GOOD OLD BOAT™

The sailing magazine for the rest of us!

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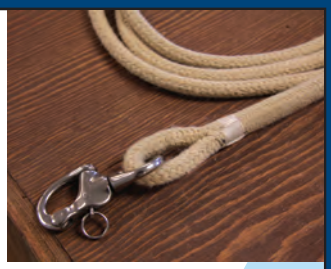

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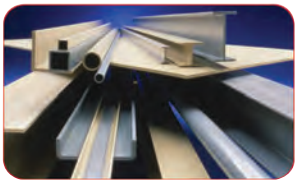

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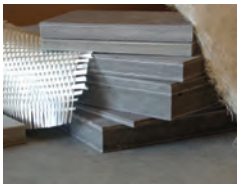

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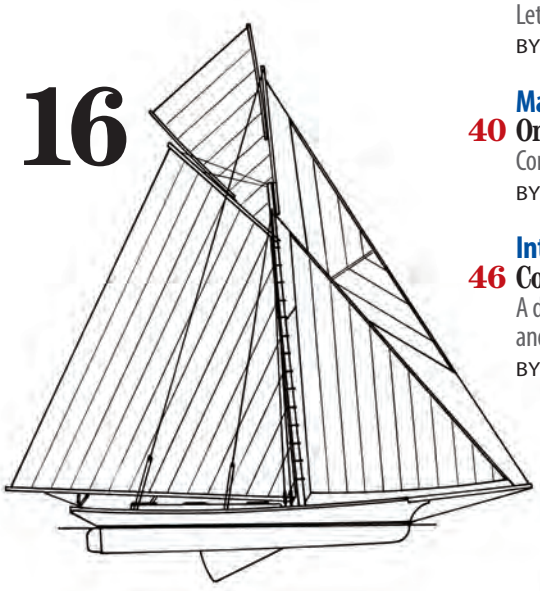

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On the cover . . .

Michael and Windy Robertson and their two daughters cruised *Del Viento*, their 1978 Fuji 40, on the west coast of North America from Mexico to Alaska. A highlight was Chatterbox Falls, at the top of British Columbia's Princess Louisa Inlet. They are now on their way back toward Mexico.

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Annual index of articles

Every December (except for the year we forgot and went with the February issue instead) our subscriber newsletter lists an index of all articles printed in the magazine that year. It's a handy tool if your library is too large for thumbing through. Our index of newsletters has a link to every newsletter (including those December index issues): **www.goodoldboat.com/newsletter/newsletter_index.php**.

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The downloadable collection of the boats we've reviewed in the 25- to 27-foot range was so popular we've come out with another. The new downloadable PDF gathers all the boats we've reviewed in the 28- to 30-foot range. We'll carry on with these collections of articles from our archives. We call them our Archive eXtractions. Look for them by that name on our downloads site: **www.audioseastories.com**.

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Boat Reviews
25–27 Footers

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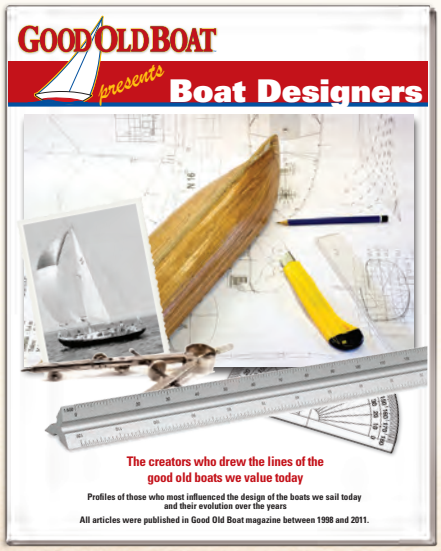

Boat Designers

The creators who drew the lines of the good old boats we value today

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The mystique of tall ships

Little *Mystic*'s crew is in awe of their grace

BY KAREN LARSON

With a sparred length of 122 feet and a mast height of 94 feet, the privateer ***Lynx***, a War of 1812 replica ship, makes Karen's blue 30-footer at left look small. For more, see privateerlynx.com.

That old saying about how "the sea is so great and my boat is so small" never seemed truer than this past summer when *Mystic*'s 30 feet on deck seemed puny indeed during the five days that nine tall ships visited Duluth, Minnesota.

What *is* it about these historic craft that attracts crowds of non-sailing spectators like filings to a magnet? We were told an additional quarter million people would visit the town of Duluth during the five days the tall ships were in port. What draws those who have no clue about today's sailboats or the traditional ones of long ago? Are they simply moving museums? Works of art? Objects transporting us to a long-ago era? Complicated and remarkable machines? The essence of romance? Do they signify the power of sail and encompass pure beauty? Yes! Yes! Yes!

Over the past few years I've been particularly smitten by these majestic time travelers. It began with a chance sail on the Royal Canadian Navy's training ship, the HMCS *Oriole*, and a tour complete with a prominent lump on the head aboard the two-masted brig *Niagara* (watch out for the low overhead!). There were the chance sightings three years ago in which we met first the barque *Europa* and then the ill-fated *Bounty* out there while cruising on Lake Superior.

PHOTOS BY MARY GREGG

The barquentine ***Peacemaker*** welcomes adoring visitors on land and in small ships. She has a sparred length of 140 feet and a rig height of 123 feet. Read about her at peacemakermarine.com.

The *Europa* was under full sail and made a particularly lasting impression.

Later that year, we were given the full captain's tour of the Texas tall ship, the barque *Elissa*. I even climbed halfway up her rigging, 55 to 60 feet above the deck, a memorable event if *ever* there was one. I've blogged with photos and linked about these earlier close encounters with ships of the tallest and most traditional kind: http://goodoldboat.wordpress.com/category/really-old-good-old-boats and www.goodoldboat.com/blogs/2010_adventure_blog.php.

It didn't hurt that Jerry and I have read our way through all the Patrick O'Brian books about the adventures of Jack Aubrey and Stephen Maturin, the Horatio Hornblower series by C. S. Forester, William Hammond's Cutler Family Chronicles, and currently Richard Woodman's Nathaniel Drinkwater series of books . . . all about the age of fighting sail.

In Duluth, they came. They saw. They conquered. The crowds were smitten. Those of us who were able to avoid the long lines waiting to board the boats for just a short tour — preferring to enjoy the spectacle from the decks of our own craft — returned to the dock positively joyous about our private encounters, no matter what they had been. The crew of each boat had a different story to tell. These ships had come to the top of the Great Lakes chain, to the farthest end of Lake Superior . . . right into the heart of this country and right into the hearts of those who welcomed them.

We, the admiring masses, showed them a good time, I hope, because I'm looking forward to the day when they will return and make me realize once more how truly insignificant a 30-foot fiberglass sailboat only 38 years of age can be.

Empire State Building, cover on

At the top of the Empire State Building

Writing the 101 article about coax cable (page 14) brought back a memory worth sharing.

In 1950, I was involved in installing ABC-TV's transmitter and antenna on top of the Empire State Building. The ABC and NBC transmitters were located on the 85th floor (the floor just below the large open observatory) and the antenna would be about 300 feet away near the top of the 200-foot antenna tower that was to be constructed on top of the building's dome to accommodate antennas for the TV stations and several FM radio stations. The dome of the Empire State Building is a small enclosed observatory and is designated as the 103rd floor.

We needed a low-loss coax to join the transmitter to the antenna. The coax ended up as a 6-inch diameter copper pipe — the outer conductor — and a 1-inch copper pipe — the inner conductor, or core. The core was held in the center of the 6-inch pipe with nylon wafers about 6 feet apart and the pipe was pressurized with dry nitrogen gas.

In a memorable experience, I visited the site where the antenna tower would be installed with the construction engineer. We took the elevator to the 86th floor (the observatory) and transferred to another elevator that took us up to the 103rd floor. We then went through a locked door into a small room where a vertical ladder led to a trapdoor in the top of the dome. When I came out of the trapdoor, I was standing on top of the dome of the Empire State Building. I immediately held on to the mast, which was next to the trapdoor. The top of the dome had a flat section about 10 feet across with a small metal railing around the perimeter. While I was clutching the mast, the construction engineer casually walked over to the railing and sat on it, rocking back and forth as he looked up while explaining the planned construction job. In retrospect, I think he was playing mind games with me.

After many visits to the top of the dome, it didn't bother me anymore, but I don't think I could do it today without a bit of trepidation.

–Don Launer, Forked River, N.J

Sockdolager on video

Jim and I are pleased to be back home in our Pacific Northwest cruising grounds and we have some news: Off Center Harbor, a Maine-based film documentary group, made a video about *Sockdolager*, our Dana 24, called "Outfitting a Small Cruiser for Voyaging." Part 1 is available for your viewing pleasure on our very own Off Center Harbor web page at www.offcenterharbor.com/sockdolager. It has been paired with a 2010 article by Karen Larson about me and my former Dana 24, *Minstrel*.

Off Center Harbor is a subscription site, but this video and 10 others, as well as the Good Old Boat guest blog post, are free. So far, we've been unable to plumb all of Off Center Harbor's fathomless depths because they have so many cool videos to choose from. I found myself sitting back and saying "Ahhh!" a lot. In addition to films about voyage preparation, their topics cover seamanship, boatbuilding, tools of the trade, tours of historic boats, and instructional videos for kids. The site also has links to many blogs. Sailing is a small world, so I'm delighted to be seeing a lot of people I either know or have heard of.

Enjoy the video, including parts 2 and 3.

–Karen Sullivan, Port Townsend, Wash.

Good Old Boat shirt

As a subscriber to your great magazine, I thought you all might enjoy this picture. Yesterday, I took out my good old boat, *Northwind II*, a 1984 Endeavour 38 aft cockpit, for a spin and I wore my Good Old Boat shirt. When I got home and looked at the pics, I thought this was a fun picture to share.

I sail on Lake Ontario. However, next year (hopefully), my father, Ron Turk, who is 73, and I are planning on sailing her to Barbados starting in April. I also have another good old boat, *Northwind*, a 1979 Endeavour 32 that I am restoring and keep on Lake Ontario.

Keep up the great work on the magazine. I always look forward to the next issue.

–Bob Turk, Batavia, N.Y.

FenderStep

The November 2013 issue includes the article "Single-step boarding ladder" by Mike Holtzinger that details a clever PVC-pipe step to assist boarding. I admire creativity, of course, but there exists a fantastic product that solves the problem oh so well. Just Google "fenderstep." As my wife and I have grown older this has become a must-have piece of gear. We love it so much we have a spare on hand in case the FenderStep disappears from the marketplace.

–Art Hall, Belfast, Maine

the rocks, and fully-corked

Boat fetishers anonymous?

As I found myself once again selecting a boat from the classifieds page, I wondered if others are afflicted by this crazy habit. This month I thought I would choose the Southern Cross 28, but then again the Allied Seawind, a classic good old boat if ever there was one, looks pretty good too. I go through this process every month, from way over here in Australia no less. While feeling slightly ridiculous and not a little self-conscious, I am betting I'm not alone. Will anyone else admit to having an irrational next-boat fetish?

By the way, I loved the off-season usage of your cover boat, but worry about the choice of anchorage. She looks mighty close to those rocks.

–Petrea McCarthy, Yungaburra, Queensland, Australia

Rocky anchorage

I am a very satisfied subscriber, but buoy, oh buoy . . . Craig Anderson's Hunter 27 on the cover of the November 2013 issue looks just like a good old Columbia. We have a Montgomery 17 good old boat on Clitherall Lake in beautiful Otter Tail County.

–Mike Allmann, Battle Lake, Minn.

Craig responds

Slack'r is beginning her winter-season boat maintenance and projects at the studio (where she serves as a Friday-night beer-and-Buffett cure for sailing-season withdrawal). My list of projects is a full two pages long.

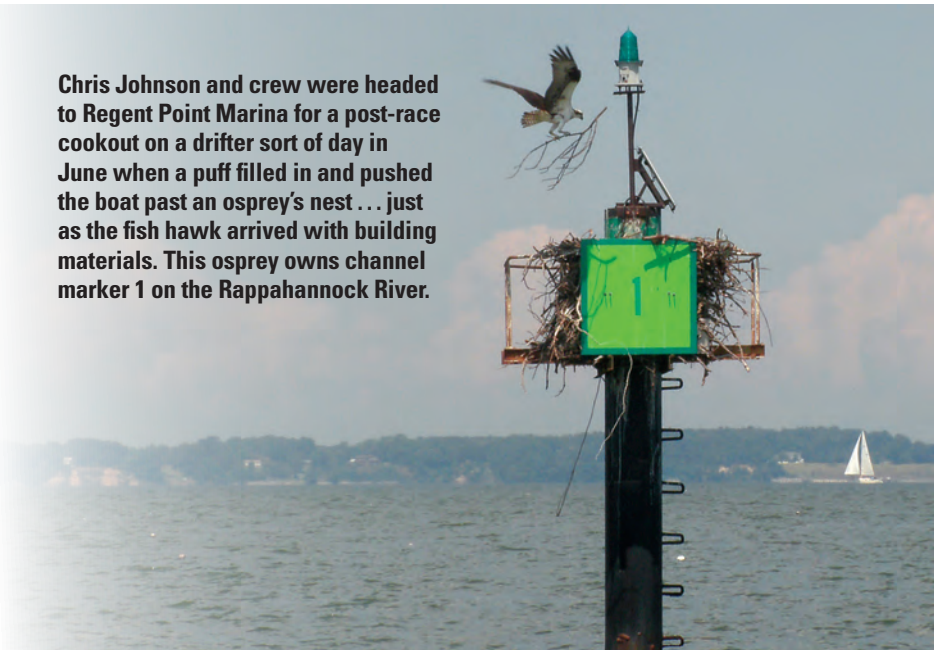
Petrea, as to *Slack'r* being anchored too close to the rocks, it probably is an optical illusion caused by telephoto-lens compression. Add to that, the anchor holding there is great. Linda and I have spent many nights there listening to the sound of waves on the rocks and owls in the trees. Yes, Mike, she is a 1983 Cherubini Hunter 27.

–Craig Anderson, W. Des Moines, Iowa

Fully-corked

Chuck Jones' "Half-Corked" piece in the November 2013 Mail Buoy has inspired me to share a similar, if larger, project with the *Good Old Boat* readership. This effort was first publicized at the April 2013 Nor'Sea 27 sail-in held in Oakland, California. I have long been interested in sailing safety and particularly in crew-overboard equipment and spent many hours researching ways to improve on the present state of the Personal Flotation Device. Although I've given a lot of attention to buoyancy, I have also thought of the appearance of PFDs. The Vendee Globe singlehanders don't much bother about matters sartorial,

continued on page 64



Chris Johnson and crew were headed to Regent Point Marina for a post-race cookout on a drifter sort of day in June when a puff filled in and pushed the boat past an osprey's nest . . . just as the fish hawk arrived with building materials. This osprey owns channel marker 1 on the Rappahannock River.

Freedom 38

A well-built sloop with an unstayed mast

BY GREGG NESTOR

Frustrated with the sailboat offerings of the time, Garry Hoyt decided to do something about it. The former advertising executive and champion one-design sailor took his ideas to yacht designer Halsey Herreshoff and boatbuilder Everett Pearson of Tillotson-Pearson Industries (TPI). The outcome of this collaboration, the Freedom 40, was introduced in 1977.

The first Freedom 40 was an engineless cat ketch with unstayed carbon-fiber masts and wishbone booms, a flush deck, and a shoal-draft keel with a weighted centerboard. Two words describe the boat: fast and maneuverable. Its success led to the founding of Freedom Yachts and the introduction of several other ketches and a pair of sloops ranging from 25 to 44 feet. (See "The Man Behind the Boat," May 2002.)

In 1986, Garry sold the business to TPI, which hired naval architect Gary Mull to design a range of new models. The first of these, the Freedom 36, was introduced that same year and heralded things to come. While the hallmark unstayed carbon-fiber mast was mounted well forward, the 36 was not just a big catboat with a vestigial jib but, technically, a fractionally rigged sloop. The boat was clearly a winner; and was soon followed by a half dozen other Freedom models.

In the early 1990s, TPI sold Freedom Yachts to a group of investors that included Paul Petronello, who was a TPI employee and Freedom's sales manager. After the sale, the new company took the molds and set up shop in Middletown, Rhode Island. It was right around this time that a sugar scoop stern was added to the Freedom 36 to create the Freedom 38.

Her Diamond

A while back, I met Bob and Sheila Allenick at the town docks in Vermilion, Ohio. Their 1991 Freedom 38 caught my eye, and so did its name. Bob told me that, early in their marriage, money was tight and their emphasis was on important things like careers, family, and a sailboat. There never seemed to

***Her Diamond*, at top, owned by Bob and Sheila Allenick, shows off the Freedom 38's unconventional rig with its large, full-battened mainsail and small self-tending jib set on a CamberSpar. The cockpit is spacious and comfortable, at left. With the companionway offset to port, at right, all the sail control lines lead to just two winches on the starboard cabintop, where they are neatly retained on the bulkhead.**

> "Overall, the quality of construction . . . is above average for a production boatbuilder."

be enough money for a proper engagement ring. When they purchased the Freedom 38, Bob, seeking to take care of this deficiency, named the boat *Her Diamond*!

A few years later, I ran into Bob and Sheila again and took the opportunity to go over *Her Diamond* for a review. (By the way, I'm happy to report that Sheila did eventually get her real diamond.)

Design

Compared to the earlier Freedoms, the Mull-designed Freedom 38 has a slightly boxier and more angular cabin trunk. Its beam is enormous, its waterline long, and its large mainsail is augmented with a small self-tending jib. The hull is sleek and powerful and has a flat bottom, a fin keel (a shoal keel and wing keel were offered as options), and a spade rudder.

The design focus of the Freedom 38 was on interior volume and easy sailing. To achieve this, the hull has a wide beam and it's carried well aft, which allows more space for the accommodations and cockpit. It also adds form stability. The rig is simple and powerful and can be handled easily by a singlehander or a short-handed crew.

Construction

The hull and deck are laminated fiberglass with an end-grain balsa core. The outer laminate is coated with a tough isophthalic neopentyl gelcoat. Below the waterline, a vinylester barrier resin beneath the gelcoat is intended to reduce the possibility of moisture penetration. All through-hull fittings are installed in solid laminate.

The standard fin keel is lead (alloyed with a small amount of antimony for hardness) and weighs 5,530 pounds. It's attached externally with Type 304 stainless-steel bolts. The wing keel is also attached externally and weighs 6,180 pounds, while the 6,500-pound shoal-keel ballast is internal and encapsulated in fiberglass. On all versions, the elliptical rudder and its stock is a one-piece fiberglass layup. As such, there is no way the stock can part from the blade.

The deck joins the hull on an inward-facing flange. The joint is chemically bonded and fastened with ¼-inch stainless-steel bolts on 6-inch centers through an aluminum toerail. The deck hardware is of good quality and conveniently placed.

With the exception of the head, which is a fiberglass module, the boat is "stick-built." No pans or liners are used. All interior surfaces are teak veneer over marine-grade plywood, trimmed in solid teak, and finished with hand-rubbed oil. The sole is teak and holly and the cabin overhead is foam-backed vinyl held in place with teak battens. When the vinyl overhead in *Her Diamond* began drooping, Bob replaced it with texture-finished polypropylene sheeting. This eliminated the drooping problem and also allows for easy access to deck hardware. Headroom is 6 feet 1 inch.

Overall, the quality of construction, including the interior finish and joiner work, is above average for a production boatbuilder.

The rig

The Freedom 38's fractional sloop rig, with its free-standing carbon-fiber mast, is designed for simplicity. The arrangement minimizes sail handling and trimming while providing impressive cruising performance. A CamberSpar tensions the clew of the 195-square-foot jib and also makes it self-tacking. The mainsail is fully battened and came with two reef points and lazy-jacks as standard equipment. The air draft is 55 feet 6 inches.

To improve sail handling, Bob installed Strong Track and a Mack Pack from Mack Sails. The mid-boom mainsheet attaches to a 6-foot Harken traveler that's just forward of the sea hood. All control lines, including the jibsheet, are led aft on the starboard side through clutches to a pair of Barient 27-48 self-tailing winches mounted on the aft end of the cabintop.

On deck

Spacious decks and very little deck clutter are a direct result of the Freedom 38's generous beam and the absence of standing rigging. Most noticeably, the sidedecks are 22 inches wide for much of their length.

On the bow, the stainless-steel pulpit has an integral mounting plate for the optional Hoyt spinnaker-pole "gun-mount." A pair of hefty 10-inch open-throat cleats, a single anchor roller and hawsepipe, and the tack fitting for the self-tacking jib's CamberSpar round out the foredeck hardware. There is no anchor locker.

Just forward of the cabin trunk is a large forward hatch situated over the V-berth. On the cabintop aft of the mast, a small hatch is above the head, a pair of Dorade vents with stainless-steel cowls plus a larger hatch are over the saloon, and a sea hood protects the companionway hatch.

Teak handrails, each over 4 feet long, are fitted on either side of the cabintop. With the mast set well forward, there's

Two 11-pound propane tanks are neatly stowed in a dedicated cockpit locker that drains overboard. The engine control panel is recessed into the seat front.

The interior of the Freedom 38 is nicely finished: bulkheads are teak-veneered plywood and most of the joinerwork is solid teak. The layout is straightforward with settees port and starboard and a bulkhead-mounted dining table in the saloon, at left. The galley, at right, is nice and snug for cooking under way and has a stainless-steel bar to keep the cook from falling onto the stove. At 38 feet, there is room for a proper navigation station, below, with a large desk surface for laying out charts and instruments and the electrical panel within easy reach.

enough room to store a dinghy and/or a life raft on the cabintop between the mast and the mainsheet traveler. Aluminum-framed portlights and deadlights of various sizes are fitted in the cabin trunk, five to a side.

The cockpit is large. The seats are 7 feet long and 20 inches wide and the coamings form 11-inch-high seat backs. An 8-inch-wide bridge deck protects the companionway and two 1½-inch drains are fitted aft. Forward, beneath the port cockpit seat, is a cavernous 4-foot-deep locker that provides a tremendous amount of stowage as well as access to the aft portion of the engine. It also houses the galley's trash receptacle, which is accessed via a pass-through flap in the aft bulkhead. Aft of the cockpit locker is the propane locker with space for two 11-pound tanks.

The engine's control panel is located in front of the propane locker in the footwell. An opening port in the footwell ventilates the quarter berth. Because the companionway is offset to port, there's space for an opening port in the forward bulkhead.

The steering system is by Edson, with a pedestal-mounted 32-inch destroyer wheel and a Radial Drive. Access to the sugar-scoop stern is via a centerline stainless-steel swim ladder that swings down from the two-part stainless-steel stern pulpit. Double lifelines connect both pulpits and a slotted aluminum toerail runs stem to stern. Two 8-inch open-throat stern cleats are fitted aft and a similar pair amidships is for use with spring lines.

Belowdecks

The layout belowdecks in the Freedom 38 is straightforward. A large V-berth dominates the forward cabin. The chain locker is at its foot. Port and starboard overhead bookshelves and a series of drawers and bins beneath the berth provide stowage. Due to its rather large diameter, the mast takes up a significant amount of the cabin's floor space. To port of the mast, a door opens to the head, and to starboard is a large bureau with three drawers and three lockers.

A folding door leads to the saloon via a lobby with a second door to the head and another bureau and a pair of lockers to starboard. The head is a roomy fiberglass module trimmed in teak that contains a VacuFlush toilet, a stainless-steel sink with hot and cold pressurized water, an en-suite shower, and plenty of stowage. The 12-gallon polyethylene holding tank is beneath the vanity.

Seating in the saloon consists of a straight settee to starboard and an L-shaped settee to port. Both are 6 feet 4 inches long with shelving and lockers above and a series of bins behind the seatbacks. A 60-gallon polyethylene water tank is situated under the starboard settee. The long portion of the L-shaped port settee expands into a double berth. Beneath the short leg of the L are the VacuFlush unit, water pump and accumulator, a cartridge filter, and a UV sanitizer. Even with all of this equipment, there's still plenty of stowage. A large fold-down,

Resources

Parts and support:
Warren River Boatworks, Inc.
www.warrenriverboatworks.com

Online forum:
Freedom Yachts sailboat forum
www.freedomyachts.org

drop-leaf table is mounted on the forward bulkhead.

Aft on the port side is the U-shaped galley. A double sink with pressurized hot and cold water is near the boat's centerline with a 6-gallon water heater beneath it. Outboard is a gimbaled 3-burner stove with oven/broiler and a spacious top-loading icebox, insulated with 4 inches of closed-cell foam, occupies the aft counter. Bob converted the icebox to a refrigerator/freezer by adding a 12-volt Sea Frost refrigeration system. Plenty of bins, drawers, and shelving are provided for provisions and galleyware. The chute to the waste receptacle in the cockpit locker is in the aft galley bulkhead.

