1997. It's a great sailing boat and could handle a lot of sail. It's a great looking boat and a head turner with its stainless steel and bowsprit. Likes: quality build, storage space, layout and size of cockpit, very dry, no leaks, Westerbeke 35 is a good motor for the boat. Dislike: does not back.

–**John and Ruth Waltman**, Millersburg, Ohio

As a cutter with a large genoa, she does not point well, nor is tacking a simple matter; one needs lots of speed and some practice getting the genoa over the inner stay. But we are very happy with the cutter rig. The boat is exceptional on a reach — literally steers herself. You simply cannot appreciate the fit and finish of a Gozzard until you've been on one. We have the optional hardtop, which is a blessing in summer; it is a nice option over a bimini and dodger.

–**David Williamson**, Gulf Breeze, Florida

AC/DC electrical panels and several electronic instruments The stateroom in the starboard quarter has standing headroom inside the door, a set of cabinets, and a double berth.

Countertop space in the L-shaped galley is expandable with a flip-up extension inboard of the large centerline sink. The top-loading refrigerator and the two-burner Force 10 propane stove/oven are located outboard. Due to clever use of the available space, storage volume is good.

The head, located aft of the galley, has plenty of elbow room. Because longer term cruising was in their future, the Garniers replaced the marine head with a Nature's Head composting toilet, and they gained storage space by removing the holding tank. Jamie says it was one of the most worthwhile improvements they have made.

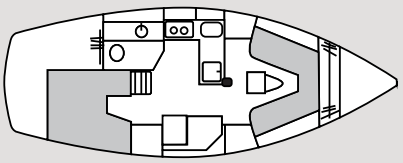
Two 24-x 18-inch screened deck hatches provide volumes of air to the main cabin. Nine opening portlights, all screened, ventilate the remaining compartments, and a solar vent circulates air in the galley 24/7. A 51-gallon stainless-steel water tank mounted in the bilge, along with a 6-gallon Force 10 water heater, feeds a pressurized water system throughout the boat.

Power

Odyssey came with the optional 37-horsepower Westerbeke 38B4 diesel engine turning a 16- x 14-inch three-blade bronze propellor, giving her plenty of power for motoring through a heavy chop. Jamie upgraded the alternator to a 140-amp model. Removing the companionway stairs and opening hinged panels in the quarter berth allows access to the engine. An electric pump delivers fuel to the engine from the 55-gallon aluminum tank located in the bow.

Gozzard 31

Designer	Ted Gozzard
LOA:	36 feet 2 inches
LOD	31 feet 0 inches
LWL:	26 feet 0 inches
Beam:	11 feet 0 inches
Draft:	4 feet 5 inches
Displacement:	12,000 pounds
Ballast:	4,800 pounds
Ballast/disp. ratio:	.4
Sail area (100%):	607 square feet
Sail area/disp. ratio:	18.5
Disp./LWL ratio:	305



Resources

Specifications and other information on the Gozzard 31 can be found at www.gozzard.com.

Under way

I had a chance to sail *Odyssey* on a cool Florida day in December with clear blue skies, temperatures in the mid-60s, and a 15-knot north wind with gusts into the low 20s. Although we were seven aboard and filled the cockpit, everyone felt comfortable, including the non-sailors. As we motored from the dock on the Banana River, around Dragon Point, and into the Indian River Lagoon, that extra horsepower and the three-blade prop paid off; we didn't need to push the throttle far past idle to hold the bow into the gusty wind to raise sail. With the mainsail hoisted and the staysail rolled out, Jamie asked if I would like to take the wheel, which I promptly did, and I didn't relinquish it for the rest of the sail.

The smooth motion through the heavy chop gave the feeling of being on a larger boat. The G31 didn't hobby-horse and the bow didn't slam into the waves. I attributed this to the boat's moderate displacement and stiff design plus the sail plan keeping it powered up. With the wind in the 15-to-20-knot range, the G31 felt very comfortable with the full mainsail providing the power and the staysail balancing the helm. I expected the helm to feel a bit heavy due to the smaller wheel and rudder, but the boat was easy to steer and I noticed only a slight amount of normal weather helm.

The Gozzard 31's nav area has a chart table, a comprehensive electrical panel, and space for instruments, below left. The head, in the port quarter aft of the galley, is handy to the companionway, near right. A private stateroom in the starboard quarter has standing headroom and an opening portlight for light and ventilation, far right. Access to the top of the Westerbeke diesel engine is under the aft cabin berth, far right below.

Once on course and up to speed, the G31 tracked very well and made little leeway. But with that longer keel, the boat was a little slow coming about and fell off some before picking up speed on the new tack. Sailing downwind, the G31 was rock steady and didn't exhibit the uncomfortable corkscrew motion sometimes felt when the wind and waves are on the quarter. On a day when the conditions were less than ideal for a casual sail, the Gozzard 31 was in its element.

Conclusion

While the Gozzard 31's traditional styling may not appeal to everyone, this well-designed, well-built, and handsome yacht will take a cruising couple just about anywhere in comfort and safety.

Jamie and Miriam sailed *Odyssey* from the Great Lakes, to the Exumas in the Bahamas, and back to Florida and have nothing but praise for her. The boat is as comfortable to live aboard as it is to sail. The G31 is well-thought-out and the builder's attention to detail goes far beyond that seen in most production sailboats. Reading the spec sheet for the G31 could be a lesson in "How to build the proper sailboat."

Gozzard Yachts built only 20 G31s but would be happy to build number 21 for a customer. An internet search came up with only one listing, a 1992 model for $89,000. Prices in older ads ranged from $90,000 to $110,000 depending on condition and outfit. The high resale value of the G31 is a testament to Gozzard's commitment to building a high-quality yacht that has timeless appeal.

Joe Cloidt is a sailor, writer, film maker, tinkerer, and electrical engineer by trade. His current boat is Desire, *a 1988 Pearson 31-2 that he sails on the Indian River Lagoon on the central east coast of Florida. Joe also enjoys charters in far-off locations and the occasional cruise to the Bahamas when he's between jobs. Although mostly a cruiser, Joe crews on a J/30 at the local yacht club for the Friday night Rhum Races.*

Filling in the blanks

Unwanted portlights left holes to patch

BY CONNIE MCBRIDE

Over dinner one evening aboard their Allmand 31, *Here & Now*, our friends mentioned wanting to replace the boat's portlights. They planned to head to the Caribbean that year and sought ways to make their boat more seaworthy. We looked around and counted 11 portlights. The conversation led from the enormous cost of replacing them all with a quality product to questioning the safety of having 11 holes in the cabin trunk. By the time dessert was served, a decision was made: they would eliminate six of the portlights and replace only the remaining five. And they hired my husband, Dave, to do the necessary fiberglass work and installation.

Eliminating six portlights would entail removing them and fiberglassing the resulting holes in the cabin trunk. Aware that the daily arrival of Florida's afternoon summer thunderstorms limits the amount of time available for working with epoxy, Dave elected to undertake the project two portlights at a time.

He began by removing the old portlights. After removing the hardware securing them, he worked to get the portlights out of the sides of the cabin trunk, a task that, because they had been in the boat for all of her 31 years, required patience and tools. Dave placed a thin scraper along the cabin side to protect it from the chisel and mallet he used to loosen each portlight.

After removing a portlight, Dave went below and pulled away the plywood trim panel that covered the inside of the cabin side, which was raw fiberglass. He then cleaned the area where the portlight had been, scraping off all of the sealant.

Next, he marked around the hole a 1¼-inch border with square corners. Following this pencil line, he used

Not wanting to damage the fiberglass, Dave placed a scraper between it and the chisel he used to pry out the portlight, at top. In Florida's heat he used any available shade, upper right. Where did the hole go? When the job was completed, it was as if no portlight had ever been there, above.



After removing a portlight and cleaning up the area, Dave cut a 1¼-inch-wide rabbet around the inside of the hole, at left, into which he would fit a plwood insert, center, with a matching rabbet to fit in the opening. He glued the plywood in place with epoxy, at right.

a Fein saw to cut through the inner laminate and the core, taking care not to cut into the outer laminate. He then chiseled out the core right up to the inside face of the outer laminate, creating a 1¼-inch-wide rabbet all around the hole. Because our friends lived aboard during the project, he often kept a shop vac running to reduce dust and debris.

Plywood insert

Next, Dave cut a piece of ⅜-inch marine-grade fir plywood so that it easily fit into the rectangular hole in the inside laminate and core. With a circular saw, he cut three vertical kerfs about halfway through the inside face of the plywood to allow it to bend to conform to the slight curve of the cabin trunk. While I held this plywood in place from the inside, Dave went on deck and traced the shape of the portlight hole onto the outboard side. Using this line as a guide, he then routered a rabbet around the outboard side of the plywood, leaving an "island" about 3/16 inch high that matched the shape of the hole in the ⅜-inch-thick outer laminate.

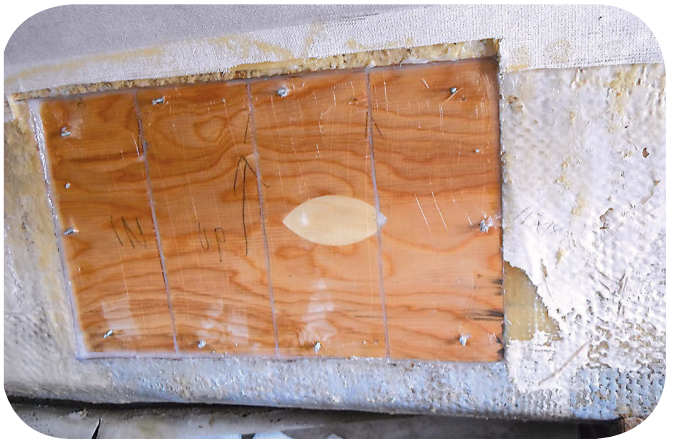
We dry-fit each piece of plywood, removing wood as necessary for an easy fit in the opening. A tight fit was not necessary, because we wanted epoxy to fill the gap around the edges. Next, we pre-drilled holes through the outer laminate and the plywood for screws that would hold the plywood in place as the epoxy cured.

Working from inside the cabin, Dave used West System epoxy (plain, with no filler) to wet out the rabbeted area on the inside of the cabin trunk and the side of the plywood that would mate with it. He then coated the same surfaces with epoxy thickened with colloidal silica. After placing the plywood in the hole, Dave filled the kerfs with thickened epoxy. Summer in Florida dictated that he use 206 Slow Hardener, but he still had to work as quickly (and neatly) as he could.

While I held the plywood in place from the inside, Dave screwed into it from the outside, through the holes we'd previously drilled in the outer laminate. This ensured a strong bond with no voids while the epoxy cured overnight. We caught any epoxy that was squeezed out and redistributed it to the kerfs and the edges. Before the epoxy was completely cured (while a fingernail still made an impression in it), Dave backed out each screw a quarter turn and retightened it (using a screwdriver for finesse, rather than a screw gun). He uses this trick often to ensure fasteners will back out from cured epoxy and not break off.

Glassing begins

The following day, after removing the screws, we sanded and scuffed the inside of the plywood, and a 1-inch-wide border of the cabin side around




After coating the rabbets with epoxy, Dave screwed the plywood in place from the outside, using holes he'd pre-drilled for the purpose, at left, The kerfs, filled with epoxy, are visible in the plywood. The outside face of the plywood was flush with the cabin side, at right.



David sealed the interior side of the plywood with a layer of fiberglass cloth. After cutting the cloth, at left, he wet out the plywood and surrounding margin with epoxy, center. To avoid distorting the cloth, he applied it dry, at right, then wet it out thoroughly in place.

it, in preparation for applying fiberglass cloth. Dave used just one layer of fiberglass cloth here as its purpose was to waterproof the plywood and to prevent the joint from cracking. The laminate to be applied on the outside of the cabin trunk would provide the needed structural strength.

Dave cut a piece of fiberglass cloth large enough to extend 1 inch beyond the plywood on all sides. He wet out the plywood and the margin around it with epoxy, then filled the screw holes and faired the edges with epoxy thickened with colloidal silica. He carefully placed the fiberglass cloth over the wet-out plywood and wet out the cloth thoroughly with epoxy, making sure to leave no voids.

Experience has taught Dave to handle fiberglass cloth with great care. Even when the fabric is dry, pulling in any direction on a piece that's cut to a shape permanently distorts that shape. Cloth that has been wet out before it's positioned is even more likely to become distorted, and it can create a mess. Fiberglass mat, on the other hand, is more dimensionally stable, wet or dry, and can be wet out before it's applied to a surface.

Beveled buildup

Leaving the interior to cure, we moved outside, where Dave started by scraping off sealant that remained on the cabin side. That done, he drew a line on the cabin side 1½ inches out from the exposed plywood. Using a grinder, he beveled the area from his line down to the face of the plywood, creating a 1½- x 3⁄16-inch taper over which to laminate the new fiberglass to the cabin side. The taper makes the repair stronger and less likely to crack. He also rounded the corners of this area, because rounded corners are stronger than square corners.

Dave would build up the laminate with alternating layers of fiberglass mat and woven cloth. The mat is used mostly for bulk while the cloth provides most of the strength.

Though he planned to round the corners of the pieces of cloth and mat to match the shape of the area to be filled, Dave initially cut the pieces as rectangles to better ensure that the opposite edges were perfectly parallel and the adjacent sides perpendicular to each other. Using a carpenter's square, he verified that the fiberglass was not pulled out of shape, then marked the dimensions of the largest rectangle on both the cloth and mat.

Because he was working on two holes at a time, he cut two pieces of cloth and two pieces of mat of each size. The largest pieces were the exact size of the beveled edge on the cabin trunk, 7½ x 15 inches. For each subsequent pair, he reduced the dimensions by ½ inch to 1 inch in each direction.

On a project like this one, Dave always cuts more pieces of fabric than


To prepare the exterior for rebuilding with fiberglass, Dave ground a 1½-inch-wide bevel around the perimeter of the opening, at left. Using a square, at right, he then marked and cut rectangles of mat and cloth in pairs, each pair about an inch smaller than its precursor.

After rounding the square corners of the cut pieces, Dave laid them out so he could pick them up in the sequence — largest to smallest — in which he would use them, at left. Mat holds its shape well enough when wet that Dave could pre-wet it before placing it, at right.

he thinks he will need. Any waste is a small price to pay for ensuring that he does not have to cut fiberglass in the middle of the job when he is messy and his epoxy is kicking. We labeled and separated the pieces to make it easier for me to hand him the correct piece of mat or cloth as he required it.

In preparation for epoxy work, we taped off the cabin trunk and covered the deck in front of the work area to contain any possible messes. Next, Dave thickened a little epoxy with colloidal silica and used it to fill the screw holes, then wet out the plywood with plain epoxy. Then, well aware that fiberglass mat takes up a considerable amount of epoxy, he wet out the largest piece of fiberglass mat. He placed the wet mat on the cabin side, aligning it with the marks to cover the ground-out area, then laid the same size cloth piece over the mat and wet it out in place. He repeated the process for the next-smaller-sized pieces, alternating between mat and cloth and building up the area until it was flush with the rest of the cabin trunk.

After placing each mat-and-cloth pair, Dave used a resin roller to completely flatten the fiberglass and squeeze any voids out of the layup. He worked from the middle of the area, pushing the roller outward toward the edges.

While the epoxy was still green (before it cured), Dave applied a skim coat of epoxy thickened with colloidal silica to begin the fairing process. He immediately peeled the tape before it became epoxied to the cabin trunk.

Fill and fair

Dave waited four days for the epoxy to cure and finish off-gassing. Before sanding, he scrubbed the surface with ammonia water to remove the amines that would prevent the fairing compound from adhering. Sanding alone does not remove amines but drives them into the surface.

Using 3M Marine Premium Filler, he faired the sanded area until it perfectly matched the original cabin trunk side. As usual, the fairing process required several days: sand, apply filler, wait for it to cure, repeat. Dave used the filler for only the finest fairing, as he'd already done most of the fairing with the thickened epoxy.

When sanding large, nearly-flat areas like this, Dave likes to use his home-made longboard as it prevents him from inadvertently creating divots or leaving high spots. (See "Longboard Sander," facing page.)

After repeating the entire process for all six portlights (two at a time), Dave applied two coats of primer over the large section of the cabin trunk that encompassed them. He wanted the area perfectly fair, as painting would highlight any high or low spots.

Camouflage

The next challenge was painting these parts of the cabin trunk so the new paint wouldn't stand out next to the old, dull gelcoat. Though it is usually not recommended to use Awlgrip's flattening agent when rolling and tipping paint, our friends decided we should try it anyway. While a few irregularities showed in the end result (the paint finish was flatter in some places than others), we all agreed that the final product looked much better than if the new section were bright and shiny.

We completed this project several years ago. *Here & Now* is currently in



Dave laid the wet-out mat in position, followed by the matching piece of dry cloth, at left. With a foam roller, he applied more resin to the cloth, center, then finished each pair by using a resin roller to flatten the laminate, work the resin into it, and eliminate voids, at right.

the Caribbean, a more seaworthy boat with fewer holes in the cabin trunk. When I recently asked her owners how the patches and paint were holding up, they assured me they have had no problems with them. No cracks have appeared and the paint now blends in perfectly with the original gelcoat. The only challenge they faced with the entire project was deciding how to cover the holes in the original trim where the old portlights used to be. Their solution was to hang pictures over those areas. Tropical scenes and family members hide the only evidence that there were once more than five portlights in *Here & Now*.

*In 2002, **Connie McBride**, her husband, Dave, and their three boys began their lives of adventure on board their 34-footer* Eurisko. *After nearly a decade in the Caribbean, including a year in Panama, they returned to the U.S. for a while. Now empty-nesters, Connie and Dave are in the middle of a slow meander back to the Caribbean. Follow their adventures, tips, and DIY projects on Connie's website: www.simplysailingonline.com.*

Longboard sander


When sanding any large area, it's easy to inadvertently create humps and hollows. To help prevent this, Dave uses a longboard. It's flexible enough to follow gently curved surfaces but stiff enough to sand them fair.

He cut a piece of ¼-inch plywood 3 inches wide and 16 inches long, as those dimensions fit sandpaper designed to be used with belt sanders. (The same sandpaper is sold as rolls and can be cut to fit boards of different lengths.)

He then cut two 3-inch handles out of ¾-inch-square stock, glued them to the plywood with Gorilla Glue, then backed that up with countersunk flathead screws. The handles are 12 inches apart.

He cut the sandpaper belt along its "crooked" seam and glued it to the longboard with 3M Super 77 spray adhesive. The angled ends of the paper wrap around the board, helping to keep the paper in place.

The ¼-inch plywood is flexible enough to conform to the shape of cabin trunk sides and other nearly-flat surfaces. For fairing surfaces with a little more curvature, kerfs cut in the back of the board will make it more flexible.

Fridge/freezer

Reinsulating means rebuilding

BY DAVID LYNN

As is the case aboard many good old boats, the refrigerator/freezer insulation aboard *Nine of Cups*, our 1986 Liberty, was less than perfect. Our cold box was built with 2 to 3 inches of foam insulation surrounding it. This insulation was marginal when new, and when we purchased *Nine of Cups* 14 years later, it was pretty much useless.

Reinsulating the cold box had been on my to-do list for years. Then, a few years ago, I found myself moored off South Australia for a few months while Marcie flew home to take care of some family issues. This seemed the perfect time to tackle the project.

Nine of Cups has a 12-volt system. The condensing unit sits under a settee in the saloon. Copper tubing runs behind the galley sink and stove, through the refrigerator, and to a cold plate evaporator in the freezer. A partition separated the refrigerator compartment from the freezer. Two thermostatically controlled fans mounted in the partition circulated cold air from the freezer compartment to the refrigerator compartment, a typical spillover arrangement.

My plan was to remove the old countertop, the fridge/freezer compartments, and all the old insulation and start anew. Because the evaporator, condensing unit, and temperature controllers were all fairly new, I planned to reuse them. I had Don Casey's book, *This Old Boat*, for guidance. What could possibly go wrong?

This project would require me to demolish the better part of the galley and convert the saloon into a workshop. I'd be without a refrigerator for the duration. I would also have to disconnect and remove the stove and the sink for much of the time. Yes, this was a project best done while Marcie was away.

"Extract the old"

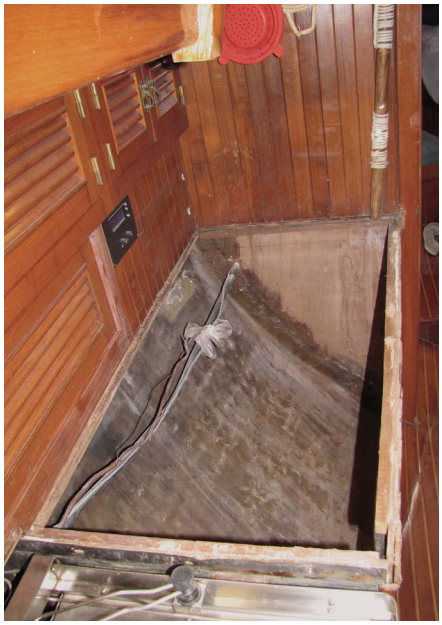
In his book, Don devotes 12 words to the demolition part of the project: "… extract the old ice chest. Remove all traces of the old insulation …" It took me three days to accomplish that phase. The old insulation dripped water and there were gaps between the foam sections. The insulation in any old Coleman cooler is probably more effective.

There were only a couple of glitches in this phase. I wasn't able to extract the copper tubing without kinking it, so I had to cut it. I would have to repair it with new couplings when I put it back together. And although I tried to be very careful, I wasn't able to remove all the teak trim without cracking a couple of pieces. I hoped I'd be able to repair them as well.

