

Boat Buying Facts of Life & Buying a Fiberglass Sailboat or Powerboat

Excerpt from “Relax, It’s Only a Boat” by Walt Schulz



Boat Buying Facts of Life

When mass-produced fiberglass boats stormed onto the scene in the mid 1950's, everything changed. Boat manufacturers realized that a new paradigm would be required to handle the increased volume of sales, trade-in boats, and geographical logistics. The obvious model to be followed was the method of sales that automobile manufacturers had perfected over the previous 40 years. A visit to the dentist for a root canal is more enjoyable than the distasteful activity of buying a new or used car with its rug bazaar haggling over price, but the format is all we have. We in the boat business inherited the best and the worst of the car manufacturers' sales techniques. And, after that last statement, I think I will have to put steel shutters on the windows of my Albanian hideaway after writing about this subject.

The whole object of both car and boat sales is to keep the actual sales price a Top Secret. God forbid that the buyer should ever find out exactly what the manufacturer really needs to receive for a car or boat to make an honest profit. The cloud of secrecy that surrounded the Manhattan Project, during the development of the atom bomb during World War II, is nothing compared to the obscuring of the real sales price necessary to buy a boat. Like the automotive business, the boat industry has list prices, discounted prices, option prices, boat show deals, and trade-in allowances. Somewhere in this maze of numbers is the real sales price. And, just to make you feel like making an appointment for a pleasurable dental experience, the boat business also includes a salesperson working on commission who frequently has little or no knowledge about the product, and a lot of interest in making a "deal."

Like the military, car and boat salespeople use a secret code formula to decipher the prices. When the car salesperson disappears to "talk to the sales manager to get you a good deal," he and the manager are looking at the real price the dealer paid the manufacturer for the vehicle. Even the so called "Invoice Price," supposedly the price paid by the dealer to the manufacturer, is a smoke and mirrors number, because there are hidden discounts to the dealer for volume, selling certain slow moving models, etc., which are not reflected in the invoice price. For trade-in values, the car people usually use the NADA book or the Kelly

Blue Book to determine the recent wholesale auction prices for a specific car. Car sales people love the word "deal," and use it constantly in advertising and when talking to customers. In my opinion the word "deal" is just another four-letter word for negative copulation, like the word that begins with the letter "f."

Not to be outdone, the boat industry uses basically the same secret code format for pricing. A boat dealer purchases boats from a manufacturer at one price, then marks the price up 10% to 30% and arrives at the list price. Usually a boat dealer borrows the money to purchase the boats from a local bank on a "Floor Plan Line" at 2 or 3 points (percentage points) above floating Prime Rate, with the interest paid monthly. In many cases there is an additional mark up on something called "standard options," like electronics, special cushion fabrics, ice makers, TVs, and stuff that can be easily installed when the boat is built. The dealer orders the boat with these standard options to increase profits and also to provide more room for discounting the "list" price. For trade-in values, dealers refer to books, such as the BUC book, listing all boat models and what they sold for on average during recent months. Unlike the used car industry, there are no national auction centers for dealers to wholesale their trade-ins to used car lots. Boat dealers must hold their trade-in boats and carry the financing costs until the trade-in is sold. Compared to a car dealer, boat sellers take a much higher risk when they accept a trade-in. The potential cost of sitting on a trade-in with the bank interest meter running has to be factored into the selling price of the new boat. And the dealer often has the expense of fixing the manufacturers' screw ups on the new boat and then has to battle the builder for reimbursement money, a potential warranty nightmare. I may be prejudiced, but I think that the boat dealership business is far tougher and riskier than the car dealership business.

So, how do you determine what a fair price is for a new or used boat? It is not easy, to say the least. Forget asking a salesperson unless you have access to sodium pentothal and a rubber hose. The CIA should use car and boat salespeople to teach recruits how to keep state secrets under extreme pressure or torture. To determine what you should pay for a new boat, try to get the dealer to give you the names

of people who recently purchased a similar model, and then contact them to see how much they paid. Of course they may have paid too much, had a bad trade-in, or be unwilling to tell you the truth. But, if they had a bad experience with the dealer, or big warranty problems with the boat, they will definitely chew your ear off with their complaints. So at the worst, you will learn something from the effort.

If you are going to trade in your present boat on a new boat, get some idea of what your boat is worth before talking to a salesperson about the price of a new boat. Classified ads in the magazine *Soundings*, and Online sites like www.yachtworld.com have used boat listings and are excellent resources to obtain information about pricing. Recognize that no boat dealer is really going to give you the actual value of your trade-in. He may juggle the numbers to give you the appearance that you are receiving more for your trade-in than its worth, but in reality he is just giving you a smaller discount on the new boat.

If you own a boat and want to purchase a new boat, you must balance the money you will lose on a trade-in deal against the headache of selling the boat yourself. You would have to pay a broker a 10% sales commission to sell your present boat, and the transaction could take a year or more. Plus, you may have to deal with a buyer's survey report that could require expensive repairs before the sale goes forward. Of course, you will be able to get a better price on the new boat if there is no trade-in. Personally, I think that if you have your heart set on a new "Sled 35" and want to move up from your present "Slug 30," find out what the "Slug" is worth and trade it in if it is possible. Remember that boating is supposed to be a fun hobby, not a financial ordeal. I have met and built boats for people who have waited far too long just to get the money together in a safe, orderly fashion, only to find out that the sand has run out of their physical hourglass. Money is just replaceable paper, but time, youth and good health are fleeting seconds that pass very quickly, never to return.

How do you purchase a used (now called "pre-owned") boat? With a little research, you can find the selling price range for a specific boat. The spread in asking prices among similar years and models is a reflection of the condition of the boat, engine

hours, etc., and the desperation of the seller. Most buyers are very sensitive to cosmetics, often overly sensitive. Obviously, if the hull is heavily scarred or the gelcoat is "cubar," (chalked up beyond all redemption), the boat will require a paint job at some point. It is not something that has to be done right away, but it will be an expensive issue when you try to sell the boat in the future. Sometimes, it is possible to buy a trade-in boat at a good price from a dealer, especially during off-season months. Since there are no wholesale auction outlets for dealers to unload their trade-in boats, a dealer may have a strong incentive to make a sale. And unlike used cars, there is no more risk buying a used boat from a dealer than from a private party.

Having a Boat Surveyed

A survey by a professional marine surveyor can ascertain the condition of a boat. A boat's significant problems are usually the result of low quality construction and poor material when the boat is originally built. Yet, an amazing fact of the boat business is that people will buy a new boat without getting it surveyed by a competent surveyor. The exact same boat for sale a year later, with no real use, is always carefully surveyed. Silly, but true. New boat buyers apparently think that some magic fairy dust is spread to protect them and that somehow the new boat warranty will overcome any sloppy workmanship or cheap parts. Unfortunately, like automobiles that seem to fall apart the day after the warranty runs out, badly built boats also have a warranty time clock. The fenders of cars don't fall off after 3 years or 36,000 miles, but the air conditioner may drop dead. The same holds true for boats; the hull and deck will last for many trouble free years, but a cheap, undersized battery charger may struggle to survive for 12 months. In my opinion, a professional should survey any new boat you are considering buying, especially a marine surveyor with experience in that model of boat. That great "deal" you received at the boat show may turn out to be a bust. The real concerns about such things as the quality of electrical wiring, the ability to get to the wiring, the size and brand of installed equipment

refrigeration, engines, generators, freshwater pumps, seacocks, winches, the windlass, light fixtures, toilets, batteries, battery chargers, windows, opening ports, electronics, and all the other stuff that has been glued, screwed and bolted into the fiberglass hull and deck should be considered. These are the things that will make you crazy when you use the boat. And the surveyor can evaluate construction issues like the hull to deck joint, the fiberglass laminate schedule, bulkhead installation technique, the method used to attach the interior fiberglass liner, mast and rigging concerns, how the fly bridge is attached, and so on. Many of these concerns are almost impossible to evaluate fully on a finished boat. ***If you are spending a great deal of hard earned money, consider paying a pro to go to the factory where the boat was built just to inspect production techniques and the attitude of the people building them.*** There are no real “bargains” or “deals” in the boat business, or any other business for that matter. The object is to get a boat that meets reasonable expectations and that you paid a fair price for, new or used.

Almost always, there are concrete and verifiable reasons why the Sunshine 35 costs more money than the Dusk 35. Keep in mind that the costs of fancy advertising, brochures, free DVDs, boat show expenses, and dealer commissions are all factored into the price of a boat. The money that is left over after promotion, expensive overseas freight, and dealer costs is what's available to build the boat. The math is simple and the competition is fierce. Take it from me, boat building is definitely not a get-rich-quick business. One only has to look at all the boat manufacturing companies that have come and gone in the past 30 years to understand my point. Be aware that even though the brand names of some companies have lasted many years, it does not mean anything if the companies have been bought and sold several times. “Established in 1960” can be nothing more than marketing hype. After a change in management, a company that was building good boats ten years ago may now be building junk. The name is the same, but the boats are not. Conversely, new management may have provided a positive change, and the current boats may be better than ever. ***A boat company is only as good as the last boat built.***

One of the reasons I recommend using a surveyor is that there are no simple third party sources for specific information about boat companies or boat model quality. If you want to learn something about a specific automobile, spending a few hours on the Internet reading various reviews from car magazines and/or looking at resources like Consumer Reports is time well spent. However, automotive magazines are largely supported by a huge amount of subscriber revenue, but boating magazines depend mostly on advertising revenue to survive. The marine print media, therefore, has to walk a swaying tightrope between maintaining editorial integrity and accommodating big advertisers. Many of the boat model review articles are more “puff” than substance. Compounding the problem is that there have been many mergers and acquisitions throughout the media industry, resulting in staff writers and editors shuffling between marine and non-marine magazines. A writer for a gardening magazine with little or no on-the-water experience, may end up writing for a boating magazine. A case in point, up to a few years ago the chief editor of a major sailboat magazine had no personal sailing experience. At least with a car magazine the probability that the editor has a driving license is high.

At the present time, the Internet is not a great place for reliable information concerning quality and performance issues on specific brands and boat models. Far too many well-intentioned neophytes, plus all the other screwballs, without any boat building or yacht design experience, are putting up websites and blogging away; providing, for free, all sorts of misleading and incorrect opinions. The “information highway” can easily be a “cul-de-sac” when it comes to non-biased, intelligent information about specific boats. I should mention here that it did not take long before some advertising agencies and public relations firms representing boat manufacturers realized that they could “plant” stories and information, under the guise of being a private, unbiased person on the Internet, hyping their clients boats and bashing the competition. I love the Internet; it is one of the most remarkable resources to come along in my lifetime. However, any information posted Online should be filtered through a tight screen of common sense. If something is free, it may not be worth anything.

Finding a qualified surveyor is not a simple task. Every profession or trade has skilled, talented people, and lazy jerks. Currently, there two major surveyor organizations in the USA, the National Association of Marine Surveyors, “NAMS,” and the Society of Accredited Marine Surveyors, “SAMS.” Both organizations have excellent websites that list their members, locations and specialties. Although I have been dealing with yacht surveyors for over 40 years, I don’t have enough in-depth, inside experience to recommend one of these organizations over the other. But, I do urge you to use a surveyor who belongs to either of them just to weed out “moonlighters” and non full-time people calling themselves “surveyors.” Under no circumstances should you use a “house” surveyor, one recommended by a broker or boat dealer. A surveyor who is consistently getting work from one source may be somewhat prone to overlook or miss things to avoid blowing a sale and losing future work from that source.

All surveyors, understandably in our litigious society, have qualifiers or disclaimers in their survey reports, absolving them from any liability for anything they miss or fail to report. Survey work is incredibly difficult, when done properly, for a shockingly small amount of payment. Even the most competent and diligent surveyor can miss a problem with a boat. However, in most cases, a surveyor will find major problems like structural defects, pre-existing damage, and major machinery problems. ***It is important to remember that a surveyor is hired to ascertain the condition of a specific boat, not to pass judgment on a manufacturer’s quality controls and boat-building techniques, or to comment on design performance.*** As I mentioned earlier, companies and managements come and go in the boat business, and trying to make a blanket statement about a manufacturer’s overall product is very difficult, if not impossible. A surveyor will tell you about his/her personal experience with a manufacturer of a similar model of the same vintage if he/she has any firsthand knowledge. In addition to a condition report, a surveyor will also provide a current value assessment for insurance and financing purposes, based on numbers obtained from the BUC book or similar sources.

Before you retain a surveyor take the time to check out references with previous clients. While I understand it is a pain in the ass to call or e-mail strangers to ask them how the surveyor performed on their boat, it is a sure-fire way to evaluate his/her competence. Surveyors, like all human beings, suffer from the same problems and frailties, regardless of experience and credentials. People have martial problems, drinking and drug issues, burnout, and a myriad of circumstances that can affect their work. Talking to previous clients will up your odds that the surveyor you hire is still on the ball and not on the booze.