Across from the galley on the starboard side is the navigation station. It faces outboard with the electrical/electronics panel above a large chart table with stowage beneath its lift-up surface. Below this, and easily accessible, are the boat's three batteries. While the navigation station is at a height to be used while standing, for comfort, there's also a swing-out stool. Just aft of the navigation station is a lined wet locker.

Adjacent to the wet locker is the door to the aft cabin, which contains a large double berth, a bureau and locker forward, and overhead cabinets aft. The 37-gallon aluminum fuel tank is under the berth. Aft cabins like this can feel dark and confining, but that's not the case on the Freedom 38 as two portlights in the cockpit and a third at the boat's sheer stripe provide light and cross ventilation.

Under way

The Freedom 38 is well mannered and an easy boat to sail. It is extremely stiff and sails quite flat. Its normal angle of heel is 10, maybe 15 degrees. Bob says he's never buried the rail — and he's tried. *Her Diamond*'s mainsail has three reef points and at 20 knots Bob takes in a tuck. Unfortunately, on the day of our test sail the winds were too light for us to experience any kind of performance sailing. The fractional jib establishes a nice slot that helps when sailing to weather but the boat does not like to be pinched. The Freedom 38 sails best off the wind.

The auxiliary is a 27-horsepower Yanmar 3GM 30F diesel nestled behind the companionway ladder. It turns a carbon-fiber shaft that, in turn, spins a 3-blade Max Prop. The engine will drive the boat along at 6 knots at 2,500 rpm and 7 knots at 3,000 rpm. Access to the engine is good from the front, rear, and port side but poor from the starboard side, where the dipstick is mounted.

The head compartment is fitted with a VacuFlush toilet that uses fresh water.

Freedom 38

Designer:	Gary Mull
LOA:	37 feet 11 inches
LWL:	30 feet 8 inches
Beam:	12 feet 6 inches
Draft (fin keel):	6 feet 0 inches
Displacement:	13,400 pounds
Ballast:	5,530 pounds
Sail area:	685 square feet
Sail area/disp. ratio:	19.4
Disp./LWL ratio:	207

Things to check out

Other than the typical age-related problems of gelcoat crazing and the possible delamination of the balsa core, there are no significant issues associated with the Freedom 38. Its carbon-fiber mast might show some signs of age and flex-related surface crazing that is mostly cosmetic in nature.

It's more of an annoyance than a problem, but the shallow bilge always contains an inch or so of water that has entered via the masthead. At least one good bilge pump is a necessity. Another inconvenience is the narrow opening that makes it difficult to climb into and out of the cockpit locker. The self-tacking jib with its CamberSpar takes up foredeck space and can get in the way of anyone working on the foredeck.

Conclusion

The Freedom 38 delivers uncomplicated sailing, impressive performance, and voluminous accommodations. It's also appealing to the eye. A boat in acceptable condition will fetch between $75,000 and $85,000. Even though Freedom Yachts is no longer in business, parts and support can be obtained from Warren River Boatworks in Rhode Island. The owner was the former production manager for Freedom Yachts.

Gregg Nestor is a contributing editor with Good Old Boat. *He has authored three books on sailing, including* Twenty Affordable Boats to Take You Anywhere *and* The Trailer Sailer Owner's Manual. *He's currently contemplating his fourth, maybe an e-book.*

Coaxial Cable 101

Wireless systems depend on this wire

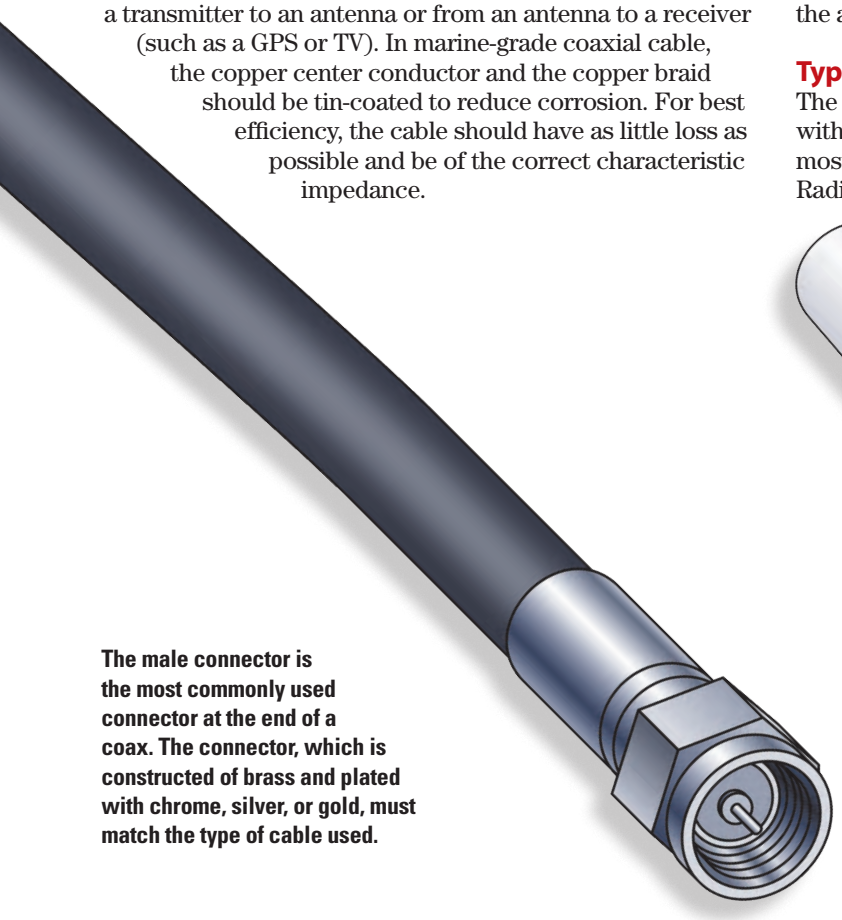
BY DON LAUNER

Coaxial cable, or coax, is used for transferring radio-frequency energy from one place to another. It was invented by English engineer Oliver Heaviside in 1870.

Flexible coaxial cable is constructed with a copper wire in the center of the cable surrounded by insulating material (the dielectric), which is usually polyethylene or Teflon. The dielectric is itself surrounded by a conductor in the form of tubular copper braid, sometimes metal foil, or a combination of the two that is normally at ground potential. The whole cable is encased in an outer protective covering, usually PVC, and should have UL-approval markings. This outside covering should be UV- and oxidation-resistant if the cable will be exposed to the sun. As its name implies, the inner conductor and the outer shield share the same axis.

The advantage of coax over other methods of transmission is that the electromagnetic field is confined within the cable and electromagnetic fields outside the cable are prevented from causing interference with the signal within the cable.

Aboard boats, coax conducts radio-frequency energy from a transmitter to an antenna or from an antenna to a receiver (such as a GPS or TV). In marine-grade coaxial cable, the copper center conductor and the copper braid should be tin-coated to reduce corrosion. For best efficiency, the cable should have as little loss as possible and be of the correct characteristic impedance.



The male connector is the most commonly used connector at the end of a coax. The connector, which is constructed of brass and plated with chrome, silver, or gold, must match the type of cable used.

Characteristic impedance

The characteristic impedance of a coaxial cable is expressed in ohms and determined by the physical construction of the cable: the diameter of the inner conductor, the diameter of the tubular outer conductor, and the type of dielectric (the insulating material between the two).

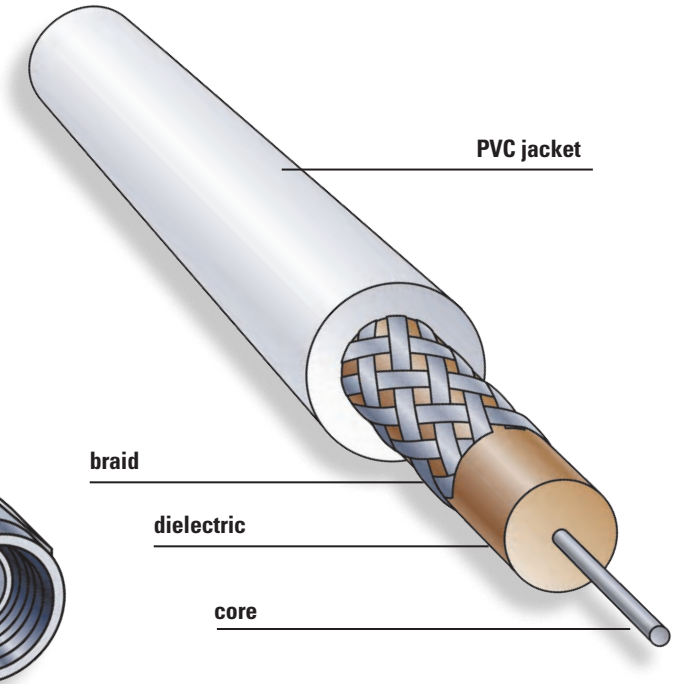
The impedance of the cable must match the impedance of the electronic components at each end of the cable. For nearly all VHF-FM marine-band transmitters and antennas, this impedance is 50 ohms and, consequently, 50-ohm cable must be used.

For coaxial cable that runs between a TV antenna and a TV set, the impedance is nearly always 75 ohms. But TV cable must never be used on a 50-ohm installation, such as the VHF-FM radio.

Coaxial cable in these impedances can be manufactured in many diameters. This can have a great effect on how much the signal is attenuated as it travels through the coax. The longer the coax, the more attenuation of the signal and, in general, the larger the diameter of the coaxial cable, the less the attenuation.

Types of cable

The 50-ohm cable is made in many diameters and qualities, with RG-58U, RG-8X, RG-8M, RG-8U, and RG-213 being the most common. (The "RG" stands for the rather archaic term Radio Guide, and the "U" is for Universal.) Of these, RG-213



LAYOUT AND ILLUSTRATIONS BY TED TOLLEFSON

has the largest diameter and the least loss. However, because of its size and its stiffness, it can be difficult to install, so the more flexible RG-8X or RG-58U are often used instead. Naturally, the larger the cable, the more costly it is. For TV, the 75-ohm cable used is usually RG-59U.

Cable connectors

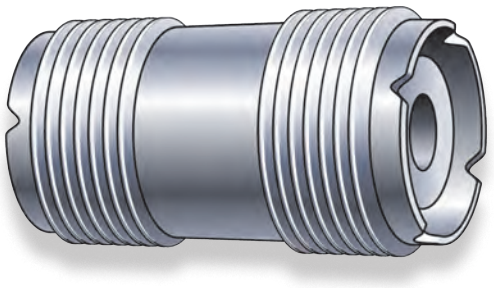
Connectors are used at the ends of the cable to connect it with electronic gear, such as a transmitter or antenna. These connectors must match the cable on which they are used. On a boat, the connectors should be marine-grade and be made of chrome, silver, or (preferably) gold-plated brass. They come in two types: crimp-on and soldered. Crimp-on connectors often require special tools. Soldered connectors require the braid and center conductor to be tinned (if they aren't already) and just enough heat applied to melt the solder but not enough to melt the dielectric. If your soldering skills are poor, get some help.

When installing a connector, make sure no stray strands of the braid touch the center conductor. This can cause serious and expensive damage to a transmitter. You can check for shorts in the cable by disconnecting both ends and using an ohmmeter across the center conductor and the shield. The ohmmeter should show a resistance close to infinity.

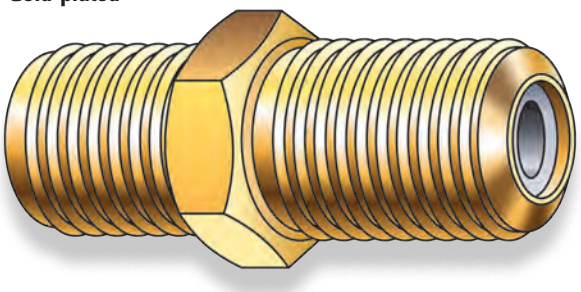
When connectors are exposed to the elements, water can wick into the cable, and capillary action will draw it into the braid. It's good practice for outside connectors to be coated with silicone grease and covered with heat-shrink tubing. At the very least, they should be tightly wrapped with multiple layers of waterproof tape. A better way of ensuring the connector is waterproof is to wrap it in Coax-Seal. This is a plastic putty-like material in a tape form with a white waxed paper to prevent it from sticking to itself. In use, as it is wrapped around the clean, dry connector, the waxed paper is removed and the putty can be molded tightly by hand.

Bad connectors are the leading cause of failures in a coax installation and should be the first place to check when there is a malfunction.

Chrome-plated

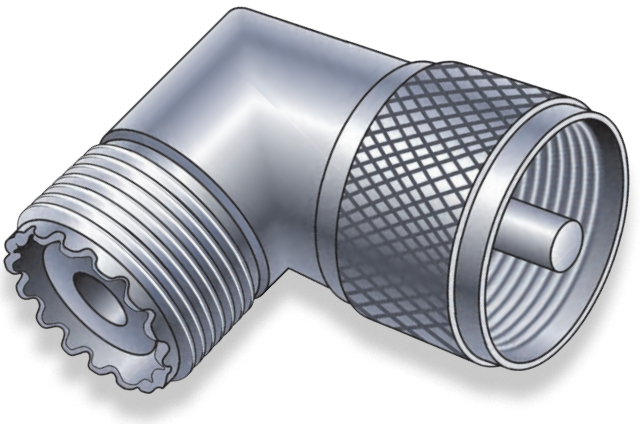


Gold-plated



The "barrel" connector is used to join together two cables with male plugs.

It may be used to join two different types of cables as long as those two cables have the same impedance rating.



A 90-degree elbow is often used to change the direction of a coax without bending it too tightly.

Don Launer, a Good Old Boat *contributing editor, built his two-masted schooner,* Delphinus, *from a bare hull. He has held a USCG captain's license for more than 40 years and has written five books. His 101 articles through November 2011 are available for downloading as a collection from the Good Old Boat download website, www.audioseastories.com. Look under Archive eXtractions.*

Don tells a tall-building tale about a high-altitude coax installation in Mail Buoy on page 8 –Eds.

Scientific yacht design

Designing by eye gives way to numbers

BY ROB MAZZA

Alexander Cuthbert built the very successful *Annie Cuthbert* from this half model in 1872.

ANNIE CUTHBERT, ROYAL CANADIAN YACHT CLUB COLLECTION. PHOTO COURTESY OF DAVID WEATHERSTON.

We have discussed at length in recent issues the design formulas used to compare boats of different designs and reach conclusions regarding their relative performance. Indeed, the average sailor might be as obsessed with numbers as the average baseball fan. However, this was not always the case.

Like architecture and engineering, yacht design evolved in the late 19th century from "rule of thumb" design to "scientific" design. Great strides were taking place in the 1880s in structural engineering, with the development of the steel-framed skyscraper and the suspension bridge, and in mechanical engineering, with the development of faster trains and locomotives and larger steamships and passenger liners. To ensure they would perform as expected, these structures, trains, and ships had to be "designed" before they were built.

The idea of designing a yacht before it was built was an equally innovative concept, especially in North America where the self-taught rule-of-thumb yacht designer held sway for many years. This changed in the America's Cup racing of 1881 when the first "scientifically designed" America's Cup defender, *Mischief*, beat the last "modeled" challenger, *Atalanta*, and the scientifically trained yacht designer gained supremacy. Before that, the profession of yacht designer did not even exist.

A model method

Prior to 1881, the great majority of yachts in North America weren't "designed" as we now use the term. There were no lines drawings showing plan, elevation, and sections with waterlines and buttocks. There was no calculation of displacement or centers of effort and buoyancy, let alone block or prismatic coefficients. Yachts at that time were "modeled," usually by the builder. The hull shape was literally carved out of a block of wood formed by several "lifts" or layers screwed together. The carving was done to scale, of course, ⅜, ½, ¾, or 1 inch to the foot, depending on the size of the finished boat.

Since one side of the yacht is the mirror image of the other, a half model was used, although there was no consensus as to which side, port or starboard, should be modeled. Once the desired shape was achieved to the modeler's satisfaction, the lifts were disassembled and the waterlines traced off. Beam measurements at each waterline were taken at several sections and transferred full-size to the lofting floor. Full-sized frames were cut and erected and planking followed. Before cutting the frames, the builders set up the stem, backbone, and sternpost. Because the model was used primarily to cut the frames and backbone, this "builder's model" was almost always undersized by the thickness of the planking and often did not include appendages, such as a keel or rudder.

> "There was no guarantee that the hull as built was an accurate representation of the initial model."

As the frames were being set up and planked, it was not uncommon for changes to be made, especially in the ends, to create easier runs or to facilitate planking. By launch time, there was no guarantee that the hull as built was an accurate representation of the initial model. For that reason, no one really knows what the true hull shape of the original *America* was, since the models of her that exist are not the same. Another complication with using models is that it was difficult to make quantitative assessments of subtle changes to subsequent designs, since everything was intuitive and done by eye.

After the boat was finished and launched, inside ballast was added as needed to get her down to her waterline and achieve proper trim. The spars and rig were installed and, after she was sailed, alterations were made in mast position or sail configuration to achieve proper balance. Once the builder had modeled and launched several boats, he would have a pretty good rule-of-thumb knowledge of what worked best. As long as he didn't depart too far from his base design, each boat was slightly less of a guess than his previous one.

Skeptics of this process would do well to remember that some of the finest yachts in the history of sailing were modeled, not designed, including the schooner *America*. The finest yacht "designers" in North America prior to 1881 were of this school, including George Steers, who modeled *America*, and David Kirby, who modeled the 1876 America's Cup defender, *Madeleine*. Other leaders in the field were the great sandbagger modelers and builders Bob Fish and Pat McGiehan and the Canadian modeler Alexander Cuthbert.

These early yacht designers were actually builders. They used the model to sell the concept of the design to the potential customer but they made their money in the building and sale of the boat, not usually the design.

Science enters the field

Across the pond in Scotland, things were proceeding in a slightly different direction. There, future yacht designers of the 19th century — like George Lennox Watson and William Fife III — were receiving design training in shipyards building iron and steel high-speed passenger steamers and warships. These vessels were designed before they were built as they had to meet performance expectations in speed, stability, and cargo and passenger-carrying capability. In their spare time, these men applied their design knowledge to yachts. It was not long before the theories and methods of scientific yacht design were published in book form, first by Philip R. Marett and then, more notably, by Dixon Kemp, another Englishman.

Also in Great Britain, slightly prior to this time period, the Royal Institution of Naval Architects was formed. One of the founding members was young Scottish engineer and naval architect John Scott Russell, one of whose earliest papers was on the wave-line theory of hull shapes (see sidebar on page 19). At this time, sail propulsion in passenger vessels was rapidly giving way to steam and, due to the limited horsepower of the early marine steam engines, it was imperative to have a hull form with minimum resistance. The American clipper ship builder and designer John W. Griffiths developed a similar theory and may well have been influenced by Russell's work.

It is quite possible that the work of Russell and Griffiths influenced George Steers when he designed *America*. It's interesting to note that when *America* voyaged to England to generate prize money for John Cox Stevens and his New York Yacht Club (NYYC) syndicate, the only one-on-one match race they could arrange was against Scottish railroad engineer Robert Stephenson and his slightly smaller yacht, *Titania*, designed by . . . John Scott Russell. *Titania* was designed to the wave-line theory but was artificially narrowed to be better optimized to the British tonnage rules then in effect that severely penalized beam. So, in Russell's eyes, *America* better embodied his wave-line theory than his own *Titania* design, especially considering that *America* handily beat the smaller challenger.

Americans adopt science

As a boy, A. Cary "Archie" Smith saw *America* being built in 1851. He later apprenticed with Bob Fish building sandbaggers, where he received excellent training in conventional modeling and boatbuilding. He then embarked on what he considered to be a more stable and potentially lucrative career as a marine artist, specializing in "portraits" of the yachts of wealthy NYYC members. Two of his paintings still grace the library of the New York Yacht Club on 44th Street in Manhattan. He also kept his hand in as the club's measurer.

In those days, the NYYC calculated ratings and handicaps with the Cubic Content Rule that required measuring the hull and calculating its volume, or cubic content. This rule only exacerbated the tendency to build low-freeboard, shoal-draft, lightweight centerboard sloops and schooners.

About this time, Bob Center, a good friend of Smith's and an amateur designer in his own right, returned after spending some time in England. He brought home copies of the

***Mischief*, the American defender in the 1881 America's Cup, was designed "scientifically."**

***Atalanta*, the Canadian challenger for the 1881 America's Cup, was built from a model.**

Resources

For more on this subject, read:

- ***Traditions and Memories of American Yachting*** by W. P. Stephens
- ***The Search for Speed Under Sail*** by Howard I. Chapelle
- ***Annals of the Royal Canadian Yacht Club*** by Charles Henry Jeremiah Snider
- ***Sailing Craft*** by Edwin J. Schoettle

British texts by Marett and Kemp on the methods of scientific yacht design: methods for developing the lines plan on paper and of calculating displacement and centers of buoyancy and effort before the boat was actually built. Together, using as an example *Mosquito*, a British cutter published in Marett's book, Smith and Center designed the cutter *Vindex*, a marked departure from the American "skimming dish" designs of the time. Then, in 1879, Smith designed the iron cutter *Mischief*, the "Iron Pot," for the Englishman Joseph Busk, who was living in New York and was a member of the NYYC. *Mischief* is believed to be only the second iron yacht ever built in the U.S. and, like *Vindex*, one of the earliest in the U.S. to be completely designed on paper before she was built.

North of the border

In 1870s Canada, as in the U.S., yachts were being modeled and built by local builders. The most successful of these builders was a Scottish immigrant named Alexander Cuthbert who had become a very proficient helmsman racing other people's boats on the Great Lakes for prize money. It wasn't long before he established his own yard in Cobourg on Lake Ontario and was modeling his own designs. He had early success in 1872 with *Annie Cuthbert*, named after his wife.

Annie Cuthbert was owned by a syndicate sailing out of Hamilton, Ontario. Cuthbert's work is often compared to that of McGiehan in New Jersey, since both were designing the "American model" of wide-beam shoal-draft centerboarders of the "flat iron" model. The top yacht on the Great Lakes at that time was the McGiehan-modeled *Cora* sailing out of the Detroit Yacht Club. So it was with a good deal of pride and one-upmanship that *Annie Cuthbert*, sailed by Cuthbert himself, handily beat *Cora* at the Put-in-Bay Fisher Cup Regatta on Lake Erie that year.

The success of *Annie Cuthbert* and other Cuthbert designs led directly to Cuthbert's *Countess of Dufferin* — at more than 100 feet in length the largest design he ever attempted and the largest yacht built on Lake Ontario at the time. Built initially to take part in the U.S. Centennial Regatta in Philadelphia in 1876, she became the third challenger for what was now becoming known as the America's Cup. However, like any number of subsequent challengers, the *Countess* was badly underfunded, poorly tuned, and totally unprepared. She was quickly defeated by the schooner *Madeleine*, a modeled hull by Long Island builder David Kirby.

America's Cup fever

Like a lot of yachtsmen after him, amateur and professional, Cuthbert was bitten with America's Cup fever and, after returning to the Great Lakes to lick his wounds, he challenged for a rematch in 1881. Thus we return to

Sandbaggers — sailing for high stakes

***Bull* and *Bear*, reproductions of a 19th century sandbagger, are in active use at the National Sailing Hall of Fame in Annapolis, Maryland.**

PHOTOS COURTESY OF THE NATIONAL SAILING HALL OF FAME AND KATE GAHS

Nowhere in the late 19th century was there more aggressive racing than in the very competitive and lucrative sandbagger racing out of Pamrapo (Bayonne), New Jersey, and Gowanus, New York, in the Upper Bay of New York Harbor. From the 1860s to the 1890s, this is where many of the more successful early modelers and builders made their reputations, often after first establishing their competence on the racecourse.

Sandbaggers were wide-beam, lightweight, sloop-rigged centerboarders from 20 to 30 feet in length. In addition to their large crews of 10 to 16 men, who were often oystermen in the winter and professional sailors on racing yachts in the summer, they gained extra stability by piling 50-pound bags of sand on their weather decks. This was high-stakes professional sailing with thousands of dollars in bets riding on the outcome of a single race. Disputes were more often than not settled with fists in the local saloon rather than in a protest hearing at the yacht club. A wealthy New Yorker would own a sandbagger the same way he might own a racehorse and for the same reason: to win prize money. There was even a winter circuit for sandbaggers in New Orleans.