This was the worst point of the project. As I looked at the large cavern where the old refrigerator/freezer box had been, self-doubt crept in. What the heck was I thinking? I'd never get it all back together and working … and even if I did, it would look like crap. Thoughts of burning *Cups* to the waterline to destroy the evidence cropped up. "So sorry, Marcie. I don't know what happened. The boat just burned down."

New lining

I got past my feelings of self-doubt by breaking down the project into small sub-projects. The first of these was to create a new lining on the inside of the empty box. It would consist of two layers of epoxy-impregnated glass cloth, a layer of heavy foil, and a layer of plastic sheeting to act as a vapor barrier (illustration on facing page).



Nine of Cups' **finished fridge/freezer looks much like the original, at top of page, because David reused the hatch lids. The renewal began with a cavern, above.**

mega makeover

I sanded the cavern walls with 80-grit sandpaper, then donned a chemical-grade respirator, opened all the ports, and turned on as many fans as I could before I stuck my head into the cavern to clean the sanded surfaces with acetone.

Next, I measured and cut all the fiberglass cloth pieces I would need. I wanted every section to overlap its adjoining section by an inch, so I cut them all slightly oversized. Because I was applying two layers, I cut the pieces for the second layer so the joints would be staggered. I stacked the cut sections of cloth in the order I would be using them.

I next cut pieces for the foil layer, again allowing for a 1-inch overlap at each joint, and stacked these in the proper order. Finally, I cut the plastic to size, with the same overlap at the joints and enough extra at the top to overlap the top of the foam.

I knew the job would be messy, so I taped waxed paper and plastic drop cloths on the teak cabin sole and around the work area. I donned latex gloves and an old long-sleeved shirt. Alcohol is a benign solvent for epoxy, so I poured some into a container and set it nearby in case of a spill. I placed rags in strategic locations.

I used the wet method for applying the glass cloth. I mixed the first small batch of epoxy and rolled a coat of it onto a section of the cavern, pushing it into the corners with a chip brush. When the epoxy was tacky, I applied the first section of glass cloth, working out the wrinkles by lifting the edges and smoothing the cloth from the center. Once satisfied with it, I rolled more epoxy onto the cloth until it was thoroughly wetted out. I removed the excess epoxy with a squeegee and worked it until the glass was consistently transparent. After the first piece of cloth was done, I applied the second piece, overlapping the first by an inch or so, and continued until the entire first layer of cloth was in place.

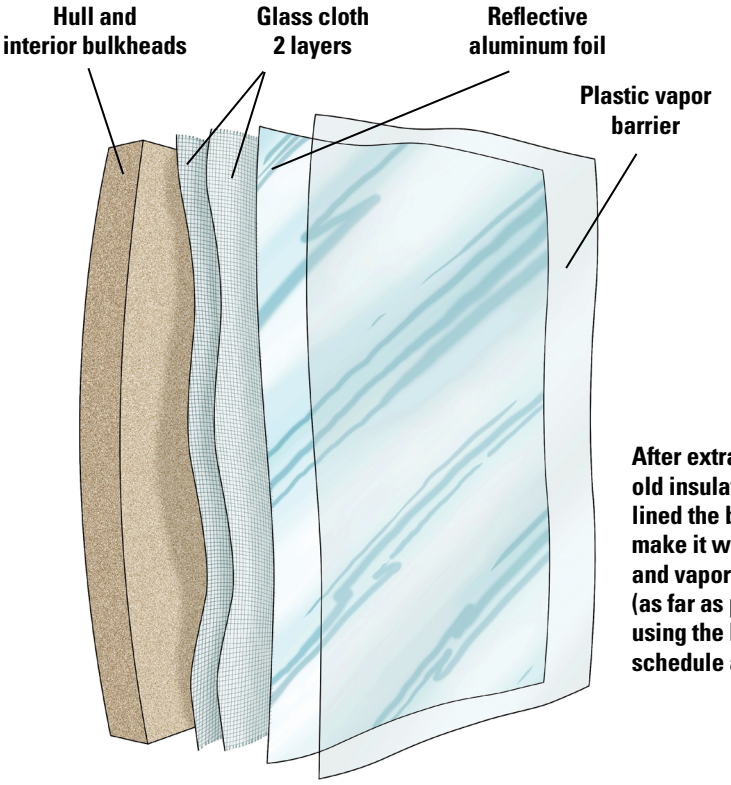
I repeated the process for the second layer of glass cloth. When that layer was completed, I rolled on another coat of epoxy and, while it was still tacky, pressed the aluminum foil into place over the glass cloth. I stopped the foil short of the top edges of the cavern, just enough to leave a surface I would use later to bond the countertop edge. On top of the foil, I layered the plastic sheeting, leaving the top edge high enough that I could later fold it inward over the foam.

I accomplished all of this in one day and, by applying each layer of epoxy before the previous layer cured, avoided having to sand between layers. If this were a segment on *This Old House*, the camera would now pan out to the workers cracking open cold brews. In my world, it didn't go exactly like that. Removing the waxed paper and plastic from the work area didn't take long but, during the course of the day, close encounters with wet epoxy had left the sleeves of my shirt glued to the hair on my arms in several places. It took another hour to remove the epoxy from my arms and the rest of my anatomy. Worse, without a fridge there was no cold brew.

ILLUSTRATION BY FRITZ SEEGERS

To prepare the cavern to receive new insulation, David lined it with fiberglass cloth and epoxy, a layer of aluminum foil, above, and a plastic film vapor barrier.

Pre-insulation preparation



After extracting the old insulation, David lined the box to make it waterproof and vapor proof (as far as possible) using the laminate schedule at left.

Insulation choices

Insulation materials range from the exotic to the mundane, and the more effective the insulation, the more expensive it is. One trade-off is the gain in cool-box volume achievable with thinner but more expensive panels.

Aerogel insulation – Silica aerogel is an extremely low-density foam made from a silica gel. Only 3 percent of its volume is solid, while the remaining 97 percent is composed of tiny nanopores of air. Since the air cannot move, heat transfer by convection and by conduction is very low. Commercial insulation made from aerogel has a thermal-resistance (R-value) of about R9 per inch of insulation. Its drawbacks are that it is difficult to cut, working with it produces a lot of dust, and it is very expensive.

Vacuum insulation panels (VIPs) – Several companies have attempted to develop insulation panels that successfully incorporate a vacuum, the perfect insulator. These panels encase a core material inside a membrane. Air is pumped out until the core is at a near total vacuum, and the panel is sealed. Manufacturers of these panels claim that their products have insulation ratings of R30 to R50 per inch.

Before its demise, the Glacier Bay company specialized in refrigeration systems for boats and offered a type of aerogel as the core for its VIPs. The panels were expensive.

Rparts makes its own vacuum panels using a silica-based low-density core much like aerogel. These panels can be encapsulated in fiberglass-reinforced plastic (FRP), making them less fragile. Rparts offers a 20-year warranty on its FRP-encased panels. While priced comparatively lower than Glacier Bay's products were, these panels are also quite costly.

Aside from the cost, vacuum technology has two potential drawbacks. One is the possibility that the panels will, over time, lose their vacuum, due to molecules of air passing through the membrane or from out-gassing of the core material. The other drawback is that the panels cannot be cut or drilled; they must be ordered to the correct size, including any cutouts for tubing or wiring. If custom-sized panels are needed, expect a 6- to 10-week delivery time.

Rigid polyurethane and polyisocyanurate (polyiso) foam insulation – Polyurethane and polyiso foam insulation have almost identical properties and thermal resistances of R6 to R7 per inch of thickness. Both are produced in rigid sheets, are often laminated with aluminum foil, and are used extensively in the building industry. The foam sheets are easy to cut and shape. Critics claim that the thermal resistance of these materials declines with age and that the useful life is around 15 years.

Liquid polyurethane foam – Liquid polyurethane foam insulation comes as either a two-part liquid or in aerosol cans. Once applied, it expands to two to 20 times its initial volume. It's great for filling gaps and the closed-cell version has, in theory, the same insulation characteristics as the equivalent rigid polyurethane foam sheets. In practice, however, I am skeptical. Our boat's fridge/freezer was insulated with this material. It became saturated and pretty much useless sometime between its installation and 14 years later when we bought her. (See also "Two-part Polyurethane Foam," page 33.)

Polystyrene – Polystyrene insulation has been used in the building trade for decades. It has a thermal resistance of around R3 to R4 per inch of thickness, is readily available in most building supply stores, and is less expensive than polyurethane foam. It is also easy to cut and shape. Proponents claim it loses its thermal resistance more slowly than polyurethane foam insulation.

New insulation

My goal for the new insulation was a minimum R-value of 20 for the refrigerator section and a minimum R-value of 30 for the freezer section. I did a lot of research and learned about several different insulation materials, each with its own pros and cons. I distilled what I learned in the sidebar (at left), and the table (on facing page).

Aerogel insulation was not readily available and vacuum insulation panels (VIPs) at the time were either exorbitantly priced or new and untested technology (or both). In addition, every panel would have to be specified and fabricated in advance, increasing the delivery time and expense, not to mention the high probability of an error on my part.

I chose to use rigid polyurethane sheets. I was able to find a local source for 2.4- x 39- x 30-inch polyurethane panels at a reasonable price. A double thickness of these panels should result in a thermal resistance of about R33. Even if, after 15 years, the polyurethane were to lose 50 percent its initial thermal resistance, its R-value would still be equal to or greater than that of the equivalent thickness of polystyrene over the same period.

Installing the insulation was straightforward. I cut each section of the rigid foam to size and installed it against the plastic liner on the interior of the box, tacking it in place with a small dab of hot-melt adhesive. I then cut the sections for the second layer of foam, making sure to stagger the joints, and installed these sections, using hot-melt adhesive as necessary.

The box

I built the interior box from ½-inch marine plywood with plastic laminate bonded to the inside surfaces. I started by cutting the plywood sides, top, and bottom, and assembled the box using small dabs of hot-melt adhesive to hold

The insulation is two layers of 2.4-inch-thick polyurethane foam, at left. The inner box, at right, is lined with white laminate. David would place it inside the insulated cavern once he had fitted the divider, sealed all the inside corners, and installed the cold plate in the freezer.

it together temporarily. Once I was happy with the fit, I disassembled the parts and cut the openings for the front access hatch and small cutouts in the corners for routing the copper tubing and electrical wiring. Then I laid the plywood pieces flat and bonded the laminate to each section with contact adhesive. Using my handheld router with a laminate-trimmer bit, I trimmed the laminate flush with the edges of the plywood.

Next, I re-assembled the sides and bottom of the box, again tacking the plywood pieces together with hot-melt adhesive. I used epoxy and glass cloth to seal and bond all the outside edges of the box, and sealed the entire exterior of the box with two coats of epoxy.

I made an insulated panel to separate the freezer section of the box, which would house the cold plate, from the refrigerator section. To make the panel, I cut a single thickness of foam to size and bonded laminate to both sides. I cut a circular hole in the panel for mounting a small computer fan. The fan would be temperature-controlled to blow cold air from the freezer into the refrigerator section as needed. Warm air would return to the freezer side of the box through a small opening in the top corner of the panel.

I slid the completed panel into place and applied a bead of white silicone adhesive to its edges on both sides and to all the interior corners of the box. I used a wet finger to remove any excess adhesive and to smooth the bead before it set.

My next step was to mount the cold plate to the inside of the freezer section.

Comparison of insulation materials

Insulation material	Thermal resistance (R-value/inch)	Thickness needed for R20	Cost per square foot for R20	Thickness needed for R30	Cost per square foot for R30	Cost to insulate a 2- x 2- x 2-foot refrigerator to R20	Cost to insulate a 2- x 2- x 2-foot refrigerator to R30
Vacuum panels	30 to 40	.7 inch	$29.00	1.0 inch	$38.00	$700.00	$912.00
Aerogel foam	9	2.2 inches	$30.00	3.3 inches	$48.00	$720.00	$1,152.00
Rigid polyurethane or polyisocyanurate (polyiso) foam	6 to 7	3.3 inches	$1.50	5 inches	$2.30	$36.00	$55.00
Liquid or spray polyurethane foam	6	3.3 inches	$1.00	5 inches	$1.50	$24.00	$36.00
Polystyrene foam	3.5 to 4	5.7 inches	$.60	8.6 inches	$.95	$14.40	$22.80

I marked the hole locations and drilled the four mounting holes. Because there might come a time when I will need to remove the cold plate, I secured the nuts to the outside of the box with epoxy and used standoffs and screws to mount the cold plate (illustration below).

Once everything was complete, I lowered the box into the insulation. Getting all aspects of the box just right required lowering it into and removing it from the insulation several times, and it was quite difficult to get a grip on the box after it was in place. Don Casey suggests taping two long lengths of 50- to 75-pound fishing line underneath and up the sides of the completed box before putting it in place, to make it easier to pull the box back out. This worked well.

With the inner box installed, David hooked up the plumbing and wiring and performed a pressure check before adding the top.

Copper tubing and charging

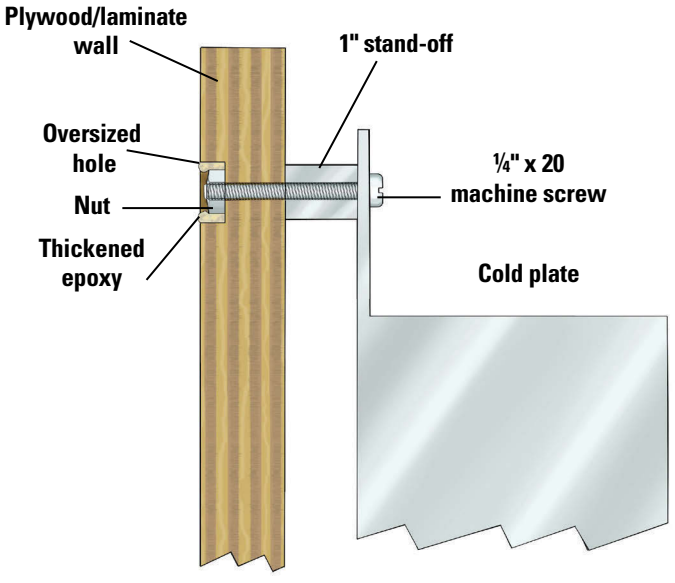
I routed the copper tubing between the condensing unit and the cold plate. As noted, I had kinked a section of the tubing while removing it. Now was the time to cut out the kink and splice the tubing. I used a short section of copper tubing one size larger for the splice.

Since everything had been open to room air, allowing water vapor to enter the system, I also soldered a new dryer in place.

The next step was to pressure-check the system. Over the years, I have gathered a fairly complete set of tools and supplies for repairing our refrigerator/freezer in places far from a professional technician. I used nitrogen gas to pressurize the system to 100 psi. Nitrogen is preferable to room air as it has a very low water content and is available in disposable bottles. I checked for leaks by brushing each connection with a solution of water and dishwashing detergent, knowing that any leak would generate soap bubbles.

When I was sure the system was not leaking, I began the process of evacuating the system and removing any water. I used the old-fashioned low-tech triple-evacuation method. While it takes considerably longer than other methods, it is just as effective and requires a much smaller investment in equipment. When done, I pumped the system down one last time and recharged it with 134a refrigerant.

Cold plate installation



In case the cold plate ever has to be replaced, David epoxied nuts into recesses in the liner box. The stand-offs accommodate the shape of the box and allow air to circulate around all sides of the cold plate.

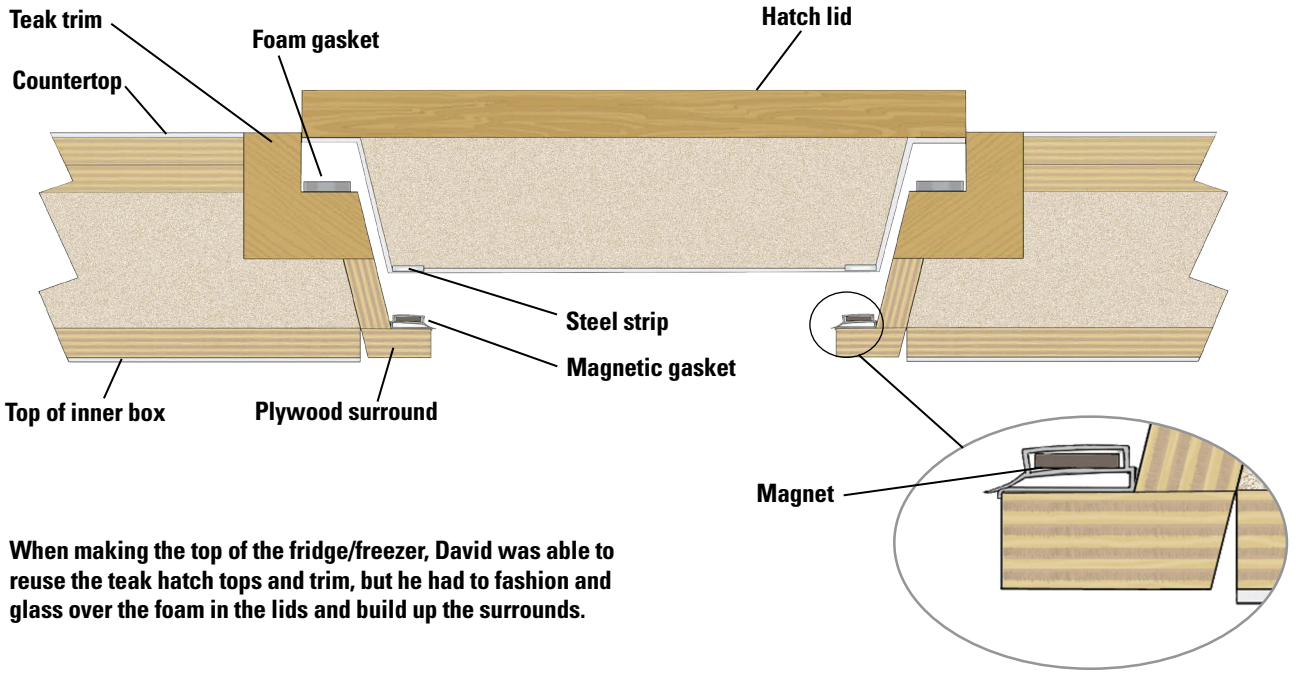
Electrical wiring

I routed the wiring for the temperature sensors in the freezer and refrigeration compartments and for the spillover fan. I ran the wires along the top of the compartments, securing them with cable ties as necessary.

The hatches

The refrigeration compartment had a shelf that divided the compartment into two sections. We stored most of our food in the upper section and bottles and cans in the lower section. This necessitated having an access hatch in the side as well as one in the countertop. The freezer had one access hatch in the top. Each hatch consisted of 4 inches of rigid polyurethane encapsulated in fiberglass with a teak exterior.

Schematic for the access hatches



When making the top of the fridge/freezer, David was able to reuse the teak hatch tops and trim, but he had to fashion and glass over the foam in the lids and build up the surrounds.

ILLUSTRATIONS BY FRITZ SEEGERS

To build new hatches, I started with the teak exteriors salvaged from the original hatches. I used a hacksaw blade and sandpaper to shape the foam to the correct size and epoxied it to the underside of the teak. Then I epoxied two layers of glass cloth to the foam using the technique described earlier. I faired it using an epoxy-based fairing compound and, once it was smooth, applied several coats of primer, sanding between layers to make the surface absolutely perfect. Finally, I rolled and tipped three coats of a good marine enamel onto them. It was a lot of work but the end result was quite nice.

I constructed the interior surface that mates with the hatch from plywood epoxied to a teak trim piece I salvaged from the original hatch. I filled, faired, and painted it in the same manner as the hatch.

Each hatch is double-sealed. The upper seal is a rectangular gasket of soft foam. The lower seal is a gasket with an embedded magnetic strip, like a refrigerator door gasket, and a mating steel strip I embedded in the bottom of the hatch. I cut the gasket material to size and attached it to the hatches using contact adhesive. I encapsulated the steel strip in epoxy and attached it to the mating surface.

Two-part polyurethane foam

by Jerry Powlas

Why not use two-part polyurethane foam for all the insulation? In my 29-year career as a refrigeration engineer, the several companies I worked for made several million refrigerators, freezers, and display cabinets with two-part polyurethane foam insulation and most of those products will enjoy excellent insulating properties throughout their long lives.

Most of the units will be good, some will not. Two-part polyurethane insulation is said by some sources to be a closed-cell foam and, for the most part, the cells are closed . . . but some are not. To make "good foam," the structures should be preheated in an oven and the measured "shots" of foam should be applied to various openings in the cabinets while the cabinets are restrained in a mold that supports all the walls and floor (doors made separately). The mold is necessary because as the foam expands it applies considerable force to the walls. Foam *not* expanded under pressure does not have anywhere near the structural and insulating value.

Finally, all the open exposed edges of the foam must be sealed so water does not enter the foam and migrate through the cells that are not closed. One company I worked for had a full-time engineer who monitored the foaming process. Others I worked for should have had an engineer doing that and some paid the price for not having this process closely monitored.

Short answer: it is possible to use two-part polyurethane foam as insulation for a refrigerated cabinet, but the process required is probably beyond the ability and means of most individuals (and small manufacturing operations) to execute effectively.

Fiberglassing materials

- Epoxy: West System Epoxy with 206 Slow Hardener
- Glass cloth: 10-ounce fiberglass cloth, enough for two layers
- Aluminum foil: heavy duty, 75-square-foot roll
- Plastic lining: 6-mil plastic sheeting
- Disposable 2-inch chip brushes
- Foam roller covers for epoxy
- Plastic mixing bowls: plastic ice cream or yogurt containers (they can be reused by flexing the sides of the container and peeling off the cured epoxy)
- Plastic squeegee
- Mixing sticks
- Disposable gloves
- Open container of alcohol (no, not *that* kind!)
- Rags to clean up drips

Project costs

David reused the cold plate and other mechanical components, so their cost is not included in this list of parts and supplies.