When I started out in the boat business, many surveyors were yacht designers with wood boat building experience who supplemented their income by surveying boats. The switch to production fiberglass construction from wood boat building in the 1960’s created an experience gap, because the new materials and construction methods were unfamiliar. I used to pull my hair out with old timers who were extremely knowledgeable about wood boats and clueless about fiberglass. Time and attrition has changed this situation, and now the majority of surveyors do have a background in fiberglass boats. However obtaining experience as a surveyor is not a simple task. To learn the trade, a person usually goes to work as an “associate” or apprentice to an experienced surveyor. Working alongside an experienced individual is an excellent way to learn how to survey a boat, but there have been cases where the “pro” has sent out a green person to survey a boat without the necessary experience or proper supervision. Obviously, the report isn’t worth a damn if the actual survey you paid for from a survey firm with great credentials and references was performed by someone who lacks the required skill working alone. Be sure to ask who is going to do the actual on-site work and to obtain a copy of that individual’s time on the job and experience.

Another consideration when picking a surveyor is whether they have any past experience with boats of similar make and model. A surveyor with a great deal of previous work in powerboats may not be the person to survey a sailboat, and vice-versa. The big issues with powerboats are the engine and running gear. On a sailboat the big issues are the keel and the overall structural integrity of the hull and deck. Find

a surveyor who has documented experience in the specific type of vessel and the specific manufacturer of the boat you are considering. To broaden their market base, many surveyors claim to be experienced in both power and sail, but they may not be familiar with the model of the boat, or with the track record of the company.

Dealing with Dealers: Go Slow

Like the automotive business, most salespeople in the new or used boat business get paid on a commission basis. They may get paid a weekly “draw” against sales commissions, but it is still not a salary they can count on. It is a “sell or starve” situation that many people involved in any type of sales must deal with every day. Thanks to some obscure DNA linkage, the people who gravitate to boat sales don’t seem to have the “go for the throat and then the check” mentality found in the car business. Nevertheless, the pressure to make a sale, especially for new boats, is evident. Remember that most boat manufacturers don’t sell boats to people, they sell their boats to a different species: boat dealers. The boat dealership usually borrows the money from its local bank under what is called a “floor plan line” to buy the boats from the builder. Every day, the interest cost is ticking off on the floor plan loan, cutting into future profits, until the boat is sold. It is the same format as the car dealership business, except the volume for boat dealers is lower and the unit price (and interest cost) can be much higher. The pressure is significant to get a buyer signed and sold. The whole new boat sales picture is psychologically complicated because selling a boat over 25 feet is much more like selling a house than an automobile.

With some exceptions, like condo developers and real estate syndicates, people selling houses for a living don’t own the houses they are trying to sell. Real estate agents are not dealing with daily costs of floor plan lines. That’s why they are called agents, not real estate “dealers.”

New Boat Dealers

Before you get your tissue out to wipe a tear for the poor boat salesperson, remember it is a voluntary profession with no heavy lifting that can pay very well. It is impossible for me, after spending my adult life in the boat business, not to have empathy for people trying to sell boats. Selling anything to the public is very difficult, and boats are no exception. My biggest complaint about some salespeople selling cars or boats is their total focus on the sale, not on the product they are selling. For years I have been sitting in restaurants at the end of the day at a boat show, forced to listen to loud salespeople at the next table bragging about their latest sales “kill.” I understand that it takes a very competitive person to be a successful salesman, but I cannot grasp the total disinterest and lack of knowledge by some of them about the product being sold. I have heard the sales mantra, “a sales pro can sell anything from shoes to yachts,” countless times. Perhaps it is a true statement, but it makes my brain hurt when I encounter a salesperson who is completely ignorant of the product he is selling.

The key to buying a boat, new or used, is to take your time and avoid impulse buying. Although this statement holds true for every big ticket purchase, it especially applies to boats. You can trade a car after just a year or so, but a boat is not an easy thing to sell quickly without taking a big financial hit. Sure, you can trade a currently owned boat on a new one. But, the boat dealer does not have auction organizations, like car dealers do, to get rid of trade-in boats at wholesale prices. The boat dealer must buy your trade-in and hope to sell it on the retail market. Taking trade-in boats is a risky business, and there must be enough profit spread built into the transaction to cover the expenses of storing and puffing the boat for resale during the time it takes for the dealer to sell your old boat. He may sit on your trade-in for a year or more trying to unload it. Of course, if the dealer is sharp and lucky, he might flip your boat in a few weeks and make more money on the trade-in than the sale of the new boat. The point here is that it is likely that you will take some financial loss if you trade your old boat.

There is usually an old W.C. Fields “you can’t cheat an honest man” factor at work during the trade-in negotiations. A person wants to trade in his old

Turkey 35 on a new Svelte 40. He has a pretty good idea of what his boat is worth. The dealer selling the new Svelte 40 has checked the BUC Book and other sources and also knows what the top dollar value is for the trade-in. The dealer discounts the price on the new boat by \$10,000 and gives an extra \$10,000 in value for the trade-in boat. The buyer thinks he is a pretty sharp negotiator, getting ten grand more than his old boat is worth, and the deal is quickly made. The reality, in most cases, is that the buyer could have gotten a discount of more than \$20,000 off the price of the new Svelte 40, without a trade-in boat. And so it goes...

The moral: trade in your boat because you don't want to deal with selling the thing yourself, but expect to pay for the convenience. It is common for boat dealers to buy boats from the manufacturer with a built-in discount of 10% off the retail price. Dealers also receive additional discounts on certain factory installed options. In order for the dealer to handle the necessary trade-in nightmare costs on some sales, retail asking prices for new boats may be 20% to 40% higher than the dealer paid for the boat. This spread provides the negotiating room to create a "real deal" for the buyer.

Boat Show Rotation

If you are wondering why you meet a knowledgeable salesperson at the boat show in the morning and then return a few hours later and that person is nowhere in sight, the answer is "sales rotation." When a boat manufacturer puts a model line on display at a boat show, it is not uncommon for several dealers in the area to share the opportunity to work the show. Each dealer is given allotted times to work specific models. The competition for sales time on popular models is fierce. So every couple of hours all the salespeople have to play musical boats moving from one model to another. Remember, the salespeople are getting paid on a sales commission basis. No sales equals no commission. After several hot days of smiling and answering questions, many salespeople go home without making a dime.

Complicating the rotation routine is that salespeople are required to get your name, address, phone

number, current boat, and other useful information, including the name of your dog. All of this "lead" information is used after the boat show for follow-up mailings and sales contacts. It doesn't matter if you are in the market for an inflatable canoe and happen to step aboard a 40-foot boat, you still become a lead. A variation on the lead information card is a pretty young woman sitting at a counter who takes all this information and glues a silly company sticker to your shirt as a guise to maintain traffic flow or create boarding times. "Boarding by Appointment" is another method to obtain lead information (and to weed out those who do not look like they can afford an expensive boat by giving them appointments hours later).

No Shoes

In my less than humble opinion, taking off boat shoes to board a boat at a boat show, or anywhere for that matter, is dumb, dangerous and somewhat disgusting. I understand why cowboy boots and high heel shoes are forbidden—but boat shoes? Part of the reason for removing boat shoes is that some boats have imitation teak cabin soles (read: floors) with a veneer that is so thin the teak is more like a photograph than actual wood. A few hundred people with boat shoes walking through the boat at a show could easily wear right through the thin veneer. The other reason for having people board a boat barefoot or with slippery socks is pure elitist stupidity of the sort that compels me to remove my shoes every time I have to get through airport security. I curse the name of Richard Reid, the idiot who tried to blow up a jet plane by setting his explosive sneaker on fire, but I really don't think anyone is going to try to blow up a boat at a boat show with an explosive boat shoe...not even Richard Reid.

Yacht Brokers

Selling your used boat is a real pain in the ass. You have to put up with all the "tire kickers" or "fiber-glass groaners" who will exhaust you with questions and fail to show up for appointments. Unless you have selling experience, you are not likely to have the patience and intestinal fortitude it takes to tolerate all

this nonsense and make the sale. Enter a group of boat sales people called “brokers.” As in every other profession, these folks run the full gamut from highly motivated to downright lazy. Check to see if the broker has a “CPYB” (Certified Professional Yacht Brokers) certificate. While a “CPYB” may not always prove knowledge, the certificate does prove motivation and commitment to the profession.

Brokerage firms and brokers don't own the boats they are selling; they represent the person who wants to sell his used boat. It is important to remember that the broker is representing the seller, not the buyer. A broker normally secures a contract with the seller and receives 10% of the selling price of the boat. It is rare, but not unheard of, for a broker to cut his or her sales commission to a number less than 10% to make a sale. The broker creates a listing form with information about the boat, advertises the vessel in periodicals and on the web, responds to requests for information, answers phone and e-mail inquiries, shows the boat to prospective buyers, handles all the negotiations, and provides the necessary closing documents when the boat is sold. When brokerage activity is done professionally, it is a great deal of work coupled with a fair amount of aggravation.

Before I go any further, let me say there is a difference between a seller's brokerage representative and a dealer's salesperson selling a used boat that was taken as a trade-in. Mostly it is a geographical and logistical difference. A trade-in boat is usually located near the dealer's offices since the dealer owns the boat. A broker may be located hundreds, if not thousands, of miles away from the boat. Depending on the location, size and price, a broker may never have seen the used boat he is representing. If that is the case, the broker has to rely totally on the seller for accuracy about the general condition of the vessel. At first glance, a salesperson sitting near the boat may seem a better format to a prospective buyer than a remote broker. However, boat dealerships work on a rotation basis on to give each salesperson a fair shot at the next customer walking in the door or on the phone. So, unless the prospect hits the roulette wheel and gets the actual salesperson

who was involved in the trade-in, the buyer may end up talking to someone who knows even less about the used boat than a remote broker.

Let's cut to the chase. If you are a buyer looking for a used boat built by a specific manufacturer, check the listings by new boat dealerships that sell that brand. The salespeople at the dealership may know something about the boat since they are selling new ones. If they have a suitable trade-in boat, and want to move the thing off their floor plan line, you may be able to get a “deal” on the price. You also may get a headache, because the salesperson will try to steer you toward a new boat with a bigger sales commission for him.

With that said, let me get back to average used boat brokers. There is a great deal of wheel spinning and wasted energy trying to sell used boats. A broker has to put up with all sorts of people from potential buyers, to the mildly curious, to all the dreamers who are never going to buy even a rubber duck for their bathtubs. A broker doesn't want to put advertising dollars and valuable time into listing a used boat only to have someone else sell the boat and collect the sales commission. To help their odds, brokers want the seller to sign a “central listing” brokerage contract. Central listing contracts vary, but they all promise that the signing broker will be paid something, regardless of who actually sells the boat. If another broker sells the boat the 10% sales commission is split 70% - 30%, 50%-50%, or some other agreed on split. A central listing contract is an incentive for the broker to put some real effort into advertising and selling the boat. Conversely, it may dampen the enthusiasm of another broker who has a buyer for a specific type of boat but who doesn't want to split his commission with the broker holding the central listing contract.

If you don't sign a central listing, you can get any number of brokers listing the boat, upping your numerical odds. Then again, you might have ten brokers just sitting on their collective asses, putting minimum effort into the sales effort. If this discussion is starting to sound like the Swahili instructions for assembling a child's backyard swing set, you're ready for my opinion. Sign a central listing broker contract for the shortest period of time possible. See how the broker is advertising the boat. Check out their web site

to see how your boat is being handled. If you're not happy, don't extend the central listing contract. The good news is the Internet has made life easier for all parties because prospects love to "surf" when looking for a used boat.

One sure way to waste everyone's time and energy is to have the boat overpriced. Your beloved pride and joy that you invested a great deal of money in upgrading equipment and electronics is still going to be measured by the most recent sale of a similar make, year, and size. The other boat may be trashed, but it is still going to affect the selling price of your boat. Be realistic, and remember that boating is a hobby that is supposed to be fun. A boat is not a good investment instrument; in fact most people go boating to get away from that kind of anxiety. All the money you spent on the latest digital light show radar that also opens your garage door is probably not going to be recaptured when you sell the boat. You may have conned your spouse into believing that the expensive toy you bought for the boat was good investment at the time, but when you reach the point of selling the boat, don't con yourself about its real worth. Any good broker will be able to supply you with recent comparative sales to help establish a realistic sales price. You may be tempted to overprice the boat with the idea that maybe some jerk will come along and overpay. Forget it. There's only one jerk on the planet like that, and he's already bought his boat.

After price, the next critical issue when selling a used boat is cosmetics. It is a Homo sapien thing, like mowing grass, waxing cars, or painting pictures on the walls of caves. We love shiny and clean things, including engine compartments. The old expression, "first impressions are lasting impressions" applies especially to used boats. There is a generally accepted belief that owners who are neat and tidy take better care of their boats than those who are sloppy about cosmetic appearance. The used car people discovered this human quirk a long time ago. That's why they paint the black sidewalls of tires on a used car that may only be one year old. It may be silly but it is a fact of life—accept it. Five hundred dollars of cosmetic work can easily make a boat worth five thousand dollars more on the used boat market.