All the sandbaggers were built from models, and the winning modelers and builders, like Bob Fish and Pat McGiehan, were also sought after by members of the New York Yacht Club to design and build larger racing craft, or to modify existing underperforming yachts. The great schooner *Sappho* was "hipped" by Bob Fish, greatly improving her performance and Fish's reputation. Because these sandbagger modelers were only really familiar with the shoal-draft wide-beam centerboard model, that's what they generally scaled up to a larger size for these clients. No lines plans were drawn or calculations made before the boats were built, and subsequent disasters were inevitable. The most famous of these was the capsize of the 150-foot schooner, *Mohawk,* at her mooring off the New York Yacht Club's Staten Island clubhouse in 1876 with the loss of the lives of her owner and his wife and two guests.

Archie Smith and *Mischief*. Since, for the first time, the challenge was going to be in smaller (70-foot) sloops, rather than the larger schooners, there was a bit of a panic to find a defender, as the NYYC at the time was a little short of sloops. David Kirby, whose *Madeleine* had so successfully defended the Cup during the previous Cuthbert challenge, was asked to model and build a new defender for a NYYC syndicate. This he did, and the new boat, *Pocahontas*, would be the first boat built specifically to defend the Cup.

Built, as was her predecessor, from a carved model, *Pocahontas* was definitely "old school." There was a selection series and, to everyone's surprise, *Mischief*, the little Iron Pot, emerged as the best defender. However, the Cuthbert-modeled *Atalanta* was well behind schedule and not yet finished and even more badly prepared than his *Countess of Dufferin*. The racing was anticlimactic, with *Mischief* easily beating the ill-prepared and badly sailed *Atalanta*. However, what seemed to outrage the American defenders as much as the Canadians' lack of preparedness was the fact they were challenging not with British cutters but with what the defenders considered to be Canadian-built typical American sloops.

Thus the 1881 America's Cup was the first to be sailed by a scientifically designed defender and the last to be challenged by a modeled challenger. The new methods were replacing the old. Cuthbert continued to model and build yachts the old way until his death in 1890, and Archie Smith had already hung out his shingle as the first independent yacht designer in North America, the first of a new breed using the methods of scientific design. Smith went on to establish an enviable design career specializing in large schooner yachts. He also designed some very successful high-speed Long Island Sound passenger ferries that operated very economically into the 20th century.

In 1881, after *Mischief* beat *Atalanta*, yacht design became less intuitive and more analytical, and that trend has continued. However, in this age of computer-aided design and 3-D modeling, the model has taken center stage again, even if it is only virtual, and the programs generate far more numbers than the early scientific designers could ever contemplate.

Now when we talk about designing by the numbers and start comparing different design coefficients, remember that it was not always so. This sport we all enjoy has an intriguing history full of unique individuals with fascinating stories, each of whom has contributed something worthwhile to this sport. In that respect, I can't think of another sport quite like it.

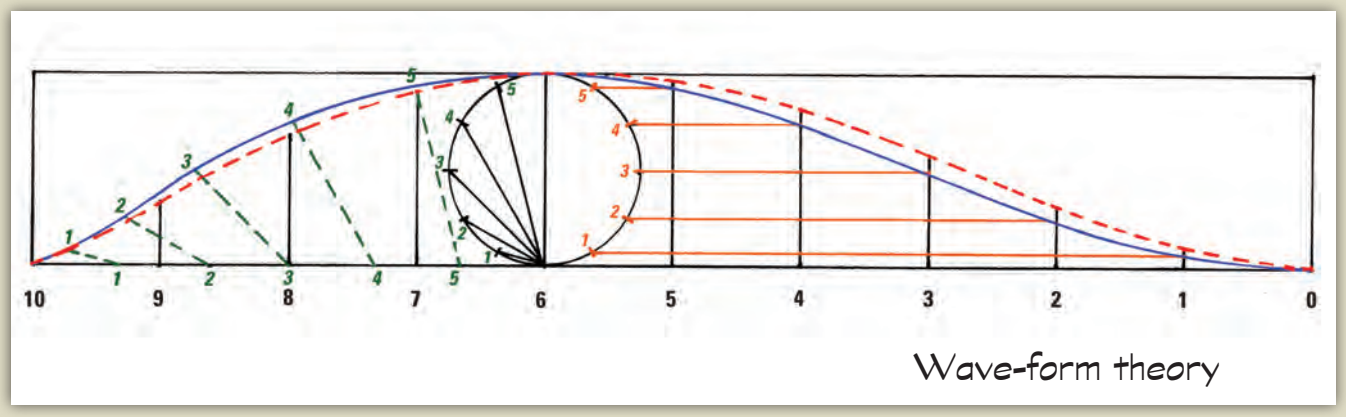
Rob Mazza, a Good Old Boat contributing editor, spent much of his professional life designing good sailboats that are mostly now old. He is an avid student of yachting history.

The wave-form theory of hull shapes

John Scott Russell devised what he considered the ideal shape of a waterline for minimum resistance by scribing a circle on the waterplane at the location of maximum beam (a position he had determined to be slightly aft of amidships) and plotting a sinusoidal curve for the forward waterline and a trochoidal curve for the waterplane aft of maximum beam (solid blue line on the diagram).

American amateur designer and yacht club measurer John Hyslop and noted Scottish/Norwegian yacht and pilot-boat designer Colin Archer corresponded about further developing Russell's wave-line theory. Both believed Russell was basically correct but had not taken the theory to its logical conclusion, which is that, rather than the shape of individual waterlines, the important consideration is the distribution of *displacement* over the length of the hull. They felt that, if the longitudinal curve of sectional areas met the requirements of the wave-line curve and was hollow forward, the individual waterlines themselves need not be hollow forward.

Their work revolutionized yacht design. For the first time, designers were not only designing for a specific displacement in advance but were also designing hull forms that would match a predetermined fore-and-aft distribution of displacement. The wave-form theory would persist for many years. Even racing dinghies were designed to it.



Although the wave-form theory had by then passed out of use, the curve of cross-sectional areas of a typical 1970s C&C hull (dashed red line) appears generally similar to the curve of areas constructed according to the wave-form theory (blue line) that John Hyslop and Colin Archer derived from John Scott Russell's wave-line theory for waterline shapes. The C&C hull is fuller forward than the wave-form hull and finer aft.

HULL ENVY

PART TWO

Rolling Awlgrip topcoat

BY ANNE MCMILLEN-JACKSON

In part one, in our November 2013 issue, Anne and Chris explained the research that went into selecting Awlgrip for painting the topsides of their Bruce Roberts 45, Mr. Mac, *and the prep work involved. They also walked us through the sanding, taping, and applying the primer and guide coat. At last, it's time to paint!*

Painting the hull takes some advance preparation, and we also had to keep a sharp eye on the weather forecast and conditions in the boatyard. It wouldn't do to start painting if it looked like rain or if the fellow next to us was sanding his bottom paint (see the sidebar on page 24).

Though this next tip sounds odd, it worked well. One of the how-to documents on the CD of tips, techniques, and advice we'd been given recommended mixing the Awlgrip and refrigerating it overnight before painting, stating that it will stay good for up to four days if kept cold. This might serve to maximize the induction period, during which the base and converter chemically cross-link (the recommended induction period is 15 minutes at ambient temperature). Following this advice, the evening before we intended to paint, Chris (wearing his respirator) mixed paint in a quantity sufficient to apply a complete single coat to the topsides.

The recommended proportions were 2 parts paint, 1 part converter, and 1 part reducer. For our 45-foot boat, we mixed 12 fluid ounces of Awlgrip Topcoat (G8009 Off-white Revisited), 6 fluid ounces of Awlcat #3 Brush Converter (H3002) and 6 fluid ounces of Awlgrip Slow Brush Reducer (T0031) at a time. We used a 32-ounce mixing cup with fluid-ounce graduations on the side. Chris stirred the mixture for two minutes then poured it into a scrupulously clean and sturdy 40-ounce peanut butter jar with a tight-fitting lid. Since our water-cooled refrigerator was out of commission while our boat was out of the water, we put the jar on ice in a cooler.

Early the next morning, Chris cleaned the hull with acetone using the dust/wash/wipe-with-black-T-shirt procedure (see part one of this article in November, 2013). We laid out everything we thought we might need on a towel (the same list of supplies as for the primer) and removed the paint from the cooler. We stirred it thoroughly, adding reducer as necessary.

For the first coat, Chris applied the Awlgrip with a roller, then tipped with a brush. (At this point, we did not quite believe the how-to documents on the CD that said tipping was unnecessary.) He used a good-quality badger-hair brush to paint the hard-to-roll spots. I performed all the "as-needed" procedures: handing him the brush to paint

***Mr. Mac*'s topsides show their gleam six months after painting, at left. Before painting, after washing the hull with acetone, Chris wiped it down with a black T-shirt to ensure that no dust particles remained, below.**

or tip, cleaning the brush afterward, refilling the paint in the tray, adding reducer to the paint, helping him move the scaffolding, and maintaining quality control (no missed spots). Chris worked in 3-foot sections, maintaining a wet edge as he progressed. It took us less than two hours to apply a coat of paint to the entire topsides. By beginning and ending at the bow, we avoided an obvious line break.

Paint and painting tips

We developed some specific painting techniques based on recommendations from the how-to documents and on our own observations as painting progressed.

Use plenty of reducer in the paint – The paint should have a very thin consistency, similar to that of milk. After removing the paint from the cooler, we added sufficient reducer to obtain the desired consistency (about a 20 percent reduction) and mixed it in well using a stirring stick. However, the volatile reducer evaporates quickly, thickening the paint. To adjust for this, we poured only a small amount of paint, about half a cup, into the roller pan at a time, stirring well before pouring, and periodically added more reducer to the paint in the roller pan. I added roughly one to two tablespoons of reducer every five minutes and stirred until it was completely incorporated. These measurements are estimates and vary depending on temperature and breeze intensity. During our first coats, we developed an eye for the desired consistency and how much reducer to add to maintain it.

Apply a very thin layer of paint with each coat – Chris would barely wet one side of the roller with paint, then roll it vigorously on the textured

Chris applied the Awlgrip topcoat in 3-foot sections, overlapping with the wet edge of the previous section, at left. Note the difference in texture between the current section, with lots of air bubbles, and the previous section, which has already smoothed out. Once the paint was applied to a section, Chris used full top-to-bottom strokes to spread it evenly and minimize the air bubbles, at right.

portion of the pan to distribute the paint throughout the roller. The correct amount quickly becomes apparent as the paint is applied to the hull, because excess paint will run and has to be spread over too large an area. Applying more paint per coat in an effort to minimize the number of coats will actually add to the work, as the surface will need sanding between each coat to remove runs and sags. This is definitely a case of "less is more."

Roll the paint thoroughly – For each 3-foot section, Chris applied the paint initially using vertical and horizontal strokes to distribute it evenly. As we had masked it off completely, he went right up to the rubrail with strokes in this area. Once the horizontal strokes were done, he used only long vertical strokes from the top of the section to the bottom and from bottom to top without lifting the roller from the painted surface. He continued rolling, overlapping each stroke, across the entire section and back again, multiple times.

At first, the paint was covered with bubbles. The number of bubbles decreased as he rolled but never disappeared entirely. The first day, we used a brush to tip them out, but that was labor-intensive and left some brush marks that had to be sanded the next day. Chris soon developed a better method. He rolled over the section many times, gradually decreasing the pressure applied, aiming for a consistently smooth, even application of paint with no runs or sags. He found that initial rolling of the paint produced a loud Velcro-like squelching sound but the sound faded as he continued rolling. He stopped rolling when the sound muted (though it didn't go away entirely), even though there were still some bubbles. Over the next few minutes, as he was painting the next 3-foot section, the bubbles in the previous section popped and the paint leveled into a smooth, shiny coat. If the bubbles don't go away or don't level to a flawless surface, the paint needs more reducer. With sufficient reducer in the paint and lots of rolling, tipping with a brush will not be necessary.

Keep a wet edge and overlap painted sections – This is vital to achieving a smooth and even surface. Painting over an edge that has dried or become tacky results in a matte finish that will require sanding and re-coating.

Keep the paintbrush clean – For narrow and hard-to-reach spots, Chris used a badger-hair brush instead of the roller. A little paint on just the tips of the bristles was enough to cover these small areas. Immediately after he painted an area, I would clean the brush in acetone, flick the solvent from the brush, and set it aside to dry until needed again. I did not let the paint dry on the brush.

Practice quality control – The paint takes a lot of rolling to achieve an even surface with no drips or sags. We watched keenly for defects before moving on to the next section and dealt with them immediately. Going back to previous sections to fix a sag or missed spot, even if the paint still looks shiny and wet, just makes the problem worse.

Mix only enough paint for that day's work – That said, it is better to have more than needed than not enough, since a new batch will require a 15-minute induction period during which the wet edge will be lost. The 24 ounces we initially made were more than enough to cover the hull, since only a thin coat is applied and reducer is added as necessary to maintain consistency.

When finished painting for the day, we threw out whatever paint was left in the roller pan, then tightly capped the peanut butter jar and put the unused paint back on ice. That evening, we made new paint in a new mixing pot

> “To ensure maximal coverage, we applied five coats: one per day for four days, then two days to do the final coat.”

and put it in a new jar. The next day, we poured some of the old paint into the roller pan with some of the new paint and mixed them well, until the old paint was used up. The results were the same as if we had used all new paint.

Don't try to cover defects with topcoat paint – Each coat is so thin it's translucent. Large or dark defects must be primed before the topcoat is applied, especially when the topcoat is light in color.

Between coats

The Awlgrip application guide recommends a minimum of 16 hours between coats and sanding between coats for a smoother finish. If more than 24 hours have elapsed between coats, then the surface *must* be sanded before recoating. We tried several methods of recoating: full sanding, spot sanding, and no sanding.

Full sanding – After applying the first coat on one morning, the next morning we sanded the entire hull using 320-grit sanding pads on the random orbital sander, cleaned the hull with acetone, then applied the second coat. Our friends who had painted their 52-foot sailboat said they always did a full sanding between coats, painting one side of the hull in the morning and prepping the other side in the afternoon.

Spot sanding – The morning after painting, we spot-sanded only the few areas with a drip, sag, or dried-in bug, then cleaned the hull with acetone and painted the next coat.

No sanding – We cleaned the hull with acetone and applied another coat within 24 hours of applying the previous coat.

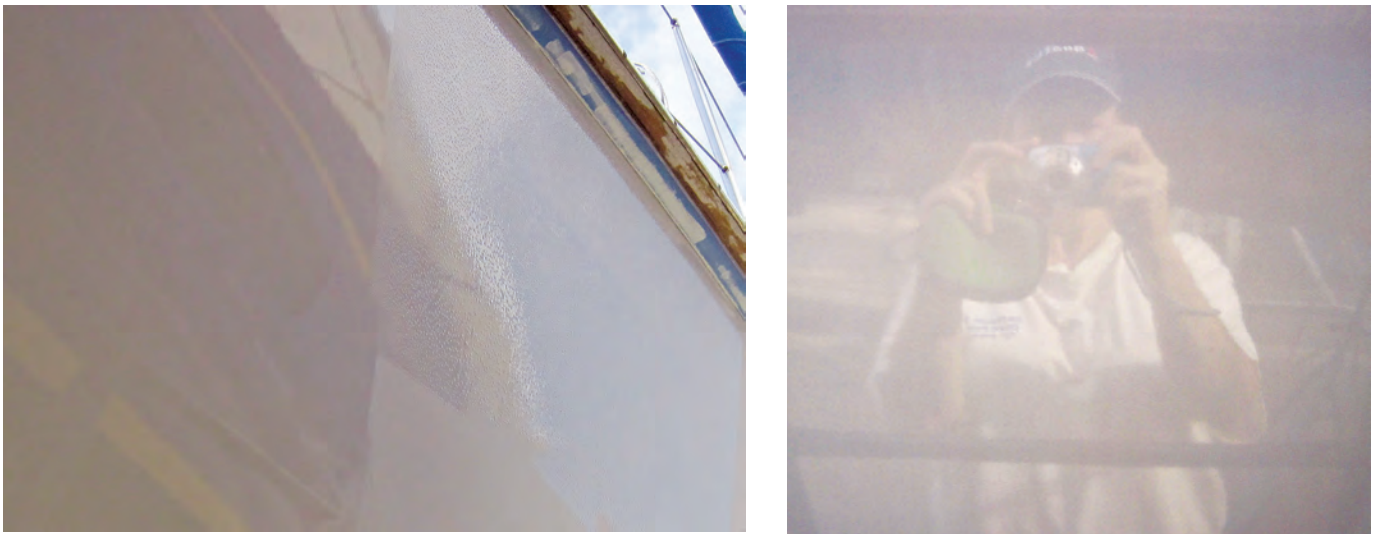
We found no distinct differences in the overall finish using any of these methods. However, it was much easier to keep track of where we had already painted when we were painting over a dull sanded surface versus a shiny unsanded surface.

Number of coats

According to the Awlgrip application guide, at least two coats of paint are required. Since only a very thin layer of paint is applied with each coat, color accumulation is gradual. Don't despair! The results are worth the effort. It took us less than two hours to apply each coat on a 45-foot hull. To ensure maximal coverage, we applied five coats: one per day for four days, then two days to do the final coat. The morning after applying the fourth coat, we did a full sanding and hosed off the hull. Early the following morning, while we were fresh — and before workers started bustling around the boatyard, kicking up dust — Chris cleaned the hull with acetone and we applied the final coat. Voilà! We were done.

Curing period

The Awlgrip application guide provides detailed descriptions of the curing of Awlgrip topcoats. Briefly, Awlgrip topcoat paint has three cure cycles. After the first cure cycle (12 to 24 hours), the finish appears dry



A close-up view of newly applied paint, at left, shows the most recently applied section (at the right of the picture) with air bubbles and the section painted right before that (at the left of the picture) in which the bubbles have already flattened out. The result: a mirror shine, at right.

Chris used a straight-edge razor blade to pry up a corner of the masking tape, at left, then carefully removed the tape. By investing their own time and labor, Chris and Anne gave *Mr. Mac* a gleaming hull, at right, for a fraction of the time and cost of a professional spray job.

and the painted surface can be exposed to weather or handled (to apply masking tape, for example). The coating becomes much harder during the second cure cycle (72 to 96 hours) with increased resistance to abrasion and chemicals. Full cure is complete only after 14 to 21 days. To maximize the curing time before we went back into the water, we painted our topsides before doing our antifouling and other projects. If we were going to splash soon after painting, it was recommended that we place large pieces of cardboard or wax paper between the hull and the travel-lift straps to avoid damaging the finish.

These cure times apply for a temperature of 77°F and relative humidity of 50 percent and may vary with temperature, humidity, and paint thickness. Since September in Trinidad is hot and wet, we were most concerned with temperature and water exposure. The mixed paint cures more quickly at higher temperatures, so we used the Slow Brush Reducer in the topcoat to maximize the usage time. It seemed to help that we kept the paint on ice overnight. Though we did not keep it on ice while we painted, it remained cool and we had no problem with premature curing. We also tried to paint early in the day, before the sun had heated the hull, but detected no differences between sunny and non-sunny conditions when we painted later in the day.

The Awlgrip application guide warns against moisture coming into contact with the topcoat paint before it has completed its first cure cycle. "Disastrous" is the word used . . . never a good thing with regard to boatwork. The guide suggests covering or shading the work area to prevent rain, dew, fog, or condensation from adversely affecting a newly painted surface. We worked without cover, selecting days with low probabilities of precipitation. On a couple of occasions, it did rain several hours after we had painted; however, we saw no obvious effects in the finish.

The bottom line

The boatyard had quoted $10,000 to $12,000 to Awlgrip *Mr. Mac*'s topsides

Tips for working in a boatyard

There is a big difference between painting a boat's bottom and its topsides with regard to the beauty of the finished product. A bit of dust on your bottom paint will not adversely affect its efficacy. However, the least amount of dust on newly painted topsides could mar the surface enough to require a whole new coat of paint. Here are some ways you can minimize exposure to dust while painting topsides.

Choose the right boatyard
Look for a yard with stone or gravel ground cover, rather than just dirt. It makes a world of difference in the amount of airborne dust.

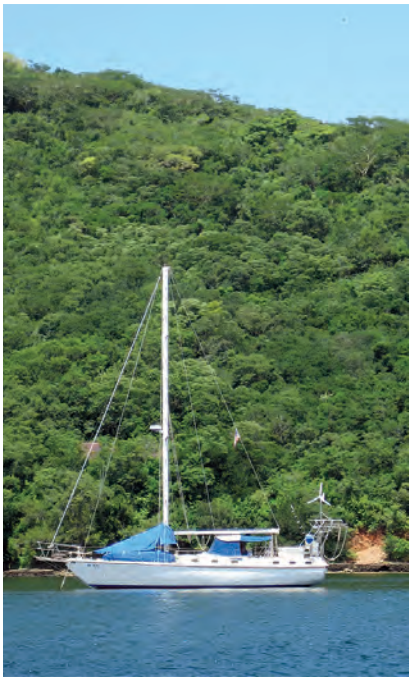
Talk to the management
Before your haulout, ask if the yard can place your boat away from active roads where vehicles will kick up dust, perhaps in an out-of-the-way spot where boats are stored rather than being actively worked on. Make sure there will be plenty of room for scaffolding around the boat. Also ask about boatyard maintenance schedules. As we were applying our final topcoat, a boatyard worker came by blowing dust from the road. In a panic, I rushed to tell him what we were doing and ask him to avoid our area, and he readily complied. I would have saved myself some stress by talking with the management first.

Talk to your neighbors
Make friends with your neighbors in the boatyard and with yard workers, maybe by bringing over a cold six-pack at the end of a long workday. Tell them when you'll be painting and ask if they can minimize dust during that time. Chances are they will comply, as they will be in the same position someday.

and estimated four to six weeks to do the job. Our material costs for this project totaled less than $2,000 and we ended up with an excess of topcoat. We bought a gallon of topcoat, a half gallon of converter, and one gallon of reducer and used only half of the topcoat and converter for five coats; this stuff goes a long way. And it took us just two weeks from start to finish. Some days were long, while on others we spent just a few hours cleaning and painting. For our efforts, we saved yard costs of $350 to $700 for the extra two to four weeks it would have taken to have it sprayed by the professionals.

Of course, the job took time and effort, but what boat project doesn't? The most physically demanding part was the initial preparation of the hull. Chris spent many hours sanding off the old paint and making sure the hull was smooth. The painting itself was exacting, but not difficult. We had developed our feel for the paint and established our painting habits by the time we finished the first full coat.

The real bottom line? An Awlgrip mirror shine is not beyond reach if you have basic boat maintenance and painting skills and an eye for detail. Then you can sit back and smile at the hull envy in the eyes of your fellow boaters as you float by.



***Mr. Mac,* anchored at Chacachacare, Trinidad, still shines a year after painting.**

Anne McMillen-Jackson is a marine biologist turned full-time cruiser. She and her husband, Chris Jackson, cast off the docklines in May 2009 and have cruised from Maine to Trinidad aboard their Bruce Roberts 45, Mr. Mac. *They support their seaborne habits by writing articles about boating and fantasy/science fiction novels for which they have won awards.*

Trailer-sailer choices

Middle Benjamins, North Channel, Lake Huron is popular with cruisers of all types.

Let how you cruise be how you choose

BY MIKE NELSON

Cruising in trailerable sailboats has its advantages. In the winter, you can get your boat from the frozen north to Florida at 60 mph in a couple of days. You can cruise on a great variety of inland or coastal waterways without making long voyages to get to them. You can store your boat in your backyard.

On the other hand, you are not likely to sail to Tahiti or to cross oceans in your trailerable cruiser. (Yes, it has been done, but it's not common.)

I consider a trailerable cruising sailboat to be one that can be legally towed on U.S. highways and in which you can cruise for several days or more. Most trailerable sailboat cruising is done on coastal or inland waters, so I'm not including boats more suited to extensive bluewater cruising.

If a trailerable sailboat is in your future, which one is right for you? Start by focusing on how you will use the boat. By that, I mean how you will use the boat *most often*. Don't get sidetracked by the idea that it *might* be nice to take cousin Herman, his wife, six kids, and two dogs on a cruise with you once every seven years. If you want to cruise occasionally with additional people, you can always charter a bigger boat for those times.

