Good Old Boat

Still sailing after all these years!

July/August 1999

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This Issue

Creating a community

***Good Old Boat* magazine is about:**

Creating a community of sailors – Through our directory of sailing organizations and contacts, we're developing links between sailors.

Offering a resource – By pooling the knowledge of our readers, we're creating a directory of the suppliers of parts and services we all need.

Keeping our boats afloat – Our technical articles focus on maintenance and upgrade issues and give them the space they deserve.

Celebrating older-model sailboats – We emphasize pride of ownership.

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Good Old Boat

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About the cover . . .

Mary Jane Hayes continues to astound us. Her photography is always exceptional and a pleasure to print in these pages for others to enjoy. She also creates prose that is photographic in quality. That, too, must be shared *(see Page 40)*. When we asked for cover ideas for celebrating our first anniversary, it was Mary Jane who suggested the flag. And *what* a flag it is!

What's left to say?

by Karen Larson

People have asked us whether we'd run out of material to write about after a few issues and, if so, what then? I used to worry about the same kind of thing in my youth as I was beginning to form relationships with members of the opposite sex. What would happen, I wondered, if you got married? Could you run out of things to talk about after a few years? What then?

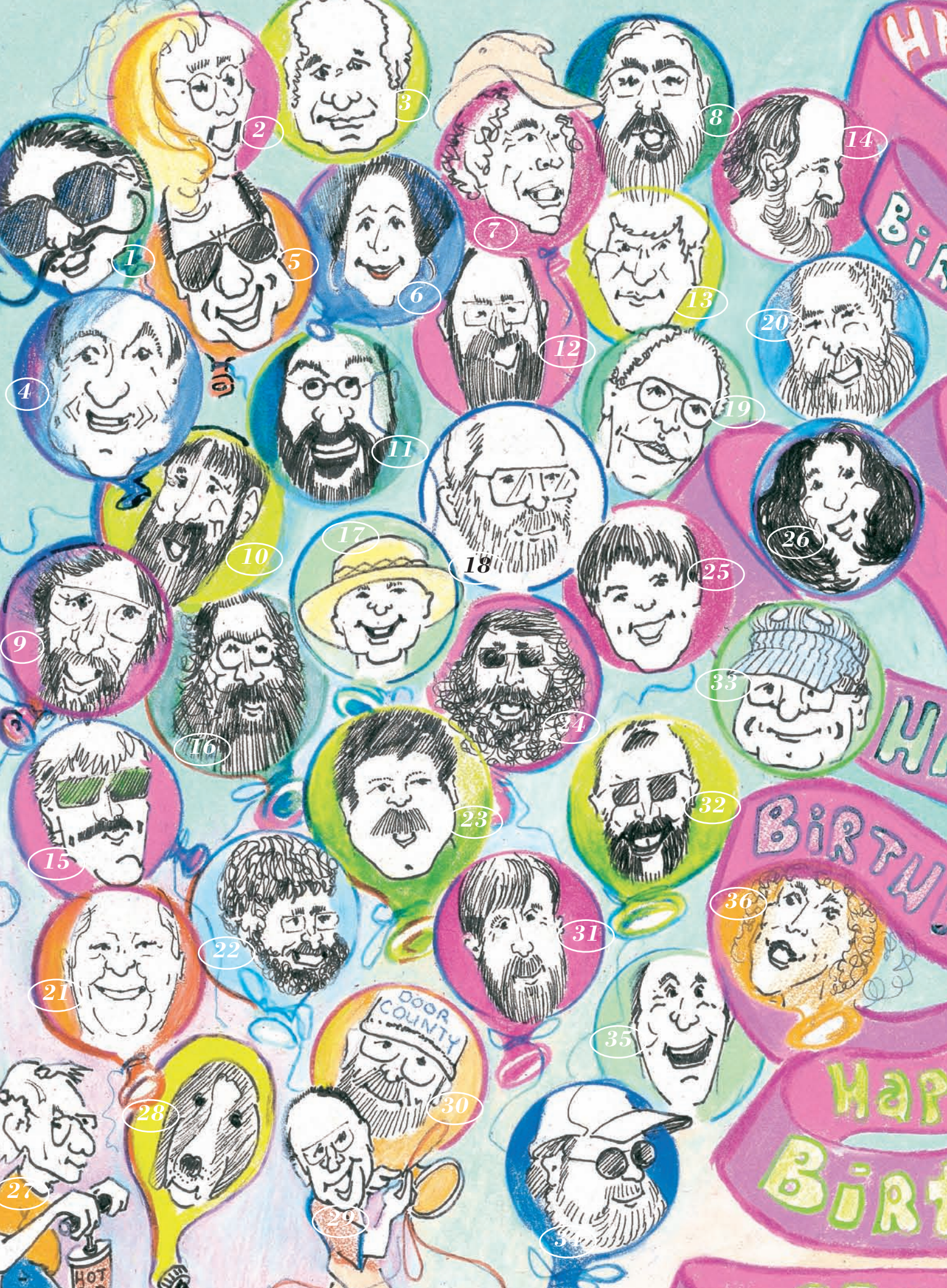
Instead as this magazine has evolved, it has grown beyond our big idea and has become something created by the entire community of sailors. People give us their ideas and suggestions, and we take a new leap forward. In almost every issue we have added a new section for our readers to write, allowing you to share the depth of your sailing experience with the rest of us. In the first issue I introduced the *Reflections* column and invited readers to submit their own *Reflections* pieces.

That column has been so popular with readers I may never have the chance to write another one. We had to invent *Last Tack* in order to have our own place to write these pieces. We've had so many good submissions that *Good Old Boat* is set for *Reflections* pieces until May 2001. We don't have a *Reflections* piece scheduled for that issue yet, but I'll bet one's on the way to us by mail or email.

Next we added *Cruising Memories* to accommodate other pieces that were too good not to share. Then came the *Simple Solutions* features, which are short and inexpensive fixes you've discovered while out there cruising. And there were the short restoration pieces which began with David Berke's piece on the Bristol 27 in our last issue and continued with David Telle's "New Mast for an Old Cat" in this issue. (I don't think your name has to be David to write these, but it helps.) We listened to those of you who wrote about missing *Small Boat Journal* and added the column we call *Small Wonders*. This is usually written by Ken Textor, but we had a neat story to share from the West Coast, and asked John Vigor to pinch-hit for this issue, since we weren't ready to offer Ken airfare to Seattle. *(He was willing to fly, however!)*

Like our *Reflections* piece, our feature boats have been very popular articles. So far we've looked at a Cape Dory 30, an Ericson 35, a Niagara 35, a Blackwatch 19, a Baba 30, a Pearson Commander 26 and, in this issue, a Block Island 40. We get notes and phone calls daily reminding us of another deserving boat. The demand's been so high I often walk away muttering, "So many boats, so few pages." With only six issues a year, we made promises which scheduled us well into next year before I figured out what was happening. Fortunately, John Vigor's book, *Twenty Small Sailboats to Take You Anywhere*, has doubled the number of boats we can feature at a time, since we're now committed to one feature boat article and one chapter from his book in each issue. And still we aren't keeping up with the demand.

Our technical articles have developed in much the same way. You write or call with suggestions or subjects you'd like to see covered, or with articles you've written on subjects pertinent to other good old boat readers, and so it goes. Will we run out of material anytime soon? It's unlikely. Expect us to be here — still carrying on this conversation with you, our partners — for many years to come. With this issue we celebrate our first anniversary as publishers. It's been a fascinating journey so far. Thanks so much for being here with us as we grow, for sending comments and contributions, for subscribing, and for being part of our community of sailors.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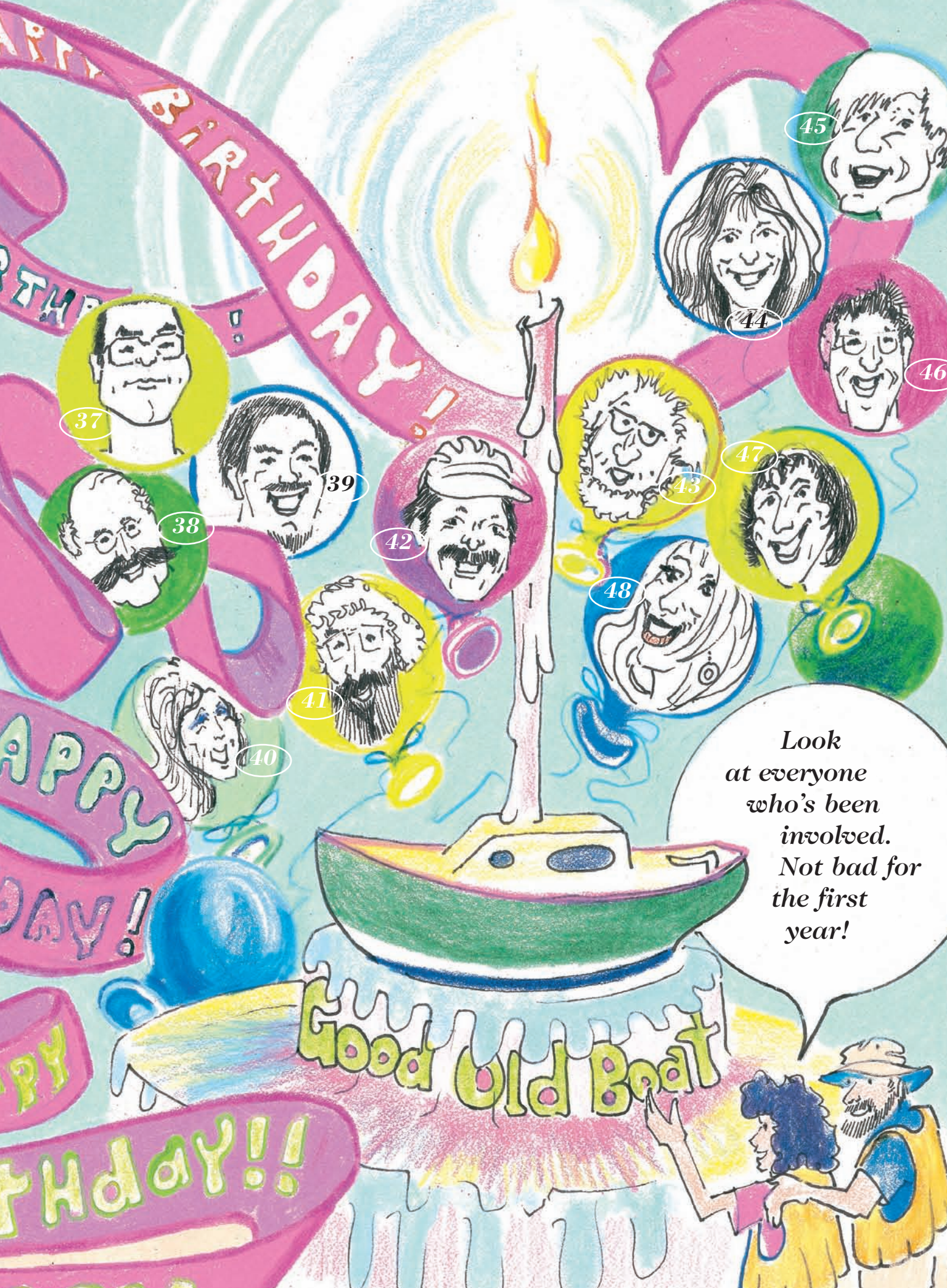
BIRTHDAY!
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Good Old Boat
Look at everyone who's been involved. Not bad for the first year!

Contributors

This issue

3 – Jim Isbell, Page 18, began sailing at age 33, crewing on a Thunderbird. He then bought his own sailboat (a 12-foot fishing-sailer), abandoning his racing career and frustrating his sailing mentor. Next he built a 32-foot plywood sloop and bought a Balboa 20 and a 26 before purchasing his Bruce Roberts-designed 44-foot steel ketch, *Millennium Falcon*.

6 – Mary Jane Hayes, Page 40, and her husband, Warren, have been boating for more than 25 years. They sailed *Serena*, a Sabre 28 for seven years and now cruise the East Coast in a Grand Banks 36, *Sea Story II*. A freelance writer and photographer, Mary Jane has been widely published in boating magazines. Her new book, *Eye on the Sea*, is featured in these pages.

9 – John Vigor, Pages 8, 30, and 34, has raced, cruised, and written about boats for more than 30 years. He's the author of *Danger, Dolphins and Ginger Beer* (Simon and Schuster), a sailing adventure novel for 8- to 12-year-olds; *The Practical Mariner's Book of Knowledge* (International Marine); and *The Sailors' Assistant* (International Marine). His new book, *Twenty Small Sailboats to Take You Anywhere*, is coming out later this year.

12 – Sven Donaldson, Page 22, has a background in marine biology, 35 years of sometimes serious sailing, and four years as a sailmaker. He works as a marine technical writer and editor and spends a disproportionate amount of time on junior sailing activities.

15 – David Telles, Page 58, is a coastal New England native who's been sailing all his life. A professional guitarist by trade, he has spent the time between tours and recordings building and designing sailboats, his other passion. He lives in South Dartmouth, Mass., where he is building a boat of his own design.

21 – Dick Bunker, Page 38, spent the better part of the last 10 years singlehanding *Sans Souci*, a 29-foot Westerly motorsailer, from Maine to Mexico, the Great Lakes and the Mississippi, the Bahamas, Belize, and Guatemala. He's thinking of Fiji now. He's had two serious love affairs: his wife Joan and the one you can read about in these pages.

22 – Don Casey, Page 84, co-authored *Sensible Cruising: The Thoreau Approach* and became the authority on boat fix-it projects with *This Old Boat*. He is the author of a series of books in the International Marine Sailboat Library and of *Dragged Aboard — A Cruising Guide for the Reluctant Mate*. He and his wife, Olga, cruise aboard their 29-year-old Allied Seawind. They've done all the work themselves with no adult supervision.

27 – Dave Chase, Pages 2, 30, and 65 illustrations, is a maker of drawings such as this caricature of the contributors. With his wife, Susan, he sails in *Old Sam Peabody*, a Cabot 36. Since this is the last caricature in *Good Old Boat* magazine, so Dave can have his summers free, we wonder whether that's helium or dynamite he's drawn there.

30 – Dennis Boese, Page 44, his wife, Dyane, and faithful boat dog, Cincinatti, spend their summers cruising the Great Lakes aboard their Catalina 28, *Whisper*. In addition to his work as a freelance writer on marine-related subjects, Dennis worked for the former *Bay Mariner* and is a staff writer with *Great Lakes Cruiser.*

33 – Ted Brewer, Pages 13, 49, and 68, is one of North America's best-known yacht designers, having worked on the America's Cup boats *American Eagle* and *Weatherly*, as well as boats that won the Olympics, the Gold Cup, and dozens of celebrated ocean races. He also is the man who designed scores of good old boats . . . the ones still sailing after all these years.

42 – Jim Hatch, Page 50, practices medicine in Bemidji, Minn. He and his wife, Cathie, have a passion for exploring Lake Superior's wilderness anchorages on *Nokomis*, their Bristol 35.5. They are working toward an eventual trip down the St. Lawrence Seaway to Newfoundland and beyond.

48 – Pepper Tharp, Page 84 illustration, grew up in a family dedicated to sailing. Her husband, Howard Merriam, has been an avid racer in all classes and in all ports throughout their marriage. Their children are following the family tradition in X-boats and Prams.

Mike Dickey, Pages 50 and 68 illustrations, has been a sailor since he was 9. He and a friend converted an old, rotten duck boat into a passably decent sailboat until his friend put his foot through the bottom. Mike's been hooked on drawing sailboats, building them, and sailing ever since.

Bob Keller, Page 55, has been an emergency physician specializing in wilderness medicine for 25 years. But his real passion is sailing. He has completely restored and customized a Pacific Seacraft Orion 27 and sailed it singlehanded to Hawaii and back to Monterey, Calif. Bob understands the importance of being able to handle medical emergencies at sea, especially when you happen to be a doctor.

Bill Barth, Page 37, started sailing in a Klepper kayak then on a relative's Chrysler 22. He took Power Squadron courses, earned a captain's license, and began chartering sailboats. Finally he bought his own Chrysler 20 followed by his current Grampian 30, *Polina*.

Roy Kiesling, Page 62, was introduced to sailing on San Francisco Bay racing J24s and now crews regularly on Monterey Bay on a C&C 30. Crewing on round-trip passages between Santa Cruz and Seattle gave him a taste for GPS navigation, whetted by a degree in physics and a few years spent operating high-altitude satellites for Lockheed. He's senior product advisor for West Marine Catalog.

Our previous issues

1 – David Berke an analog man in a digital world, started sailing at age 8 in Blue Jays, Lasers, and Sunfishes. When finishing last, he invented a new technique: sailing backward under spinnaker, frustrating the more serious types on the committee boat. Sea Snarks came next, then a Bristol 27 which he and a friend rescued.

2 – Susan Peterson Gateley has written two books about boats she has known. *Ariel's World* and *Sweet Water* both feature her good old 23-foot 1930s-vintage homebuilt sloop. She now sails Lake Ontario with a partner on *Titania*, a 32-foot Chris-Craft, and gives sailing lessons with a Lippincot Lightning. Both are circa 1968.

4 – David R. Chase sailed the Great Lakes for 26 years with his wife, Jan. Following his retirement from teaching English in 1996, they've cruised the Chesapeake, the ICW, the Florida Keys and parts in between. Dave fancies "simple boats."

5 – Bob Wood learned to sail on small O'Days more than 30 years ago. He has owned an odd assortment of sailboats and sailed them in waters from the Florida Keys to British Columbia's Gulf Islands and from New York's Finger Lakes to Colorado's and Idaho's impoundments and reservoirs.

7 – Roland Barth owns a 26-foot Contessa in Maine, a 25-foot Cape Dory in Florida, and a 20-foot gaffed-rig sharpie in the Florida Everglades. In addition, he's a devoted Laser sailor. He recently published the book, *Cruising Rules*.

8 – Jay Knoll sailed a Herreshoff America Catboat, a Tartan 27, and a Crealock 37 on waters from the Great lakes to the Bahamas. He and his wife, Linda, have also completed passages as crew from Bermuda to the Virgin Islands, from Italy to Yugoslavia, and along the coast of Turkey. Off the water he's a computer trainer and human resources consultant.

10 – Mike Corcoran and his wife, Maurine, began sailing with a Bandit 19 (which he says he used to think was SO BIG!). They currently sail a Tartan 31, *Four Winds*.

11 – Dave Gerr is a naval architect in New York City. Gerr Marine, Inc., founded in 1983, designs yachts and commercial vessels. Dave is a contributing editor for *Offshore* and *Boatbuilding* magazines and author of *Propeller Handbook* and *The Nature of Boats* (International Marine). He's writing a new handbook on engineering boat structures, *Boat Strength*.

13 – Geoff Parkins cruises aboard his good old boat, a 46-foot Ted Brewer-designed cutter, *Ocean Tiger,* with his wife, Lori, and an assortment of pets.

14 – Bill Martin is a clinical psychologist in private practice. He and his wife, Shirley, have trapped their Lord Nelson, *At Ease*, on Lake DeGray in Arkansas. With an early retirement in the works, they hope to set her free again in a few years, moving her first to the coast and then on to the Caribbean where she belongs.

16 – Ken Miller has been cruising for more than 17 years. Beginning with a 19-foot Mirage with two holes in the bottom, Ken progressed through several boats to his present 34-foot Tartan. Each was in poor shape when he bought it and has been restored to safe running condition for cruising.

17 – Bob Haussler is a biologist working for the California Energy Commission. After selling their Baba 30, Bob and his wife, Nancy, purchased and live aboard *Swan*, a William Garden-designed ketch. They've sailed together for 29 years up and down the West Coast and to the Marshall Islands.

18 – Jim Plummer started out in a family boat business in 1952. His first job after college was in the finance field. Later he discovered sailboats. These days Jim and his wife, Bonnie, sail *Plumair*, a Tayana 37.

19 – Art Saluk built his first boat at age 13, although it later sank. He presently owns a 20-year-old Cheoy Lee 32, *Flying Dragon*. After spending too long as an executive in the electronics industry, he pursued his lifelong interest in boats as a yacht broker, opening his own brokerage (SGA Yachts) in Fort Lauderdale.

20 – Larry Pardey discovered sailing early and turned it into a lifelong passion when he and wife, Lin, built their 24-foot Lyle Hess-designed *Seraffyn* and sailed her 45,000 miles in the next 14 years. Next they built and launched *Taleisin* and voyaged another 51,000 miles. Although Larry was trained as a diesel mechanic, neither boat was equipped with an auxiliary engine.

23 – Charles Duhon has been an artist and sailor in the Dallas, Texas, area for more than 20 years. For fun he paints good old boats for their owners and dreams of retiring to paint and sail. He and his wife, Lynn, and their daughter enjoy daysails and weekends aboard their Hunter 34, appropriately named *Artistry*.

24 – Nigel Calder is the author of the best-selling *Boatowner's Mechanical and Electrical Manual*. He has also written *Marine Diesel Engines* and several other books, including cruising guides to the northwest Caribbean and Cuba.

25 – Matt Grant soloed at age 5 in an 8-foot Sabot when his father pushed him away from the dock. Fearful of sharks, Matt tipped the boat over so the mast rested on the dock and scrambled to safety over the sail. Over the years he overcame this first harrowing experience and now is a freshwater sailor who favors C-Scows and an S2 7.9.

26 – Lin Pardey sailed around in the lakes of Michigan until meeting Larry in 1965, romancing for three weeks and beginning what has become a legendary cruising saga on board *Seraffyn* and *Taleisin*. They plan to explore as long as it remains fun. The Pardeys have developed an entire library of books and videos on sailing and won several notable awards.

28 – Cincinatti (sic) is a faithful boat dog sailing with Dennis Boese.

29 – Stan Terryll has a passion for art, boats, airplanes, and the blues. An art teacher from White Bear Lake, Minn., he designs, builds, and sells small boats as a hobby. Stan markets limited-edition nautical art prints.

31 – Ken Textor has lived and worked aboard boats for 22 years. In addition to work he did for the former *Small Boat Journal*, he contributes to *Sail, Cruising World, Yachting, DownEast, Maine Boats & Harbors,* and *Boating World*. He also offers boat deliveries and pre-purchase surveys for other mariners.

32 – Bill Sandifer is a marine surveyor and boatbuilder who has been living, eating, and sleeping boats since the early '50s when he assisted at Pete Layton's Boat Shop. Since then he's worked for Charlie Morgan (Heritage), Don Arnow (Cigarette), and owned a commercial fiberglass boatbuilding company (Tugboats).

34 – Larry DeMers began sailing 30 years ago with a wood Melges C-Scow. Now he and his wife, Jan, sail *DeLaMer*, a Cape Dory 30. An electrical engineer, Larry is also interested in making videotapes for fun and more recently for profit.

35 – Scott Perkins is owner and head technician at Perkins Electronics, an electronic sales and service business in Houghton, Mich. He and his wife, Cyndi, cruise Lake Superior waters while they wait until both kids have flown the nest — in the year 2001. By then, Scott and Cyndi will be ready for adventures in saltier seas.

36 – Sylvia Williams Dabney and her husband, Stanley, lived aboard their Valiant 40, *Native Sun*, for 15 years, sailing more than 60,000 miles. They were among the original founders of Valiant Yachts and now own their own brokerage house, Offshore Atlantic Yachts, specializing in bluewater, offshore liveaboard cruisers.

37 – Greg Mansfield has raced a Laser and a Coronado 15, taught sailing, and chartered in exotic locations. He and his wife, Sue, bought their Bristol 29.9, *Surprise!* in 1993 and moved it from Wisconsin to the Chesapeake area via the Great Lakes, the Welland and Erie canals, the Hudson River, and the Intracoastal Waterway.

38 – Norman Ralph and his wife, Jeanette, were late bloomers when it came to sailing. After buying a Compac 16 in 1986, they sailed a series of Midwest lakes and reservoirs in a variety of boats. A 1988 trip to the Gulf Coast exposed them to year-round sailing and sowed seeds that initiated early retirement and a move to Lake Pontchartrain in Louisiana.

39 – Brian Barone has been living aboard his Pearson Triton, since her purchase less than two years ago. An environmental engineer in Manhattan, in his free time he writes, scrapes varnish, drips paint where it doesn't belong, and strives to keep his work shirts looking like they haven't been wadded in balls.

40 – Cathy Haupert started sailing with her husband, Dan, on Lake Superior. Before long they bought an Ericson 35 and took it to the Caribbean, where they sail during the winter months.

41 – Eric Broudy sails his Ericson Independence, *Rigel*, on Narrangansett Bay and yearns for shorter winters. He left corporate publications work to do freelance work on subjects close to his heart, such as good old boats and sailing.

43 and 47 – Reese and Marilyn Palley have been sailing partners for 20 years. They live in Key West. *Unlikely*, their Ted Brewer cutter, is their third leg, completing perfect "passages à trois." Reese has published three books: *There Be No Dragons, Unlikely Passages,* and *Unlikely People*, all with Sheridan House.

44 – Pat Vojtech sails on the Chesapeake Bay and along the mid-Atlantic Coast with her husband, George, and their son in a 34-foot Hunter, *Athena*. She has been writing and taking photos professionally since she took on an after-school job at the local newspaper at age 16. Her work has appeared in many magazines, and she has produced two coffee table books: *Lighting the Bay: Tales of Chesapeake Lighthouses* and *Chesapeake Bay Skipjacks*.

45 – Bernard Joseph and his wife, Hildegard, have sailed extensively on the Great Lakes and made passages to and from the Chesapeake one summer on *Astigafa*, their Alberg 35. Bernard has crewed in a number of Chicago-to-Mackinac races and campaigned his own Columbia 8.3 in club races.

46 – Dan Smith boarded a coal freighter as deckhand in Toledo four days after graduation from high school. Hurricane Andrew destroyed *Kohinoor*, his Allied Seawind. Dan bought a Marshall Catboat and now enjoys winters gunkholing in the Florida Keys.

And many more who wrote book reviews, sent thoughtful letters to the editor, and contributed in their own ways!

The trouble with anodizing

I enjoyed the article by Greg Mansfield about anodizing (March '99). However I had a couple of problems when I tried it. The aluminum wire I used for the electrical connection was multistranded picture-hanging wire, and it kept breaking off on the anode side. When inspected, it seemed that it was consumed in the process. I thought maybe the connection was not good enough but even when I cleaned it, it kept happening.

The other problem was that one of the pieces I anodized (a chock) came out resembling a piece of pumice: porous. The other chock, done separately, was fine. I also agree with the person who wrote the letter in the May issue about the need for ventilation.

Pablo Gazmuri
Needham, Mass.

I suspect the strands of your wire were too thin. I don't know why one piece was porous. It could be that the wire did not allow enough current to pass. It's like a lot of crafts: you have to practice.

Greg Mansfield
Washington, N.C.

More on mildew

Bob Wood's article (May '99) was informative. The standard cleanup for mildew is diluted bleach, but that is not the kindest thing to put on your gear. Bleach actually oxidizes (burns) the mildew away, but then it washes right off and does nothing to prevent further growth. An alternative that kills mildew, inhibits its regrowth, and does not harm textiles or other organic materials is ethylene glycol (auto antifreeze-coolant).

In the chemical literature of about 70 years ago, there are a number of papers describing work using glycol in place of glycerin. Glycol was a newly available synthetic organic chemical. Glycerin was made from animal fat and its availability and price fluctuated widely (it, too, is now a synthetic organic chemical). Glycerin was used as a humectant for tobacco and in all kinds of lotions and ointments. Researchers testing glycol found that it prevented growth of molds and fungi in simulated replacements of glycerin. It was toxic to these organisms. Other papers described how it was toxic to staphyloccus bacteria in hospital settings.

I have done considerable work with glycol in killing and preventing wood rot. Glycol is infinitely soluble in water; it is also extremely hygroscopic (absorbs water) and is vigorously absorbed by wood, just as water is. Even though it is so water soluble, its attraction to water and wood apparently makes it difficult to wash out of wood and accounts for its persistent rot prevention. As another example, I keep a lover's knot doormat at the back door. The first mat rotted to mush in a couple of years. When I bought the replacement, I wetted it thoroughly with antifreeze before putting it in use in the same location. After five years it is sound as a dollar.

Glycol will not remove the black mildew stain because it is not an oxidant. I do not have a lot of experience with it on mildew, but it should be a pretty good persistent preventive. The dyes in it are so weak they do not discolor white materials. Do not leave open containers accessible to pets or children, as it is very sweet and toxic to mammals: lethal dose for a 150-pound human is about an 8-oz tumbler.

Dave Carnell
Wilmington, N.C.

We asked Dave about the possibility of using propylene glycol (the non-toxic pink antifreeze sold for boats' water systems). His response, unfortunately, was: "It is sold as a non-toxic antifreeze — good if you drink it, but not effective against beasties."

Wheel steering versus tillers

Regarding Lin Pardey's article on tillers (May '99), I would like you to consider:

First, Lin and Larry are friends (of mine). They have written many articles about boating and have a lifetime of experience. They have also been very kind to the Edson Corporation and are strong supporters of Edson quality products. However, I think it is fair to say they are very traditional sailors. They have spent little time sailing boats equipped with wheel steering systems. They are tiller people, but that alone doesn't make tillers right for everyone.

Secondly, they support their position by citing the steering failures of the 1979 Fastnet Race as a reason to use tillers. It wasn't the wheel steering systems that failed, but the rudders themselves. This was 20 years ago, and all the rudders were early composite construction. They failed because they were simply underengineered and underbuilt. They would have failed whether they were being turned by a wheel or a tiller.

They also cited that wheel steering is bad because a crewmember was injured when thrown across the cockpit by green water. Typically when people are moved around by green water, they end up hitting something and getting hurt. If the wheel steering pedestal hadn't been there, where would that person have gone? Would he have been washed overboard and lost, would he have hit the helmsman, injuring two people, or would he have been impaled on the pointy end of a tiller? I don't know. But I do know that hitting the pedestal doesn't make wheel steering bad, and it isn't the proper criterion for selecting one type of system over another.

Your readers need to judge the benefits of both types of steering and make the selection based on what suits them, their boat, and their sailing. Edson has been the leader in steering systems for all types of sailboats for over 140 years. We make wheel

steering systems and tillers. The vast majority of our customers select wheel steering systems because they feel they have better control over their boat. Typically the helmsman can sit farther outboard where there is a better view of the surrounding waters, a better view of sail shape, and the run of rigging. Women find wheel steering easier to handle. There is less weather helm imparted to the wheel, so you get less tired. And, when you turn the wheel to the left, the boat moves to port; turn the wheel right, and you turn to starboard. We also have a selection of wheel steering systems that include traditional rack and pinion and worm gear steerers or pedestals with direct linkage or cable drives. Wheel steering systems usually take up less cockpit space and provide a very convenient place to mount modern electronics, engine controls, and a host of cockpit convenience products.

Edson has built its reputation on being there to help. We have steering data sheets on over 2,000 different sailboats available to your readers at no cost. We're bound to have the information and hardware they need to equip their good old boat with the proper steering system for their type of sailing. They can call us at 508-335-9711 or visit our website: <http://www.edsonintl.com>.

William Keene, President
Edson Corporation

Mayonnaise continued

I'd like to add a little to John Dean's letter about mayonnaise (May '99 Mail Buoy). We used to bring mayonnaise on offshore sailboat deliveries without ice or refrigeration. The rule was that if you opened a jar, you must ***never*** put a dirty knife in the mayonnaise. That was the secret. If you did, you would contaminate it and make everyone ***sick***. We never had a problem. As John says, three weeks opened without refrigeration, and it was fine. Same for eggs: We would bring dozens . . . hang them in net hammocks … turn them every few days . . . forget about the Vaseline . . . they would survive and so would we.

Hope Wright
Douglastown, N.Y.

Dangerous day, happy ending

My wife and I were preparing to take a sunset cruise on our good old boat, the *Genie B*, when I saw smoke around the river's bend. We found a power cruiser engulfed in smoke with the engine roaring. Two people were in the water in life jackets. We took them aboard as there are alligators in the nearby swamp, and it was getting on to dinner time. The woman could not swim and was terrified.

The man said the boat had a diesel engine that "ran away" as soon as he started it. He pulled the fuel shutoff, but it kept running. I was afraid the engine would self-destruct and spray the area with shrapnel and engine parts, so I quickly distanced myself from the runaway. I called the River Patrol who responded quickly and boarded the vessel to try to stop the engine. The smoke was so thick only the bow of the cabin cruiser was visible. After almost an hour they were able to pour enough water into the air intake to stop the engine. Two brave men.

We disassembled the engine and found a broken throttle control arm that let the engine run away. No one was hurt, and there was no fire so — except for a ruined engine — all ended well.

This true tale emphasizes the fact that even diesels can have unsafe failure modes. A runaway diesel is a serious matter. Perhaps one of our readers knows a better way to stop one than feeding it water. It would be good to be prepared for this emergency. Down here you might even end up as the entrée de jour on the swamp menu, if you are not careful.

Bill Sandifer
Diamondhead, Miss.

Thoughts on shorepower

Don Casey's article on Safe Shorepower (March '99) was most interesting, but I am not sure that I agree with everything he says. On Page 58 he states that the AC grounding wire must be connected to the boat's ground, usually a bolt on the engine. Surely if you do this and you develop a short between the hot and the ground wires, you are going to cause electrolytic corrosion of your underwater fittings, thru-hulls, propeller, etc.

On my own good old boat I have disconnected the AC ground wire from the boat's ground and rely on the ground on the dockside. Before plugging in to shorepower, I check the shore outlet with a polarity tester or a volt meter. Using a polarity tester will quickly show whether the shore/ground connection is satisfactory and whether the polarity has been crossed. Using a VOM, if there is voltage (100 to 120 volts) between the hot and the ground, then the ground is working. If there is a similar voltage between the neutral and ground, the polarity is reversed, and the outlet should not be used.

Having no ground connection on the boat protects against corrosion due to a short. One argument against it is that if the shore/ground connection fails, and a short occurs on equipment on the boat (battery charger, water heater, etc.), the case of the appliance can become live and be a shock risk to anyone touching it. Careful testing of the shore ground, as described above, will prevent this.

I like the mag. Keep up the good work.

Alan Porter
Victoria, British Columbia

Dead metal (defined as metal that is normally not energized but that could become energized in the event of an insulation fault) must be grounded to protect against electric shock. The ground path must include the shore ground.

Just a couple of questions

To Tony DeLima at MAS Epoxies: Jerry Powlas at *Good Old Boat* suggested I contact you about my '78 swing-keel C22. I'm redoing the bottom because of blisters in the gelcoat. The bottom paint and gelcoat have been removed, and the hull is drying out while I fix a few other problems: the starboard side aft was damaged and repaired by a previous owner and is starting to delaminate. It looks as if he repaired the damage (transom and aft bilge cracks in the fiberglass) from inside without removing the old paint . . . just put in a few layers of epoxy! I'm going to reglass the area from the outside.

I'd like to recondition the keel at the same time. It's got some rust along the bottom and leading edge where the paint is worn off — looks like auto

Continued on Page 74

The Cal 20
A pocket cruiser that also suits

You know which pocket . . . it's that little one in the front of your jeans . . .

by John Vigor

One has to wonder why that extraordinary adventurer, Webb Chiles, chose an open 18-footer like the Drascombe Lugger to sail single-handed three-quarters of the way around the world when he could have done it more safely, in far more comfort, and more cheaply in a used Cal 20.

The Cal 20 is essentially a dinghy with a lid on. She handles like a dinghy; she's light on the helm and very responsive. But she has a heavy ballast keel that makes her very stiff and safe at sea, and her cockpit is self-bailing. She's sparsely appointed down below, to say the least, but she does have four bunks — two of which are 6 feet 6 inches long — and the cabin provides a dry, sheltered, comfortable place to sleep. That's a big step up from a Drascombe Lugger.

Better yet, the Cal 20 is cheap. Nearly 2,000 of them were built by Jensen Marine, of Costa Mesa, Calif., between 1961 and 1974, and the vast majority are still going strong. Some are going stronger than others, of course, but you should be able to buy a Cal 20 in excellent condition for $4,000 to $5,000 and a fixer-upper for about $2,000. Parts are still available, and racing fleets are still active on the West Coast, in the Great Lakes, and in Hawaii.

You'd have to be young and carefree to sail around the world in a Cal 20, but you wouldn't have to be foolhardy. Although she's basically a club racer/cruiser designed for nothing more than short coastal trips, she doesn't need major modification for long-distance voyaging. She has earned a reputation for seaworthiness that is the envy of the owners of many larger, more expensive craft. George Cadwalader and his crew, Duncan Spencer, crossed the North Atlantic in one, sailing from Newport, Rhode Island, to Crookhaven, Ireland. Kun Poi Chin sailed his Cal 20, *Chalupa*, from San Francisco to Hawaii in the early 1980s.

The one thing she doesn't have is room. She is the pocket they were talking about when they invented the phrase "pocket cruiser." It's the little pocket in the front of your jeans, the one that fills up with pennies, fluff, and paper clips. Like many other boats of her size, she's little more than a floating fiberglass pup tent — except that if you're willing to put up with a little discomfort, the Cal 20 has the thrilling ability to whisk you away over the blue oceans to magical tropical islands and palm-fringed beaches.

Basic design

One of the wonderful things about a small boat like the Cal 20 is that everything is so manageable. The sails are small, the anchor is light, and you can anti-foul the bottom in an hour. You never seem to suffer from that dreadful feeling that creeps up on you sometimes in bigger boats, that everything is just too overwhelming.