The flip side of the cosmetic issue is that a

buyer should try to avoid the impulse to judge a vessel based on its looks. Here's another one of those tired old expressions: "you can't judge a book by its cover." Used car salespeople refuse to think about that expression as they open the can of tire "look new" paint they buy for less than a dollar. Perhaps the owner of a cosmetically poor boat never did any of the necessary maintenance items and was generally abusive to the boat. It's also possible that he was so busy changing oil, rebuilding the head, and replacing the bilge pumps that there was no time to screw around with boat soap, varnish or cushion covers. These are all reasons why a buyer should hire a professional marine surveyor to determine the real condition of a vessel.

As a seller, be honest about the condition of your boat. And don't try to "sell" the broker, because he is not buying the boat. Any big issues, beyond optics, will be found during the sales/purchase survey.

Negotiating the Price

Whether you are buying a new boat, selling a used boat, or buying a used boat, settling on the price is usually a painful task. For some unexplained genetic reason, even private boat sellers cannot bring themselves to advertise the real price they want for their boat. Like boat dealers, they always have a dollar spread between the "asking price" and the "real price" they'll take. Rug bazaar price haggling is called for, even when buying a used boat from a private party. The custom probably dates back to the Stone Age when one of our ancestors had two little rocks that he wanted to swap for one big rock. It is a real pain, unless of course you are Turkish. For people in parts of the world where price haggling is a normal daily occurrence, negotiations are done with humor and good spirit. On the other hand, for folks in Western Europe and North America, this is an unpleasant component of buying cars, boats and even airplanes. Most of us really suck at price haggling. Sellers are mortally insulted if the initial price offered is too low, and buyers are convinced they over-paid if their first offer is accepted. I can't offer any good advice about price haggling because I have no patience with the whole exercise. All I can suggest is that an offer between 10% and 20% less than the asking price

seems to be a place to start. Don't forget that if a broker is involved, a 10 % sales commission is deducted from the seller's net price. On the other hand, the asking price has probably been bumped up to reflect a brokerage commission, so you're back to just haggling. Think about hiring a freelance Turkish rug merchant to do your boat price negotiating. I wonder how much price haggling they do in Albania?

The Purchase/Sale Survey

Once you have settled on the price of the boat, the money game is far from being over. Now you must hire a surveyor to check the condition of the boat. You will need a survey anyway for insurance purposes and, if need be, for boat financing. Once surveyed, issues and problems found by the surveyor will have to be addressed one way or another. Remember, a surveyor is hired by the buyer to find problems. Even a boat in excellent condition will end up with a list of concerns. Surveyors have to find some problems, even if they are minor, just to prove that they are really looking and checking things. It is then up to the seller to fix and correct the problems or to adjust the sales price to reflect the cost of correction and repairs (read: more haggling). The buyer usually has a contingency clause in the sales/purchase contract that he can walk away if not satisfied with the survey, or can come back to the seller and work things out. Unless some major problem with the boat turns up in the survey, some equitable compromise is usually reached. Brokers really earn their commission at this phase of the sale.

Title Transfer

The title and Bill of Sale for boats comes in two flavors: USCG (US Coast Guard) (Federal) Documentation and State Registration. Usually it's an either/or situation, although I have seen some with both types of ownership papers. USCG Documentation is the first choice for vessels over 40 feet, because it provides a complete paper trail from the original owner right up to present day. The boat builder or manufacturer provides the original owner with a signed Builder's

Certificate providing all the information to prove that the boat was built, exists, and that there is only one boat with that specific hull number. According to law there should only be one Builder's Certificate for each vessel built. The original Builder's Certificate remains on file in Washington, and it is referred to every time there is a change in ownership and/or name of the vessel. The whole USCG Documentation system was incorporated about two hundred years ago for commercial sailing vessels. Typical of everything involving the Government, it is a complicated and arcane process. I believe they are still using the hand cranked photocopy quill machine developed by Ben Franklin. Once the process of documentation is complete, the new owner receives a very official piece of parchment paper that has to be renewed every year. Whether it is a 700-foot commercial freighter built in the USA or a 35-foot sailboat, all documented vessels carry the same type of papers. A boat has to be built in the United States in order to receive USCG Documentation. USCG Documentation is important if the boat is ever going to be certified to carry passengers for hire or charter by the US Coast Guard. The US Coast Guard will not inspect a foreign built vessel for charter use. It is basically a very good system and virtually free from computer hackers because I don't think they have installed electricity in the Documentation Office yet.

Documentation is especially useful when clearing Customs in foreign ports. Foreign Custom Officers with small brains and big stamps love the official look of the USCG Documentation paperwork. The Documentation Office issues a set of numbers that has to be permanently affixed to the boat. On a wood boat, the numbers were carved into a deck beam, to make them permanently a part of the vessel. By the way, documentation numbers are different from the hull identification numbers that are molded into the transom on fiberglass boats. On a fiberglass boat the documentation numbers should be carved into a piece of wood that is then epoxied to a bulkhead below. One of the numbers to be carved and permanently affixed is the "Net Tonnage" number. Pay no attention to this number, it is based on the depth and breadth of the ship's hold for cargo purposes and has nothing to do with the actual weight or displacement of the boat. It also

V. NAME(S) AND ADDRESS(ES) OF PARTY(IES) FOR WHOM BUILT	
<p>IF BUILT FOR MORE THAN ONE PERSON, THE PERSONS NAMES ABOVE ARE TENANTS IN COMMON, EACH OWNING AN EQUAL UNDIVIDED INTEREST, UNLESS OTHERWISE INDICATED HEREIN: CHECK ONLY ONE OF THE FOLLOWING BLOCKS TO SHOW ANOTHER FORM OF OWNERSHIP.</p> <p> <input type="checkbox"/> JOINT TENANCY WITH RIGHT OF SURVIVORSHIP <input type="checkbox"/> TENANCY BY THE ENTIRETIES <input type="checkbox"/> COMMUNITY PROPERTY <input type="checkbox"/> OTHER (DESCRIBE) _____ </p>	
VI. CERTIFICATION	
<p>I, _____ DO HEREBY CERTIFY THAT THE FACTS RECITED HEREIN ARE TRUE AND THAT I HAVE PERSONAL KNOWLEDGE OF THESE FACTS BECAUSE I:</p> <p> <input type="checkbox"/> PERSONALLY PERFORMED THE CONSTRUCTION OR <input type="checkbox"/> SUPERVISED THE CONSTRUCTION AT AND ON BEHALF OF: _____ (NAME OF COMPANY) <input type="checkbox"/> HAVE EXAMINED THE RECORDS OF THE COMPANY CONCERNING THE FACTS OF BUILD OF THE VESSEL IN MY CAPACITY AS _____ OF _____ (TITLE) (NAME OF COMPANY) </p>	
<p>NOTE: THIS CERTIFICATE MUST NOT BE COMPLETED BY AN IMPORTER OR AN IMPORTER'S AGENT.</p> <p style="text-align: right;"> _____ SIGNATURE DATE </p>	
VII. FIRST SALE OR TRANSFER OF VESSEL	
<p>100% OF THE VESSEL IDENTIFIED HEREIN IS SOLD (TRANSFERRED) BY THE PARTY(IES) NAMED IN SECTION V TO THE FOLLOWING PERSON(S) (NAMES AND ADDRESSES)</p> <p>IF SOLD (TRANSFERRED) TO MORE THAN ONE PERSON, THE PURCHASER(S) (TRANSFERREE(S)) ARE TENANTS IN COMMON, EACH OWNING AN EQUAL UNDIVIDED INTEREST, UNLESS OTHERWISE INDICATED HEREIN: CHECK ONLY ONE OF THE FOLLOWING BLOCKS TO SHOW ANOTHER FORM OF OWNERSHIP.</p> <p> <input type="checkbox"/> JOINT TENANCY WITH RIGHT OF SURVIVORSHIP <input type="checkbox"/> TENANCY BY THE ENTIRETIES <input type="checkbox"/> COMMUNITY PROPERTY <input type="checkbox"/> OTHER (DESCRIBE) _____ </p>	
<p>VIII. SIGNATURES OF SELLER(S) (TRANSFEROR(S)) OR PERSONS SIGNING ON BEHALF OF SELLER(S) (TRANSFEROR(S)):</p> <p style="text-align: right;">DATE SIGNED: _____</p>	
<p>IX. NAME(S) OR PERSON(S) SIGNING ABOVE, AND LEGAL CAPACITY IN WHICH SIGNED (E.G. OWNER, AGENT, TRUSTEE, EXECUTOR)</p>	
<p>X. ACKNOWLEDGEMENT (TO BE COMPLETED BY NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED BY A LAW OF A STATE OR THE UNITED STATES TO TAKE OATHS.)</p> <p>ON _____ THE PERSON(S) STATE: _____ (DATE) NAMED IN SECTION IX ABOVE ACKNOWLEDGED EXECUTION OF THE FOREGOING INSTRUMENT IN THEIR STATED CAPACITY(IES) FOR THE PURPOSES THEREIN CONTAINED. COUNTY: _____</p> <p style="text-align: right;"> _____ NOTARY PUBLIC MY COMMISSION EXPIRES: _____ </p>	
PRIVACY ACT STATEMENT	
<p>IN ACCORDANCE WITH 5 USC 552(A), THE FOLLOWING INFORMATION IS PROVIDED TO YOU WHEN SUPPLYING PERSONAL INFORMATION TO THE U.S. COAST GUARD.</p> <ol style="list-style-type: none"> 1. AUTHORITY. SOLICITATION OF THIS INFORMATION IS AUTHORIZED BY 46 USC, CHAPTER 313 AND 46 CFR, PART 67. 2. THE PRINCIPAL PURPOSES FOR WHICH THIS INSTRUMENT IS TO BE USED ARE: <ol style="list-style-type: none"> (A) TO PROVIDE A RECORD, AVAILABLE FOR PUBLIC INSPECTION AND COPYING, OF THE SALE OR OTHER CHANGE IN OWNERSHIP OF A VESSEL WHICH IS DOCUMENTED, WILL BE DOCUMENTED, OR HAS BEEN DOCUMENTED PURSUANT TO 46 USC, CHAPTER 121. (B) PLACEMENT OF THIS INSTRUMENT IN A BOOK FOR EXAMINATION BY GOVERNMENTAL AUTHORITIES AND MEMBERS OF THE GENERAL PUBLIC. 3. THE ROUTINE USE WHICH MAY BE MADE OF THIS INFORMATION INCLUDES DEVELOPMENT OF STATISTICAL DATA CONCERNING DOCUMENTED VESSELS. 4. DISCLOSURE OF THE INFORMATION REQUESTED ON THIS FORM IS VOLUNTARY; HOWEVER, FAILURE TO PROVIDE THE INFORMATION COULD PRECLUDE FILING OF A BILL OF SALE AND DOCUMENTATION OF THE VESSEL NAMED HEREIN PURSUANT TO 46 USC, CHAPTER 121. MOREOVER, BILLS OF SALE WHICH ARE NOT FILED ARE NOT DEEMED TO BE VALID AGAINST ANY PERSON EXCEPT THE GRANTOR OR A PERSON HAVING ACTUAL KNOWLEDGE OF THE SALE. (46 USC 31321(A)). 	
<p>AN AGENCY MAY NOT CONDUCT OR SPONSOR, AND A PERSON IS NOT REQUIRED TO RESPOND TO A COLLECTION OF INFORMATION UNLESS IT DISPLAYS A VALID OMB CONTROL NUMBER.</p>	
<p>THE COAST GUARD ESTIMATES THAT THE AVERAGE BURDEN FOR THIS FORM IS 30 MINUTES. YOU MAY SUBMIT ANY COMMENTS CONCERNING THE ACCURACY OF THIS BURDEN ESTIMATE OR ANY SUGGESTIONS FOR REDUCING THE BURDEN TO: U.S. COAST GUARD, NATIONAL VESSEL DOCUMENTATION CENTER, 792 T J JACKSON DRIVE, FALLING WATERS, WEST VIRGINIA 25419, OR OFFICE OF MANAGEMENT AND BUDGET, OFFICE OF MANAGEMENT AND BUDGET, PAPERWORK REDUCTION PROJECT (1625-0027), WASHINGTON, DC 20503.</p>	

should be noted that, as everyone who has ever flown knows by heart: it is a Federal crime to tamper with the smoke detectors in the lavatories on airplanes, and it is also a Federal crime to alter the hull numbers on a boat, documented or not.

You can get all the forms and paperwork and go through the process of documenting a boat yourself, and it is also possible to hit yourself over the head fifty times with a hammer, which would be less painful. Most brokers provide documentation services at no charge except the government fees. For many years I have been using the patient and very helpful people at Marine Documentation, Inc. in Newport, RI. The good people there have been able to get all my old wood restoration boats documented even after some of the boats have had expired documentation for many years. These folks are worth every dime they charge for their service.