Some say you should choose a sailboat with your heart. Others say you should choose one with your brain. I think you should choose a sailboat not only because you fall in love with it, but also because it is the one that will best suit the *kind of cruising* you plan to do. When considering a trailerable sailboat, it helps to think about three different types of cruising:

- Marina hopping
- Short cruises of two to five days
- Cruises of a week or longer

***Legato,* a Com-Pac Horizon Cat owned by Rahn Lawton of Binghampton, New York, sails just south of Badgeley Island in the North Channel of Lake Huron.**

Marina-hopping cruises usually involve staying in a slip at a marina at the end of each cruising day. In most cases, food, fuel, heads, and supplies are readily available at the marina or nearby. Marina hopping can be done on coastal and inland waters. If the weather looks bad, it's easy to stay in port. This mode of cruising places the fewest demands on a boat and its features.

On short cruises of two to five days, it's nice to be able to stay out for the entire cruise without needing to use shore facilities. I'll consider that time period as the baseline for a short cruise. This mode of cruising places more demands on boat features than marina hopping, but not as much as you would need for more extended cruising.

For cruises of more than a week, the time between shore stops can be considerably longer, increasing the importance of several boat features.

If you are now saying to yourself, "But I want to take *all* those kinds of cruises," consider how *often* you will do each. Focus on the type of cruising you will do most frequently and decide if the

> “The number of people who need to sleep aboard is the main determinant of adequate boat size.”

tradeoffs for the other types of cruising are critical for you.

Marina hopping

Boats suitable for marina hopping do not need the storage space and tank capacity required by boats that will be taking longer cruises. You will still want a portable potty for use away from the marina but you can easily carry enough water, fuel, food, and ice for daily use.

You will want a small outboard engine for maneuvering in marinas and getting somewhere when the wind dies. You will want sails that can be reefed if the wind pipes up and you will want an anchor for lunch stops. A light-air sail is convenient, but not really necessary for marina hopping. You don't need a tender for marina hopping unless you plan to anchor off a beach along the way.

The number of people who need to sleep aboard is the main determinant of adequate boat size for this type of cruising. Two adults can easily marina hop in small boats such as the West Wight Potter (15 or 17 feet), Sage 17, or Com-Pac Horizon Cat (20 feet).

Two adults and two children can find sleeping space in slightly larger 21- to 22-foot boats that offer, in addition to a V-berth, two settees or a settee and a quarter berth for sleeping. Boats in this size range are or have been made by Precision, Catalina, O'Day, San Juan, Com-Pac, Venture, and others.

Four adults will find boats in this size range a bit snug, although the ability to get off the boat while at the marina may help. Boats in this size range are readily available on the used market for well under $20,000 and many can be found for less than $10,000, often including trailers.

Two-to five-day cruises

Cruising for two to five days puts more demand on storage space and tank capacity than marina-hopping does. A couple of 5-gallon water jugs will last two people for this time period. Most chest coolers can keep block ice for a few days or you can plan to travel without ice. If you are using a portable potty, its capacity may be the limiting factor in how long you can stay out. The largest portable potty on the market has a holding tank of only 5 gallons. Two adults could go three to four days with a tank that size.

Since you will be anchoring out overnight, you will want good ground tackle. You will want sails that can be reefed in heavier air. A light-air sail might be handy if you want to conserve fuel or if you just want to be able to sail rather than motor when winds go light.

A small tender is handy even on short cruises. It can be used for going ashore, rowing out a second anchor if needed, visiting other boats, and also for exercise. If the cruising sailboat is not beachable, a tender is just about a necessity.

Once again, the number of people who will sleep aboard is a determining factor in boat size for cruises of this duration. Most boats of 22 feet or smaller do not have an enclosed head compartment and the head is often located under the V-berth. Moving the portable potty into the cabin will make nighttime access easier. You have to decide whether modesty is an issue for you.

Also, boats under 22 feet in length can seem very small if you are confined below in bad weather. Two people would have room to stretch out in a boat of this size, but four adults would feel cramped. Boats under 20 feet do not usually have a lot of storage space, and can feel cramped by the time you add water jugs, ice chests, extra sails, food, clothing, and other gear.

Top Secret, **a Canadian Sailcraft 22, sailed by Dave and Gwen Debney, Dryden, Ontario, lies to her anchor in Boyle Cove off Frazer Bay in the North Channel, at left. Also in Boyle Cove is** ***Traveler,*** **a Rhodes 22 owned by John and Coleen Travis of Sheboygan, Wisconsin, at right.**

Taranui, **a Catalina 25 owned by John and Irene Clement of Aurora, Ontario, sails wing-and-wing bound for the Benjamin Islands.**

For use by two adults and one or two children, I'd recommend considering at least a 21- to 22-foot boat, such as those listed above.

For four adults or two adults and older children, the added volume of 22- to 24-foot boats will be welcome. Several boats are available in this size range, such as the Precision 23, Com-Pac 23, Rhodes 22, Canadian Sailcraft 22, Montgomery 23, or the San Juan 24. Many of these boats can be found on the used market for less than $20,000. Any of them can also be used for marina-hopping cruises.

Note that if you can arrange to stop at a marina every couple of days for pump-outs and provisioning, you can easily extend your cruise without needing a larger boat. For example, the Trailer/Sailors Association leads a two-week cruise to the North Channel of Lake Huron every summer. Members cruise in boats ranging in length from 17 to 30 feet. However, these are relatively protected waters and it is fairly easy to arrange marina visits every three or four days.

Cruises of a week or longer

When you plan to cruise for a week or longer with no shore stops, you need larger storage and greater tank capacity than you would for shorter cruises. You may need to carry extra jerrycans of fuel. You will want an engine with an alternator so you can charge batteries and a holding tank of at least 10 gallons capacity. Remember that overboard waste discharge is illegal in inland and coastal waters.

You will need to be able to carry adequate drinking water. It is almost impossible to get block ice to last a week, so you'll need to consider adding refrigeration or learn how to cruise without ice. You will need enough storage space for food, libations of choice, anchors, extra sails, charts, clothing, recreational materials, foul weather gear, and so forth.

You can use a sunshower for bathing in the cockpit. Two people can easily shower on a gallon of warm water if the water is used carefully and only while rinsing. A small tender (a dinghy or a kayak) is necessary for going ashore, rowing out a second anchor if needed, visiting other boats, exploring anchorages, and exercise.

Aside from storage needs, the number of people the boat must sleep continues to be the primary determinant of recommended boat size for extended cruising. Two adults can usually handle extended cruising in boats 23 feet or larger. For four adults, or two adults and children, a 25-foot boat will be considerably more comfortable.

Most boats in this size range can be fitted with auxiliary tanks for waste and for fresh water and often have enclosed head compartments and separation between the V-berth and the main cabin. Many have standing headroom. Popular choices include the Catalina 25, MacGregor 26, Seaward 25, Bayfield 25, Com-Pac 25, and the Cape Dory 25.

Gary and Karen Breault of Lick, Wisconsin, greeted the full moon aboard *Xanadu,* a Seaward 25, while at anchor near Heywood Island in Lake Huron's North Channel, at left. *Eventide,* seen here at anchor in the Benjamin Islands, at right, is the author's Pacific Seacraft Flicka. Mike and his wife, Diana, are from Yellow Springs, Ohio. They have been active members of the Trailer/Sailors Association for years.

John and Irene Clement brought their Catalina 25, *Tarauni* to the Trailer/Sailors cruise in the North Channel. She's anchored near Heywood Island.

If the capacity of your tow vehicle is limited, consider lighter, water-ballasted boats such as the MacGregor. These boats can be found on the used market for around $20,000 or less, depending on age and condition. Any of them can also be used for marina-hopping or on shorter cruises.

Some larger boats on the market can also be trailered with a sufficiently powerful tow vehicle. Among these are the O'Day 26 and 27, the 20-foot Pacific Seacraft Flicka, or the 24-foot Pacific Seacraft Dana. A few 30-foot boats are also legally trailerable, such as the C&C Mega 30 or the Alberg 30. The legal width limit for towing trailerable boats is 8½ feet. Set up and launching of larger boats is more challenging. A mast-raising system is necessary, and a trailer tongue extension is almost always needed.

Your choice

As you look at different boats, think about how you will be able to use them. Check the storage space. Visualize where you will put clothing, food, and other supplies. Gather all the people you plan to take with you below and try to imagine how comfortable you would be if stuck below for a day or more in bad weather. Visualize changing clothing or using the head and see if it meets your modesty needs.

See if the cockpit seating is comfortable enough for several hours of use. Decide whether there's enough room to prepare meals below. Walk around the deck and imagine deploying an anchor or changing sails. See if the seller will show you how to set the boat up for launching. Then step back and look at the boat and see if you like the way it looks. Look at the condition of the hull, the sails, and the engine. Check the trailer for rust and look at the tires. Consider having the boat surveyed, especially if you're going to spend a lot to buy it. Take the boat for a test sail if possible. Read reviews in *Good Old Boat* or on the Internet to see if there are any other pluses or minuses that might sway your decision.

Moral support

Trailer sailors are a friendly and helpful bunch. Many congregate and offer advice and answer questions on online forums. In addition, owner-run forums for many specific brands of boats are available. A number of membership-based sites with modest dues also exist, and most current builders of trailerable sailboats also maintain websites. Internet searches will yield many, many other resources.

Mike Nelson is a retired engineering psychologist. He and his wife, Diana, sail a Pacific Seacraft Flicka, a good old boat that, happily, meets all the requirements above for longer cruises. Mike is also the past president of the Trailer/Sailors Association.

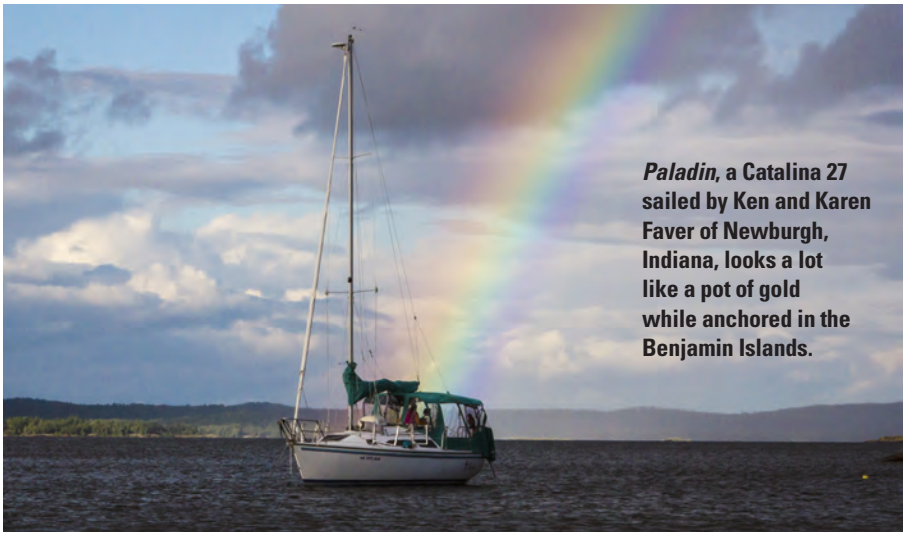
Resources

Online forum
The Trailer Sailor
www.trailersailor.com

Owner associations
www.goodoldboat.com/resources_for_sailors/owners_associations.php

Membership organizations
Trailer/Sailors Association
www.trailersailors.org

North East Trailer Sailors
www.ne-ts.com



***Paladin*, a Catalina 27 sailed by Ken and Karen Faver of Newburgh, Indiana, looks a lot like a pot of gold while anchored in the Benjamin Islands.**

Readers send "baby pictures"

1. Rob Legate races out of Ontario's Bay of Quinte Yacht Club, first in the Bluenose class and now with Shark 24s. Crew member Peggy prepares to pass through the foretriangle in a roll tack. Photo by Don Riddell.

2. Joe Grieser sent this photo of *Shiva*, the 1973 Albin Vega he and Kirsten sail in Southeast Alaska and shown here sailing in northern Chatham Straight. Photo by Robert Broussard.

3. Charles and Gina Strasburger sail *Boomerang!* (the March 2013 review boat), their 1980 Cal 39 Mk II on Chesapeake Bay.

4. Skip Reynolds says *Vagrant Gipsy*, built just five years ago, may not be old yet, but is a traditional boat. The 60-foot mahogany ketch, seen sailing in Elizabeth Harbour in the Exumas, is based on a Sparkman & Stephens design.

5. David Spencer says, "I love this photo of our CS27, *Good Idea*, ghosting along on Georgian Bay with our colorful drifter drawing nicely." The photo was taken by John and Moyra Barlett.

6. David Branby's *Splendido*, a 1993 Catalina 270, pleases the crew (Patty Bell, Debbie and Mike Bryant) on a Lake Tahoe outing.

7. You know it isn't a sailboat. We know it isn't a sailboat. But when Gregg Nestor sent this photo of a fruit boat, we figured it was worthy. He snapped this shot in Rodney Bay, St. Lucia, while sailing the Windward Islands. The fruit boat sells fruit, ice, beer, and crafts.

8. Robin Mayo sent a photo of his boat taken in 1984 while cruising in the Exumas. The skipper climbed into the dinghy to shoot this, he notes, while most of the family was sleeping. So we figure that left the kid in the cockpit in charge of fishing, navigation, and operating the boat . . .

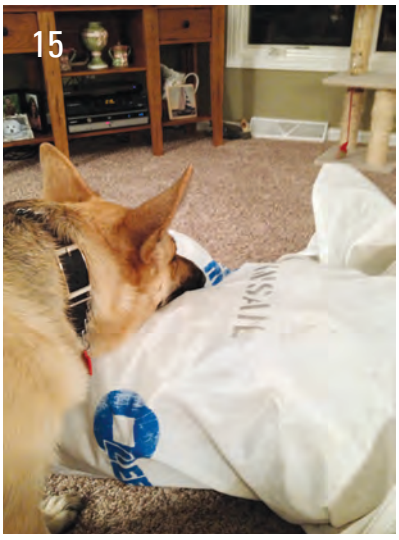
9. Lee Gardiner wrote: "I'm sending a photo of *Baja*, my dearly beloved Sea Sprite 30 that my wife and I enjoy sailing around Fishers Island Sound and points beyond. This was taken at Block Island's Great Salt Pond Harbor."

10. Tim Bunner races *Del Rose*, a 1969 Morgan 30-1, on Colorado's Lake Dillon.

11. Bert Vermeer's *Natasha*, a 1978 Islander Bahama, sails to windward in Malaspina Strait (an extension of Georgia Strait) near British Columbia's Pender Harbor. Photo by SeaSnaps.com.

12. Rod Witel sent this gorgeous shot of *Georgie's Girl*, a Mariner 36, owned by George Sparr and Rich Boehm and sailed on San Francisco Bay.

13. Dale Bagnell sent this photo of ecstatic new sailor Wendy Chen enjoying her time aboard. The crew of Dale's boat, *MoonShadow,* a 1983 Hudson Force 50, were watching the America's Cup race last summer near the Golden Gate Bridge.



14. James Hunta's 1979 Catalina 27 tall rig, *Sea 130*, sails on Green Bay in an 18-plus-knot wind.

15. Tom Cooper's best friend, Sophie, enjoys sailing. Good news! Sailbags mean she's headed for an adventure on the water.

Replacing lifelines

Hand-crimped terminals make for easy DIY

BY GARY PARDUN

Gary eliminated the gate and attached his new lifelines to the pushpit with pelican hooks. By releasing the lifelines, he can make a temporary gate anywhere he wants on that side of the boat.

Rust stains on the vinyl cover indicate a corroded lifeline cable inside — it's time to replace it. The old-style pelican hook was difficult to open and close because the tension was on the lever.

Rust-colored stains in the cracked vinyl-coated lifelines on *Galilean*, our 1984 Islander 30, signaled corrosion at work. Vinyl-coated lifelines are smooth to the touch and nice to lean against, but moisture becomes trapped between the cable and the vinyl and the cable corrodes underneath and out of sight. By the time the brown stains appear, the cable is already compromised.(See also, "Maintain Your Perimeter" by Don Casey, November 2009.) Given that our lifelines probably dated to 1984, it was clearly time to replace them.

Our boat was built with gates in the lifelines, but the Bimini frame that had been added later made it impossible to use them. The pelican hooks, being of the "classic" design, were difficult to open because the tension of the lifeline was on the moving lever rather than the fixed hook.

I had read about sailors who dispensed with the gate entirely. Some connect the pelican hook to the pushpit and run a continuous cable all the way to the pulpit. This way, releasing the pelican hook lets the lifeline droop the length of the boat and you can make a temporary gate wherever you want it. Reconnect the pelican hook from the comfort of the cockpit and you're back in business. This design also eliminates much of the (expensive) hardware for making a traditional lifeline gate as well as the labor of installing it. Dispensing with the gates was an easy decision. While I was at it, I decided to replace the old pelican hooks with the newer "over the center" design that takes the stress off the lever.

Lifeline anatomy

Lifelines have three basic components: the cable, the connectors at the ends, and the fittings. The connector is called a terminal because it terminates the cable and provides a way to attach it to the fittings.

A wooden block with a hole and a kerf makes an excellent jig for sawing stainless-steel cable with an ordinary hacksaw, and the red-handled crimping tool is essential for stainless-steel terminals, at left. The crimping tool must be held securely in a vise, at right, while the bolts are tightened little by little on alternate sides of the terminal. The signal to stop tightening is when the jaws of the tool touch on both sides. (Fittings, such as the pelican hook in the picture, do not need to be attached while crimping.)

Cable comes in a choice of diameters (⅛ inch and 3⁄16 inch are the most common for lifelines) and wire patterns, which include 1 x 19 (one group of 19 wires), 7 x 7 (seven groups of seven wires), and 7 x 19 (seven groups of 19 wires). I also had a choice of vinyl-coated or bare. The consensus for our 30-foot sloop was to use 3⁄16-inch 1 x 19 Type-316 stainless-steel uncoated cable.

The most common terminal is a stud, a threaded bolt with a hollow end just big enough for the cable. After the stud is attached to the cable it will still fit through the holes in the stanchions.

Fittings connect the stud to the boat. This is where both the variety and expense increase. Common types of fittings include turnbuckles, gate (or pelican) hooks, toggle jaws, gate eyes, and deck toggles. These fittings screw onto the stud and then fasten to a stanchion, pulpit, pushpit, or the deck. (These parts are illustrated in "Lifelines 101," May 2010).

Since a turnbuckle has screws on both ends that turn in opposite directions, I had to make sure that if the stud on a cable had a right-handed thread, the stud on the other side of the turnbuckle had a left-handed thread, and vice-versa.

Terminal attachments

Friction keeps the cable from sliding out of the terminal, and that friction can be achieved in three ways: machine swaging, mechanical terminals, and hand crimping.

In machine swaging, the cable is inserted into the terminal (stud) and a hydraulic press squeezes the living daylights out of the assembly, forming a nice tight bond between the terminal and the cable. The surface of the terminal is left smooth and shiny but smaller in diameter. This is not a do-it-yourself option. You have to buy the completed swaged lifelines from a rigging dealer. A well-known marine retailer quoted a price of $700 for the four lifelines (without gates).

Several manufacturers, such as Sta-Lock, offer mechanical fasteners you assemble using wrenches after you unravel the end of the cable and insert a metal cone (see "Where There is no Rigger," September 2011). You have to assemble these terminals after passing the cable through the stanchions. This is the most expensive option.

Hand crimping uses a special hand tool to pinch the terminal against the cable in a series of indentations about ⅛ inch apart. This is the least expensive option. Being a die-hard do-it-yourselfer, I chose hand crimping.

Measure once, but order extra

While the old lifelines were still in place on the boat, I measured each one from the tip of one terminal to the tip of the terminal on the other end by pinching a tape measure against the lifeline every foot or so as I shuffled my hands along the cable. Since I was just looking for an estimate of how much new cable I needed, I didn't bother to subtract the length of the threads of both terminals. I didn't see any point in trying to cut it too close just to save a buck.

Since studs are not reusable, I needed two for each of the four new lines. My new pelican hooks came with their own studs, so I ordered only four new studs along with the cable and crimping tool. The studs for hand crimping differ from those used for machine swaging; I had to be sure to order the right ones. When the parts arrived, I removed the old lifelines and labeled each one, e.g., "port upper," so I could match them to their new counterparts when measuring the new cable for length. This would be particularly helpful if I had different fittings for different lifelines, but in my case everything was symmetrical.

Tools and techniques

To hand crimp lifelines, I needed a few common tools and one I didn't have: a hand crimper for stainless steel. The manufacturer made it abundantly clear that crimpers for other materials, such as aluminum or copper, simply won't work. Stainless steel is very hard to crimp and requires a tool built specifically for that purpose.

C. S. Johnson makes a lever-type model and a bolt-type model. I chose the bolt-type hand crimper (part number 53-210) that runs about $50. I used a ½-inch socket wrench to tighten the bolts. The crimping tool has an opening for ⅛-inch terminals and one for 3⁄16-inch terminals. It comes with the bolts straddling the 3⁄16-inch side. To crimp ⅛-inch terminals, you will

Each terminal requires five crimps, above. The jig made sawing the cable easy, at right, and the result was a clean square cut.

need to move the outside bolt to the other side.

I could have bought a special tool for cutting the cable. Instead, I used an ordinary hacksaw. A bolt cutter will not work. (Don't ask me how I know.)

Sawing stainless-steel cable presents a couple of challenges. The first is that the sawed ends tend to fray just like a rope cut with a dull knife. The individual wires bend and don't spring back and the frayed ends that result don't fit well into tight-fitting terminals. The second problem is that the cable flexes back and forth as you try to saw it, making it difficult to cut it cleanly.

People typically suggest wrapping electrician's tape around the cable where it is to be cut. This will reduce, but not eliminate, fraying but does absolutely nothing to keep the cable from bending and rolling as it's being sawn. I couldn't figure out how to put the cable in a vice or clamp it down close enough to the cut on both sides to hold it firmly, so I made a simple jig that solved both problems.

I found a piece of wood about 2 x 2 x 6 inches and drilled a 7/32-inch hole all the way through one of the shorter dimensions about 1 inch from the end and centered. I wanted the hole slightly larger than the 3/16-inch cable so it would allow the cable to slide through easily but hold it tightly once it was inside. I stood the block in the vise with the hole parallel to a long wall so I'd have plenty of room to stretch out the cable. Using an ordinary hacksaw, I made a cut perpendicular to the hole and deep enough to pass through the hole.

The hole in the jig holds both sides of the cable firmly so they don't move or fray while the pre-cut slot, or kerf, guides the hacksaw as it does its work. The jig doubles as an extra pair of hands to tame the cable, which is inclined to coil up. (***Note:*** *While it is possible to cut stranded wire with a hacksaw, another way is to use a Dremel or other rotary tool with a cutoff wheel. Tape the wire and cut through the tape. The cut will be clean, with no burrs or distortion to the strands.* ***–Eds.***)

I used a handsaw and drill to make the sawing jig. A vise or clamp is essential for holding the crimping tool and the sawing jig.

Rather than cutting all the lengths of cable at once, I found it easier to work on each lifeline one at time. That way I didn't have unruly pieces of cable getting in my way while I was crimping on the terminals. As insurance against a measurement error, I started with one of the longer lifelines so, if I cut the cable too short, I could turn it into one of the shorter lifelines.

Crimp, measure, cut, crimp

My basic procedure was to crimp on a terminal, mark the new cable for length, saw it, and crimp on the other terminal. A friend told me to lubricate the bolt threads of the hand crimper to make it easier to tighten and loosen the bolts. This was helpful advice, since I had a lot of cranking to do on those bolts.

First, I passed a couple of feet of cable through the jig and set the jig aside. Then I put the lower (smaller) jaw of the hand crimper in the vise with the upper jaw (with the handle and the bolt heads) on top and free to move up and down. I loosened the bolts enough to accommodate the stud terminal, inserted the terminal from the back until it was flush with the front side of the tool, and gently tightened the bolts with my fingers until it held the terminal in place. I then inserted the cable into the terminal as far as it would go and held it in place with one hand while tightening the bolts with the socket wrench. Switching back and forth between the bolts, I tightened each one about a half a turn.

How tight is tight enough? I read about one guy who wanted to make sure the crimps would really hold so he just kept tightening the bolts. He ended up stripping the threads and the manufacturer had to send him a new tool. The rule is to stop tightening the bolts when you can't see a gap between the jaws of the tool. The crimp can't get any tighter than when the jaws touch.

After making the first crimp, I loosened both bolts, again alternating between them, enough to slip the terminal out a little more, so the back edge of the crimp I had just made was even with the front side of the tool, and finger-tightened the bolts to hold it. As I started tightening the bolts on the second crimp, I tried to hold the cable perpendicular to the crimp tool so the crimps would be straight and parallel.

After crimping the terminal the recommended five times, I removed the completed terminal from the crimper tool and removed the crimper tool from the vise. With the cable still through the hole, I put the sawing jig back in the vise.