C. William "Bill" Lapworth designed her specifically for sailors moving up from Lightnings and small dinghies. She had to be agile, like a dinghy, but she had to be big enough for weekend cruising for a couple, and possibly two small kids as well. She also had to be fast enough for weekend racing, so Lapworth stuck a 900-pound bulb-style ballast keel on the bottom, much like that on the Star Class. It's made of cast iron. *(Photo on Page 11.)*

Her overhangs are commendably short, which gives her the most interior room possible for her length, and her

Kelly O'Neil

Steve Rander's Cal 20*, Reality Check, *started the Portland Cal 20 fleet. Steve bought the boat when it was to be scrapped by a fellow who wanted just the mast. Steve gave him another mast in exchange and went on to start something big in Portland* (see Page 10). *In the photo at left, Steve's at the helm, Lynne Hemmert is adjusting the spinnaker, and Todd Johnson is hidden from view.

the pocket

Although this pocket cruiser is meant for cruising (note the palm trees behind* Bandini Mountain*) this photo from Doug McLean is the only photographic evidence we have of its ability to cruise. As Cal 20 National Class President, Doug gets many photos from sailors. This one is from Mark Gollison. His crewmember is listed only as Walley.

accommodations also benefit from the raised foredeck, a very sensible idea that adds strength to the hull/deck unit. It's tricky to design a raised foredeck that looks right and doesn't destroy the pretty line of the sheer, but Bill Lapworth managed it very well here.

Her hull is solid GRP with no coring, but the deck is of composite construction and has a plywood core, which means problems of rot and delamination if water ever manages to seep in around a poorly caulked deck fitting. The Cal 20's rudder, hanging dinghy-style from the transom on pintles and gudgeons, is about as rudimentary as they come, but its simplicity and accessibility would be strong factors in its favor if repairs were ever needed. In fact, it's one of the few rudders you could remove, repair, and replace at sea.

She has a daysailer cockpit an 8-foot-long affair that seats four in comfort for short periods. Its volume needs to be reduced for ocean voyaging and there are several ways to do this. You could, for example, make the well narrower with plywood panels. You might also use plywood to form a box at one end or the other, and gain more stowage area at the same time. But one of the best solutions was discovered by Kun Poi Chin, who simply stored his life raft in the cockpit. That reduced its volume by about 40 percent.

The cockpit coamings, incidentally, are uncomfortable to lean back against. They are too low to provide good support for your back. But few problems are insoluble, it seems. If your boat has lifelines, a roller cushion fitted around the stainless steel wire could be the answer. Some owners have increased the comfort level by fitting stainless steel side railings to rest their upper bodies against.

At the aft end of the cockpit, a well for an outboard motor protrudes up for a couple of inches from the sole, sealed top and bottom with removable hatches. If you remove the hatches, you have a hole in the bottom of the boat that is less than hydrodynamically perfect. It creates swirls and eddies that slow the boat down. It also allows water to slop into the cockpit in rough following seas. But at the same time it forms a huge and really efficient cockpit drain. If you're going deepsea with this little boat, you might want to do exactly what Kun Poi Chin did. He left the bottom of the well open, but drilled holes in the top hatch and placed it back on. This stopped most of the slop splashing into the cockpit, and still acted as a drain that Chin regarded as very efficient.

The standard outboard is a 6-hp model and probably the most convenient place for it, if you're going to use the well as a permanent drain in this fashion, is on the transom. In fact, however, the boat is so small that you can sail her almost anywhere, and a pair of 8-foot oars will move you around the marina or anchorage.

Accommodations

To maintain her speed and nippy performance, she had to be kept light, so practically no furniture was built into the fiberglass cave below, apart from a V-berth up forward and two settee berths. Shelves and storage compartments sit at the head of the settee berths, with just enough space for a camp stove on one side and a breadboard on the other. There's a head compartment aft of the V-berths, big enough for a pump-through toilet. But finding space for the legally required holding tank is such a problem that most owners will opt for a portable potty, or the bucket-and-chuck-it system at sea and the bucket-and-bag-it system in port.

Like any boat of its size and shape, the Cal 20 does not aspire to the luxury of a well to collect bilge water and keep it away from everything else in the cabin. Any water that finds its way aboard will slosh to and fro across the sole and, if it isn't removed quickly, everything down below will soon be sodden. This means that clothes and important documents should be kept in watertight containers, just in case.

The original boats were supplied with a flush-through toilet between the berths in the forepeak. But current legislation calls for holding tanks to be fitted to fixed toilets, and there is simply no space for a tank of any reasonable size in a Cal 20. So most owners have thrown out the original

Resources for Cal 20 owners

Cal 20 Website — http://www.cal20.com
Cal Website — http://www.bright.net/~go2erie/
Cal Email Discussion List — http://www.sailnet.com/list/cal/index.htm
Seal's Spars and Rigging — 510-521-7730, http://members.aol.com/sealsspars

A funny thing happened in Portland

There used to be a Cal 20 fleet in Portland, Ore., years ago, but, as has happened in many other areas, the boats became semi-derelict and used for little more than an occasional daysail.

Not so anymore. Two seasons ago Steve Rander of Schooner Creek Boat Works in Portland traded a bent mast for a Cal 20, cleaned the boat up and raced it under PHRF to win the overall performance trophy. He had so much fun he found another Cal 20 for his wife, Nancy. Then yet another appeared and so it went: a Cal 20 fleet was born. More old Cal 20s were located; lots of effort went into upgrading the boats and the whole approach to fleet organization.

Moorings were found so members of the fleet could moor together (yes, this fleet is wet-sailed, what else in Portland?). The fleet also passed a local variance allowing the use of spinnakers.

The Cal 20 fleet works at promoting sailing and their organization by taking new sailors out sailing, making a visible showing at the Portland Boat Show, offering the boats for Sail Education Week (SEW sponsored by CYC and SYSCO), and lingering at the finish of races to cheer on other finishers.

The fleet motto: "If it's fun you want, get a Cal 20." Now almost two years old, the fleet already has 35 members and a waiting list of people looking for boats. To contact fleet members, email fastboat@teleport.com or call 503-735-0569.

While Portland has a growing racing fleet, southern California (the birthplace of the Cal 20) has the largest fleets. The photo from Doug McLean at top shows Fleet One action. The two photos below come from Glenn Selvin of the Alamitos Bay Yacht Club in Long Beach where Cal 20 Fleet One will be hosting the 1999 class championships. Selvin says, "For an inexpensive boat to buy and rebuild . . . these boats can't be beat."

toilet and replaced it with a portable toilet. This allows them to glass over the two thru-hulls the original toilet needed and reduce the number of holes in the hull.

The rig

You could hardly design a simpler rig than this. The Cal 20 is a sloop with 196 square feet of sail area, a Bermudian mainsail, and a 7/8ths foretriangle to hang the jib from. No great strains here; but remember, this is a small boat, and a third row of reef points in the mainsail is a good idea for offshore work. The spars are anodized aluminum. The standard stays and shrouds were designed for daysailing. If you're taking a Cal 20 to sea, you should replace them with ones at least a size bigger all around.

Incidentally, be sure to check out the original spreader brackets for cracks or other signs of deterioration. They're the weakest part of the rig, according to Steve Seal, an Alameda, Calif., sparmaker and supplier of rigging parts for several makes of sailboats. He carries spare parts for the Cal 20. *(See resources section on Page 9.)*

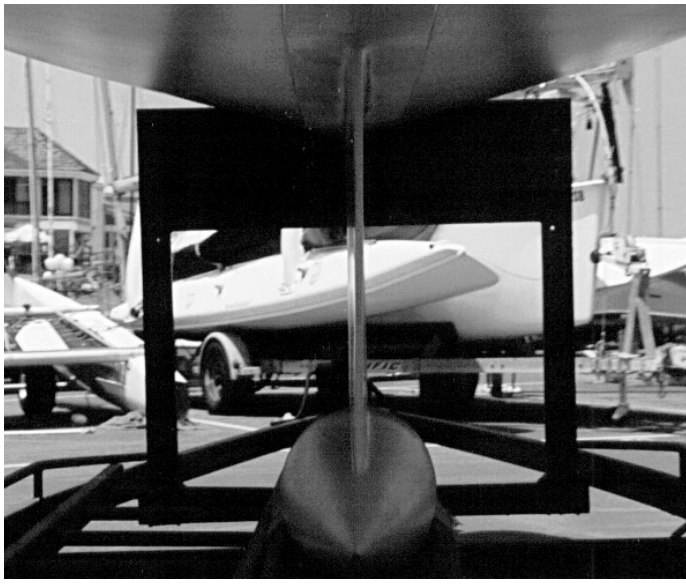
Performance

With 46 percent of her nominal displacement low down on her keel, the Cal 20 is a stiff little boat. In fact, she has built a reputation in San Francisco for being able to carry full working sail downwind in 30 knots. Her stiffness means she works to windward at a minimal angle of heel, which is less tiring on the crew but harder on the rigging — hence the need to upgrade the stays and shrouds for ocean work.

She's no flier, of course. She couldn't be, with only 18 feet of waterline length on a full displacement hull, but she has earned a respectable PHRF rating of 264 on the Northern California PHRF list. The ubiquitous Catalina 22 with a swing keel rates 270 on the same list.

For a small boat, she's fairly dry. Her ample freeboard, combined with the raised foredeck, takes care of a lot of the spray. But dryness is comparative, of course, and no boat of this size can truly be called dry when beating to windward in the open sea in heavy weather. Nevertheless, her reputation for seaworthiness is well earned.

As the windspeed rises, she tends to develop some weather helm, which can be cured by reefing the mainsail and keeping the working jib flying as long as possible. When it's time to change down to a storm jib, it's time to take in another reef in the mainsail, too. Excessive heeling in this boat is the major cause of weather helm, and sailing her more upright is the key to control, so in really heavy weather a third row of reef points for the mainsail is a good idea. Downwind, though, she really shows her stiffness, and racing Cal 20s often carry their spinnakers long after other classes have doused theirs.



A look at the polished bottoms of the serious racers tells the tale. Glenn Selvin's* Sore Subject, *a 1964 Cal 20, and others in Fleet One show their owners' love of speed.

Known Weaknesses

- Check the foredeck for rot of the plywood core and separation of the fiberglass layers, inside and outside, from the core. Water seeping into the plywood over the years will eventually soften the plywood and cause delamination. It's not easy to fix.
- The original spreader brackets have been known to crack.
- Excessive lee helm or weather helm is sometimes caused by a badly cast or slightly misaligned keel. Some owners have gone to the trouble of fairing out the keel to improve its performance; and re-aligning the keel is not a big job, but it's one you would rather not have to do in the first place.
- Some boats that have been raced hard have managed to loosen the deck attachment points for the forestay and the aft lower shrouds. Check them carefully, and beef them up if necessary.

Owner's opinion

If you're planning to cross an ocean in a Cal 20, you'd do well to contact *Cruising World* (401-847-1588) and ask for a copy of an article called "Expand Your Pocket Cruiser's Horizons," by Kun Poi Chin. It appeared in the September, 1985, issue. Your local library may also be able to help you locate the article.

As we've already mentioned, Chin sailed his Cal 20, *Chalupa*, from San Francisco to Hawaii in the early 1980s. He weathered six days and nights of gales during the 20-day trip, and went on to cruise more than 1,000 miles among the Hawaiian islands without major problems. He did, however, beef up the original hull before he left. For a start, he glassed in a full-length internal stringer of wood and foam from bow to stern on either side of the hull. He replaced the portlights with 1/8-inch Lexan and through-bolted them.

He stiffened the bulkhead under the mast and installed new keel bolts

THE CAL TEAM

JACK JENSEN

The motivating force behind the success of Cal boats is Jack Jensen, President of Jensen Marine Corp. Any weekend you're apt to find Jack sailing the Catalina Channel in his Cal 34 "Allegre" or racing on another Cal boat in local regattas. You'll also find him at the big ones — Transpac, Bermuda, etc. Practicing, racing, continually observing the many details that make a boat go, combining his observations with his engineering training, and incorporating them into Cal boats is Jack Jensen's life and love. No wonder Cal boats win.

BILL LAPWORTH

From racing catboats on the Detroit River at age 12 to designing Cal boats, Bill Lapworth has inadvertantly made himself famous. The years he spent racing small boats influenced his design concepts — his preference for light displacement. But when asked why he settled on light displacement design he answered, "Money. The cost factor meant a lot, and light displacement construction is generally less expensive."

The success of his early light displacement designs, which include the L 36 and the first Cal boat, the Cal 24, led to the design of the triumphant Cal 40 — 2 time SORC, Transpac and Bermuda Race winner. An active racer, in great demand as helmsman and crew, Bill is constantly testing his designs and theories. Combine design knowledge and actual experience with a creative mind and you have a naval architect whose success is legendary. Fortunately, he continues — on his most successful family of designs, Cal boats.

Above, a page from an old Jensen Marine brochure, with special thanks to Chris Ackerman.

In short

Cal 20

Designer: C. William Lapworth (1961)
LOA: 20 feet 0 inches
LWL: 18 feet 0 inches
Beam: 7 feet 0 inches
Draft: 3 feet 4 inches
Displacement: 1,950 pounds
Sail area: 196 square feet
Ballast: 900-pound cast-iron bulb
Spars: Aluminum
Auxiliary: 6-hp outboard
Designed as: Daysailer, racer, coastal cruiser

with extra-large washers. He also replaced the rudder with a stronger one with heftier pintles and gudgeons, and he anchored the aft lower shrouds and the forestay more securely. Chin carried no engine. He relied on a pair of 8-foot oars for auxiliary power.

He summarized his Cal 20 adventure this way: "Taking a small boat, designed for coastal sailing, on the ocean required some compromises. I accepted that. But after a year of cruising, I do not think that I could find another boat of the same size that would provide me with all the fun and joy of cruising at such an affordable price."

Voyaging in small craft, he added, might not be for everyone, but if you want to do it badly enough, it's definitely possible. And the key is simple: "An attitude of how little one needs, rather than how much one wants, is required."

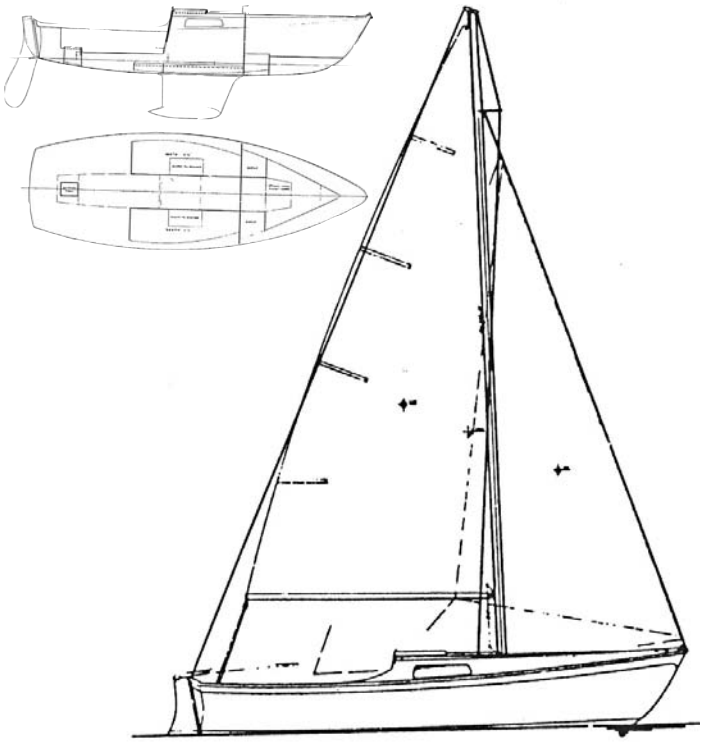
Conclusion

Kun Poi Chin pretty much said it all. If you're adventurous and filled with a passion for cruising, you can do it very cheaply in reasonable safety with a bit of planning and a lot of caution. You can do it in a Cal 20. Voyaging in a boat as small as this comes at the expense of physical comfort, of course, and it requires commonsense planning of your route. But the rewards are great. The experience will breed confidence, independence, and abilities that will serve you well for the rest of your life.

John's new book, Twenty Small Sailboats to Take You Anywhere, *to be published by Paradise Cay (800-736-4509) later this year, will be available on* Good Old Boat's *bookshelf.*

In comparison

- **Safety-at-sea factor:** 5 (Rated out of 10, with 10 being the safest.)
- **Speed rating:** PHRF 264. Not bad for her size and weight.
- **Ocean comfort level:** No comfort whatsoever, but she can accommodate two adults with their elbows in each other's faces. A good candidate for singlehanding.



Is there a metal yacht in your future?

Whether constructed of steel or aluminum, metal yachts deserve a second look

by Ted Brewer

In the 1960s and early 1970s we rarely saw metal yachts in North American waters. Steel yachts had been built in Holland and Germany for many years but, with only oil-based paints to protect them, they were not particularly long lived. Indeed, I've seen lovely 40-foot steel yachts corroded to junk in 10 to 12 years. A few custom aluminum yachts were built overseas as well and in a couple of quality yards in the U.S. However, aluminum was considered to be a material restricted to large and expensive craft; half the weight for twice the price was the popular conception. Today however, due to advances in the protection of steel hulls and the reduction in the cost of aluminum, metal is often the material of choice for both custom-built and amateur-built yachts, so steel and aluminum craft are commonly seen in almost every harbor.

Each material has its advantages, but the racing skipper will choose aluminum construction for its combination of lightness and strength, of course. The cruiser, on the other hand, may prefer steel for its greater strength and lower initial cost, or aluminum for its longevity, low maintenance, and high resale value. Sailors interested in a metal yacht need to know the pros and cons of the two materials so they can make an intelligent choice, whether buying a used boat, building their own, or having a new custom yacht built. I offer a few points to consider.

Weight

The simplest comparison is that aluminum weighs about 168 pounds per cubic foot and steel weighs 490 pounds per cubic foot, almost three times as much. It is not that simple a comparison though. The machinery, interior furnishings, hardware, rig, general equipment, and stores weigh about the same for steel and aluminum craft, so the overall weight advantage of an aluminum yacht is not nearly as great as it might seem.

Strength

Comparing strengths is made more difficult because aluminum alloys lose strength after welding while steel does not. The table below shows the differences between some typical alloys.

Alloy	Ultimate Tensile Strength		Yield Strength	
	Unwelded	**Welded**	**Unwelded**	**Welded**
Aluminum 5086-H34	44,000 psi	39,000 psi	34,000 psi	21,000 psi
Aluminum 6061-T6	42,000 psi	30,000 psi	35,000 psi	19,000 psi
Grade A mild steel	58,000 psi		34,000 psi	
Grade AH32 mild steel	68,000 psi		45,000 psi	

Steel's strength advantage seems obvious, but it is normal practice to increase the scantling of an aluminum part to make up for its lower strength. For example, a steel 40-footer would be plated with .140-inch-thick steel, giving a tensile strength of .140 x 58,000 = 8,120 pounds per inch of plate. Her aluminum sister might be plated with .1875-inch-thick material, giving a strength of .1875 x 39,000 = 7,312 pounds per inch of plate. The 10 percent difference in strength is relatively inconsequential while the thicker aluminum still has a substantial weight advantage: 2.63 pounds per square foot of hull compared to 5.72 pounds per square foot for the steel yacht, less than half the weight of steel.

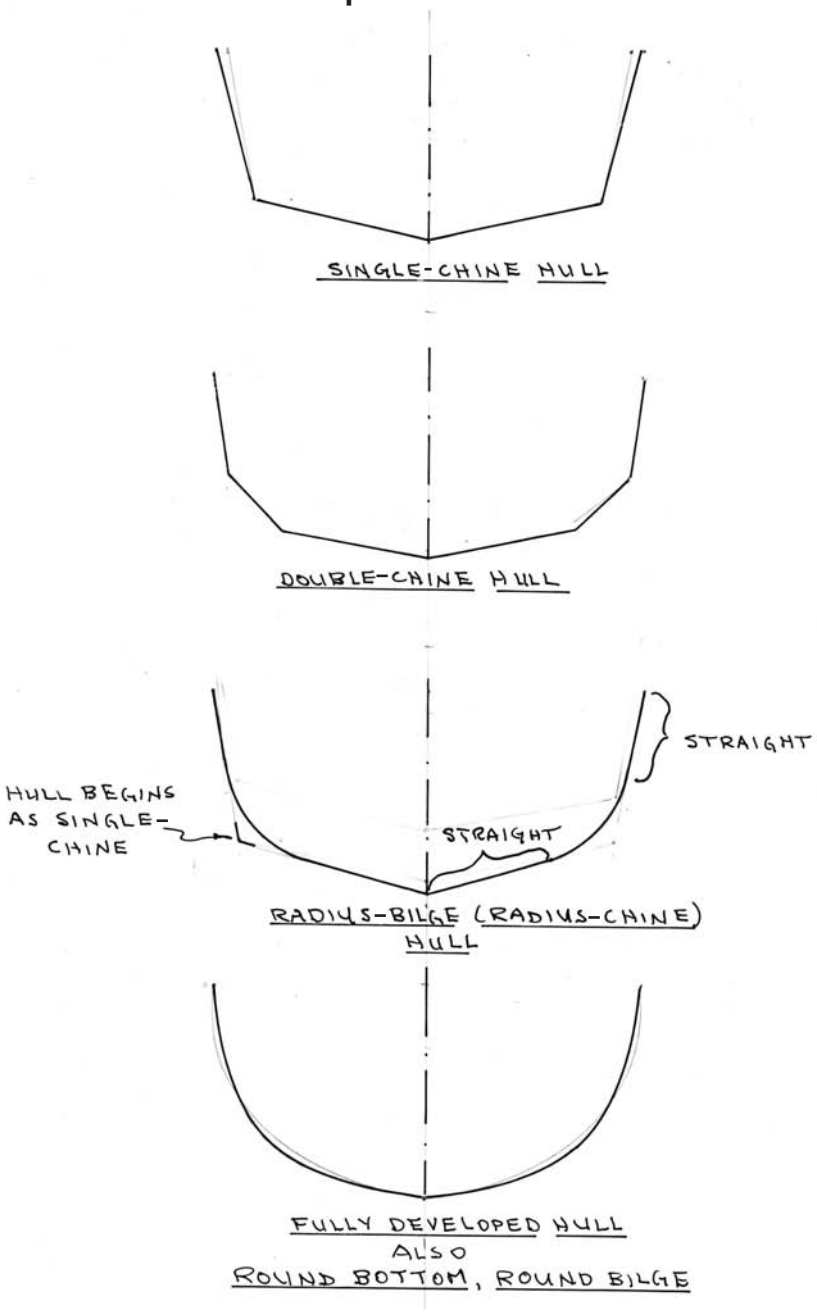
However, as pointed out earlier, the overall weight advantage might be only 20 to 25 percent in the long run due to the weight of the other parts of the yacht. Still, that means the aluminum yacht can be 20 percent lighter or carry extra ballast, and that translates into improved performance.

Steel also has the advantage of being 60 percent harder than aluminum, so it is much more resistant to abrasion in a grounding on rock or rubbing up against a concrete bulkhead. And, it is more malleable, so it will stretch farther in a collision or a hard grounding on granite before rupturing. Aluminum, in turn, is more resistant to abrasion than either fiberglass or wood and will stretch a great deal more in a collision. In any case, I'm sure our readers will never allow their boats to get into a grounding or collision situation so this factor is not critical!

In the stretching category, I can tell of a 60-foot ultra-light aluminum design of mine that had her anchor chain slip the stopper while sailing into the teeth of a 50-knot squall, letting the anchor drop 15 feet or so before it jammed. For close to an hour the boat rose on each big sea and fell onto her heavy Bruce anchor, yet the only damage was several 2-inch-deep dents

Brewer's Alaska 43 is an example of a double-chine steel hull.

Hull shapes for metal boats



in her light .160-inch aluminum plating. This is certainly an unusual accident but shows one of the solid advantages of metal yachts. I feel certain a wood or glass hull would have suffered severe damage in a similar situation. In any case, sailing aboard a metal yacht can be very comforting when you are out on the deep blue competing for lebensraum with floating cargo containers.

Too, both steel and aluminum yachts are essentially one-piece structures without the annoyance of leaking hull/deck joints, leaking chainplates or other weak points. Even cleats and other hardware can be welded to the deck, or machine-screw fastened to pads welded in place, to avoid bolt holes through an otherwise watertight structure.

Corrosion

The marine aluminum alloys (5454, 5083, and 5086) used for yachts and commercial fishing vessels are very different from the aluminum used in your pots and pans at home. The marine alloys contain a substantial percentage (3.4%-4.9%) of magnesium, depending on the specific alloy, and are highly resistant to corrosion in sea water. They are essentially inert. Indeed, these metals are not even similar to the 6061-T6 used in your mast. The latter is a heat-treatable alloy that loses substantial strength in the vicinity of a weld; hardly a quality we want in our hulls with their hundreds of feet of welding. Nor is 6061-T6 as corrosion-resistant in a marine atmosphere, as some sailors have discovered to their sorrow. Still 6061-T6 is favored for internal use by many builders due to its stiffness and is used, suitably increased in thickness, for frames, longitudinals, keel, knees, and other parts that will not come into contact with sea water. Quality aluminum yachts are plated with 5000 series alloys on the hull and superstructure, of course, and are all-welded structures.

Proof that the marine aluminum alloys are unaffected in sea water is that many commercial fishing craft, and an increasing number of yachts, are not even painted above the waterline. To paint or not to paint is solely at the owner's discretion. The aluminum will darken to a gray color with age, but its

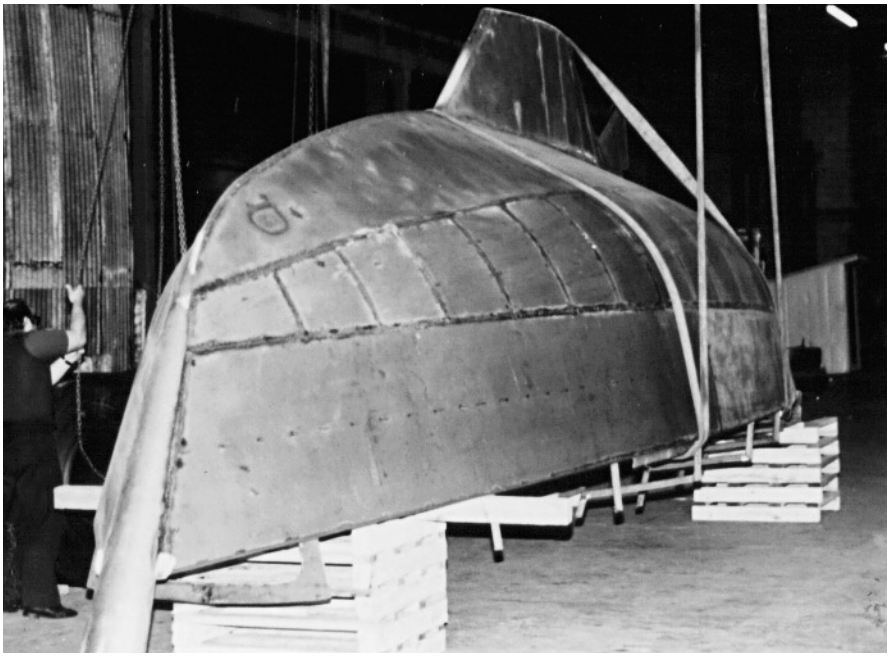
strength and durability are essentially unchanged. The interior of the aluminum hull need not be painted either but, obviously, the bottom must have anti-fouling paint applied to prevent the growth of performance-robbing weeds and barnacles.

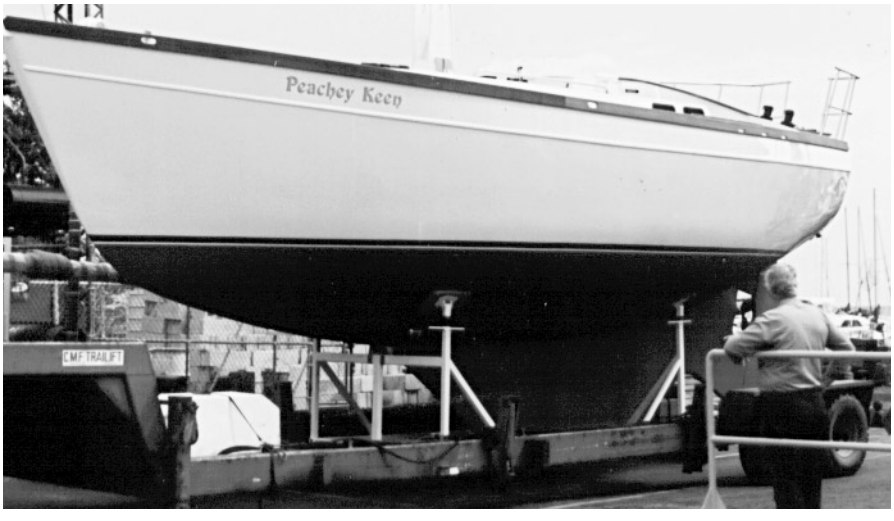
Steel, of course, rusts quickly in a saltwater atmosphere, so a steel yacht needs to be protected inside and out. The interior is usually painted with coal-tar epoxy, while the exterior can be epoxy-coated or flame-sprayed with zinc or aluminum. In either case, the steel must be sand-blasted inside and out with sharp silica sand to provide a tooth for the paint or flame spray. This substantial extra labor can offset the higher material cost of the aluminum to a substantial degree. In talking to a couple of builders recently I had one tell me that he would charge about 20 percent more for a completed aluminum yacht over steel and another say that aluminum and steel yachts come out very close in price due to the extra labor of blasting and finishing the interior of the steel hull.

The same disagreement arises when "experts" are asked about the benefits of flame spraying a steel hull to prevent corrosion. One advises to flame spray, preferably with aluminum; another says that an epoxy coating is better than flame spraying. I have seen both methods give good results after years of service and, in my opinion, it is simply up to the owner to toss the coin.

Whether steel or aluminum, both metals are well below copper on the galvanic scale, and using bronze or copper in contact with either is a **no-no**! Perhaps the epitome of this is the very famous designer who, early in this century, built a large and expensive racing yacht of aluminum plating on bronze frames. The vessel barely lasted a year, much to the surprise and dismay of the designer and owner!

So, no bronze seacocks, no copper bottom paint, and don't drop any pennies in the bilge of an aluminum yacht! Some designers and builders use stainless steel seacocks, but I prefer the fiberglass-reinforced nylon type, as I do not like to see stainless steel used below the waterline in salt water if at all avoidable. For anti-fouling protection, tin-based bottom paint is





Peachy Keen, ***in various stages of development, shows Brewer's radius bilge with straight frames above and below the radius bilge. When plated, the radius bilge goes on in short sections while the flat areas are installed in long plates. Ready to launch, the boat's a beauty.***

the best available for metal yachts, the best available for any yacht for that matter, but is outlawed in many countries due to its toxicity. Paint manufacturers have come up with several alternatives, though, so some research will be necessary if there is a metal boat in your future.

Hull shape

Although European builders in the '50s, and even earlier, had the skills necessary to build fully developed hulls, this ability was limited to a very few quality (read "expensive") yards in North America. Thus, only chine hulls were readily available here and that, of course, was another reason that metal boats were not popular.

In the early '70s we designed a 35-foot steel sloop called the Goderich 35 and used a shape that was, essentially, a single-chine hull with a very large radius at the chine. The radius started at the stern at about a 2-foot radius and increased as it progressed forward to 4 feet or more. I don't know if we were the first designers to use this technique, but I had not seen it done before, so it is possible that we did originate it. In any case, the boat turned out quite well, a number were built and one 35, *Globe Star*, skippered by professor Marvin Creamer, circumnavigated the globe without instruments of any kind, using Creamer's knowledge of currents, drift, winds, and other natural phenomena to locate his daily position. These methods proved surprisingly accurate and could have been known to the very early navigators.

Shortly after the Goderich 35 appeared on the scene, other designers were coming out with radius-bilge hull designs and, in a few years, it was not at all uncommon to see radius-bilge steel yachts advertised as semi-production boats or bare-hull kits for home completion. The radius-bilge system caught on with aluminum boats as well, but a few builders were already beginning to turn out fully formed aluminum yachts as the softer 5000 series aluminum is somewhat easier to work with and form than steel. Today there are a number of good builders who can produce an excellent, fully formed aluminum hull, a few who can do the same in steel, and many who can do a fine job on a radius bilge hull in either metal.

A look inside* Troubador *(top) while under construction, shows the shining ribs and curved frames of a fully developed aluminum hull. A visit to* Troubador *in the early stages might remind the uninitiated of a visit to a traditional wood shop — except for the missing aroma of sawdust and varnish.* Troubador's *plating (bottom) shows details of an elaborate construction process.

Miscellaneous advantages

Both metals have their own unique qualities, of course. Steel is easier to weld, especially under adverse conditions. Aluminum needs to be kept hygienically clean while under construction, and welding it requires considerable training and solid experience.

Aluminum is non-magnetic, so compass adjusting is easier and autopilots work better, at least in my experience. Steel is fireproof, while aluminum will melt if given enough heat, as the Brits found to their dismay in the Falkland Islands war. It is still more fireproof than wood or fiberglass, obviously. However, if everything else aboard the boat burns, having a hot metal hull afloat in the middle of the ocean may not be of any great comfort.

Built-in tanks work well in both materials and increase the tankage capacity substantially. The 5000-series aluminum water tanks do not need to be epoxy- or cement-coated inside to prevent corrosion. Some people say an aluminum water tank can cause neurological disorders (Alzheimer's). I believe it can if you grind it up and eat it, but we still use our aluminum cooking pots and pans, and I would not hesitate to have aluminum water tanks on my boat. An unusual advantage of metal boats is that the built-in tanks are easy to repair. You simply cut a hole in the hull, repair the tank from the inside, and weld the hull back up again. It beats trying to wrestle a 50-gallon tank out of a 40-gallon opening so you can get at it to fix a bad leak.

Emergency repairs on either material are fairly straightforward. Not as simple as repairing a wooden boat, perhaps, but certainly as easy as fiberglass. A repair patch can be quickly welded onto a steel hull and almost any out-of the-way port will have the necessary equipment to do it. Aluminum, on the other hand, can be readily drilled and tapped so an owner can fasten a gasketed patch in place until he can get to a port where aluminum welding facilities are available.

Steel and aluminum each have distinct advantages. They can both be built by amateurs, and I have had fine yachts, from 30 to 60 feet, crafted in metal to my designs by competent amateurs as well as by professional yards. If the amateur can combine good welding skills with reasonable experience in metal fabrication, there is no reason why an excellent yacht cannot be produced at a reasonable cost. And now, with sound 20- to 25-year-old metal yachts occasionally available on the market, the older metal boats can take their place within the fleet of good old boats as well.

Further reading

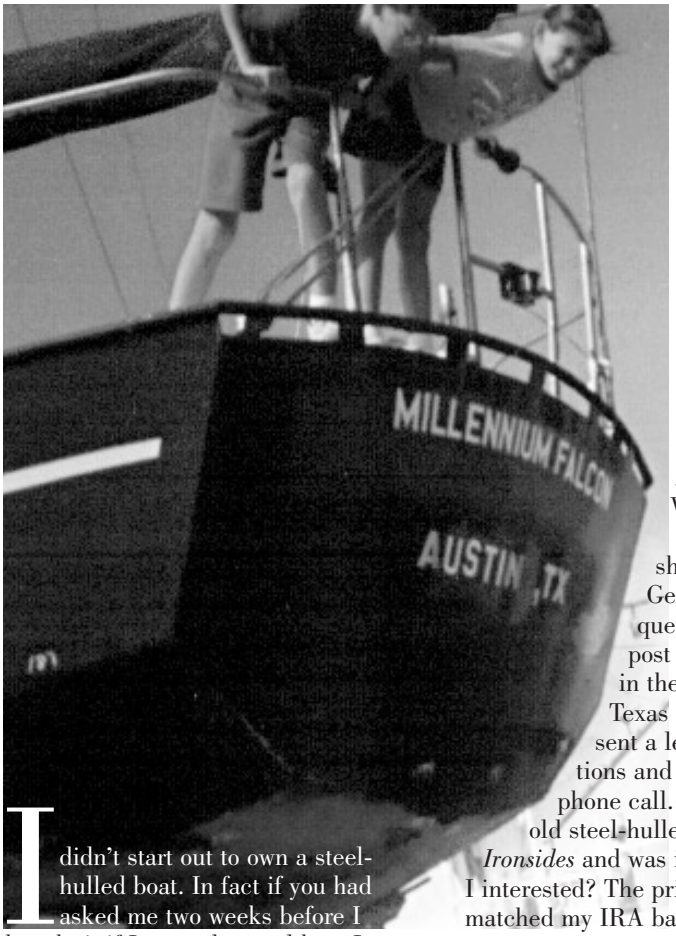
Steel Boat Building, by Thomas E. Colvin, International Marine Publishing Co.

Boatbuilding with Steel, by Gilbert C. Klingel, International Marine Publishing Co.

Boatbuilding with Aluminum, by Stephen F. Pollard, International Marine Publishing Co.

Nomad ***(top) has an aluminum deck and house on a steel hull.*** **Sandingo** ***(bottom) is launched with unpainted aluminum topsides and deck.***

What's so st



I didn't start out to own a steel-hulled boat. In fact if you had asked me two weeks before I bought it if I wanted a steel boat I would probably have said, "No, I would prefer a fiberglass or wood boat." But I had not yet owned a steel boat.

On December 1, 1996, I was having a cup of coffee with my secretary and commented that I was about to have a "late mid-life crisis." Late, because I was already 60 years old, and you are supposed to have those things when you are 40. I was about to admit to myself that a lifelong dream of sailing around the world was dead. I did not own a boat and had no prospects of owning one at the time. I didn't even live on a body of water any more. Tears came to my eyes as I related the death of a dream. Inside I was praying, "God, please don't let me give up this dream." I think God heard me.

Two days later, I drove to Rockport, Texas, to have a bon voyage dinner with a friend who was getting ready to cut loose and head for the Caribbean in his Hunter 37. During dinner, Gene commented on a man he knew who was about to sell his boat and buy a motor home. We all laughed at the absurdity of that, and the conversation went on to other subjects.

The next day I remembered the comment, and a light went on in my head: "Boat for sale? . . . Where? . . . How much? . . . Who?"

I immediately shot off an email to Gene and asked those questions. The return post gave me an address in the middle of the west Texas desert in Abilene. I sent a letter asking questions and a week later got a phone call. It was a 20-year-old steel-hulled ketch named *Ironsides* and was in Port Lavaca. Was I interested? The price was right (just matched my IRA balance), so the next day we drove 200 miles to see the boat.