State Boat Registration

Registering a boat with the State is pretty much like registering an auto or truck. The big difference is that instead of getting a nice, neat, little metal license plate, you get the opportunity to glue big ugly numbers on each side of the bow of your boat. Every year you send money to the state, and they send you big decals to put next to the unattractive numbers on the bow. The decals have the year and a color code; yes, just like the little one on your car's license plate. The State also provides a piece of ownership paper which looks just like the registration paper in your car. No one is ever going to accuse State Workers of using too much imagination. And to make sure you feel right at home, you also get to deal with the long lines and surly people behind the counter at state motor vehicle offices. However, compared to the USCG Documentation process, the cost of registration is lower and the process is quicker.

Make no mistake, the whole state boat registration effort is about revenue to the state. Someone has to pay all those disgruntled state workers at the Department of Motor Vehicles (obviously, I am not referring to all those dedicated State Workers in Albania). There is not much effort given by states to the

absolute ownership trail. Although you have a piece of registration paper, no one is really checking the small hull numbers molded into the transom. In most states, all you have to provide is a piece of tracing paper with a pencil "rubbing" of the hull numbers to prove that the boat exists and that you are entitled to register it. This high-tech tracing paper system was ingeniously designed after years of research to stump the best minds involved in boat thievery.


Although boat registrations are like automobile registrations, there is one big difference. When a non-disgruntled and polite police officer (I may not leave the country right away) stops you for a traffic violation, the registration and license plates, as well as the vehicle VIN number behind the windshield, can be checked very quickly by the officer to see if the car is stolen. Thousands of cars are stolen every year, but at least the police have a chance of catching some car thieves. With a registered boat, there is no quick way for the boat police or the Coast Guard to see if the boat is stolen. A little glue can change the bow numbers, and it is not even that difficult for a thief to alter the molded-in hull numbers on the transom, unless he is too dumb to know where to buy tracing paper.

I don't want to give the impression that a federally documented boat is more secure against thievery than a one that is state registered. A motivated crook can also beat a documented vessel's paperwork, but the documentation system is more complex and unwieldy to screw around with easily. If you are buying a documented boat, get the "abstract of title" history from the USCG Documentation Office (or a documentation service), which has a complete list of every owner the boat has ever had. If the person selling you the boat is not on the list, find out why, or buy him some tracing paper so he can try again with a stolen state registered boat.

State Sales and Use Taxes

Unless you register your boat outside the U.S. or live in a state that does not have sales or use taxes on boats, you have to deal with giving your state government more money. The percentage of the purchase price or value that is subject to tax varies from state

DHS, USCG, CG-1270 (REV. 06-04) OMB APPROVED
1625-0027





UNITED STATES OF AMERICA

**DEPARTMENT OF HOMELAND SECURITY
UNITED STATES COAST GUARD**

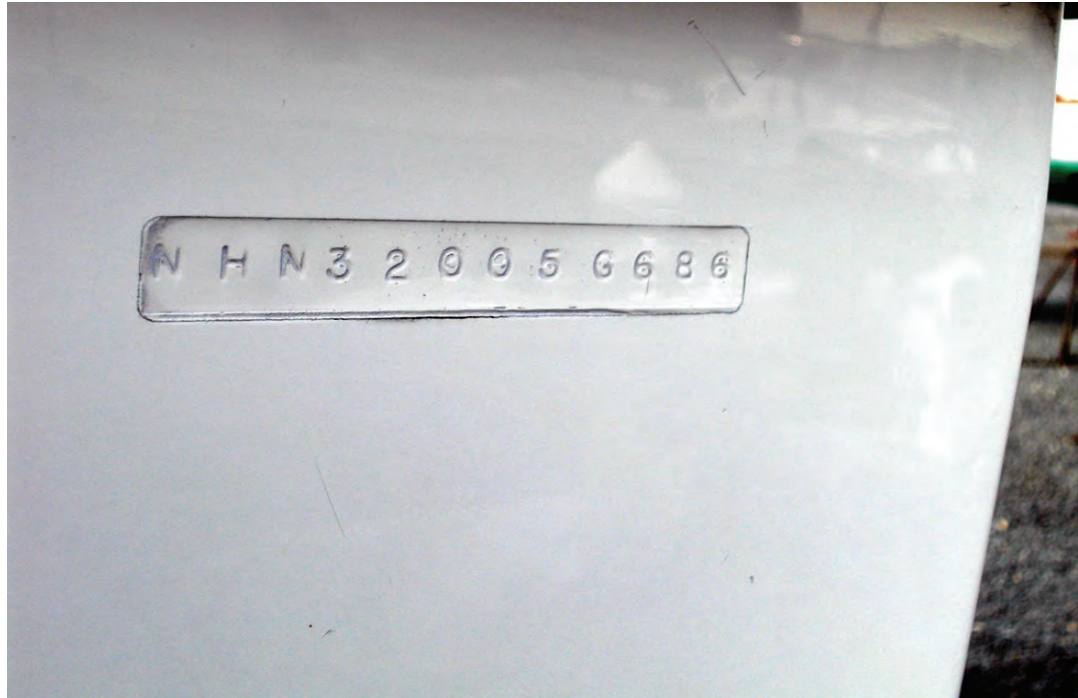
NATIONAL VESSEL DOCUMENTATION CENTER

CERTIFICATE OF DOCUMENTATION

VESSEL NAME POGARIS		OFFICIAL NUMBER 909430	IMO OR OTHER NUMBER 15798	YEAR COMPLETED 1937	
HAILING PORT BRISTOL, RI		HULL MATERIAL WOOD		MECHANICAL PROPULSION YES	
GROSS TONNAGE 18 GRT	NET TONNAGE 15 NRT	LENGTH 41.4	BREADTH 11.7	DEPTH 5.8	
PLACE BUILT NEW WESTMINSTER BC, CANADA					
OWNERS JWEB HOLDINGS, LLC COMPRISED OF TWO MEMBERS			OPERATIONAL ENDORSEMENTS RECREATION		
MANAGING OWNER JWEB HOLDINGS LLC 19 BLACK COMMON ROAD BRISTOL, RI 02809					
RESTRICTIONS NO COASTWISE: FOREIGN BUILT NO FISHERY: FOREIGN BUILT					
ENTITLEMENTS NONE					
REMARKS NONE					
ISSUE DATE SEPTEMBER 10, 2008		 DIRECTOR, NATIONAL VESSEL DOCUMENTATION CENTER			
THIS CERTIFICATE EXPIRES OCTOBER 31, 2009					

VDS 9446625

PREVIOUS EDITION OBSOLETE, THIS CERTIFICATE MAY NOT BE ALTERED



Hull numbers molded into the transom on a boat



Documentation numbers

RELAX IT'S ONLY A BOAT

to state. A few states, like Rhode Island and Delaware, have no sales tax because boat building and marine related businesses are vital to the states' economies. The impact of taxation on the boat business in Rhode Island became readily apparent when, in 1989, the dimwits in Washington passed the Federal Luxury Tax on yachts. The plan was to "soak the rich," but the result was to put 100,000 working-class employees in the boat business out of a job. The Federal Luxury Tax was finally repealed in 1993. Unfortunately, most states currently charge anywhere from 3% to 7% of the value of the boat, and, like automotive sales taxes, in most states you can deduct the value of a trade-in boat from the taxable value of the purchased boat new or used.

The state employees charged with enforcing this law show incredible tenacity in making sure they collect every dime of sales tax on boats. They monitor the movement and storage of boats to a degree that makes the officers of the Federal Homeland Security Agency look like school crossing guards. I am sure that every knowledgeable terrorist always pays his boat sales tax, because there is almost no way to avoid these diligent sales tax people.

By buying a boat in Rhode Island, or any other state that has no sales tax on purchases, you can beat the sales tax. But if you keep the boat in another state, usually for six months or more, it is subject to a "use" tax that is the same as a sales tax. The tax people actually check on marina slip and storage contracts to catch culprits. If state road and highway employees showed half the dedicated work ethic of the boat tax people, there would not be a pothole in America.

When all is said and done, pay the damn sales tax and move on, having fun with the boat. Don't dwell on questions of why there is no sales tax on ski chalets. Don't concern yourself with all those 300-foot multi-million dollar mega yachts that are registered in the Cayman Islands and other foreign ports and that move around enough to avoid paying any taxes. I like to think that those poor folks, sitting in the air conditioned, enclosed aft decks of their mega yachts, are spending their very last dollar on champagne and caviar. A sales tax would break their collective hearts and bankrolls.

Video: Walt Schulz answers a reader's question: What makes a boat seaworthy?

Buying a Fiberglass Boat

I hope there are boat shows in Albania, because after I write this chapter I will never be able to walk down a dock at a boat show in the U.S. or Europe. The dealers and salespeople will push me off a dock. Actually, I must admit that I really don't like boat shows anyway, so this chapter may give me an excuse to skip the torturous ordeal.

Most of the big problems with a boat, new or used, can be traced back to original construction. Many of these problems do not surface until years after manufacture. The force of the wind on the sails, mast, and rigging, for example, creates tremendous loads on a sailboat. The rigging is trying to pull the base of the mast right through the bottom of the boat, or if the mast is stepped on the deck, tremendous compression or downward loads are exerted on the cabin top. In use, the mast and sail loads create an enormous twisting moment that tries to peel the deck off the hull. I have always been amazed when I look at a ten year-old, cheaply built, production sailboat and see it's still in one piece.

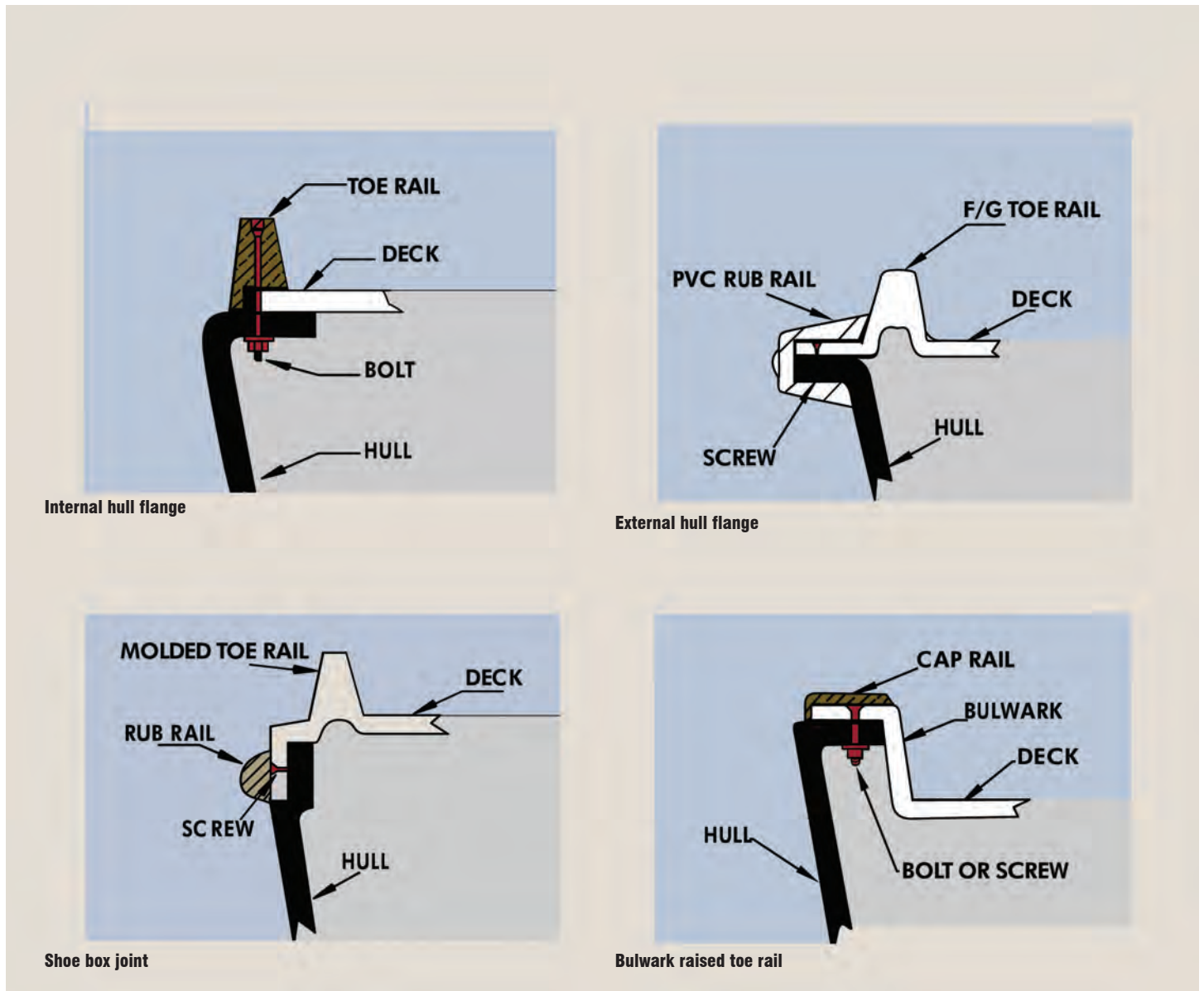
This is not a book on how to build a boat, and I don't want to flat line your brain waves with a lot of boring construction stuff. The following comment on hull to deck joints is just to illustrate one of the hundreds of critical decisions that go into building a boat. Most buyers don't know or care about some of these things, and people in yacht manufacturing take advantage of their lack of interest. If a builder wants to cut some corners to keep the sales price down and profits up, he has many "opportunities" in areas that don't show up right away. For some builders, the goal is just to keep the boat together until the warranty runs out.