To determine where to cut the new cable, I pulled it through the jig for the approximate length of the lifeline I was

Resources

Lifeline components
C. S. Johnson
www.csjohnson.com
Use the Marine Dealer search tab to find retail outlets.

> “Normally, the carpenter’s adage to “measure twice and cut once” is good advice . . . I measured four times.”

replacing. With the end of the new terminal matched up with the end of the terminal on the old lifeline, I taped the ends together. I used the pinch-and-shuffle method to keep the cables parallel until I reached the end of the old lifeline.

Normally, the carpenter’s adage to “measure twice and cut once” is good advice, but in this case, due to a minor bout of paranoia, I measured four times. Holding the end of the new terminal even with the end of the old terminal — the old and new terminals were different lengths — I used a Sharpie pen to mark where the cable would end inside the new terminal.

Since the cutting mark would be hidden inside the sawing jig, I needed another reference mark. The cutting slot in my jig was ¾ inch from the edge, so I made a large mark on the cable ¾ inch from where I actually wanted to cut it. Aligning this mark with the edge of the jig put the cutting mark directly in the kerf for the hacksaw.

Several light strokes of the hacksaw made a clean cut through the cable. After pulling the cut piece out of the jig and to prepare for the next one, I shoved another couple of feet of new cable through the jig before removing the jig from the vise.

I put the crimping tool back in the vise and crimped the terminal for the pelican hook on the end of the cable I had just cut to length. I loosely coiled the completed lifeline and marked it as an upper lifeline.

I followed the same procedure for the other lifelines. Each took about an hour to complete. My concentration and vision tended to falter after a couple of hours, so I took a break each time I finished two lifelines. I didn’t want to zone out and start crimping with the cable only halfway in the terminal or make shallow crimps because I didn’t feel like bending over to see if the jaws were touching.

I threaded the completed lifelines through the stanchions and screwed on the fittings. The old lifelines couldn’t be tightened all the way because the studs had been screwed unevenly into the turnbuckle bodies and one stud would hit the center post of a turnbuckle while the other was only partway in. Not wanting to make the same mistake, I detached each turnbuckle from the boat so I could thread the body evenly onto both studs before reattaching the turnbuckle to the boat. By holding the cable terminal while tightening the turnbuckle, I was able to prevent the cable from twisting.

The bottom line

The new “gateless” lifelines look great and function better with the new pelican hooks. The uncoated cables permit easy inspection and promote worry-free sailing. Hand crimping the lifelines was about half the cost ($380) of sending them out to be machine swaged and twice as rewarding. I might even recover some of the cost of the crimping tool by posting it for sale on a certain well-known auction site.

Part of the joy in owning a good old boat is fixing it yourself and making it a better old boat. Whether repairing something broken, improving the boat’s seaworthiness, or enhancing safety, doing the work yourself brings a great sense of accomplishment. Achieving all three in one project is a good old boat grand slam.

Gary Pardun and his wife, Carol, after 10 years of the pleasures of fickle-wind lake sailing, now navigate the tidal waters near Beaufort, South Carolina. Since Carol is at heart a “big boat” girl, they have also enjoyed chartering in the Mediterranean around Italy and Greece. Their boat provides plenty of opportunities for Gary to meet his goal in life: “Make everything better.”

Engine instrument update

BY JOHN CHURCHILL

A new panel and gauges to keep tabs on the motor

My good old boat, *Nurdle*, is a 1979 Bristol 35.5 centerboard model, a Ted Hood design with fairly heavy displacement but a modern underbody. She has filled my evenings and weekends with many hours of sailing and projects. A job I undertook recently was to replace the engine's aged instrument panel, along with the elderly gauges, and add some warning lights to it.

Nurdle's power plant is the original Westerbeke W30 (the newer name for the venerable 4-91, a 25-horsepower diesel). The engine wiring harness was factory original, although the initial design and installation left something to be desired. In addition to a tachometer that had been replaced years ago, the panel included the basic gauges for oil pressure and coolant temperature and an ammeter. I was inspired to replace my panel when a haulout revealed some through-hulls damaged by electrolysis. This led to a review and rejuvenation of the entire electrical system.

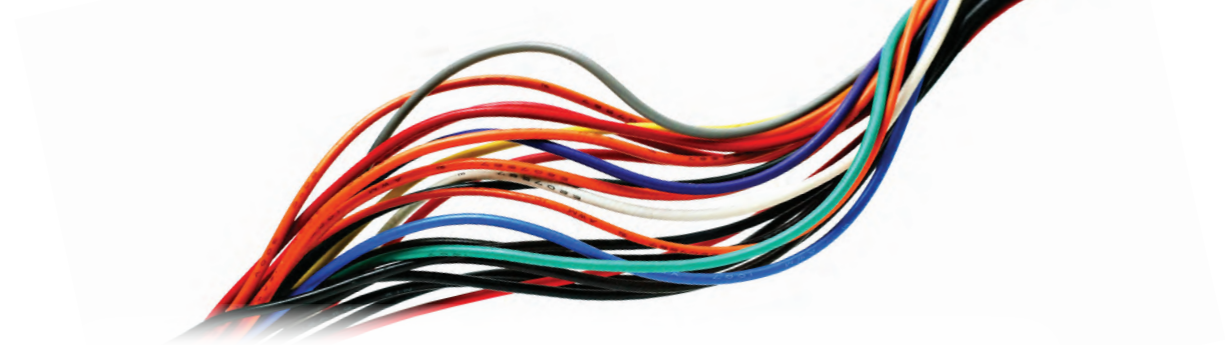
One minor electrical annoyance had been that the engine ammeter had never functioned, so I added that to the replacement list. After purchasing a new ammeter, I discovered that the original ammeter didn't work because it was wired incorrectly and had no current across it. I also found that the original panel was cracked, which explained at least one mystery leak. It had been exposed to UV for more than 30 years and, given my wish for more space, seemed ripe for replacement. Using "as long as I am at it" reasoning, I decided to replace the other gauges as they, too, were showing their age. I obtained direct replacements for the Stewart Warner gauges from various eBay sellers. As it does with many such efforts, the wish list continued to expand as I added engine warning lights to it. At 9½ x 5½ inches, the original electrical panel was quite compact, but I thought warning lights could be squeezed in somehow.

Gauges, sensors, and lamps

Many different styles of tachometer are available, the signal source being the important distinction. Most automotive models work off the ignition coil and are not suitable for diesel applications. While some older diesel tachometers run on a rotating mechanical cable, most receive an electrical signal from a dedicated terminal on the alternator. Another style, called a Hall effect, works off a magnet typically incorporated in the flywheel. The sensor for this style would be located in the vicinity of the starter motor.

Another common gauge is the hour meter. These come in two variations. The common independent gauge simply counts elapsed time while the ignition switch is turned on. My hour meter was integral to the tachometer. Some of this type record elapsed time but others record an hour as a set number of accumulated revolutions. Idling results in the meter running slower than the clock, while prolonged high-speed operation results in a more rapid turnover. This information is quite useful for keeping maintenance on schedule and for monitoring fuel consumption.

Time had taken its toll on the original engine instrument panel on John's 1979-vintage boat, inset above, so he made a new one with telltale lights as an extra feature, main photo.



A water-temperature gauge (more correctly called coolant temperature) provides critical information about the engine's operating condition. This instrument is essentially an ohmeter that depends upon a sensor that's typically mounted in the cylinder head. The sensor is an electrical device in which the resistance varies in response to a change in the temperature of a brass rod immersed in the coolant flow. Temperature gauges are available with different ranges. For accurate readings, it's important to match the sensor correctly to the gauge.

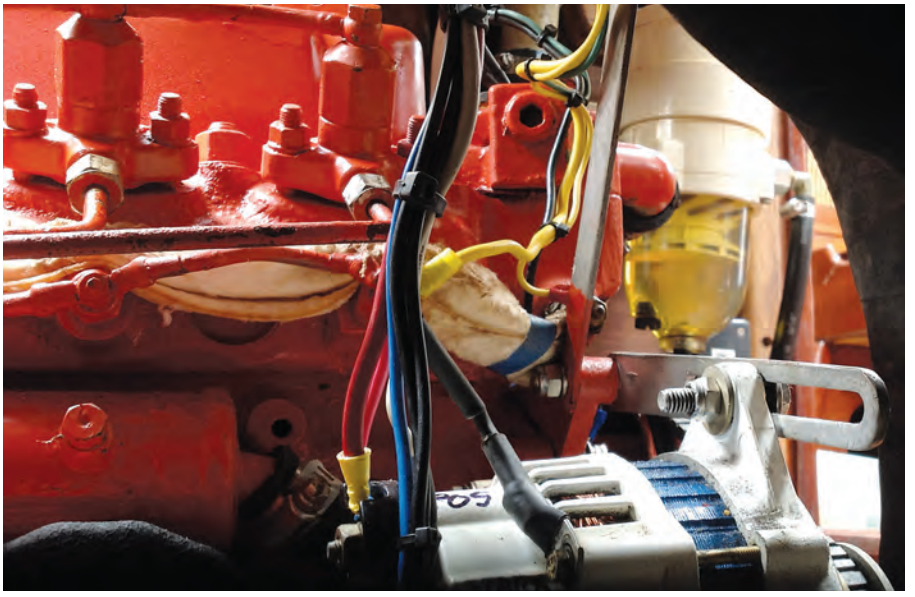
In addition to the temperature gauge, I added a warning light. For $5 shipped, I purchased four waterproof jewel-style red indicator lamps from the Partspipe store on eBay. Time will tell if they hold up to the UV exposure. My Westerbeke had an unused tapped and plugged hole on the thermostat housing, which made it easy to install the temperature switch. The disadvantage of this location is that it is high in the cooling system and loss of coolant will leave the switch dry and unable to warn of rising temperatures.

While the gauge is activated by a variable-resistance sensor, the light requires an on/off switch. These are available in various types, with important features being the normal (or cool) position of the switch, the temperature setting, and the size of the threads. The common style is normally open. It closes and completes a circuit upon reaching a predetermined temperature. I considered adding an audible alarm, which could be wired in series with the light. Alternatively, multi-stage switches are made for electric cooling fans that have two switches in one device with different set points, so the light could be illuminated at one point and a separate circuit could activate an audible alarm if the temperature continued to rise.

A search in Standard Engine Management's online catalog turned up a good switch that fits a VW Passat. However, it has metric threads and an adapter is not readily available for my NPT threaded hole. It may be a good choice for a Japanese or European metric-based engine. I ultimately selected through Summit Racing Equipment an AutoMeter 3247 that has a 220°F setting and ½-inch NPT threads. An alarm can be added to this circuit later, if desired. The circuit is simple, with a hot source from the ignition switch to the light and from there to the switch.

The oil-pressure gauge is similar in principle to the water-temperature gauge, except its sensor is pressure- rather than temperature-dependent. These gauges are also available in different ranges and must be matched with the proper sensors. The sensor is screwed into one of the oil passages coming from the oil pump. There did not appear to be a spare hole in the oil system on my engine, so I used brass pipe fittings to tee in an oil-pressure switch for my warning light. Pressure switches are available with various characteristics. I chose the AutoMeter 3241 with a 15-psi setting and ⅛-inch NPT threads. This switch is "normally closed" and opens with pressure. A failure of oil pressure closes the circuit and illuminates the light. Again, the Standard catalog is a good resource. Identify an automotive application and then inquire about it at your local auto parts store.

My panel has an ammeter that monitors the current coming from the alternator. Some ammeters are direct reading and require all the current from the alternator to pass through the gauge. This requires heavy gauge wires to be run to the panel. A few older models are designed with a shunt and require lighter wiring, although these are uncommon. The wire from the alternator needs to go directly



John was able to use a pre-tapped hole in the thermostat housing to fit the sensor for the temperature warning light (green and black wires), at left. The ammeter and the tachometer are wired to the alternator, at right.

John's engine instrument panel had an oil-pressure gauge but John wanted to add an oil-pressure warning light. He took off the pressure sensor, at left, and inserted into the oil line a brass tee fitting into which he screwed the switch for the warning light, at right.

to the positive side of the ammeter with the feed to the battery/ignition switch/DC panel coming from the ammeter's negative post. The negative terminal is not grounded and must not be connected to the negative battery terminal. The instrument panel ammeter only reflects alternator output and functions solely when the ignition switch is on. For monitoring the ship's DC systems, a separate ammeter is required in the circuit breaker panel.

More gauges

Some installations may substitute a voltmeter for an ammeter. The advantage of this is that smaller wires are needed and the state of charge in the battery is more directly displayed. A voltmeter is simply wired into the hot side of the ignition circuit. It does not, however, indicate current flow. My engine no longer had the original alternator. It was replaced with a Balmar high-output alternator mated to an ARS-5 smart regulator. There is a terminal on the regulator for a dash light that grounds at excessively high or low voltage.

A fuel gauge could also be fitted to an instrument panel. Mine was already installed elsewhere belowdecks, so I did not relocate it. These gauges are also modified voltmeters that work with a specific sender. The sender has a mechanical float with an arm that slides along a piece of resistance wire, and resistance varies with the level of the fuel in the tank. All senders have an SAE standard mounting-hole pattern and are adjustable for tank depth. The important feature is the resistance of the sender. The two most common ones in marine applications are opposite ranges, either 0 ohms empty to 90 ohms full or 240 to 33. If your fuel gauge reads opposite, you probably have a mismatch. Erratic operation is usually due to a poor ground from the sender.

Assembling the panel

The factory panel was the familiar placard-style white plastic with a black facing. For the replacement, I selected ¼-inch black acrylic sheet. Often referred to by the brand name of Plexiglas, it is resistant to UV and impacts, is rigid, and is easily worked with hand or power tools. I ordered several 12- x 12-inch pieces from McMaster-Carr to spread out shipping costs, figuring I'd have extra in case of errors or for future projects. It's also available as translucent gray or smoked, but opaque is the most suitable for this application. Extruded is preferred over cast. The more easily found clear acrylic sheet can be used. If painted on the rear face, it gives a high-gloss scratchproof finish, although the edges are less aesthetically pleasing.

My panel's location on the aft face of the cabin trunk was satisfactory and provided adequate room for an enlarged panel. Prior to cutting, I made a cardboard mockup with paper circles representing the gauges and warning lights. The overall size of 12 x 6 inches gave a pleasing 2:1 proportion and required only one cut. While I could have used algebra and geometrical formulas to space the circles, I just made them look equal and balanced, fine-tuned the gaps with a ruler, and transferred the measurements to the plastic.

Acrylic comes with a paper masking on the surface. This simplifies marking and protects the surface during fabrication. A ½-inch margin outside the gauges looked right and seemed to provide a wide sealing surface, although I failed to take into account the mounting brackets for the gauges, which narrowed the lip to ¼ inch in two places.

The secret to success in working with acrylic is to use sharp tools and advance the material slowly. Acrylic sheet is easily cut to size on a table saw using a sharp carbide blade. A dull blade will chip the edge and require

Resources

McMaster-Carr
www.mcmaster.com
Acrylic sheets

Partspipe store at eBay
http://stores.ebay.com/PARTSPIPE
Indicator lights

Standard Engine Management online catalog
www.standardbrand.com
Sensors and switches

Summit Racing Equipment
www.summitracing.com
Sensors and switches

www.egauges.com
Fuel gauge and sender

more finish work. The cut edges can be filed smooth, although a router makes the best finish.

I cut the holes for the smaller gauges with a hole saw, pre-drilling the pilot hole to be sure each would be properly located. Remember to measure twice, cut once. Standard gauges are 2 1/16 inches in diameter and fit nicely in a 2⅛-inch hole, a common hole saw size used for installing door locks. The tachometer hole was more challenging as the 3⅜-inch size was not in my hole saw set. I cut it with a jigsaw and finished the inner edge with a Dremel tool and a rasp. I made the holes for the ½-inch warning lights with a Forstner bit and drilled mounting holes in each corner. Special drill bits specifically for plastic are available inexpensively from McMaster-Carr and prevent breaking out the rear surface. Drilling 1/32 inch oversize helps avoid cracking the corners.

I was uncertain whether additional mounting holes would be needed in the middles of the long sides, so I marked them but did not drill them initially. As it turned out, the acrylic proved to be stiff enough for corner mounting only. I mounted the gauges to the panel prior to installing the panel on the boat.

Wiring

Once I had mounted the panel and gauges, it was time to give some attention to the wiring. The factory engine harness was overly long and had some corroding plug connectors that I was able to remove by shortening the excess. I used two spare wires in the harness for the oil and temperature warning lights and only had to run one additional wire for the voltage regulator light.

There were many hot wires in the panel itself, so I fabricated and installed a small hot bus bar on a red plastic base and epoxied it to the back of the panel. The feed is from the ignition switch and then to the instruments and warning lights. I also made a negative bus bar and mounted it on black plastic. The feed for the gauge-illumination lights is from the steaming-light circuit breaker. Coupling the steaming light to the engine-panel illumination means it gets turned on or off at the appropriate times.

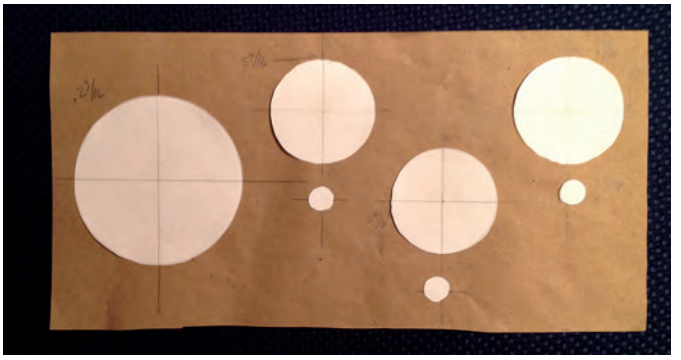
Incidentally, the ignition switch was located belowdecks. That's a secure location but inconvenient, so I added a second switch in parallel at the helm.

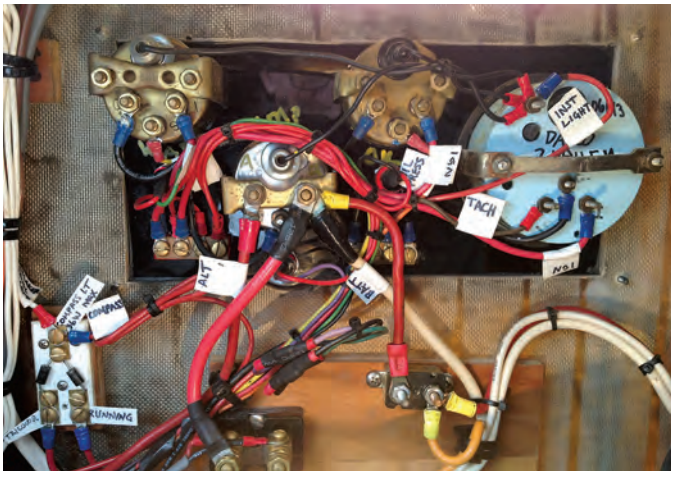
Once I'd completed the wiring, and after confirming the gauges and lights functioned properly, I tidied it up with wire ties. I always cut off the excess wire tie flush with a razor to avoid the knife-like ends that can be left when the ties are simply clipped.

An important task when I have completed a project like this and it has has passed final inspection and testing is to make a wiring diagram for reference. I place a copy in the ship's papers for future owners.

In use, the new panel is a source of delight. The gauges are clear and bright, I feel confident in their accuracy and reliability, and the warning lights provide an additional measure of confidence. Incidentally, the correctly wired ammeter works like a charm.

John Churchill grew up in Indiana as a boat-crazy kid. He built a raft at age 6, sailed Snipes as a teenager, and worked his way toward salt water and bigger boats as an adult. He has sailed a Cape Dory 26 singlehanded to Bermuda and back and a Bristol Channel Cutter transatlantic with his father. Now in Florida, John races and daysails Nurdle, *a former repo Bristol 35.5, while rehabbing her for extended cruising after he retires.*





John made a pattern for the layout of his new engine panel, top right, then transferred the centers of the compents to a sheet of black acrylic. He assembled the gauges and lamps onto the acrylic and installed the panel, at left, then connected, labeled, and tidied up the wiring, at right.

On watch in all weather

Conduct ocean passages from the Maestro seat

BY ED ZACKO

In the mid-1960s, Bernard Moitessier was in Tahiti preparing his 40-foot steel ketch, *Joshua*, for a "fast return to France" by way of Cape Horn. In a burst of inspiration, he bought a round steel washbasin, cut holes in the sides, covered the holes with acrylic "portlights," then bolted the basin upside down on top of his main hatch, creating what amounted to a ball turret. This turret would give him a 360-degree view from inside the main cabin, keeping him dry and safe from the huge seas of the Southern Ocean. His voyage, which he described in his book *Cape Horn, the Logical Route*, made him an instant hero with ocean sailors the world over. Since then, the washbasin concept has evolved into a full acrylic bubble turret and, to this day, no self-respecting French cruising yacht puts to sea without one.

The first time we saw a boat so equipped, we laughed, saying it looked more like a spacecraft than a proper sailboat. But our first trans-Atlantic crossing (3,000 miles entirely to windward) caused us to reconsider the idea. We now understood the turret's appeal. Devising a way to sit a watch high up where we could see everything, while staying warm and dry out of the wind and weather, became a quest.

Unfortunately, there seemed no practical way to add a turret to *Entr'acte*, our Nor'Sea 27, without destroying her classic look and compromising our dinghy storage. The idea went to the back burner. During our 2003 winter in Seville, Spain, however, we met the French yacht *Maestro*, which was equipped with a full bubble turret. Her owner, Michele, suggested I "try it on for size." His version employed a simple plywood seat hinged to the companionway sill and supported by two lengths of chain connected to eyebolts on either side of the hatchway — simple and effective. I sat on the seat, looked around, and knew we had to have this.

For days we brainstormed . . . until the light came on.

An extemporized solution

Because of our companionway configuration, *Maestro*'s simple seat would not

Ellen is ready to stand her watch from the comfort of the Maestro seat while sheltered under the dodger, top of page. On *Entr'acte*, the supporting hatchboard is StarBoard and the seat is plywood, at left. Proper foot support is essential for the watchstander's long-term comfort, at right.

Ed hinged the seat off-center to leave room forward of it for standing on the ladder, top left. To ensure the seat was smooth, Ed countersunk all the nuts and cut the bolts flush with the nuts, left center. The support-rod assembly is made up of a threaded rod, compression tube, stopper nut, and a tensioning wingnut, bottom left. With the support rod in place and the limiting strap taut, the seat is ready for use, top right.

work for us . . . but what if we made a seat that slid down into the hatchboard tracks and allowed us to sit upright under the dodger? The seat would have to be secure enough to support an adult body while withstanding the strains it would encounter on a passage. It would also need to be compact and easy to stow when not in use.

The next day, I threw one together with materials I had lying around. It was Jazz! I made it up as I went along. It was easy to construct and turned out far better than I dreamed. The Maestro seat was born! The original version — made from two pieces of plywood — served us for thousands of miles and we came to rely heavily upon it.

The seat is simply two pieces of plywood hinged together. The main support piece is cut to the width of the hatchboard tracks and slides inside the tracks to sit securely on top of the companionway sill. This piece will support Ellen's or my entire body weight. The seat itself is mostly on the cockpit side of the support piece and hinged to it for easy stowage. The support slides easily down the hatch tracks and the seat is ready for use in seconds. The challenge was to make the seat solid and safe.

To make the seat one rigid, stable unit, I employed a "support rod" combined with a "limiter strap." This is the heart of the system and its only complexity. It consists of a piece of ⅜-inch stainless-steel threaded rod with a Nylock nut screwed to one end to serve as a stopper, a short piece of aluminum tubing with one end cut at a 45-degree angle to serve as a "compression tube," a washer, and a wingnut. The support rod slides through the compression tube and fits into two openings, one in the support piece and the other in the seat. The rod sets the seat into a comfortable position and prevents it from collapsing aft.

The limiter strap prevents the seat from folding forward and losing the support rod. This strap is a length of ¾-inch nylon webbing. One end is attached to the seat and the other end to the support piece. Both ends are through-bolted. Once the rod is in place, screwing the wingnut against the compression tube pushes the seat into position and puts tension on the limiter strap, which is set to become taut just as the seat reaches the perpendicular. The strap has to be tight when the seat is in use, so I made it a little short to allow for stretch.

To use the seat, I install the rod and screw the wingnut against the compression tube until the strap is tight, making the seat one rigid unit. I then slide it into the hatch tracks.

To stow the seat, I simply unscrew the wingnut and remove the rod. The seat will fall flat and remain out of the way in the hatchboard tracks, or I can slide it out and stow it as a handy backrest in the cockpit.