Epoxy, foil, vapor seal, supplies	$ 53
Insulation and materials	$ 35
Interior box and liner	$ 125
Countertop	$ 110
Gaskets	$ 95
Varnish, paint, supplies	$ 80
Gases, soldering supplies	$ 70
Total	**$ 568**

Reusing the hatch covers and trim from the original fridge/freezer saved David some time. He used a magnetic gasket strip for the lower seals and foam strips for the upper seals.

Countertop

I made our countertop from ¾-inch plywood and laminate. I cut the plywood to size, cut openings for the hatches and, once I was happy with the fit, glued the laminate to the plywood with contact adhesive. After trimming the laminate, I flipped the countertop over and attached the interior mating surfaces for the hatches to the underside.

I treated the underside of the countertop to two layers of epoxy and glass cloth, a layer of reflective foil, and a plastic vapor barrier just as I had done for the enclosure walls. I stopped the foil 2 inches from the edges and, again, left enough plastic vapor barrier exposed so I could fold it underneath. That left a nice bonding surface around the countertop perimeter. I cut the rigid polyurethane to fit inside the box insulation and around the hatches.

Once I was convinced everything fit together, I completed the interior box by bonding the top to the sides. After the epoxy set, I used a can of expanding polyurethane foam to fill the opening in the side of the box that was used to route the copper tubing and wires, as well as a few small gaps in the rigid foam. I then laid the foam pieces for the top in place.

Now came the final step. I bonded the countertop to the top edges of the cavern perimeter with thickened epoxy, using weights to hold the top in place until the epoxy kicked.

Finishing

I was able to repair the old teak trim pieces and reuse them to finish the edges of the countertop. I attached them with screws and covered the screw heads with teak bungs.

I refinished all the teak with 12 coats of Epifanes, my varnish of choice for interior teak. As long as I was at it, I refreshed the varnish in the rest of the galley and redid the galley sole.

What I'd do differently

In general, I am happy with the results. The insulation is far superior to the original and the freezer actually gets cold enough to freeze ice cream in a warm climate, something it wasn't able to manage before. If I were to do it again, however, I would do several things differently.

Silica aerogel wasn't readily available when I began this project and vacuum insulation panels were new and untested. If I were to do the project today, I think I would use a combination of aerogel and polyurethane foam, at least for the top and the hatches. The added cost might be worth the gain in interior space. I'm not sure I'm quite ready to trust the VIPs yet.

I would put the gaskets on the hatches rather than on the mating surfaces. We've found that spills on the countertop have a tendency to run down onto the gaskets, and it's difficult to keep them clean.

I used a thin steel strip embedded in epoxy to attract the magnet in the gasket and make an airtight seal. The epoxy did not prevent the steel from rusting. I think I would paint the steel first, then embed it in the epoxy.

Finally, I would construct the refrigerator section differently and eliminate the large hatch on the side. It took a lot of time and effort to construct the hatch and we rarely use it. Opening it lets most of the cold air out of the refrigerator section.

David Lynn and his wife, Marcie, have been living aboard Nine of Cups, *their 1986 Liberty 458 cutter, since purchasing her in Kemah, Texas, in 2000. In 16 years they have sailed her nearly 90,000 nautical miles and visited some of the more remote places in the world in their ever-so-slow world circumnavigation.* Nine of Cups *and crew returned to U.S. waters in April of this year and spent some of the summer cruising Chesapeake Bay. Find the Lynns on their website at www.nineofcups.com or their blog at www.justalittlefurther.com.*

Resources

Refrigeration parts and supplies, vacuum panels
Rparts: www.rparts.com

Magnetic gaskets
O-Reps.com: www.o-reps.com

Epifanes varnish
Epifanes: www.epifanes.com

A TOPPING IDEA FOR STORAGE

Trays organize the upper regions of deep lockers

BY DREW FRYE

Cavernous lockers are handy when you have something bulky to stash: a spare sail, a sun awning, or a folding grocery cart. But the small stuff I store in large lockers mostly slips down into the darkest recesses, only to be found when I dive in headfirst, making the mess far worse than it was. My solution — rather than banning all clutter from the boat — was to make the available space better fit the stuff. I didn't accomplish this by dividing up the space so it can never again hold anything large, I added topper trays, like those found in the traditional seaman's chest. Best of all, to add topper trays, I did not have to cut or drill into the boat.

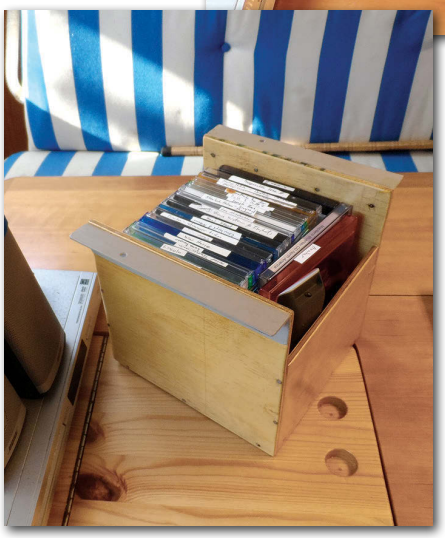
Specific storage problems beg for custom solutions. I started by carefully considering what items I wanted to make more accessible, where they should be stored, and which of them should be grouped together. Once I knew what I wanted to stow and where, I determined the dimensions each tray needed to be.

Under-the-bunk trays – Bedding and clothing would be stored in the sleeping cabin in trays as deep as a typical drawer in a chest of drawers. For the last 8 years, the under-the-bunk trays I made to fit atop these lockers have kept extra bedding dry and easy to get to.

Under-the-seat trays – Much is permanently lost in lockers under the saloon seats, some of which house air conditioning ducts and plumbing and are unsuitable for storing heavy boxes or loose parts that could roll around. One of my under-the-seat trays contains only electrical parts and electrical tools and I'm able to carry it around the boat as a toolbox — quite handy.

An under-the-bunk tray, top left, is suspended from the sides of the opening on aluminum angles. It can be lifted out with the rope handles or slid out of the way when Drew needs to inspect the steering cables beneath it. The partitioned tray under a settee, above center, keeps small items organized while preventing them from getting lost in the locker beneath. The air conditioning is a recent addition, above. To install it, Drew simply lifted out the storage tray. He had to shorten the tray before putting it back.

Drew made a tray to fit in the saloon table and hold DVDs, at right. He made a trial cover for the locker opening out of pine and hinged in the center. It's still in use 8 years later, below.



Saloon table tray – The deep and narrow center storage area in the saloon table was hopelessly cluttered. For this locker, I built a tray specifically to stow DVDs and the remote, dimensioned to fit the DVD cases on-edge for easy viewing, and with the tray sides cut down so the DVDs can be easily grasped and removed.

Construction

I built my trays light, in part because weight is only useful in steamrollers but mostly because I know I'm more likely to use them if they are easy to heft. I fabricated all my trays from thin plywood and epoxy, using a few wire brads to hold things in place while the epoxy cured. As a result, the trays weigh ounces rather than pounds. Because all of the spaces in which I added trays already had plywood covers, I found no need to build separate lids for my trays.

Nominal ¼-inch plywood, either hardwood or underlayment, is sufficiently strong and stiff for making the trays. For each tray, I first cut rectangles to create the bottom and the sides needed to make a box of the desired depth. I made their length and breadth about ⅜-inch smaller than the opening at the top of the respective storage space (this margin allows for the sliders that support them and for comfortable wiggle room).

After dry-fitting the plywood pieces, I coated the edges with thickened epoxy (West System 105/205 resin and hardener thickened to a peanut butter consistency with fumed silica), and then tacked the edges of the box together with ¾-inch wire brads every 3 to 4 inches. Although the brads lack the strength to hold such a tray together in use, they provide the firm, even pressure needed to hold the shape while the epoxy cures, thus eliminating the need for numerous large clamps.

The ¼-inch plywood is strong enough to make a box, but lacks the beef on the edges needed to accept strong corner fastenings. The traditional solution is to add cleats in each corner, but I knew this would add unacceptable weight to a tray that should slide and might need to be lifted out. Instead, I bonded the tray corners with fillets of thickened epoxy, using my gloved finger to smooth the epoxy to a ¼-inch radius. I used the same thickened epoxy to fair the outside corners, hiding chips and tiny misalignments.

After all the epoxy had cured, I sanded and faired the joints to attain the degree of finish I wanted. I could have coated the entire box with epoxy, but I decided painting was sufficient for this interior application. Before painting, I scrubbed the epoxy surfaces with TSP (trisodium phosphate) and warm water to remove any amine blush (the paint would otherwise never dry). I used four coats of Interlux Brightside polyurethane enamel.

Dividers

For the trays that fit over the lockers beneath the saloon seating, I had specific tool stowage in mind. I fitted dividers in these trays to organize the space (bearing in mind that too many dividers restrict storage of larger items). I used the same plywood-and-epoxy construction method to create the dividers.

Reinforcement

The trays for stowing bedding are quite large, so I reinforced the upper edges of the sides to stiffen them and prevent them from pulling inward under load. After building the tray box, and after the epoxy set (but before it cured, to avoid the need to remove amine blush and to sand), I used thickened epoxy to bond ½- x 1-inch strips of plywood to the longer sides and ¼-inch strips to the shorter ends, tapping in a few brads to hold them in place while the epoxy cured. The trays with dividers did not need additional reinforcement as they were shallower and the dividers provide considerable stiffening.

Handles

For the large trays I built to stow bedding, I installed rope handles for easy lifting. But I seldom use the handles as I can slide the trays out of the way when I need to access the

depths beneath. For the trays that fit over the lockers beneath the saloon seating, instead of making rope handles, I conserved space by cutting handholds into the ends. I used a hole saw to drill two 1-inch holes set on 3-inch centers and made the straight connecting cuts with an oscillating multi-tool.

Sliders

Next, I installed sliders on on two sides of each tray. These allow me to hang the trays from the lip of the locker opening. For the under-the-berth bedding trays and the DVD tray in the saloon table, I created sliders using thin PVC angle cut from the outside corner trim of household vinyl siding. In both cases, the plastic angle is sufficient because I am unlikely to place my body weight on these suspended trays and I am not using them to stow anything heavy. When using the plastic angle as a slider, I attached it along the full length of the tray. For the trays that fit over the lockers beneath the saloon seating, in which I stow heavier items, I made sliders from ¾- x 1/16-inch aluminum angle. While unquestionably more durable, the aluminum angle can scratch the gelcoat. To prevent that, I covered these sliders with athletic tape.

On trays with reinforcement added to the sides, I attached the plastic angle sliders with countersunk #6 x ½-inch brass screws every 6 inches. The sides of the trays that are not reinforced are too thin to screw into, so I attached the aluminum angle with countersunk flathead #8 x ½-inch bolts.

The aluminum angle sliders attached to the trays beneath the saloon seating

Atop-the-table tray

The atop-the-table tray has 1-inch-deep fiddles, deep enough to retain objects on a catamaran, at top. The tray is held in position by a board on the underside that fits in the locker opening, above. The white felt tabs protect the table surface.

Every time we prepared for sea, we'd have to put away all of the bits and pieces that had accumulated on the saloon table; there was no fiddle to prevent them from sliding off. Adding a fiddle would have made the table less comfortable in port and created lumps under the cushions when it was converted to a berth. Instead, I attached a fiddled tray to a new cover I made for an existing storage locker in the tabletop. It's easy to lift out when we want to access the locker and we can stow it and replace it with the original plain cover when we convert the table to a berth. We have even used this fiddled lid as a serving tray.

I used similar methods to construct the table tray as I did the topper trays, but because this tray is exposed to view, I gave greater attention to fit and finish when building it. I used ¼-inch plywood for the base (a rectangle about 5 inches longer in each dimension than the locker cover), and framed it with 1¼- x ¾-inch pine. I mitered the corners of the frame and cut a ⅜-inch x ¼-inch rabbet in the pine edges to bring the bottoms flush with the plywood rectangle. This gives my tray 1-inch-high fiddles, which are sufficient for my catamaran (taller fiddles may be more suitable for monohulls). I bonded the plywood rectangle to the pine with thickened epoxy, tacked the pine to the rectangle from underneath with wire brads, and clamped everything together.

I cut a board from pine lumber to match the size of the original cover and screwed and glued it to the underside of the tray. I attached felt tabs to the exposed underside of the tray to prevent it from scratching the table. I could have attached the tray to the original cover, but I wanted to preserve the original cover for a future owner, and we need a plain panel when the table is converted to a berth.

I finished the tray with 4 coats of semi-gloss varnish to match the rest of the woodwork, lightly scuffing between coats with 400-grit paper.

The same effect could be achieved with mimimal carpentry — just add a few felt pads to the underside of a store-bought serving tray and fasten it to a locker cover with screws.

do cause the plywood covers to be proud by about 1/16 of an inch, but under a seat cushion this isn't noticeable. The thickness of the plastic sliders on the DVD stowage tray would ordinarily cause the saloon table filler to sit a fraction of an inch too high, but the original filler board was supported on felt pads, and removing the pads from the area beneath the tray provided the required clearance for the sliders. I think if I'd not had the option to remove the pads, I could have solved the problem by cutting recesses in either the filler or the cabinet, or by supporting the tray on narrow cleats lower in the locker.

Odd-shaped locker openings

Locations where stowage lockers don't have parallel sides, such as under a V-berth, might require an imaginative approach. The trays could be made to fit the existing supports, or the supports could be modified to acccept trays with parallel sides.

Living with topper trays

After using the topper trays over a period of time, I got tired, every time I accessed a tray, of removing the large heavy plywood locker covers and then having to find a place to set them aside. Because the cabin is dry, I bought inexpensive piano hinges at Home Depot, lightly coated them with Corrosion Block anti-corrosion spray, and attached them so the plywood covers are easy to lift in place. I have yet to see a spot of rust on these hinges and access to the topper trays is much easier.

The week before I wrote this article, I removed all of the saloon trays to give me access to install air conditioning. When the project was finished, I replaced the trays just as quickly as I'd removed them. When one tray needed to be made smaller to allow space for a duct, it was easy to cut the tray back to the first divider, refinish it, and drop it back in place. Imagine the hassle a fixed installation would have presented: demolition, head scratching, rebuilding, refinishing, and all the associated stress.

I built and finished all of these trays at home during otherwise wasted evenings. It's great that they can be removed in seconds to allow access for maintenance. And because the trays have tight lids when the locker covers are in place, no bits and pieces stowed in them have rolled into the inaccessible corners of deep lockers while under sail. Much better.

The seat-locker covers on *Shoal Survivor* are large plywood boards. To make this one easier to deal with, Drew attached it to the locker top with a piano hinge.

Drew Frye cruises Chesapeake Bay and the mid-Atlantic coast aboard his 34-foot catamaran Shoal Survivor, *searching for out-of-the-way corners known only by locals. A chemical engineer by training, 40-year climber and 30-year sailor by inclination, he brings a broad mix of experiences to solving boating problems and writing about his solutions.*

Resources

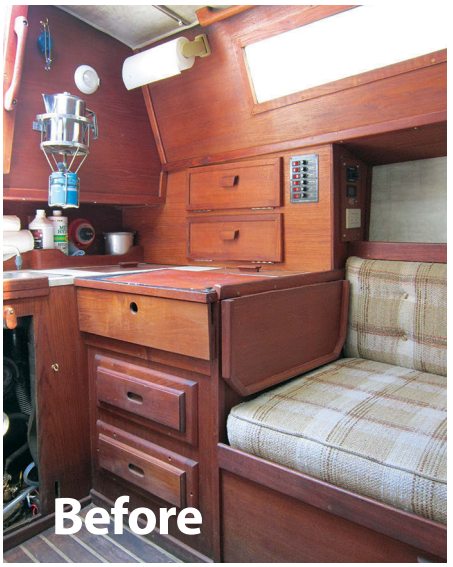
The products used in making the topper trays can be found in most marine stores

- West System 105/205 resin and hardener
- Fumed silica (Cab-O-Sil, for example)
- TSP (trisodium phosphate)
- Interlux Brightside polyurethane enamel
- Corrosion Block

Storage with benefits

Removing drawers leads to safer plumbing

BY DAVID SALTER



We bought our Mariner 28, *Day by Day*, in 2014, downsizing from our Corbin 39 as a concession to our advancing years and the desire for more manageable upkeep. The Mariner is a well-built good old boat with good interior volume and meets our three principal requirements: an inboard diesel, a separate head compartment, and a sleeping cabin. However, having grown used to the storage capacity on the Corbin, we found the Mariner's capacity a bit skimpy.

One day, my wife, Eileen, always on the look-out for opportunities for additional stowage, noticed wasted space around the two drawers under the galley counter and suggested we make better use of this area. We decided to convert it to a locker and reconfigure the surroundings. Removing the drawers and supports was fairly easy; everything was screwed in place and there was little gluing to detach. This opened up a large space . . . and set the stage for another project (see facing page).

Where the drawers had been, I built an enclosed locker to use the most I could of the available space. I used ½-inch plywood, painted on all surfaces. A horizontal cleat below the door opening provided a means to support the front edge of the locker's floor. To support the inboard edge of the locker's aft partition, I glued and screwed a cleat vertically to the inside, just to the left of where the left-hand door would be attached. The existing bulkhead forms the right (forward) partition. I secured the locker floor and aft partition to the cleats with screws, which will enable me to remove it should the need arise. At the back of the locker, I installed a removable panel to allow access to the new seacock. A shelf I added in the middle increases the useable space.

To finish the project, I made a pair of doors out of new ½-inch teak plywood and applied some of the original drawer trim to maintain the original design aesthetic. I hung the doors on stainless-steel piano hinges and installed unobtrusive knobs. Sealed with teak

David removed two drawers, "before" photo, and made a single deep locker that provides a lot more storage, main photo. He refashioned the drawer fronts as trim for the doors, "after" photo. A wedge holds down the foot pump pedal to allow the door to open fully, inset.

oil, the doors blend in well with the rest of the furniture. Initially, the foot pump for the galley faucet prevented the aft door from opening fully, but I overcame that problem by using a wedge to hold the foot pedal down whenever greater access is needed.

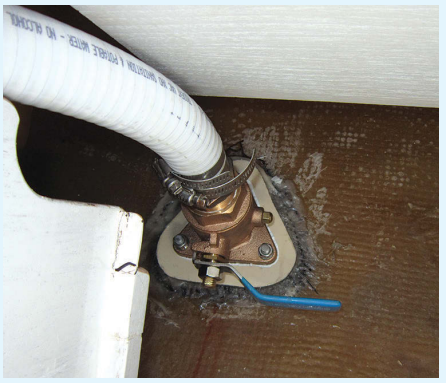
David Salter and his wife, Eileen, have fitted out a series of cruising boats, beginning with a steel-hulled HO28 (a Dutch design), graduating to a Corbin 39 and, most recently Day by Day, *a Mariner 28. They sail on Lake Ontario from their dock outside the back door as soon as the ice has gone out. Woodworking has always been David's hobby and he has been fortunate to find local craftsmen to fabricate the stainless-steel fittings he designs.*

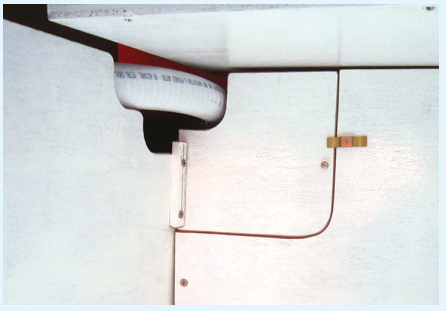
Sidetracked to a seacock

Removing the galley drawers gave me unimpeded access to the through-hull for the galley sink drain. Even though the outlet is above the waterline (at least when the boat is floating level), I had been unhappy that there was no seacock here, and I now had the access I needed to rectify that.

The drain hose sagged in the middle, trapping sink water that turned smelly, and I didn't like the convoluted thin plastic hose in a place where a break could be disastrous. What began as a project to increase stowage was now also a project to fortify this through-hull.

Installing a 1½-inch bronze seacock was the first job. It is good practice to reinforce the hull where there is a penetration, and for this I used a piece of surplus ⅜-inch-thick fiberglass reinforced plastic (FRP). Before bonding the FRP to the inside of the hull, I drilled holes in the FRP for the through-hull and the three bolts that secure the seacock. Then I epoxied the bolts to the FRP, heads to the hull side. This allowed me, once the epoxy cured, to slide the seacock over the captive bolts pointing inward and attach it with nuts. Doing it this way, there would be no need to drill additional holes in the hull.





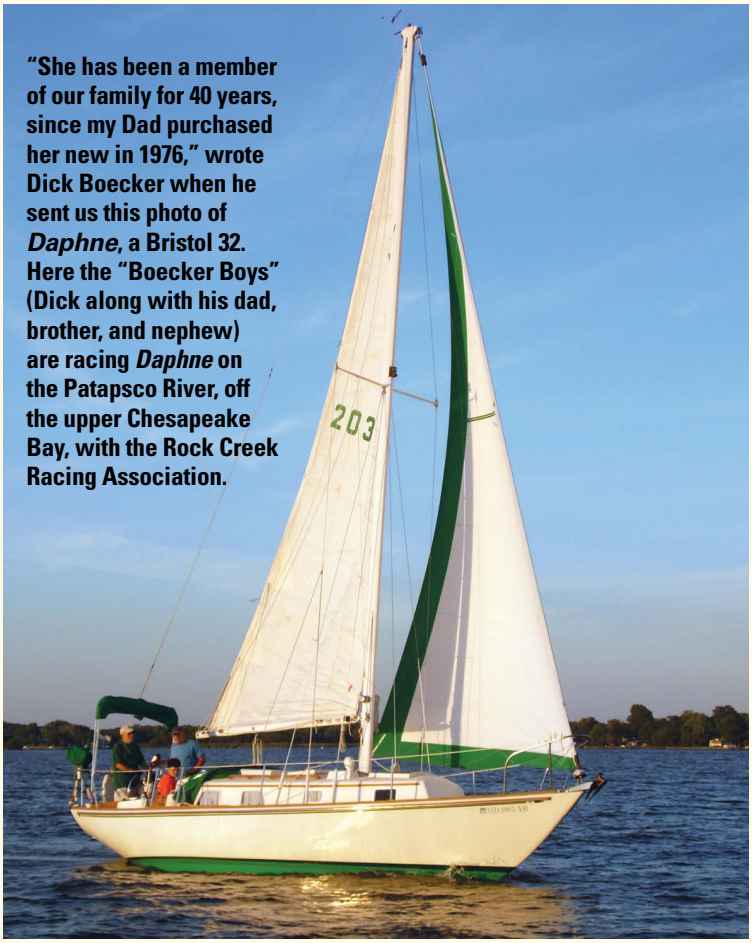
David installed a seacock for the galley sink drain, upper photo. He can reach it through a panel in the back of the new locker he built in the galley, above.