The hull to deck joint is an example of just such an "opportunity." The hull and deck of all fiberglass boats are fabricated as two separate pieces. So, the deck has to be attached to the hull. Builders use all sorts of hull-to-deck joint methods, ranging from excellent, to mediocre, to poor. I have seen hull and decks attached with aluminum pop rivets, sheet metal screws, fiberglass tape, and various kinds of glue and bedding compounds. The drawings here show just a few of the different methods. As with many things in life, the best method is the most expensive one. A hull with a generous internal deck flange to which the deck

is bolted is the strongest. But the shape of most hulls makes it impossible to pull them straight up out of the hull mold when the hull is molded. An internal hull flange can be achieved by using a two-piece hull mold that separates, allowing the finished molded hull to be removed. If the hull is laid up in two halves, and then stuck together with a secondary bond down the center-line seam, you can get a great internal hull flange, but the hull is not as strong as a one piece molding. And so it goes... I mention this because once the boat leaves the factory, a repair or fix is a nightmare job. Hitting a piling, struggling through a storm, or just aging might be enough to cause the hull to deck joint to open up. For those who think I may be overstating the importance of the hull to deck attachment, a very prominent yacht designer and offshore sailor was drowned off Cape Hatteras when the deck of his sailboat peeled off the hull and the boat sank.

Whether you are buying a boat, new or used, power or sail, you need to know the following before taking out your checkbook. Unlike automobiles and houses, boats sold in the USA are subject to absolutely no government standards, building codes, or any other regulations concerning construction, electrical wiring, plumbing or anything else. In most cases, building a boat is a total free-for-all, although it is definitely not free for an owner when he eventually discovers poor workmanship, thin fiberglass laminates, undersized electrical wiring, cheap hardware, or a thousand other problems resulting from the boat's construction. Organizations like Lloyds and ABYS have published standards and on-site inspection programs, but even these standards, in my opinion, are often minimal, and in many cases are ignored by builders anyway. The European Union is moving to develop boat building requirements and CE standards, but from what I have seen to date, the EU seems more concerned with paperwork than protecting buyers. I think that "caveat emptor" (let the buyer beware) are the opening words of the mission statements for many unscrupulous boat manufacturers, both foreign and domestic. Those builders who don't know what a mission statement probably have the words inscribed on their pinky rings.

The competitive pressure on builders to build big, cheap boats is tremendous. Years ago, wealthy yachtsmen bought yachts made



Representative hull to deck joint methods

from wood and a naval architect would be hired to design a custom boat. When the design was finalized, the project would be put out for bid to various builders with specific requirements for construction standards, such as the “scantlings” of Herreshoff or Nevins. A builder would be hired, and the designer would make periodic visits to the yard to be sure the boat was built properly. At the time yachts were the expensive and exclusive toys of the very wealthy. The emergence of fiberglass production boats changed that whole equation and put millions of people in boats who could never have afforded a custom built wood yacht.

Surprisingly, fiberglass turned out to be a superior building material to wood. I know I’m going to get bad mail for saying that, but as much as I love wood boats, I believe it’s true. Please notice I said

“building material” not “final product.” The bad news about fiberglass is that it is very accommodating to builders who want to cheat. As I mentioned in the section on fiberglass, the thickness of a laminate doesn’t mean much if the resin is low-grade and the workers doing the lay-up work are overworked, untrained, and underpaid. All the regulations and construction standards in the world cannot address the issue of fiberglass quality, if the lay-up people are pushed to unrealistic schedules and are not supervised properly. Even with periodic inspection visits by quality control inspectors, it is not hard to cut corners and bury sloppy work.

Many boat buyers want a “deal,” a bargain. Perhaps this attitude is a byproduct of the automotive industry and its sales techniques. At one time or



another, we have all been tortured by car salespeople. We haggle and bargain to be sure that we don't pay more for the same car than the person before us. We live in a culture that is numb from trying to get a car or a sweater at the lowest possible price. Just to get a good deal, people will spend more gasoline dollars traveling across town to buy a coat than they are saving on a purchase. This attitude has permeated the boat industry, and it has contributed to the production of some very poorly built boats.

Notwithstanding all of the above, it is not difficult to buy a wonderful boat that will provide years of enjoyment. The key is to be honest and realistic with yourself about your budget and personal requirements. There are no "bargains" in the real world of boating. ***The trick is to know what you want and then get what you pay for.***

Do you buy a new boat or a used boat? The simple answer, once you resolve the question of requirements, is determined by your budget. Much like automobiles, a new boat is usually better than a used one. The engine will not have been abused or neglected by the previous owner, the electronics will be up to date, hardware, pumps and machinery will be current and new, etc. However, a poorly built new boat almost guarantees that you will have headaches and future expense. That's why the salespeople who sell new boats are called "dealers," and the sales people who sell used boats "brokers." If you buy a new boat, you have to "deal" with the people to get warranty problems fixed. With a used boat, problems just stay "broke."

Resolving Personal Requirements

Many people purchase boats that are either too small or too big. This phenomenon creates a lot of grief and unnecessary expense. If the boat is too small, no one is happy, and a few years later the owner is caught in the "stepping up" exercise. People buy boats that are too small because they don't have enough dollars or because they think that they don't have enough experience to handle a bigger boat. Both reasons for buying a boat that is too small are a mistake. If the reason is just money, buy an older boat that is the right size. If the reason is concern about boat handling

experience, you will find that you hit the same piling with a 25-foot outboard powered boat or a 35-foot inboard powered boat. On the other hand, if the boat is too big you will find yourself consumed with trying to find friends and relatives to help handle it whenever you want to go out. Excited boat-loving children quickly turn into reluctant teenagers. Good friends on land can easily become "guests" on a boat, expecting a quality of service that can only be duplicated on a luxury ocean liner. Dealing with paid crew is an exercise in employment management skills that has the potential to become a test of your intestinal fortitude. ***There is a "right" size boat for every owner's specific requirements,*** and with a little research and a few reality checks, it can be found regardless of boating experience and money. Any boat from 10 feet to 1000 feet is a series of compromises. The challenge (and fun) is to find the compromises that fit your lifestyle and budget.

VIDEO: Walt Schulz discusses what size boat should someone buy

Buying a Fiberglass Sailboat

How are you going to use the sailboat? How many people or children do you expect to have aboard? Do you want to race or just sail locally? Are you thinking about sailing long distances offshore? How much time do you have available for sailing? What maintenance skills do you have?

Racing, Cruising, or Both

While not mutually exclusive, the criteria for a boat that is going to be used for serious, competitive racing are going to be different from those of a boat designed for cruising. That said, there are many well designed “racer/cruisers” on the market that provide the necessary compromises between cruising amenities and the performance criteria for Wednesday night yacht club races. Decide if you are ever going to be involved in any type of racing, and if the answer is yes, then go aboard several privately owned sailboats (boat salespeople will make you crazy) at your yacht club and check out the layouts, tankage, cockpit seating, and other characteristics of the boats owned by successful competitive sailors. You don’t have to belong to a yacht club to enjoy racing a sailboat, but it makes life much easier and more fun. Yacht clubs offer organized races, family events, and the opportunity to learn from other members. Some yacht clubs are difficult, if not impossible, to join without having a current member sponsor your membership. Yacht club memberships are subject to available space and other criteria including, in the more exclusive clubs, bloodlines and bank rolls. On the other hand, if you are like me and adhere to the old Groucho Marx philosophy of: “I don’t want to belong to a club who’s standards are so low that it will accept people like me as members,” you still will not be precluded from sailboat racing.

If your spouse and family are going to crew during the racing, be realistic about their participation and interest in racing. Crashing around a race course is great fun for those with a competitive spirit. However, sheeting in big headsails by cranking on winches, reefing mainsails, and getting big downwind

spinnakers up and down quickly is a lot of work. Holding the wheel or tiller is not easy, but cranking winches and pulling sails up and down can be just drudgery for a non-motivated crew. A fair amount of shouting combined with protest flags and hard feelings, at times, is standard practice when racing a sailboat. Additionally, it is practically un-American to be last in any race, as anyone who has ever stood in a checkout line at the supermarket knows. So, racing a sailboat can be a great adrenalin rush for those temperamentally inclined, or an unpleasant experience for those who are just looking for a simple, fun boating experience.

You may discover that your family crew becomes suddenly “busy” whenever there is a scheduled race. I know many owners that use a group of friends who enjoy racing as crew and leave family sailing for non-competitive days and nights. Go out racing with your spouse and family as crew on someone else’s boat to see how competitive your gene pool is.

A cruising boat doesn’t have to be a slow slug that’s passed by people paddling kayaks. I sail because it is the most relaxing pastime I have ever found. Getting a sailboat from point A to point B gives me lots of things to do onboard, and my focus and attention on sailing vaporizes all my other worldly cares and woes. Sailing is my personal fountain of peace. I don’t like to race because it requires too much tension, and I also really don’t enjoy beating a boat up in an attempt to win a race.

Additionally, I don’t have the temperament to be satisfied ending up in the middle or at the wrong end of the racing fleet. On the other hand, even when sailing causally, it makes me totally crazy if a sailboat of similar size sails right by me going in the same direction. Instantly I start trimming the sails, rousing my relaxed family into action to get whatever sailboat we are on to move faster.

Even when I am sailing an old, wood, gaff rigged hooker that I have restored, I cannot control the impulse to get some more speed out of the crate to keep up with a fiberglass sailboat that is leaving me in the dust.

These days, if my family is on one of the fiberglass Shannons that I designed, and another boat sails past us, everyone leaves their comfortable sun-

bathing and lounging and jumps into action without my ever having to say a word. It is kind of a Pavlovian dog reflex. My wife and daughters could care less, but they know me too well.

One of my more memorable sailing experiences was sailing right through a fleet of fiberglass racing boats with a 1905 Friendship sloop that I rebuilt. The gaff rigged Friendship had a 32-foot main boom, the same length as the length of the boat on deck. The old sloop's enormous mainsail gave the boat a shocking amount of speed on a "broad reach" (the wind coming across the boat amidships). I deliberately sat casually at the wheel with a drink in my hand watching the yachtsmen in their hot shot racing boats scramble as the old wood boat went right by them. Of course, if there had been less wind or it had been coming from another direction, the old Friendship would not have stood a chance of passing anyone unless they were anchored.

The point is that if you have any latent competitive spirit, then buy a cruising sailboat that has some performance sailing potential. A great deal has happened in yacht design in the past 20 years, and most cruising sailboats built since 1985 perform very well on all points of sail. The downside of this improved performance is that it takes more work to get the speed and the improved windward potential, (sailing about 38-40 degrees into the wind).

Ninety-nine percent of recently built sailboats are sloops, which rely heavily on big headsails to obtain superior performance. On a sloop you only have one sail forward of the mast, and it is supposed to work in all wind conditions. At least that is what some boat salesperson is going to tell you. In truth, the headsail you need in 5 knots of wind is going to push the boat over on its ear in 25 knots of wind. In moderate wind (15 knots), it is not unusual to see a sailboat sailing with just the big genoa out and the mainsail still furled on the boom under a sail cover since most of the sailing horsepower is generated by the headsail on modern sloops.

Headsails are described as a percentage of the fore triangle. The "fore triangle" is a fancy term for the triangle of space formed by the mast and the head stay. Theoretically, a headsail that fills up the entire space forward of the mast to the bow is



The Friendship Sloop

called a 100% jib, "theoretically," because sails are made from a fabric, Dacron, and not, for example, plywood, but the concept is close enough for this explanation. A 75% jib would only fill three quarters of the space between the mast and the bow. A 150% headsail would fill the entire area between the bow and the mast plus have additional area aft of the mast that approximates another 50% of increased sail area. I can't recall why big headsails that run past the mast are called "genoa." Maybe it was some Italian from Genoa who figured out that the racing rating rule could be cheated, since racing boats were only penalized on sail area for the distance from the masts to the head stay, and the part of a sail that overlapped the mast was not counted. So, thanks to racing rules and perhaps some smartass Italian, boats lost their bowsprits and picked up the term "genoa."