I constructed the supporting hatchboard from ½-inch scrap plywood and the seat from 1-inch mahogany plywood and connected them with a stainless-steel piano hinge. The original plywood support eventually delaminated. We replaced it with ½-inch StarBoard, but retained the 1-inch plywood for the seat.

Design for comfort

Make the seat wide enough athwartships that you can sit on it comfortably for long periods of time. At the same time, you don't want the finished seat to interfere with your use of the companionway ladder. You will also want to stand on the ladder periodically and stretch. If the seat extends too far over the ladder it will be in the way.

With the support strut released, the seat folds down for quick stowage, at left. Grinding the groove in the support rod takes patience, center, and safety glasses are essential. A Dremel tool and sanding drums can be used instead of a router to trim the edges of the hatchboard, at right.

So the seat stows conveniently when not in use, you will want to assemble it so it folds flat. I accomplished that by joining the seat to the support with a piano hinge, and I found the right position for the hinge from trial and error with a mock-up by "sitting" on it, placing my feet on the top step of the ladder, and standing up or stepping down as if to go below. In my case, the best position for the seat was with one fourth of it extending forward of the supporting hatchboard.

For quick-release stowage, the fore-and-aft measurement of the seat and the height of the supporting hatchboard should be such that, when you remove the support rod, the seat folds down perfectly flat against the hatchboard.

Construction

When determining the thickness of the supporting hatchboard, bear in mind that the seat will be subjected to a surprising amount of torque as your body moves around in a seaway, so your personal body weight and the width of the hatchboard are factors along with the size of your hatchboard track. At a minimum, the support board should be ½ inch thick, but thicker is better. A close fit in the hatchboard channel is desirable so the board will slip easily into it without binding but not be a sloppy fit — if the seat wobbles, you'll become exhausted trying to sit still. If you use a board that's thicker than the hatchboard channel, shave the edges to the proper thickness with a router or Dremel tool.

If you make the seat of 1-inch-thick material, that will allow you fasten the hinge with through-bolts, which I recommend, and to countersink and recess the nuts.

Make a cardboard mock-up of the seat and its supporting hatchboard. Check that it meets your requirements before you cut any wood.

Before attaching the seat to the supporting hatchboard, think about which side the hinge should be so your weight on the seat is in the direction of closing the hinge and not opening it more. Center the piano hinge on the hatchboard support and through-bolt it in place.

Attach the hinge to the seat with through-bolts and countersink the seat to recess the nuts. I cannot overstate the importance of through-bolting everything. This seat will endure a surprising amount of torque when under way. Screws will pull out in a very short time and that could lead to a nasty fall.

With the Dremel tool and a cutoff wheel, remove any bolt threads that extend from the nuts. You want the entire seat to be as smooth as possible with no protrusions to compromise

Resources

Jamestown Distributors
www.jamestowndistributors.com

MSC Industrial Supply
www.mscdirect.com

McMaster-Carr
www.mcmaster.com

The cushion makes standing (sitting?) a watch so much more comfortable, at left, and the watchkeepers's essentials are close at hand, at right.

your comfort or safety or to interfere with ease of stowage.

I was tempted to use acorn nuts because they would look nice and finished, but the Nylocks are more permanent.

Support system

The support system consists of a support rod, compression tube, limiter strap, and two strike plates. They perform as a unit.

The support rod makes the seat rigid and supports your weight as the boat moves around in a seaway. The limiter strap prevents the rod from falling out as your weight shifts. A wingnut against the compression tube maintains tension on the limiter strap. The strike plates provide a solid metal-to-metal surface against the compression tube at one end and a stopper nut at the other. They also serve as chafe protection where the compression tube and support rod come in contact with the seat and hatchboard.

I made the compression tube "captive" so it would not fall off the rod and get lost every time it was stowed. I used a Dremel tool with cutoff wheels to grind a 2½-inch-long channel into the rod. I then drilled and tapped a small hole in the compression tube and installed a 10 x 24 stainless-steel Allen setscrew with a dab of red Loctite for security. The Allen screw slides inside the channel and stops when it reaches either end of the channel, thus preventing the tube from falling off the rod. The rod, tube, wingnut, washer, and stopper nut become one permanent unit — I have only one piece to find when I want to use the seat.

For strength, I made the the support rod from ⅜-inch stainless-steel threaded rod. Any metal tubing will do for the compression tube as long as it fits over the ⅜-inch rod, but a thicker-wall tube will better accept the setscrew that holds the tube captive.

The most difficult part of this entire project is machining the groove for the compression tube setscrew. With the aid of a small vice, a steady hand, and a little patience, I achieved an acceptable result with the Dremel tool. Safety glasses are a must for this operation.

Strike plates

My original strike plates were simply stainless-steel fender washers drilled out on an angle to accept each end of the rod and screwed permanently in place. I replaced them with 1½-inch lengths of 1 x ⅛-inch stainless-steel bar stock. Mortising out the support and seat to receive the strike plates will prevent the plates from drifting under your weight. I also recommend through-bolting the strikeplates.

For maximum strength and efficiency, position the strike plates so the support rod meets both the seat and hatchboard at a 45-degree angle. Drill the holes in the strikeplates that receive the support rod at a 45-degree angle and a bit over-sized to allow for easy assembly. The hole in the seat should not go all the way through the seat. The hole in the support piece must be

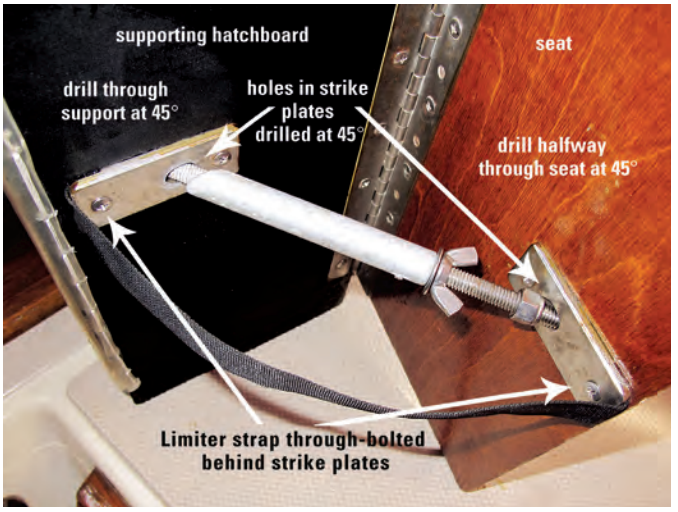
Materials and tools

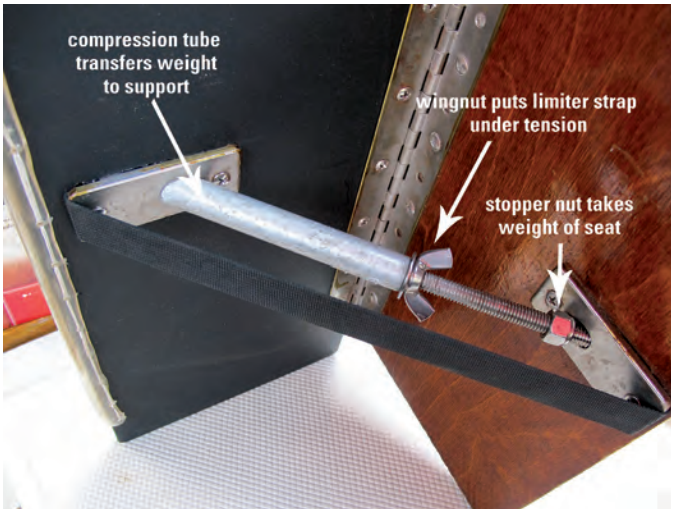
Materials

- Plywood: two pieces, one for the hatchboard (at least ½ inch) and one for the seat (¾ to 1 inch) (StarBoard, a plastic composite that's easy to work with and very strong is a good alternative material.)
- Stainless-steel piano hinge (length determined by width of seat)
- 10 x 24 stainless-steel oval head machine screws, Nylock nuts, washers
- Length of ⅜-inch stainless-steel threaded rod (1 foot), one ⅜-inch Nylock nut, one large wingnut
- Length of ⅜-inch-ID stainless-steel or aluminum tubing
- One 10 x 24 Allen setscrew
- Loctite, red
- Two pieces of brass or stainless-steel bar stock 1½ x 1 x ⅛ inch
- ½-inch nylon webbing (about 1 foot) for limiter strap
- Short length of soft plastic hose for anti-chafe at bottom
- Sail twine and needle to attach anti-chafe hose

Tools

- Saber saw
- Drill, ½-inch countersink
- Dremel tool with cutoff wheels and sanding drums
- Router with ½-inch mortise bit (or use Dremel)
- Hacksaw
- 10 x 24 tap





The Maestro seat is easy to set up: insert the support rod into the holes in the striker plates, at left, and spin up the wingnut against the compression tube until the limiting strap is taut, at right. Fit the seat support into the hatchboard track, below, and get ready to sit your watch.

drilled all the way through to facilitate mounting the support rod.

Limiter strap

Without the limiter strap, the support rod will fall out every time you shift your weight. Worse, the seat will move beyond the limits of its attachments and something will break in short order. The limiter must always be under tension to perform properly, so set the strap to come up short just before the seat reaches 90 degrees. Allow for some stretch in the webbing as the wingnut pushes the compression tube along the rod. You might have to experiment a bit to get the length just right.

Secure the ends of the strap under the strike plates and through-bolt them into place along with the plates.

Final touches

Slice a length of soft clear-plastic water hose and mount it to the bottom of the supporting hatchboard to protect the wood and silence any squeaks. To secure the hose, drill a few small holes through the hose and the board and fasten the hose in place with a needle and waxed sail twine. Slide the seat into the channel and cut off any excess support rod that protrudes inside the cabin.

As a finishing touch, since you'll spend a lot of time on this seat, make it more comfortable by adding a cushion made of closed-cell foam with a laced-on cover. A really cheap source of closed-cell foam is a garden kneeler you can find in almost any hardware store.

Once you have everything assembled, insert the rod, spin out the wingnut and slide the seat into the tracks. Grab some coffee and cookies and enjoy your watch. Don't forget the MP3 player!

Ahead of the game

There is an old adage about hatchboards: when the first reef goes in, so does the first hatchboard. Most of us tend to neglect that until we take the first bucketful of water below. Normally, the hatchboard is in the way, but with this system we're ahead of the game. The first hatchboard is always in the right place at the right time and in a much more useable way.

This has saved us on many occasions. We might not be able to fit an acrylic bubble, but we now have what amounts to the same thing, and perhaps better. It is a favorite piece of our offshore cruising equipment, second only to the windvane steering gear. Ellen recently remarked that of all my additions to *Entr'acte* over the years, the Maestro seat has been the most useful. The watch enjoys a 360-degree view and remains warm and dry in any winds from a beat to a beam reach. Rain? Who cares?

What happens when the wind goes astern? That is the next step. We do have a solution for that eventuality that we call our Bubble of Comfort.

Ed Zacko the drummer met violinist Ellen while playing in the orchestra of a Broadway musical. They built their Nor'Sea 27, Entr'acte, *from a bare hull and since 1980 have sailed thousands of miles on both sides of the Atlantic and in the Pacific. After shipping* Entr'acte *from Noumea to France, they are in Seville. Follow their voyage at www.enezacko.com.*

Countertop extension

A drop leaf makes and saves space

BY BERT VERMEER

Counter space is at a premium on almost any boat and Bert's Islander Bahama 30 is no exception. By adding a store-bought cutting board as a stowable extension, Bert expanded his work surface without impinging on the space needed for other onboard activities.

Owners of sailboats of a certain vintage face a dearth of counter space during food preparation and galley cleanup. The boat is, after all, a sailing machine and not designed to offer the equivalent of a household gourmet kitchen! Perhaps because there is so little available space to begin with, simple modifications can double or triple usable counter space without intruding on that all-important living space. Our 1978 Islander Bahama 30 was fortunate enough to leave the factory with a U-shaped galley and a reasonable amount of counter space. However, the icebox lid, range, and sink cut into that space, leaving little usable room for meal preparation.

Borrowing an idea from a drop-leaf dining-room table, I came up with a convenient counter extension that can be mounted almost anywhere there's a vertical surface. The first step was to purchase (or make) a cutting board. It proved less expensive to purchase a ready-made board at the local hardware store than to make one from scratch.

While choosing between functional and cost-effective versus decorative and expensive, I discovered a plethora of available boards. I selected one labeled "roast carving board," as it had valleys cut along the edges of the top surface for collecting liquids. I wanted to catch the runoff when stacking wet dishes from the sink on the board. The space I had available was 17 inches on its long edge and about 12 inches wide. The board I found was a perfect fit.

The next step was to find a support bracket that could be operated with one hand yet would be sturdy enough to take abuse. I found a simple 10-inch spring-loaded drop-leaf support made

by Builder's Hardware (Model # BH2316087) at the local hardware store for less than $15. It's not a "marine" product but I've had it in place for more than eight years and it shows no sign of wear or rust.

The trick to mounting the board was to ensure that there would be sufficient space for the support between the folded board and the cabinet. The manufacturer's mounting instructions on the back of the packaging call for a spacer at the hinge to create that room. In my case, the fiddle already on the counter provided a near perfect spacer. To add stability to the board, I attached it with a standard ¾-inch stainless-steel piano hinge. Careful measurement and a steady hand had the assembly in place in no time. It's a simple one-handed operation to raise or lower the board and it's completely out of the way when not in use.

The board is attached by a hinge to the counter's fiddle rail, which provides the needed offset for the drop-leaf support bracket.

The added counter space is most welcome when preparing or cleaning up after meals. It also serves as a safe place for cookware hot off the stovetop, as there's no fear of damaging the Islander's Arborite countertop. (Not all of us old-boat owners have granite or Corian countertops.) Multiple boards could be placed in the galley if additional space is needed. This simple, inexpensive addition was well worth the effort.

Bert Vermeer and his wife, Carey, live in a sailor's paradise. They have been sailing the coast of British Columbia for more than 30 years. Natasha *is their fourth boat (following a Balboa 20, an O'Day 25, and another Islander Bahama 30). Bert tends to rebuild his boats from the keel up. Now, as a retired police officer, he also maintains and repairs boats for a number of non-resident owners.*

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Made in Japan

Turbulent economic winds pruned a budding sailboat industry

BY MICHAEL ROBERTSON

Most owners of good old boats have a strong association with Japanese products: Yanmar diesel auxiliaries are popular throughout the world, Mercury (Tohatsu) outboards are clamped to many transoms, gasoline-powered Honda gensets are ubiquitous, and Yamaha personal watercraft are the bane of peaceful anchorages. But when it comes to actual sailboats — cruising boats, racing yachts, daysailers — where does Japan fit in?

Today, none of the shiny sailboats displayed at boat shows from Annapolis to Miami to Seattle are made in Japan, but once upon a time, and for more than 25 years, Japan did manufacture sailboats for the U.S. market. For many years, Japanese yards did a brisk business turning out several models each of Mariner, Fuji, and Yamaha sailboats for export.

As would be expected of an island nation, Japan has a long seafaring history. But not until the late 1950s, a little more than a decade after the end of World War II, did Japanese boatyards begin to build recreational sailboats for export. It began when a few enterprising Americans partnered with two Japanese yards to turn out a small number of wooden sailboats to ship back home for sale.

International Marine and Okamoto Shipyard were located in southeastern Japan, not far from Tokyo. International Marine grew out of a partnership between an American businessman and a Japanese businessman. Their enterprise turned out a small number of wooden Samurai 28s, a variation of L. Francis Herreshoff's H-28 design. The larger Okamoto Shipyard built 35- and 40-foot ketches designed by American William Garden and commissioned by American Bill Hardin. With this handful of wooden boats and no formal dealer network abroad, the Japanese recreational boatbuilding industry got off to a slow start, but in 1958, the pace began to pick up.

After commissioning a couple of H-28s for export, American businessman Clair Oberly started his own company in Japan, Far East Yachts. During the first few years, production was slow and Far East Yachts built only a few very early wooden versions of the Mariner 31, an Alden design that Oberly modified, and the Garden-designed Mariner 40. But the recreational sailboat market grew steadily, if slowly, and all three small Japanese yards — International Marine, Okamoto Shipyard, and Far East Yachts — remained busy. Then in 1960, they all underwent major changes.

Bill Hardin effectively shut down Okamoto Shipyard when he partnered with the Taiwanese Chen family and moved his operations to three Taiwanese yards (two Chen yards and the Formosa yard). Soon afterward, Kawasaki Dockyard Company, Ltd. (later to become Kawasaki Heavy Industries) purchased both International Marine and Far East Yachts. Under Kawasaki ownership, International Marine began doing business as TOA Yachts and Far East Yachts became Far East Boats, Ltd., with Oberly remaining at the helm.

By 1964, Oberly had refined operations at Far East Boats and added two boats to his lineup: the Garden-designed Mariner 35 and Sparkman & Stephens design No. 1738, a full-keel 40-foot

Doug Wilson cruised aboard his Mariner 31, *Cactus Tree*, in the Sea of Cortez, top of page. Tom Kucera's Mariner 32, at left, was built in 1970 or '71. He bought her in Mexico and had her trucked to Sausalito, California, where he has undertaken a three-year refit. Tom says that when they took the mast down, "the first turnbuckle exploded," a clear demonstration of the long-term effect warm salt water has on rigging terminals. Now, he says, he doesn't get nearly enough time sailing on San Francisco Bay.

sloop with long overhangs. The yard was slowly and steadily turning out a supply of boats for sale on the U.S. West Coast.

Material changes

On the U.S. East Coast, cousins Clint and Everett Pearson were already pioneering a new era for yacht construction. Pearson Yachts of Bristol, Rhode Island, released their fiberglass Triton 28 at the 1959 New York National Boat Show and it was selling well. The end of wooden boatbuilding was near.

In Japan, Far East Boats was slow to adopt the new material. Only in 1967 did the company begin building hull molds for the first two models they would manufacture in fiberglass. Finally in 1968, Far East Boats turned out the last of the all-wood Mariner 35s and 40s, the yard was completely retooled, and production of the fiberglass version of the Mariner 31 was in full swing.

The transition paid off handsomely. Like Pearson (as well as many Southern California builders of the time, such as Jensen Marine, Columbia Yachts, and Coronado Yachts), Far East Boats found a strong market for its plastic boats. Because of the new material, sailboats were now affordable for the exploding U.S. middle class and builders serving that market sold everything they could produce.

Responding to the demand, in 1970 Far East Boats added the Mariner 32 (using the same hull mold as the 31 but with a wooden deck and cabin) and the Garden-designed Mariner 40 to their fiberglass models. Two years later, it added the Garden-designed Mariner 36. Ultimately, Far East Yachts delivered more than 200 units from its four-boat fiberglass lineup during the five-year period from 1968 to 1973. Then disaster struck.

Financial challenges

The Smithsonian Agreement was a byproduct of the economic turmoil of the early 1970s. It was a decision by the major nations of the world to float their currencies. Overnight, the U.S. dollar was devalued against the Japanese yen (raising the prices of Japanese goods to Americans) to the point that Kawasaki shut down both its yachtbuilding subsidiaries. Far East Boats and TOA Yachts were out of business by the end of 1971.

Clair Oberly scrambled to keep production running. He partnered with Japanese businessman Takuji Kato, negotiated for some of the Far East Boat assets, convinced about half his former employees to follow him, and reopened for business as Clair & Kato Yachts. After only a few boats were finished, this venture failed and Oberly returned to Long Beach, California, where he built a few more Mariner boats before closing shop for good. A rumored design for a Mariner 45 was never built.

The rise of Fuji Yacht Builders

Back in Japan, a former principal of TOA Yachts and the former head carpenter of Far East Boats (Mr. Makise and Mr. Nakazaki, respectively) joined forces to start Fuji Yacht Builders in Yokosuka in the same yard where Far East Boats had turned out the Mariners. With some assets and employees of the shuttered companies, the new Fuji yard turned out a couple of one-off boats that likely used a left-behind Mariner 36 hull mold. But by 1973, with entirely new Alden designs in hand, it delivered the first Fuji 35 and began construction of the Fuji 45 model. Within a year, using the Mariner 32 hull mold as a basis and a new deck and coachroof designed by Alden, the company launched production of the Fuji 32.

While sales of the full-keel, ketch-rig lineup were initially brisk and more than 200 boats were eventually built, sales began to wane into the mid-1970s. Though the Fuji hulls were solid fiberglass and the spars aluminum, the Alden designs echoed those of the now-eclipsed wooden-boat era. In the U.S., the cruising boat market had discovered Bill Lapworth's Cal 40 and Bob Perry's Valiant 40. Builders and buyers alike were learning that the new material allowed for new designs and these boats were proving the speed and viability of modern underbodies with separated keels and rudders.

SUSAN LYNN KINGSBURY

The 1977 Fuji 32 *Sunshine*, owned by Dee Schumacher and Joan Lyon (who passed away last April), was the feature boat in *Good Old Boat*, July 2011. Her home port is Alamitos Bay, California.

The long-standing demand for tried-and-true traditional designs was weakening.

Five years after launching the Fuji 35, Fuji Yacht Builders responded to the market forces. In the late 1970s, it turned to Sparkman & Stephens to design, "a roomy, comfortable cruising yacht." In short order, S&S's Francis Kinney drafted design No. 2292 that was to become the Fuji 40, a sloop with a modern underbody — a radical departure from the full-keel Alden ketches that made up the rest of the Fuji lineup. Driven by the urgency to get with the times, the company started building the first seven Fuji 40s in late 1977 before the plans were even complete. It was probably a case of too little, too late. In the end, only about a dozen Fuji 40s were built. Less than two years later, Fuji Yacht Builders shut its doors.

As the market for recreational sailboats grew, so did the number of builders. By the time it got the Fuji 40 out the door, Fuji Yacht Builders faced increasing competition, and the disparate economies of Japan, Taiwan, and the U.S. put Fuji at an increasing disadvantage. Even in this era of fiberglass hull construction, cruising sailboats built outside Europe featured ample hardwoods above and below decks. Construction of these boats was costly in materials and skilled labor. Says Niels Helleberg, curator of the designs of the late John G. Alden, "I don't recall what the Fuji boats were selling for, but it was not enough to keep them in business."

Compared to Japan, material and labor costs in Taiwan came at a significant discount. Since Bill Hardin moved his operations there almost two decades earlier, boatbuilding in Taiwan had continued to accelerate. By the late 1970s, more than 100 yards — some of them very good — were turning out Tayanas, CTs, Transpacs, Masons, and more. In Southern California and Florida, the 35- to 45-foot Columbia and Morgan yachts enjoyed the competitive advantages of efficient production techniques and close proximity to market. In 1978, Catalina Yachts released its flagship 38-footer, and by the end of 1979, the Newport Beach, California, importer of Fuji yachts had stopped ordering.

Yamaha – another approach

In 1960, at about the same time that Japanese conglomerate Kawasaki entered the production-built sailboat business through its purchase of Far East Yachts and International Marine, another Japanese conglomerate, Yamaha, got into the act. Located in Shizuoka, 75 miles from Kawasaki's operations at the mouth of Tokyo Bay, Yamaha's boatbuilding operation began as an offshoot of its burgeoning fiberglass operations. Accordingly, the company started on a much smaller scale, building boats under 15 feet.

Ten years later, the Yamaha model lineup had expanded to include modest-sized coastal cruisers, but in limited numbers and for sale only in its domestic market. Then, in 1975, two years after Kawasaki abandoned the production sailboat business, Yamaha made a splash on the international sailing scene. The Yamaha 29 was an ultra-modern racer/cruiser designed by France's Jean Marie Finot. It was sold in Europe and profiled in European sailing magazines. The flush-deck, center-cockpit design showed the IOR influences of the time (such as pinched ends and modest tumblehome), but also radical elements such as an aft saloon and large transom portlights.

Within 12 months, Yamaha capitalized on its success with the launch of three additional models, the Y33, Y24, and Y25 — all of which maintained the ultra-modern design cues of the Yamaha 29. While the company employed the design input of Scandinavian designer and yachtsman Peter Norlin for this product expansion, it was also by now drawing on in-house design expertise gained over the years.

Yamaha was founded in the late 1800s by a man who, charged with repairing a musical instrument, decided he could design and build a better one. So it makes sense that, after laying a foundation based on French and Swedish design input, Yamaha decided it could do it better and formed its own in-house design team. The group spared no expense getting up to speed, taking cues from the best designers of the time.