When working with epoxy, I often apply grease to surfaces I don't want the epoxy adhering to. In this case, I applied a layer of grease to the bolt threads before epoxying the heads to the backing plate. I also painted the exposed 1½-inch hole in the FRP with epoxy.

To ensure the seacock would be perpendicular to the hull, I greased the through-hull's threads and used it to hold the seacock in place (attached to the backing plate) while I set the backing plate on a bed of thickened epoxy. (I used West System epoxy thickened to a buttery consistency with approximately 2 parts milled fiberglass and 1 part Cab-O-Sil, a fumed silica).

After the epoxy cured, I removed the through-hull (with some difficulty and a lot of leverage), cleaned the grease off the mating threads of the seacock and through-hull, and re-installed the through-hull with polysulphide caulk on the threads and hull flange. To finish the job, I connected the new seacock to the sink drain with good-quality hose, routing it and supporting it to keep it from sagging.

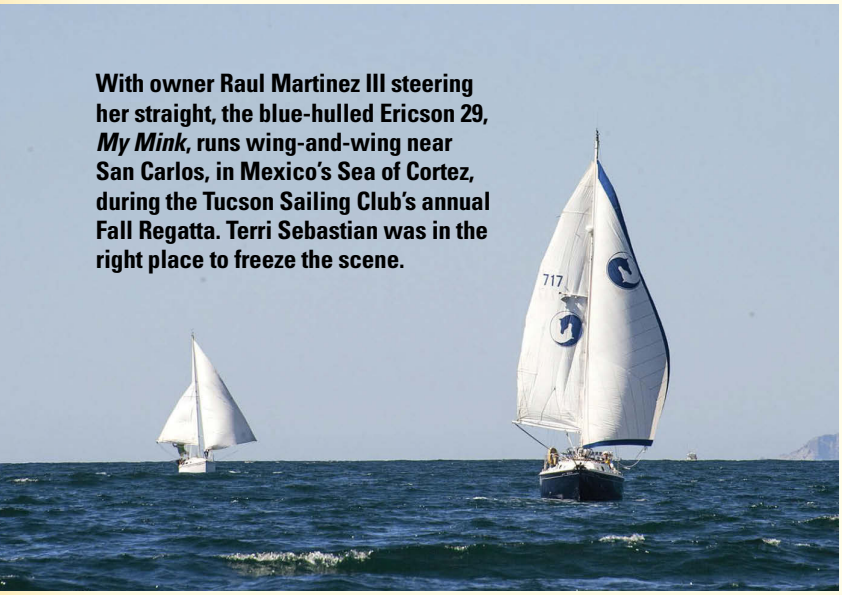
Readers' favorite boat pictures



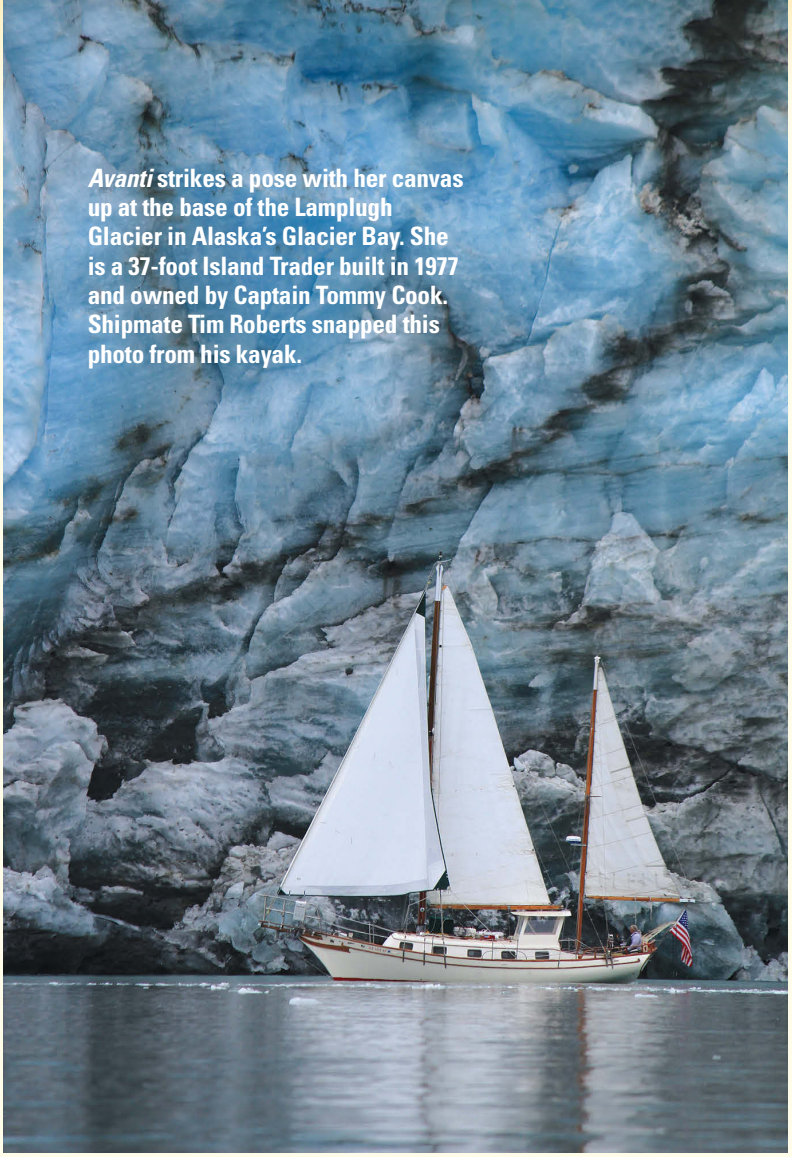
"She has been a member of our family for 40 years, since my Dad purchased her new in 1976," wrote Dick Boecker when he sent us this photo of *Daphne*, a Bristol 32. Here the "Boecker Boys" (Dick along with his dad, brother, and nephew) are racing *Daphne* on the Patapsco River, off the upper Chesapeake Bay, with the Rock Creek Racing Association.

"I'm an 80-year-old sailor on a 40-year-old good old boat!" announced Terry Sargent when he sent us this lovely photo of his 1976 Fuji 32, *Valhalla*. He bought *Valhalla* in 1980 and started cruising in 1988. He's currently in the Philippines, where friend Brian Waters took this picture.

This lovely lady, on the right, is *Panache*, Richard Charette's 1984 Sea Sprite 30, sailing on Lake Michigan near Sheboygan, Wisconsin. Can you imagine a more perfect name for a boat that flies a spinnaker with this much style? Gunnar Vagenius captured the action.



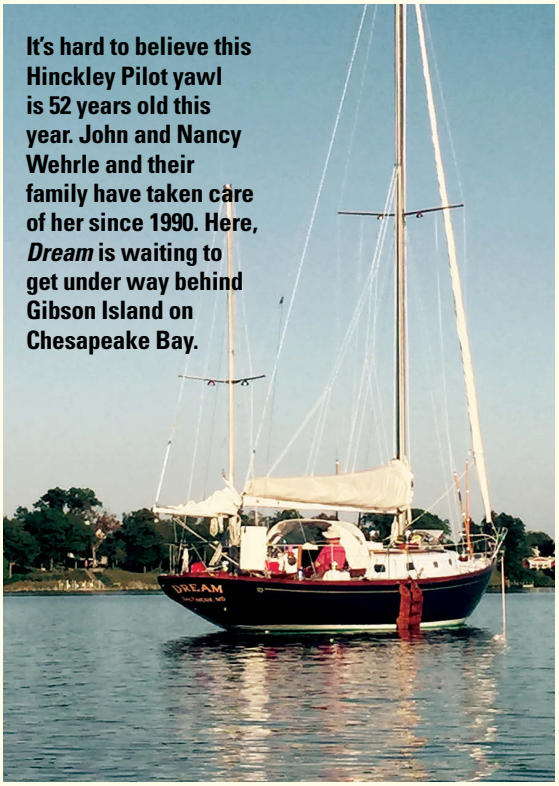
With owner Raul Martinez III steering her straight, the blue-hulled Ericson 29, *My Mink*, runs wing-and-wing near San Carlos, in Mexico's Sea of Cortez, during the Tucson Sailing Club's annual Fall Regatta. Terri Sebastian was in the right place to freeze the scene.



Avanti strikes a pose with her canvas up at the base of the Lamplugh Glacier in Alaska's Glacier Bay. She is a 37-foot Island Trader built in 1977 and owned by Captain Tommy Cook. Shipmate Tim Roberts snapped this photo from his kayak.

Just another Wednesday night race for the Pirates Cove Race Club of Galesville, Maryland. Mark Schaeffler captured this dramatic shot of *Tsavo*, a 1981 Mirage Kirby 25 skippered by owner Ed Gray.

It's hard to believe this Hinckley Pilot yawl is 52 years old this year. John and Nancy Wehrle and their family have taken care of her since 1990. Here, *Dream* is waiting to get under way behind Gibson Island on Chesapeake Bay.



Vince Bednar was behind the lens and his wife, Julie, was all smiles at the helm of *Free Spirit*, their 1981 Shannon 38 ketch. Julie reports it was a perfect September sailing day on Lake Erie. Just check out the polish on this boat!

When a fuel tank goes south

BY TERRY KOTAS

I was staring at the rivulet of diesel forming a pool near the fuel tank. "Well, we knew it was bound to happen sooner or later," said my wife, Heidi, by way of consolation.

Cetus, our Fantasia 35, has been our cruising home for 21 years, and in the back of my mind I knew it was just a matter of time before the 120-gallon iron tank would need to be replaced. After all, *Cetus* was 31 years old and had four South Pacific crossings under her keel. I just wish it hadn't happened right after we'd filled the tank.

We had left La Paz, in Mexico's Sea of Cortez, the day before to begin our spring migration north in the Sea. Wanting to avoid a diesel calamity in the event the leak became uncontrollable, we headed back to our just-vacated slip at the marina, where we offloaded the diesel to fellow cruisers. When the tank was finally empty, we sat back to figure out our next move.

On Fantasias, and many other boats built in the 1970s and '80s, the fuel tanks were installed with almost no thought given to how they were to be maintained or, eventually, replaced. The tanks were simply placed in position and the boats built around them. *Cetus*' fuel tank was nearly as wide as the boat's beam and about 4 feet long. The tank was fully baffled, but had only one inspection plate, which was in the center of the tank and accessible through a small hatch in the cabin sole. Settees, a chart table, and bulkheads were built above the rest of the tank, so no other access was possible.

We quickly realized that, because so much of the tank was inaccessible, patching the leak was not a consideration. The tank would have to come out. Because we planned to continue living aboard during this project, we wanted to remove the tank while doing the least amount of damage to our home. Accordingly, we decided to leave the furniture intact and cut a rectangular opening in the cabin sole above the 4-foot length of the tank. The width of the hole was determined by the width of the sole in that area. The narrowest spot was 18 inches.

A tidy incision

Using an oscillating multi-tool with the standard thin blade, I made a cut as neatly as I could in the middle of the sole, removing a 4-foot x 18-inch section. I used the thin holly strips of the teak-and-holly sole as a cutting guide, reasoning that the cut would be less noticeable and make it easier to put the sole back together when the time came. We hoped an opening this size would give us enough working space to cut the iron beast into manageable pieces.

After carefully removing the cabin sole, we cut through and removed the three 2 x 2-inch support beams that crossed over the tank, making sure to number the pieces. We also made a drawing so we would know how to put them back. I made three temporary braces out of 2 x 4s to replace the support lost when we removed the beams. We then covered all the adjacent teak surfaces with a collection of towels, T-shirts, and plastic bags to protect them from damage while we removed the dirty old tank.

Around the dock, the consensus was that I would need a robust reciprocating saw to remove the tank. At a local hardware store I purchased a Milwaukee Sawzall along with a dozen blades to start with (six short and six long). They were bi-metal blades with 14 teeth per inch (tpi). The tank was 14-gauge black iron; we knew there would be more blades in our future.

I started cutting at the inspection plate. A couple of hours and five blades later, we pried the first section off. It

Living the dream, top of page. Cruising is the art of repairing boats in exotic locations. Terry, here making a mock-up for a new diesel tank, and Heidi didn't let a major repair interrupt their sailing plans.

was only a 2-foot piece, but it gave us hope that we were on the right track — a good thing, as there was no going back. While the initial cut along the top and sides was encouraging, the bottom of the tank sat on the keel and allowed little room for the blade to cut. I needed the short blades here. Several times, I used my electric drill to make starter holes for the blade so I could begin a new cut.

The welded baffles proved to be blade-breakers, but luckily the town had a great supply of metal-cutting implements. The baffles also made it challenging to get a good cutting angle because the Sawzall was longer than most of the baffled compartments. We pressed on, cutting and removing strips, and then pulling the remaining tank toward the middle of our access hole. We continued this awkward process for seven days. When the last piece hit the dock, I am not sure who was the happiest: the *Cetus* crew or the neighbors who had to endure the dawn-to-dusk hammering, sawing, and longshoremen-type verbiage.

So what goes back in?

Naturally, we wanted the replacement tank to have as great a capacity as possible, but we knew we'd never be able to replace the 120-gallon capacity of the old tank — especially as the new tank had to fit through our 4-foot x 18-inch hole. We first explored using a bladder tank, which would fit through our limited access when empty and offer high-volume storage. While we found a bladder that had a volume close to that of the tank we had just removed, we identified two problems with off-the-shelf bladders. First, they are rectangular in shape. Only the middle portion would rest on a flat surface; the ends would follow the curvature of the hull, reducing the usable volume. Second, how could we securely anchor something that big?

Having ruled out off-the-shelf bladders, we got quotes for custom-made bladders (also called fuel cells)

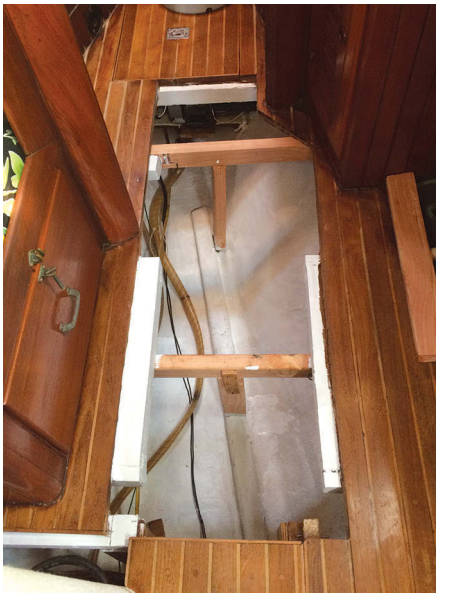
that could be designed to fit our space. We quickly abandoned this idea due to the high cost (around $2,000 to $5,000). When the manufacturer informed us that the useful life of its bladders was somewhere between 10 and 15 years, we said thanks, but no thanks.

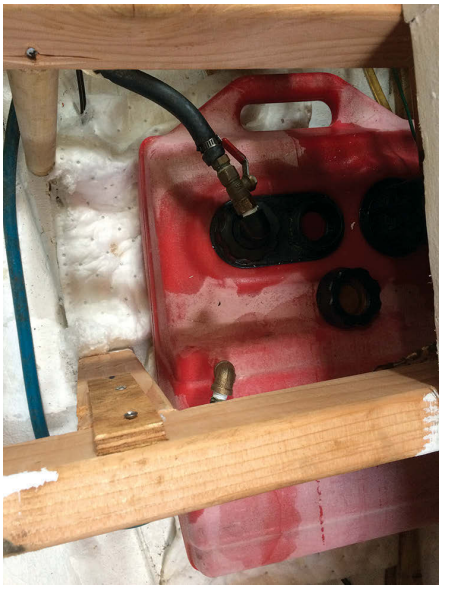
We perused loads of premade plastic tanks on the internet. Many of them would fit through the opening in our cabin sole but, because they were rectangular and couldn't make use of all the available space, their volumes were disappointing: ranging from 25 to 30 gallons. We were now coming to the conclusion that, to get decent capacity, we would need at least two tanks custom-built to conform to the shape of the hull.

Purgatory postponed

As we pondered this thought, Heidi came up with a truly brilliant idea. "Let's hook up a small temporary tank and go out and enjoy the Sea," she said. "We can use that time to evaluate our options."

I procured a used 5-gallon outboard motor tank, did some creative plumbing, borrowed a couple of jerry cans for diesel, and off we went. With our fuel-stingy Yanmar (it only burns about a





Blue tape marked the section of the cabin sole to be removed, upper left, to expose the old black-iron fuel tank, at top. With the tank fully removed, Terry and Heidi painted the bilge and fitted temporary braces to support the sole, center. Heidi's temporary tank idea, above, allowed them to sail north in the Sea of Cortez for the summer.

Terry checks the mockups before shipping them to La Paz, at top. The temporary tank has done its job and the new starboard tank awaits its turn, center. Heidi works the starboard tank into position, above.

half-gallon of diesel per hour) and 10 extra gallons in jerry cans, we had enough fuel for cruising. The sun and the daily swims in the warm Mexican waters were great therapy after the hard work of removing the tank. Yet the tank replacement problem was never far from our minds.

Before leaving La Paz, I happened to run across a small advertisement posted in the cruisers' lounge by an ex-pat, Albert Klettke of Scubahoy Enterprises, whose business was repairing plastic gas tanks, kayaks, and the like. One day, while thinking about our temporary plastic tank, it occurred to me that maybe Albert could modify a couple of tanks to fit our needs. We contacted him and learned he had the machinery and tooling to make plastic tanks from scratch. Now we were in business!

Albert described how he would make the tanks using HDPE — high density polyethylene — the material used to make gas tanks, kayaks, and water bottles. (For more on this subject see "Holding Tank Harmony," September 2015.) He uses a Canadian-made injection welding system that works in a similar manner to wire-feed metal welding, but with plastic welding rod. His standard practice is to fully baffle the tanks, reinforce the area where the plumbing attaches, and provide extra material at points that might wear against the hull. He cautioned us that the biggest mistake made when building a tank out of any material is not measuring correctly. He suggested we construct plywood mock-ups to make sure the finished tanks would fit.

Plywood and planning

We decided that custom-built plastic tanks were our best option, so when we arrived at Puerto Escondido, 115 miles north of La Paz, we bought several sheets of ¼-inch plywood (the same thickness as the HDPE Albert would use). We also purchased a variety of brackets and screws to aid in making the tank mock-ups. We first thought we could join the pieces with duct tape, but that didn't prove rigid enough so we went with the brackets and screws.

We thought the best way to go about it would be to design one large tank to fit the space and then divide it down the middle to create two tanks that could fit into and out of the hole in the sole. We cut the bottom of the tank first, using the flat area of the bilge as our guide to the shape. Next, we placed the sides, laying long pieces of plywood against the hull and butting them to the edges of the bottom piece. Then we measured and marked the plywood sides at the height we determined the tank could be: 3 inches below the sole beams.

Using my battery-powered circular saw, we started small, initially making sure the tanks would fit through the opening. When we saw we could go a little larger, we added higher sides or a bit more length until we had two tanks that would just make it through the opening with almost no room to spare. Recording all the measurements

Time and materials

Time

Removing old tank	42 hours
Design and mock-ups	20 hours
Installing new tanks	12 hours
Replacing flooring	12 hours
Total	86 hours

Materials

2 30-gallon HDPE tanks @ $335 ea.	$ 670
Various brass fittings	$ 100
New filler hose	$ 75
Closed-cell foam	$ 20
Milwaukee Sawzall	$ 120*
24 various saw blades	$ 50
Miscellaneous wood, screws	$ 15
West System epoxy	$ 30
Brackets for sole beams	$ 10
Total	$1,090

**Terry later sold the Sawzall for $60*

Resources

Albert Klettke
Scubahoy Enterprises
U.S. cell 619-467-5877

and angles as we went along, we removed the plywood pieces and made new cuts or added pieces as needed, then reassembled them on deck.

Constructing the mock-ups informed us that the true limiting factor was not the opening in the sole but the width of the companionway hatch. If we could get a tank through the companionway, we could get it under the sole.

Satisfied that these tanks would fit and provide us with the maximum fuel capacity, we placed the order with Albert and sent the mock-ups to his shop in La Paz. We then sat back for a couple months of sun, swimming, and the occasional anxiety attack when we worried that we'd overlooked some detail. When we returned to La Paz, the tanks were done, and we were very impressed with how they looked.

A fine fit

The tanks fit through the companionway more easily than the plywood models had, in part because we were not as concerned with the plastic scratching the teak around the hatch as we had been with the rough plywood and metal brackets of the mockups.

Once we had cleaned and painted the bilge where the old tank had been, we lined the entire area with closed-cell foam for additional abrasion protection. Then, with the slightest bit of nudging, the two tanks fell right into place.

I plumbed the various hoses using brass fittings: two fuel pickups, two vents, two fuel returns, and the long fill hoses. We have three two-position valves: one for fuel pickup between the two tanks, one for returning fuel, and the third for recirculation when we want to polish the fuel.