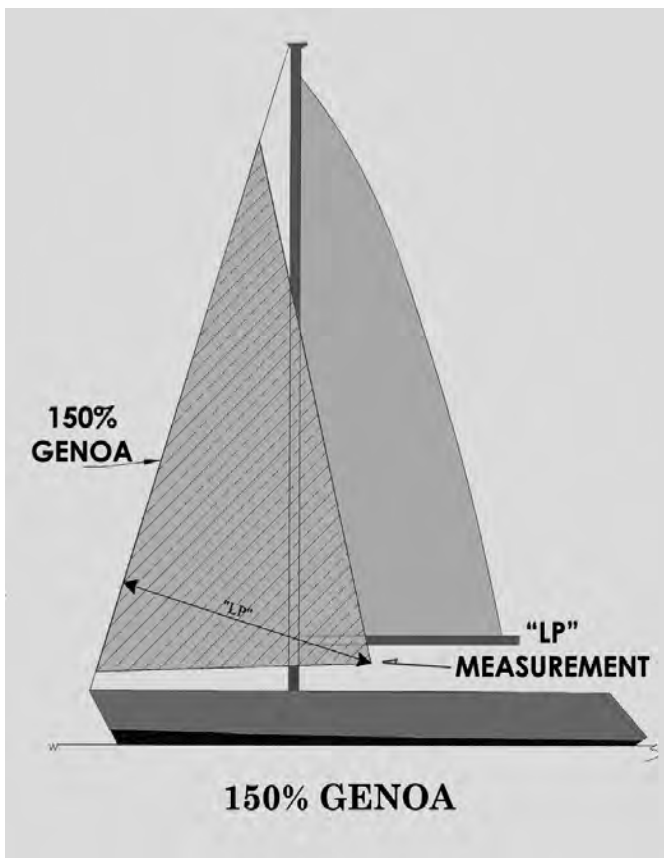
When the wind gets too strong, a big genoa has to be shortened (the area reduced) or the boat will not be able to handle the increased wind. Years ago, the only way to reduce sail area forward on a cruising boat was to go up on the bow, lower the big genoa, take it off the head stay, put it in a bag, and then reverse the process to replace the sail with a smaller jib, a job that was a real pain in the neck and other body parts. **Competitive all out racing boats still make numerous headsail changes depending on wind conditions.**

The advent of dependable roller furling gear on the bow was supposed to alleviate the pain of changing headsails to match wind conditions. Unfortunately, one marketing hoax claims that a single big genoa can adjust to all wind speeds by rolling part of the genoa up on the furler to reduce the size of the sail. Regardless of what anyone tries to tell you, a genoa can only be furled or shortened to about 70% of its total area. After that it becomes more of a bed sheet rather than a sail. A sail needs “draft” or a curve similar to an airplane’s wing to produce lift and enable the boat to sail to windward. I have tried all sorts of fancy-cut genoas that were supposed to be able to be roller furled to make a decent jib, but to date, the big genoa still becomes a rag instead of a real working jib. A 150% genoa, therefore, can be rolled up to a 100% jib, but in high winds a 100% jib may still be too much sail. A 120% genoa can be furled to down to a 84% jib, which is not a bad sized jib for heavier winds, but a 120% genoa may be too small in area to push the boat when

the wind is below 10 knots.

This headsail issue is a real conundrum for people today who want to cruise in their sloops with just one headsail on roller furling gear. All the marketing hype in the world does not overcome the basic fact that even in areas of generally light air, the wind can pipe up to over 30 knots with very little warning. And it is not that easy to change a headsail mounted on roller furling gear. An aluminum foil-shaped “receiver” that has a very narrow slot to accept the “luff” (forward edge) of the sail runs up the head stay. Getting the original sail down is not a problem, but trying to get the new sail up requires two people, one to feed the sail into the slot and another to pull the “halyard” (the line that pulls the sail up) up in slow increments. This is not easy at the dock and becomes very difficult in a boat that is bouncing around with 20 knots of wind blowing over the deck. I firmly believe that the failure of the sailboat industry to address this obvious headsail issue is one of the biggest reasons that fewer people are staying in the sport of sailing each year and why there is a growing popularity for golfing.

To address headsail issues, I developed a rig over the years called the “Scutter,” which I made standard on all Shannon’s in 1995. I’m sorry if what follows sounds more like a sales pitch than an expla-

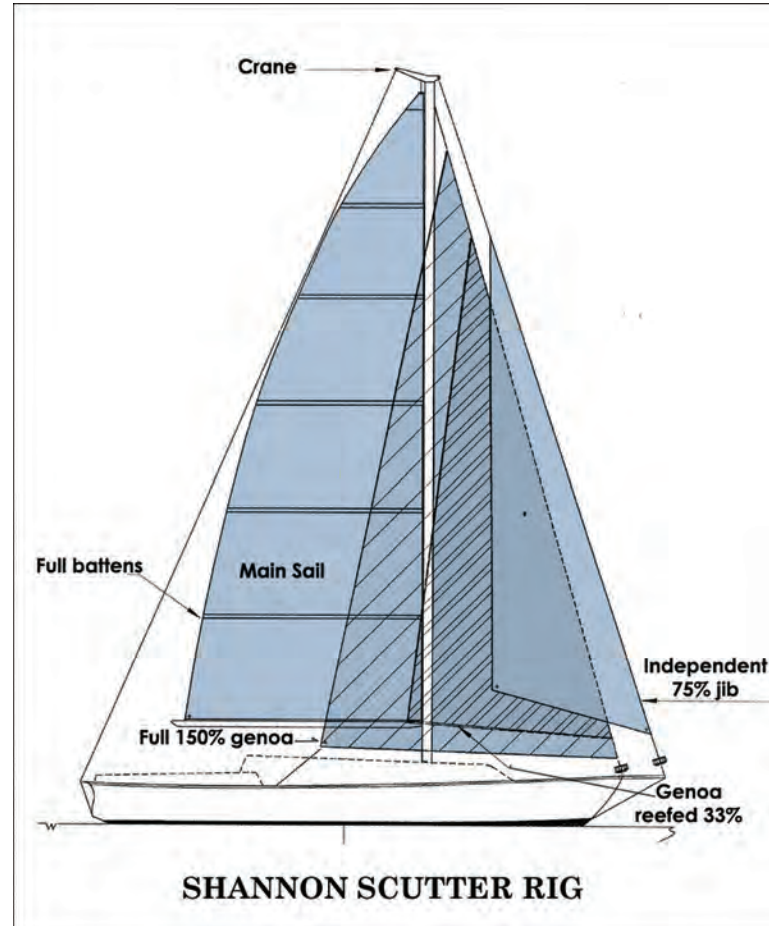


Roller Furling

nation. Basically, there are two roller furling units on a Scutter, one out on the bow platform with a real working jib and the other mounted at the bow, with a light air genoa. The objective was to provide a jib that would easily “tack” (fit) through the space between the furlers and also provide enough room for a big genoa to tack between the mast and the furler on the foredeck. The Scutter rig also has a third stay, that is tied back to the mast, when not in use, to accept a “storm jib,” for winds of 60 knots or more. The Scutter rig allows a single person to effect optimum sail combinations, from 5 knots of wind on up, without leaving the cockpit. In spite of what some of the “experts” say, you want the small 75% “working” (sailing) jib as far forward as possible to counteract “weather helm,” the tendency of all sailboats to turn up into the wind when they heel. On the other hand, a tiny, survival 30% storm jib should be placed aft near the mast where it can be handled safely on deck. Unfortunately, like most of my brainstormers, the Scutter rig is a very expensive solution requiring a special mast location, bow platform (flat bowsprit), reinforced mast, twin roller furling units, etc., and is not viable for mass market, price sensitive production sailboats.

Why are most sailboats today sloops?

There is no question that the most efficient sail rig is a single head stay sloop. Two big sails, the mainsail and the headsail are far more efficient, aerodynamically, than breaking the sail area up into smaller sails. The interaction between the sails is critical, especially sailing to windward. The more sails hoisted, the less efficient the air flow across them. The increased competitive interest in racing around buoys has had a tremendous impact on the sport of sailing. The quest to be able to “point higher” (sail closer to the direction of the wind) is the Holy Grail of racing sailors. Since a sailboat race course has basically three legs, (windward, reaching, and running) any boat that can point higher than its competitors is likely to win, because it sails a shorter distance over the water. Just a few degrees of pointing ability can make the difference between winning and losing a race. It is important to note that most racing sloops have an inventory of different sized headsails and strong crews to change the sails to match wind speeds. Sailing magazines give sailboats that win races a great deal of ink. Boat manufacturers,



trying to capture that free publicity, put a great deal of emphasis on windward ability. Even cruising magazines give windward ability an important place in their boat reviews. Although the underwater shape of a sailboat hull has a great deal to do with windward ability, the sloop rig itself is a critical factor in being able to point high. When talking about windward performance, it is important to note that it is not necessarily a question of speed, it is an issue of distance traveled to a point upwind. A faster sailboat can lose a race to a slower boat, if the slower boat can point a degree or two higher.

I am not interested in racing, so why do I need a sloop? Simply put, because 99% of the fiberglass sailboats available, new or used, are sloop rigged. It's like the old Saturday Night Live TV show segment in a Greek diner, except you substitute the word “sloop” for “cheeseburger.”

What about “cutter rigged sloops”? A “cutter rigged sloop” is a recent marketing hustle, not a nautical term. There are cutter rigged sailboats and there are sloops, two very distinct rigs. A cutter is a single-masted sailboat with the mast “stepped” (placed) further aft than in a sloop. Usually on a cutter there are two headsails in front of the mast: one sail called the jib or “yankee” is placed out on a bowsprit, and behind the yankee is a “fore staysail” which has a club boom that is “self-tending,” meaning it “sheets” or is controlled just like the lines on a main boom. An objective of a cutter is to have only one small jib to set every time you tack (turn the boat into the wind,) since the fore staysail, once it is set, will work on either tack (direction) without any attention, thus, the term “self-tending.” When the wind gets light, you crawl out on the bowsprit, take the small yankee down, and replace it with a larger light air jib or genoa. Since the space between the yankee “stay” (the stay running up to the masthead from the tip of the bowsprit) and the fore staysail “stay” is usually narrow it is not uncommon for a big light air sail to hang up on the staysail stay when tacking, which means that someone must go forward to push the genoa around the fore staysail stay. A cutter is a great rig for moderate to heavy winds, because compared to a sloop, a cutter requires very little effort or winch work, especially when tacking into the wind in close quarters. If the wind becomes too strong for both the yankee jib and the forestaysail when beating into headwinds, you lower the fore staysail. Trying to sail hard to windward with just the staysail is not good idea since the “luff” (leading edge of the sail) of a fore staysail is too short to get any real driving power. Also, keeping the yankee jib up will help reduce weather helm.

I designed and built cutter rigged Shannons for over twenty years (1975 to 1995), and owners sailed these boats to the far corners of the globe. The only spin I put on the cutter rig was the use of twin, side-by-side, headsails out on the bow platform. Before we had dependable roller furling gear, the sails were hanked on to a stay and lowered to the deck or bowsprit. On one stay, out on the bow platform, I put a 75% working jib, and on the stay alongside, I put a light air genoa. This enabled an owner to have a heavy weather sail and a light air sail ready to go, without



The 1975 Shannon 38 had a small fore staysail on a club boom

struggling to change sails. Each sail had its own deckbag and sheet lines. Behind the jibs I put a conventional self-tending fore staysail on a club boom. I wish I could take credit for using twin side-by-side headsails, but in truth, I jacked the idea off of the famous single-handed sailor Sir Francis Chichester’s “Gypsy Moth,” after I saw the boat in Newport, R.I. By the late 1980’s, more and more Shannon owners wanted roller furling gear, so I started putting both the jib and the genoa on roller furling. The rolled up sails rubbed on each other because they were so close, but the twin sail idea still worked with roller furling gear. ***Contrary to myth and marketing, the conventionally rigged fore staysail on a club boom is not big enough to drive a cutter to windward in heavy air, and the jib out on the bow platform had to be used.*** Eventually I replaced the twin headsail arrangement with the Scutter rig on Shannons. A fore staysail is fine off the wind in high winds, but it is generally useless going to weather. That’s the reason I dropped the fore staysail when I developed the Scutter rig in ’95.

What about “double headsail” sloops?

Yes, there are sloop rigged boats with two headsails instead of just one forward of the mast. The legendary Friendship sloop from the days of wood boats is a classic example of the use of double headsails. Basically, it is the same rig as a cutter except that the mast is stepped further forward. Friendships evolved from Maine working boats in the 1800's. They used a jib on a long bowsprit and a fore staysail with a club boom mounted right in front of the mast. The objective for these working boats was to achieve power from a huge, easily handled mainsail, instead of jerking around with headsails. In those days there were no cockpit headsail winches, and sails were made out of Egyptian cotton (called canvas). Cotton sails were heavy, and making a big light air headsail was both difficult and expensive. It is important to remember that this period was before engines were put in boats, and these tough fishermen had to sail all the time, in all wind conditions, including into the wind, on a regular basis. Although they might only be sailing 45 degrees into the apparent wind, instead of today's 38 to 40 degrees, they were not struggling with winches every time they turned the boat. We certainly pay a price in physical labor, struggling with winches on modern sailboats, to achieve our “improved” performance. I restored a Friendship sloop built in 1905 and loved the old boat, even though sailing the 32-foot sloop to windward in winds above 20 knots required two hands and one foot on the wheel to hold course. It's called “weather helm” and the Friendship had more than it's share.