When I saw the boat my first thought was, "What a rust bucket." It was streaked with rust, and the paint was in need of replacement. My thoughts were something like Luke Skywalker's must have been when he first saw Han Solo's spaceship. That is why, after I bought her, I decided to change the name from *Ironsides* to *Millennium Falcon*. She didn't look like much . . . but what a ship.

On boarding her I had an immediate feeling of solidity, security, and just plain mass. It felt like she could take a hurricane and shrug her shoulders. Here, on the Texas coast, hurricanes are a reasonable concern. Shallow water is also a concern here, and she had a steel keel.

More importantly, it was the first boat that both my wife, Martha, and I had agreed on in our entire lifetime. We fell in love immediately. A week later we took her out for a sea trial and on return to the dock agreed on the price. In just two weeks I had gone from having a dead dream to owning the boat that could fulfill the dream, and . . . it was a steel boat.

by Jim Isbell

So far I've only told the emotional side of the story, but this really wasn't an impulse purchase. A lot of soul searching and research went on in the two weeks leading up to the purchase. I had never owned a steel boat before, and I had never contemplated owning a steel boat. Why would I want a boat made out of a material that salt water just loves to destroy? Isn't it true that, "If God had intended for us to have steel boats, He would have planted steel trees?" I always remind myself He, in fact, did plant ironwood.

Every material has its pros and cons. I purchased my steel-hulled boat for reasons that made sense to me; your reasons will surely be different.

I can't compare ferrocement boats since I never owned one. But I have owned a 30-foot wooden boat, a 26-foot fiberglass boat, and now a 44-foot steel boat. Each, in its own time, was the right boat for me.

The wooden 30-footer was my first large boat. I built it myself and sailed it for several years. It was the boat for its time because it was inexpensive to acquire. I had intended to do a solo circumnavigation in it but later came to my senses and sold it.

The fiberglass boat was a Balboa 26 swing-keel cruising boat that I tried to race. It didn't race worth a damn, but it was a good family boat. At the time I had a family of four, and I sailed on a large lake in Texas, Lake Travis. It was perfect for that use and that time of my life.

But *Millennium Falcon* is an entirely different boat. She is a Bruce Roberts 44-foot center-cockpit ketch built in the Houston shipyard in 1978 by commercial shrimpboat builders. The hull is multi-chined 3/16-inch steel plate.

Fiberglass is impervious to salt water, and wood floats even when its full of water. Steel rusts, corrodes and, most of all, sinks like a rock. But . . . it *is* strong.

range about steel boats?

We are contemplating ocean crossings. One concern is the cargo containers that are sometimes lost from the decks of ships. They float, just awash, at the surface. It's not a large percentage bet that you will hit one of these, but if you do, the fact that statistically it might never happen doesn't make it any easier to survive. I looked at the substantial steel bow on *Millennium Falcon* and decided that if it did hit a container at sea, there was a good chance that, instead of holing, it might just dent and ride up over the container.

There have been several stories of steel-hulled boats being tossed up on a reef and later being winched back into deep water to sail away with just some scratched paint and a few dents. As one of my friends said sometime later, "You don't need insurance. After the hurricane you just take a truck out to the golf course where the storm left your boat, pick it up, and relaunch it." Steel can be holed, but it's much stronger than wood or fiberglass in an encounter with a UFO (undetected fixed object).

When I brought *Millennium Falcon* home to Aransas Pass, Texas, a skipper in an adjacent slip who has a fiberglass boat suggested that I would always be cleaning rust streaks off the hull. Well, it is true that steel rusts, but fiberglass blisters, and wood rots. Is any one of them worse than the others? There are ways to treat steel to minimize the rusting, just as there are ways to treat fiberglass and wood to minimize problems they face. I have done all of the above, and I think rust prevention is easier. My wooden boat now rests on the bottom in 300 feet of water because the last owner let it rot through at the waterline. If my steel boat were to rust through, and it already has once, it starts to seep *slowly*. The seep is very noticeable in the normally *very* dry bilge. It could seep for years before the leak became big enough to sink the boat. The previous owner of *Millennium Falcon* didn't even have a working bilge pump on board, such was his confidence. I have three pumps. It's not that I don't trust the hull, it's that I also believe in Murphy's Law.

I said the hull had rusted through. What do you do then? The repair is simple. Place a piece of 3/16-inch steel over the bad area, and weld it in place. One of the big attractions of steel, to me in planning a world cruise, is that no matter where you go in the world, you can find competent welders. In the most desolate backwater there is always someone who can weld. But try to find an experienced shipbuilder in wood or a qualified fiberglass technician with *fresh* materials in some of the out-of-the-way places where you might find yourself on a world cruise.

Double-plating a hull is relatively inexpensive. I know of one boat that was double- and then triple-plated without significantly affecting its waterline. You can carry the welding torch with you on the boat, and almost anywhere you go there will be scraps of steel available. Man seems to have had wars everywhere in the world, and war machines are made of steel. Maybe it's not the grade you would choose, but for an emergency repair it's usable. Even some desert islands I have been on have had scraps of steel lying about. Wake Island is a virtual stockpile of material for a steel boat. And if you have a welding torch on board and a few small plates of steel in the locker, you can actually patch a hole from the inside while under way!

As I explained to my wife as we contemplated the purchase, "If it needs to be repaired, we will go to a shipyard.

Millennium Falcon ***before (above left) and after (right). Her double-chine hull gleams in the Texas sunlight. A Bruce Roberts design, this 44-foot center-cockpit ketch was built in 1978.***

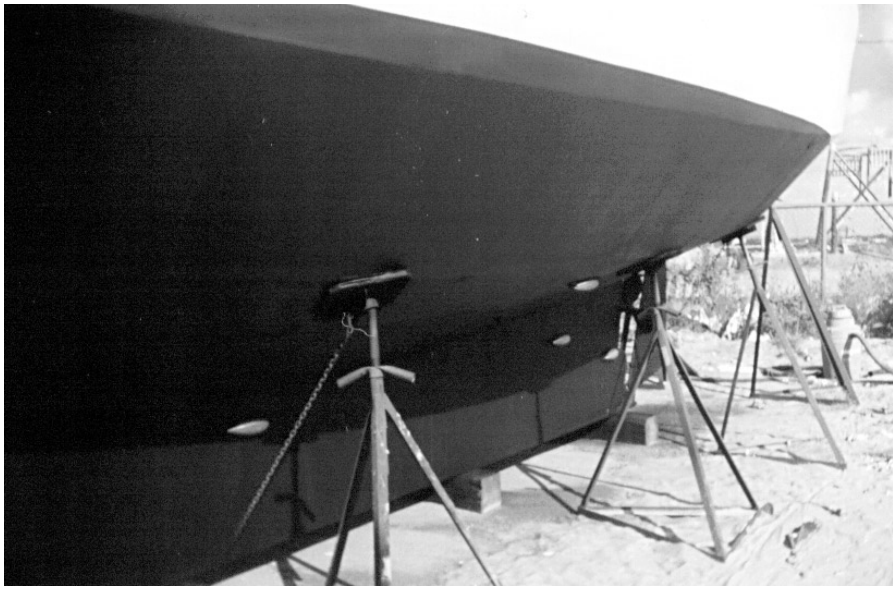
If a fiberglass boat needs repair, you go to a yacht yard. Now which one do you think would be more expensive?"

My grandson asked me one day, "Steel sinks, doesn't it?" Sure it sinks, but so do boats made of other materials. Every boat carries more cargo than its natural buoyancy will support. The engine alone is enough to sink most of them. The only time the building material will make a difference is when you're installing a positive flotation system. In the case of steel, it will require more flotation. No matter what it's made of, if your boat sinks you will be more concerned about whether or not your life raft floats and if the EPIRB is working.

Another concern about steel boats, mentioned every time a dockside discussion starts, is maintenance. My first big boat was a 30-foot wooden, hard-chine sailboat. I was most concerned about the prevention of rot. I spent most of my maintenance time trying to keep the inside of the boat dry so rot could not develop. The bilges had to be pumped whenever it rained and water *always* found its way into the bilge. The boat was in fresh water, so the problem was even worse than in salt water. I kept bags of salt tucked under the deck and routinely salted any water in the bilge. I watched the painted canvas deck (very traditional but a pain in the neck) for the slightest lifting or tear that would allow water to reach the wood. A wooden boat can rot through in just three years. I watched *Eglantine*, in the hands of her next owner, sink at the dock as she rotted through at the waterline because of fresh water in the bilges.

My second big boat, the fiberglass Balboa 26, *Shamrock 5*, required constant waxing to prevent clouding of the gelcoat in the intense Texas sun. I was not at all concerned about water in the bilge, however, because it couldn't hurt the fiberglass. Water in the bilge, as long as it is not rising, is not a big concern in a fiberglass hull. But on the outside of the hull, water can lead to blisters.

Now on *Millennium Falcon* my fears are of galvanic action and rust. By using a good two-part paint, I can control the rust. And by keeping the zincs fresh and watching the hookups at marinas, I can keep galvanic corrosion to a minimum. I can now go two years before repainting the bottom as long as I keep after the zincs. My bottom maintenance is not as time-consuming as the work I did on the other two boats. The rust on the deck whenever a chip in the paint lets water in is really easy to keep ahead of since it announces its presence immediately by a brown stain. Neither fiberglass nor wood give you any such signal. I find that my bilges are dryer now, probably because of my preoccupation with preventing rust.



"What a rust bucket," was Jim's first reaction to* Ironsides, *as she was called when he bought her. But he warmed up to the idea of steel boat ownership and has transformed the rust bucket into a beautiful and solid cruising machine.

If the hull is not protected by zincs, isolation transformer, or isolation diodes, the hull material on my boat can be etched away. But rust is not a real worry. It takes decades for rust to do much damage. Rust is more a cosmetic worry than a safety concern. When I first dove into the bilge of *Millennium Falcon*, I found some large scales of rust. The previous owner had sailed for eight years in the Caribbean with *no protection* on the inside plating of the boat. The owner before him had let it sit filled with water for 12 years.

Some of the scales were as thick as 1/8 inch. I was very concerned until I had an ultrasonic survey of the hull

done and found that there was a barely noticeable reduction in thickness of the hull plating in the area of these scales. Steel expands 16 times when it rusts, so a 1/8-inch rust scale represented .008 of an inch of steel plate out of .188 of original thickness. She had lost less than 5 percent of the thickness of the hull. This loss occurred over a period of 20 years! I couldn't live long enough to see it all rust away. But just to be safe, I have since treated the bilges with a corrosion preventive and paint.

A bonus on a steel boat is that it will not be as musty smelling as most fiberglass or wooden boats. When you are concerned about rust, you tend to be a fanatic about a dry bilge. Recently I was aboard a fiberglass boat in a nearby slip. As I entered the boat I looked down and could see water through a grate in the sole. "Hey," I said, "You have water in your bilge, did you know that?"

The response was, "Yeah, how far is it from the top?" He explained that he always had water in the bilge, but as long as the bilge pumps kept it pumped down, he was happy. My bilge is dry and dusty. If I develop a port leak or a deck leak, I fix it immediately and don't depend on the bilge pumps to take up the slack. The previous owner of my boat stored his electric drill and bits in the bilge.

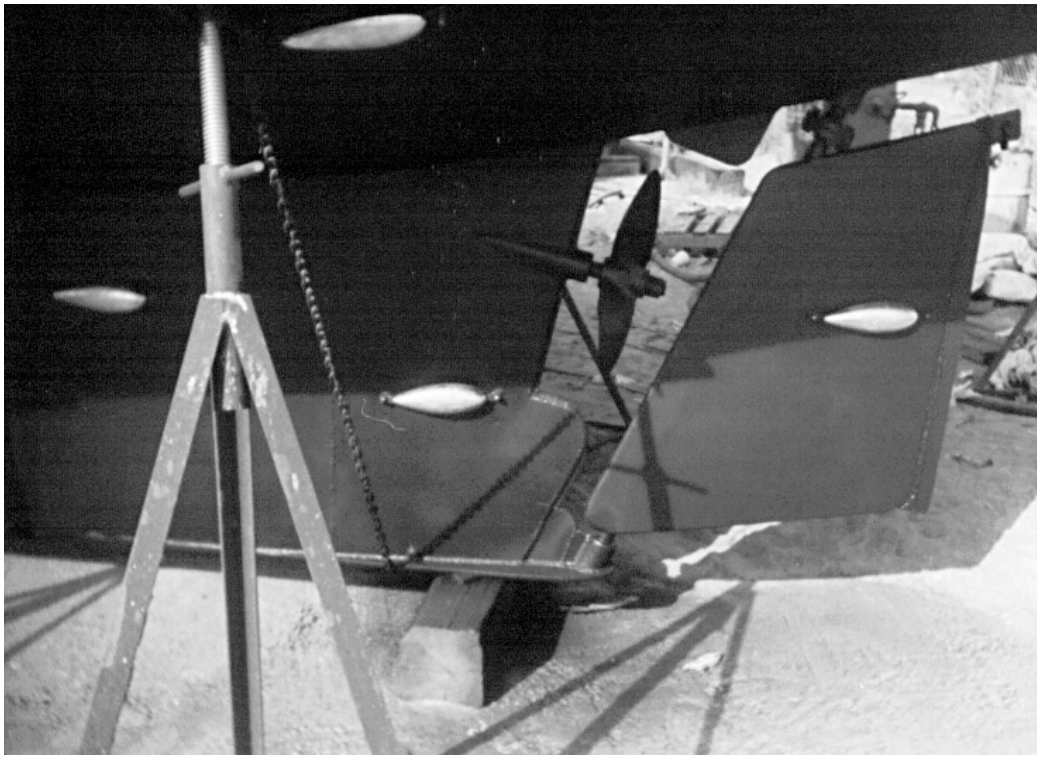
Another comment I hear commonly when I mention that I have a steel boat is that steel boats look like steel boats. This is also heard when people describe ferrocement boats. It just isn't true. A steel boat, as well as a ferrocement boat, can be made to look just like any other boat. A large number of ferrocement and steel boats are handmade by their owners and, of course, the quality of the construction depends on the person doing the job. Most large fiberglass boats are built in a factory in shiny molds. But a well-built steel or ferrocement boat can be virtually indistinguishable from a "plastic boat" until you rap on the hull with your knuckles.

Many people think steel can only be made in a hard-chine design. My boat is a multi-chine design and has beautiful lines. Steel can also be done in smooth round-radius chine designs. But even a hard-chine design, if properly executed, can be beautiful. The plywood Thunderbird 26 is a beautiful hull in hard-chine.

There are many other reasons why steel is a good hull material. First, there is the simplicity of adding features such as davits or cleats or any other item that has to be deck-mounted. When the support structure is 3/16-inch steel, all you have to do is drill holes and bolt them or weld them. No need for under-the-deck stiffeners. I am thinking about lengthening the bowsprit on *Millennium Falcon*, and the job will be easy: just get my welding torch out and start welding. The masts can be stepped on deck, which results in more room below. The pilothouse is 3/16-inch steel and is welded to the deck. It won't be carried away when hit from the side by a wave. The anchor windlass and cleats are bolted to the deck and will not pull out in a storm.

One of the biggest advantages of a steel hull is lightning protection. With the masts and shrouds grounded to the hull, any lightning will be carried through the hull and into the water. The hull will act as a Faraday cage to protect all equipment and persons inside from the effects of the lightning. I don't have to worry about the lightning emerging from the hull at the grounding plate and blowing a hole in the bottom of the boat or cutting through the hull at the chainplate to find a way to the water.

So, would I buy another steel boat? You bet I would if it fit my needs. I would also buy another wooden boat or another fiberglass boat if they fit my needs. The choice of material depends on what you want the boat to do and what kind of maintenance you feel you can handle the best. But there is no reason to shun steel as a hull material. It's a strong, easy-to-maintain, permanent method of enclosing some dry space to stick in the water.



Millennium Falcon ***can go two years between bottom paint jobs, as long as Jim "keeps after the zincs."***

New sails for good old

Get maximum value in replacement mains and jibs

by Sven Donaldson

Let's face it, most of us who sail older boats do so, at least in part, because the new ones are so darned expensive. Few sailors are entirely immune to the allure of the latest yachts and their ingenious design features. But when it boils down to an objective assessment of functional value versus dollars expended, good old boats keep coming up the winners.

It's rare to encounter an "experienced" sailboat with no serviceable sails whatsoever. Boatowners buy new sails to fill gaps in the inventory as their sailing plans become more ambitious or to replace key sails that are gradually wearing out. But there's a third reason — equally rational and sometimes overlooked — for buying another sail.

Many of our boats were designed 20 or 30 years ago, when rigs and sails were often quite crude by today's standards. For this reason, the purchase of a new sail (or sails) can be a golden opportunity to take advantage of recent thinking and some genuinely superior technology, which may well enhance the performance of an aging boat so it's literally better than new.

Racing sailors with long-term experience in one-designs — such as the Thistle, Lightning, and Star — are fully aware of the substantial increases in speed these classes have achieved over the years. Better boathandling techniques have, of course, contributed; but the biggest accelerator has been steady improvements to sails and associated spars and rigging. The same principles apply to larger sailboats. With good planning, improvements can be dramatic.

Performance, for the purposes of this article, means an optimal combination of speed, easy handling, and seaworthiness. By and large, the owners of older, cruising sailboats will fall into one of four camps, each with distinctly different needs when it comes to sails.

Coastal cruiser — The first and largest group are the inland/coastal cruisers — folks who use their boats to travel and explore without ever making open-water passages that put them more than a day or so from a safe harbor. By watching the weather, the risk of getting caught out in Force 6 or worse conditions can be almost eliminated, so dedicated storm sails will ordinarily not be necessary. This sailor's working sails are unlikely to rack up high hours quickly.

Offshore cruiser — A second and increasingly sizable contingent are the bluewater sailors — those who make offshore passages. These cruises can be anywhere from weeks to years. In every case, offshore sailing puts heavy demands on sails. Chafe problems are greatly exacerbated by the motion of a yacht at sea. UV exposure is generally more prolonged. And sooner or later, there's sure to be heavy weather. On most of the popular voyaging routes, close-hauled sailing is rare. However, upwind capability in very rough conditions may be essential at times to escape a tight spot.

Cruiser/racer — A third set of sailors are those who mix racing and cruising. In most cases the racing will be fairly casual competition at the club or regional level; but racing is racing, and the aim, as always, is to finish ahead of the other guy. Many older boats can be highly competitive, particularly under PHRF (the Performance Handicap Racing Fleet system). In some regions, the owners of certain popular boats have organized as one-design classes and enjoy good, close racing with restrictions on sail purchases to control costs. More than any other equipment-related factor, sails spell the difference between top finishes and mediocre results. Unfortunately, it's become very easy to spend a bundle on modern racing sails — perhaps defeating the purpose of buying that "economical" older boat in the first place. Without the protection of one-design class sail restrictions, a casual or occasional racer may find it difficult to achieve competitive speed while keeping sail expenditures at a reasonable level.

Racer — Finally, there are the gung-ho owners of older boats whose primary passion is racing. There is nothing contradictory about this — quite often the most affordable way to achieve fairly lofty racing goals is to "recycle" a retired raceboat and upgrade her sails, gear, foils, and bottom to near-perfect condition. *(See Block Island 40 story on Page 44.)* New raceboats often depreciate even faster than automobiles, and used ones regularly sell for a small fraction of their original cost. On the other hand, the ongoing expenses of campaigning an older racing machine will likely be about the same as competing with a new boat of comparable size. Suffice it to say, a full-bore program requires state-of-the-art racing sails, and unless a good supply of fairly fresh sails comes as part of the package when a used boat is purchased, they certainly won't be cheap.

Sailors in each of these groups need to approach the complicated business of sail shopping with their goals and expectations clearly in mind. In general terms, the aim of the first three groups is to achieve acceptable performance across the range of anticipated conditions without buying or carrying more sails than strictly necessary and without spending too much on each sail. Dedicated racers,

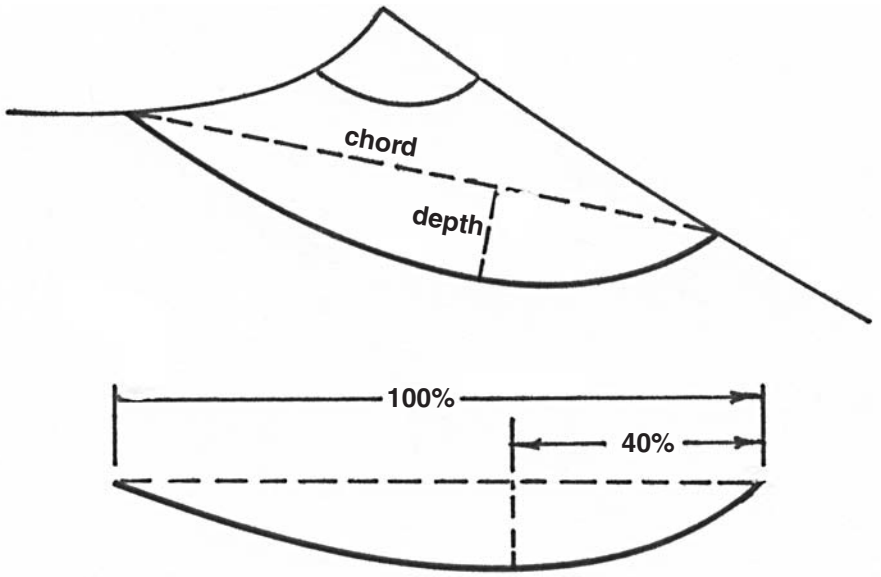
however, must be prepared to spend more freely but may still be able to achieve some savings through principles outlined in this article.

Stable sail shape

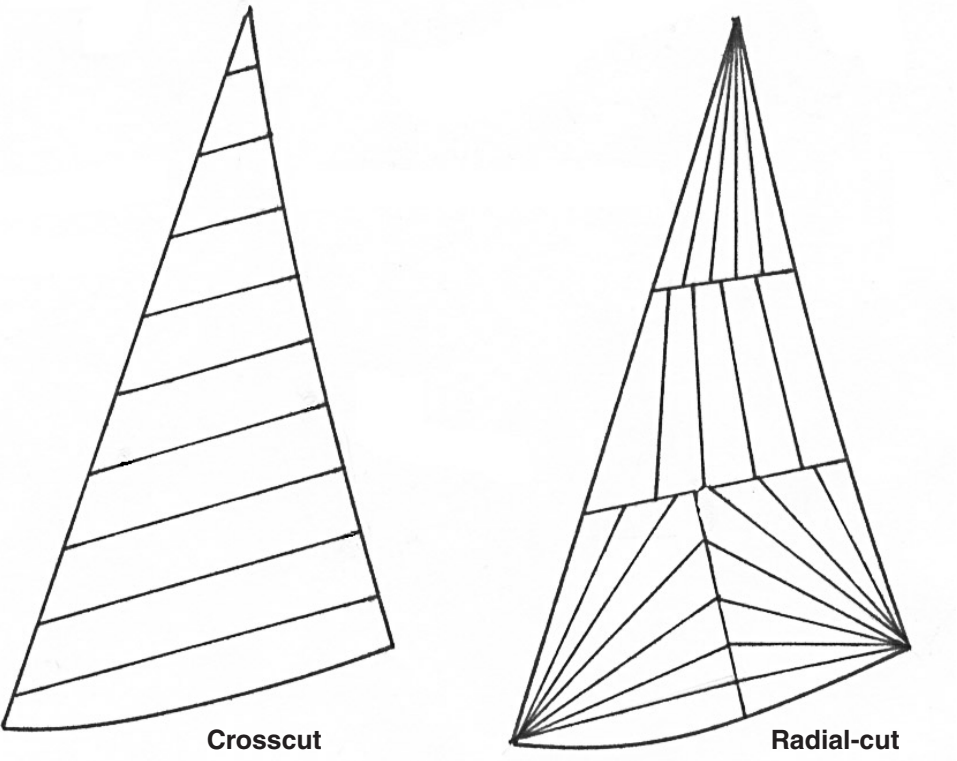
The wind makes no distinction between racing and cruising boats, so for similar sailing conditions, the ideal "flying shape" for any particular sail will be almost identical. The popular notion that cruising sails can be designed with a "wider groove" to better accommodate inexperienced helmsmen is mostly just a sales pitch. In reality, many cruising sails — especially flat-cut headsails made from relatively stretchy cloth — are less forgiving than their more sophisticated racing counterparts (and considerably less efficient to boot).

The description of a sail's flying shape begins with its draft — the depth of its curvature as a percentage of the distance from luff to leech. The difference between a "flat" sail and a "full" one is quite subtle — rarely more than about 4 percent. Efficient upwind headsails are typically between 9 and 12 percent draft, while mains range from 8 to 11 percent. Also very important is the so-called draft location — the position of greatest depth in a sail's horizontal curvature as viewed from the windward side. For headsails (or cat-rigged mainsails), the draft location should normally be fairly far forward, around 40 percent of the distance from luff to leech. Due to the effect of the jib, the optimal draft location for most mainsails is a little farther aft, around 45 percent, but it should never stray aft of the 50 percent position. In principle, a deeper sail can generate more power, but too much draft leads to flow instability and a dramatic reduction in drive, even when the boat is not overpowered.

The typical crosscut genoa made of fairly soft, stretchy "cruising cloth" is a serious compromise for allround use — too flat, particularly near the luff, for good light-wind performance, yet prone to becoming excessively full and draft-aft when loaded up in a brisk breeze. To some extent, it's possible to "drag" the draft forward by winding up halyard tension, but trim adjustments will seldom induce anything close to an optimal shape all the way from head to foot. The real solution is a sail which retains its built-in shape over a wide wind range. This calls for some form of radial construction plus a durable, low-stretch sailcloth that's compatible with a radial panel layout. More often than not, the most suitable materials are laminates rather than traditional woven Dacron fabrics *(see illustration on next page)*.



Horizontal draft stripes on a sail make it feasible to determine sail shape. The draft of a sail at any given level is the depth divided by the chord, expressed as a percentage. Draft location is the distance between the luff and the deepest point in the sail's curvature, again expressed as a percentage of the chord. These measurements are most easily obtained from a wide-angle photograph taken with the camera almost directly against the foot of the sail.



A low-tech crosscut sail is easily assembled and wastes little material. A radial layout does a better job of aligning the strong fibers in the sail material with the actual load paths in a working sail. More fabric is wasted, however, and computerized sailmaking technology is almost essential.

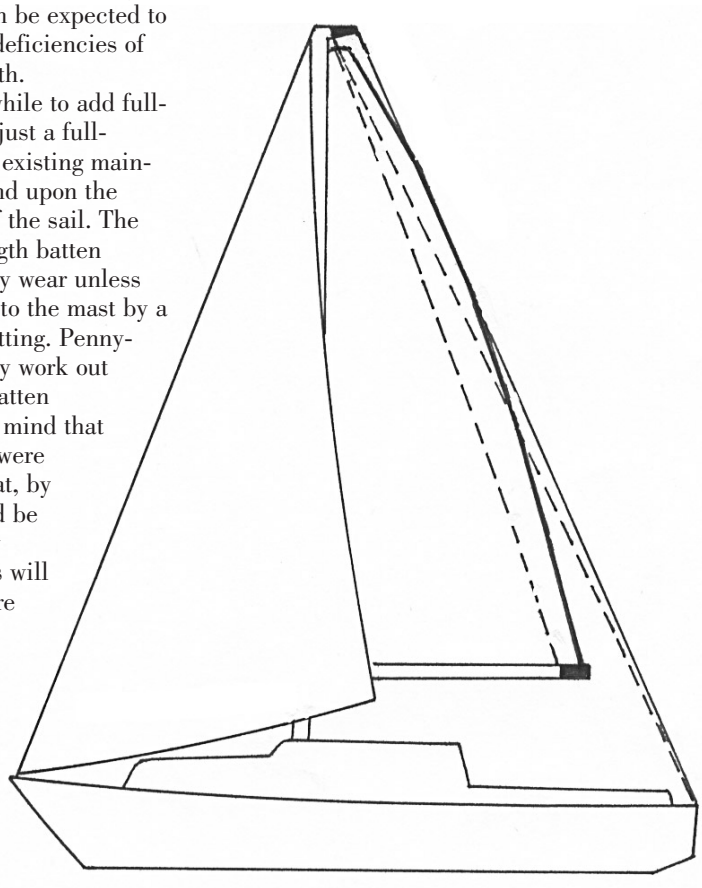
Aside from lost boat speed, a stretchy genoa with a "draft-starved" luff and a tight leech will be prone to backwinding the mainsail. When this happens, the crew will tend to oversheet the main which will induce excess weather helm. Another common indication of sub-standard genoa shape is the behavior of the yarn telltales (normally positioned on either side of the headsail luff at various heights, and from 12 to 15 inches behind the luff tape). If your boat goes to windward best with the telltales on the leeward side drooping and the windward ones streaming straight back, it's a sign that the front quarter of the headsail lacks sufficient curvature.

The typical crosscut mainsail handles a wide range of wind speeds more successfully than its headsail counterpart, primarily because its luff is supported by a sturdy mast instead of a sag-prone headstay. Long battens, especially the luff-to-leech variety, also help a great deal by maintaining fair, uniform curvature as the mainsail ages. However, no battens can be expected to overcome the inherent deficiencies of an overly elastic sailcloth.

Whether its worthwhile to add full-length battens (or even just a full-length top batten) to an existing mainsail will naturally depend upon the condition and quality of the sail. The forward ends of full-length batten pockets will suffer heavy wear unless each batten is attached to the mast by a small gooseneck-type fitting. Penny-pinching solutions rarely work out well when it comes to batten hardware. Also, bear in mind that quite a few older boats were designed with mains that, by today's standards, would be considered significantly undersized. These boats will often speed up with more mainsail area and, surprisingly, it's often feasible to add to this area without major changes to the rig itself. In many cases, the easiest way to get this extra area is to bite the bullet and buy a new main that employs long battens to support a larger roach.

All-weather inventory

Aerodynamic forces increase exponentially with flow velocity, so even if sail shape could be "cast in stone," you can expect a fourfold increase in propulsive and heeling forces when the wind speed doubles. The fact that most sails stretch and get fuller as they load up makes these forces escalate even faster. This, of course, is why we reef or change down to smaller, flatter sails. Trim adjustments, such as altering mast bend, headstay sag, luff tension, lead/traveller position, and sheet tension can certainly help a sail function more efficiently across a range of wind conditions. But no advancements in sailmaking will probably ever allow a single sail to perform effectively in everything from a light-air day to a gale. So for most sailors, the challenge is to assemble a



Many older cruising boats came with rather skimpy mainsails as original equipment (inner dashed line). The purchase of a new main can be a great opportunity to gain worthwhile sail area supported by full-length battens and/or an extended boom. Adding to the backstay crane may help to minimize backstay interference.

When do you need new sails?

Most sailors choose to replace their working sails before they literally fall apart, so deciding when to pull the plug becomes a judgment call. Signs that it may be time for a new sail (or sails) include:

1) Weakened sailcloth resulting from years of sun, salt, and mechanical stress. Heavily worn sailcloth tears easily and stretches much more than when new. Note that when seam stitching chafes or fatigues, it's not expensive (or difficult) to have the sail re-stitched. However, when the cloth itself gets too tired, there's no practical fix short of a new sail.

2) Underbuilt sails with skimpy corner/reefing patches, inadequate reinforcements, or sub-standard hardware can sometimes be beefed up to extend their service lives. However, "bargain sails" were rarely made with quality sailcloth to begin with, so upgrading may not be worthwhile unless there's no affordable alternative.

3) Poorly shaped sails may conceivably be suffering from nothing worse than improper trim. In other cases, it's possible for a sailmaker to "re-cut" a sail to correct minor deficiencies. On the other hand, if the shape problems are rooted in excessive or uncontrolled fabric stretch there's rarely much that can be done short of replacement. Basically, you'll have to decide first, how much performance are you giving up; and second, how much does it bother you?

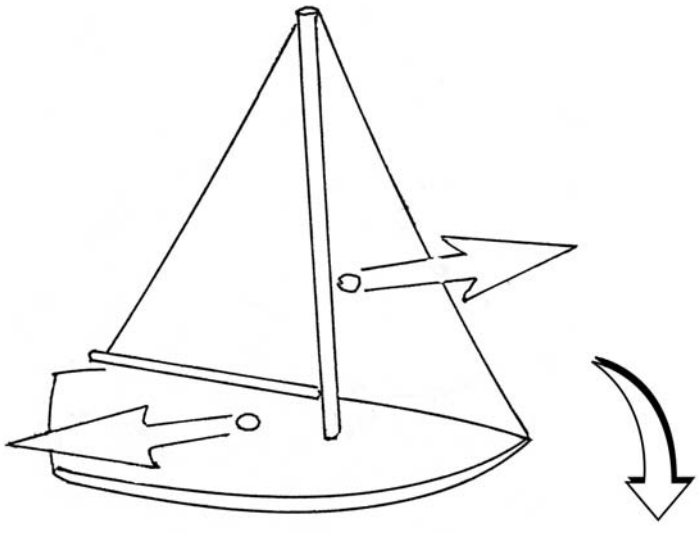
4) Existing sail (or sailplan) is hindering the boat's performance or inconveniencing the crew. If you decide to modernize the rig, add furling gear, or make other upgrades, your used, but serviceable, sails can often be sold through sail brokers or marine consignment outlets to partially offset replacement costs.

5) Extensively patched, stained, or otherwise unattractive sails may be candidates for replacement for aesthetic reasons. After all, most sailors want to take pride in their boats.

modest inventory — typically three to six sails — that can handle all anticipated conditions with competence.

Coastal cruisers should begin by deciding whether sailing efficiently in winds under 8 knots is important enough to justify the cost of specialized light-air sails. If you'd just as soon motor when boatspeed drops below 4 knots (and I don't mind admitting that I usually do), you can save a bundle by optimizing your sail plan for medium-to-brisk conditions. Many masthead-rigged cruiser/racers from the late '60s through the mid-'80s were designed with an eye to the IOR (International Offshore Rule) which favored tall, narrow mainsails set on very short booms. The foretriangle of these boats is disproportionately large by today's standards. If you set a genoa with substantial overlap (greater than 135 percent) in an effort to enhance performance in light air, the big headsail becomes a bear to handle in a breeze, especially when tacking repeatedly.

On the other hand, the same older boats with big foretriangles will often perform beautifully in 8 to 10 knots when powered only by a "lapper" of 105 to 110 percent, in combination with a big-roach mainsail for added power and enough extra sail area toward the back of the rig to prevent a lee helm problem from developing when there isn't enough force in the breeze to heel the boat to her normal sailing lines. Remember, because the typical keelboat is designed to sail upwind at a substantial heel angle, the forward force from the rig will normally be quite far to leeward of the center of resistance for the hull. This creates a couple which tends to pivot the bow into the wind *(shown below)*. Therefore, to compensate for the reduced heeling force associated with a smaller headsail, the center of effort of the



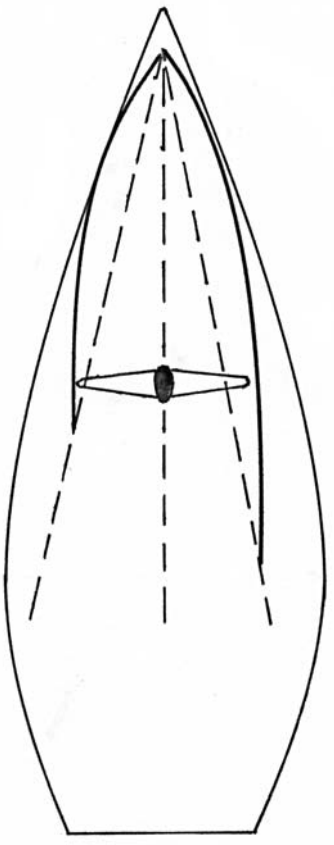
When a sailboat heels, the forward propulsive force from the sails is offset to leeward of the backward resistance created by water flowing past the hull. More heel produces greater lateral separation between these opposing forces and generates more weather helm.

entire rig will usually need to be shifted aft — hence the enlarged mainsail roach. Conversely, when the boat begins to heel too much in a stiff breeze, the rule is always to de-power from back to front; readily accomplished in most cases by flattening the main, easing down the main traveler, or putting in a reef as required.

Another key to success with the "smaller jib approach" is getting a lapper with enough built-in draft to set well in moderate air. A #3 heavy-weather jib that's as flat as a board in anything less than 20 knots true, simply won't do the trick. What you want is around 10 percent average draft just as soon as there's enough breeze for the sail to fill. The challenge, of course, is to prevent the narrow lapper from becoming too full once the breeze builds enough to induce appreciable headstay sag. This is where an adjustable backstay and contemporary, low-stretch sail construction will really pay off. A good modern lapper in combination with a big-roach, reefable cruising main will enable most keelboats to sail upwind or close reach with good speed in winds from around 7 knots up to the mid-20s.

Another necessity for good results with the "small jib" approach is a low-drag propeller. Replacing a fixed prop — still the norm on a majority of cruising sailboats — with a folding or feathering model is typically worth at least half a knot in light air and, unlike a big genoa, will pay speed dividends in strong winds as well. In terms of expense, upgrading the prop generally falls in the same ballpark as replacing a genoa.

One caveat: the sailor who races and cruises needs to approach the headsail size decision with extra care. Boats that were sold as racer/cruisers in the '60s and early '70s were often designed for monster 170 percent genoas that overlapped almost the entire length of the main boom. It's difficult to justify carrying a sail of this size. Its effective wind range is too narrow because the mainsail traveler cannot be eased down without choking the slot, and the outsized genoa is laborious to grind in after tacking. Still, traditions die hard in sailing, and the



Bands of super-strong Kevlar are bonded to the surface of this high-tech sail in a pattern that highlights the actual load paths within the sail membrane (above). A genoa with substantial overlap (right) will wrap around the shrouds and spreaders allowing it to be sheeted to a tighter angle (starboard side). A "lapper" (port side) is limited to a wider sheeting angle, which may, to some extent, impair its pointing ability.

history of big overlap genoas goes back to the CCA (Cruising Club of America) rule which pre-dated the IOR. CCA rule-makers recognized that overlap area is considerably less efficient than headsail area within the open foretriangle, but erred in allowing this overlap area to be almost "free" in handicapping terms. Naturally, when the wind is light, even inefficient sail area will contribute a bit more speed. On the other hand, as soon as there's a significant rating penalty involved, the benefits of this minor speed gain tend to dim.