We thought it prudent to test the system before we replaced the supports for the cabin sole, in case of unforeseen problems or leaks we'd need to attend to. We filled the tanks with diesel 5 gallons at a time so we could mark a dipstick for future use. Here we discovered another benefit of the plastic tanks: by shining a flashlight on top of the tank, we could see the level of the fuel and were able to mark the 5-gallon increments right on the tanks' sides.

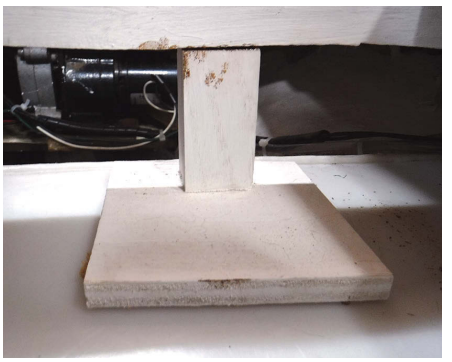
After the full tanks sat overnight with no signs of leakage, and we had successfully fired up the engine and let it run, we were confident that we were ready to secure the tanks and restore the sole.

We used galvanized corner brackets to reattach the sole beams and thickened epoxy to fill the gaps created where we'd cut them. With the sole beams in place, we were able to begin securing the tanks.

The original tank had been held down with wooden wedges under the sole beams. Our new tanks were several inches shorter in height, so we needed braces. We screwed and epoxied 3-inch-high 2 x 2 hardwood blocks to 6-inch-square pieces of ½-inch marine plywood and wedged these braces between the tank and sole beams every 6 inches, with the plywood sitting on the tank to spread the load. To secure the tanks against moving fore and aft, we again used 2 x 2 hardwood blocks, these being 6 inches long, two forward and two aft. For good adhesion, I ground the fiberglass on the hull next to the tank, then used thickened epoxy to hold the blocks in place.

The total capacity of the two new tanks is 60 gallons, about half that of the original tank. That's the downside. On the upside, we no longer have tanks with 30 years of accumulated crud that was impossible to clean out (and only made its presence known when rough seas stirred it up and it clogged the filters). We also ended up with some new storage space forward of the new shorter tanks.

All in all, even with the reduced diesel capacity, we could not be happier with the new tanks. It's a relief to have this project behind us and not have the constant worry about that old iron tank. Albert did an excellent job constructing the tanks and meeting our design parameters, as well as offering good advice along the way.



The two tanks are a close fit in the space under the sole, at top. Terry restored the sole beams that had been cut with galvanized corner brackets and epoxy, center. Braces that butt up to the sole beams hold the tanks in place, above.

Terry Kotas and his wife, Heidi, have lived and traveled aboard sailboats for most of the past 30 years. They are currently enjoying Mexico's Sea of Cortez while planning and readying their Fantasia 35, Cetus*, for their next South Pacific adventure.*

DIY exhaust mixer

Inexpensive pipe fittings beat the cost of custom

BY ROBIN URQUHART

On a beautiful March weekend in the Pacific Northwest, my partner, Fiona, and I decided to go for a cruise aboard *MonArk*, our 1979 Dufour 35. Immediately after we started the engine, the smell of exhaust began to permeate the interior. We hadn't fired up the engine since winterizing the boat in November, and a quick inspection revealed the problem immediately: the exhaust mixer had corroded through and was dripping salt water into the engine room.

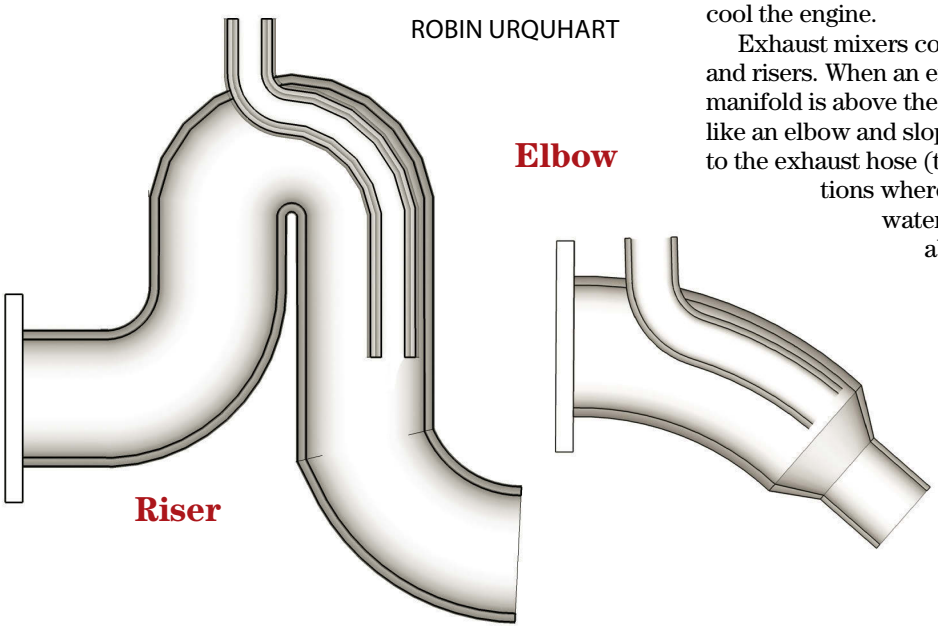
After looking online and calling marine diesel shops, we realized we'd need to have a new exhaust mixer custom-fabricated. A local welder said he could fabricate one for us in a couple of weeks for the meagre sum of $500. While I was bemoaning our predicament on the dock, a friend suggested we make our own. Make our own? "I can't weld," I told him.

"You don't need to weld," he said.

Exhaust mixers

Almost all inboard marine engines have an exhaust mixer attached to the exhaust manifold. Its function is to cool the hot exhaust gases produced by the combustion of fuel in the engine by mixing into them the water that has been used to cool the engine.

Exhaust mixers come in two distinct types: elbows and risers. When an engine is installed so that its exhaust manifold is above the waterline, the exhaust mixer is shaped like an elbow and slopes down from the manifold to connect to the exhaust hose (the Elbow, shown at left). In installations where the manifold is close to or below the waterline, the exhaust must be led in a loop above the waterline to prevent water from being sucked into the engine through the exhaust system when the engine is shut down. This type of mixer is called a riser and is shaped as an inverted U (the Riser, shown at far left).



Mixer failure

Exhaust mixer failure is a major cause of engine damage and catastrophic engine failure (see "Dead in the Water," January 2015). Due

to the extreme environment in which mixers operate, they are significantly more prone to corrosion, carbonization, and material fatigue than other engine parts. The rule of thumb with a mixer is to routinely check it after two years of service and consider replacing it after four years. It can be an expensive item to replace, costing anywhere from a couple hundred dollars for a stock mixer to a couple thousand for a custom mixer. Repairing an old or failing mixer is usually a false economy as the longevity of a repaired mixer, usually about two years, doesn't justify the cost of the repair.

The easiest solution is to buy a stock mixer or riser that fits your engine, unless you are one of the unlucky many — like us — for whom a stock mixer is not an option. In that case it may be cheaper and easier to fabricate your own than to pay somebody else to do it.

Homemade mixer

The style of mixer I made doesn't require any special tools to fabricate and the parts are available in most hardware or plumbing stores and marine chandleries. Our new mixer is heavier than single-piece welded versions, but the fact that a mixer assembled this way can also be disassembled is a real advantage for those traveling to remote places or cruising on a tight budget.

Fabrication of the exhaust mixer begins with removal of the old mixer. The dimensions of the old mixer can be used to help design its replacement. In cases where the exhaust system is being changed, the mixer and exhaust system should be designed together to ensure that they will be compatible.

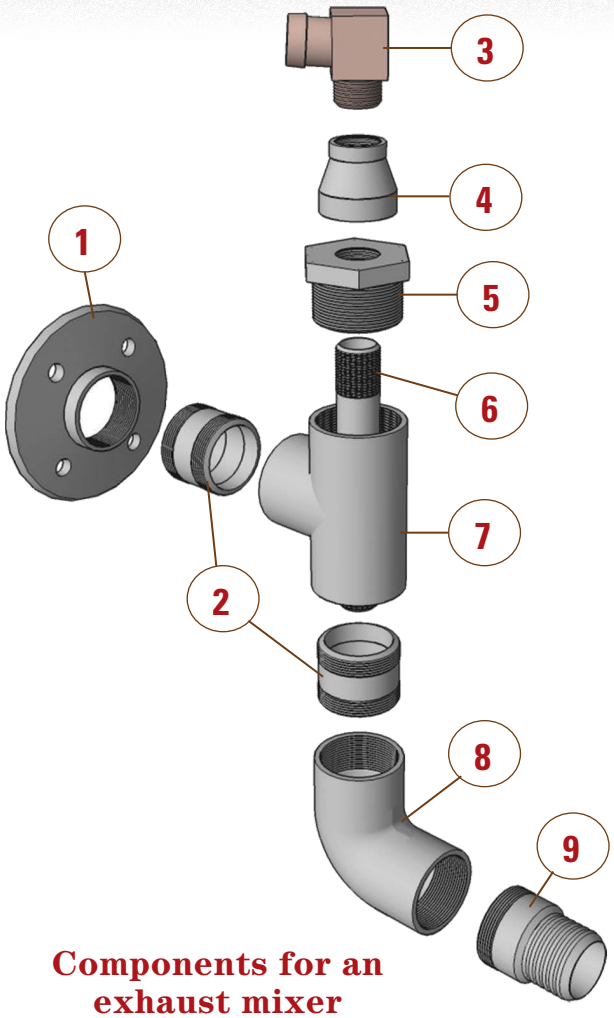
Our engine on *MonArk* is a 27-horsepower marinized Kubota V1305 diesel, and I used parts to match the existing exhaust system. Exhaust mixers are also used on gasoline marine engines.

Parts

While the exhaust mixer is usually a single welded piece (or a casting), the same effect can be achieved with the use of threaded pipe fittings (see the exploded view at right for the list of parts used and how they are assembled). The needed fittings can be purchased at most hardware or plumbing stores. For this project, I was able to pick up all the fittings I required in one visit to the nearest chandlery. With the exception of the threaded floor mount, which I could only find in cast iron, all the fittings are stainless steel. The fittings cost a total of $95, but they could possibly be obtained for less from wholesalers or plumbing-supply outlets.

Assembly

The first step before assembling the mixer was to match up the floor-mount flange (1 on the parts diagram) to the exhaust manifold. The pre-cast holes on the flange didn't align with those on the manifold, so I used the old mixer base to mark where I needed holes on the new flange. I used a center punch to ensure the holes would line up perfectly and drilled them using a 5⁄16-inch titanium-coated drill bit.



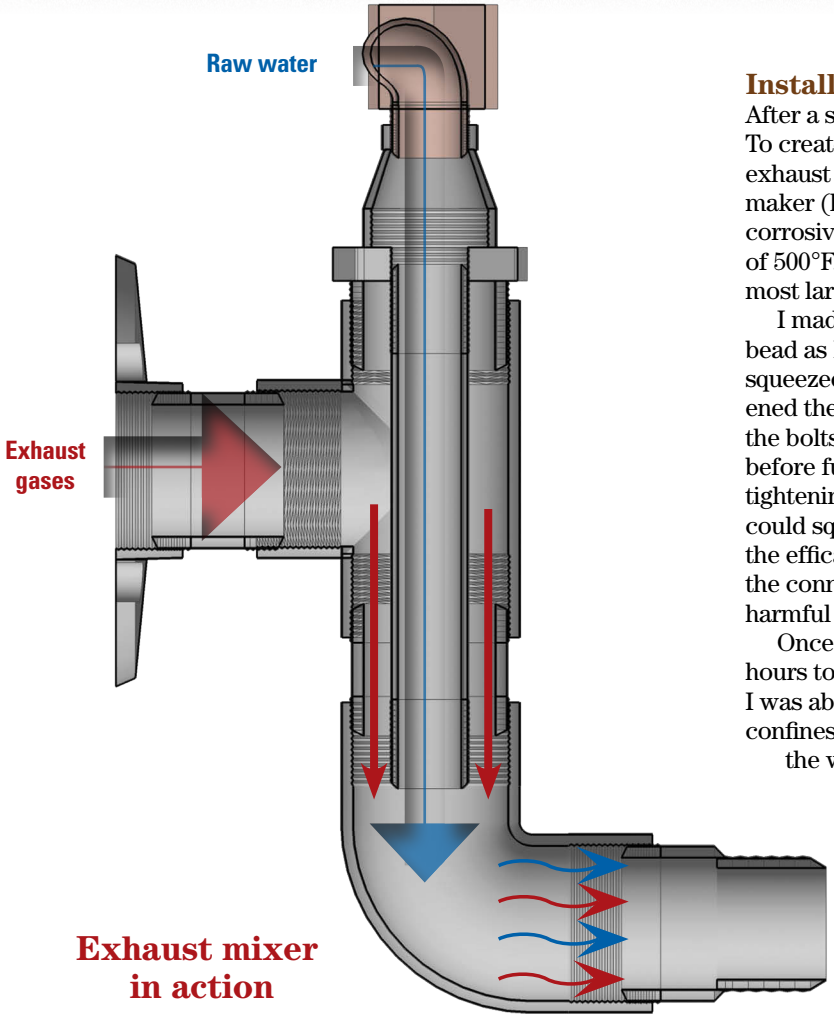
Components for an exhaust mixer

The fittings required for this project were:

1. **Threaded floor-mount flange (black iron)**
2. **2-inch-diameter x 3-inch barrel couplings (2)**
3. **¾-inch 90° elbow**
4. **¾-inch to 1-inch reducer socket**
5. **2-inch to ¾-inch hex bushing**
6. **¾-inch-diameter x 10-inch barrel coupling**
7. **2-inch tee**
8. **2-inch 90° elbow**
9. **2-inch hose nipple**

I did have two parts welded together, the reducer socket (4 on the diagram) and the Hex bushing (5). I did this because I was worried that the female threads in the hex bushing were not long enough to accommodate the 90° brass elbow (3) and the 10-inch barrel coupling (6). The welding took 10 minutes and cost $15.

The order in which the parts are assembled might be dictated by the space in the engine compartment. That makes it a good idea to dry-fit everything first and to write down the order of assembly. As all the pieces have threads, it's simply a matter of threading the pieces together in an order that works within the space. I took care not to tighten the pieces too much during the dry-fitting as stainless-steel threads have a tendency to bind and may be difficult to loosen.



Exhaust mixer in action

Raw water exiting the engine's cooling system is injected into the top of the mixer. The hot gases that enter from the engine's exhaust manifold are cooled by the water to a temperature at which the mixture can be safely conducted to the exhaust outlet without the need for insulation.

Installation

After a successful dry-fit, I was ready to install the mixer. To create a gasket between the mounting flange and the exhaust manifold, I used Permatex Ultra Blue gasket maker (high-temperature sealant). Ultra Blue is non-corrosive, oil-resistant, and has an operating temperature of 500°F. It can be picked up in the automotive section of most large department or hardware stores.

I made sure to leave no gaps in the ¼-inch sealant bead as I applied it and that the blue gasket maker squeezed out uniformly around the manifold as I tightened the flange onto it. At first, I only hand-tightened the bolts. I wanted the gasket maker to cure for an hour before further tightening the bolts with a wrench. Fully tightening the flange without allowing any curing time could squeeze out all of the gasket maker and reduce the efficacy of the seal. It is very important to ensure all the connections are airtight, because exhaust gases are harmful and often undetectable.

Once the flange mount had been allowed a full 24 hours to cure, I installed the rest of the exhaust mixer. I was able to assemble the remaining pieces outside the confines of the "engine room" as I had enough space for the whole unit to rotate onto the flange mount. I used Loctite 510 flange sealant on all the threads as well as gas-fitting Teflon (PTFE) tape. Wearing gloves, as the product can cause allergic skin reactions and/or eye irritation, I applied Loctite 510 to just the male threads, in the same way that one would apply PTFE paste to the threads of plumbing pipe. At least 20 foot-pounds of torque is needed on all the joints to ensure the threads are locked. I used a pipe wrench and a vice. When finished, I spun the assembled unit onto the flange mount, again using Loctite 510 and Teflon tape to ensure the threads were well sealed.

Commissioning

The moment of truth comes after attaching the raw-water inlet hose and the exhaust hose and running the engine

up to operating temperature. This is best done at the dock in case an unforeseen problem arises with the mixer installation.

We tied the boat off to the dock and put the engine in gear. Under load, it didn't take long to get up to operating temperature at lower-than-normal rpm. I checked all the connections to ensure there was no bubbling or visible discontinuity in the sealant. I held a bucket under the exhaust tailpipe and collected the expelled water for 10 seconds at 1,500 rpm to measure the raw-water flow rate. As the flow was significantly better than with the previous mixer, I considered the trial a success.

With the engine running at normal operating temperature, the Loctite 510 will cure and off-gas, creating a peculiar smell. This curing period lasts an hour or so.

Two years, 500 hours

We've been using this exhaust mixer for two years and have run the engine more than 500 hours. I recently removed the mixer and examined it for signs of corrosion or material fatigue. I completely disassembled the mixer and examined every inch, including the threads, as I thought they could be a potential weak point in the system. Beyond the expected dusting of exhaust soot, which I removed, there was no sign of corrosion or material fatigue of any kind. In fact, the friend who taught us how to construct this type of mixer told us he has been using his for 10 years.

While replacing a custom exhaust mixer can seem like a daunting and expensive project, it can be accomplished with ease and for relatively little cost. Furthermore, by building your own exhaust mixer, you'll have a deeper understanding of the workings of your exhaust system, enabling you to catch problems early. The entire mixer can be disassembled and individual parts replaced, a clear advantage for those cruising to remote places because they won't have to carry an entire mixer as a spare. Also, for those on a tight cruising budget, individual parts can be replaced as required. On the whole, building your own should be less "exhausting" on your time and your wallet.

Robin Urquhart's master's degree in building engineering has been severely tested since he and his partner, Fiona McGlynn, decided to sail MonArk, *their good old 1979 Dufour 35, halfway around the world. They departed September 2015 from Vancouver, British Columbia, and are on a multi-year voyage that will end when they make landfall in Australia. Follow their projects, problems, and adventures at www.happymonarch.com.*

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I *am a sailor*

A young woman traces her avocation to infancy

BY KATIE ALLEY

I am a sailor. I always have been and I believe I always will be. Most people, when they hear the word sailor, picture the stereotypical image of an older man with a prickly white beard and large, worn, blocky hands. Plenty of the sailors I know match that description. The majority are retired and purchased a boat in which to invest their time. However, there are other sailors. Families with children buy boats on which to pass summer days. Young couples, who typically have a strong interest in sailing from former experiences, purchase boats too. All these sailors gather in one spot and form a community: the marina. I like to think of the Watkins Glen Village Marina as my genuine home because it is where I am truly happy. It reminds me of what I am.

I became a sailor because my dad — whom I refer to as Captain — was drawn to both the sky and the water. When he could not become a glider pilot, he acquired a Grampian 26. During the 1990s, he earned the status of senior navigator and obtained a captain's license. He even purchased a larger boat, an Alberg 35 that I sail on today. My parents circumnavigated Lake Ontario while Mom was pregnant with me, so I am not exaggerating when I say I have been on boats since I was in the womb.

Early days

During my childhood, I spent the endless, hot, dull summer days on *Tomfoolery*, the Alberg 35. Captain would put me in a harness and tie me to the jackline running along the sidedeck so I wouldn't fall into the cold waters of Seneca Lake. I enjoyed sitting on the deck, feeling the cool, crisp breeze in my thin hair while watching other boats shift their tall white sheet-like sails across their foredecks.

On Saturday afternoons, the local yacht club had races and I came along with Captain's crew. They became good friends of mine. On Sundays, Captain, my mom, and I would sail for the luxury of it. We would always sail past the salt plant on the west side of the lake. Occasionally, when I behaved well, Captain would let me touch the steering wheel or the winches. The old men back at the dock would say, "Captain Tom, I believe you have a sailor in the works."

As I grew up, I developed a familiarity with the loose boards and liveaboard boats of Dock 4 and the adults I saw regularly at yacht club picnics. Everyone knew me as Tom Alley's daughter. My younger brother tagged along to these picnics occasionally and sailed infrequently. He preferred the television and comforts of the house. My mom generally stayed home with him, leaving me to join Captain and the racing crew.

Acquiring skills

When I was 14, I took my first boating class and earned my boating card. I learned sailing terminology and could finally put a name to that rope I had been grabbing all those years and recognize terms Captain used frequently. Sailing made more sense to me. There's more to it than just hoisting your sails and sitting back waiting for the wind to magically move your vessel. Being a sailor is not simple.

By age 15, I had learned more sailing tactics and taken on a leadership role at the marina. To increase the number of younger members, the marina created the Seneca Junior Sailing Program. The dockmaster's son, my best friend whom I call my first mate, and I became very involved in the program. As coaches, the Captain and several other older sailors taught the club's teenagers how to efficiently dock, cruise, and race their sailboats.

There is a process to leaving the dock. The correct lines have to be taken off the cleats in the right order. The wheel must be turned to the correct spot so the boat can glide out of the slip without hitting a piling, the breakwall, or another boat. We must remember to watch the boat's speed and look for traffic as the boat makes its way out of the marina. The vessel must be steered into the wind and the mainsail cover removed. Someone with powerful biceps needs to hoist the mainsail up the mast. The halyard needs to be secured to the cleat. The jibsheet will likely get caught on a stanchion as someone turns the winch handle to pull it out. Is anyone still watching for traffic? The tactician had better be planning tacks and jibes down to the second so the boat will be in the best spot near the starting line for the race.