"One afternoon, two Japanese gentlemen came to my office, dressed in dark suits," Seattle designer Robert Perry recounted in an email. "They introduced themselves as being from the Yamaha design office. One spoke some English and asked if they could look at some of my design work. I was flattered and began to lay out drawings for them. They studied the drawings pretty much in silence. After a while one of them said, 'Problem with American boat, not designed for human body.' I'm six-three and as I looked at the two Japanese guys, neither of whom was over five-five, I replied, 'Yours or mine?'"

Resources

Websites about Mariner, Fuji, and Yamaha sailboats

- **Mariner Owners Association:** www.marineryachts.com
- **Fuji Yachts information:** www.fujiyachts.net
- **Yamaha Sailboats information:** www.yamahasailboats.org

More Online . . . Michael has compiled a table of boats built by the Japanese companies mentioned in this article and a timeline that traces the fortunes of those companies over the years they were in business. Look for this extra content at www.goodoldboat.com/reader_services/more_online_/japaneseboats.php

Simone Vattheuer sails the Yamaha 33, *Magnetic Attraction,* on facing page, out of Comox, Vancouver Island, British Columbia. Ken Buckley keeps his 1981 Yamaha 30T, *Misty Blue,* above, in Vancouver and sails Howe Sound, the Georgia Strait, and the Canadian Gulf Islands.

The bold move by Yamaha to combine design and manufacture under the same roof proved to be a good one. Much like the Japanese automobile companies did in the same period, Yamaha quickly became a leader in a new technological approach to sailboat design and manufacture. Its design team was one of the first to employ computers in the design and engineering phases of production. Engineers studied hydrodynamic properties of hull models in test tanks and design enhancements followed. Carpenters built full-size mock-ups of proposed decks and interiors so that sailors could provide input before production commenced. The company taught non-sailing engineers to sail. On the manufacturing side, the company turned inward for production of much of the hardware found on Yamaha sailboats, including blocks, hatches, mast collars, latches, and chocks.

Out in the real-world test bed, Yamaha boats were on the scene proving their mettle. *Magician V*, designed by Yamaha's Ichiro Yokoyama, won the 1978 Quarter-Ton World Championship. (The same designer went on to lead Yamaha's designs for the 1992 and 1995 America's Cup challenges.) Two years later, Linda Weber-Rettie raced her Yamaha 33, *Rough & Rettie*, across the finish line in the Singlehanded Transpac race from San Francisco to Hawaii. In 1983, Yamaha-built *Super Witch* won the Pan Am Cup yacht race. Shortly afterward, another Yamaha design won its class in the Whitbread Round the World Race.

The company's rise to prominence was short-lived, however. Global economic cycles ultimately affected Yamaha too. By the mid-1980s, currency valuations and a softening sailboat market abroad led the company to curtail exports of recreational sailboats. But, unlike the Japanese sailboat manufacturers that preceded it, Yamaha didn't shut its doors. Production for in-country sales continues to this day under a subsidiary named New Japan Yachts. In addition to offering a nice range of daysailers and coastal cruisers, the company continues to sell parts for the boats that last left its shores nearly 30 years ago.

Michael Robertson and his wife, Windy, bought a cruising sailboat in Mexico, sold their Washington, D.C., home, and dropped out of their high-pressure lives in 2011 to voyage with their two daughters, Eleanor (10) and Frances (7). They're currently aboard their Fuji 40, Del Viento, *heading for Mexico's Sea of Cortez after spending more than a year cruising the North Pacific coastline from Cabo San Lucas to Alaska's Glacier Bay. They document their journey at www.logofdelviento.blogspot.com.*

The author wishes to thank Bill Kranidis and the Mariner Owners Association for historical data compiled over the years and maintained online.

Unhooked and disoriented

An inferior anchor was a drag

BY BURTON BLAIS

Autumn in the northeastern part of the North American continent is a golden time of year. Gone are the summer mugginess and drab green scenery, replaced by crisp air and brightly colored shorelines. Gone too is the sailing season. Cold nights and blustery days signal winter's rapid approach and haulout time.

It was early October and time to bring *Mahseer*, our Alberg 30, from her summer mooring in Prinyer's Cove at the eastern end of Lake Ontario to her haulout place in Iroquois, Ontario, 100 miles down the St. Lawrence River. This last journey of the season would see her travel down the North Channel between the Ontario mainland and enormous Amherst Island, across the exposed Lower Gap off the Kingston waterfront, and into the Thousand Islands to wend her way through myriad islands, rocks, and shallows.

The first day out saw us slipping quietly over steely gray water after a clammy departure from Prinyer's under overcast skies. My unshakable shipmate, Amalia, was suffering from a cold. The forecast was for a strong westerly building to 25 knots by midday. That would push us downwind nicely. A 30-knot forecast was in it for the afternoon, but we hoped to be well clear of the exposed Kingston waterfront and into the islands by then. When we reached the Lower Gap just shy of noon, the wind piped up on cue and the following seas began to build uncomfortably as we raced past the ominous facade of the Kingston Penitentiary, making helming difficult and prompting a sail reduction to just the main with the first reef. Running down the length of Wolfe Island, we hoped for some moderation in the sea state upon reaching the immense basin to leeward of the island.

The wind lost none of its strength as we were chased down the 5-mile stretch of relatively open water toward the entrance of the so-called Canadian Middle Channel at the eastern end and thence into the heart of the Thousand Islands, with many granite islands at close quarters. Transiting the easternmost buoy in the basin known locally as the "40 acres," we were washed into the channel by one monstrous swell in whose crest *Mahseer* seemed to bury her hull before starting her charge down the face.

By now the wind had apparently reached its full strength of 30 knots. As we were long past the time to take in the second reef, the boat was difficult to manage with the wind trying to bring her head up one moment and the seas kicking her stern the opposite way the next. Yet I dared not turn head to wind in those seas! Once we were in the channel, off Leek Island, the wind seemed to strengthen further and, with the seas diminished in this relatively sheltered area, Amalia held *Mahseer* head to wind while I scrambled onto the cabintop to wrestle down the mainsail and lash it securely to the boom. While up there, I was overawed by the raw strength of the unwavering blast. With things now under control, we continued our run under a scrap of genoa (with the engine ticking) for Mulcaster Island, a few miles downwind and a familiar anchorage we thought best under the circumstances.

Ensconced in a protected notch created by Mulcaster and some neighboring islands, we lowered the anchor, paying out the heavy chain rode with the electric windlass, and set the hook by backing the engine. This anchor is an undersized claw that came with the boat when we purchased her earlier in the season. Elated to be in safety after so many exertions, we settled in the cockpit. Hiding from Aeolus' searching fingers under the dodger, we lit a good Jimenez cigar and downed a bottle of red wine while Otis in the background urged us to "try a little tenderness."

> "I was jarred by a sudden gust eliciting a low moan from the rigging and causing *Mahseer* to veer on her rode."

Wine and a hectic day's run make for a weary head, so at 8 p.m. we called it a day, figuring to get up for an early start on the next leg of the trip. It had been blowing continuously throughout the evening, but we felt secure nestled in Mulcaster's bosom. I had checked our position relative to some familiar landmarks, including the brightly lit Glen Resort located on the mainland shore less than half a mile to the north and some islands in the distance to the east, and all seemed well. In fact, I had been thinking that, with the strong wind pushing her so hard, we would have a devil of a time breaking the anchor out in the morning. The air outside was positively chilly as I slipped under several layers of polar fleece blankets and buried my head in a soft pillow. What a delight to be inside our cozy little shell on such a night! Snug in my berth, I tried in vain to read Willis Metcalfe's history of seafaring disasters on Lake Ontario. The muffled sounds of rapping halyards conspired with *Mahseer*'s gentle rocking to bring on slumbers.

That uneasy feeling

Just as my consciousness was about to turn the corner, I was jarred by a sudden gust eliciting a low moan from the rigging and causing *Mahseer* to veer on her rode, which rattled briefly against the hull. "Glad I'm snug in here," thought I, and would have dozed off again, except for a nagging feeling that something was not quite right. With the heightened flow of wind, *Mahseer* resumed her former rocking attitude but now I could hear the sound of intermittent rushes of water outside the hull. "Odd," I thought, "The wind must have shifted to the south and is now sending whitecaps into the anchorage."

Long experience has taught me not to ignore feelings of unease. Reluctantly, I left the warmth of my berth to have a look outside. I grabbed a flashlight and sleepily slid open the companionway hatch. The sound of crashing waves was now very present as I aimed my light into the offing. My blood froze. I shall long remember that awful sight of my boat's stern bobbing up and down in a mess of waves falling on a horrifyingly close rocky shore, less than a boat length away.

It took a while for my reeling mind to comprehend the scene. At first I thought the wind had shifted and I had paid out too much scope and we were now being pushed into the northeastern point of Mulcaster Island. But then my beam revealed a small outbuilding perched above me on the bank and I knew none existed on Mulcaster. In any event, the boat did not appear to be pounding on the bottom and perhaps disaster could still be averted. I called to Amalia, now sitting up on her bunk. "My God, we're on a lee shore, no idea where we are. We've got to get her off. Bring me my pants!"

My first action was to start the engine. (God bless the Atomic 4!) Then I went forward to activate the switch on the electric windlass to bring in the chain, in the hope of drawing us toward wherever the anchor was (presumably in deeper water). The boat drew away a short distance, then suddenly stopped. Peering into the water with my flashlight, I could see a huge ball of weeds dangling on the chain. Pulling mightily, I drew the lot up to the water's surface (a scared man's strength, you know!), reached down, and started to tear away at the weeds in an attempt to uncover the anchor.

Meanwhile, I called out to Amalia to put the engine in forward gear and get us into deeper water (or so I hoped — I really had no idea where we were and could only assume the water would be deeper away from the island). She did so, but the boat barely moved. I ran back to the cockpit to see what the matter was and opened the throttle wide, but she still wouldn't budge. *Mahseer* twisted and tugged as though she were tethered. I immediately returned to the foredeck,

Mahseer **and her reflection speak to calmer times, on facing page. The claw anchor that Burton regretted putting his faith in that night is visible on Mahseer's bow, at left. Even in the relatively sheltered Middle Channel, the westerly wind had enough fetch to kick up a rough sea, at right.**

On the morning after their scary nighttime adventure, Burton and Amalia awoke to find *Mahseer* lying obediently to her anchors in a much quieter waterscape.

thinking it best to continue working on the weeds. When I finally did claw my way through the knotted mass down to the anchor I could feel something snagged there, like a cable.

A quick look with my light — By God, it was a cable! An electrical cable, probably supplying power to the island, was caught in the anchor fluke. The compound nature of this sailor's nightmare did not escape me and I am quite certain that a few ignoble utterances passed through my lips. No sloping *Titanic* deck declarations of meeting fate with dignity to be passed on to posterity here . . . just sheer terror and a frantic effort to save my little ship.

With the forces acting on the boat, it was impossible to pull the wire off the anchor, and because the windlass "down" switch on the foredeck was defective, I could not lower the anchor from my position. I yelled for Amalia to toggle the cockpit switch: "Lower the frigging anchor — *now*!" . . .or something gracious like that. With the cable now less taut, I managed to slip it off the fluke and we were immediately released. We motored a short distance away from the island, glad to still be afloat and un-electrocuted, hearts pounding, heads dazed, and bearings lost in the darkness.

Disentangled but distraught

Cold and terrified, with the wind still howling, we made a few tight circles under slow power to ensure that we stayed in what appeared to be safe water until we could gather our wits. We had no way of knowing exactly where safe water might be; all we knew was that we were quite literally "between a rock and a hard place" surrounded by barely visible land masses on all sides in waters we knew to be strewn with rocks and shallows. Which of these vague outlines, we wondered, was Mulcaster, whose environs we knew well enough that we could brave going back to reset the anchor? In truth, nothing was familiar. The lights of the Glen Resort were nowhere to be seen and we could not recognize any of the near islands. We could see the occasional car lights on one of the near shores and guessed this was the mainland along which Highway 2 runs. Totally disoriented, we discussed what was best to do.

What a blessing to have a partner with sangfroid at such a time. Amalia quickly connected the depth sounder so we could at least "see" the bottom and we were relieved to find ourselves in 30 feet of water. This gave us a clue as to where we might be, but in such a vulnerable position we needed certainties, not conjectures. We decided our best course was to avoid wandering about in the dark, which would only add to our confusion and perhaps even lead us back to the fate we had just narrowly escaped.

Seeing a nearby shoreline with a few house lights to windward, we cautiously approached — keeping a worried eye on the depth sounder — and deployed the anchor in 8 feet of water, the landmass ahead offering a lee from wind and seas. Then, resorting to the GPS, we were able to plot a fix and learned we were behind a point jutting from the mainland in an area of good water (with general depths of 8 to10 feet). It was just before 9 p.m., less than an hour since we had said goodnight.

Deciding to stay put for the night, I retrieved our secondary anchor from the lazarette, a Danforth type, and set off in the dinghy into the darkness ahead to deploy this anchor at a 20-degree angle to the first. I wouldn't say that we had a restful night, but we did manage to stay put until morning. In any event, both anchors found a mud bottom this time, so we were quite secure.

The rest of the trip was rather uneventful, involving a long slog motoring downriver to Iroquois over the course of the next day, light and fluky winds, swirling cold in the exposed cockpit: the usual sailor's routine. By the time we made harbor, Amalia's cold had worsened and we were both a bit sore from the previous night's exertions, but *Mahseer* was none the worse for wear from her adventures.

Epilogue

Tracing a line on the chart from our transposed location of that awful night back to Mulcaster, and taking the wind direction into account, it was plain that we had been blown in a straight line by that one strong gust. What remains incomprehensible to me is that we had dragged half a mile without any sensation of movement. The island on whose shore *Mahseer* had been cast has a depth of 10 or more feet right at its rocky edge. The other shorelines in the vicinity tend to have rocky shallows upon which *Mahseer*'s keel would have surely pounded. We were lucky on many scores that night and, in the course of things, some of our reactions were appropriate and others wanting.

The first consideration is our questionable claw anchor. Earlier in the season we had dragged on this very hook in the anchorage on the north side of Main Duck Island in Lake Ontario, a place I have anchored many times in various boats with different ground tackle and never a hint of trouble. The blast that hit us at Mulcaster must have been a strong one. Indeed, we later heard on the VHF radio of 30-knot gusts on

that night. A skipper attends to his ground tackle, anticipating any eventuality, and I was sadly deficient in this duty.

Some readers might also question my judgement in the matter of the electric cable. In my defense, I always verify the chart for the presence of submerged cables and none were indicated as a concern for our situation. Besides, we obviously caught this cable at some distance away from our original anchorage, likely near Popham Island where we fetched up. Ironically, it was probably this very cable that prevented us from knocking into that rocky lee shore.

I believe the manner in which we dealt with our disoriented state once off the lee shore was correct. We exercised the first priority, which was to get to deeper water, made every attempt to avoid wandering too far, and then utilized the available instruments to find a relatively safe place to drop the anchor and fix our position. Going upwind toward shallow water was the best choice under the circumstances, since, once anchored, we would be swinging back toward the (safe) ground over which we had come. After ascertaining that we were in a safe place, we deployed a second anchor to hedge our bets against a repeat event.

Oh, and whatever *did* happen to Glen Resort's brilliant light display? Had we interrupted its source of power? No, it had simply disappeared behind that point of land around which we had drifted.

Burton Blais is an amateur (from the Latin amator*: one who loves) small boat tinkerer, adventurer, and writer who earns his funds as a food microbiologist. He has built and restored a number of boats, from sail and oar craft for camp cruising in our great northern waterways to classic plastic keelboats that enable forays toward broader horizons. When his favorite medium solidifies during the long Canadian winter, he turns to cross-country skiing to indulge his penchant for self-sufficient wandering.*

Dear fellow sailors,
It's not easy to share your "learning experiences" with the rest of us, but we hope you will. Once the adrenaline has receded somewhat, please write to us (karen@goodoldboat.com) about any emergency that caused you to panic or put your boat in harm's way. If we learn from your learning experience, we'll all be better for it. Getting it off your chest might even be therapeutic. We pay for these articles and, to sweeten the deal, will send you a Good Old Boat ball cap or T-shirt as well. In this case, we'll send two. For her role, Amalia earned our respect that night. We hope her cold is long forgotten, even if the night itself remains a vivid memory. *–Editors*

Purchase, refit, and

After buying back his boat, he brought her back again

The legendary singlehanded sailor looked me in the eye, paused for dramatic effect, and said, "Ray, buy this boat. You will not regret it." When the great sea mystic, Bernard Moitessier, gave me that wise advice 30 years ago, I heeded his counsel. And just as he predicted, there have been no regrets. In fact, I am as happy with my little vessel now as I was three decades ago.

Here is a good test for the honesty of that claim: I have *never* seen another 30-footer I would swap for my beloved *Aventura*. Her combination of strength, beauty, speed, and seakindly motion are all one could ask for in a pocket cruiser. In more than 20,000 miles, most of them singlehanded, she has never failed me or even worried me.

Aventura is a 1978 Golden Gate 30. She's a full-keel sloop of moderate displacement designed by Chuck Burns. Sisterships were built under the brand names of Farallon 29, Bodega 30, and Bay Island 30. Back in 1983 when I was researching them, I was told she was a Cadillac boat at a Chevrolet price. But these boats had been built during the oil crisis of the late 1970s when the price of resin skyrocketed along with that of petroleum. This greatly reduced profit margins and many builders went out of business, selling their molds to others.

Now, even though I have just praised my boat as though she were the Goddess of Rum, I failed to mention that when I bought her she was a bit . . . cosmetically challenged. Her teak had deteriorated to the color of pewter. But if she had been a varnish-perfect princess, I would never have been able to afford her. However, her deteriorated teak didn't alarm me because I had a sanding brigade available at my disposal.

And what an 80-grit gang they were! Because I am that rarest of cruisers — a sailor who supports his vagabond ways by juggling bowling balls — my friends are a bit . . . eccentric. There's Dana who juggles torches with a live chicken standing on his head, Babycakes Babs the tap-dancing cowgirl, and Tommy the roller-skating accordionist. Because of the leisure time that graces the lifestyle of someone with "no visible means of financial support," my friends were all willing to spend a few hours sanding in exchange for beer, sandwiches, and other enticements.

Since 18 of my loony friends showed up to help me, we only had to sand about 4 feet each. In one hilarious afternoon, we discovered some stunningly beautiful teak under that dull gray camouflage. Over the next few weeks, I did the finish sanding and laid on 10 coats of high-gloss varnish. My sweet little sloop now gleamed like a new bride's smile. She looked exquisite.

And she remained that way for nearly two decades as I happily wandered the wide waters in her. Together we did a year-long cruise to Mexico and Hawaii and back to San Francisco in 1985. Next, in 1990, I competed in the Singlehanded Transpac (California to Hawaii) and then sailed her back to San Francisco, also alone. In 1992, I gave up my beautiful Victorian rent-controlled apartment in San Francisco and adopted the cruising life full time.

Sold to "the kids"

But early in the year 2000, a combination of extremely difficult family and personal circumstances made it necessary for me to sell *Aventura*. For someone who had meshed so effortlessly into the sea-gypsy life, this was Bad News. But there was also some Good News because my

Pewter is a fine color for metal but not for teak, at left above, so Ray made it the color he prefers with several coats of varnish.

repeat

BY RAY JASON

impeccable boat was purchased by a wonderful couple.

I thought of them as "the kids" at the time, because he was only 19 and she was barely 20. But even though their chronological years defined them as youngsters, their nautical miles and knowledge surely qualified them as salty old dogs. Claude had already circumnavigated. And he didn't do it as a teen aboard a family boat; he made the rounding with a couple of buddies who were only in their early 20s. Julie, his sweetheart at the time and wife now, was born in Paris but spent her entire life growing up aboard her parents' French cruising boat. The two met in Tahiti during Claude's circumnavigation and vowed to get a boat of their own after he completed his voyage.

They had spent months unsuccessfully wandering the want ads and docks of South Florida searching for the boat of their dreams, so they were feeling pretty dejected as they walked toward *Aventura*. The instant they saw her, they knew their luck had changed and they bought her within 48 hours.

It was a heart-rending experience for me to cast off the docklines for the young couple and watch my beloved sloop sail without me for the first time in 17 years. As I tossed the final line aboard, I told "the kids" to contact me first if they ever had to sell her.

Reunion

A couple of years later, the totally unexpected email popped up on my laptop. Claude's dad had bought a large surplus vessel from the South African navy and wanted to convert it to an expedition ship. The young cruisers were going to dedicate themselves to that project and needed to sell *Aventura*. They wanted to know if I would be interested in buying her back for the same price that they had paid me for her.

To make my decision astonishingly easy, they informed me they had done some serious upgrades to her. That was an understatement. They had swapped out the old Volvo for a brand-new Yanmar diesel. They had added radar, a wind generator, refrigeration, new standing rigging, and other gear I could never afford on a bowling ball tosser's salary.

Although this was already a very generous offer, they made it even more alluring by mentioning that my once and future sloop was in a boatyard in Carriacou, down near Grenada. I had always wanted to sail the fabled West Indies and now I wouldn't have to beat into the trade winds for weeks to get there.

The only downside to this storybook reunion was the fact that, while dedicating themselves to upgrading the equipment aboard *Aventura*, Claude and Julia weren't able to maintain her cosmetic beauty as I had always done. And, since she was now way down island, I couldn't afford to fly in even a few members of my long-ago sanding brigade . . . those who were not presently incarcerated.

Singlehanded sanding

By doing it alone, I made much slower progress, but this also gave me far more time to savor the transformation. Three areas begged for my attention. The terminally gray teak was the primary project. Then I had to discover whether there actually was "stainless" steel under what currently appeared to be "rust-more" steel. And finally, the white fiberglass had oxidized to the point at

The young couple to whom Ray had sold *Aventura* upgraded her equipment but neglected her cosmetics, at left. When Ray bought her back, he restored her woodwork, polished her stainless steel, repainted the non-skid, and cleaned up everyting else, at right.

which it was hard to determine where it ended and the gray non-skid began.

A cruising friend loaned me a palm sander. After a few days spent enjoying its labor-saving efficiency, I wanted to build a little shrine to the palm sander and make daily sawdust offerings. This is one great tool. I also eased my sandpaper burden by cutting down the number of teak objects I used to varnish. Many of these were little in size but large in nuisance. The bases under winches and beneath turning blocks are good examples of pain-in-the-palm items that I now covered with Pettit Easypoxy Mist Gray paint. It goes on easily, is readily available, and is very durable.

There is a phase when the teak becomes a pale salmon color so gorgeous I didn't want to apply the varnish. Unfortunately, that stage lasts about as long as a campaign promise, so I laid on 10 coats of West Marine Admiral's Varnish. Between each application, I sanded with 220-grit; except for the last two coats, which got the deluxe 400-grit treatment.

A boat-keeper's tricks

To convert my stainless steel from rust-more to shine-more, I used basic Brasso. It is the only metal polish widely available in Panama. When applying it with a clean rag was not sufficient, I switched up to green scrub pads. On the really tough rusty spots I used toothbrush-sized metal brushes.

To resurrect the hidden beauty of the non-skid I used Easypoxy Mist Gray marine enamel. A barbecue brush does an excellent job of prepping the surface. I used masking tape on the long linear surfaces and would then freehand in the rounded corners. Cutting the brush bristles down until they are only about an inch long helps keep the paint from building up between the high spots in the non-skid.

A final trick that deserves mention in my boat-keeping arsenal is the use of acetone on the lifelines. In my early days of owning *Aventura*, I experimented with many techniques for removing the grime that seems magnetically attracted to white lifeline covers. I finally hit upon acetone as the miracle gunk remover. Other boaters on the docks cautioned me that it was too harsh and would soon eat up the white coating. Well, brothers and sisters, I am here to testify that for more than 25 years now this has not occurred. My lifelines remain clean and white.

In closing, I'd like to address the commonly held belief that sailors can either go cruising or they can devote themselves to keeping their boats looking beautiful. In my experience, this is simply not true. I have been out here in the fleet for a very long time and have discovered many cruisers who maintain their boats superbly and yet rack up the miles, the ports, and the adventures. To me, being cocooned in a beautiful boat is well worth the extra effort.

Ray Jason is the author of Tales of a Sea Gypsy. *He and* Aventura *recently completed a fun voyage from Key West to Mayan, Mexico, then Belize, the Rio Dulce, and back to Bocas del Toro, Panama, where he is usually anchored out by his lonesome working on his "other writing." Visit www.theseagypsyphilosopher.blogspot.com for a sample.*

Kayak cart

Wheels take the weight off a paddler's shoulders

BY BEN DOUCETTE

It's not easy for a sailor to stay occupied with boat-oriented projects when snow covers the ground. Building a cart that simplifies moving a kayak or dinghy around on terra firma is one possible winter project. I cannot take credit for the design; I have seen various versions over the years. I just altered things to suit my needs.