Later, as the IOR gathered steam in the late '70s, standard genoa size became fixed at 150 percent. Today, most PHRF organizations continue to adhere to this template, although the trend in modern lightweight raceboats is to even smaller overlaps. If you race from time to time, and a 150 percent genoa is the norm in your fleet, then you'll probably need one, too. In addition to extra area, an advantage of the 150 percent genoa, as opposed to say, a smaller 135 percent sail, is that it wraps around the shrouds to a greater extent and can, therefore, be sheeted to a tighter angle for higher pointing *(see illustration at left)*. However, this extra height (pointing ability) is a subtle thing, and will only be noticeable if the boat also has a clean bottom, efficient foils, and a satisfactory arrangement for inboard sheeting.

Finally, if you routinely sail downwind in "no flying sails" mode (without spinnakers, Gennakers, a-symmetrical spinnakers, and so on), you'll need to consider the suitability of your big headsail for running, as well as for upwind work. Downwind speed using white sails is mainly determined by the projected area because, when sailing wing-and-wing, the rig functions in a stalled condition. A larger sail can potentially generate more power, but only when propped out by a whisker pole about equal in length to the sail's LP. A standard spinnaker pole (equal to the length of the foretriangle base or J measurement) is considerably too short to make an efficient whisker pole for a 150 percent genoa, although it works well with a lapper.

Furling sails

A great many cruising boats these days are equipped with headsail furling gear, and sailors who do not already enjoy this convenience will, more often than not, put it high on their wish lists. Mainsail furling has become a popular option for new boats but is rarely considered for old ones, because retrofitting generally involves either a complete new mast or an expensive in-the-boom system.

Most hank-on headsails can be readily converted for furling by cutting off the luff tape and replacing it with a boltrope luff. Depending upon the age and condition of the sail, it may also be worth adding UV-protective strips along the leech and foot. However, this addition is fairly expensive, especially when costly acrylic fabric (such as Sunbrella) is used; and it adds considerable weight to the sail's leech. Often, it's better to let the sun do its worst to the old rag for a season or two while saving up for a new sail designed specifically for the furling system.

Roller furling is easier on sails than dropping and bagging them. It also pretty much eliminates the perceived need for soft, flexible sailcloth, because these sails are rarely handled on deck. Unfortunately, many new furling genoas are still being built from soft, relatively stretchy fabrics which are essentially identical to those used 20 years ago, despite the fact that superior materials, such as cruising laminates, are now available.

Roller reefing using headsail furling gear is not without its problems despite numerous attempts to develop an "ideal" system. A partially-rolled headsail typically becomes baggy and distorted because the head and tack areas get wound in a little ahead of the center of the sail, and because there's no effective way to retain luff tension once the sail is "reefed." Some high-end furling systems now feature double swivels at the head and tack, so only the aluminum extrusion is linked directly to the furling drum.

Alternatively, some sailmakers will sew tapered foam luff pads or a staggered array of extra bolt ropes just behind the luffs of their furling sails. These approaches can improve the reefed shape of a purpose-built furling headsail, but the results won't compare to a second, smaller sail designed specifically for brisk winds. On the other hand, cruisers have been known to circumnavigate using just a single furling/reefing 135 percent genoa. I wouldn't feel comfortable with this choice.

A decade ago, the notion of racing with furling gear was considered almost laughable. This attitude has changed, thanks largely to the near-universal acceptance of this gear for high-profile single-handed events like the Around Alone (former BOC) and the Vendée Globe. True, these are predominantly offwind races that put a premium on simplified sail handling, but the speed losses associated with furling headsails are smaller than you might think. A reduced luff length is unavoidable, but can usually be kept in the neighborhood of 18 to 24 inches, if care is taken to mount the furling drum close to the deck.

Because sewn-on sunstrips are expensive and add extra weight toward the back of the sail, sailcloth manufacturers have developed UV-resistant finishes. This alternative is

An excessively low clew makes this genoa difficult to trim correctly, especially in light air.

probably most suitable for seasonal sailors in temperate climates, or as secondary protection for working sails that experience heavy use on offshore passages. Another solution is the sock-type sail cover with a full-length zipper that can be hoisted on a spare halyard after the headsail is furled. This kind of cover will protect any sail you set from the furler now and in the future.

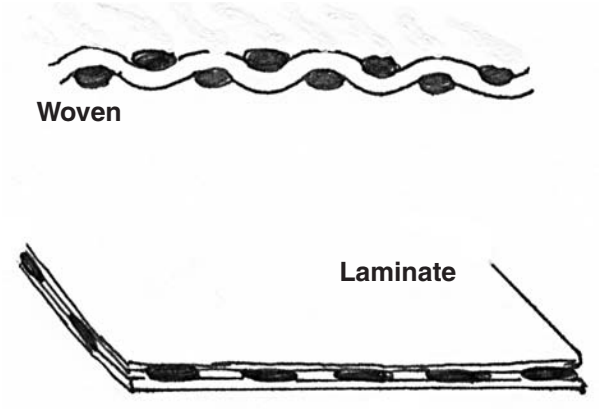
The inevitable gap between the foot of most furling headsails and the deck/cabintop is often cited as a strike against furling sails, but in reality, the importance of an "end-plate effect" is generally overrated. To effectively restrict cross flow beneath the headsail, the front half of the foot needs to literally lie on the deck. Even a six-inch gap eliminates most of the benefit. A low-clewed racing sail will achieve this extra measure of efficiency, but at the cost of poor visibility to leeward and the risk of blowing out the sail from a solid wave impact.

High-clewed sails are also less prone to twist excessively when the sheet is eased off for reaching and are generally less "twitchy" to trim. Just remember that the lead position will be further aft with a high-clewed sail of equal overlap, so be sure that the deck hardware can accommodate this. In most cases, the jib tack should be as close to deck as is feasible, and the clew as high as can be reached conveniently. The old-style furling genoa with a foot that parallels the deck will neither set nor furl as well, but some sailmakers still favor them because they are easy to build using a basic crosscut panel layout.

Dedicated racers often favor twin-groove furling systems, with split drums that can be removed when the boat is in competition mode. With multiple halyards and a twin-groove foil, the crew can perform inside/outside changes to maintain full racing speed at all times. By recutting the luff, a retired racing genoa can often be converted into a satisfactory furling sail for cruising (perhaps freeing up funds for a new racing sail).

Sailcloth and sailmaking

Sails are tensile structures similar to a mesh hammock which supports a person's weight using a network of strong cords. Even when one edge of a sail is uniformly supported by a stay or mast, the stresses tend to radiate from the corners and are most concentrated near the head and the clew. Sailmakers deal with this concentrated load by adding extra layers of material (corner patches); different fabrics for different parts of a sail; and, in some cases, bands of strong fibers which are applied directly to a lightweight foundation material during sail fabrication.



The crimp in the yarns of a woven sailcloth will inevitably tend to straighten under load, causing an extra measure of fabric stretch. In contrast, the primary reinforcements in most laminates are sandwiched between layers of plastic film and are virtually crimp-free.

Hot racing sails these days are reinforced by exotic stuff like Kevlar, Vectran, and PBO (phenylene benzobisoxazok) — super strong, stretch-resistant materials that have pretty much superseded polyester (i.e., Dacron) except where restricted by racing-class rules. These fibers are many times more costly than polyester, and with materials typically representing around 30 percent of the price for even a basic crosscut sail, the use of advanced fibers can lead to rather terrifying price quotations. Too often, club-level racing deteriorates because one or two fleet members are prepared to spend a bundle on high-tech sails, thus buying a major competitive advantage.

On the other hand, there's now a strong case for building sails out of the more economical polyester laminates as an alternative to traditional woven Dacron. Laminates ordinarily incorporate a layer of Mylar film (polyester in thin sheet form) which forms a stable foundation for the material and greatly enhances resistance to stretch on the bias (i.e., diagonal). Furthermore, in a laminate the principal load-bearing yarns lie flat on the surface of the film in contrast to a woven sailcloth with yarns that zig-zag over and under one other (*see above*). By eliminating this crimp, the laminate gains superior stretch-resistance, even when similar materials are used. In terms of both cost and performance, there's less benefit to using high-tech fibers to construct woven sailcloths so, little by little, laminates are gaining favor.

In most racing laminates, the primary reinforcements are flattened fiber bundles sandwiched between two films. In most cases they take the form of an open mesh or scrim, with spaces between the yarns to promote secure adhesive bonding between the outer layers. So-called cruise laminates usually substitute a layer of taffeta — a lightweight woven polyester fabric — for one of the outer films. The taffeta boosts tear resistance, but also increases weight and cost while contributing almost nothing to bias stability. What it does do is create a laminate that more closely resembles conventional sailcloth, and for this reason some cruising laminates have taffeta layers on both outer surfaces, plus at least one Mylar layer inside. From the viewpoint of sail performance, this is not the best way to go, except perhaps for offshore sails that are likely to suffer exceptional chafe and weathering.

Since the early '80s, computerized design and panel-cutting systems have become important tools for many sailmakers. With a computer-aided design system feeding information to a full-scale plotter or automated cutter, the speed and accuracy of sail production — be it crosscut, bi-radial, or whatever — is significantly improved. On the debit side, this specialized equipment and software is

expensive, as well as challenging to use, update, and maintain. Even in the computer age, there remains a niche for the "cottage industry" sailmaker, largely because there's still demand for basic crosscut Dacron sails which can be built inexpensively using nothing more than some hand tools and a good sewing machine.

Although the majority of the small lofts now use a computer for design work, quite a few have not yet taken the more costly step into automated cutting. Nearly all the heavier woven Dacrons favored for cruising sails are fill-oriented styles with the largest yarns extending across the width of the sailcoth roll. These materials are only suitable for conventional crosscut sails. By and large, if you want the superior shape retention of a bi-radial or tri-radial panel layout, you'll need to abandon all-woven materials in favor of laminates. These more complex layouts can only be constructed efficiently with the aid of computerized sailmaking tools, and even so there's greater fabric waste and more assembly time involved. These factors help explain the higher cost of laminate sails, despite the fact that laminating is actually quicker and potentially less expensive than weaving. The price premium ranges from about 25 percent using all-polyester laminates to 50 percent and up when advanced materials become involved.

There is, however, one group of "high-tech" reinforcing material that deserves serious consideration by mainstream owners of larger boats: the ultra-high-modulus polyethylenes, including Spectra, manufactured by Allied-Signal, and Dyneema, made by DMS. These fibers are stronger, pound for pound, than Kevlar and far superior in terms of fatigue, chafe, and UV resistance. Their main shortcoming is a tendency to "creep" or stretch permanently when subjected to high, sustained loads — a real problem for minimum-weight racing sails that are often pushed close to their limits. On the other hand, for a more conservatively-built sail, brief load peaks caused by knockdowns or other mishaps will not cause creep and permanent deformation.

Hard-core racing sails need to be as light as possible so they will fill more easily in zephyrs, and contribute less to speed-sapping weight aloft when the wind pipes up. However, the cruising sailor or casual racer shouldn't worry much about sail weight — shape stability and robust construction are far more important. There's no question that Spectra laminate sails offer both superior shape stability and much larger safety margins than polyester sails of similar weight.

Choices

The owners of older sailboats are as diverse as their vessels, making it extremely difficult to generalize about sail needs. Inshore cruiser, bluewater sailor, casual racer, or serious competitor — each must evaluate the existing sail inventory, set priorities, and come up with an affordable schedule of sail replacements. A first-rate modern main or jib has the potential to give good service for 15 to 20 years of seasonal, inshore cruising, so it's not unreasonable to regard good sails as long-term investments.

Laminate sail materials and radial layouts represent a genuine improvement over traditional cross-cut Dacron sails, but have been slow to gain popularity within the cruising community due to a 20- to 50-percent price premium and nagging concerns about durability and repairability. This is not to say that a conventional Dacron sail will necessarily have a longer useful life, or that a "high-tech" sail will be impossible to repair at sea. However, the first of these "new generation" cruising sails have not yet seen a decade of use, and despite some positive indications from solo marathon racing, the longevity issue has not been settled to the satisfaction of most cruisers. Sailmakers generally sell what their customers want, and many are happy to keep building sails the "old-fashioned way" as long as there's a call for functional, economical sails and personal service.

At one end of the size spectrum, a small-boat sailor with a microscopic budget will likely have a hard time rationalizing anything but basic Dacron. Boats over 45 feet will nearly always be better served by laminate radials (although offshore voyagers may still elect to play it safe for a few more years). That leaves the owners of the mid-sized good old boats with the difficult decisions . . . but at least we have more, and better, sail options than the original owners ever did.

Many cruising boats, both new and old, will perform very nicely in moderate air using just a well-cut lapper and a large-roach, full-battened main.


Mighty Neptune
BIG $ BUBBLY
CREDIT

On naming ceremonies, black boxes

Renaming a boat? How bad could that be?

Superstition got you down? John Vigor offers tips for renaming your boat and keeping it lucky

by John Vigor
illustrated by Dave Chase

I once knew a man in Florida who told me he'd owned 24 different yachts and renamed every single one of them.

"Did it bring you bad luck?" I asked.

"Not that I'm aware of," he said. "You don't believe in those old superstitions, do you?"

Well, yes. Matter of fact, I do. And I'm not alone. Actually, it's not so much being superstitious as being v-e-r-y careful. It's an essential part of good seamanship.

Some years ago, when I wanted to change the name of my newly purchased 31-foot sloop from *Our Way* to *Freelance*, I searched for a formal "denaming ceremony" to wipe the slate clean in preparation for the renaming. I read all the books, but I couldn't find one. What I did learn, though, was that such a ceremony should consist of five parts: an invocation, an expression of gratitude, a supplication, a re-dedication and a libation. So I wrote my own short ceremony: Vigor's inter-denominational denaming ceremony. It worked perfectly.

Freelance carried me and my family many thousands of deep-sea miles both north and south of the equator, and we enjoyed good luck all the way. I used the same ceremony after that to change the name of my Santana 22 from *Zephyr* to *Tagati*, a Zulu word that means "magic" or "bewitched."

I'll give you the exact wording of Vigor's denaming ceremony, but first you must remove all physical traces of the boat's old name. Take the old log book ashore, along with any other papers that bear the old name. Check for offending books and charts with the name inscribed. Be ruthless. Sand away the old name from the lifebuoys, transom, topsides, dinghy, and oars. Yes, sand it away. Painting over is not good enough. You're dealing with gods here, you understand, not mere dumb mortals. If the old name is carved or etched, try to remove it or, at the very minimum, fill it with putty and then paint it over. And don't place the new name anywhere on the boat before the denaming ceremony is carried out. That's just tempting fate.

How you conduct the ceremony depends entirely on you. If you're the

Continued on Page 32

Vigor's denaming ceremony

"In the name of all who have sailed aboard this ship in the past, and in the name of all who may sail aboard her in the future, we invoke the ancient gods of the wind and the sea to favor us with their blessing today.

"Mighty Neptune, king of all that moves in or on the waves; and mighty Aeolus (pronounced EE-oh-lus), guardian of the winds and all that blows before them:

"We offer you our thanks for the protection you have afforded this vessel in the past. We voice our gratitude that she has always found shelter from tempest and storm and enjoyed safe passage to port.

"Now, wherefore, we submit this supplication, that the name whereby this vessel has hitherto been known _____, be struck and removed from your records.

"Further, we ask that when she is again presented for blessing with another name, she shall be recognized and shall be accorded once again the selfsame privileges she previously enjoyed.

"In return for which, we rededicate this vessel to your domain in full knowledge that she shall be subject as always to the immutable laws of the gods of the wind and the sea.

"In consequence whereof, and in good faith, we seal this pact with a libation offered according to the hallowed ritual of the sea."

Christening ceremony

After a boat is denamed, you simply need to rename it using the traditional christening ceremony, preferably with Queen Elizabeth breaking a bottle of champagne on the bow, and saying the words:

"I name this ship _____, and may she bring fair winds and good fortune to all who sail on her."

Vigor's Black Box Theory

Just when you thought it was safe

Why is it that some sailors go quietly about their business, consistently making quick, safe, and satisfying passages, while others lurch erratically from port to port amid a series of catastrophes? Is it luck? No, it's the Fifth Essential.

I first stumbled across the concept more than 30 years ago, when I was a newspaper reporter in Durban, South Africa. One of my early assignments was to cover a speech by a visiting American yachtsman and scientist, a talk he called "The Fifth Essential for Successful Yacht Voyages." He talked about it for a full half-hour, but never once mentioned what the Fifth Essential was. "I'm not superstitious," he said, "but I am not going to name it. I'll leave that to you to work out."

He listed the first four essentials in this order:

1. A well-found ship
2. A good crew
3. Adequate preparation and maintenance
4. Seamanship

As he wouldn't *name* the Fifth Essential, he could only *describe* how it worked. He offered some well-documented examples of how it had affected the lives of yachting pioneers.

We soon got the idea. Take Joshua Slocum, for instance. During his circumnavigation he was chased by a pirate vessel off the coast of Morocco. He cracked on all sail, but the pirates were still bearing down on him. Determined to give a good account of himself, he ducked down below for his rifle. Suddenly a squall hit the *Spray*. When his little vessel was under control again, he glanced back and saw that the squall had dismasted the pirate ship, which lay wallowing in the wreckage of its spars.

Then there was Harry Pidgeon, who sailed twice around the world singlehanded. On one occasion, when a change in wind direction set his yawl, *Sea Bird*, sailing toward the coast while he slept below, the boat ran aground on the only sandy bay in tens of miles of rocky coastline. Furthermore she had to pass over a rocky ledge at the entrance to the bay. Had it been low tide when *Sea Bird* sailed in so confidently, she would have gotten no farther. As it happened, Pidgeon was able to refloat her, refit her, and carry on.

Over the years I noted the same theme recurring in talks with such splendid seamen as Bernard Moitessier, Jean Gau, and Eric Hiscock. In fact, I expect all of us who have sailed for any time have had similar experiences — and thanked our lucky stars at the time. But it isn't luck, really. There's much more to the Fifth Essential than mere chance.

In 1986, when I started fitting out my own 31-footer, *Freelance*, for a voyage from Durban to the United States, I reduced the Fifth Essential to a simple system of accident prevention. In the *Freelance* corollary to the theory, every boat possesses an imaginary black box, a sort of bank account in which points are kept. In times of emergency, when there is nothing more

Renaming continued from Page 31

theatrical type, and enjoy appearing in public in your yachtclub blazer and skipper's cap, you can read it with flair on the foredeck before a gathering of distinguished guests. But if you find this whole business faintly silly and embarrassing, and only go along with it because you're scared to death of what might happen if you don't, you can skulk down below and mumble it on your own. That's perfectly OK. The main thing is that you carry it out. The words must be spoken.

I compromised by sitting in *Tagati's* cockpit with the written-out ceremony folded into a newspaper, so that any passerby would think I was just reading the news to my wife, sitting opposite. Enough people think I'm nuts already. Even my wife has doubts. The last part of the ceremony, the libation, must be performed at the bow, just as it is in a naming ceremony. There are two things to watch out for here. Don't use cheap-cheap champagne, and don't try to keep any for yourself. Buy a second bottle if you want some. Use a brew that's reasonably expensive, based on your ability to pay, and pour the whole lot on the boat. One of the things the gods of the sea despise most is meanness, so don't try to do this bit on the cheap.

What sort of time period should elapse between this denaming ceremony and a new naming ceremony? There's no fixed time. You can do the renaming right after the denaming, if you want, but I personally would prefer to wait at least 24 hours to give any lingering demons a chance to clear out.

Afterward

Now you can pop the cork, shake the bottle and spray the whole of the contents on the bow. When that's done, you can quietly go below and enjoy the other bottle yourself. Incidentally, I had word from a friend that the Florida yachtsman I mentioned earlier had lost his latest boat, a 22-foot trailer-sailer. Sailed her into an overhead power line. Fried her. She burned to the waterline. Bad luck? Not exactly.

He and his crew escaped unhurt. He was just very careless. He renamed her, as usual, without bothering to perform Vigor's famous interdenominational denaming ceremony. And this time, at long last, he got what he deserved.

e to go back in the water . . .

to be done in the way of sensible seamanship, the points from your black box can buy your way out of trouble. You have no control over how the points are spent, of course; they withdraw themselves when the time is appropriate.

You do have control over how the points get into the box: you earn them. For every seamanlike act you perform, you get a point in the black box. Points come in so many ways it would be impossible to list them all. But I can send you in the right direction. Let's say you're planning a weekend cruise down the coast, and time is precious. You have been wondering for some weeks if you ought to haul out the bosun's chair and inspect the masthead fittings. It has been a couple of years since you checked everything up there, but it would mean delaying your departure by an hour, maybe more, should you have to change a shackle or something.

If you finally give in to the nagging voice inside you and go aloft, you earn a point in the box. If you don't take that trouble, your black box will stay empty. If you sniff the bilges for fumes before pushing the starter button, you'll score a point, just as you will for taking a precautionary reef at nightfall or checking the expiration date on your rocket flares. Thinking and worrying about what could happen is also a good way to earn points — if the wind started blowing into your quiet anchorage at 40 miles an hour and the engine wouldn't start, or whether you should put a couple of reefs in the mainsail before you climb into your bunk, just in case.

No matter how good your seamanship, there are times when there is nothing left to do but batten down the hatches and pray. If you have a credit balance of points in the box, you'll be all right. People will say you're lucky, of course. They'll say a benign fate let you get away with it. But we know better. That luck was earned, maybe over quite a long period.

Not that there's any room for complacency. If an emergency drains all the points from your black box, you must immediately set about replacing them by tending to your boat, your crew, and yourself in a seamanlike way and by practicing extra caution for as long as seems right.

It may seem unfair that you cannot check your credit balance in the black box, but it's just as well. If I knew I had sufficient points to get me through a weekend, I might not bother to go up the mast before setting out. Not knowing keeps us on our toes.

In practice, however, your conscience will be a good guide. Have you put off changing the engine oil for the umpteenth time? Does the port navigation light still need a new bulb? Be careful. You may be running low on points.

In the same way, your conscience will tell you when you have credit. You will glow with that quiet sort of confidence that inspires crews and makes for happy voyages.

Three-minute boat takes the world by storm

The obvious question: Why hasn't someone done this before?

by John Vigor

We're in a warehouse large enough for at least a half-dozen Goodyear blimps, and Jeff Larsen is pointing to endless stacks of plastic 8-foot dinghies fading away into the distance. "We're selling them all over the world," he says. "And they've already won a prestigious international award."

This industrial park, only a few miles from Seattle, Wash., is the center of a boating revolution. In the 21st century, this is how small boats will be built, sold, and distributed. We're looking at the world's first true "belly-button boat." If Walker Bay Boats has its way, everyone will have one.

"We're aiming to get a boat in every home," says Larsen, president of Walker Bay Boats. And at a selling price of $399 for an 8-foot dinghy, they might just succeed. The Walker Bay 8 is injection-molded from polypropylene plastic — the same stuff that's in 95 percent of today's car bumpers. It's light, it's cheap, and it's almost indestructible.

But how do you produce a quality boat for $399? The secret lies in the design of the boat, the manufacturing process, and the arrangements for shipping the finished product. Walker Bay produces hundreds of dinghies at a time from a 6,000-ton press. Each one takes less than three minutes to complete.

The finished hulls nest like dories on an old Cape Cod schooner. Better, in fact. They nest so tidily that each new hull adds only two inches to the height of the stack, so you can fit 192 of them into a regular 18-wheeler truck, and 168 of them will fill a 40-foot sea container. That makes for cheap transportation.

"Human beings have a genetic disposition toward boats," says Larsen. "It's something deep inside all of us. You see a river, a bay, a pond — and straight away you want to get out there on a boat. This is the boat that will do it. You can row it, sail it, or motor it."

So why hasn't anyone produced a boat like this before? There's a huge upfront cost," Larsen explains. "The mold for this 8-footer cost nearly $2 million. It's not something you recoup in a couple of years. The investment is not for the short term."

The finely detailed mold weighs 70 tons, and was imported from Italy. "They have a history of fine craftsmanship over there. There is a lot of handwork in these molds." The boats must be classic, Larsen insists. "They must be good quality. They must last, because a boat that performs badly soon gets a bad reputation. The word gets around. Sales decline."

But to cover the upfront costs they need to sell a large number of boats. Normally, one of the major expenses for boatbuilders is freightage. Boats take up a lot of room, and are mostly empty inside. So from the outset Walker Bay planned a boat that could be cheaply shipped in volume — 6-packs, 12-packs, truckloads, container loads, whatever. And they recognized the importance of mounting an aggressive sales drive.

When Walker Bay Boats started out a bare two years ago, the idea of injection-molding an 8-foot boat was almost revolutionary. It was a very big deal to mold anything much bigger than a plastic duck for the bathtub. Certainly no boatbuilder in the United States was able to produce an 8-foot injection-molded dinghy. But Walker Bay's executives figured it could be done — if they were prepared to risk the huge capital outlay for the mold.

Another problem they had to overcome was one of public perception. A cheap polypropylene plastic boat is just what it sounds like, right? Well, no.

Not any longer. It's cheap, all right, but only because it takes moments to make and because the cost of materials is minimal. The quality is actually first-class.

It used to be that polypropylene was adversely affected by sunlight. Ultraviolet rays would react with the plastic and make it brittle. Then it was prone to fracture and puncture under a heavy, localized blow. But now newly developed chemical stabilizers protect the hull from the adverse effects of ultraviolet rays and preserve its flexibility and impact resistance. Walker Bay is confident enough to give the hull a two-year warranty. You can drag this boat over barnacle-covered rocks. You can ram it into submerged stakes. It won't flinch. You can slam it with a hammer, and it laughs at you.

But when it comes to making one, you need a 6,000-ton press in addition to the 70-ton mold. Luckily for Walker Bay, there happened to be the right kind of press in the city of Yakima, 140 miles south-southeast of Seattle. Yakima lies at the heart of Washington state's apple-growing country, and the injection molding press was churning out thousands of plastic crates for apple farmers. Now they swap molds every little while and turn out 8-foot dinghies instead of apple crates.

Walker Bay Boats is about two years old, and has been shipping 8-foot dinghies for only about a year. But in that time they have already made a major impact. Official statistics show that the number of boats 11 feet and under produced in the U.S. in 1997-98 totaled 5,922. That is 72 percent more than the number produced the year before. "We think it's due in no small measure to the Walker Bay 8," says Larsen.

The boat has already had its share of glory. It won the prestigious 1998 Montell Worldwide Innovation Award for the best new or existing consumer product that uses polypropylene. Walker Bay was commended for its innovative use of design, esthetics, functionality, and marketplace significance. The award was presented in Dusseldorf, Germany, late last year.

You can row it, sail it, or motor it. Walker Bay Boats wants to get its 8-foot model into every home.

The boat is now selling all over the world, from New Zealand at one end to Finland at the other. A shipment even went to Kuwait, in the Persian Gulf. Larsen admits he's a bit puzzled about why Kuwait would order 8-foot plastic dinghies, but he's very happy to supply them. They're going to the Far East as well. Walker Bay 8s are making their mark in Hong Kong, China, Singapore, South Korea, and Malaysia.

Nevertheless, the company is making relentless efforts to improve name recognition. Walker Bay executives attended 20 shows in Europe in the past year and 25 or 30 U.S. shows. Larsen says Walker Bay's strategy is to target three main markets:

1. Yacht owners needing tenders.
2. Sail-training programs for kids where the traditional Optimists and other small boats are too expensive.
3. The "genetic disposition" market.

The third marketing strategy represents a dramatic departure from traditional methods of selling boats. It presents the Walker Bay 8 as a family boat that panders to the urge within us to get out on the water — any water. And it makes this possible by keeping the price so low that even impulse buyers will be able to afford to buy one, sling it on the car roofrack, and take it home. This market obviously needs work to develop, but once the principle is firmly established the prospects for growth seem almost unlimited all over the world.

Elena Rista, Walker Bay's marketing manager, describes the dinghy as the first truly "world boat" in the marine industry — one that families around the world could comfortably afford. It is Walker Bay's unique concept of injection molding, combined with a design intended for cheap transportation, that makes it possible for the company to appeal to the "genetic disposition" of buyers everywhere.

Rista says the privately held company also insisted from the beginning on quality in every phase of manufacturing, marketing, and customer assistance. There's a lot of documentation with the boat, for instance. Walker Bay provides an illustrated booklet to show buyers how to fit the seats — not just a sheet of uncaptioned diagrams with mysterious arrows and missing symbols. Furthermore, the booklet has been translated into all major languages.

Meanwhile, the company is not resting on its laurels. The revolution continues. There are plans afoot to mold a 9-footer and an 11-footer. Can a 35-footer be far behind?

Honor is satisfied, the dinghy tested

Walker Bay Boats is a different kind of multi-million-dollar company, so it makes sense that Jeff Larsen is a different kind of company president. He's tall and wiry, a waterskier and boater from way back, and on this bright, but cool, day in early spring he's dressed for work in jeans and a warm Pacific Northwest shirt.

"You can't write about it unless you've tried it," he says. He grabs a trolley on castor wheels, heaves a Walker Bay 8 dinghy onto it, and trots off through the parking lot. "Let's go down to the slough," he says.

He shoves the boat down a steep bank and holds the painter. "Jump in," he says. He squats down and watches me intently, coiled up like a watch spring, ready to dive in and save me if I capsize. You can tell this guy takes responsibility seriously.

I row upstream a bit, doing my best fancy stroking, not lifting the blades too high, not pulling too fast. Then I do a couple of fancy spins and twirls. I let her drift back downstream and ship the port oar. I scull with the starboard oar and get her moving forward, mostly to show off to the president of Walker Bay Boats but also to prove you can get home with one oar in this boat if you know what you're doing.

The president is not impressed. Or, if he is, he doesn't say anything. But I suspect he's impressed deep down inside. As soon as I've gone, he'll probably be back here trying the sculling trick for himself. I nudge the dinghy into the bank, and we pull her up the grassy slope.

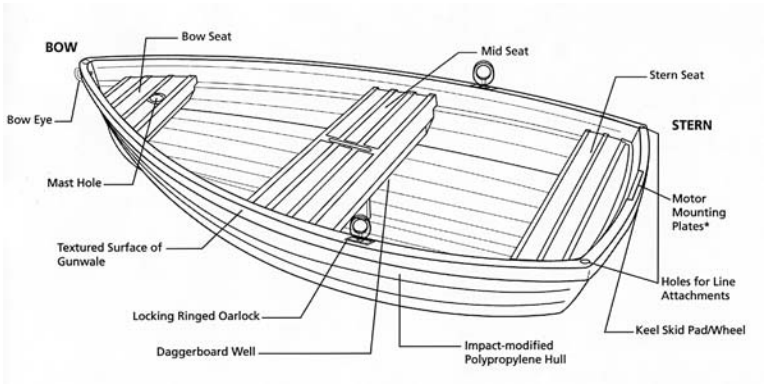
Back at the warehouse, the president takes a claw hammer and starts lambasting the boat. Yeah, well. I've seen enough wrestling matches on television to recognize pulled punches. He hands me the hammer. "Your turn," he says. "Do your worst." Now I don't want to be the first person to put a hole through this boat and ruin a multi-million dollar advertising campaign, so I take it easy.

"Harder," says the president. "Give it all you've got." Well, he asked for it. I flex the rippling muscles in my right shoulder and forearm, and I let fly with the hammer. It bounces right off the boat. Not a mark.

"Try the claw side," says the president. "Try to dig it in." So I slam the claw side down at lightning speed. It's like a jet-propelled wrecker's ball equipped with tiger's teeth. A tiny sliver of plastic curls off the hull. It's the thickness of a tissue, and it leaves a shiny smooth patch that seems to improve the look of the hull.

"Well done," says the president. "Not everybody manages to do that."

I smile modestly. I have left my mark. Honor is satisfied.



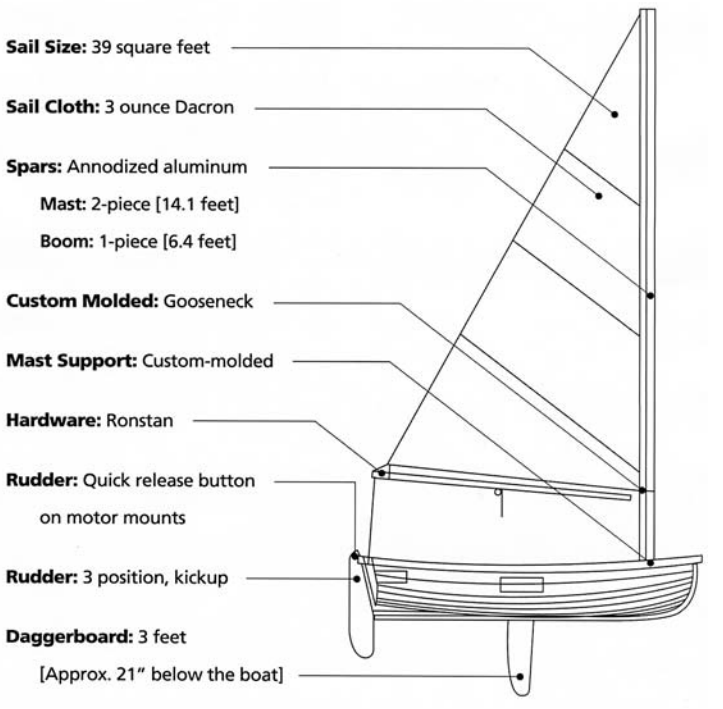
Walker Bay 8

Vital statistics:

Length overall: 8 feet 3 inches
Beam: 4 feet 4 inches
Weight: 71 pounds
Capacity: Two persons
Maximum load: 425 pounds
Outboard motor: 2 hp maximum
Material: Impact-modified polypropylene resin
Hull: Hard-chine lapstrake design for looks, strength, and stability
Designers: Paolo Rista, a South African artist now living in France, and Grahame Shannon, a member of the America's Cup design team
Price: $399

The Walker Bay 8 comes with three seats filled with closed-cell foam flotation. The hull material also floats. The center thwart has a slot for the built-in daggerboard case. Oars and locking ring oarlocks are included. A cat-rigged sailing kit, with a 39-square-foot Bermudian mainsail, anodized aluminum spars and kick-up rudder, is an optional extra.

A small plastic wheel is incorporated in the aft end of the skeg, so you can move the boat by lifting the bow.



The dinghy meets the safety standards of the U.S. Coast Guard, the Canadian Coast Guard, and Japanese and European authorities.

Performance:
This is a beamy, stable little dinghy with clean modern looks. The lapstrake molding adds strength to the hull and makes the boat look longer than she really is. Her sheerline is moderately swept, and avoids the strained cuteness of an overly tip-tilt bow.

She rows easily with one person aboard, tracking well and showing no inclination to suck the transom down unless you row fast enough to give yourself a heart attack. The rowing position is fixed, so with a second adult in the stern, her transom would drag, and her performance would suffer accordingly.

There are built-in fittings for oarlocks in the transom, on either side of the outboard motor plate, so you can scull home if you lose an oar, or steer with an oar if you lose your rudder while sailing.

Walker Bay builds little boats in a big way

by Bill Barth

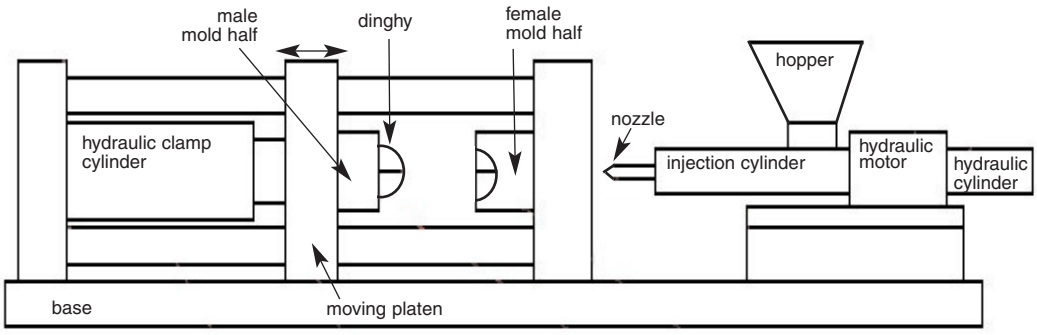
The original run of these 8-foot dinghies was made in a 6,000-ton clamp-force press, with five 150-hp electric motors to operate the hydraulic pumps.

The present production is done in a 9,000-ton clamp-force press with six *(count 'em, six)* 175-hp electric motors. This press is approximately 18 feet wide by 17 feet high by 80 feet long and weighs about 1,000,000 pounds. This is one of the largest molding presses manufactured. The 9,000-ton clamp press can produce a part up to 160 pounds. The present boat weighs about 70 pounds. Does this mean there might be a larger boat on the horizon from Walker Bay?

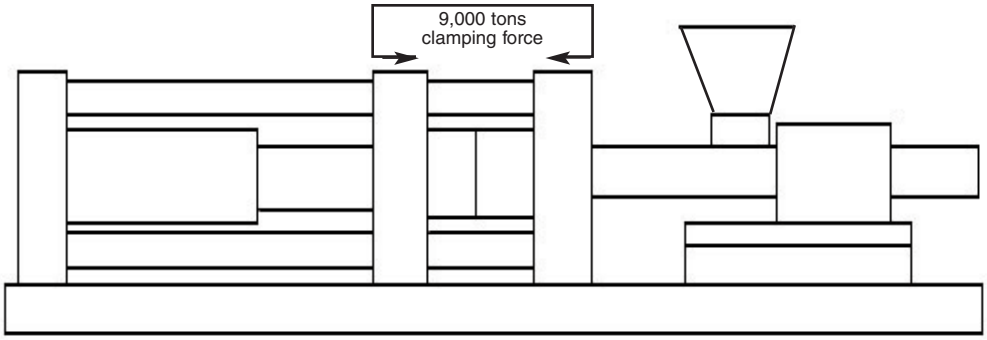
The mold for the boat is four feet wide by six feet high by 11 feet long and weighs about 160,000 pounds. The boat is removed from the press by a robot arm with suction cups while air blows the boat off the male half of the mold. Two operators inspect and stack the boats at the rate of about 100 per day. The boats stack very compactly because the seats, which have the flotation built in them, are installed later.