I continued to develop as a "sailor in the works." My first mate and I cruised with Captain and became his foremost crewmembers. With more experience, we could run the boat ourselves under his supervision. We raced *Tomfoolery* and placed well. We practiced man-overboard drills despite Seneca's cold water. We sailed the entire length of Seneca in windy, rainy, and wavy conditions. We learned how to swap out a sail in stormy weather. We navigated to an unfamiliar lake when original plans did not work out. We challenged ourselves in circumstances in which other experienced sailors may have chosen to stay put. Sailing demands passion and a sense of adventure, and we certainly possess these.

Confirmation

Along the way, I'd acquired several new titles including, "veteran junior sailor," "youth committee co-chair holder," and even "the dockboy's girlfriend" for a while. One of the junior sailing coaches told me, "Young lady, get a good education, make a lot of money, and buy yourself a boat." I thought about his advice regularly while lying in my berth on *Tomfoolery* awaiting sleep. I know now what he said is what I want to do. It is exactly what I want to do.

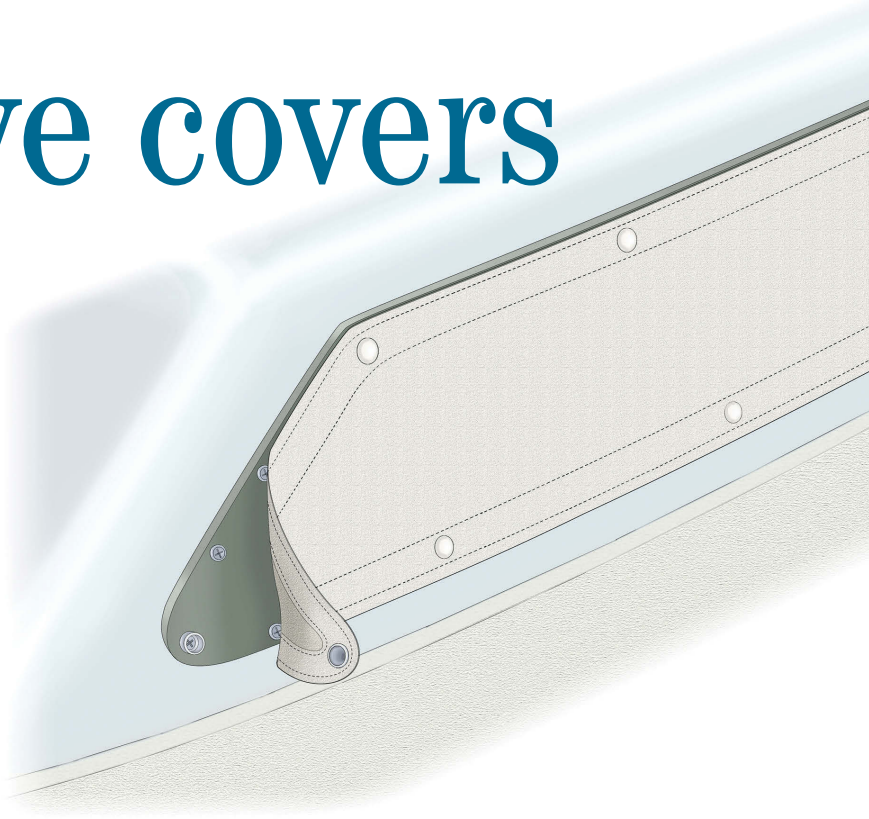
Another retired sailor I knew made money by charging people for rides on his boat and then took his wife and his boat down to Georgia for the entire winter. I listen to all the experienced older sailors' stories of sailing in Lake Ontario races with hundreds of boats or navigating the vast ocean and meeting new faces in unfamiliar harbors along the canals and coasts. One day I will visit and experience these places, because I am a sailor.

Captain routinely recited the old proverb, "A smooth sea does not make a skillful sailor." I do not need the luxuries of TV, air conditioning, or WiFi; all I need is the luxury of the wind in my sails. I can navigate the shifty winds of Seneca Lake, make my way through the canals, travel anywhere in the world, and never come back. I will forever treasure the oranges, pinks, and yellows of the vibrant Seneca Lake sunsets. Our dock neighbor, an older man who lives on his boat, said to me that sailing "is tomfoolery, all of it." I am passionate about the foolishness of putting a big sheet up in the sky to push me slowly through the water. Another older sailor in the marina, watching his boat being launched for another season, said to me, "Gee Katie, the older I get the more unsure I am about all of this."

As I get older, I feel ever more confident and certain. I am a sailor.

Katie Alley has been sailing all 17 years of her life, mostly on Seneca Lake, one of the Finger Lakes in upstate New York. She competes in weekend races aboard Tomfoolery *and oversees youth activities in the Seneca Sail and Power Squadron, a non-profit organization that offers a variety of educational boating opportunities. Katie plans to become a coach in the Seneca Junior Sailing program and eventually own her own boat to sail wherever she pleases.*

Protective covers for fixed windows



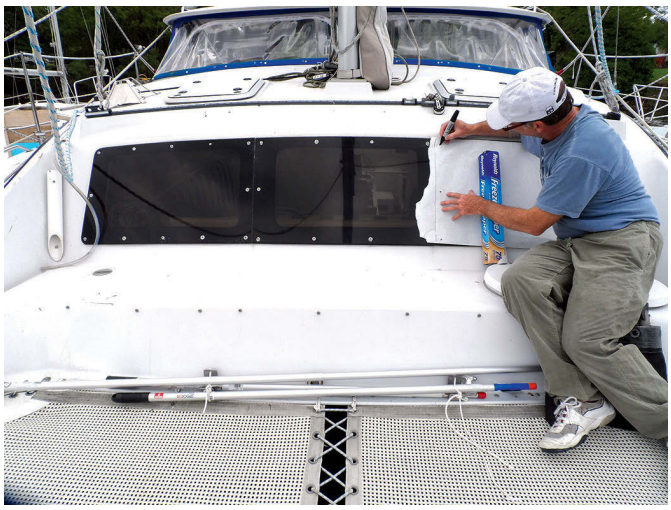
Banish the hazing, crazing rays of summer

BY DREW FRYE

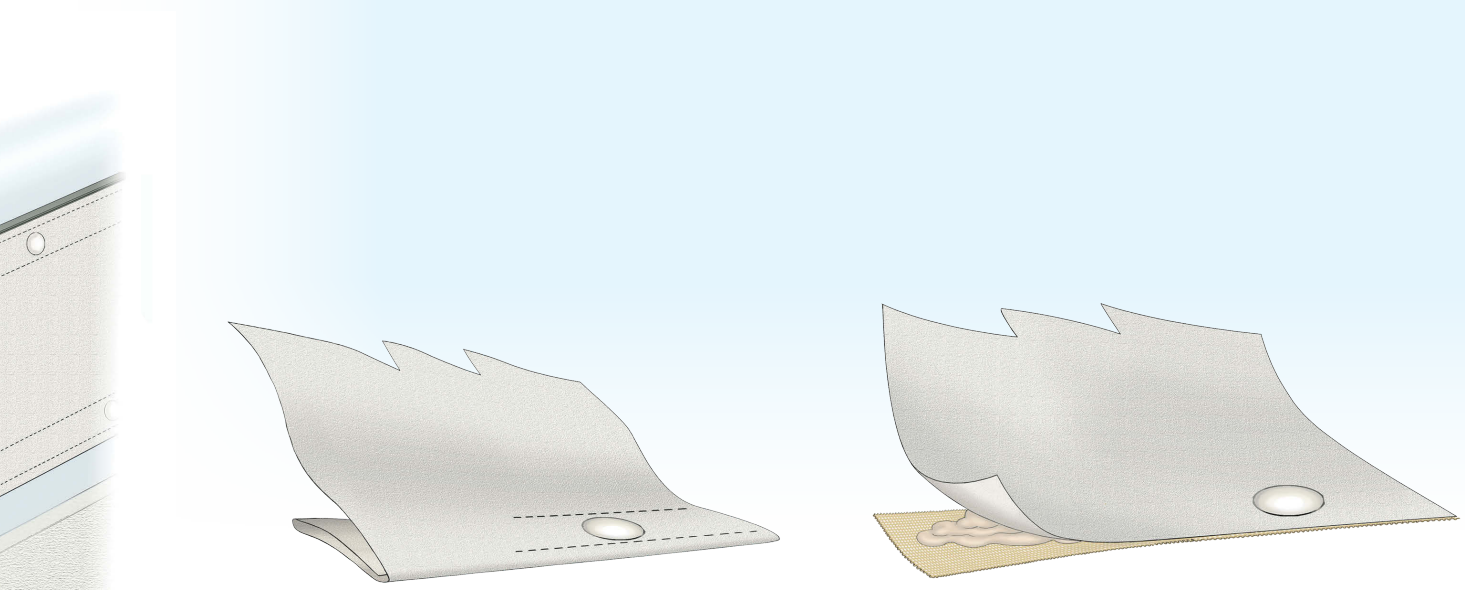
Under the relentless glare of UV, crisp sails turn to fragile rags, shiny paint dulls, and clear plastic windows become hazy and crazed. Compounding and polishing can remove surface haze from plastics but they can't reverse crazing damage deep within. Crazing is especially bad because it can weaken the plastic until it cannot be trusted to take a heavy blow, necessitating major surgery to remove and replace glued-in windows. Waxes promise protection, but the protection is slight and ephemeral, and cleaning the windows to remove dust and bird bombs removes the wax.

The best protection for acrylic or polycarbonate windows is to cover them. Fixed plastic windows, like those on our PDQ 32 catamaran, are typically attached by a ring of screws on the perimeter. By replacing the corner screws and a few in between with male snaps (⅝-inch with a #8 wood-screw thread), I created attachment points for covers without drilling any new holes. These male snap screws are shorter than the screws they replaced, but I did not remove many, and the window is actually secured by the adhesive, not the screws.

I made patterns for my covers using freezer paper. It comes in a convenient roll, is reasonably strong, and doesn't stretch. I marked the fastener locations by feeling through the paper, pressing to make an impression, and marking with a Sharpie. I marked the perimeter of the window the same way, by feeling and making an impression. I labeled each pattern and wrote "this side out" to avoid confusion.



To protect the fixed windows on his catamaran from the sun's damaging UV radiation, Drew made canvas covers for them. He began by making patterns out of freezer paper, at left. The covers attach to screw-in snaps that replace some of the windows' fasteners, at right.



Triple-layer hem reinforcement

Glued-tape hem reinforcement

ILLUSTRATIONS BY FRITZ SEEGERS

Because I was making my covers from Sunbrella, I increased every dimension by ¼-inch per foot to allow for shrinkage. To measure this, I marked a single centrally-located fastener on the pattern with an "X" and increased the dimensions from that point. The covers were a little baggy at first, but shrank over time to a nice fit.

I allowed an additional 3 inches around the perimeter for the edge hem. To make the hem, I doubled the cloth under, slitting it as needed to make the corners lie reasonably flat. The resulting three layers of Sunbrella are required to hold the pound-in female part of the snap. I sewed the hems with Tenera thread as it lasts as long as the fabric, which is at least 15 years for a simple window cover. On the top inside corner of each cover, I used a Sharpie to write its location; they all look alike when they are on deck and I'm trying to decide which is which.

An alternative to sewing is to cut the fabric to the patterned size with a hot knife (or flame the edges), allowing for shrinkage. The thickness around the borders can be built up with 1½-inch-wide strips cut from the same fabric, or with webbing, glued flat along the edges with polyurethane adhesive sealant (Locktite PL S30 is an economical choice). This will seal the edges and provide the snaps enough material to bite into. I have used this shortcut under grommets for years, for repairs and in places where sewing would be awkward.

I've used these covers for 5 years. They have stood up well and have not caused chafe on the windows. By blocking the sun, they dramatically reduce heat gain and air-conditioning loads in the summer, help with heating in the winter, and add privacy when desired. I lubricate the snaps regularly with grease to lessen stress on the snaps when I remove the covers, reducing the chance of pulling out a snap. I almost never have to clean the windows as the covers bear the brunt of atmospheric fallout and bird bombs. I could take the covers home for laundering, but I just scrub them in place.

Drew Frye's bio appears on page 41.

Resources

All the materials are available from Sailrite: www.sailrite.com

- DOT snap fastener cloth-to-surface set
- ⅝-inch screw stud
- Sunbrella fabric, 54 inches wide
- Tenera thread

As well as protecting the plastic windows from dirt and sun damage, the white Sunbrella covers, at left, cut down on heat gain in the boat's interior in summer and heat loss in winter, making life on board more comfortable. They are also tidy-looking, at right.

Klacko & Klacko: sparring partners

BY ROB MAZZA

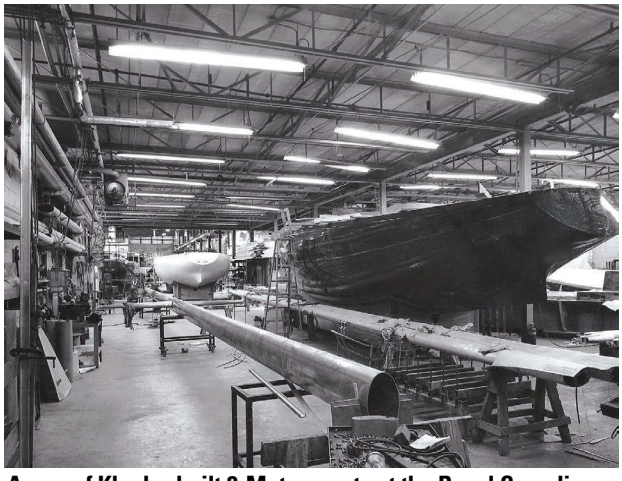
When you break a mast or need a new spreader base or just want to have a fresh coat of paint applied to an old aluminum mast, where can you go? What if you want a new cockpit arch, bow rollers, pulpits, or fixed rails? For many years on Lake Ontario and well beyond, the answer has been obvious — the Klacko brothers.

Martin and Danny Klacko were in on the ground floor when C&C Yachts was formed in 1969 and came by their expertise through building masts for the C&C Custom Division in the 1970s and '80s. That expertise and years of experience eventually led to the development of two separate companies. Danny and his crew at Klacko Spars have specialized in replacing and updating masts for good old boats for many years; Martin, his older brother, has produced custom stainless-steel and aluminum metalwork at Klacko Marine for just as long.

The Klackos' path to careers in metalworking began at high school in Welland, Ontario, at the Lake Ontario end of the Welland Canal. At the time, neither brother saw university in his future, but Welland High exposed them to training in a variety of vocations — woodworking, auto mechanics, electrical, and metalworking. Martin had always been fascinated with metals, marveling at the ability of one alloy of steel to cut another. This would eventually lead him to study metallurgy, but the immediate result was a sound education in metalworking and a budding hobby in woodworking. Danny, three years younger, was intrigued with auto mechanics, but Martin persuaded him to go into metalworking.

After graduating from high school, both found good work in their chosen field. Martin earned a degree in metallurgy from Ryerson Polytechnical in Toronto and was recruited by a large mining company to work in its research center in Mississauga, Ontario.

One day, a young co-worker began asking Martin specific questions about fabricating stainless steel. It transpired that this fellow was moonlighting for a new boatbuilder in Oakville named Erich Bruckmann, who was building a radical racing sailboat called *Red Jacket*. Erich was about to move into a larger facility to begin series production of a similar design, the Redline 41, and needed a lot of custom stainless-steel and aluminum hardware. The younger fellow bowed out of the picture and Martin ended up working for Erich evenings and weekends, fabricating fuel and water tanks, pulpits, foot blocks, and other custom fittings for the new boats.



A row of Klacko-built 8-Meter masts at the Royal Canadian Yacht Club, main picture. In 1972, The Klackos' spar shop occupied a lot of space at the C&C Custom Division, above.

A symbiotic relationship

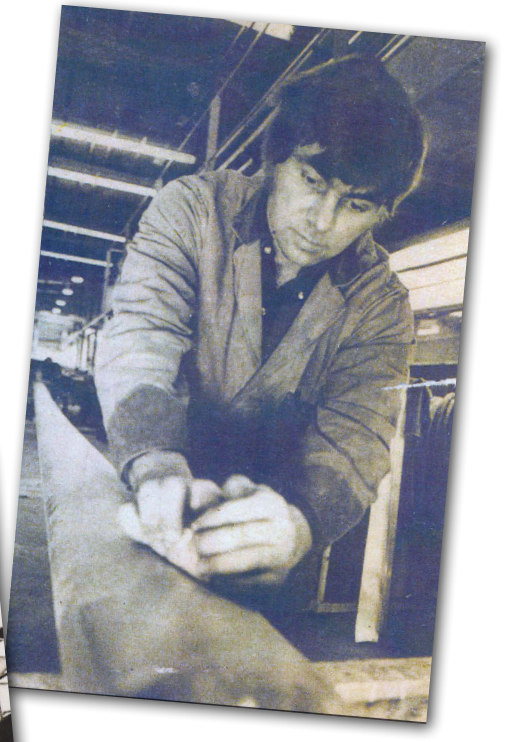
Martin's main reason for moonlighting was to earn extra money to buy a house for his new wife and himself, but the more he got into the boat work, the more he enjoyed it. He had

ALL PHOTOS BY ROB MAZZA UNLESS OTHERWISE INDICATED

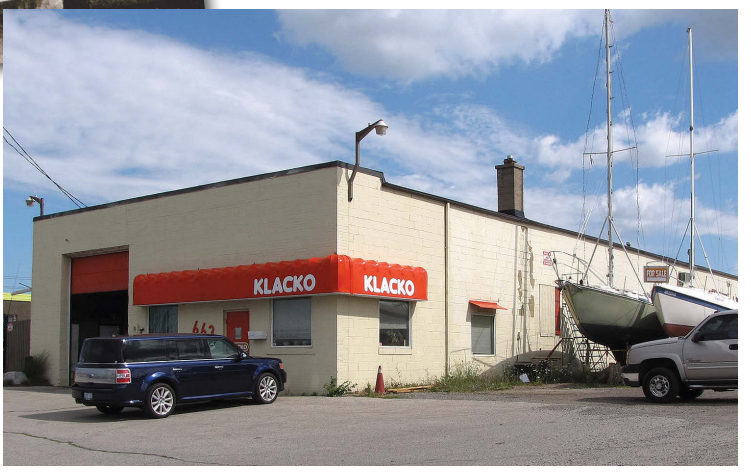
PHOTO BY KEN DEELEY

The backroom brothers who made masts and hardware for the famous

PHOTOS COURTESY OF OAKVILLE BEAVER AND MARTIN AND DANNY KLACKO



Erich Bruckmann (left) and Martin Klacko pore over a blueprint at the C&C Custom Division in 1977, at left. A C&C 42 is in the background. Danny Klacko then, above. The present-day Klacko Spars shop in Oakville, Ontario, below.

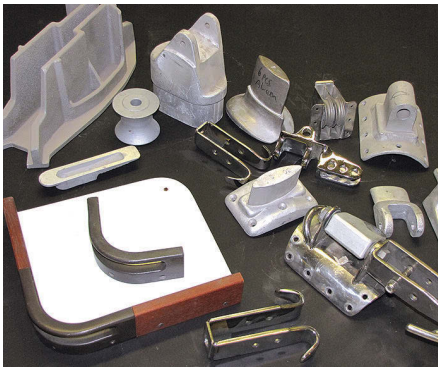


always wanted to have his own business, and this looked like a great place to start. So, with a handshake, Martin Klacko and Erich Bruckman struck a deal. Martin could have a dedicated area in Erich's new facility for his machine shop, rent-free. Erich would also pick up the overhead expenses, including utilities and phone. All Martin had to do was make Erich's needs his first priority. Martin could do whatever he wanted with his leftover time, even supply metalwork to competing boatbuilders, of which there were many in Southern Ontario in the 1960s.

At the time, the spars for Bruckmann Manufacturing were being made by George Ward, a small company in Toronto, and later by Belleville Marine, the company that would eventually become a founding member of C&C Yachts. Because these spars inevitably required a good deal of additional work, and some of the Belleville masts tended to twist under load due to "soft" welds, Martin brought Danny into the business to focus on manufacturing the spars. As a result, the two Klackos provided all the masts and custom hardware for the boats shipped from what would become — with the formation of C&C Yachts in 1969 — the C&C Custom Division. Those boats included all the C&C 43s, C&C 50s, and C&C 61s. The Klackos also built the replacement rig for *Red Jacket*, as well as spars for custom one-offs, such as *Bonaventure*, and the Canada's Cup winners and contenders *Manitou*, *True North*, *Bagatelle*, *Merrythought*, *Mirage*, and *Marauder*. Not a bad legacy! This symbiotic relationship between Erich Bruckmann and the Klacko brothers would last 25 years and deliver some remarkable products.

A period of growth

After the formation of C&C Yachts in 1969, business increased exponentially for the Klackos, who concentrated on producing custom metalwork and all the spars for the larger boats coming out of the Custom Division. The spars made by the Klackos were always tapered and had welded integral aluminum mastheads and welded spreader bases. The production division built its own spars in the former Hinterhoeller Yachts facility in



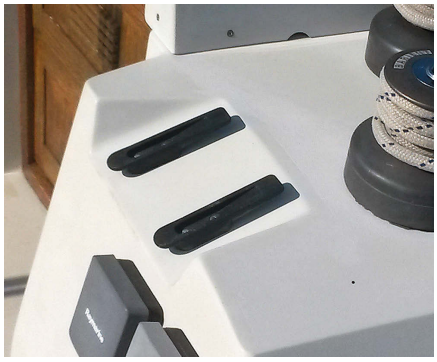


PHOTO AT LEFT COURTESY OF KLACKO MARINE WEBSITE

As well as spars and fabricated hardware, the Klacko brothers produced castings, at left, not just for C&C Yachts but also for Ontario Yachts, Hinterhoeller Yachts, and others. Among the custom metalwork they made for the C&C production line in the 1970s and '80s was the distinctive C&C jam cleat, center. Martin Klacko's Klacko Marine fabricates, among other things, cockpit arches, at right.