I made our cart fairly large with a wide wheelbase to handle the sloping terrain between our kayak shed and car. We don't need to transport the cart in or on the kayak, so we gave up compact size in favor of stability. We need to move the kayak about 400 feet uphill if we wish to cartop the kayak, so having the cart support the entire weight of the kayak is very convenient. I made the bunks 14 inches apart and 21 inches long. This easily accommodates even our narrowest kayak, which has a 22-inch beam.

The cart is easy to build using parts found at the local hardware store. The tools you need include a measuring tape, hand saw, and screwdriver (a small cordless screwdriver makes the work a lot easier).

Parts and assembly

- 10-foot length of 1¼-inch plastic electrical conduit. I used about 81 inches.
- Two 1-inch electrical conduit 90-degree elbows. These are used to make a leg to keep the cart upright when putting the kayak on the cart. They also add rigidity to the bunks the kayak sits on.
- One plastic 2-inch hose fitting with a 90-degree angle. This joins together the conduit elbows to make the leg. I drilled a small hole at the lowest point so it would not hold water.
- Six plastic 2-inch-tee hose fittings.
- One pool noodle.
- One ½-inch steel rod for the axle. I made mine 29 inches long.
- A few pieces of hose or conduit of different diameters to act as a bushing to make the axle fit snugly inside the 1¼-inch conduit.
- Two plastic wheels, the bigger the better. Mine were 12-inch wheels.
- Two ½-inch hose clamps. I used these to keep the wheels on instead of drilling the ends of the axle to take cotter pins.
- A handful of 1-inch deck screws.

The cart goes together easily and the deck screws go through the plastic without the need to drill holes first. The hardest part was making a hole in the pool noodle large enough for it to slide over the 1¼-inch conduit. I found that by sharpening the end of a scrap piece of conduit with a grinder, I could twist it into the end of the noodle to cut the hole.

I tie the kayak to the cart tightly and keep the cart from slipping back by putting a second line around the forward edge of the cockpit lip. If I had to wheel it over rougher terrain, I would use two tie-downs to make the kayak more secure and to prevent it from twisting on the cart. Webbing and quick-release fastex buckles could be used for a fancier way to secure the kayak.

Ben Doucette and Sue Vey live in Seabright, Nova Scotia. They spend their summers kayaking and sailing the coast of Nova Scotia aboard their Ontario 32.

The frame for the kayak cart is assembled from electrical conduit connected with tees, top two photos. Sundry pieces of hose serve as a bushing for the axle and the 90-degree conduit elbows form the parking leg. Ben ties the kayak securely to the cart and is ready to roll.

Protecting a dinghy's skeg

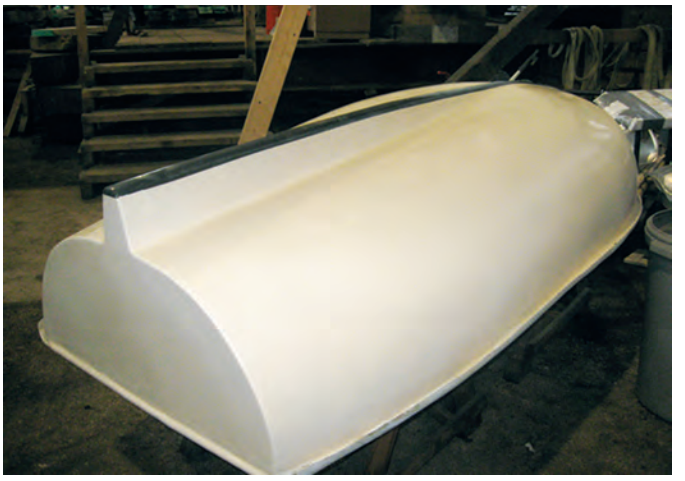
Limiting wear from beach landings

BY BEN ZARTMAN

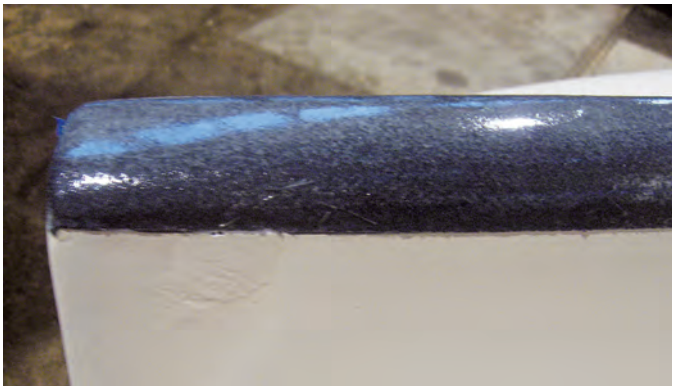
The cruising life is a hard one for dinghies, especially in tidal areas where they often have to be dragged 100 feet and more up pebble beaches. After a few years and hundreds of surf landings on beaches with varying grades of abrasiveness, our faithful fiberglass rowing dinghy was beginning to show some wear on the skeg. Though it's far from wearing through, since we carry the dinghy whenever possible rather than drag her, it seemed time, while giving her a fresh coat of paint, to also add a little protection to the skeg.

On the advice of a New Zealand boatbuilder, I ordered some 60-grit carborundum (silicon carbide) powder from a rock-hobby supply, made a thick mixture of it with G/flex epoxy, and painted it along the entire length of the skeg. I should have made it thicker than I did, since it ran off slightly onto the masking tape, but it made a nice thick layer with a smooth finish. The carborundum powder, which is harder than almost anything but diamond (it's used for making sandpaper), should take a good long time to wear off and give the dinghy's bottom a greatly extended life, regardless of how many prickly beaches it gets pulled up onto in the course of our future travels.

Ben Zartman lives with his wife, Danielle, and their three young daughters aboard Ganymede, *the 30-foot Cape George Cutter he built from a bare hull. The carborundum skeg paint performed admirably, Ben says, as they explored the Canadian Maritimes last summer. They are wintering again in Newport, Rhode Island. Follow them on their blog at www.zartmancruising.com.*



***Ganymede*'s dinghy gets dragged up all manner of beaches and its skeg was showing wear. At a boatbuilder's suggestion, Ben applied a mixture of carborundum in epoxy as a protective layer, above.**



Carborundum is harder than most rocks. Take that, pebble beaches!

Racor filter fix

A bolt replaces a faulty valve

BY DAN MILLAR

After removing the inoperable valve from his Racor filter, Dan tapped new threads, far left, and inserted a nylon hex-head bolt with an O-ring seal, at left.

Though I have never seen any of this described, I have been having terrible problems with the self-venting drain valve on 500 series Racor filter bowls. The valve progressively binds up so badly I cannot turn the valve, either to loosen it and drain water or to tighten it again. My tentative suspicion is that the heat from the engine causes the valve to expand more than the plastic bowl. I have discussed the problem with a Racor technician, who tells me he has argued with his management time and again that the part is poorly designed and doesn't function well.

The worst part of the saga is that, although replacement drain valves are readily available, the process of extracting the old, bound-up valve is horrendous and violent, and requires prying, hammering, drilling, and many cuss words. Knowing I would face the same problem again at some time, I didn't want to install a new valve. Instead, I determined to modify the bowl to make draining it easy.

After removing the old valve, I drilled out the threads with a 17/32-inch bit, then tapped new threads with a 5/8-inch tap. Since the bowl is plastic, it was important to be patient and work the tap slowly and carefully, backing off repeatedly before screwing in the tap a little more each time. A good sharp tap will cut the plastic nicely.

On the bottom of the bowl there are three protuberances and three adjacent dimples in a triangular pattern. I sanded these out completely. I then fitted a 5/8-inch nylon hex-head bolt onto the new threads with a snug O-ring for a seal. (***Note**: Constantly check this repair to make sure that it never leaks. –**Eds**.*)

The bottom is now fluid-tight. The bowl doesn't drain immediately upon my loosening the bolt but, as I progressively unscrew it, the bowl begins to drain before the bolt is completely out.

Simplicity carries the day. Gone, at least for the moment, is my frustration!

Dan Millar is a seaplane pilot with an airline based in Seattle. In the winters, he and his wife, Peggy, sail their 51-foot Morgan ketch, Transcendence, *interisland from Jolly Harbour, Antigua, West Indies.*

Mail buoy

Wendy Moritz loved the photo section of the September 2013 issue, so she sent us Molly Anderson's photo of *Orient,* a 1965 wooden-masted Cheoy Lee, taken in September while passing Maryland's Smith Island in Chesapeake Bay. Send your high-resolution sailboat photos to jstearns@goodoldboat.com and we'll post them on our website. If we publish yours here, we'll send you a Good Old Boat T-shirt or cap.

continued from page 9

but you simply won't see a shabbily dressed America's Cup crew-member. This was the market I set out to address when I created the FFD — the Fink Flotation Device. It is designed at once to keep any unfortunate crew overboard or dunkee safely and well upon the surface of the water while providing suitable garb to encourage instant rescue and proper respect among first responders. Enhanced press coverage of any incident involving the Fink Flotation Device will be a certainty. In the event of a ventral overboard landing, a suitable EPIRB (External Posteriorly-affixed Identifying Relay Beacon) was incorporated for further visibility. I am currently in discussion with several West Coast venture capitalists concerning start-up financing. Both West Marine and Defender have expressed interest in the FFD. For further information concerning this project, please consult www.corkybuchon.com.

–Al Fink, Denver, Colo.

There we go again!

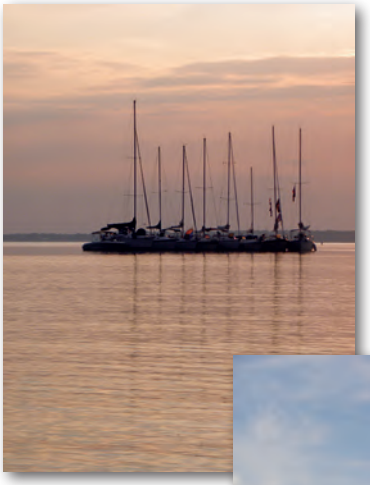
The large illustrations in the Windvane Steering 101 article published in the November 2013 issue were incorrectly credited to Ted Tollefson, who typically illustrates and designs the 101 pages. This time, however, the illustrations were based on existing illustrations we had published previously. These CAD drawings were developed for an article on windvanes published by *Good Old Boat* in May 2002. Walt Pearson created the original art. Our apologies to Walt for failing to give credit where credit is due.

–Editors

Reading my mind?

After a nice weekend aboard my Irwin 23, *ShaBoat Shalom*, with a quiet night at anchor in one of the coves at Carlyle Lake, Illinois, I started my work week with a nice surprise: the arrival of the September 2013 issue of *Good Old Boat*.

The cover picture (taken in Carver Cove, Maine) looked like some of the pictures I had taken two evenings earlier. Then I saw in the Mail Buoy section a letter from a former sailor at my marina on Carlyle Lake who has thrown off an attachment to the land and now follows the sun. Next, I turned a few pages to the photo spread to see a photo of a raft-up at the mouth of the same inlet on Carlyle Lake where I like to anchor. This group rafts up almost every weekend during the summer.



–Steve Wein, St. Louis, Mo.

Boats for Sale

Stonehorse 24
1971 Edey & Duff sloop. Classic Sam Crocker design. Full keel, efficient sail plan. 8-hp Yanmar diesel. Tanbark sails. New cushions. Trailer included. V.G. cond. East Taunton, MA. $12,000.
Robert Pirozzi
508-269-1173
rppirozzi@aol.com

Ranger 28
1977. *Gilded Lily*. Fully restored. Feature boat Sep/Oct '06 issue. Many upgrades. Beautiful, fast, comfortable sailer. Enhanced A4. New bottom paint. Dinghy, davits. On the hard, Atlanta. $10,500.
Walt Hodge
770-498-1678
walt@wingnwing.com
www.wingnwing.com

Capehart 47
1969 classic motorsailer. Single Ford Lehman diesel in great running cond. Sound hull (layered wood/fiberglass), beautiful teak interior. Got boat in divorce. Must sell as is. Restoration required. Serious interest only please. On a mooring in San Diego. $12,000 OBO.
Cheryl Bain
Cheryll666@gmail.com

Abbott 28
1967. Rare example of an Abbott cruising sloop. 5 sails, Atomic 4. Newer bottom paint, standing headroom, 12V and 120V electric, marine head, microwave, AM/ FM/ CD radio, VHF radio. Lots of other equipment, standing rigging replaced '07. Interior needs some TLC, but fully functional. Must sell. New boat on way. Toledo, OH. $3,000 OBO.
Kevin Clark
419-836-4136
419-344-2154
kclark6@woh.rr.com

Herreshoff H-28
1963. Classic sailing ketch. Wooden hull. 30-hp Atomic 4 engine. Exc cond. GPS, Autohelm. 5 sails including cruising spinnaker. East Lake, OH. $10,000.
Warren Burrows
440-488-6294

Vindo 35
1976 Swedish sloop. Sound fiberglass hull. Beautiful teak decks and cabintop over fiberglass. Newer Yanmar diesel 3GM30 (about 11 yrs) w/210 hrs. Fuel system polished, new Racors ('13). RF jib, Bruce anchor. Engineer maintained. Needs some restoration. Annapolis, MD. $24,000.
William O'Neil
239-565-2345
thejobo@aol.com

Bodega 30
1986 San Francisco-built blue-water veteran. Sailed to Alaska and through Panama Canal to Bahamas. Set up for singlehanding but ideal for a couple. Now needs a new captain to follow the dream. Solid full-keel construction with beautiful teak interior. Extensive sail and equipment inventory. Email for specs and additional photos. Serious inquiries only please. Titusville, FL. $16,000.
Sharon Kelly
321-506-1062
321-615-1375
sailsundancer@yahoo.com

Morgan 30
1971. Three careful owners from new. Very original (in a good way!), except for shiny Yanmar 2GM20 w/low hrs. Tillerpilot, VHF, depth. Sailaway cond. Afloat in Flag Harbor, MD (dock paid for until Feb 2014). $11,500.
Stuart Haddon
410-394-9123
stu@hadjer.net

Gulfstar Motorsailer 36
Rare 1971 upgraded center-cockpit sloop. Fiberglass trawler hull, 3.5' draft, 7 knots at 1.5 gal/ hr. Rebuilt in '12: 80-hp Lehman, transmission, Bimini, bottom paint, Cutless, Racor filter, macerator. Upgrades added: 3½-kw genset, A/C, 2 heads, holding tank, inverter, 110V stove, fridge, VHF, GPS, Autohelm. Davits, 12V windlass, standing rigging, mainsail, 110 RF jib, 150 genoa. Venice, FL. $29,900.
William Owens
941-497-3654
wowens19@comcast.net

Grampian 34
Deck and hull assembled together by owner in '06. Lead keel 6,400lb. Year-old Harken furling. 150 genoa, anchor w/100' chain on electric windlass. 30-hp Nissan OB. Bimini and complete enclosure 2 yrs. WS, Garmin GPS and depth, large marine inverter w/50' cord. Home-built, ocean-rated with many more options (too many to list). Tottenham, ON. $19,500.
Merv McDowell
905-936-2038
tullyho@gmail.com

Tartan 34C
1976. Freshwater boat w/Yanmar 22-hp diesel, 3'11" draft w/CB. Lewmar ST primary and halyard winches new '10. Canvas includes dodger, Bimini, and connector, new '10, and mainsail cover, new '13. Hood FB main with Harken battcars, Harken RF w/150 genoa. Custom cockpit cushions. Wonderful teak interior w/Origo non-pressure alcohol/electric stove, fridge, H/C pressure-water. Cheboygan, MI. $28,500.
Paul Wenner
513-777-2158
wennerpa@gmail.com
http://76tartan.wordpress.com

Nor'Sea 27
1986 factory-finished aft-cabin sloop w/3-axle EZ Loader trailer. Very generously equipped and well-maintained bluewater cruising boat. Please contact me for pricing and an extensive listing of items included in the package. Recent pictures on website. Denver, CO. $40,000.

Al Fink
303-377-1528
afink@q.com

Tartan 34C
1970 classic Sparkman & Stephens design. Hull #136. Third owner. 3'11" draft with CB up. Perfect for exploring shallow bays. 2-year-old Moyer Marine FWC Atomic 4 w/16 hrs, professionally maintained. Deck re-cored by previous owner. Just surveyed: exc cond. New cushions, stove, winches, running rigging, much more. Falmouth (Cape Cod), MA. $19,900.

John Dow
617-291-1865
stigdow@comcast.net
www.yachtworld.com/boats/1970/Tartan-34-C-2559046/MA/United-States

C&C 27 MK II
1974 w/twin-axle trailer. Fresh water. Good cond. Rebuilt rudder post, new bottom paint '13. Main, 155 RF genoa, 2 spins plus extra sails. All lines lead to cockpit. GPS, W/S/D. Full list of equip. and photos available. Lake Geneva, WI. $11,000.

John Lavallee
815-378-5237
jlav0322@charter.net

C&C 30 Mk I
1971. Well loved and upgraded with ST primary winches, traveler, bonded electrical ground, lines led aft, double lifelines. Tiller and Atomic 4. V.G. sails, newer interior, fresh teak, custom shorepower and extra water for cruising. Sound decks and hull. Steel cradle and paid winter storage. Holland, MI. $13,500.

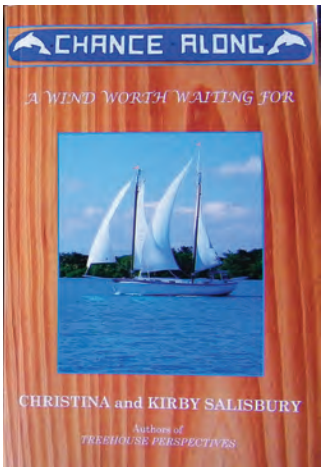
Richard Winslow
269-986-4831
Rhwins1060@aol.com

Rhodes Bounty II 41
Beautiful 1957 Phil Rhodes sloop strongly built at the dawning of the fiberglass era. Completely restored inside and out by Deltaville Boatyard over the past several years at a cost far exceeding the current asking price. In the water in Deltaville, VA, in sailaway condition. $65,000.

Skip Madden
804-436-7131
skipmadden@gmail.com

Next Good Old Boat Ad Deadlines

Issue	Deadline
March/April	Dec 23, 2013
May/June	March 4, 2014



Great New Book
Chance Along: A Wind Worth Waiting For. Descriptive, informative, humorous, and exciting, it will give you the inspiration to finish your own project. A personal story in which financial and other obstacles that few can imagine are overcome. It describes the rewards of the boatbuilding process and the life-enriching experiences that occur when a sailor bonds with his craft. Introductory offer on website.

Kirby Salisbury
falconfrst@yahoo.com
www.amazon.com/author/christinakirbysalisbury

Products - General

Products - Gen, cont

Restoration

Boatbuilding

Cushions/Bedding

Sails/Canvas

Boat Deliveries

Everything you wanted to know about our classifieds

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

- Total word limit: 75 words.
- Web ads remain posted for approximately 90 days.
- Send email text to: classifieds@goodoldboat.com
- Or by post to: Good Old Boat, 1501 8th Ave. N.W., Jamestown, ND 58401.
- Photos may be emailed as jpgs or sent by post for scanning at *Good Old Boat*.
- Payment is made in advance by check or credit card.
- For full details, go to: www.goodoldboat.com/resources_for_sailors/sailing_classifieds or call 701-952-9433.

Display classified ads (boxed product and service ads)

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

Let us know when your boat sells!

Next Good Old Boat Ad Deadlines

Issue	Deadline
Mar/Apr	Dec. 23
May/Jun	March 4
Jul/Aug	May 5
Sept/Oct	June 30
Nov/Dec	Sept. 2
Jan/Feb 2015	Oct. 31

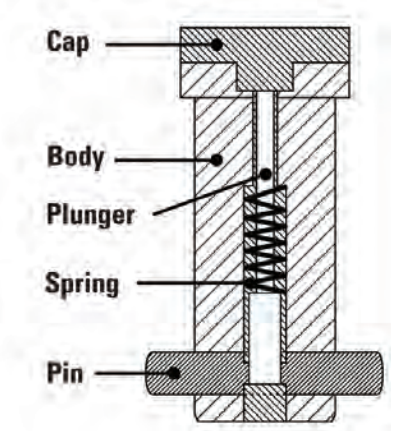
Deadlines are subject to change, Please visit http://www.goodoldboat.com/advertiser_services/ad_deadlines.php for updated information

"My Team Talks" Bluetooth headset

Cruising Solutions has done it again. Its "My Team Talks" Bluetooth wireless headset offers hands-free operation and full multiplex capability for up to four headsets over a 900-meter (line-of-sight) range. The rechargeable lithium battery provides up to 10 hours of talk time or seven days on standby. The unit is water resistant, lightweight, comfortable to wear, and delivers very good audio. It also includes two different microphones. Because the headset is Bluetooth, it can interface with your cell phone and other Bluetooth devices. Each unit sells for $179.95 (two needed for a pair). For more information and to purchase, visit the Cruising Solutions website, www.cruisingsolutions.com.

–Michael Facius

Jurgan Tool-Free Clevis Pin



Hans Jurgan Hinke invented and manufactures a clevis pin that eliminates the need for conventional cotter pins and the tools for installing and removing them. The Jurgan Tool-Free Clevis Pin has a built-in mechanical system that holds a unique "cotter pin" in place with a spring-loaded plunger. Pulling the cap of the clevis pin away from the body of the pin and rotating it 90 degrees frees the "cotter pin" for removal — no tools required. This security pin can then be stored in the end of the clevis, where it's retained by another spring. Currently, almost 50 different sizes are available at prices from $35 to $45 each. For ordering, more information, and to see a video of how the Jurgan Tool-Free Clevis Pin works, go to www.crealock.com.

–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.

The right boat for the job

Opening the door to a new paradise

BY CONNIE MCBRIDE

You don't have to cross oceans to enjoy sailing and you don't have to sail around the world to have grand adventures. As my husband, Dave, puts it, "I can scare the crap out of myself in an 8-foot dinghy in 4 feet of water 100 feet from shore."

Somewhere in the world of sailing, the joy of small boats has been overlooked. To be a "real" sailor anymore, it seems you need a bigger boat than you can handle, more gadgets than you need, and an itinerary that leaves no room for spontaneity or fun.

When we set off as vagabond sailors, we sailed a 34-foot Creekmore. With her full keel, powerful rig, and solid hull, she is a go-anywhere boat. And go we did. After more than a decade of bluewater sailing and wandering from island to island, we sailed back to Florida. We dropped off our youngest son on his mother continent, scanned the horizon, and thought, "Now what?" That's when *Walküre* found us.

We weren't really looking for a different boat, just a different adventure. But when we saw *Walküre* for sale in the local boatyard, we realized that she was exactly what we needed. Our new adventure would be defined by the capabilities of the newest addition to our fleet. When we bought *Walküre*, we bought into a new kind of sailing dream.

A Bolger AS-29 (AS stands for Advanced Sharpie), *Walküre* is not what comes to mind as a cruising boat if what you have in mind is conventional cruising. I understand the lure of clear water and secluded palm-fringed beaches. But, after a while, even paradise starts to show its faults. Now that we were back in the home country, what we dreamed of was gunkholing in shallow water. We were ready to appreciate the kind of anchorages we previously sailed right by because of *Eurisko*'s 5-foot 6-inch draft. Another kind of boat entirely, *Walküre* draws 13 inches and — with masts that we can step ourselves in minutes — she fits under any bridge higher than 8 feet. Suddenly, the parts of the East Coast we had missed started to sound exciting. We looked at charts with new eyes. Every few minutes Dave would say, "We can go here. And here." Florida Bay, the Great Dismal Swamp, North Carolina's Outer Banks, and the Delmarva Peninsula are all accessible for us to explore as we never could before.

Although *we* haven't changed at all, I've noticed a change in how people talk to us and look at us now that we are sailing *Walküre*. We aren't seen as "real" sailors anymore. "Well, you certainly can't cross oceans in *that* thing," some say. Maybe not. But we *can* go to deserted islands and up small creeks to towns that haven't been overrun by cruisers, and we *can* put her on a trailer and sail almost any lake in the country. That doesn't earn us the respect that our bluewater *Eurisko* used to, but we're OK with that. We know that for what we want to do, *Walküre* is perfect. To us, having the right boat for the job is more important than being "real" sailors. Aboard *Walküre* we're learning that being in too big of a hurry to sail away means you might be sailing right past a different kind of paradise.

Connie McBride and her husband, Dave, have been cruising for 12 years. They are still sailing the right boat, whichever one that may be. You can read about their adventures at www.simplysailingonline.com.

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