The material for the boat is a UV-stabilized polypropylene. The molding press heats this material to about 500 degrees Fahenheit and injects it into the mold at 5,000 psi.

Electric heater bands heat the injection cylinder. Inside the injection cylinder is a screw that is rotated by the hydraulic motor. As the screw rotates, it forces granulated plastic toward the nozzle. The plastic is heated and mixed. At a preset volume, the rotation stops, and the screw becomes a plunger, pushed forward by the injection cylinder. The mold is temperature-controlled by water lines in the mold.



Press shown open



Press shown closed

Love at first "site"

by Richard Bunker
photos by Myron Baumer

I dinghied ashore shortly after 8 a.m., in good time to catch the coffee group at the Conch Inn. (You'll find it on your chart, at Marsh Harbor in the Abacos, Bahamas.) I was living alone on my *Sans Souci*, and I was at least a quart low on human contact and hungry for conversation and a toasted blueberry muffin.

Charlie Price, a spry 83-year-old former chemistry professor and singlehander of Abacos cruising fame, had just sat down. (Charlie is a singlehander in more ways than one; he lost his right hand just above the wrist at age six.) George Friesen welcomed me aboard. He's 76 and Canadian, but has lived in the Abacos for 50 years. We ordered up and chatted weather. In a lull, I raised the question of the day: Do you believe in love at first sight?

Charlie set his coffee cup down and slid backward in time. He smiled. I saw a sparkle of delight in his eyes. "You bet. I walked into a freshman college classroom and knew right then and there that a certain girl sitting in the front row was going to be Mrs. Price. Yes, sir! Totally smitten. No mistake. The romance lasted 50 years."

"And," I thought, "he has five truly outstanding children as evidence."

George had been listening patiently; now he took a coffee warm-up and seized the floor, glowing with enthusiasm. "I didn't even have to see my Myrna to know she was the one. I was in the Canadian Air Force on my way overseas and just had time for one blind date. She was only 17, but when I heard that sweet voice on the phone — well . . ." He stopped to give

his glasses a wipe. They were married for 45 years, a wonderful marriage and three kids who would be a credit to anyone.

Here were three widowers, long in the tooth and talking about real romances of yesteryear. I finished my muffin. Charlie had been doing some glasses-polishing of his own, but now he put them back on and looked at me. "OK, Dick, it's your turn."

"Well," I said, "it happened right after I jumped ship from a bulk freighter in Lima, Peru. While I was in that part of the world, I decided to see more of it. A clever travel agent found me an empty passenger berth on a small motor vessel that was scheduled to spend five days in the Galapagos Islands. Great, I was traveling light and I'm always flexible."

I drank a little coffee and took a breath while I pictured the scene. "We went ashore in inflatables, in considerable surf. We carried our shoes and socks in buckets, and they stayed reasonably dry. We had rolled up our pants, but we were wet to the hips by the time we got ashore. The steep climb off the beach to a rocky, wind-swept barren plateau was tough on my limited lung capacity, but I made it.

"Our guide was a local girl, very pretty, with straight black hair tied back. She flashed those almond eyes and tossed her ponytail as she led us through that strange landscape and described the native flora and fauna. After about an hour, we got to a flat place with some big rocks, and she called a brief halt. 'If some of you want to sit here for a few minutes,' she said, 'fine. Don't wander from the trail. I'll take the rest of you folks on to that rocky point and be back.' I welcomed the break, and wished I could find shade. It was high noon on the equator, but there was a nice breeze with a tang. Bird cries and guano everywhere.

"I looked up the trail, and waddling toward where I sat on my resting rock was a blue-footed booby. They stand three feet tall and have a

five-foot wingspan; they have big yellow eyes with jet black pupils, and blue webbed feet that they make a show of during courting rituals. This one came right up to me. She cocked her head and seemed to decide I was someone special. She turned around, picked up a twig, and placed it on the toe of my sneaker. She was building a nest! Twig after twig was carefully placed and arranged. After each add-on, she looked up, cocked her head, and stared me down. They don't blink. It was fascinating. I was enthralled.

"Too soon, my companions returned and our guide called for me to join up or I'd miss the boat. I reluctantly slipped my sneaker out from under our nest. My friend cocked her head, added one more twig, and watched me straggle behind my shore party."

Our waitress stopped by with refills. Charlie accepted his, then looked toward the floor. "Dick," he asked thoughtfully, "were you wearing those blue canvas boat shoes?"

Summertime is endless

story and photos by Mary Jane Hayes

Summertime — and the cruising is easy, and its reason, really, for being.

Summer is your two-week cruise to Maine, maybe, or to Cape Cod and the Islands, or to Newport and Mystic. It is fueling and buying ice and searching out a laundromat — and cruising right up to a restaurant to dine.

Summer is homely little variety stores and choice S. S. Pierce-type markets and elegant gift shops dealing only in the select. (Also rakish ones dispensing plastic trinkets.) Summer is too many postcards to choose from.

Summer is five windjammers strung out in a row leaving Camden. And behemoths, one upon another, at Newport and Nantucket. It is a gaff-rigged yawl flashing like diamonds in the sun.

Summer is a horizon daubed with spinnakers, and "hundred-harbored Maine" absorbing boats as easily, it seems, as a garden does plants. And summer is ferry and excursion boats by the dozens, and barges and freighters with no one (or so you'd swear) aboard them. And the splendid arrival of the New York Yacht Club at Oak Bluffs, with cries of: "Where's Charlie? Where's George? Has anyone heard from the *Wee Winks* yet?" filling the air.

Summer is days soft as a Cezanne and "smoky southwesters" that *finally* blow themselves out. It is a day so perfect you use seven of its diamond hours to run all the way home. Summer is early departures and breathless noons and harbors at twilight — each boat unspooling a bolt of blue silk as it cruises slowly by. And summer is seagulls screeching and wheeling low over the water and then coming to rest in dories or as ruching on roofs. Summer is lobster buoys strewn like confetti across harbor mouths.

Summer is the unexpected repair work that reminds you (not that you need it!) that a boat is "a hole in the water into which you pour money." It is strange movie houses and faces copper as pennies and friendships struck up and as quickly surrendered. Summer is anticipation, absorption, exhaustion: plans scrapped by the weather (among other causes) or happily carried out. Summer is being underway for so long your bones are turning revolutions per minute, or tying up (as you swiftly discover) too early. Summer is busily sightseeing or blissfully doing nothing. It is taking your father out fishing or your aunt for a ride.

Summer is pan-fried sole and a gin-and-tonic (or a Coke) and the delicious

Continued on Page 43

and over all too soon

"Summer is a horizon daubed with spinnakers"

At far left, the 34-foot Sea Sprite,* Nedwick, *and sailors Walter and Neddie Barnard enjoy a spirited sail. At left,* Christine, *an O'Day 32 flies off with the Bob Lyons family aboard. Above, a luminous morning. All photos near Scituate, Mass.

"Summer is early departures and breathless noons and harbors at twilight — each boat unspooling a bolt of blue silk as it cruises slowly by."

Above, twilight sailing. At right,* Waterlot, *a 1986 Bristol 35.5, creams up Massachusetts Bay with Bob and Mary Ann Moll aboard. Both photos near Scituate, Mass. At far right, a sun-gilded vessel ghosts into McGlathery's Cove on McGlathery Island, Merchants Row, Maine.

Continued from Page 40

scent of steak sizzling on someone else's hibachi. Summer is Bass Harbor Light set amid its battalions of spruce. Summer is seas smooth as pearl-colored oil or blue as a colleen's eyes. It is each little pine-packed island, sprigged with flowers and frosted with clouds.

Summer is gorgeous horseflies with vicious bites and midges — making up in numbers (and a sense of purpose) for what they lack in size. It is coots, cormorants, porpoises — and the whiskered, mischievous seals sunning themselves on ledges or playing hide-and-seek with your boat. Summer is the bleak splendor of the Isles of Shoals. And the blue and cream of chicory and Queen Anne's lace popping out like corn in Block Island's fields. It is insects buzzing deep in the grasses at Menemsha; the latter's fishing fleet and public beach and mountains of scallop shells.

And summer is the wave of a stranger in the Cape Cod Canal (or Eggemoggin Reach or Fishers Island Sound). It is donning a lifejacket and swimming through crystal-clear water to a perfect cove. And then looking up — so romantic is the spot — half expecting to see Long John Silver come hobbling over a dune.

Summer is endless — and over all too soon.

From Mary Jane Hayes' new book, *Eye on the Sea: Reflections on the Boating Life*, Breakaway Books, 800-548-4348.

Block Island 40

Tom Kuber and *Bantu*: a w

Photo Pix

Bantu, *a 40-year-old thoroughbred sailboat, wins trophies and admiring glances*

The traditional-looking Block Island 40, drawn in 1957 by William H. "Bill" Tripp, Jr., is considered by many to have some of the most aesthetically pleasing and balanced lines of any boat ever built. The Sparkman & Stephens-designed centerboard yawl, *Finisterre*, is most often cited as having been the inspiration for the Block Island 40 and the Hinckley Bermuda 40, both of which are Tripp designs.

One of the finest examples of the Block Island 40 to be found anywhere is on Lake Michigan's Green Bay. She is *Bantu*, owned by Thomas Kuber of Menominee, Mich. Tom is one of a number of accomplished yachtsmen who own or have owned one of these rare, true dual-purpose boats which are equally adept at racing and cruising. The list of owners of the first 10 boats built reads like a *Who's Who* of yachting in the 1950s and '60s. The list includes the likes of Van Allen Clark, Niebold Smith, and members of the prominent Vanderbilt and DuPont families.

The original BI 40 first sailed in 1958. That boat, *Rhubarb*, was owned by Benjamin DuPont who won the Bermuda Race that year. The boat is still a member of the DuPont family. *Bantu*, one of the first fiberglass hulls built in 1958, is hull #7. At the time, these were the largest fiberglass yachts yet built.

Two companies — American Boat Building Corporation of Warwick, R.I., and Metalmast Marine, Inc., of Putnam, Conn. — built a total of 36 boats. (Those companies have long ago gone out of business, but new BI 40s continue to be built, almost to the original plans, by Migrator Yachts of Wareham, Mass.)

You won't find many boats the vintage and design style of the Block Island 40 out on the racecourse competing in, much less winning, races these days. However, in its day, the BI 40 enjoyed a successful racing

inning team

by Dennis Boese

career, mostly under the old Cruising Club of America (CCA) rule that had its heyday in the '50s, '60s, and early '70s. In the 1960 Bermuda Race, six of the first 11 places were won by BI 40s, and as late as 1978, the BI 40, *Alaris*, won her class in that race. (The story goes that Bill Tripp, Jr., designed and built the BI 40 to beat the very successful *Finisterre*.)

Since the inception of IOR and IMS rating rules, it takes some pretty expensive high-tech boats to win major races. Yet today, Tom Kuber and *Bantu* continue to win big races around the Great Lakes under PHRF rating rules.

Tom is an entrepreneur who owns and manages industrial warehouses trucking and dock facilities in Northeastern Wisconsin and the Upper Peninsula of Michigan. He recently began a commercial shipping operation with three oceangoing ships. His shipping line provides regularly scheduled cargo service between the Great Lakes and European ports of call.

Tom was attracted to BI 40s for a number of years before he bought *Bantu*. In fact, he has had a connection of some sort to *Bantu* since the 1960s when he raced against her on a Sparkman & Stephens-designed 40-footer named *Windborne*. They raced in the same class, but "*Bantu* always cleaned up," he says. In the '60s the boat was raced out of Chicago, but for some reason she wasn't being raced during the summer of 1967 and was being kept at the Palmer Johnson boatyard in Sturgeon Bay, Wis.

Bill Tripp, Jr., designed the Block Island 40 in 1957 and the Hinckley Bermuda 40 in 1959 after being inspired by the winning streak of Sparkman & Stephens'* Finisterre. Bantu, *hull #7 built in 1958, is one of the first fiberglass hulls.

Learning the boat was available, Tom and some racing friends made a deal to charter *Bantu* for three races on Green Bay. "We had a lot of fun with her that summer," he says. Later that year *Bantu* was sold to another Chicago racer who re-named her *Fury* and raced her for another seven years until, as chance or fate would have it, Tom's brother, Jim, bought the boat. Jim, who lived in Fond du Lac, Wis., and sailed on Lake Winnebago (which is a big, but very shallow lake) was looking for a larger, shallow-draft, centerboard boat, and he asked if Tom knew of any boats of this type that might be available. As it happens, Tom had just become aware that *Fury* (formerly *Bantu*) was up for sale. Jim bought the boat in 1974 and kept it until 1989 when he sold it to Tom.

"The interesting story behind that transaction," Tom says, "is that my brother called to tell me he was selling the BI 40 and wanted to know if I would like to buy it. Of course I said I would love to, but there was one problem: with two daughters in college I couldn't afford to pay for it." In true brotherly fashion, Jim said, "That's all right, you're my brother; you can have it."

"So," Tom says, "we worked out a price, and when my daughters graduated from college, I paid him for the boat."

Although Tom is a dedicated racer, he bought *Bantu* as a cruising boat. His last big boat, prior to the BI 40, was a Hans Christian 38 he owned from 1980 to 1985 and on which he cruised with his wife and three young daughters. "When the girls were small," he says, "I retired from racing and spent every weekend on the Hans Christian, cruising and having a lot of fun with the family."

As a kid, Tom started sailing on Snipes with friends who still sail with him today. Around 1964, he bought a varnished wood 22 Square Meter boat which he raced against four others on Green Bay. In 1966 he bought and raced a 5.5-Meter boat, and then in 1971 he purchased a Soling and raced it. In early 1985, after he sold the Hans Christian, Tom, not a man to be without a boat, bought and raced Pearson Ensigns, finishing sixth in the nationals one year. Although he still owns two Ensigns, he is not actively racing them. He loves one-design racing and has had a lot of fun with those boats.

Tom's office is a testament to his passion for and success in sailboat

racing. The walls are covered with sailing photos, prints, models, half-hulls, plaques, and trophies commemorating racing successes with *Bantu* and one-design boats over the years. A large blueprint of the BI 40 takes a prominent place on one wall. Even with all that, though, he seems proudest of the large framed photograph of his three lovely daughters at the helm of a sailboat.

Once Tom took possession of *Bantu* (he re-named her *Bantu* because everyone around the lakes knew this BI 40 by that name) in the fall of 1989, the first step in the restoration process was to completely strip the boat inside and out. He went to work with fervor. The work went on all winter and well into the next summer until she was finally re-launched in August of 1990. More work was done again on the boat in the fall of 1990 and spring of 1991. Tom estimates he has spent over 2,000 hours working on the boat himself, and he's lost count of how many thousands of hours of paid labor have gone into her over the years.

To this day, Tom expresses a sense of amazement when he speaks about how the hulls and decks of these BI 40s were originally constructed. According to Tom, while he was in the process of installing a thru-hull transducer for a new knot-meter, it became apparent that the transducer wasn't long enough to reach all the way through the hull. When he called the manufacturer of the knotmeter to explain his dilemma, the manufacturer wanted to know how thick the hull was. When Tom told him that he measured it at 1 3/4 inches, the man didn't believe him. "In fact," Tom says, "he told me that's impossible — you're out of your mind, no fiberglass boat built in America has a hull 1 3/4 inches thick."

Tom assured the man that he did, in fact, know how to read a tape measure and that the hull was definitely that thick. Finally taking Tom at his word, the manufacturer explained that the only transducer they had that was long enough was a special bronze one they made exclusively for some custom wooden boats being built in Europe. These boats' hulls were still being constructed of double planked mahogany 1 3/4 inch thick. Needless to say, *Bantu* now has a bronze thru-hull transducer for her knotmeter.

Bill Tripp III, the son of the BI 40 creator, once explained to Tom that when his dad was building the BI 40s, wooden boats were being built with 1 3/4 inch-thick hulls. As this was the first attempt at building a big boat out of fiberglass (smaller boats like the Pearson Triton had been built by this time, but this was the first really big boat), and since they really didn't know what fiberglass would do and how the engineering would work, they built the BI 40 out of hand-laid fiberglass the same thickness as a wooden hull. The solid hand-laid decks are 1 3/4 inches thick as well. Tripp III also remembers that in 1959, when his father was working on the Hinckley Bermuda 40 design, he would take newly molded pieces of fiberglass 1 1/2 inches thick out on the driveway of the family home and drive over them with the family's 1957 white Jaguar XK-140 trying to measure deflection of the material. He told Tom that the hull of the BI 40 was so strong that he could use the boat as an ice breaker when Green Bay froze over in the winter.

Although 40-footers with a displacement of 20,000 pounds are now considered heavy, back then, when compared with the wooden boats of the day (which weighed in at 30,000 to 40,000 pounds), they were relatively light.

Bantu has been rebuilt twice while Tom has owned her. The first time was in 1989 and 1990, when he first bought her. The second time was in 1995 and 1996 when he made the decision to get serious about racing her. Tom readily admits that *Bantu* will forever be a "work in progress." There is always a lengthy work list of projects and things that need to be done. The list usually includes some form of fiberglassing, painting, interior modifications, and go-fast upgrades.

During the winter, *Bantu* is stored in one of Tom's warehouses along the Menominee River. That is where the work is done. He hires mostly local

The original linoleum floor was replaced with a handmade teak-and-holly sole, and original mahogany veneer was replaced with solid mahogany.

labor and feels they are some of the best craftsmen around. One of these craftsmen, and a person Tom also considers to be a good friend, is Mark Zimmerman. Mark does the fiberglass and painting work with such artistry he has been nicknamed Picasso. When Tom first got the boat, Mark worked on her almost every day for 10 months. Another artist who works on the boat is carpenter Jimmy Biersteker. "The job he does is incredible," says Tom. "The work is intricate and detailed, and Jimmy is meticulous about how he goes about doing it . . . the finished product is absolutely gorgeous."

The BI 40s were built prior to gelcoat technology. Nothing fancy here, just hand-laid fiberglass faired with Bondo autobody putty, which is then painted. When it came to re-painting the hull, Tom didn't go the route of modern two-part paints. The hull is spray-painted with a white acrylic enamel automotive paint and then covered with six coats of clear enamel to protect the paint and give the hull a high gloss shine. This method is less expensive than using special marine paints, and the process of repairing any

scratches or dings the boat may get over the season is much easier, he says.

The original boats were not finished all that well down below, Tom admits. His first order of business was to gut the interior and have the inside of the boat sprayed with acrylic enamel paint as he did with the outer hull. The original builders installed a linoleum sole in the boat and used a lot of mahogany veneer for interior panels, doors, and trim. The linoleum was replaced with a handmade teak-and-holly sole, and the wood veneer doors, panels, and trim were replaced with vertical tongue-and-groove mahogany.

Corian counter tops replaced the old Formica ones. When Tom's wife, Sandy, learned that he had installed better quality countertops in the boat than they had at home, she wouldn't let him hear the end of it. Tom admits that the Corian tops are heavy, but says, "we don't worry about weight on *Bantu*, because we are so heavy to begin with."

On the starboard side of the boat, where a large refrigerator once took up residence, there is now a new steel-reinforced, mahogany navigation table. Although the boat was rewired in 1990, she was rewired a second time in 1996 when the new navigation station was put in and all new state-of-the-art electronics were added.

Some additional interior modifications include a remodeled head with a full-length mirror (a concession to his wife and daughters for when they are on the boat) and a compartment just for eye glasses. Most of Tom's crew-members are in their 40s and 50s. (Tom figured the average age of *Bantu's* crew for one race last year was 53-plus years.) With reading glasses, bifocals, and sunglasses, they often end up with 30 pairs of glasses on board. "With that many eye glasses on board, it was important to have a safe place to keep them together and out of the way," Tom says.

The restoration also included replacing the original aluminum ports with bronze ones. Every fitting on the boat was re-chromed and all the stainless parts were buffed to shine like new. And *Bantu* has been refitted with a 35-hp Westerbeke/Universal diesel to replace the original Gray Marine engine which was really tired and had a shot transmission.

Tom keeps in contact with Eric Woods, the owner of Migrator Yachts, who builds new BI 40s. He has sent Eric photos of the interior work and other projects that he has done. Eric told Tom that if he had to finish a new BI 40 to the level of *Bantu's* finish, he can't imagine what price he would have to charge.

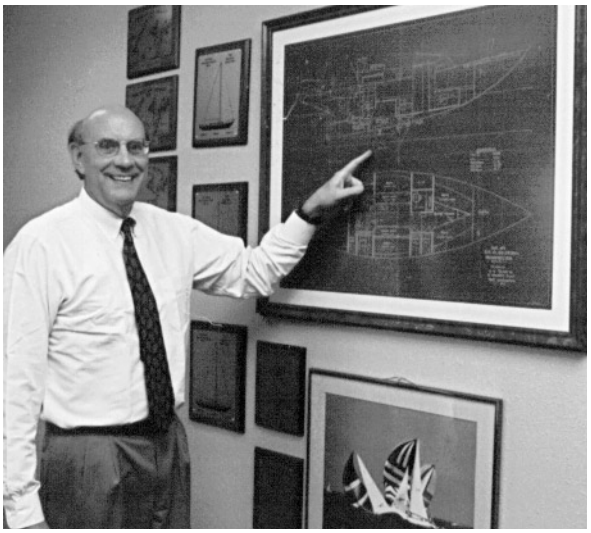
Some day, Tom would like to add teak decks to *Bantu*, but that day won't come until her racing days are over. None of the BI 40s ever had teak decks, but he likes them, and feels they would aesthetically complement this very special boat.

All BI 40s were built with yawl rigs. For racing purposes, *Bantu's* first owner converted her to a sloop. Tom has chosen to leave her that way. It is uncertain if he will convert her back to a yawl when her racing days are over.

Racing the BI 40 was not the original plan when Tom bought the boat, but with his extensive racing background and *Bantu's* noted racing heritage (she won the Chicago-to-Mackinac race in 1964 and 1965 with her first owner), the urge to race was too strong to ignore. Tom started racing a little bit in 1992 and 1993. In 1994 he entered a couple more races. "We were doing OK but not great," Tom says. However by then he had really gotten to know *Bantu*, and he could see that this beautiful sailing icon from another era could still be very competitive.

Bantu races as a class boat under the PHRF rating rules. When the racing rules changed from CCA to IOR, the BI 40s (and boats like them) became totally non-competitive. But under the PHRF rating system, they can compete quite successfully. Unfortunately the better she does, the more the PHRF rating committee lowers her handicap rating (this has happened twice since 1994) in an attempt to level the playing field between *Bantu* and her competitors. This is grossly unfair according to Tom. "BI 40s are 'class boats,' and *Bantu* now has the lowest rating of any BI 40 in the country, including the four others that have been converted to sloops," he says. "What we have done to make this boat fast is to spend thousands of hours on the details to make her as competitive as possible under the rating rules," he says, "We have never added anything, taken off anything or, in general, done anything to the boat that would affect her rating under the rules."

A mahogany navigation table replaced a large refrigerator on the starboard side. Tongue-and-groove strip paneling gives the boat's inner space a beautiful custom-finished look.



Tom is motivated to keep *Bantu* competitive, if for no other reason than to show people that you can take an old boat with good sailing qualities, add good equipment, involve an experienced crew, pay meticulous attention to detail, and compete against and beat larger, faster high-tech boats costing $500,000 or more. This concept doesn't always endear him to some of his competitors (especially the ones who have paid big money for those high-tech sleds).

In 1995, after the first rating change, Tom's response was to attack the BI 40's bottom in order to make it as smooth and efficient as possible. He also put together a seasoned crew. "My crew is from all over," Tom says, "just a bunch of friends I have known and raced with for years."

In 1995 and 1996, Tom added the necessary go-fast upgrades *Bantu* needed. He focused on the performance aspects of the boat: a Harken BatCar system was added to the mast and mainsail, but the mast is still the original heavy, overbuilt, thick-sectioned one that came with the boat. All new Harken hardware and hydraulic backstay tensioners have been added. The boat has been upgraded to be an "absolute racing machine — all on the original hull," he says. "We have upgraded it technically to make it an absolute super, super-fast boat, but again we haven't done anything that would change the rating."

Bantu gets the best new racing sails every year. In 1996, 10 Melges sails were added, including a new main, a couple of new genoas, high top reachers, and three spinnakers. Tom is constantly upgrading sails as part of his comprehensive racing program. This attention to detail really began to pay off when *Bantu* started winning the big races. They won the Chicago-to-Mackinac race overall in 1996 and 1997. Also, in 1997, *Bantu* won the Queens Cup race, the M & M 100-Miler race and took a third overall in the Port Huron-to-Mackinaw race . . . almost a clean sweep. In addition to these victories, Tom and *Bantu* have won three other Queen's Cup races and two other M&M 100-Milers. They've placed first in their class in both the Chicago-to-Mackinac and the Port Huron-to-Mackinac races since 1993.

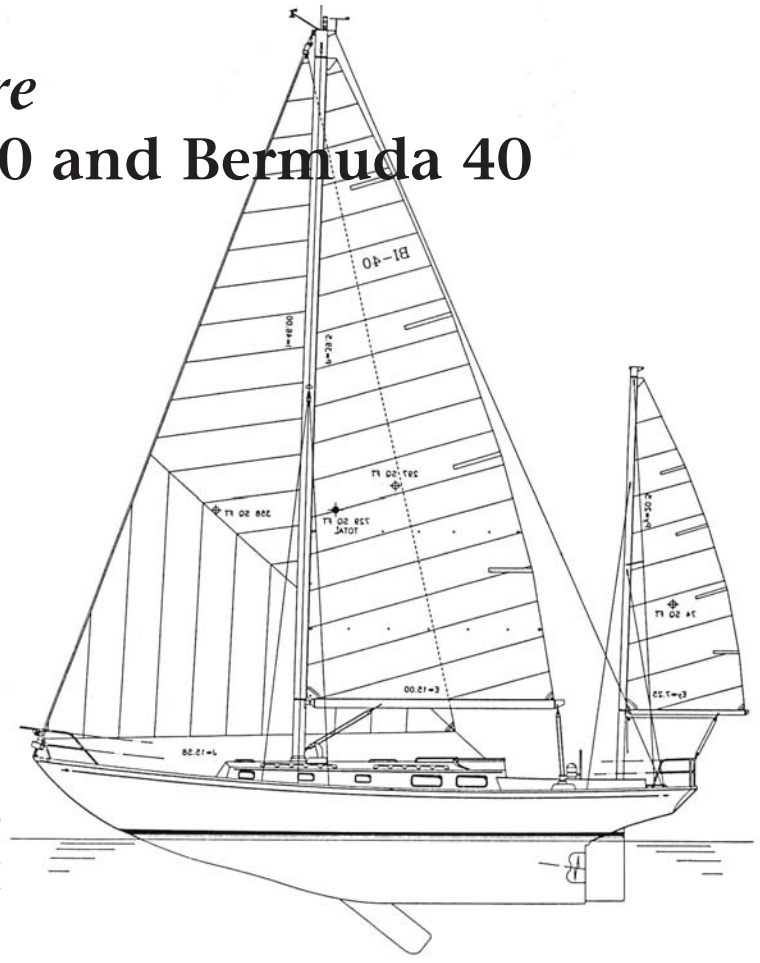
Tom readily admits that he picks races that are best suited to the boat. He doesn't do any around-the-buoy races. A long-keeled, centerboard boat is not designed to be very fast beating to weather. *Bantu* is no exception. The boat is fastest reaching and running. The bronze centerboard requires constant adjustment for different points of sail. It is a good heavy-air boat because of its weight. During the race, the crew is constantly changing sails, depending on wind strength and the wind angle. Tom credits his very experienced crew, as well as the BI 40, with their racing success.

With *Bantu* only competing in about three or four big races each year, the rest of the season is spent daysailing with some short cruises thrown in. At that point the racing sails come off, and the cruising mainsail and the roller furling genoa goes on. With this setup, Tom is able to sail *Bantu* singlehanded, something he enjoys doing. That's not to say he doesn't sail with the family. All three of Tom's daughters are sailors. And Sandy likes to take short cruises around Green Bay with Tom and *Bantu* a couple of times every year. "She enjoys being on the boat when the weather is nice, and it's fun to go sailing," Tom says of his wife, "Sandy is not a racer, and she certainly wouldn't enjoy being out there during a thunderstorm."

Tom plans to keep *Bantu* until his last day. "The boat is in my will to go to my children . . . not to own," he says, "but to sail."

Tom's office, above, shows his passion for, and success in, sailboat racing. The walls are covered with sailing photos, prints, models, half-hulls, plaques, and trophies. A large blueprint of the BI 40 is prominently on display. **Bantu** ***at the dock, left. The early Block Island 40s were built before gelcoat technology came about. Hand-laid fiberglass is faired with Bondo autobody putty and spray painted with white acrylic enamel automotive paint which is then covered with six coats of clear enamel.***

Olin Stephens' *Finisterre* inspired Block Island 40 and Bermuda 40



Courtesy of Migrator Yachts

Finisterre, designed by that genius of yacht design, Olin Stephens, was the first of the fleet of cruiser/racer keel/centerboard yawls that became so popular in the '50s and '60s. The reason for the popularity of the type is that *Finisterre* won almost everything in sight, including the Bermuda Race, three times. Naturally that inspired a number of other designers to come out with their own versions of the winning keel/centerboard yawl formula. These boats ranged in size from Bill Shaw's delightful little 24-foot MORC racer, *Trina,* to Charlie Morgan's very successful *Paper Tiger* and George Cuthbertson's beautiful 54-foot *Inisfree*.

The late Bill Tripp, Jr., also tried his hand at the keel/centerboard yawl, and it is significant that his two creations — the Hinckley Bermuda 40 and the Block Island 40 — are still available today in limited production. That alone says much about the fine qualities of these two very enduring designs The Block Island 40, designed in 1957, was the first of the Tripp keel/centerboarders. In 1959 that design was modified slightly to produce the Bermuda 40. It is truly wonderful that these yachts, masterfully designed more than 40 years ago, are being built today for owners who appreciate and can afford brand-new good old boats.

A comparison of the characteristics of the Tripp designs, along with *Finisterre*, is very interesting:

	Finisterre	Block Island 40	Bermuda 40
LOA	38' 6"	40' 8"	40' 9"
LWL	28' 11"	29' 2"	28' 10"
Beam	11' 3"	11' 10"	11' 9"
Draft			
c.b. up	3' 11"	4' 2"	4' 3"
c.b. down	7' 7"	8' 10"	8' 9"
Disp. (lb.)	22,000	20,000	20,000
Ballast (lb.)	9,460	7,800	6,500
Ballast Ratio	43%	39%	32.5%
Sail Area (sq.ft.)	710	738	776
DISP/L Ratio	406	360	372.6
SA/DISP Ratio	14.47	16.03	16.85
Motion Comf.	42.3	35	35.5

The Tripp boats have about the same waterline length as *Finisterre* but are a bit beamier and a couple of feet longer overall. They also have about 10 percent more draft with the board up, and 16 percent more with the board down. This slightly greater beam and draft may account for the fact that the Tripp designs carry a significantly lower ballast ratio than *Finisterre*. Indeed, the 32.5 percent ratio of the Bermuda 40 seems unusually low, but I called Hinckley and that is, indeed, the figure they quoted. The Bermuda 40 is a very well-proven design but, still, I would feel better with another 1,000 pounds of lead fitted as low as possible in the boat, if my dreams included extended ocean cruising.

The wooden *Finisterre* is heavier than the fiberglass 40s but would be closer in displacement if she carried less ballast. However the added ballast will result in a higher capsize angle and the heavier displacement in greater motion comfort, so it is not out of place on a cruiser. Still, the BI 40 and her sister are quite capable of crossing oceans; more than one has circumnavigated the globe and, of course, both yachts have participated in ocean races in every kind of weather and won more than their share.

The sail area/displacement ratio of the Tripp boats is higher than *Finisterre's* so I would expect them to be faster in light-medium air, but *Finisterre's* smaller rig and greater stability would put her back into the competition when it breezed up. Back in the '60s when I sailed with Bill Luders on *Storm*, I raced against a sister of *Finisterre,* which was skippered by the legendary Arthur Knapp. I recall that we beat her on a long slog to windward in a stiff breeze, but I also recall that it was not easy. We worked very hard for every inch we gained! I'm sure the BI 40 and the B 40 will do every bit as well.

by Ted Brewer

Of course, that was back in the good old days of good old boats and the Cruising Club of America rating rule. Any of these heavy CCA cruiser-racers would be easy meat for a hot contemporary IOR yacht, but that does not take a thing away from the ability of the BI 40 and B 40 to perform as comfortable and able-to-go-anywhere cruising yachts. Their shoal draft capability alone will endear them to many who cruise where the bottom is close to the top. Too, these boats are a solid investment. They may not equal the return on Microsoft stock, but many have repaid their lucky owners with years of service and most, or all, of their initial investment back later when it was time to swallow the anchor. Few of today's crop of cruising yachts will be able to make that claim!

The sailor's medical bag

Case number 1: It's blowing hard outside your safe anchorage. You've successfully completed a rough passage. You're several days' sail from the nearest clinic when your partner develops fever, chills, and pain in the kidney area. Your boat is equipped with the latest communication equipment, enabling you to contact a physician. Do you have on board the medication the doctor recommends to treat this condition?

Case number 2: Seven days into a Caribbean sailing vacation, you develop a high fever, severe headaches, joint pain, vomiting and, later, a rash. Could you have prevented this?

Case number 3: The boiling water you were pouring for morning coffee spilled onto your leg. Your skin is painful with some blisters. Do you have the right creams, bandages, and equipment to ensure a good outcome?

Case number 4: During a fast tack, your partner grabbed a winch handle with a bee on it. Five minutes after the sting she is experiencing hives and throat swelling. Are you prepared with a simple pre-loaded epinephrine syringe that may be needed to save her life?

by Jim Hatch, M.D.
illustrations by Mike Dickey

While sailors may be compulsive about carrying spare parts and extra supplies, the act of preparing a good medical kit seems to be an afterthought. This is understandable perhaps. From experience, we expect that the boat will need repairs, but it seems to be human nature not to anticipate illness or injury. And medical supplies are, of course, more difficult to obtain; they are not ordered from marine catalogs or found at the local chandlery.

However, with thoughtful planning, an appropriately stocked medical bag should be relatively easy to obtain. A detailed pre-trip interview with an interested primary-care physician is essential. Find a physician willing to provide long-distance advice over time, especially if your cruising plans extend over a period of months or years. Since medications are expensive and it is impossible to anticipate the need for refills, discuss the fact that you may need to have additional supplies shipped to you at a later date.

If you anticipate foreign travel, try to obtain a separate written prescription for each medication. Be sure to note the expiration date and ask your pharmacist for the farthest date possible when you purchase medications.

During your medical visit:

1. Review the following list of supplies/medications, and have your doctor individualize it for your needs.
2. Review any previous history of negative medication reactions to determine whether the specific drug can still be used again but perhaps taken in a different manner (with food, change in dose, etc.), or whether it was a true allergic reaction and must be avoided.
3. Update immunizations for tetanus/diphtheria and determine whether you should have vaccinations for hepatitis A and B. Hepatitis A is the most common vaccine-preventable illness. A two-shot series starting six months before travel is effective for more than 10 years. The vaccine has an excellent safety profile. Hepatitis A vaccine is recommended for susceptible travelers going anywhere outside the U.S., Canada, Western Europe, Japan, Australia, or New Zealand. Hepatitis B is endemic in many parts of the world, including the South Pacific, and the vaccine is recommended for travelers who will stay more than six months or may require medical or dental care in these areas. Yellow fever vaccination is required for entry into some African countries, French Guiana, and recommended for most travelers to the South American or African tropics. Depending on your travel plans, your doctor may need to consult with, or send you to, a travel medicine specialist to determine the necessity for providing these vaccines as well as those for typhoid, polio, and additional medications to prevent malaria. The mysterious illness, dengue, described in the second case above, is a virus transmitted by mosquitoes throughout the tropics. It can be

quite debilitating and, occasionally even fatal. Supportive care is the only treatment. Prevention with repellents, nets, and screens is effective, however.

4. Ask your doctor to review the technique for giving injections for analgesia and epinephrine for severe allergic reactions.
5. Obtain information about how to clean wounds and close lacerations with Steri-Strips or sutures. Discuss methods and medications for burn treatment. Your physician may recommend a general surgeon as the best resource for these topics.

You can get advice concerning treatment of any medical problem when you're offshore, but you will need a stock of essential medications to ensure the best outcome.

Antibiotics

Several types and classes are required for treatment of the variety of infections that might be encountered. Also, a variety of antibiotics is necessary to provide an alternative if anyone develops an allergic reaction or resistance to the first choice. In general, most infections other than uncomplicated urinary-tract infections require a minimum of seven days of treatment. A 10-day supply would almost always be adequate to treat an infection. Generic medications, when available, are usually acceptable. A conservative approach to initiating antibiotic therapy is wise since these medications can occasionally cause severe diarrhea, allergic reactions, or yeast infections, especially in women. Unnecessary antibiotic use also serves to promote the development of resistant organisms.

You should have these:

Cephalosporins

This large family of general-purpose antibiotics can be used for skin, soft tissue, urinary, sinus, bronchial, pulmonary, and strep-throat infections. There is a 15 percent cross-reaction with patients who are allergic to penicillin, so avoid them if the reaction was severe.

First generation, cephalothin (Keflex, Duricef). A generic will be considerably less expensive.

Second generation (Cefzil, Ceftin, etc.). These are more expensive but offer somewhat better coverage for respiratory and other infections.

The third generation isn't applicable.

Penicillins

Penicillin is inexpensive, but its usefulness has been limited by the resistance people are developing. Amoxicillin/clavulanic acid (Augmentin) is another excellent choice to have on board for treatment of most infections if none of the crew members has an allergy to penicillin.