What about all the sloops at boat shows that have a small fore staysail on a club boom behind the roller furling gear on the bow? This is the fiberglass boat industry's solution to the problem of not being able to make a real working jib out of a partially furled big light air genoa. The brochures tell you that by rolling a big genoa all the way up in heavy wind, the small, self-tending forestaysail becomes the sail of choice. There is some truth to this premise, as long as you are not trying to sail anywhere near where the wind is blowing. The tiny fore staysail does not have enough area to drive the boat into headwinds. Sailing with a double reefed mainsail and the small fore staysail, the boat will make a 100-year-old Friendship sloop seem like an modern America's Cup racing



The friendship Sloop rig

boat in terms of pointing ability. You need to read the chapter about engine maintenance carefully to make sure the engine will start if you ever get in a situation where a strong wind is blowing you up on the shore. Also, on many of these boats, the space between the roller furled genoa and the stay for the fore staysail is so tight that a big light air genoa will hang up on the inner stay when tacking, requiring you to go forward and push the genoa through.

What is the best solution for a sloop rig just used for cruising and family-type sailing? I know this answer is going to aggravate many people, and I am going to have to start looking for additional acreage in Albania, but here is my suggestion. The sloop rig's proven performance features are based on changing the headsails to match wind conditions. A racing sloop has a large inventory of different size headsails along with a strong crew to wrestle different headsails up and down and in and out of sail bags. For family cruising, buy a single headsail sloop, without any of the small fore staysail nonsense, and put the one headsail on roller furling gear. No one wants to scrap roller furling today and start hanking different headsails on a sailboat every time they go sailing or the wind changes. In a culture that celebrates power windows on cars, the effort required by excessive sail handling when sailing for recreation can be perceived as un-American. Depending on the average wind conditions in your sailing area, choose either a 150% genoa or a 120% genoa. The former will roll up to a good 100% jib (two thirds), and if the wind gets too strong, completely roll it up and turn the engine on. The 120%

A Story

A few years ago, I was coming back from Block Island to the mainland, about 20 miles away. A Nor'easter had come up during the night, and it was blowing about 25 knots with gusts higher, and, naturally, it was coming from the direction I needed to go to get home. We had just left New Harbor and turned into the wind going north alongside the island. I was plowing along on a 43-foot Shannon under power, watching the knot meter drop from 7 knots to 4 knots every time we hit a big sea. The autopilot was on and my wife was tucked up under the dodger out of the spray. I was cursing the fact that I had to be back at work the next day, because it was going to be a long day slugging against the wind all the way to Bristol.

After about 20 minutes or so, I noticed a sailboat about a half-mile east of us, tacking back and forth at a heavy angle of heel. I was surprised to see a boat that close to the shore because there is a long reef that sticks out on the northwest corner of the island for about a mile off Sandy Point called North Reef. We were on the west side of the reef and they were on the other side. The boat was close to the beach and it was obvious they were trying to sail out to get around the reef. But the heavy wind was right on their nose, pushing them toward the beach. After about a dozen tacks back and forth, they were not moving very far forward. I pointed the boat out to my wife, commenting, "Look at those diehards over there. Here I am wishing I was below dry and warm sipping some rum, and they're out here yachting on a day like this".

As we got closer I took out the binoculars to watch the boat and keep my attention away from our creeping knot meter. We were just about abreast of the boat, about a quarter of mile away. With the glasses I could see clearly that there were two people aboard. The man at the wheel had grey hair and a middle-aged woman was working the winches, like an Olympic athlete, every time the boat tacked. It was like I was watching some kind of weird, senior citizen, Iron Man contest as they tacked back and forth every five minutes or so, trying to get away from the beach. It became obvious that they had accidentally sailed too close to the reef and were trying to get around it, without much success in the high wind and heavy swells. By the look of the boat, it was a fairly new fiberglass sloop with a double reef in the mainsail and the genoa partially rolled up in an attempt to create a small jib. The problem was that the partially furled genoa created a lot of heeling angle and very little drive. I wondered why they didn't just sail further east away from the reef and get some sea room, but maybe they were too close to the shore to make it back past the east end of the island. It seemed to me the guy should start the engine before his companion had a heart attack from humping on the winches, but for years I have watched people kill themselves rather than start a motor.

Watching this scene through the binoculars, I saw the man give the wheel to the woman, and he disappeared below. The loud voice that came over the VHF radio cockpit speaker on my boat made me jump. It was a Mayday, a distress call to the Coast Guard on channel 16. It turned out that it was from the sailboat I was watching. The engine would not start and they were looking for help. Once the Coast Guard determined that they were floating, not hurt and had their PFDs (life-jackets) on, they switched them over to Sea Tow. I wanted to get on the radio and tell them to set an anchor, but the bottom in there is soft sand, and maybe they might drag right up on the beach. As long as the woman didn't collapse, they were holding their own. About 10 minutes later a big Zodiac inflatable with twin outboard motors went right by us crashing into the seas. The Sea Tow boat cut through a narrow, unmarked passage in the middle of the reef and picked them up.

The show was over and I settled back under the dodger and watched the people get their sails down as they were being towed around the reef. I could not help but be impressed by the strength and endurance of that woman aboard the sailboat. I wondered whether she was thinking about the merits of a country club membership with a waiter bringing drinks poolside after her ordeal. If they had a real working jib up instead of that furled rag of a genoa, then sailing off that beach in strong headwinds would have been a real possibility. It's not difficult to get inside North Reef coming from the east, because the lighthouse on Sandy Point is way up on the land, and the buoy at the end of the reef is not obvious. The combination of bad luck navigating, no real working jib for the wind conditions, and an engine that would not start all conspired to give these folks a real bad day.

The moral of this story is that if you sail a sloop with only a genoa on roller furling gear, you need to anticipate problems and realize that you do not have a real headsail for heavy wind sailing to weather. If the wind is blowing over 25 knots and there's a remote chance that you may have to sail into the wind, then start the engine, roll up the genoa, and power sail with a reefed mainsail. Then if the engine does not start (and someday it will not), there is still time to change your destination to avoid windward sailing off a lee shore or some other tight spot. I know it sounds like a "pussy" solution, but it sure beats the hell out of having your spouse take out a subscription to a golf magazine.

genoa will furl into a decent 85% working jib, and turn the engine on if the wind gets too light. I know that suggesting the use of an engine is going to offend a lot of people, but there are few other realistic options once you have a sloop, which is what you are likely to buy or own since it is the dominant rig available in the new or used sailboat market

What about light air “drifters” or downwind spinnakers? Unquestionably, a very light-weight drifter or a spinnaker will improve the sailing qualities of a sailboat when the wind is under 10 knots or so. To get the improved performance requires effort, money, and some experience. While these sails can be set and lowered by a single person, ***depending on the size of the boat, it is best to use three people, one person to steer, one person to work the halyard up and down, and another to handle the sail on deck.*** Just about every sail maker has very strong opinions and discrete designs for light air sails, and it is a good idea to talk to several to get their opinions for a specific boat and geographical area. Both a drifter and a spinnaker operate independently of the roller furling headsail, which is rolled up when they are used. Today, we have “radial cut” light air drifters that can be carried up to 50 degrees into the apparent wind. A spinnaker is used for running before the wind (the wind is generally behind the boat) and is available with or without a pole to hold it open depending on the design. It is important to note that these light air sails usually require turning the boat away from the wind, or “jibing,” whenever the boat has to make a turn. Jibing calls for some planning and coordination of the crew to prevent the sail from fouling on the headstay or someone getting hit in the head with the main boom. While light air sails are a real fun alternative to starting an engine in light wind conditions, they do require some effort and crew cooperation. But be advised, they must be taken down before the wind gets too strong. Leaving the light air sail up too long can lead to a really dangerous fire drill to get it down, not to mention a lot of expense if you tear the sail up. Several years ago, I screwed up and succeeded getting a new spinnaker under the bow of the boat right in the middle of Newport harbor on a crowded Sunday afternoon. Now as age creeps up, I carry light air sails on a boat, just like I carry battery jumper cables in the

trunk of my car, but I rarely ever use them. Perhaps, it's because I seem to get very lazy whenever I am sailing, especially, when I have an engine that will start.

I want to sail a boat out to Bermuda or across the Pacific Ocean; what should I be looking for in my next boat? Look for my next book, assuming I ever write one, which is very doubtful, on offshore sailing. There are so many critical issues concerning long distance, serious offshore sailing that I'm not sure that I could even fit my thoughts into a single book. I have tried to sail at least 1,000 miles offshore every year for the past 40 years just to make sure that I don't make any wrong decisions in my yacht design and boat building career. It is quite possible that I know too much, besides having been scared out of my wits too many times in the past 40 years, to ever present a balanced, coherent viewpoint. A few years ago, some guy went around the treacherous Cape Horn on a windsurfer without a problem. People have made extraordinary voyages in sailboats that I wouldn't take across the pond in New York's Central Park. Perhaps offshore sailing is just a matter of luck. I can't help wondering if the gods of wind and water are not carefully watching over the truly foolish, or at least those who live to talk or write about their experiences.

With that said, I want to stress that the biggest problems I have personally encountered aboard a sailboat have all been in coastal sailing, almost in sight of land. When you are 100 miles offshore there is usually more time to react to situations and conditions. An engine that breaks offshore is a pain in the ass because you have no way to recharge the batteries for lights and electronics. The same engine failure when you have your back up against a pile of rocks can be deadly. A navigation error offshore is aggravating, but a navigation error when sailing near the land can be fatal. A simple electrical problem that shuts off navigational running lights near the coast might create a collision or get you run down by a commercial freighter. Things can happen very quickly when you are close to land and other boats. ***Confusion compounded by hesitation, without any time to react, is the big danger with coastal sailing.***

Even though 99% of sailboats built recently are sloops, I thought I might mention some of the other rigs that you might see floating around. At least you

can sound like an old sea dog as you point out the various rigs to family and friends.

YAWLS

A yawl is basically a sloop rig with a very small/low mizzen or “jigger” mast stepped aft of the rudder post. While yawls have been around for a long time, the rig only became popular in the US in the 1930's to the 1950's, thanks to the CCA (Cruising Club of America) racing rating rule. The racers were able to hoist a small, but effective, light air mizzen staysail that was not penalized under rating rule. The actual mizzen sail, because of its size, was only good for holding the boat into the wind when anchored. The CCA rule also encouraged the design of boats with short waterlines and long overhangs in the bow and transoms. When the boats heeled, the overhangs increased the waterline length, another rating rule advantage. The advent of the IOR rating rule in the 1960's put an end to the long overhang yawls for competitive racing. Those long overhangs made the boats look very sleek. To this day, I still think that the wood Loki yawls, the Concordia 39' yawls and the fiberglass Hinkley Bermuda 40' yawls are the prettiest yachts afloat.

KETCHES

A ketch is a two-masted boat with the lower, aft mast stepped forward of the rudder post. The high forward mast is called the main mast and the lower aft mast is called the mizzen mast. Most ketch rigged boats have two headsails forward of the main mast, called double headsails. It makes my brain hurt when yacht brokers describe a double headsail ketch as a “cutter ketch.” A cutter is always a single-masted boat. The only place a cutter ketch exists is in the mind of an ill-informed boat salesperson. A ketch can also have only one sail forward of the main mast, called a single headsail ketch. A ketch is defined by its two masts, their size and placement.

What are the advantages of a ketch rig?

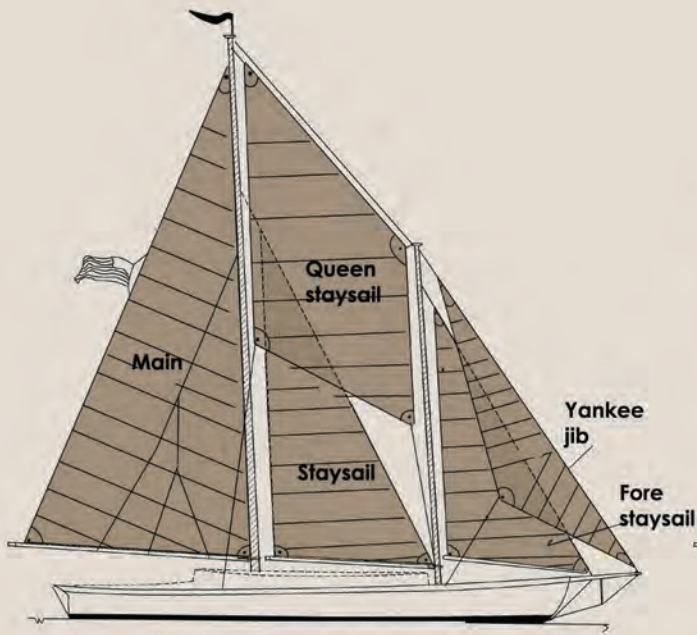
A properly designed double headsail ketch with a large mizzen offers an easy way to achieve numerous sail combinations. Reducing the workload is a big

advantage for long distance single-handed sailors, and for senior citizens like me. You can drop the main sail and foot along with just the headsails and mizzen sail set. Hard on the wind in a blow, the mizzen can be dropped without leaving the cockpit. In light air, a single person can set a mizzen staysail to increase off the wind sail area. I should mention here that since I am one of the last designers to build ketch rigged boats, I am not exactly impartial. However, I have found over the years that regardless of age or sailing goals, folks who have owned ketch rigged boats seldom choose another rig when they buy their next boat.