Niagara-on-the-Lake and in Middletown, Rhode Island. These "production" spars differed from the Klackos' spars in that they involved no welding, were not tapered, and used cast-aluminum masthead units and spreader bases that were fastened with machine screws.

During my 15 years with C&C Design, I produced a lot of the drawings for all these spars for both divisions until we started buying spars from outside, beginning with the Canada's Cup challenger *Evergreen* in 1978. However, if the drawing wasn't yet ready, that never held up the Klackos. If a stainless-steel water tank had to be built, it got built, drawing or no drawing. And Martin and Danny were never bashful, but always good-natured, about pointing out to us that the objects we young, often green designers envisioned occasionally could not be built as drawn.

Martin's interest in the process of casting components in aluminum and zinc-based white metal came to the attention of Rod Gerrard, whom George Cuthbertson had hired to apply industrial design to the process of creating interior and exterior components of C&C's custom and production boats. Rod began designing new cast-aluminum stanchion bases to fit on the extruded aluminum toerail, as well as powder-coated cast corner details for interior joinery. I designed a cast-aluminum jam cleat for cockpit winches that was then used on all C&C production boats in the 1970s. The Klacko shop in C&C Custom was soon producing a variety of castings for all C&C boats, custom and production.

Changes at the helm

This more formal relationship between Erich Bruckmann and the Klacko Brothers came to an end after Erich, the last remaining of the official founders, left C&C Yachts in 1986. By then, most of the racing masts were being produced by specialized outside vendors, such as Tim Stearn at Stearn Sailing Systems.

Air Ontario had acquired C&C Yachts in 1981. The new management didn't see the same value in the relationship with the Klackos that Erich Bruckmann had and deeply resented its in-house

An aluminum Mega

After working in the boating business for so many years, the Klackos were sometimes approached about building welded aluminum boats. From observing Erich Bruckmann as he managed the wide range of skills involved — mechanical, electrical, plumbing, woodworking, and hardware installation — they knew that boatbuilding was not for them. They did, though, make one notable exception.

In 1977, C&C was developing the Mega 30 that is so dear to the leadership of this magazine. The concept for this boat was so different from C&C's other products that the company decided to test it with a prototype. Building the hull in fiberglass would require tooling, or at least a plug and a lot of fairing, so when Martin Klacko suggested that it could be built in less time and at a lower cost in aluminum, C&C management jumped at the possibility. In very short order, they had an aluminum prototype, and the rest, as they say, is history.

PHOTO BY WILSON YATES

A rare photo of the aluminum prototype for the C&C Mega 30 shows her in 1978 in Bronte Harbour, Oakville, next to another product of C&C Custom Division, the Canada's Cup winner *Evergreen*.

Alex Mcaulay (at left), Tim Doel, Danny Klacko, and Nolan Steele, on the floor at Klacko Spars, at left. Danny is restoring another Dodge truck, above. Doug Gierula, below, bought Klacko Marine from Martin Klacko.

machine shop being allowed to make products for competitors. This led to a parting of the ways. The Klacko brothers relocated their business to a shop on Third Line in Oakville in the late 1980s. The C&C Custom Division closed its doors soon after. It was the possibility of such a closure that precipitated the Klackos' move, because Martin did not want to see all his equipment and machinery (most of it custom-made) locked inside the fences of a company in receivership.

The purchase of the premises in Oakville presented a financial challenge that they partially mitigated by renting out portions of the building. Cliff Howard moved his rigging shop from downtown Toronto to be closer to the Klackos, and other C&C Custom alumni established mechanical and electrical subcontracting ventures under the same roof. All these businesses have since gone and Klacko Spars now occupies the entire building.

Soon after the relocation, Danny and Martin divided the company. Klacko Spars, under Danny's leadership, worked out of the Third Line location, specializing in spars. Klacko Marine, under Martin's direction and focusing on custom stainless-steel and aluminum fabrication, moved to a specially built workshop at Martin's home in Grimsby. Both brothers maintained an active interest in the hobbies they had picked up so many years before at Welland High, Martin in woodworking and Danny in restoring vintage Fargo and Dodge trucks.

The future

Martin is now officially retired, having sold Klacko Marine to Doug Gierula, who was still in high school when he started working with Martin. Doug, who has degrees in biochemistry and mechanical engineering, relocated the company to nearby St. Catharines, Ontario. He has brought his metal-working business into the 21st century by using 3-D design programs, such as Rhino and SolidWorks, to develop new products. His speciality is cockpit arches.

Danny has brought his daughter Dannial and son-in-law Tim Doel into the spar business so it can carry on after Danny's much-discussed retirement. Klacko Spars still occasionally builds

spars for new boats as well as new masts for older boats. Working closely with local designer Steve Killing, Klacko Spars has been building new masts for the large fleet of vintage 8-Meters at RCYC. And because older masts need to be replaced or repaired, the shop is never empty — come springtime it's rather full. In addition to masts, Klacko Spars fabricates a large variety of stainless-steel and aluminum products, ranging from davits to water tanks, and stocks a large number of raw castings waiting to be turned into finished components when required.

Reflections on the past

Klacko Spars and Klacko Marine have never advertised, but have succeeded through word of mouth and their good reputation. Over four decades in the boating business, the Klackos have accumulated a wide variety of loyal customers with whom they have established lifelong relationships.

One of those customers is David Howard, past commodore and long-time member of the Royal Canadian Yacht Club in Toronto. Last summer, he decided it was time to recognize the long relationship between the Bruckmanns and the Klackos. David had recently been working with Martin and Danny Klacko and Erich Bruckmann's son Mark on the restoration of an old Dragon that David had acquired in remembrance of *Tomahawk*, the Dragon he had sailed in the 1956 Melbourne Olympics. It occurred to David that he had been dealing with Klackos and Bruckmanns for 55 years — most of his sailing career. He felt it was long past due that he should honor that relationship and make newer sailors aware of the debt all sailors owed to these individuals who worked behind the scenes to create the products that brought such joy to our lives.

David organized a garden party on the front lawn of RCYC with a number of the boats that had benefited from the Bruckmann/Klacko collaboration lined up on the front docks. The well-attended event was a very appropriate way for sailors to say "thank you" to the brothers Klacko and to the Bruckmanns, father and son.

David Howard, at right, welcomes Martin Klacko and his wife, Bette Pender, to the garden party he organized at RCYC.

PHOTO BY JIM DAWSON OF PHOTOWORK.CA

Rob Mazza, a Good Old Boat *contributing editor, joined the C&C design office in 1968 and, over the next decade or so, in the days when good new boats were being produced in large numbers, worked on many of the same projects as the Klacko brothers.*

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Portable 12-volt source

GOB's troubadour tests conductors with an electric baton

BY TOM WELLS

As part of a major refit of our Tartan 37, *Higher Porpoise*, we decided to replace all the in-mast conductors while the mast was out of the boat. Because neither of us wanted to have to later go up the mast to fix a mistake, I needed a supply of 12-volt power with which to test the wiring of each mast-mounted light while everything was accessible. With no vehicle access, getting a 12-volt feed to the base of the mast posed a challenge.

Tom's electric baton is a piece of ½-inch PVC pipe long enough to hold eight AAA batteries, above. A cap at each end holds a spring taken from a wire nut of the type used in household wiring, at left. Tom now has portable power for testing 12-volt circuits, below.

The answer came during one of those 3 a.m. epiphanies that rousts you from a sound sleep. Eight AAA batteries in series will provide 12-volt DC current. All I would need was a container for the batteries and a pair of conductors. It turns out that AAA batteries fit neatly into ½-inch PVC pipe. After adding two ½-inch PVC caps, suitable lengths of red and black wire, and two small coil springs, I had a simple, lightweight, and very portable source of power for testing.

Construction

To obtain the springs, I broke and cut away the plastic from a pair of large wire nuts. (It may be necessary to cut off the narrow ends of the springs to create a surface that provides good battery contact.) I then cut a length of ½-inch PVC pipe to contain the springs and the batteries (14⅛ inches worked for me) and prepared two ½-inch PVC caps by drilling a hole in the center of each one just big enough to pass an insulated #14 conductor. After stripping both ends of 16-inch lengths of red and black #14 wire, I passed one end of each wire through a cap. Inside the top of each cap, I spread the wire strands and spun the spring onto the wire. This held the spring securely without the need for solder.

After pushing the cap with the black conductor firmly onto one end of the pipe (there should be enough friction that the cap will hold without glue) I dropped eight AAA batteries into the pipe with their negative poles down. When I pushed the cap with the red wire onto the top end, the project was complete. I recommend covering the exposed wire ends with wire nuts when the tester is not being used.

When testing this mobile power source on the LED anchor light, I had to occasionally push inward on the end caps — just slightly — to get good contact. Otherwise, this small, handheld power source worked perfectly. It is much more convenient than running long conductors from a car or boat.

Tom Wells is a contributing editor with Good Old Boat *and, with his musical talents, has earned the title of troubadour. He and his wife, Sandy, have been sailing together since the 1970s. They recently retired and have cast off the docklines to embark on full-time adventures aboard their 1979 Tartan 37,* Higher Porpoise, *starting in Florida this winter.*

Tech support

A rack where phones stay dry, charged, and in reach

Here's a simple project for 21st century sailors who want a safe and dedicated place to stow expensive little gizmos. I designed and fabricated a rack to safely stow his-and-her phones. It's made from cherry and mahogany odds and ends that look great with a few coats of satin urethane varnish applied.

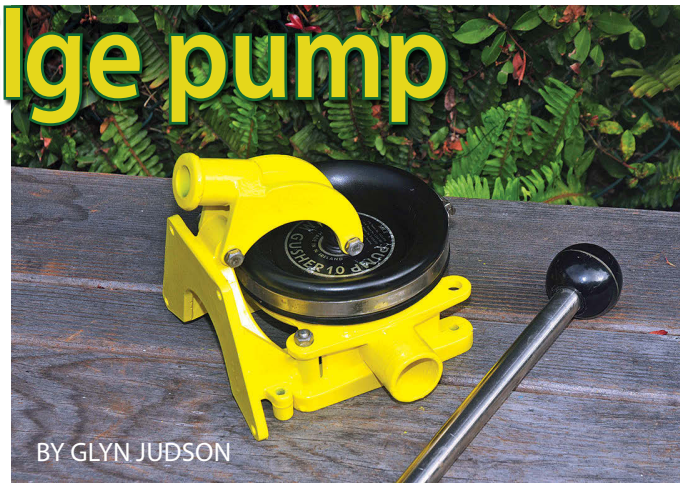
I made the center divider that separates the compartments wide enough for two holes that keep pencils at the ready. I used a Forstner bit to bore these holes as it allows good control and makes a clean cut. I made the slots in front just wide enough to permit the charging cord to remain attached to the phone while I put it in the rack, thus allowing my rack to serve as a charging station.

I mounted the rack far enough from the companionway to be safe from spray, but close enough that the phones are handy and can be heard when they ring. To attach the rack, rather than drill holes for fasteners, I used double-sided foam mounting pads. Technology will change, and when it does, I'll just remove this rack and make a new one to suit.

Art and Sandy ***Hall****, and their not-so-inclined-to-sail Pekingese, Kitri, can be found sailing* Secret Water, *their Allied Seabreeze 35, on Penobscot Bay, Maine. Occasionally they'll push way Down East for some solitude. Art enjoys the challenge of keeping a good old boat going strong from season to season, decade to decade.* Secret Water *turned 50 two summers ago and is headed for a century.*

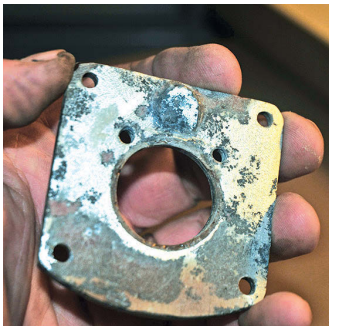
Rebuild that bilge pump

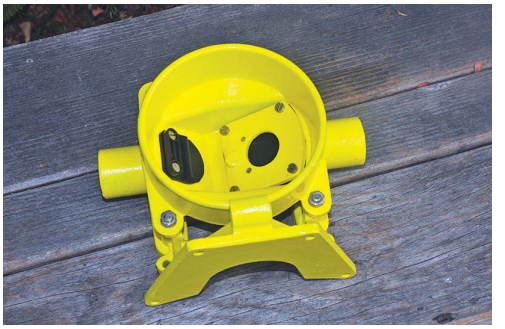
If it ain't broke, it just needs cleaning and painting



BY GLYN JUDSON

The inspiration to rebuild, rather than replace, the non-functioning Whale Gusher 10 bilge pump on our Ericson 31 had two sources. The first was my friend Keiffer, a fellow Ericson 31 owner, who had successfully rebuilt *his* pump. A price tag of $250 for a new replacement pump was the second. After all, how hard could it be to diagnose any problem and then repair or replace any broken parts? I dove right in.





Resplendent in fresh paint, Glyn's 37-year-old bilge pump looks brand-new, at top. Glyn disassembled the pump, at left, sandblasted the corroded areas, and cleaned all the parts. He patched one corroded area with epoxy, center, before painting and reassembly, at right.

I started by disassembling the pump. Right away I saw that aluminum oxide debris had collected beneath one of the flapper valves. This prevented the valve from closing fully, rendering the pump useless. After removing the corrosion from all the aluminum parts with my little home sandblaster, I used thickened West System epoxy to repair one corroded corner of an internal plate. I then sprayed all the parts with a coat of zinc chromate primer and the first of three coats of Rust-Oleum yellow enamel paint.

While the paint dried, I cleaned all the stainless-steel parts and the two rubber flapper valves in preparation for reassembly. I also applied a coat of Armor All Protectant to the flapper valves.

Because I was able to repair the plate and everything else was in good shape, I didn't need a repair kit. My biggest expense was the cost of the paint and primer.

I reinstalled the pump on *Dawn Treader* with the hope that it will serve me well for another 37 years.

Glyn Judson, a retired corporate aerospace photographer, has been raising dogs for Guide Dogs of America for the past 14 years. Between boat projects, he sails the waters of Southern California with his wife, Marilyn, on their 1979 Ericson Independence 31, Dawn Treader.

Mail buoy

continued from page 9

Easy living in the California summer

We have finished our dodger-bimini enclosure project that you published in the July 2016 issue ("Cockpit Canvas One Kit at a Time"). We now have a top for the dodger and a top for the bimini and the rest of the panels can be removed or added as needed to suit changing weather conditions (see photo above). A I write, we're in the midst of summer in California, so we're just using the two tops.

–Dale Bagnell, Redwood City, Calif.

Burp-free fueling

On our Rhodes Reliant, *Astarte*, I have an alternative approach to avoiding fuel "burping" out of the air vent (see "Diesel-Vent Burp Suppressor" by Cliff Moore, July 2016).

The first step is to make sure the fuel tank vent line angles upward along its entire length. This enables any fuel in the vent line to trickle back down into the tank. The danger is that if there is a dip in the vent line, fuel can settle there and create an obstruction to air going out the vent. In such a situation, when fuel comes into the tank and displaces air, the air pressure in the vent can blow the trapped fuel out onto the deck (in the case of *Astarte*).

Second, install an accurate fuel gauge. My boat has a Tank Tender, made by Hart Systems, Inc. (www.thetanktender.com). The gauge is surprisingly accurate. It does not use electricity but works by measuring air pressure. It can measure several tanks — fuel, water, holding, bilge — depending on the setup. It is a bit pricey but worth it.

The Tank Tender measures the depth of the fluid in the tank in inches. For each tank being measured, it is necessary to create a table that relates depth in inches to gallons in the tank. It is fairly simple to do this. Start with an empty tank, pour a known number of gallons of fluid into the tank, and measure the depth. Do this as many times as needed until the tank is full. With this data, you can make a table that shows how many gallons of fluid you have in the tank for any given reading on the gauge.

When you come to the dock for fuel, you can check how much fuel is in the tank. Subtract from the full tank capacity how much fuel you need. Let's say your tank holds 40 gallons and you have 5 gallons left in it. Don't try to fill it to the very top (but take some paper towels on deck, just in case). Tell the dock attendant that you need a total of 34 gallons but to stop the flow of fuel at 30 gallons (when you will have 35 gallons in the tank.) Wait a few minutes to let the foam in the tank settle, then proceed to take on fuel very slowly. Stop at 32 gallons (37 in the tank) and let the foam settle again. Then take on the last 2 gallons very slowly and stop at 34. Don't try to fill the tank to the very top. The likelihood is that there will be no spill at all.

Apart from avoiding fuel spills, having an accurate knowledge of how much fuel and water are in the tanks changed how we cruised. We used to be nervous that we might not have enough fuel or water, so we stopped very frequently to fill up. Now we know how much fuel and water we have, we feel confident sailing the extra miles.

–Ben Stavis, Bala Cynwyd, Pa.

Watching the weather

I learned much from Mark Thornton's article on Doppler radar ("Doppler Weather Radar, Part One," September 2016), and I look forward to part two.

I suggest Mark plan a future article on wind modeling. As a sailor, I am obsessed with accurate, dependable wind prediction, but am confused by the many wind models available. My Windalert app has eight wind models, and I do not understand the strengths and weaknesses of each. I know that their Quicklook is a long-range wind model, useful for what might happen days hence, but not so great for the next few hours. Similarly, other wind apps seem to have their own proprietary models, but it is difficult to know which to look at for a given time frame.

Even those models that seem to be short-term might disagree. Today, NAM 5km says 8-10 on White Bear Lake, while HRRR 3km says 5 gusting to 12-13. What to choose?

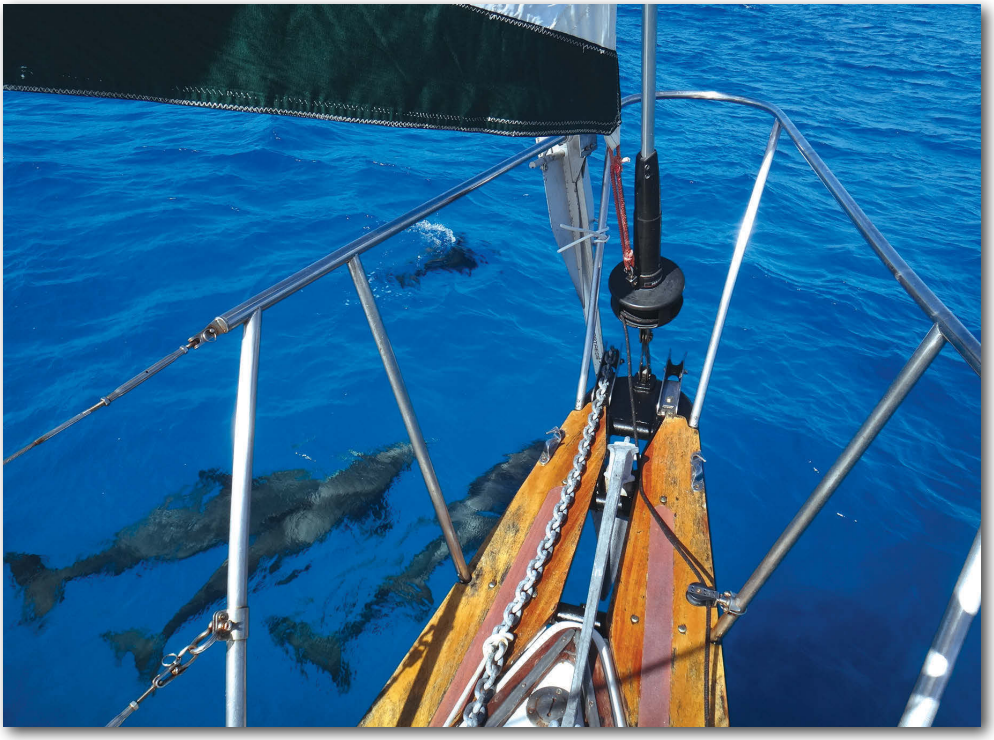
–K.S. Kokko, Roseville, Minn.

Mark responds

Thank you for your comments on my radar article. I hope you enjoy part two (on page 16 in this issue).

Weather models can be very confusing. Besides the standard models used by government agencies, universities and app providers (such as SailFlow and PredictWind) create proprietary models by post-processing the output from the standard models. It gets very confusing in a hurry. Each forecast model has strengths and weaknesses, and no model consistently outperforms the others. In general, higher-resolution models that are updated more frequently, such as

"*Good Old Boat* has provided guidance for many DIY projects on our 39-year-old good boat. Thank you!" So read the note Jeff and Dawn-Marie Rudolph included with this photo taken from their 1977 Morgan Out Island 37 ketch, *Live The Dash*, on an idyllic daysail off the north coast of St. Croix in the U.S. Virgin Islands, where dolphins regularly play in the bow wave. Our message back is, "Thank you!" in the form a *Good Old Boat* T-shirt or cap we're sending the Rudolphs. We selected their photo from submissions this month that appear on the GoodOldBoat.com site. Just click Reader Services and go to the Readers' Boat Photos.



the HRRR (which stands for High Resolution Rapid Refresh), are the best choice for sailors. In addition, ensemble models, such as the Short-Range Ensemble Forecast (SREF) are generally more effective than a single model.

I am planning a series of articles introducing the forces governing the wind and wind-forecasting resources that will be published sometime this winter in my marine weather blog: www.lakeeriewx.com/blog.

Shedding light on and with diodes

I found John Churchill's masthead wiring scheme very clever ("Masthead Enlightenment," September 2016), but it occurred to me that the diodes might be unnecessary with LED lights, since these lights are also diodes. Could the same thing be accomplished by using the lights alone?

–Paul Maravelas, Mayer, Minn.