Quinolones

This is another large family useful for urinary-tract infections (including prostatitis) and travelers' diarrhea (ciprofloxacin). Newer members of this family have expanded coverage for respiratory infections. These medications may cause nausea. Cipro would have been an excellent choice for treating the kidney infection described earlier in case number one above.

Macrolides (Erythromycin and many other brands, including generic)

These medications present a good alternative when there is a penicillin allergy. They're useful for skin, soft tissue, respiratory, sinus, and strep-throat infections (optional for carrying on board).

Sulfonamides

This is a useful, relatively inexpensive class of broad-spectrum antibiotics, especially when combined as trimethoprim/sulfamethoxazole, for respiratory and urinary-tract infections. I tend to avoid prescribing this, due to a relatively high rate of allergic reactions.

Trimethoprim

This is especially useful for treatment of uncomplicated urinary-tract infection in women. One advantage is that it is inexpensive.

Metronidazole (Flagyl)
It is important to carry this one for treatment of diarrhea caused by antibiotics, Giardia, and amebiasis. This is a drug of choice for non-specific vaginitis.

Topical antibiotics
1. Mupirocin ointment (Bactroban). The best, but most expensive, treatment for superficial staphylococcal, streptococcal infections.
2. Bacitracin ointment (Baciguent). This is available over the counter (OTC). It's a good, inexpensive, general-purpose ointment for mild localized skin infections and burns.
3. Silver sulfadiazine (Silvadene). This is the most widely used cream for burns although some experts advocate newer, more expensive dressings.

Antifungal medication (fluconazole, Diflucan)
One tablet ingested is usually sufficient to treat vaginitis.

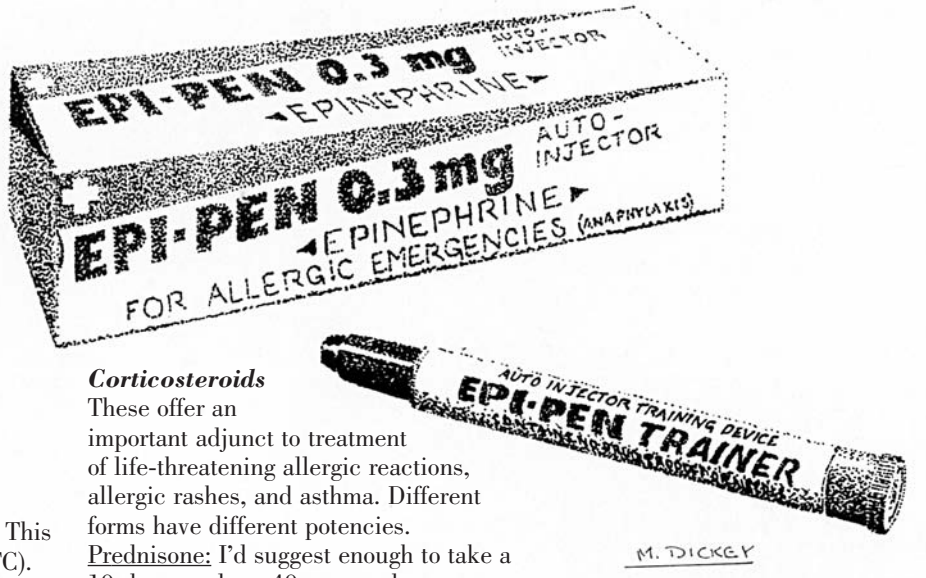
Topical antifungal cream
1. Lotrimin (OTC). This is usually adequate for most superficial infections.
2. Terazol is available in cream and tablets. This is a good choice for yeast vaginitis.

Anaphylaxis/ allergy treatment

Be prepared for life-threatening allergic reactions even if you or other members of your crew have not had a prior incident with bee stings, medications, and so on as in case number 4 above.

Epinephrine (EpiPen)
Prepackaged auto-injector syringes containing 0.3 mg for intramuscular injection. These come with explicit patient-oriented instructions. At least two should be carried on board.

Antihistamines (diphenhydramine, Chlor-Trimeton, OTC)
These are useful for allergic rashes, itching, and sinus congestion, but they frequently cause some sedation. Non-sedating forms (Claritin, Allegra) can be obtained by prescription.



Corticosteroids
These offer an important adjunct to treatment of life-threatening allergic reactions, allergic rashes, and asthma. Different forms have different potencies.
Prednisone: I'd suggest enough to take a 10-day supply at 40 mg per day.
Medrol Dosepak: These are commonly prescribed, but they're expensive and not more effective than prednisone.
Topical Corticosteroids: I'd suggest a 0.1% triamcinolone cream for topical use on localized allergic rashes. This is too strong for facial areas, so use 0.1% hydrocortisone cream on the face. A widespread rash would need prednisone.

Analgesics
Acetaminophen (Tylenol, etc.) should always be the first choice for treatment of pain as the side-effect profile is minimal if prescribing directions are followed.
Nonsteroidal anti-inflammatory drugs (NSAIDs): Ibuprofen, Naprosyn, Motrin, Aleve, and many others. These medications relieve pain with about the same effectiveness as Tylenol but have more potential for side effects (fluid retention, gastritis, ulcers, occasionally liver and kidney inflammation). NSAIDs do not exhibit significant anti-inflammatory effects with over-the-counter prescription dosing recommendations. Near maximum prescription strength doses are needed for this. These meds should be tried if Tylenol is not effective. (Newer NSAIDs without gastro-intestinal side effects will soon be marketed.)
Narcotics: These may be hard to obtain, but it would be reasonable to request at least a modest supply to treat pain from an acute fracture, burn, or similar accident. Consider Darvocet or Tylox (propoxyphene, oxycodone) to treat mild and more severe pain. Occasional side effects include hallucinations, sedation, nausea, vomiting, and constipation.

Antidiarrheal
In most cases, this probem is self-limiting, so it is best to let diarrhea run its course and not use agents to slow it down. It is better to let your body get rid of the bacteria and toxins. A few doses of Imodium (OTC) or Lomotil can be used to temporarily slow the process down when absolutely necessary (such as when trying to travel by airplane).

Anti-ulcer medications
Be sure to have some of these on board, especially if you have required these medications in the past. Over-the-counter versions (half the dosage strength of those obtained by prescription) are now available as Pepcid, Zantac, etc. Antacids such as Mylanta may suffice for occasional "simple indigestion."

Medications for motion sickness
Since this is a common problem, it would be wise to carry both tablet forms and transdermal, rectal, or injectable medication in case the oral route is not feasible.
Meclizine (Antivert or Bonine or Dramamine II, which is available over the counter) is useful for prevention and treatment of mild to moderate motion sickness in a dose of 25 to 50 mg once a day.
Transderm scopolamine patches, used for 72 hours at a time, are probably the most effective remedy. A dry mouth is a likely side effect. Drowsiness and difficulty focusing can occur. Difficulty urinating and disorientation are infrequent, but possible, complications.
Phenergan, used orally, injectable, or as a rectal suppository can be quite useful for this and for nausea in general. It has

a similar side effect-profile to the medications mentioned above.

Diabetic treatment
If diabetics are on board who require medication, insist that they bring along Glucagon and Reactose for treatment of hypoglycemia, along with a blood-sugar measuring meter, and have them instruct someone else on board in their use.

Insect repellents

Repellents should be on your shopping list if you're traveling to the tropics. These would have prevented the dengue fever described earlier in case number 2. They should contain at least 35 percent DEET to be effective against serious mosquito-borne illness (malaria, dengue, yellow fever, encephalitis, and

Medications

CATEGORY		DOSES PER DAY	DURATION (IN DAYS)	COST
cephalexin, antibiotic	250 mg	4	10	$20
Cefzil, antibiotic	250 mg	2	10	$73
amox/clav, antibiotic	500 mg	2	10	$68
Cipro, antibiotic	500 mg	2	10	$75
metronidazole, antibiotic	250 mg	4	10	$14
ERYC (erythromycin), antibiotic	250 mg	4	10	$15
TMP/SMX, antibiotic	D.S.	2	10	$15
Diflucan, antifungal	150 mg	1	1	$16
prednisone, steroid – allergy	10 mg	4	10	$10
Benadryl, antihistamine*	25 mg	4	6	$5
Allegra, antihistamine	60 mg	2	10	$23
Tagamet, anti-ulcer**	400 mg	2	30	$33
Axid, anti-ulcer**	150 mg	2	30	$111
Imodium, antidiarrheal	------	4	------	$4 (12 tabs)
Tylenol, analgesic*	500 mg	8	10	
ibuprofen, analgesic*	200 mg	4	10	$6
Tylenol No. 3, narcotic, analgesic	------	1 to 2	------	$10 (20 tabs)
Dramamine II*, anti-seasick	------	1	------	$5 (8 tabs)
Phenergan, anti-seasick	50 mg	4 - Injection	1	$10
Transderm – Scop patch, anti-seasick	------	3 days/patch	------	$6
Epi-Pen, allergy/anaphylaxis	-----	1	------	$45
Lotrimin, antifungal*	cream	2	------	$7 (15 gm)
mupirocin, antibiotic	cream	4	------	$33 (15 gm)
bacitracin, antibiotic*	ointment	4	------	$4 (15 gm)
Silvadene, antibiotic	cream	2	------	$10 (50 gm)
0.1% TAC, steroid	cream	4	------	$7 (30 gm)
1% H/C, steroid	cream	4	------	$3 (30 gm)
Betadine, antibiotic	liquid/cleansing	8 oz	------	$15
Hibiclens, antibiotic*	liquid/cleansing	4 oz	------	$5
Steri-Strips, lacerations*	#30	------	------	$7
HourGuard 12 Cream*, repellent	33% DEET	------	12 hours	$12
HourGuard 8 Spray*, repellent	25% DEET	------	8 hours	$12
Garamycin, opthalmic antibiotic ointment	for eye infections	3.5 gm tube	4x/day 5 days	$19 (generic)

**** Nonprescription (OTC)***
***** Lower dose available nonprescription***

(Generic meds not capitalized.)

so on.) Hour Guard (Amway), a slow-release polymer developed by 3M, is now provided to military personnel for this purpose. Lower concentrations of DEET can be used to protect against nuisance bites of mosquitoes and flies, where serious illness is not a consequence. Avon's Skin-So-Soft has been popular but only provides 40 minutes of protection.

DEET is very safe, but young children given excessive doses have developed toxic reactions. DEET can damage plastics and may reduce the effectiveness of sunscreens. Repellents and permethrin can be applied to clothing for significant additional protection.

Supplies

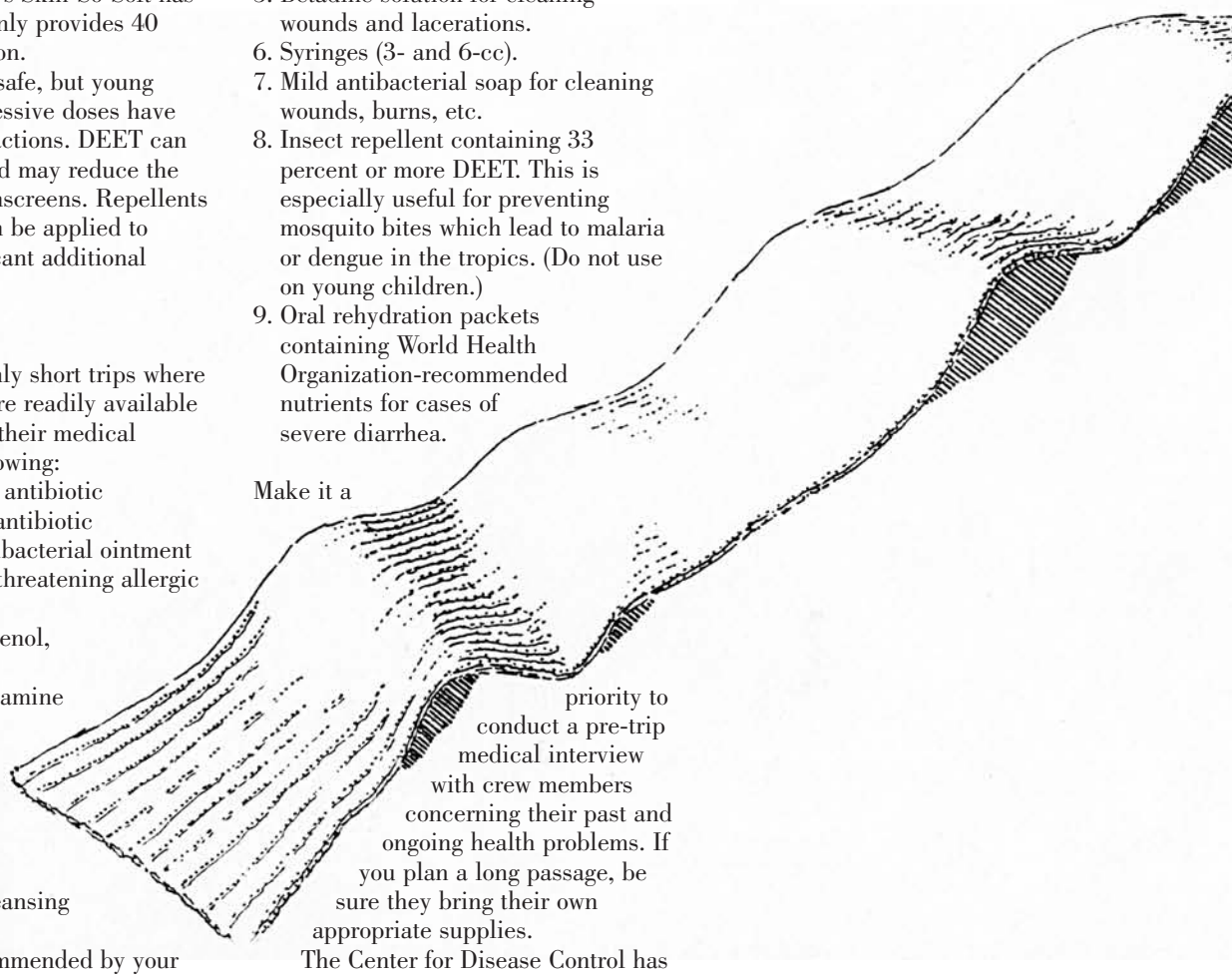
Sailors who plan only short trips where medical care is more readily available can probably limit their medical supplies to the following:

- Cephalosporin – antibiotic
- Ciprofloxacin – antibiotic
- Bacitracin – antibacterial ointment
- EpiPen (for life-threatening allergic reaction)
- Analgesics – Tylenol, ibuprofen, etc.
- Meclizine (Dramamine II, etc.) – anti-seasick
- Steri-Strips – for closing wounds
- Hibiclens – Antibacterial cleansing solution
- Any others recommended by your physician

Remember to store medications in a cool, dark place. Obtain a blood pressure cuff and stethoscope and verify your technique with your physician's nurse. An automatic cuff would probably be the best for the occasional user. Practice your readings and learn what is normal for you and your crew.

Obtain the following from your pharmacy:

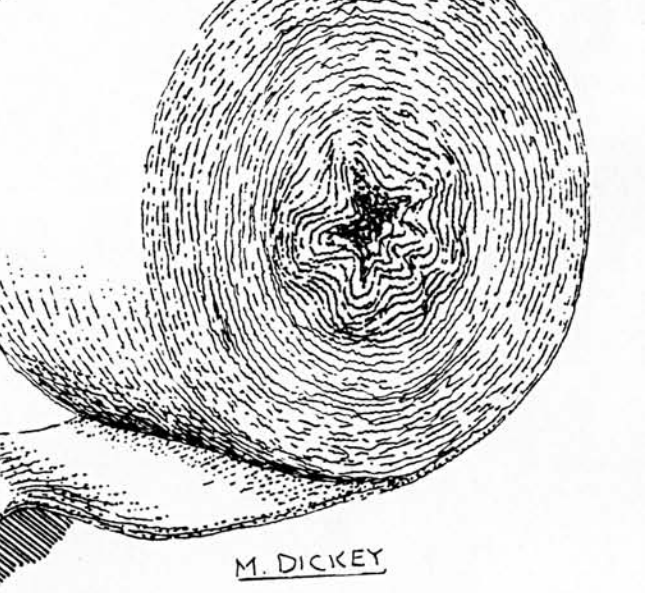
1. Ace wraps and possibly a 3M Coban, which is a similar but self-adherent wrap that can be readily cut to any length.
2. Kerlix gauze wrap.
3. Steri-Strips and benzoin solution to help them stick to the skin for laceration repair, in different sizes.
4. Injectable lidocaine, syringes, non-latex gloves, and suture materials as suggested by your physician.
5. Betadine solution for cleaning wounds and lacerations.
6. Syringes (3- and 6-cc).
7. Mild antibacterial soap for cleaning wounds, burns, etc.
8. Insect repellent containing 33 percent or more DEET. This is especially useful for preventing mosquito bites which lead to malaria or dengue in the tropics. (Do not use on young children.)
9. Oral rehydration packets containing World Health Organization-recommended nutrients for cases of severe diarrhea.



Make it a priority to conduct a pre-trip medical interview with crew members concerning their past and ongoing health problems. If you plan a long passage, be sure they bring their own appropriate supplies.

The Center for Disease Control has a website which is quite valuable for international travelers and is updated with current recommendations for vaccinations, and so on: <http://www.cdc.gov>.

Your sailing adventure will be happier if you anticipate that medical illness or injury could occur. Keep track of the expiration dates on your medications. Have guidelines for their use and, if possible, contact a physician before initiating treatment. Don't forget to send your helpful physician a periodic postcard from those exotic places you are visiting. See your physician when you return home for that annual visit.



Face medical emergencies at sea with a level head and creativity

by Bob Keller, M.D.
illustrations by Mike Dickey

Cruising, as the saying goes, is sailing from A to B, so you can fix what breaks along the way. Unfortunately, things that break include people as well as boats. This article will help you fix some common injuries that occur offshore and better prepare for medical sea emergencies.

Before we plunge ahead, a few things need to be said about expectations. Don't expect to be a doctor. Don't expect perfect results. Don't expect to know everything, and don't expect to be fearless. On the other hand, do expect to treat effectively the majority of all cruising injuries. You'll learn from experience that attitude greatly affects the outcome of your treatment. By developing a captain's foresight toward cruising medicine, you can safely voyage anywhere in the world.

What is the foresight and attitude you need to be successful in dealing with traumatic on-board injuries? Tristan Jones said, "Always put the vessel first, and she will care for you." It is likewise with high-seas medicine. Approach treating an injury with the mindset of another ship's system needing repair. When a crewmember is hurt, an integral element of the vessel's operating system is down. Safety is at stake for the injured mate, as well as for the entire crew. Consequently, approach the injury as other ship's problem to be solved. I don't intend to sound cold-hearted about the poor soul sprawled on deck, but I do intend to draw upon your skills as a sailor. You already know more than you think. You already have a mindset for solving at-sea emergencies. Cruising medicine, therefore, is simply adding new data to the mental program you currently use.

Most injuries at sea result from crew versus boat. The boat always wins in these encounters, so it might as well be accepted from the start that the vessel gets priority. "One hand for the boat, the other hand for yourself" especially applies to moving about the boat in rough seas. The most common injuries I treat arise from direct trauma involving head and extremity mishaps. Needless to say, the best treatment is prevention. Always, when topside, keep your center of gravity low and your stance wide — in other words, crouch down. This not only stabilizes your body, it also decreases the potential force of a traumatizing event. Oftentimes, the difference between a sprain and a broken bone is the distance of a fall. That's why small children (close to the ground) rarely break anything until they fall from a tree. In short, stay close to the deck.

Moreover, use a natural physiologic phenomenon called propioception, to avoid injury. Propioception lets us know where our bodies are in space and time. Occurring in the cerebellum of the brain, messages travel between brain and extremities, allowing the body to know if our position, posture, and co-ordination are correct. By watching the horizon while moving about and grasping handholds, we maximize our brain's ability to anticipate trouble. Small gyrations sensed by our body, plus visual clues of

deck vis-à-vis horizon, give us early warnings of impending disaster. Therefore, tune-in to propioception by focusing on the task at hand. As they say in Kung Fu, "Be one with your movements, grasshopper." No daydreaming on deck allowed.

Suppose, however, that despite our best Zen intentions, we collide with the boat. What should you know about treating trauma? First, let's begin by approaching accidents in a systematic fashion. When someone gets hurt, start by asking, "How serious is it?" If conditions allow, keep the patient still while you assess the damage. Start by asking the victim, "What hurts?" After 24 years in the ER, I've learned that the patient usually knows what hurts. Then do a quick assessment of the rest of the victim's body. Touch the patient from head to toe. Look for blood, deformities, and skin color changes. Listen for verbal clues that you've touched something painful under his foulies.

Be especially attentive to the neck. Feel along the back of the neck for any tenderness. If you elicit a moan, stabilize the neck with anything that will keep it from bending or moving. If you have a cervical collar, use it. But anything will work that provides support. For example, a pillow folded around the neck and taped together or the panels of a life preserver taped parallel to the neck would work well. Leave the neck immobile until the pain is completely gone or a doctor clears the neck.

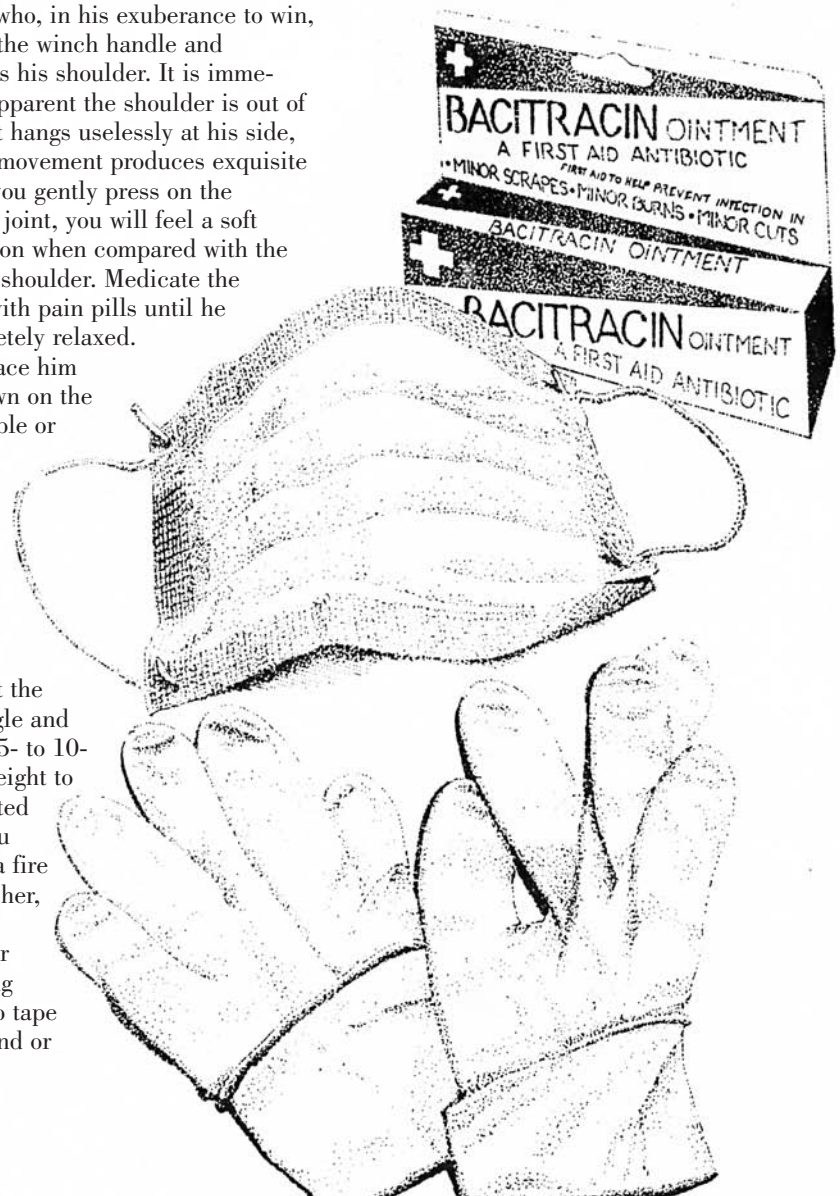
Next, examine the area of pain. My anatomy professor told me that God gave us two limbs so we could compare them when one got hurt. Look and compare the extremity that is injured to the normal one. If they look different, there is either a bone broken or severe swelling. Check the deformed appendage for blood flow by feeling the temperature of the skin.

If it looks white and feels cold, the blood flow is compromised. In essence, the kink in the blood vessel must be straightened out, or the limb will be damaged. While it may sound scary, you must reduce the deformity until the appendage looks and feels normal. Medicate the patient with whatever you have on board for pain control. Then, by trial and error, manipulate the extremity until good color, temperature, and alignment are obtained. Immobilize the appendage, elevate, and re-check color and temperature every four hours. When you arrive shoreside, have a professional check out your work.

In the event an extremity is deformed but shows no sign of restricted blood flow, it's perfectly acceptable to splint the injury as it lies. As long as the limb is getting blood downstream, a day or so of malalignment won't damage anything. In the interim, make sure the limb is supported and splinted, so no further deformity is created. Then, re-check for color and temperature every four hours. When you're shoreside again, have a doctor see the victim.

Dislocations are another cause of limb deformities. Shoulder and finger dislocations account for the majority of joint traumas. Consider the case of the grinder, who, in his exuberance to win, slips off the winch handle and dislocates his shoulder. It is immediately apparent the shoulder is out of socket. It hangs uselessly at his side, and any movement produces exquisite pain. If you gently press on the shoulder joint, you will feel a soft indentation when compared with the opposite shoulder. Medicate the patient with pain pills until he is completely relaxed. Then, place him belly down on the galley table or another high platform with his injured arm hanging over the edge. Let the arm dangle and attach a 5- to 10-pound weight to the affected wrist. You can use a fire extinguisher, fishing weight, or something similar to tape to his hand or wrist. The principle is the same: the weight will eventually fatigue the shoulder muscles enough to relax them, thereby allowing the humerus bone to slip back into the joint. If you try to force the shoulder back when the patient is tense, I guarantee failure. A patient in pain is incredibly strong. It's best to let the pain medications take effect, then let the weight do the job. When the shoulder pops back in, the patient will immediately feel relief. He can move the arm and will tell you the shoulder is back in place. Nevertheless, place his arm in a sling for several days while the tendons heal.

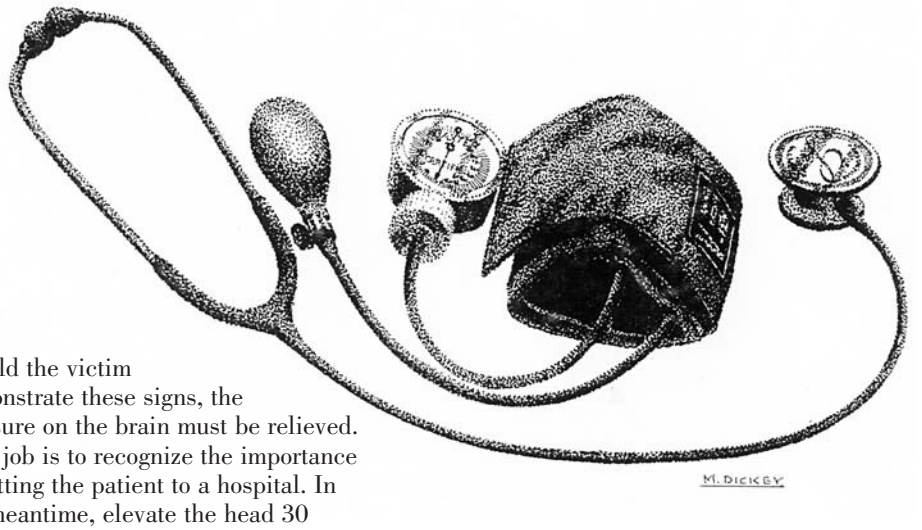
While broken bones appear more dramatic, I see more sprains and strains than anything else. With these soft-tissue injuries, pain and immobility can be as great as a fractured limb. Usually a patient knows whether or not a bone is fractured. Sprains, on the



other hand, involve ligaments and tendons but still interfere with the normal function of the limb. The object of treatment, therefore, in the case of a sprain, is to support the ligament. In the case of a sprained ankle, use whatever lateral support material you have on board. For example, extra sail battens can be cut to size and placed on each side of the ankle. Wrap strips of a torn T-shirt around the splint, then wrap the whole thing with duct tape. Be sure to leave the toes exposed in order to check for blood flow. If the foot is getting cold or pale, loosen the tape. This makeshift splint will allow the patient to move about when necessity calls. But remember this rule: for every hour the patient is on his feet, an hour of elevation is needed to reduce the swelling. In addition, use pain as a monitor. If it hurts to do it, don't do it. Try it a different way. Be creative and use your head before your limbs.

Speaking of heads, they always seem to get in the way of the boom. I've lost count of the number of sailors wearing my needlework. Usually a cut on the scalp results from boom-bang, and life at sea goes on. However, I want to give you my doomsday speech so you'll remember some danger signals. There is a one-in-a-million scenario to watch for whenever head injury occurs. Anything that causes the head to shake around can break a blood vessel inside the brain. If that vessel bleeds, there's nowhere for the blood to go because the brain sits in a box — the skull. Pressure inside the skull will gradually build until enough force is present to affect the breathing center. Now, way before the patient stops breathing, signs of increasing pressure can be noticed. These are the symptoms to watch for:

- One pupil larger than the other
- Projectile vomiting
- Severe headache
- Blurred vision
- Acting incoherent
- Fever
- Problems with walking, talking, and grasping
- Fluid coming from the nose, ears, or eyes



Should the victim demonstrate these signs, the pressure on the brain must be relieved. Your job is to recognize the importance of getting the patient to a hospital. In the meantime, elevate the head 30 degrees and keep the person quiet. Give Tylenol for pain but not aspirin or ibuprofen. These medications will cause more bleeding.

Quite simply, concussion is swelling of the brain. Whenever your body gets hit, the area of trauma swells. In the case of a leg, it's no big deal. But if the brain expands, the pressure is trapped in the skull. Rarely is this swelling life-threatening. But without a CT scan to tell us about the presence or absence of blood versus swelling, there's no way to tell for sure. Just keep watching for the signs.

This unlucky sailor has probably also sustained a laceration to the scalp. Bleeding can be dramatic because the scalp is richly supplied with blood vessels. This bleeding is different from internal hemorrhaging because we can do something about it. First, take a towel or cloth and press it firmly on the location of the bleeding. After a while, the bleeding will stop. Not only does this arrest the hemorrhage, but it gives you and the patient time to settle down. Few things look as frightening as blood all over the deck or running down a sailor's face when you're far out at sea. Studies show that we all overestimate blood loss at the scene of a trauma. Compound blood mixed with water on deck, and it may appear that *Jaws* has struck. Don't panic. Take a deep breath, lift up the towel and guesstimate the length of the cut.

Several options are available for closing the wound. Option one is to do nothing. The blood will clot, and in a few days the wound will seal. Option two is to sew the cut closed. If you have an offshore medical kit, use the staples as directed. Incidentally, there is a nifty new product on the market, which is a medical "super-glue." Its called Dermabond, and I use it in the ER to close practically all lacerations. You simply hold the wound together and glue it closed. Couldn't be simpler. Or grab your canvas kit, soak the thread in rubbing alcohol, and use your canvas-repair skills. There's nothing magical about closing a wound. Option three is to isolate strands of hair on the opposing edges of the cut and tie the strands together. I used this technique a lot when I trained people in wilderness medicine. Having only a knife and the clothes on their backs, these wilderness students made do with things at hand — or head, in this case. The key is to improvise and keep calm.

Emergency medicine at sea is but one more skill required of the bluewater cruiser. Part of the lure of the sea is self-reliance and creativity. Marine medicine, in many respects, represents the ultimate trust in yourself. You've already demonstrated the confidence to face nature on her terms by being at sea. The human body is just another expression of nature at work; therefore, approach injuries at sea in the same manner you would when caught in a gale.

Prepare yourself and the crew before the event occurs, keep a level head, attend to what's in front of you, and know when to ask for assistance. The human body has a remarkable ability to repair itself and will see you through the worst of traumatic storms. When you successfully treat your first high-seas medical emergency, the sense of fulfillment will approach the experience of landfall after a long voyage. Building your captain's attitude and attending to your vessel's safety will enhance your voyage upon the seven seas and throughout life.

New

by David Telles

I'm not rich. I'm not poor, but I'm definitely not rich. In fact, in the great chasm that separates the two extremes, I'm somewhere near the bottom trying to claw my way up a little at a time. This has not prevented me from sailing. I've sailed with friends and rented boats for daysailing and recently, when I came into a little money, I bought a 30-year-old catboat in a state of disrepair with the idea of fixing her up myself.

There were several things wrong with the boat: someone had installed handrails in the cored section of the deck without bedding the self-tapping screws they used, spoiling the core; a trim piece had come away, leaving behind a difficult-to-remove band of adhesive; and the entire boat was beaten, nicked, scratched, and holed. The ports leaked badly every time it rained. In short, the boat was sound of hull but everything above the waterline needed repairing, repainting, or replacing. The worst thing about the boat, however, was the rig.

She was rigged with a Marconi sail set on an aluminum mast that had been broken and repaired, and an aluminum boom that was so pitted and dented as to be too ugly to keep. I have always thought a catboat should have a gaff rig, and when I regarded the boat at her mooring, the Marconi rig looked ridiculous. The rig also gave her an almost neutral helm in strong winds but an unnerving lee helm in light air. Charles Whitholz, the designer, had said somewhere that he considered the Marconi version of this boat perfectly balanced, so I suspect there was some tinkering done on the rig by a previous owner. The boom seemed a little short when compared to the drawing. At any rate, I decided to re-rig the boat with a gaff sail.

I designed the rig myself after obtaining drawings of the gaff-rigged version of the boat from the previous owner. The drawings, which included the center of area of the sail, gave me the general proportions to shoot for in drawing the new rig. I put the new center of area slightly aft of the Marconi version's. Because, as I said before, I'm not rich, I decided to build the rig myself.

As I look back on it, the whole project cost me roughly $2,000, which is about what a new aluminum rig would have cost without hardware or paint. That's mainly because I had to buy several tools for the project. I look at this little investment as money well spent because I intend to build a small cruiser someday, and the tools I have acquired will come in handy. Still, the economy of using my own labor did not save me a whole heck of a lot of money. It did, however, give me control of how and with what the spars were built. The peace of mind that brought was priceless.

All of the spars were built of Douglas fir. The mast is hollow, and the boom and gaff are solid. I swiped the idea for building the hollow mast from a letter I had seen in *Boatbuilder* magazine. The plan called for eight full-length staves, notched on one edge so each stave would fit into the notch on its neighbor at a 45-degree angle, creating a large octagonal cylinder. The taper for the top of the mast was planed into the flat edge of each stave and the whole thing clamped with Spanish windlasses for gluing. Lacking the room in my basement to pass the 24-foot staves through the table saw, I made up a jig for my half-inch router and bought a 90-degree V-groove bit to cut the notches in the staves. It took several passes per stave, but the results were satisfactory.

The gaff and boom were built up of laminated stock and rounded in the conventional manner. I did not use a spar gauge to mark the cuts on the beams that would become the rounded spars. Instead, I measured in from the edge of each side (and from the pencil line at the tapers) 3.5 twelfths of the width of each face to get the octagonal cross section I wanted. I then cut along these lines at a 45-degree angle with a circular saw. From there, I planed the spars by eye and found no difficulty in turning out a set of straight, well-rounded spars.

The mast presented a small challenge in that the cables for the navigation light and the radio antenna had to ascend to the mast truck inside, to avoid fouling the mast hoops that would secure the sail to the mast. This problem was solved by simply leaving two opposing notches in the staves unglued, allowing me to separate the

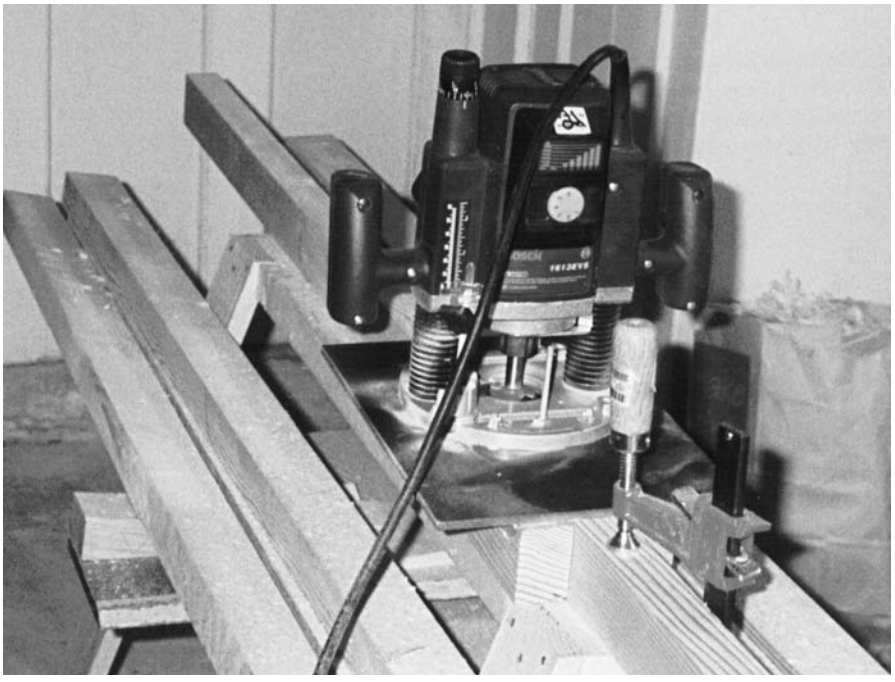
mast for an old cat

halves of the mast after curing to install cores and cables. I later glued the halves together with the cables inside.