John's reply

Thank you for this interesting point. I had discussed this concept with the technical editors prior to publication. I am not that familiar with the current LED lighting fixtures. The older incandescent lighting fixtures are typically indexed with regard to the polarity of the bulb contacts. It might be possible to delete the diodes using LED bulbs, but I suspect that would require some modification to the fixture.

–John Churchill

Editors' note: *Some LED combination light fixtures come with instructions for installing them with two wires where three wires are not available.*

Diodes and current

John Churchill has come up with a clever method employing the use of steering diode logic with polarity sensitive components. The schematic shows a single LED. If you are not using a special 12-volt LED bulb, you need to include a means to limit current, which will drop voltage so the LED is not destroyed by too much current or voltage.

You need to consider the LED's current limit and voltage drop when considering a simple resistor drop. Dr. LED uses a switching circuit to limit current more efficiently in its bulbs.

–Tom Luque, Camas, Wash.

Good Old Boat's techie responds

John Churchill's article is correct. The assumption is that the tricolor light and the anchor light are commercially available lights, whether LED or incandescent. The photos show a Guest combination light. Any commercial LED anchor or tri-color light has the current-limiting circuitry built in.

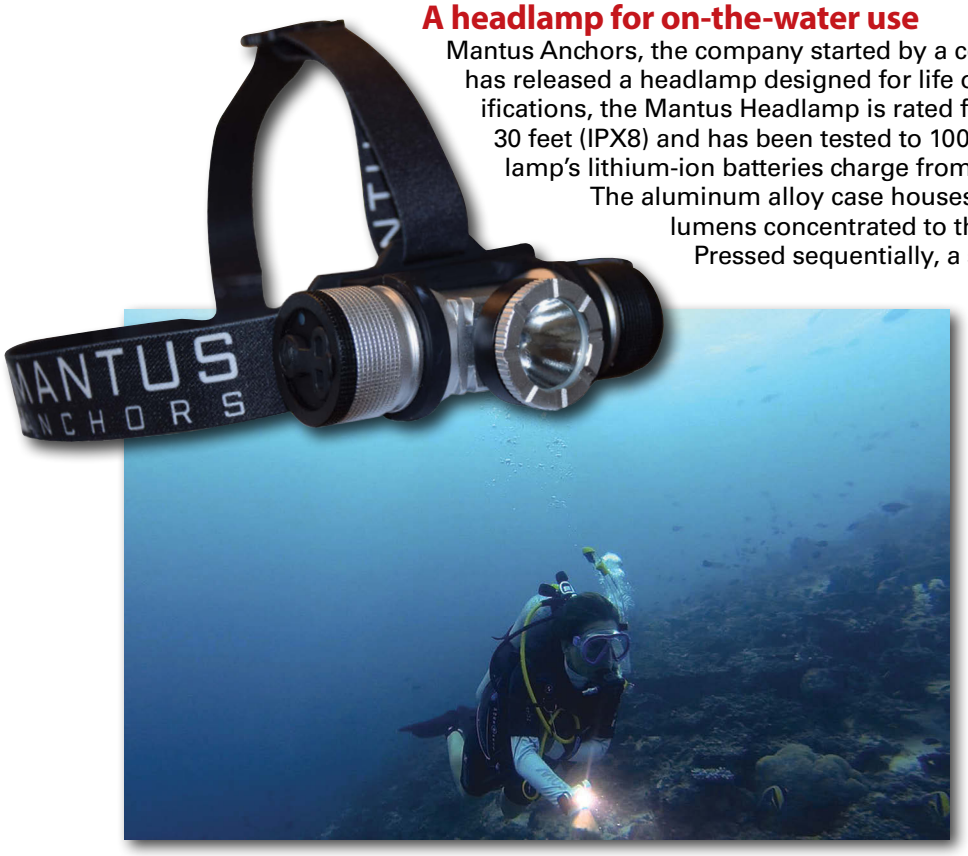
Tom, you would be correct if someone were building their own LED anchor or tri-color light using LEDs from RadioShack or Digikey, in which case the circuitry would require current limiting to prevent frying the LEDs. You appear to have misread the schematic, which shows a single light, not a single LED.

On the other hand, John's selection of a 3-amp diode may be a problem if the anchor light or tri-color lights use the old 25-watt incandescent bulbs. That would be a 2-amp draw, which would cause a fair amount of heat in the diodes and potentially damage them, especially if they were potted as he suggests. A larger diode would be better.

–David Lynn, Electronics Editor

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

A headlamp for on-the-water use



Mantus Anchors, the company started by a couple of cruising sailors in 2012, has released a headlamp designed for life on the water. According to the specifications, the Mantus Headlamp is rated for continuous immersion down to 30 feet (IPX8) and has been tested to 100 feet without water intrusion. The lamp's lithium-ion batteries charge from empty to full in 3 hours via USB. The aluminum alloy case houses 6 Cree LEDs that output 770 lumens concentrated to throw a beam up to 420 feet. Pressed sequentially, a single button allows a user to select a red light, a low-power beam, a high-power beam (don't look into this beam!), or an emergency distress setting that flashes SOS in Morse code.

The Mantus Headlamp is solid, heavy, and has a secure head-mounting system. I have used mine for changing zincs and working on props in murky water, when repairing a broken throttle cable inside the binnacle, and as a temporary port running light while I changed a light bulb in the middle of the night.

More information is available at www.mantusanchors.com. MSRP is $85.00

– Chuck Koucky

Portable power for portable devices

We have reviewed Secur products before. Their utility is aimed mostly at the camping market. But what is useful camping among the trees is often useful "camping" on the water in a large fiberglass "tent." Secur's newest product, the SP-6000, is a portable phone charger with a 10,000mAh internal lithium battery, two 6-watt fold-out solar panels, and two 5-volt, 2.4-amp USB ports for charging USB devices. The panels can be used to recharge the SP-6000's battery or a phone or tablet directly. Using the battery, I charged my iPhone from 36 to 100 percent in about two hours. To learn more, go to www.securproducts.com. MSRP is $125

– Michael Facius

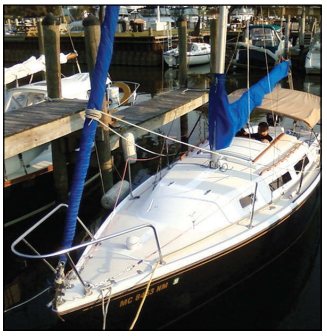
To be featured on this page, items must be new products. If you would like your product featured here, please send an email to Michael Facius, michael@goodoldboat.com, or call him at 612-605-8319. By the way, readers, if you contact a marine supplier mentioned here or elsewhere in our magazine, please remember to tell them that *Good Old Boat* sent you.

Boats for Sale

Westerly Pageant 23
1971. Beautiful one-of-a-kind Mk II. Featured in May, 2016, *Good Old Boat*. *Ladyship* is a well-appointed and spacious trailer-sailer with custom bowsprit, aluminum stern arch, reshaped keels, an innovative OB motor well, custom trailer, and air conditioning. Located in Paris Landing, TN. $49,950
Robert Wright
888-270-8823, 206-356-8698
Rob@WrightYachtSales.com
http://bit.ly/29bEKnZ

Sea Sprite 23
1980. Fine example of this classic full-keel daysailer or weekender. Fiberglass hull in exc cond. New sails, rigging, motor, and cushions in last 5 years. Teak recently stripped and varnished with care. Lazy-jacks and RF for easy handling. Old Lyme, CT. $8,500.
Thomas Gworek
860-529-7104
tjgworek@snet.net

Pearson Vanguard 32.5
1964 sloop. Always in fresh water. Restored '02 to '07; better than new. 20-hp diesel, 3-blade feathering prop, new cherry/mahogany interior, Sunbrella cushions. New plumbing and electrical. Awlcraft and Awlgrip. Race/cruise equipped. Profurl, standing rigging replaced. Cradle, custom winter cover. Lake St. Clair, MI. $29,000 OBO.
Peter Polasek
313-886-3781, 313-550-1259
dppolasek@aol.com



Catalina 25, Interlake 18
1985 Catalina 25, $6,500; 1957 Interlake 18, $950. Or trade for something interesting. (Trailer? Property? Another boat?). Both boats are fiberglass w/swing keels. Freshwater boats. Good trailers, good tires. V-10 tow truck available. Southwest MI.
Michael Murphy
269-624-6583
modalservi@aol.com

Cape Dory 25
1974. Good cond. 15-hp Evinrude. Porta potty, pump-overboard head, no holding tank. 24-gal FW tank, sink, hand pump. Anchor, chain, rode in fair cond. Main, jib, large jib in fair cond. ICOM GPS. Original winches and winch covers. Bow pulpit, stern rail. On cradle attached to hay wagon; not street legal. All offers considered. Must sell. Bridgeton, NJ. $3,500.
Kenneth Panichello
856-451-5323
krsmp001@verizon.net

Southern Cross 35
1983-1988 Airex-cored. New '04 40-hp Yanmar, 5/16" wire, Sta-Lok terminals, Merriman ½" turnbuckles (like new), bronze Bomar ports and Barient ST winches, Force 10 propane stove. Strong, great sailing, bluewater boat, daysailed on fresh water all its life. Lovely wooden interior needs a little finishing. North sails: main, staysail, and Yankee, all original, in OK cond. 135 genoa (like new). Running rigging, original, in OK cond. Marlboro, NY. $48,000
John Milici
845-255-8123, 845-417-6044
clairemilici@yahoo.com

Morgan 34
1972 yawl. RF jib. Perkins 28-hp diesel. Recent bottom paint, hull paint, brightwork. Raymarine wheel pilot. Garmin 546s chart plotter/sounder. Minifridge and ice chest. Full keel 3'3" draft, 7'9" w/CB down. Sails well with board up. All sails in good cond. Lancaster, VA. $19,000.
Winthrop Schwab
703-635-4100
winschwab@gmail.com

Bolger 35
1984. 35' x 8.5' x 2.5'/6' Bolger-designed, Story-built *Palo de Agua*. See *30 Odd Boats by Bolger*. Carvel laid, centerboard, gaff-rigged sloop/catboat. Modified by Bolger & Story for full headroom, functional galley. No rot. Needs paint, varnish and caulk. 35-hp Yanmar, Luke variable-pitch prop, Edson helm. Many custom features. Lying Toronto, Canada. $40,000USD.
Robert Rosan
716-849-0092
errosan2745@gmail.com

S2/Becker 30
1977 center cockpit. Originally an S2/8.0C. Boat was completely rebuilt by Becker Enterprises of St. Helens, OR, in '04-'08 w/ new Beta diesel, lengthened hull providing queen-size berth aft, stern boarding access, new propane system, new RF genoa, etc. A fantastic pocket cruiser with all the equipment a sailor could ever want. Portland, OR. $39,900.
Marge Welling, Broker
503-289-6306
marge@passion-yachts.com
www.yachtworld.com/core/listing/pl_boat_detail.jsp?&units=Feet&id=2874482
passion-yachts

Pearson 24
1970 classic. Solid full-keel sloop. Sad owner reluctantly retiring from sailing. However, *Picnic* is ready for new adventures with a younger crew. Good canvas, RF jib, all lines led to cockpit and easily singlehanded. 9.9-hp electric-tilt OB new '11. 4 berths, radio, Porta Potti, stove, boat cradle. Long-term resident of Madeline Island Marina, Lake Superior. $2,500.
Keith Donaldson
763-458-3236
kitdon2@gmail.com

Boats for Sale, cont

Tartan T34C
1978. Hull #498. Sensibly equipped for comfortable cruising. Fast and seakindly. Westerbeke, WS, inner forestay. Beautiful original cond. Always well cared for. Bristol. On Loadmaster trailer. The world's oceans are within your reach; brilliant concept. Bozeman, MT. Boat: $35,000. Trailer: $8,500. Both: $39,900.

George Renner
406-599-9607
sherilyn.renner@gmail.com
http://tartan34classic.org

Bill Boyd Catboat 23
1979. 23' x 10' x 27" draft (5' CB down), 6,000 lb. Wm. Garden design. Pretty, roomy, heavily built, stable, environmentally friendly with lots of character. Will go about anywhere. Folding mast, new sailcover, good sail. New cushions, Porta Potty, new canvas cockpit cover. Triple-axle King trailer. Electric Yacht IB. She's a joy to sail! Williamson, IA. $8,000.

Ford Brockman
fsbrockman@hotmail.com

Pearson Vanguard 32.5
1964. Championship boat. Exc racer/cruiser. Very good cond. 3' bowsprit. Racing main and genoa, cruising main and genoa. Many extras. 3GM30F Yanmar engine w/500 hrs, feathering prop. Hempstead Harbor, Long Island, NY. $25,000.

Robert Tatem
516-984-5654

Passport 47
1984. *Chessie* is a big, strong, capable offshore vessel. Repowered recently, less than 250 hours. Generator, air, solar panels, wind generator, refrigeration and good ground tackle. With some updating she will be ready to sail anywhere. Her rig is ICW friendly at 63.5'. Her owners lived aboard for 9 years and moved ashore several years ago. She's almost ready for her next adventure. Hampton, VA. $119,000.

Ron Mclean
757-480-1073
bayhbr@aol.com

Menger Cat Boat 19
1995. Nice, lightly used by a string of senior mariners. Includes Yanmar, depth, 2 mainsails, cockpit cushions, stove, Porta Potti, etc. Lots of stuff included. In the water and ready to go. Original EZ Loader trailer in decent shape (not registered) is free if desired. New River, Jacksonville, NC. $14,400.

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

Sand Hen/Bahama Sandpiper 24
1986 cat ketch. Chuck Paine design. Draft 2'/4', disp. 5,000 lb. Sail Area/Disp. 20. Freestanding masts on tabernacles. Old sails, but serviceable. New sailcovers. Lines from mainmast led aft. Honda 4-stroke w/alternator, low hours. Two 50 AH AGMs. Simrad AP. Solar panels. Sleeps 4. Galley w/sink, counter, storage. 100 liter flexible freshwater tank. Porta Potti. Danforth anchor w/200' rode, 25' chain. 2-axle galvanized trailer. Castine, ME. $10,000.

Silas Yates
207-326-0663
greendolphinsby@roadrunner.com

Caliber 28
1986 sloop. 4'6" draft, 18-hp Yanmar diesel. FB main, jib w/ small tears along sun protector, spinnaker in good cond w/separate halyard. Autohelm, binnacle-mounted compass, D/S, full head. Stored at Hurl's Marina, Cataba Island, OH. As is. Price reduced. $8,000.

Edward Charnock
419-797-4214
echarn@msn.com

Grampian 30
1971. Standing headroom, sleeps 5. Fully enclosed head, lots of storage. Cockpit big enough to take naps in! BBQ included. Boom tent, and 80W solar panel. Ready to launch, in sailaway cond. Toronto, ON. $11,500CAD.

John Ross
647-290-5018
jhr@fenks.org

Sea Sprite 33
1984. This is not your father's Sea Sprite. *Panache* has been featured in 2 episodes on PBS. Relaunched in '07 after $200,000+ keel-up restoration with more upgrades every year since. New Awlgrip Timeless Green hull paint in '15. Brightwork refreshed every year, fresh bottom paint '16. Butterfly hatches added '14. This full-keel vessel backs like a dream with its powerful bow thruster. Manitowoc/Kenosha, WI. Minimum bid $125,000.

Richard Charette
847-867-8296
richchar96@gmail.com
www.panachesailboat.com

Columbia 10.7
1979, *Dahlfin II*. One owner. 35' Lake Superior sloop w/considerable Bahamas and Caribbean cruising. Exc cond w/extensive upgrades for long-term cruising: extra tanks (fuel & water), solar panels, great galley, fridge/freezer, forced-air heating, davits, inner forestay w/furler, double headstay w/2 furlers, and much more. Ready to cruise immediately almost anywhere: coastal waters and beyond. Bayfield, WI.

Ron & Bonnie Dahl
dahlfin2@gmail.com
www.superiorboatsales.com

Pearson Vanguard 32
1964. Hull #66. Same owner 32 years. New Profurl, rigging, spreaders. Beta Marine engine w/86 hours. Cushions inside

and out. Secondary forestay, 2 awnings, cap rail covers, ST winches. Tiller autohelm, Aries steering vane, solar panel. 4 sails, roller boom, reef points, lazy-jacks. New stovetop, good fridge. Avon tender, anchors, etc. Many extra parts. Dodger frame, Awlgrip paint. Fort Lauderdale, FL. $17,000.

Pierre Soucy
954-515-8240
Solutions5@hotmail.com

Hunter 27
2009 Edge. Spacious cabin, 5'11" headroom, stove, Jabsco head, holding tank, macerator, 30A shorepower connection. Water heater, bimini, bilge alarm, Dutchman mainsail system. 75-hp Evinrude Etec 4-stroke OB, very low hours. 19 mph capable. 12-gal. tank. Stored on Road King Trailer, towing weight 4,900 lb. Stamford, CT. $35,900.

Harry Christensen
203-329-9128
farmor2004_1@hotmail.com

Montgomery 23
Rare, one of 19 made. A Lyle Hess lapstrake beauty. Complete sailaway/traileraway package. Factory Trailrite 2-axle trailer w/ new brakes. 1995 Mariner 8-hp 2-stroke 25" long-shaft OB w/ electric start. New Mack sails in '14, Spindrifter, 150 jib. Navik windvane. Custom wood interior w/larger V-berth, 3 anchors, rigid boom vang, Harken traveler. New DSC VHF, Navman instruments. More pictures available upon request. Washburn, WI (by Apostle Islands). $19,000.

Michael Bowden
612-964-8372
Bownez@Sprynet.com

Willard 30
1995. Custom-built down-east type trawler. To step aboard is to return to an era when naval design featured rugged construction and traditional layout. Interior is light, airy and uncluttered. Salty looking with bronze opening ports and cowl vents and stabilizer poles w/ paravanes. Heavy displacement, 2,500 lb encapsulated lead ballast. Extra fiberglass in bilge provides great stability. Mechanicals all modern. Dinghy included. Long Island, NY. $79,000.

Andrew Galasso
631-722-3400
Andrew@lighthousemarina.com

Alberg 35
1965. Better than new cond! $52,000 in improvements. New: Awlgrip, 3YM30 Yanmar, standing rigging, spreaders, Isotherm reefer, Espar furnace, tan Sensuede interior, 5 batteries June '16, Lofrans windlass, 35lb CQR, 100A Balmar, Raymarine C120 plotter/pilot, ICOM. Edson wheel, Nova Lift, dodger, Barient 27s, Lewmar 40s. Asym., Furlex RF, 170 genoa, triple-stitched offshore main, varnished boom, tricolor masthead light and strobe, multiple Datamarine instruments, bottom paint May '16. Finest afloat. Seattle, WA. $39,000.

Jon Troxel
360-317-7003

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757-813-0160
jbrooks@howardhanna.com

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Photo and text (web only)	$20	$60
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Photo and text (magazine and web)	$55	$95

- Total word limit: 75 words.
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May/June	Mar 6
July/Aug	Apr. 28

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Let us know when your boat sells!

BY FIONA MCGLYNN

TRAVELS WITH A BROKEN BOAT

Repair-centered missions bear unexpected fruit

While cruising down the U.S. Pacific coast we have had hardware break, alternators seize, water pumps give out, and all manner of rattles and grumblings from our dear old lady, *MonArk*. Yet along with these challenges, we've found ourselves having some of the most rewarding travel experiences of our lives. I like to think it's because traveling with our 1979 Dufour 35 gives us a purpose.

While some travelers are gastronomists and others are anthropologists or history buffs, we are boat fixers. Instead of visiting Alcatraz, Hearst Castle, and Disneyland, we spent our time (and money) in hardware stores and the shops of welders and machinists. In our photos, instead of hugging Mickey, I'm cradling our alternator so we can remember how to rewire it. Yet our broken boat makes the best traveling companion because she constantly causes us to step out of our comfort zone, learn new things, meet new people, and take part in the communities we visit.

Consider our experience in Morro Bay, California. There we bought a 1964 Singer sewing machine and, upon getting it back to the boat, discovered it did not work. I couldn't make saloon cushions without a sewing machine, so we stuffed the 20-pound machine into a backpack and embarked on a two-hour bus trip inland to Paso Robles, where rumor had it there was a sewing machine expert who could help us.

The #9 bus took us to within walking distance of the repair shop, a lovely garage workspace in a quaint neighborhood. Paul deftly pulled our sewing machine apart and put it back together, oiled and running beautifully. He then gave us a ride back to the bus stop. During that short ride we learned that Paul is also an ordained Buddhist and has married more than 500 people.

On the way home, we stopped in San Luis Obispo to look for a roll of camp foam. Walking along the streets in the late afternoon sun, I noticed splashes of orange amidst the city greenery. "Oranges!" I exclaimed. "Oranges and lemons!"

This was a big deal. We don't see tropical fruit trees growing beside the road in Canada. When no one was looking, I plucked an orange. We kept walking, delightedly pilfering from the city's shrubbery.

When we came to a towering avocado tree on a busy downtown sidewalk, in front of a Lululemon store, we succumbed to a sort of horticultural hysteria and began hucking our possessions upward in a bid to knock down a few fruit. I wondered what the Lululemon customers must have thought of us, two Canadians with a sewing machine throwing a roll of camp foam at a defenseless avocado tree. Not our most enlightened moment.

After getting spattered with green mush from a couple of avocado bombs, we admitted defeat and caught the last bus home.

We reflected that we would not have had this day if I hadn't needed a sewing machine to replace our mildewed saloon cushions. It seems our boat is always nudging us past the shiny veneer of "Top 10" restaurants and "Must-see" museums and into the real heart of a place, a place where we are welcomed as participants in the hum of everyday activity, not just curious outsiders looking in. It's a liberating way to travel and we find ourselves growing more curious, playful, and uninhibited by the day, thanks to our good old (sometimes broken) boat.

Fiona McGlynn's bio is on page 19.


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