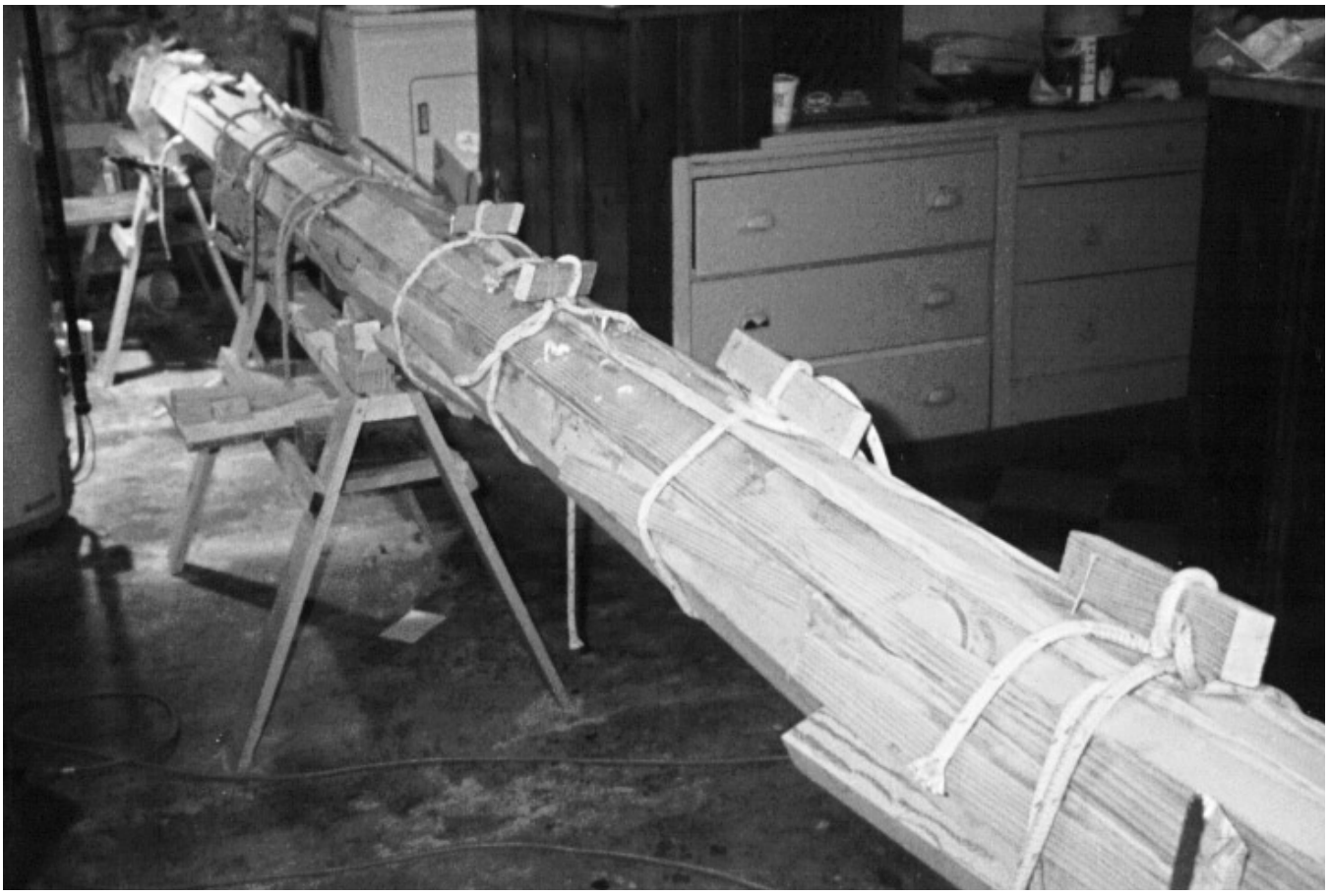
All of the new hardware on the rig is of cast bronze, which is bedded and set on lignum vitae pads backed out to the curvature of the spars. The forestay is wire looped around the mast and dropped into hardwood hounds which were mortised into the mast and then screwed and glued. I originally planned on having shrouds fitted since the original chainplates were still on the boat, but instead opted for reinforcing the foredeck to take the greater lateral load of the heavier new rig. I cut a new hole in the deck and fitted a collar to it to take the wedges that would make the mast's alignment adjustable. I also installed a new step, built up from eight half-inch layers of marine ply and glassed to the hull.

In all, the process took four months from the time I began scarfing the mast staves to the time I was ready to install the rig. In short, it took all winter. I worked part-time and at a leisurely pace. Had I been in a rush and could have worked full-time, I have no doubt that the job could have been done, including installation, in about four weeks.

After I installed the rig on the boat, I noticed an increased period of roll, due to the greater weight of the new mast. The heavier mast had raised the boat's center of gravity slightly. This meant less stability. To compensate, I dropped almost 400 pounds of lead into the bilge. This seemed to put her back where she was before the new rig, so I ordered the new gaff sail. Later, when I

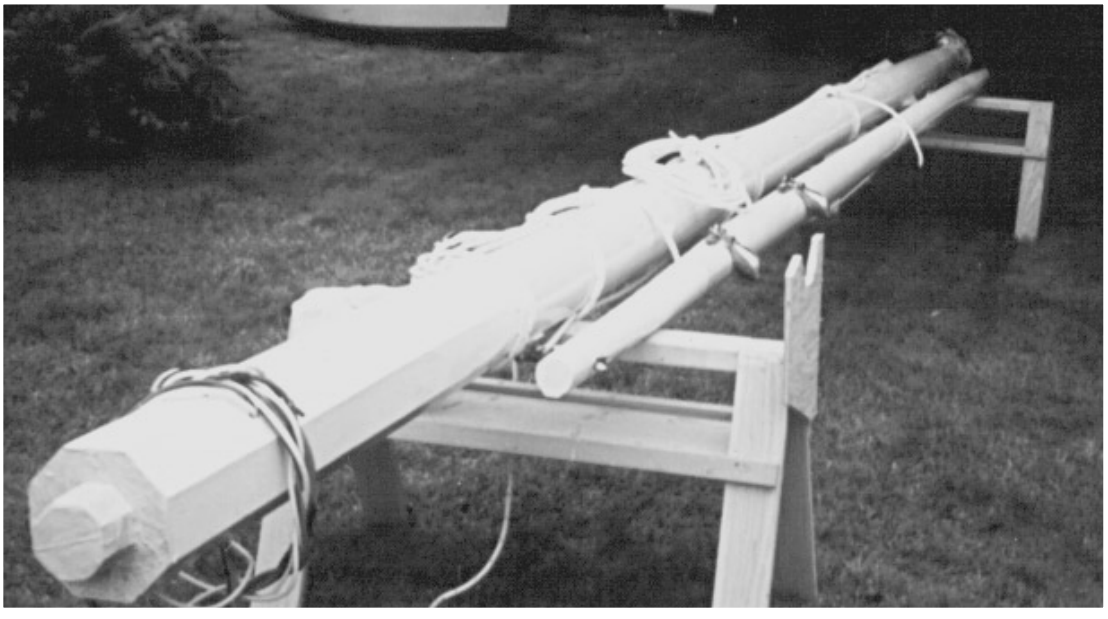


The plan called for eight full-length staves (these are of Douglas fir), notched on one edge in such a way that each fits onto the next at a 45-degree angle, creating an octagon. The notches were cut with a half-inch router and a 90-degree V-groove bit, using several passes per stave.



sailed the boat, I found the balance of the new rig to be perfect. Her performance is great. She sails like a witch and looks much better than she did a year ago.

I went to a lot of trouble to build a new rig and to refurbish the boat. For the total investment, I probably could have bought a boat that needed no work and was ready to sail. But what would have happened to *this* boat? Fiberglass boats don't rot away. They hang around for decades. There are a lot of great boats out there that, with a little work, could be giving enjoyment for years. I didn't want to add to the collective trash heap, so I chose to recycle a boat of good design. Many other people have done the same, and the rewards are great. With luck and care, this boat should be around for the *next* 30 years.



The 24-foot mast in stages: gluing (above left), smoothing (above right), and finished with a gaff to match (left).

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GPS: Four and twenty sp wizards help you find you

Accurate timing and simple geometry help your GPS sort out latitude and longitude

by Roy Kiesling

Almost as soon as radio was invented, it occurred to people that there should be a way to use it to determine the positions of ships. They started trying as early as 1912, but it was not until 1995 that they finally got it right. It was July 17, the day the U.S. Air Force formally announced that the Global Positioning System was fully operational.

GPS is the end product of a litany of lesser systems. For many decades, sailors relied on radio direction finders — which were basically table radios with rotating loop antennas and degree wheels on top. By taking bearings off shoreside radio stations, the mariner of the '40s, '50s, and '60s could find out generally what part of the ocean he was in.

Under the pressure of navigating thousands of newly-built ships to England in World War II, Loran (LOng RAnge Navigation) was developed. Loran continues to work well for many people in many places. But a Loran set is likely to do a better job of returning precisely to a place it has already been than to tell you exactly where you are in unfamiliar waters. Careful use of Loran also requires using a special chart, printed with the nested curving lines of radio propagation times.

Many other ground-based systems have been built, tried, and found deficient. The era of the artificial satellite ushered in by the Russian sputnik in 1957 finally made possible the blending of a manmade system with the perfect principles of angles and distances developed from celestial navigation. It is no accident that the cloud of NAVSTAR satellites now in orbit are referred to as a constellation.

At almost any time, and in almost any location, a GPS unit will yield a position in latitude and longitude that is slightly more accurate than can be achieved with a standard U.S. Navy sextant and years of practice. People with more precise requirements and a budget to match may pay more and get more accuracy, in very special cases down to fractions of an inch.

"Wizards" is a fair term for the people who have done this for us. While the actual mechanics of GPS are beyond the scope of this article (and most people's interests), let's look at how GPS works for sailors, how we can use it, and what its limitations are.

Thinking globally

At its very best, with everything working perfectly and the Department of Defense not monkeying with it to hinder evildoers, GPS should be able to give a position accurate to within, roughly speaking, 20 feet.

Since the information that gives rise to that accuracy comes to us from satellites, it stands to reason that someone has to know where the satellites are with that same precision — 20 feet! That tells us that there must be a small army of orbit planners behind the curtain, as it were, keeping track of the locations of the 24 active satellites in the NAVSTAR constellation.

But since the particular 20 feet you are interested in is at the surface of the earth, not out in space, those wizards also need to know where the surface of the earth is, and with equal accuracy. And no, even sea level isn't the same all over the world all the time. It's been known for centuries that the earth is not spherical, but somewhat squashed at the poles. One of the first things we learned when satellites were put into orbit and when their orbital paths behaved strangely, was that the shape of the earth is a lot worse than that. It has more bulges and irregularities than an old IOR one-tonner. Not every expert agrees on exactly where they are!

That's part of the reason why you usually find a list in the back of a GPS manual of a hundred or so "datums." These are different people's ideas, based on different surveys at different times and locations, of what the shape of the earth is. Such differences in shape are not trivial. In some parts of the world they could amount to a mile or more. The message for the practical boater is to find out beyond a doubt which datum your chart uses, and to make certain that your GPS (if it offers a choice of setting) is set to the same one. For most of us, in our home waters, the most common datum on our charts is WGS 84 — the World Geodetic System agreed upon by international conference in 1984.

Knowing your latitude and longitude with perfect accuracy is useless without knowing where that spot is on the planet, and only an up-to-date chart, with the proper datum, can show you that. If your GPS cannot be set to the precise datum used by the chart, there are corrections that you can obtain and apply.

One source of error is that some sources discuss and use lat/long in terms of degrees, minutes, and seconds. Others, including the U.S. Coast Guard Light List, use degrees, minutes, and decimal tenths of minutes. To make things even more confusing, some GPS receivers use one, some the other. Many allow you to select the one you want. Pay attention to which one you are using, because the difference can be large. The distance between a waypoint

ace-age
r way

located at 0.5 minutes and a waypoint located at 50 seconds is about 2,000 feet. That could put you very far up on shore if you just assumed the two measurements were "about the same."

Watching the birdies

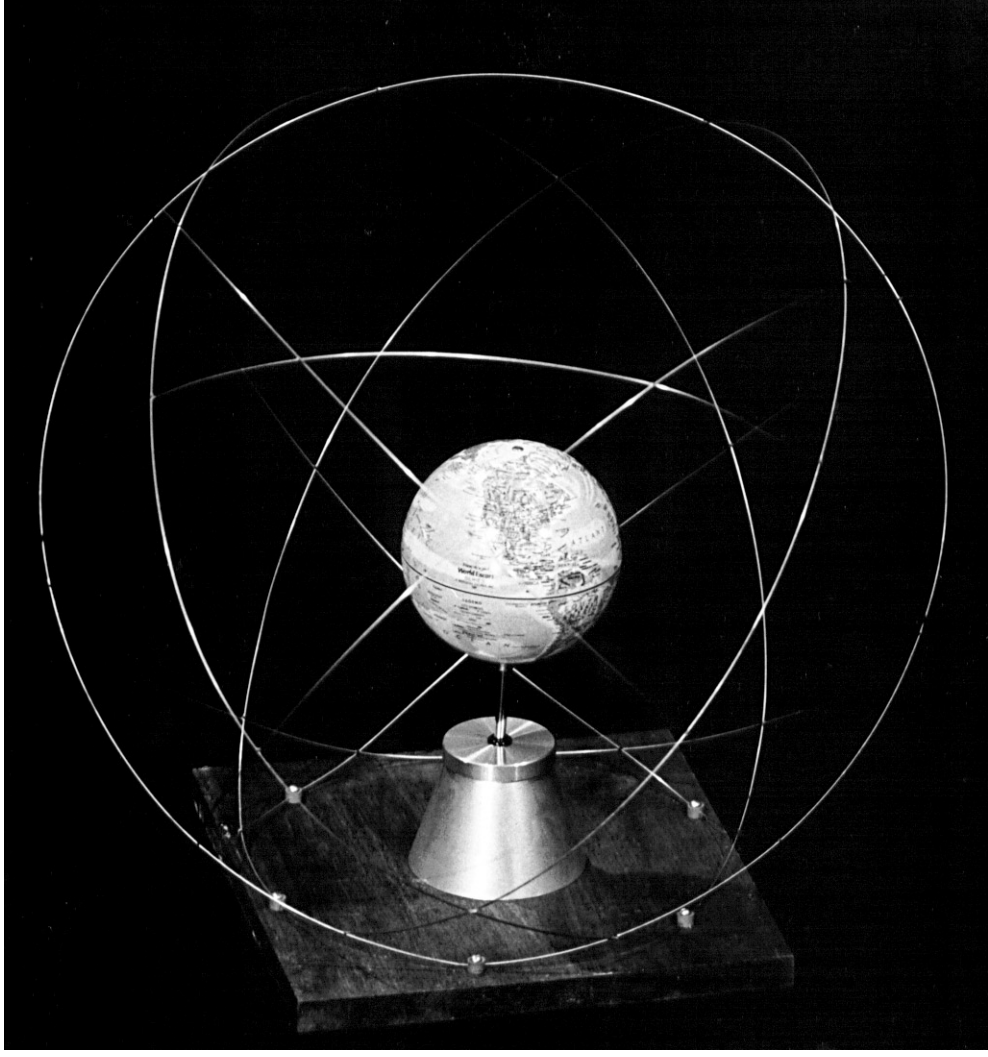
It's interesting and useful to know the basics of how the satellites and your receiver interact to tell you where you are.

The orbits of 24 satellites — and several spares — are set up so five to eight of them should be visible at any one time from any point on the globe. "Visible" means that the average receiver can find that many satellite signals. Physically, at 17 feet across (with their solar panels unfolded) and 11,000 miles out, the satellites are far too small to be literally visible, even with a powerful telescope.

People who work with celestial navigation have always taken pride in being on familiar terms with the stellar bodies they use. We who use GPS can do the same thing; the only difference being that our guiding bodies are manmade and invisible to the naked eye. Still, the task is easier — there are only 24 satellites versus thousands of stars, and they are arranged neatly in six specific orbits, rather than flung randomly throughout the sky. Further, each satellite has a number, and many GPS receivers tell you which one(s) it is seeing. You may want to take the trouble to develop a sense of where the satellites are, and which ones you find yourself using most frequently.

The constellation is the next step in understanding how GPS works. We know that there are 24 satellites in six orbits, which means there are four satellites in each orbit. That's simple enough. But why the orbit is inclined at 55 degrees bears further explanation.

To more easily understand this, envision the synchronous orbits of TV relay satellites — the ones that feed that satellite dish on your roof. Those satellites are in a very simple and special orbit, and one that's easy to visualize. This is an orbit that has an inclination of zero degrees — it lies precisely in the plane of the earth's equator, and stays there. Since these satellites are always directly above the equator, they do not have any apparent motion north and south.



Roy built this scale model to help visualize the 24 satellites in six orbits.

In addition to being in a special orbit plane, they are also at a special height: 19,300 nautical miles. This gives them a period of rotation around the earth of exactly 24 hours, which gives them the appearance of being stationary in the sky. The satellite and the earth rotate in unison. That keeps them from appearing to wander east or west, thus the name geostationary. TV satellites have to be in exactly this orbit, because if they were anywhere else, any higher or lower, TV watchers would go silly re-aiming their antennas every few minutes. (The system isn't perfect, so they have to do a little of this, as it is.)

Now think of an orbit at exactly right angles to that one, a sort of meridian of longitude in the sky. It passes directly over both poles and at right angles to the equator. This is an orbit with an inclination of 90 degrees. The NAVSTAR satellites could perfectly well have been put into that kind of orbit. Among the several good reasons they weren't is that there aren't very many potential GPS users on the polar ice caps. The compromise was to put the NAVSTAR orbits at an inclination of 55 degrees. That keeps the densest population of satellites between the latitudes 55 degrees N and 55 degrees S — where most of the users are likely to be found.

Once you have the 55-degree orbit clearly in mind, imagine for a moment that the satellite in that orbit is crossing the equator, south to north, at precisely the 0-degree longitude — the Greenwich meridian. Now note where the additional five GPS orbits would be. Since they are equally spaced around the earth, so their south-to-north equatorial crossings are precisely 60

degrees apart, at the instant that the satellite in that first orbit is crossing the zero meridian, the planes in which the other five orbits lie are, respectively, at longitudes 60, 120, 180, 240, and 300 degrees. (OK, 240 and 300 would really be 120 degrees W and 60 degrees W, but you see the pattern.)

Another interesting detail in this matrix is how far up they are — 11,000 nautical miles is approximately three times the earth's radius. The TV satellites are twice as far away, and have a period of rotation of 24 hours. The NAVSTAR birds, at half the distance, make a revolution around the earth in 12 hours. The result is that a given NAVSTAR satellite will pass over the same point on earth four minutes earlier each day. So it really is possible to get on a first-name basis with them.

How it works

Visualize a tripod with a camera on top. If you know how long the three legs of your tripod are, and you know exactly where the feet are, you will always know where that camera is. Change the length of any leg or move any foot and the camera will move. In simplest terms, that's exactly how GPS works: the GPS receiver down on earth is the camera, the satellites are the feet, and the distances from the satellites to your GPS receiver are the legs. (If it helps, visualize the tripod upside down.) All the satellites have to do is tell the receiver exactly where they are and the exact time they are there — and you have your position.

But wait a minute. How does a GPS receiver know so precisely how far it is from each of the three satellites? The speed of radio waves is the same as the speed of light, which has been carefully measured. So all you have to know is how long it took the radio signal to reach you from the satellite, and you can calculate the distance. Except that an error of a thousandth of a second means an error of 186 miles (velocity of light = 186,000 miles per second). If an error of a foot were as much as we could tolerate, we would need timing accuracy to a millionth of a second — a nanosecond.

The clock on board the satellite is almost this good. The clock in your handheld GPS receiver is not, unless you paid about $10,000 for it. The clock in your average handheld receiver is about as good as the quartz watch you buy at a drugstore. How can such a crude timepiece get spectacular accuracy? Once again, the geometry of the system comes into play, and we see why the designers of the system deserve to be called wizards.

What we want to know is exactly how far your handheld receiver is from each of three satellites. Each of those satellites contains a clock that is so inconceivably accurate that the inventor of the ship's chronometer wouldn't even have had a word for it. It is so accurate that, for all practical purposes, the NAVSTAR satellites are transmitting identical time signals. The clock in your GPS is wrong, because it's cheap, but at least it is just one clock. That means it will be off by the same amount of time for all three satellites it's using.

Any sufficiently advanced technology is indistinguishable from magic.

—Arthur C. Clarke

The receiver takes the signal from one satellite, compares the time it was sent with its own time, and calculates the distance to that satellite. That distance does not go to a single point on the earth, but represents a line that could be swung in a circle, or ring of points. Then the handheld does the same thing with the other two satellites and gets two other circles on the earth. If the clock in your handheld was as perfect as the clocks in the three satellites, there would not be three circles overlapping each other, but a single point at which all three signals intersected, which would be your position.

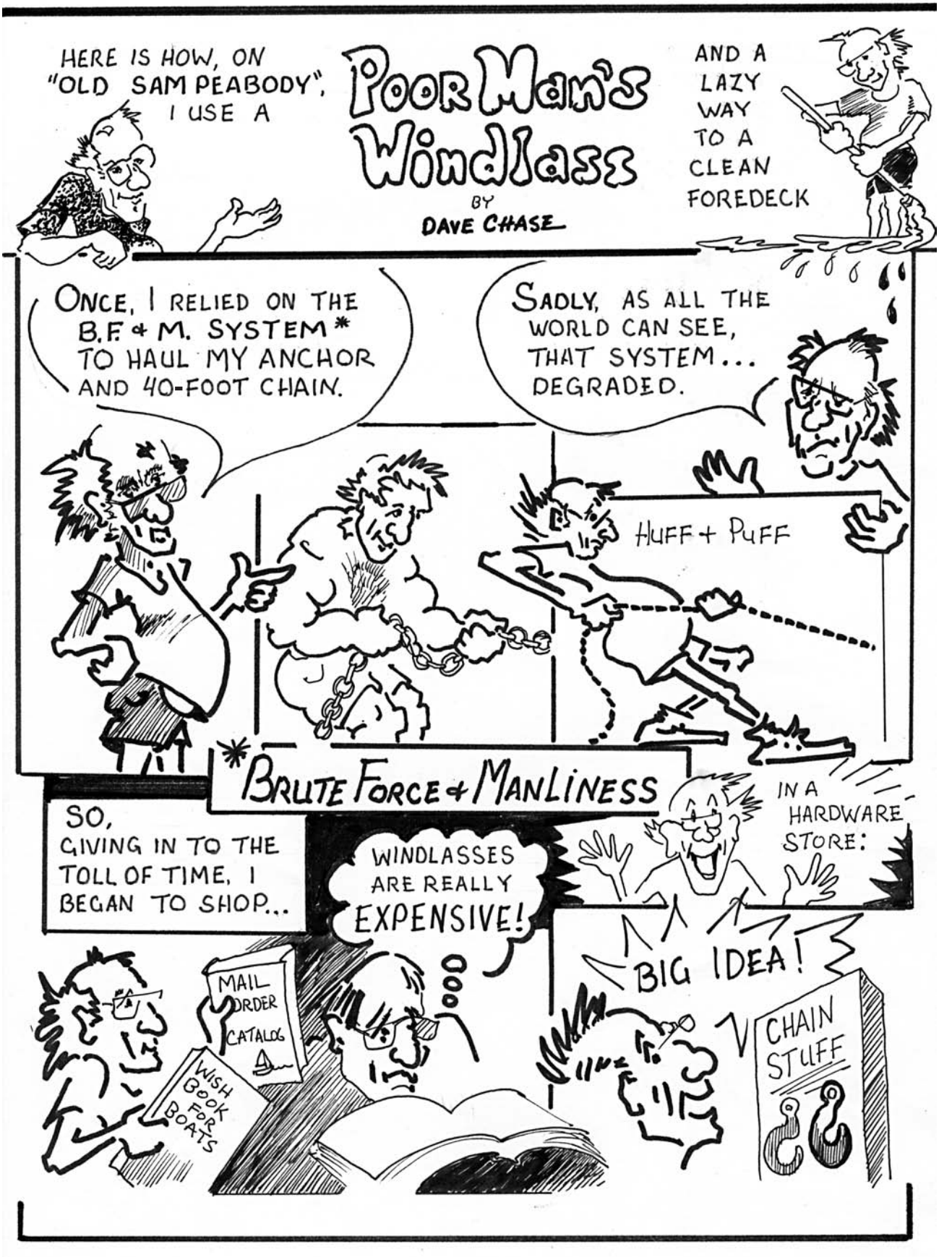
Now, since we know the clock in your handheld has the same error for all three satellites, all it has to do is calculate what single time correction it would have to make for all three time signals to coincide at a single point. A clever high school geometry student could do it eventually; the electronic chip in your handheld can do it almost instantaneously. And voilà! — you read out your latitude and longitude on the screen.

To be a satisfied GPS user, it's not really necessary to go much further than this. If your GPS receiver can get solid signals from three satellites, it can do the math and tell you where it is on the surface of the earth. If it can see a fourth satellite, it can go a step further and tell you what its altitude is. Boaters are for the most part unconcerned with this part of the equation, which is just as well because it's a lot harder to explain.

Final thoughts

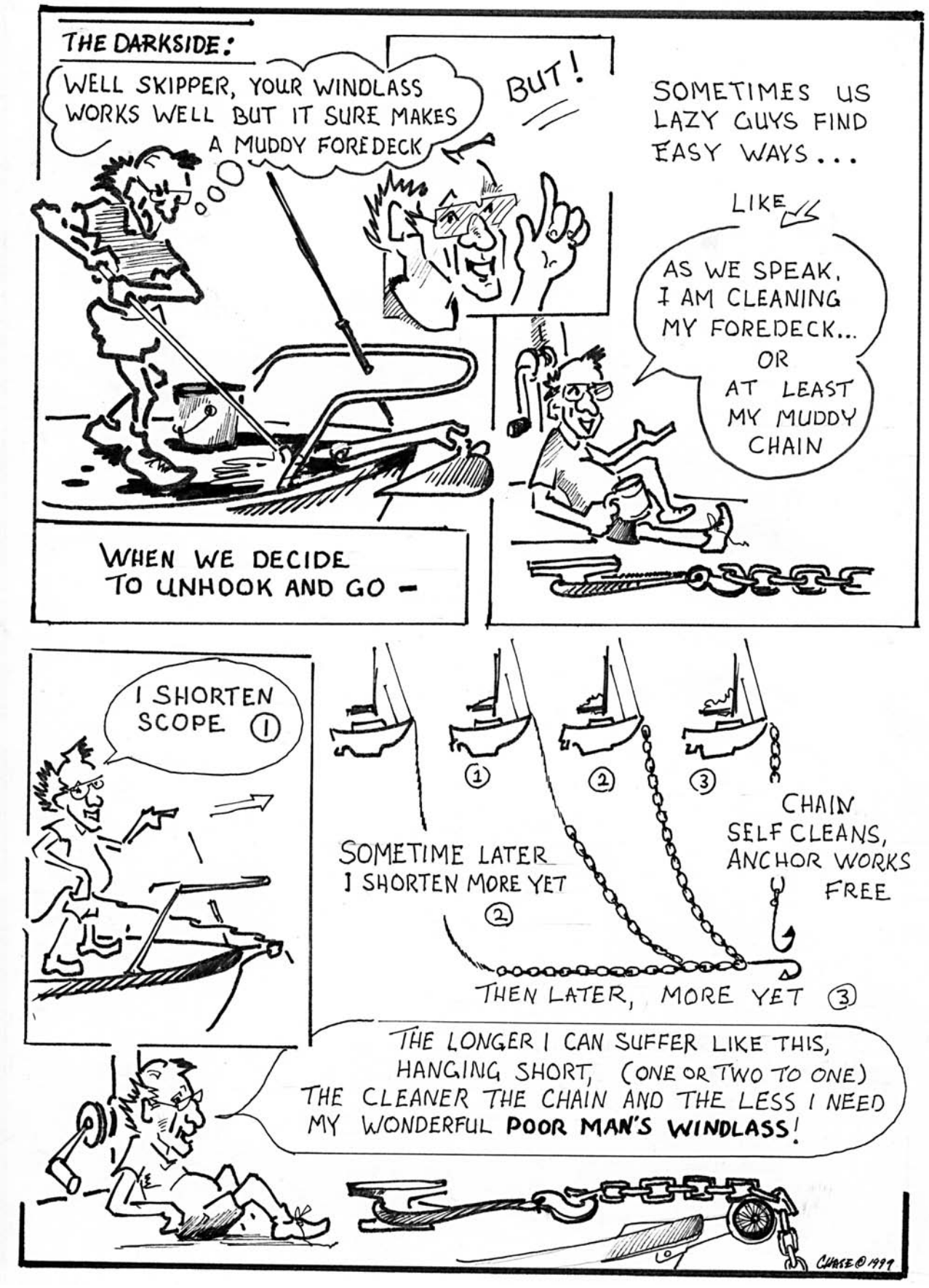
No doubt about it, the modern handheld GPS is a powerful and flexible tool. That said, remember what's printed on your charts: "The prudent navigator will not rely solely on any single aid to navigation." What if the GPS went overboard? What if there were two GPS units aboard which simultaneously got their innards turned back into sand by a lightning strike? Or what if the two GPS units simply started giving different positions — which would you trust? And never forget that the DOD owns the satellites, and can turn them off whenever it wants to. (Fortunately, this eventuality gets less likely as there come to be more large commercial users of GPS.) Any mariner who considers losing the GPS as his navigational worst-case scenario should rethink his priorities.

Just as the prudent mariner will not go far to sea without a current and accurate chart of his cruising waters, so he or she will recognize that the GPS is just the latest addition to the family of devices and techniques of the navigational repertoire. The techniques of the hand-bearing compass, the depth sounder, the speed meter, and the plotting table should continue to be part of the navigation skills of old hands, and are worthy of being learned by newcomers. There is wisdom in the words of those who say if you have a second GPS on board, it should be a Gray Plastic Sextant. If you truly venture far offshore, it could be a great comfort to know you are guided by constellations that are virtually guaranteed to be there forever.


HERE IS HOW, ON "OLD SAM PEABODY", I USE A
POOR MAN'S WINDLASS
BY DAVE CHASE
AND A LAZY WAY TO A CLEAN FOREDECK
ONCE, I RELIED ON THE B.F. & M. SYSTEM* TO HAUL MY ANCHOR AND 40-FOOT CHAIN.
SADLY, AS ALL THE WORLD CAN SEE, THAT SYSTEM... DEGRADED.
HUFF + PUFF
*BRUTE FORCE & MANLINESS
SO, GIVING IN TO THE TOLL OF TIME, I BEGAN TO SHOP...
WINDLASSES ARE REALLY EXPENSIVE!
IN A HARDWARE STORE:
BIG IDEA!
MAIL ORDER CATALOG
WISH BOOK FOR BOATS
CHAIN STUFF

Simple Solutions

Editor's Note: When Dave Chase talked to us about his idea for our *Simple Solutions* feature, he suggested that his approach for explaining his "poor man's windlass" would be the *Cliffs Notes* version. However his comic book approach may have outdone *Cliffs Notes* in simplicity. We would like to continue to encourage the non-artistic among us to send *Simple Solutions* ideas. You don't have to top this for originality. Honest.


THE DARKSIDE:
WELL SKIPPER, YOUR WINDLASS WORKS WELL BUT IT SURE MAKES A MUDDY FOREDECK
BUT!
SOMETIMES US LAZY GUYS FIND EASY WAYS...
LIKE
AS WE SPEAK, I AM CLEANING MY FOREDECK... OR AT LEAST MY MUDDY CHAIN
WHEN WE DECIDE TO UNHOOK AND GO -
I SHORTEN SCOPE (1)
SOMETIME LATER I SHORTEN MORE YET (2)
CHAIN SELF CLEANS, ANCHOR WORKS FREE
THEN LATER, MORE YET (3)
THE LONGER I CAN SUFFER LIKE THIS, HANGING SHORT, (ONE OR TWO TO ONE) THE CLEANER THE CHAIN AND THE LESS I NEED MY WONDERFUL POOR MAN'S WINDLASS!
CHASE © 1999

Brewer by the numbers

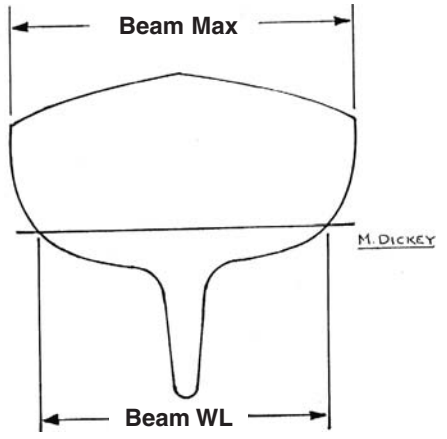
What's the meaning of all those numbers used by yacht designers?

by Ted Brewer
illustrations by Ted Brewer and Mike Dickey

The terms and ratios that follow are used by all yacht designers, so it's a good idea to have an understanding of them if you are considering buying a boat or having a custom design created. You may need to work out some of the ratios for the boats you are considering for purchase from the available information, but the formulas are simple and can be handled by an inexpensive scientific calculator. The one I use in my design business is a Sharp EL-520, almost old enough to vote, and it cost less than $25 new many, too many, years ago.

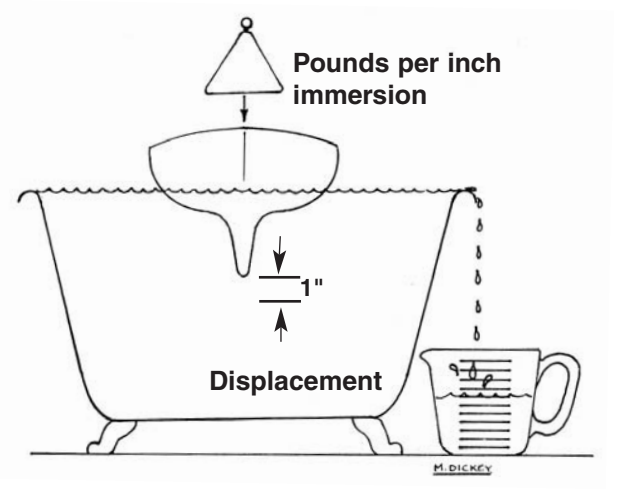
Basic weights and measures

Length: Designers and builders have different ways of expressing length. **Length On Deck (LOD)** is the true length, omitting rail overhangs, and is the honest way to describe the length of a boat. More usually, you will see it as **Length Over All (LOA),** which may be the LOD if the builder is honest but often includes rail overhangs, anchor sprit, bowsprits, and even boomkins if the builder is trying to sell a "larger" boat. **Length on the Waterline (LWL)** is an important figure to know, as it more closely represents the usable size of the yacht than LOD or LOA, and it is a necessary figure in some of the other calculations. LWL is the length of the vessel as measured from the bow ending of the waterline to the stern ending. It should not include any rudder tip that may stick out past the aft end of the hull proper. Over the years, the LWL will increase as the yacht sinks into the water with the added weight of stores and equipment.



Beam: This is the greatest width of the hull and is often expressed as **Beam (Max)**. **Beam WL** is the width at the LWL and is very useful to know but is not readily available, as a rule.

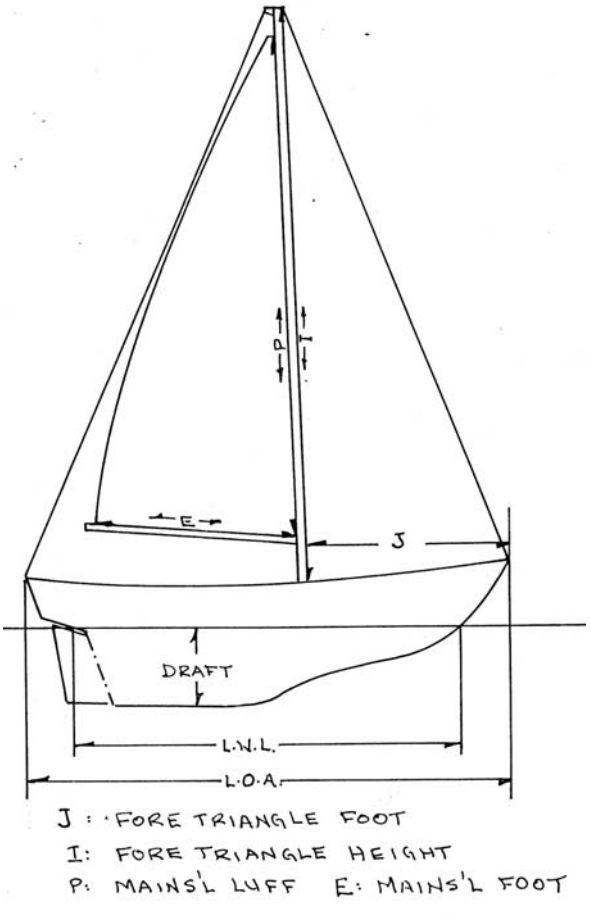
Draft: This is the depth of the hull from the waterline to the bottom of the keel or fin. Like the LWL, it will vary with the weights of fuel, water, stores, and the equipment added over the years and is usually somewhat more than the original designed or advertised draft. When you run onto a 4-foot-deep rock in a boat with 3-foot 9-inch draft, it is always nice to know that it may not be your fault.



Displacement: If you weigh the boat on a scale, that is her actual (not advertised) displacement and the weight of sea water she will displace when afloat. Most designers figure displacement when half loaded (the boat, that is, not the designer) with stores, liquids, and crew.

Displacement can be expressed in pounds, long tons, or cubic feet; one ton = 2,240 pounds = 35 cubic feet of sea water, at 64 pounds per cubic foot. Fresh water weighs only 62.4 pounds per cubic foot, so a boat taken from sea water to fresh water will sink into the water and increase her draft slightly. For example, a boat weighing 7,500 pounds will displace 117.19 cu. ft. of sea water or 120.19 cubic feet of fresh water. The difference is 3 cubic feet, so if her waterline area is 150 square feet, she will sink 3/150 of a foot (about 1/4 inch) when she is moved from salt to fresh water. This is truly insignificant for most sailors, unless you are skippering a 90,000-ton tanker.

J, I, P, E: These are letters you see on the sail plans of many modern cruiser/racers and denote the rig dimensions. As you'll see on the illustration on the next page, "J" is the length of the foretriangle on deck, from the mast to the headstay. "I" is the height of the foretriangle from the sheer to where the headstay intersects the mast. "P" is the main luff and "E" is the main foot. Yawls and ketches will also have Pmiz and Emiz to show mizzen dimensions.



Centers and areas

Center of Buoyancy (CB): Often called **Lateral Center of Buoyancy (LCB)**, this is the center of the underwater volume of the vessel and can be expressed as a distance abaft the forward end of the LWL, abaft midships, or as a percentage of the LWL from the bow end. If the boat is to float on her LWL, the **Center of Gravity (CG)** must be in line vertically with the CB, both fore and aft and athwartship. If the two centers are not in line, the boat will change trim and so change her underwater shape, until the new CB lines up with the CG.

If your boat is floating perfectly in trim and you add 100 pounds of davits and dinghy aft, for example, you will move the center of gravity of the boat aft. The vessel will sink by the stern and the bow will come up until the underwater shape changes enough to move the CB over the new CG.

The same applies athwartship. With luck, the CB and the CG are both on the centerline of your boat, so she floats level without any heel angle. When you move to the starboard rail, you move the CG off centerline to starboard, so the boat will heel until the change in underwater shape moves the CB vertically above the new CG.

Center of Flotation (CF): The CF is the center of the waterline area and is the pivot point about which the boat changes trim, much like the pivot in the center of a teeter-totter. On normal sailing hulls, the CF is somewhat abaft the CB and, like the CB, is expressed as a percentage of the LWL, or a distance from either the bow end of the LWL, or from amidships. Of course, as the boat changes trim, due to added weight at one end or the other, the LWL shape changes, so the CF will move slightly.

Center of Lateral Plane (CLP): Also called **Center of Lateral Resistance (CLR).** These indicate the center of the hull's underwater area as viewed from the side. The CLP is readily found by tracing the outline of the underwater hull on paper, cutting it out, and balancing it on a pencil, as illustrated below. Some designers omit the rudder area when finding the CLP; others use half the rudder area.

Center of Effort (CE): This is the center of the area of the sails. The CE is usually determined using 100 percent of the foretriangle area, omitting the overlap of genoa jibs. On some boats that do not carry genoas the CE may be calculated as the center of the working sails. Both the CE and the CLP may be shown on sail plans and the CE will be forward of the CLP by a distance known as lead. The lead (pronounced "leed") is essential to provide a balanced helm and the amount of lead is based on certain characteristics of the vessel. I'll discuss helm balance in detail in a future article and explain the need for lead.

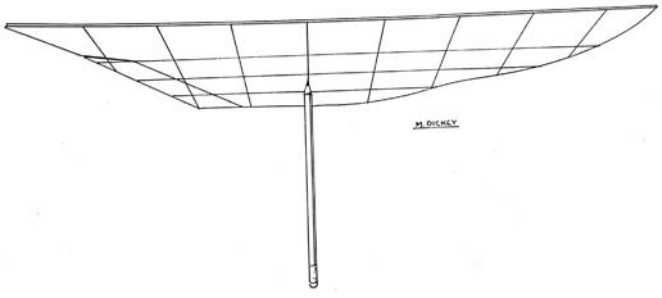
Waterline Area: This is the area of the LWL, usually expressed in square feet. It is not always easily obtained but can be calculated roughly for a sailboat by the formula: .67 x LWL x Beam. It is more accurate if you have the Beam WL rather than the Beam (Max), of course. Knowing the LWL area is essential in working out some of the following calculations.

Seven Calculations

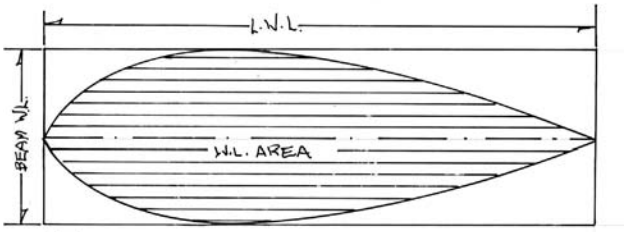
Fineness Coefficient (Cf): Also called the **Waterplane Coefficient, or Cwp**. The Cf is a figure derived from: LWL Area/(LWL x Beam WL). As shown in the illustration on page 70, the lower the Cf, the finer the hull at the waterline. Typical sailboats have a Cf of .65 to.68

Pounds Per Inch Immersion (PPI): The weight required to sink the yacht one inch *(see illustration on Page 68)*. It is calculated by multiplying the LWL area by 5.333 for sea water or 5.2 for fresh water. The PPI usually increases as the hull sinks into the water as the LWL area is also increasing due to the shape of the hull above water.

Moment to Trim One Inch (MTI): The MTI is the moment, expressed in footpounds, that will change the fore-and-aft trim of the yacht one inch. For a displacement hull, the MTI is, roughly (but close enough for all practical purposes), .35 x WL Area²/Beam WL. For example, your boat has an LWL Area of 165 square feet and a Beam



WL of 8 feet. Your MTI is .35 x 165²/8 = 1,191 ft-lbs, say 1,200 for rough figuring. Now you hang that 100-pound dink 18 feet abaft the CB. You have added 1,800 ft-lbs of aft moment, so your boat will trim 1800/1200 = 1.5 inches down by the stern. However, the boat does trim about its Cf and, as that is usually abaft amidships, the stern will move less than the bow. You might find that she trims 5/8 inch down by the stern, and 7/8 inch up by the bow, making a total trim change of 1.5 inches.



THE FINENESS COEFFICIENT RELATES THE W.L. AREA TO THE AREA OF THE RECTANGLE.

Wetted Surface (WS): This is the area in square feet of the underbody of the yacht, including the fin, rudder, and skeg. A boat with a large WS will have more surface friction than a boat with lesser WS and be slightly slower, given the same sail area, due to the greater resistance. This is most important in light air as, at slower speeds surface friction is the primary cause of resistance.

Speed/Length Ratio (V÷ L): This is the speed in knots divided by the square root of the LWL. For example, a 25-foot-waterline sailboat moving at 5.5 knots would be at a V÷ L of 1.1. while a 400-foot-LWL destroyer traveling at 22 knots also has a V÷ L of 1.1. Both vessels would develop about the same resistance per ton of displacement as they are both running at the same V÷ L.

The limiting speed for a pure displacement hull is a V÷ L of 1.34. Above this speed, the stern wave moves aft so that the stern loses buoyancy, the hull squats, and great additional power is necessary for a small gain in speed.

In truth, the typical cruising sailboat probably averages a V÷ L of about .9 to 1.0 and only gets close to 1.3 when reaching in a stiff breeze. Tender boats may never get above 1.2 since crewmembers ease sheets when the rail buries!

The modern beamy, super-light ocean racer can have a stern wide enough to resist squatting and the stability to stand up to a breeze, so it often achieves speeds well above 1.4, but that is semi-planing, and the boat is getting lift aft due to its speed. My BOC 60 design exceeded 20 knots at times, a V÷ L ratio of over 2.6, but those are very specialized yachts, definitely not good old boats!

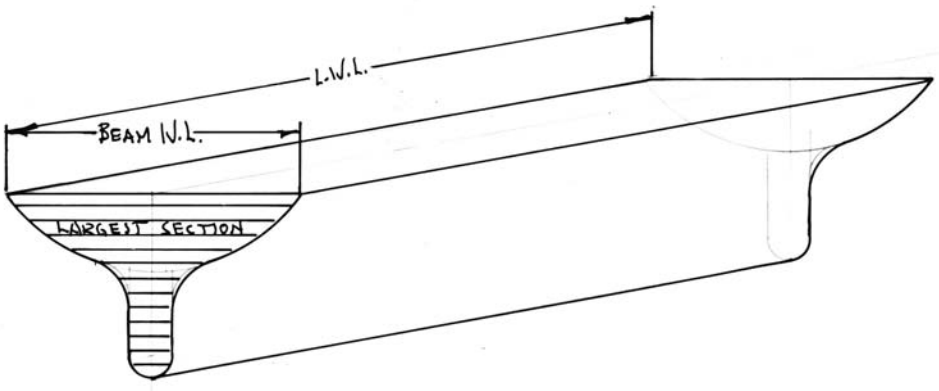
Prismatic Coefficient (Cp): This is a figure that relates the fullness of the ends of the underwater hull to the area of the midship or largest station. The sketch below will explain it better than words can. The Cp is the percentage of the original shape that remains after the hull is carved out. The more that is cut away to "carve" the hull, the finer the ends and the lower the Cp, and vice versa.

The proper Cp for a hull depends on the intended speed and is related to the speed/length ratio V÷ L . The correct Cp for various V÷ L are as follows:

V÷ L	**Cp**
1.0 and below	.525
1.1	.54
1.2	.58
1.3	.62
1.4	.64

Selecting the correct Cp for a sailing yacht depends on her speed which, of course, varies with the winds. For an inshore racer primarily in light-air conditions it might be wise to go to a .525 Cp, while an allround cruising yacht would benefit from a higher Cp, say .54 to.55, and an ocean racer from a yet higher Cp, perhaps .56 to.57. In any case, it is best if the Cp is a bit on the high side, since the penalty for having too high a Cp at low speeds is less serious in performance than having too low a Cp at high speeds. The high Cp should be achieved by fullness aft, not forward, as full bows have an adverse affect on performance.

Half Angle of Entrance: This is the angle, measured at the LWL, between the hull centerline and the actual waterline shape. Fine angles are desirable for good performance but can be overdone, creating a wet boat in a



THE PRISMATIC COEFFICIENT IS THE AMOUNT OF THIS "PRISM THAT REMAINS AFTER THE HULL IS CARVED OUT. A HIGH Cp INDICATES A BULKIER HULL.

seaway. Angles below 19 to 20 degrees would be considered fine, 20 to 24 degrees is fairly usual for a cruising yacht, and angles of 25 degrees and above are considered bluff bows today but were fairly common in the '60s.

Ratios for evaluating speed, comfort, and safety

Sail Area/Wetted Surface Area Ratio (SA/WS): The sail area/wetted surface area ratio is simply the sail area divided by the area of the hull that is below the LWL. It should include the keel and rudder areas. This frequently neglected ratio is the major determiner of boat speed in light and medium air. In these conditions, wave-making resistance is minimal and surface friction is the primary drag component. ratios below 2.0 indicate poor performance in light air. Ratios of 2.2 to 2.4 predict good light-air performance, while a ratio of 2.6 would indicate a boat designed specifically to sail in very light wind. Wetted surface is a difficult number to obtain, but the concept is important.

Sail Area/Displacement Ratio (SA/D): The SA/D ratio is the sail area in square feet divided by the displacement in cubic feet to the 2/3 power, or SA/D cf $^{.666}$ Ratios below 14 are suited for motor sailers, from 14 to 17 for ocean cruisers and from 16 to 18 for typical coastal cruisers. Ratios over 18-20 are seen on racing dinghies, inshore racers, and ocean racing yachts. The more extreme screamers can have very high SA/D ratios indeed. My 60-foot design, *Wild Thing*, had a SA/D ratio, based on 100 percent foretriangle, of well over 30, depending on her displacement at the moment. Her displacement could vary widely as she could carry 8,000 pounds of water ballast in tanks on the windward side.

Displacement/Length Ratio (D/L): The D/L ratio is a non-dimensional figure derived from the displacement in tons (of 2,240 lbs) divided by .01 LWL cubed, or, $Dt/(.01\ LWL)^3$. It allows us to compare the displacement of boats of widely different LWLs. Some examples of various D/L ratios follow, but are generalities only, as there is often a wide range within each type.

Boat type	D/L ratio
Light racing multihull	40-50
Ultra-light ocean racer	60-100
Very light ocean racer	100-150
Light cruiser/racer	150-200
Light cruising auxiliary	200-250
Average cruising auxiliary	250-300
Heavy cruising auxiliary	300-350
Very heavy cruising auxiliary	350-400

Storm, a wonderful 27-foot LWL sloop on which I raced with Bill Luders many years ago, had a D/L ratio of 386, very heavy by today's standards. However, *Storm* was 39 feet LOA, and when she heeled to a breeze her long ends would increase her sailing LWL, thus reducing her D/L ratio to a more reasonable figure when we were beating to windward. If she picked up 3 feet of WL, her D/L ratio dropped to about 281 — a significant change and one that made her a very competitive racer in the 1960s.

Capsize Screening Ratio (CSF): Some years ago, the technical committee of the Cruising Club of America came up with a simple formula to determine if a boat had bluewater capability. The formula compares beam with displacement, since excess beam contributes to capsize and heavy displacement reduces capsize vulnerability. The formula is the maximum beam divided by the cube root of the displacement in cubic feet, or $B/^3 \div$ Displ cf. The displacement in cubic feet can be found by dividing the displacement in pounds by 64, of course.

The boat is acceptable if the result of the calculation is 2.0 or less but the lower the better. For example, a 12-meter yacht of 60,000-pound displacement and 12-foot beam will have a CSF number of 1.23, so would be considered very safe from capsize. A contemporary light displacement yacht, such as a Beneteau 311 (7,716 lb, 10-foot 7-inch beam) has a CSF number of 2.14, and a Dufour 38 (14,300 lb, 12-foot 7-inch beam) comes in at 2.07. Based on the formula, while they are fine coastal cruisers, the latter two yachts may not be the best choice for ocean passages.

Comfort Ratio (CR): This is a ratio I dreamed up, tongue-in-cheek, as a measure of motion comfort but it has been widely accepted and, indeed, does provide a reasonable comparison between yachts of similar type. It is based on the fact that the faster the motion, the more upsetting it is to the average person. Given a wave of X height, the speed of the upward motion depends on the displacement of the yacht and the amount of waterline area that is acted upon. Greater displacement, or lesser WL area, gives a slower motion and more comfort for any given sea state.

Beam does enter into it as a wider beam increases stability, increases WL area, and generates a faster reaction. The formula takes into account the displacement and the WL area, and adds a beam factor. The intention is to provide a means to compare the motion comfort of vessels of similar type and size, not to compare that of a Lightning-class sloop with that of a husky 50-foot ketch.

The CR is: Displacement in pounds/(.65 x (.7 LWL + .3 LOA) x $B^{1.333}$). Ratios will vary from 5.0 for a light daysailer to the high 60s for a super-heavy vessel, such as a Colin Archer ketch. Moderate and successful ocean cruisers, such as the Valiant 40 and Whitby 42, will fall into the low-to-middle 30s range.

Do consider, though, that a sailing yacht heeled by a good breeze will have a much steadier motion than one bobbing up and down in light air on leftover swells from yesterday's blow. And remember that the typical summertime coastal cruiser will rarely encounter the wind and seas that an ocean-going yacht will meet. Nor will one human stomach keep down what another stomach will handle with relish, or with mustard and pickles for that matter! It is all relative.

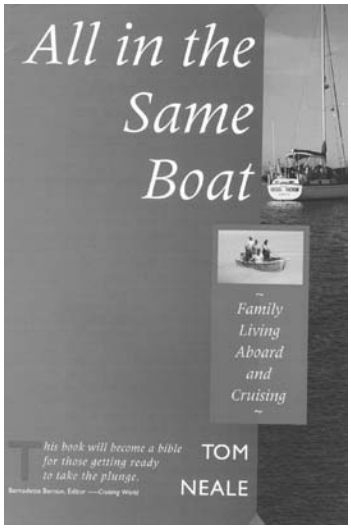
We'll tackle lead and helm balance in a future article.

Book reviews

Passages the theme of this crop

Neale's book says you can and tells you why

At 33,000 feet over the Atlantic, I look down on a cloudless day and imagine someone on a small sailboat living and dreaming down there. It is one of those days when my "eight to six" has extended far more than I would prefer, and I am enjoying reading about a family who chose another road . . . or should I say another rhumb?



In *All in the Same Boat: Family Living Aboard and Cruising* you will read about choosing the right boat and systems, maintaining them, provisioning and cooking, communications while cruising, anchoring, and fishing. And you'll notice themes related to raising a family afloat: education, health, finances, work, and play. But this book is about taking your life and dreams in your hands and leaving mediocrity behind. It tells us what it takes to build the right attitude, get away from land, and live a better life. Don't get me wrong. Tom Neale does not judge your life or mine; he just extols the virtues of his family's chosen path.

The Neales have chosen a boat to be their home for the past 20 years and raised their family doing what most of us only dream about. They will not tell you that the life you live is not genuine but rather that the dream you have is possible. You just have to work at it.

Lucy and I live in a two-bedroom condominium apartment in a typical neighborhood, drive over 15,000 miles a year, and work in air-conditioned spaces — a life Tom aptly describes. Like many others, we share a dream of knowing our greater neighborhood firsthand. We bought a good old sailboat because of this dream. Doubts nevertheless are always there. How do we do it?

Tom's approach to the subject will help the reader considering these issues realize that life aboard is not an extended vacation. It will be fun only after understanding that it involves work of a different kind. The fact that the well-being of you and your family will depend only on yourselves is primordial. You need to develop the right attitude step by step. Sailing and navigational skills are mentioned first, but this is not a basic sailing course. Financial matters also need to be considered as well as communication with those ashore. Do you have small children or teenagers? What will their needs be? Comfort in a boat is not a joke; it will be forever linked to your safety. Water. Power systems: 12-volt or AC? What type of head do you need? Will you need ice? Medical emergencies while in paradise, how do we handle them? All these subjects are treated honestly and without disproportionate enthusiasm.

Although Tom's name is on the cover, by the time you finish reading *All in the Same Boat* you will understand this book is more of a family endeavor than a one-person effort. Anecdotes by the other family members are interspersed with the main text.

In times and places where almost nobody will care for poetry and where the validity of the school system is in question, *All in the Same Boat* includes poetry by daughter Melanie (who also fixes a generator), sections written by daughter Carolyn (the musician in the family), and more from wife Mel (a photographer and painter). It covers recipes and parenting issues. This book is refreshing reading about attainable dreams.

As you read through some 350 pages of solid cruising and liveaboard counsel, your thoughts will wander just as mine did . . . if you happen not to be cruising at the time.

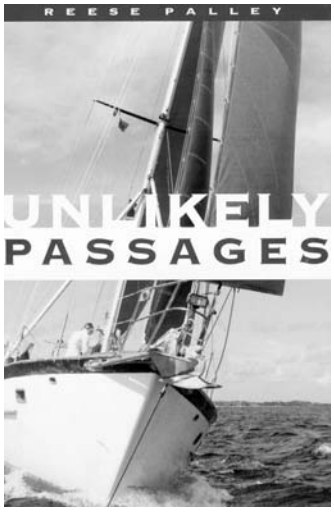
The Neales live and cruise on *Chez Nous*. At the time the book was written, this was a 1979 Gulfstar 47 Sailmaster. They have just moved to a 1975 Gulfstar 53 Motorsailer. The family also publishes a newsletter called *Cruising: Coast and Islands*.

All in the Same Boat: Family Living Aboard and Cruising, by Tom Neale. Available from International Marine/ Ragged Mountain Press, a division of The McGraw-Hill Companies, or by visiting the Neale's website at: <http://www.tomneale.com/>

Reviewed by Fernando A. Garcia Ortiz, San Juan, Puerto Rico.

Sailing with Reese: from angels to zen

Reese Palley has written about things he knows — sailing, people, and art. His sailing books are: *There Be No Dragons, Unlikely People*, and *Unlikely Passages*. *There Be No Dragons* gives the wannabe ocean cruiser a rational approach to



# of books

the dangers and the technical knowledge needed to voyage in a small boat safely. *Unlikely People* is a collection of very interesting and humorous personality sketches of people Reese has met in different ports of the world.

Unlikely Passages uses a travelogue approach in each chapter. Those introductory passages are not nearly as unlikely as the musing he gets into. Reese is crazy — like a fox. He makes statements that bruise your sensibilities and then comes to conclusions you can't help but agree with. For instance: In Chapter 4 he says he is not a moralist and he doesn't believe in God, but for the eleventh tribe (the sailing tribe) he says, "The Word of God is curiously difficult to improve upon . . . when even the agnostic sailor, faced with unacceptable odds, will seek His intercession."

So in *Unlikely Passages*, Reese covers sailing from Angels to Zen. In between he throws in a dash of sex, vomit, and God. This is a book I had to put down on occasion — but I had to pick it up again. Reese has a galling way of coming to truths I usually agree with. He said all he really wanted to accomplish in writing this book was to elicit a little giggle, and he got mine.

Unlikely Passages had a short life when it was first published in 1984, since the publisher went out of business shortly thereafter. It was republished in 1998 in its original form.

Reese is currently working on a book about the Schooner, *Fantome*, which was lost in Hurricane Mitch. He sails *Unlikely VII*, a 46-foot cutter, out of Key West.

Unlikely Passages, by Reese Palley. Available from Sheridan House Inc., 914-693-2410.

Reviewed by Bill Barth, Minneapolis, Minn.

Real-life account of family life at sea

If you ever wondered what life is like on a sailboat during a passage at sea, this is a real-life account of the interaction of a family of four: the husband, an experienced son of a sailor; the wife, a total novice with no experience whatsoever but a strong desire to regain, through this adventure, the closeness that she and her family once had; and two young children who are whisked from the comforts of home, friends, and school and thrust into a new environment so different that no one could have told them in advance what it would be like.

This event would change their lives forever, from the decision to embark to the final sail to home port. As they reach new levels of experience — interacting with each other and the friends and places they encounter along the way — you discover the closeness and camaraderie of the sailing community that abounds no matter where you go.

From her description of *Hei Tiki*, you get the feeling you are there with Susan as she sees the boat for the first time and realizes how tiny their world is about to become. It's a lot to ask two people to share such a small space for an extended time, much less two adults and two active children. At the beginning of the voyage and when crossing the Gulf Stream, you realize that simple things you take for granted every day are very different when you cruise. Even the terminology of everyday communication is different. To the uninitiated, some of it is gobbledygook, and anyone who remembers being a novice sailor can relate to the frustration Susan must have felt when asked to do even basic tasks, like anchoring.

To the cruising sailor, daily life at sea means being aware of everything around you — the wind, the sun, even the anticipation of a storm — all these things make you feel more alive as you go about your day. You realize the frustrations and pain that can be caused by being so dependent on the limitations imposed by your environment such as not being able to just run to the store when you need something.

As a sailor who has been from lake to bluewater, I have always relished a good sailing story. And more than a good story is what Susan Tyler Hitchcock weaves as she opens her life to the reader with this literary adventure.

I read somewhere that we write what we know about — and I have found it to be true . . . it becomes obvious to the reader as the journey unfolds that Susan takes you into her soul as she relates the uncertainty of the original decision to go cruising and attempts to find the connecting threads of her family's life that seem to be unraveling as everyday life extracts its measure of due. Then she sweeps you along with the family as they are thrust into the world of the cruising sailor. Novice that she is, Susan is game to learn and to become a vital part of the crew that sails this small vessel through the blue-and-emerald seas in and around the many islands that begin off the coast of Florida and extend to the Virgins in the Caribbean.

Join them as their journey progresses and experience the events that make up "the cruising life." Your life will be richer for it; mine certainly is.

Coming About: A Family Passage at Sea, by Susan Tyler Hitchcock. Available from Ballantine Books or by visiting Susan's website at: <http://www.hitchco.com/sth>

Reviewed by Skip Koski, Charlotte, N.C.

Continued from Page 7

paint, not bottom anti-fouling paint. Any ideas on how to do this neatly? The keel is 500 pounds of cast iron, and I'm trying to avoid taking it off the hangers, although there is room to work under the trailer. Are there any special problems with, or techniques for, using epoxy on cast iron?

Also, what products would you recommend for epoxying the hull? I'm trying to do this while the boat is raised above the trailer, so the easier and faster, the better. My experience with fiberglass and epoxy is limited to a few car repairs and some gelcoat patching, so any information you could give me would be appreciated. Can you give me an estimate of the coverage (about 200 square feet) per gallon and the number of coats?

Haemish MacLachlan
Sirdar, British Columbia

I would like to separate the three projects you have.

Project 1: Repair past delaminated section of the hull. You're absolutely right — the guy before you must not have taken much care to prep the repair area. I would recommend that you grind back and feather the area so you can build up new structural laminate in the failed area. Replace structure with structure. If you grind out three layers of roving, replace them with the same or better. You may find it easy to work with 12- or 17-ounce biaxial reinforcing cloth for the laminate repair (Jamestown or Paxton's distribution should have this stuff). If you are going to use gelcoat to cover the area cosmetically, be sure the epoxy laminating resin you choose has had a good chance to fully cure (one week). If you are using paint, less elapse time is required (a day or two). Scratch sand before coating.

Project 2: Repairing a rusty-looking piece of underwater iron. I have the same challenge this spring. I am going to needle gun off the ugly stuff then wire wheel the works. After this I am going to wire brush in a coat of epoxy (wear eye protection). Since I am one of the owners at MAS Epoxies, I am going to use our standard resin and slow curing agent. Once this has cured, I will give the piece a couple of extra coats of epoxy to seal it up and then fair it using the same mix thickened with cab-o-sil and microballoons. Trowel this mix on and sand off like using drywall compound (don't substitute).

Project 3: Gelcoat blisters below the waterline. Grind back all blisters. If they are within the structural laminate, follow the repair sketched out in the first paragraph. If the blisters are just within the gel, coat the hull with one penetrating coat and then fill in the blisters with the same thickened epoxy mix as above. When satisfied with the fairness of the bottom, roll and tip on an additional six coats of resin and slow hardener. Apply the bottom coating according to the manufacturer's instructions. It is best if the boat has been out of the water for a while, as this lets the bottom laminate lose some of its moisture. Try to give the laminate a couple weeks of hot and dry. This is required of all systems, since you don't want to seal moisture in the laminate. Once the bottom system is in place, bottom paint and go sailing.

I know this sounds like a ton of work. That's because it is. The keel/CB could probably be forgotten about until next year, if necessary. Please call 800-398-7556 for a catalog, and request a blister repair guide and Paxton's number, if you don't already have it. Good luck and stay in touch throughout your activities.

Tony DeLima
MAS Epoxies/Phoenix Resins
Pennsauken, N.J.

Tony,

More questions. First, I've added some extra bits to the boat — a new keelwell and a motor well. These are both made from 5/8 fir ply, screwed and glued. Is the epoxy strong enough to bond to the hull, or should I screw them to the hull reinforcement plywood? What should I use to seal them with? Would straight epoxy seal the ends before I apply a layer of glass cloth? Can I use a pigment as well to color the epoxy? I may as well try to look professional!

Second, is there a way to avoid the amine blush and low temperature curing problems? I'm living in south-eastern BC where our daytime average temperature now is 45 to 50, but our nighttime temperature still gets down to low 30s and it's likely to be like that until late June. Is this going to be a curing problem?

I agree with your idea of the workload, and I've decided to leave the keel until next season . . . maybe just a good scraping then a coat of primer. It is a great way to get rid of that winter spare tire though! Looking forward to your catalog.

Haemish MacLachlan

Once again I'm going to separate your questions and answer as decoupled subjects.

Is epoxy strong enough to bond fir ply to the hull without fasteners? Yes, MAS epoxies will form a secondary bond with about 2,000 psi of bond strength. What this means to you is that the screws are only chicken rivets. I use screws of the stainless steel drywall type as clamps to hold everything in position while my fillets and bond lines cure. I have attached a piece on filleting and glassing for your reading. Please fillet and glass all structural joints involving your motor well.

Sealing the plywood? Three coats of epoxy should do it. These coats can be done in succession wet on set. Tacky but not flowing is the earliest stage for recoatability.

Pigmentation? Please do. Most marine stores have universal pigments (meaning they are polyester and epoxy compatible). This will be printed on the label. Universal pigments are organic pigment ground to the correct Hegman level dispersed in a universal (usually acrylic) resin. Universal pigments are designed to not monkey with the curing of the selected resin system. Follow the directions on the tube, additions are usually in the 2 to 3 percent range for good coloration.

Ah, British Columbia — rainy and cool, what to use? You live in the land where few epoxies venture. We formulated an epoxy system with you in mind. It can be found in our catalog under the name "Cool Cure." This system is based on a medium speed curing agent (a 50:50 blend of our fast and slow) coupled with an activated epoxy resin, a kissing cousin of the standard MAS resin. This system is quite resistant to blushing, however do check. If you get the conditions just right, it will blush. In any event, blushing will be very noticeable and can be taken care of with a water rinse. Our standard MAS resin and slow hardener will not blush, however it will be very slow to cure at the temperatures stated.

Good move on leaving the keel until next year. I'll be doing mine this spring, and you can learn from my mistakes.

Tony DeLima

Curing those sailing fears

Regarding your response to Eva who wrote in about her fear of waves: one thing you did not mention is that perhaps the captain needs to think about shortening sail sooner. I think it is often the heeling that frightens novice sailors more that the waves. I have sailed with captains who feel that a real sailor never shortens sail in anything less than 40 knots. Baloney! That may be fine for racing but not for casual cruising.

I don't mind waves so much because our Pearson Vanguard generally takes them like a big old rocking horse, but I do not enjoy excess heel. We have found on our boat that when the wind pipes up, a little reef in the mainsail makes the boat more balanced with less weather helm, less heel, and less stress on the rig and crew. As a result, everyone is happier.

I have also gained a lot of knowledge and confidence by taking classes through the U.S. Power Squadron. Sailing and cruising can be a lot of fun. When you are in a quiet anchorage watching the sunset from your own boat, sitting next to the person you love, there is nothing like it!

Vicki Engelstad
Cambridge, Wis.

Engine overheating

Bill Sandifer's article on filters with a paragraph on engine overheating was a useful primer, but he omitted one item for checking and maintenance. If your engine overheat alarm goes off, yet the engine does not seem to be boiling, and adequate water is flowing from your exhaust (check the temperature gauge first and ***please*** release the coolant cap to the header tank with care and always with a cloth and well protected hand!), then it is time to check the thermostat, which is usually buried in the cylinder head. Thermostats tend to stick after a couple of years and are usually in the proximity of the temperature probe. If they stick closed, the probe will sense locally overheated water, even though the rest of the engine is running cool, and will sound the alarm.

Patrick Matthiesen
Sparkman & Stephens Association
London, England

My Pearson Commander

Just got your latest edition on the Commander (May '99). I had one of these fine boats for more than 10 years. The Commander was the finest sailing boat I've ever been on. In one race, I managed to stick with a J-35c for 24 miles and beat her on straight time. This was in 25 to 30 knots of wind. I covered the J and surfed on her wake. When the J broke free, she started to round up, and I reestablished overlap. The J got first in the race uncorrected, and I got first corrected by about an hour.

Doug Axtell
Rochester, N.Y.

Oops!

Another great issue (May '99). I was pleased with John Vigor's article on the BCC and find it amusing to be considered part of a cult. As far as being tight-lipped, I really don't think we have anything to hide. Most likely, Lyle Hess, with the help of Sam L. Morse, just got it right when they designed and built the boat. Roger Olson, with the help of Tommie and Dick, is preserving the heritage.

If I may be permitted one correction: in the photo caption on Page 52, my wife's name is Anice (not Alice). It's not an uncommon mistake, but one to which she is somewhat sensitive.

A sincere thank you to you and John Vigor for letting us be part of your coverage of the BCC.

Tom Walker
Annapolis, Md.

Inspiration for others

My mother wrote to tell me of two people (different families) who have decided to buy a boat and are shopping for one now. They told her it was because of the Baba articles (March '99) that they decided to buy one . . . we all communicated something of the joy of sailing which some people are really responding to. And of course, if they buy a boat, they'll need to read *Good Old Boat* to keep up with it, right?

Cathy McIntire
(featured in the Baba 30 article)
Eau Claire, Wis.

Why do I keep fixing this thing?

I have a 1972 Columbia 30 that I bought for a song and have since spent the national debt keeping afloat. I make a habit of throwing out all of my receipts — just so I won't know how much I've spent. Perhaps this year I'll have it almost together (I say that every year). One of these days I'll just put it

to sleep and buy a new boat that I can concentrate on sailing instead of fixing. My wife, however, is convinced that I'd purposely break something on it just so I could fix it. I guess she knows me too well. (We also own a 120-year-old Gothic Victorian home that needs constant attention — I threaten to sell that thing, too!)

Joe and Penny Berini
Nyack, N.Y.

Kudos

There were some thefts at my work a few weeks ago. My personal office was hit, and I lost a book of 55-cent stamps, two free passes to the spring in-the-water boat show, and . . . they took my copies of *Good Old Boat*! Now that should say something about the value of your publication. What other magazine is worth stealing?

Bill Phelon
Ariel Newsletter Editor
Orinda, Calif.

While we were sorry to hear about the loss, Bill, we were beginning to suspect that those early issues, which are already out of stock, are getting valuable.

(The following is an email response to Jerry, who mentioned that our renewal notices are not going out months in advance because we don't think people appreciate being treated like that.)

What an original thought: being concerned for the customer . . . I, too, am not a fan of receiving a renewal request just a few months into a subscription . . . in fact I have canceled because of it (I know it matters not to them but it makes me feel good). You should be called as your magazine is: Good Old Guys; I enjoy every issue with multiple rereads. Thank you.

Skip Fritz
Huntsville, Ala.

It's a pleasure to see a magazine dedicated to most of us sailors out here who are looking to maintain our present boats in an economical way. I've always enjoyed the "majors" . . . nice pretty pictures and new boats to ogle, but contrary to what the IRS seems to think, most of us just dream about those new boats. *Good Old Boat* is the real world and the most informative and interesting magazine I've seen. I'm glad I found you. The others are nice to look at. *Good Old Boat* is one I read from cover to cover!

Stephen Weinstein
New York, N.Y.

Just want to let you know that your efforts have made my restoration of an Alberg Sea Sprite much easier. From your owners' association list, I was able to find the Sea Sprite Owners' Association. They are a great resource for information to the extent of being able to supply a copy of Alberg's drawings for the Sea Sprite. Pretty amazing, considering the boat was designed in 1957. My restoration is missing its rig, and all the information I was searching for is on the plan. This all came about because of *Good Old Boat*. Keep up the good work.

Richard Care
Branford, Conn.

Send questions and comments to* Good Old Boat, *7340 Niagara Lane North, Maple Grove, MN 55311 or by email to jerry@goodoldboat.com. We'll get a response to you prior to the next scheduled publication and promise to respond whether or not your question is selected for publication.

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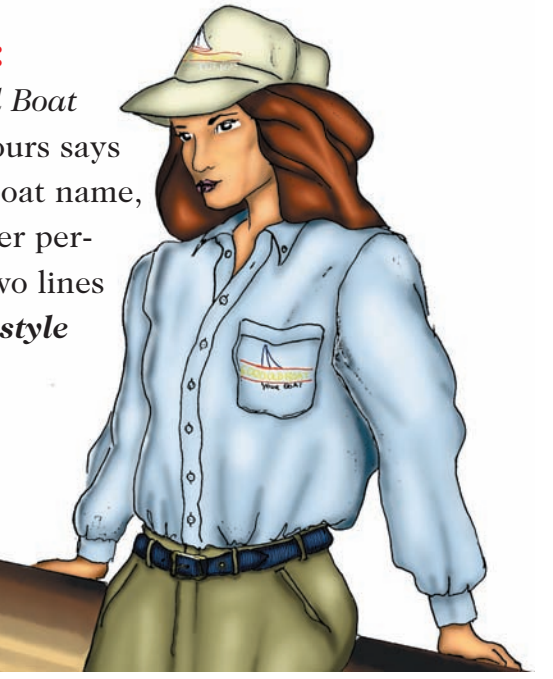

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The variable stitch length mechanism allows for **very long straight stitches**—up to 6mm. This is great for sewing Sunbrella which tends to needle pucker (the longer the stitch the less the pucker). A welting tunnel in the presser foot allows for piping installation. And, the lever activated reverse makes back stitching easy.

The LSZ-1 model straight stitches and sews up to a 5mm zigzag stitch width—great for sailmaking.

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Reflections

by Don Casey
illustration by Pepper Tharp

Sailors who cruise their boats can't avoid rainy days afloat. Indeed, most welcome the occasional rainy day for practical reasons. A day of rain often means soft, clean clothes, the luxury of real shampoo, the wealth of full water tanks. It means salt-free decks and gear. It means extended independence and undiminished funds.

Day sailors, on the other hand, tend to see rain as a reason to spend the day doing some other thing. This is understandable, but it fails to acknowledge that a sailboat is as aquatic as a duck. To skip the rainy days is to miss one of sailing's gentlest and sweetest pleasures.

Rain at anchor is sensual, soothing to eyes and ears, even to the mind itself. Far away we see the curtain drawing steadily toward our vessel, changing the scenery as it comes. The world shrinks. Colors soften into shades of gray. Red, yellow, blue, and green becoming silver, pearl, ash, and smoke. With the blending of sea and sky, nearby boats float free of earthly restraint.

A persistent rain also quiets the harbor, subduing sounds to match subdued colors. We often find ourselves whispering on a rainy afternoon, fearful of breaking the spell. And when night falls, the stars lie hissing and twinkling on the deck.

A haiku by Basho says:

Rain obscures the river.
Some roofs,
A bridge without a shore.

A rainy day makes it possible to break with shore without leaving the mooring. Even the most humble boat can make the voyage. So here is a friendly suggestion. On the next wet morning, call in sick, pack a lunch and a good book, and spend the day aboard.

Your first smile will come when you discover that the rain has given your old boat the radiance of a new Hinckley. As you step aboard, wet surfaces will reveal one another on unfamiliar axes, reflecting themselves into infinity as droplets flicker and flash like carousel mirrors.

Put up your harbor awning. Then spend the day puttering, reading, or just harbor-watching. The steady patter of rain on canvas is the ultimate white sound, a kind of cosmic mantra. It is not just your decks that will be cleansed by the rain. Tension, like encrusted salt, will dissolve and flow away.

Sometimes we show the best sense when we don't come in out of the rain.

Here's what's coming in Sept./Oct:

- Replacing the standing rigging
- Blisters revisited
- Boat Review: Contessa 26

- Climbing the mast
- Simple solutions: Valve spring compressor
- *Small Boat Journal*: Chafing gear
- Feature boat: Bayfield
- And more

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