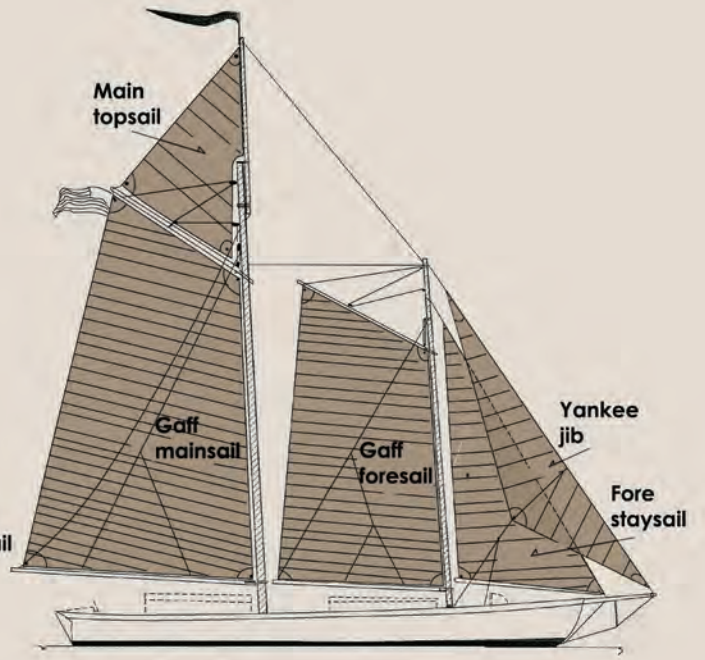
What are the disadvantages of a ketch rig? Unless you are neat, you'll have lines all over the place. You have to climb around the mast to get into the cabin. And you have to accept the theoretical loss of efficiency that results anytime a sailplan gets chopped up with multiple small sails. In theory, the most efficient sailplan should be a boat with only one big sail, like a catboat for instance (see my description of catboats for a reality check). Numerous attempts over the years to use just one big sail have not met with much success. Although Arab dhows have been sailing for thousands of years with just one big lateen sail, they also had 40 man crews to handle the sail. The real big disadvantage of a ketch is that you have two masts when the rest of the sailing public thinks that a single-masted sloop is the only rig that belongs on a sailboat. Also, the second mast, rigging and sail does add additional expense.

SCHOONERS

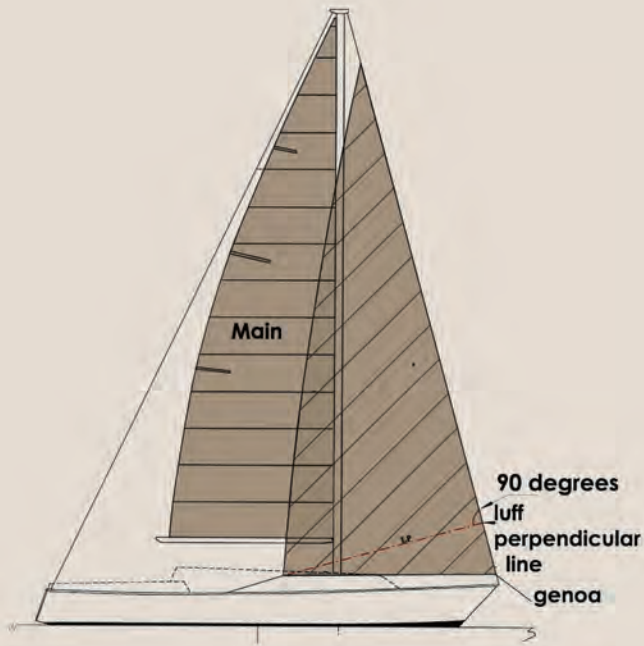
A schooner is commonly a two-masted boat with the forward mast, called the foremast, lower than the aft mast, called the mainmast. Usually schooners are rigged with double headsails forward of the foremast, although some big schooners have triple headsails. A staysail schooner has a sail forward of the mainsail, attached to the top of the aft mainmast and running down to the boom on the foremast. If a schooner is gaff rigged and has another small mast attached to the top of the main mast, it is called a main top-sail schooner. If both masts have small masts on top, it's simply called a topsail schooner. There are still



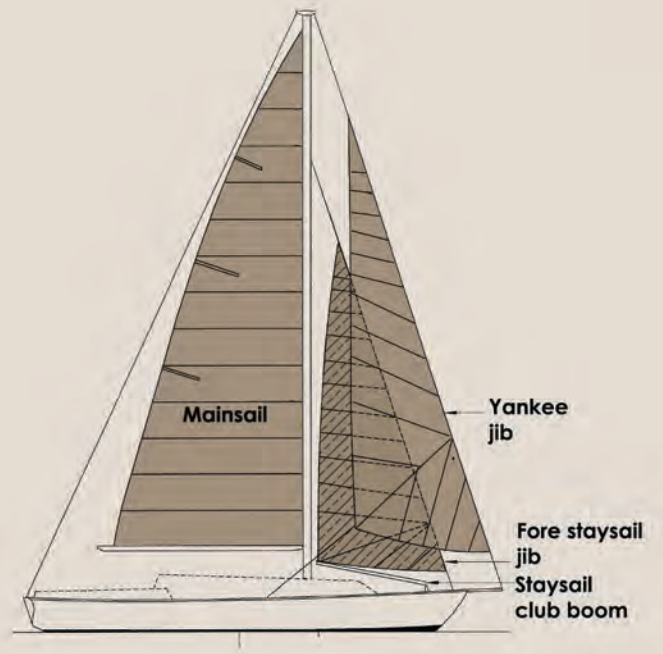
MARCONI MAIN STAYSAIL SCHOONER



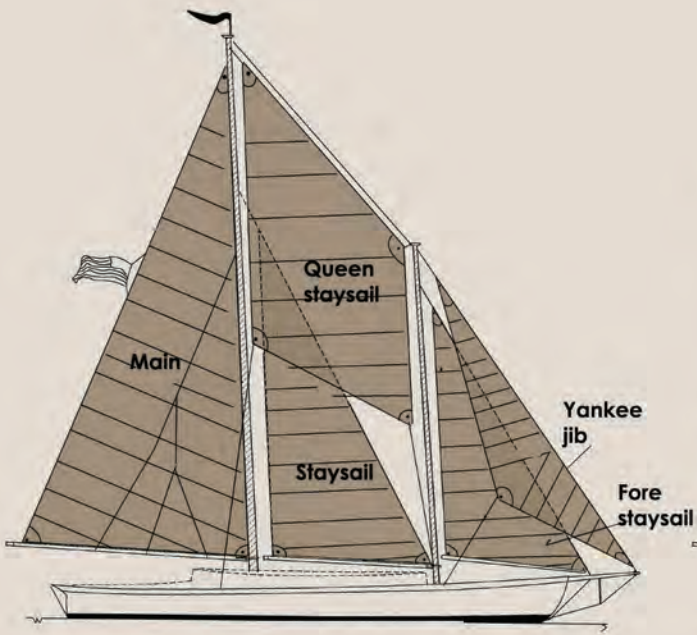
GAFF MAIN TOPSAIL SCHOONER



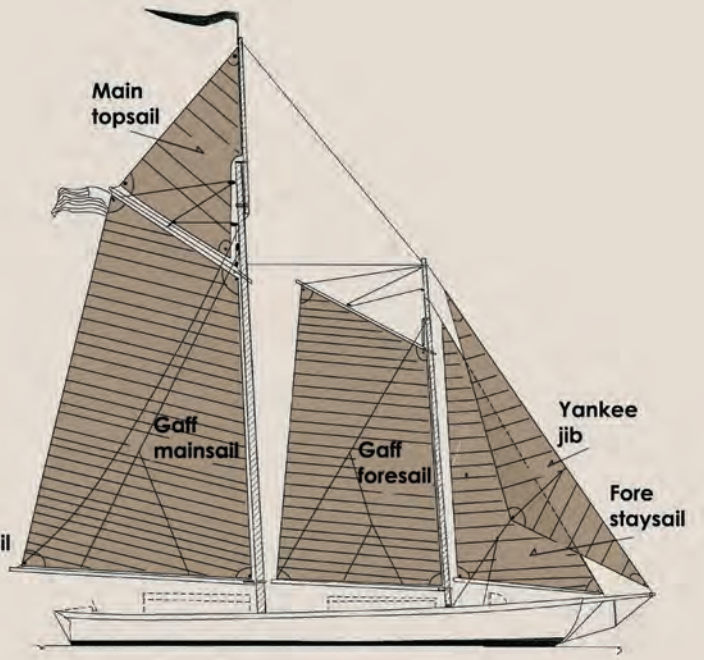
SLOOP WITH "LP"



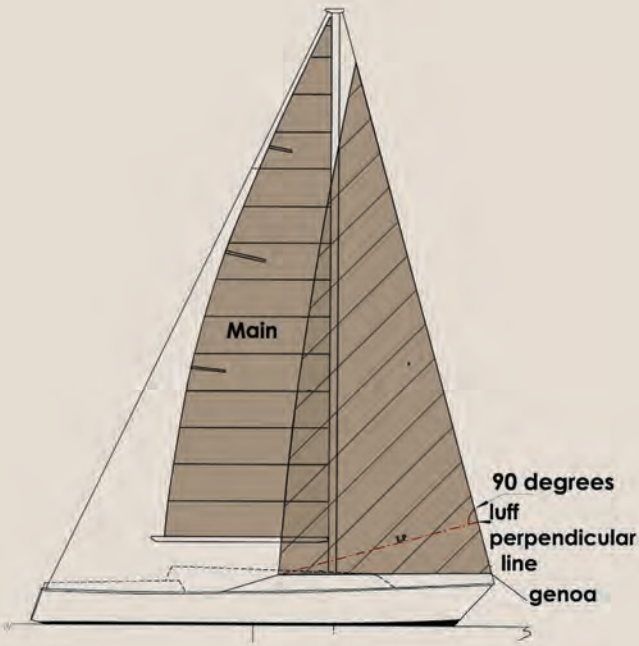
CUTTER



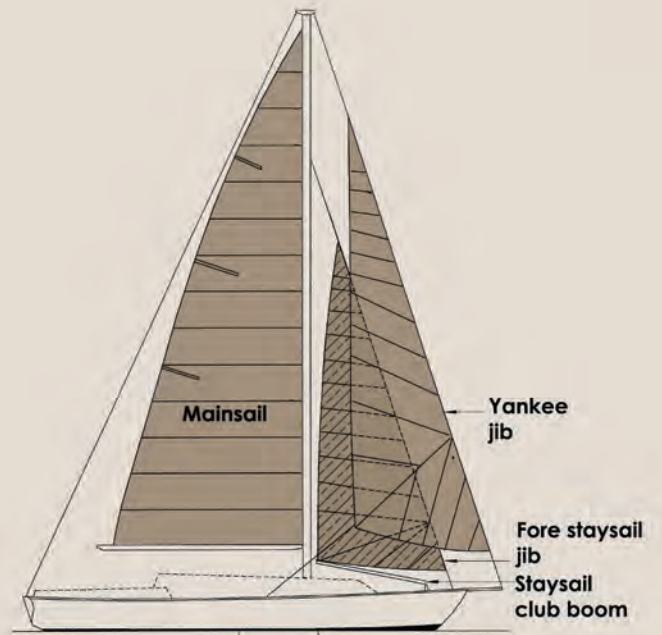
DOUBLE HEADSAIL KETCH



YAWL



GAFF RIGGED CATBOAT



CAT KETCH WITH WISHBONE BOOM

some big schooners sailing with three or more masts. Just call the boat a schooner and forget about what all the masts are called because no one will really care.

What are the advantages of a schooner rig? Schooners were the cargo carrying tractor-trailers in the days before engines and paved roads. Even after the advent of the railroads in the early 1800's, schooners were still the only way to carry cargo and people to places without rail service. Although the schooner rig was developed in Europe, the rig was embraced and perfected by Americans. Unlike square-rigged vessels, a schooner can sail much closer to the wind. Right up to the 1930's, schooners without propulsion engines were still carrying cargo up and down the coast and into rivers that a modern sloop would find hard to sail in. In spite of all of its sails and lines, a schooner is a remarkably easy and versatile vessel to sail. Most schooners have no deck winches to crank since most of the sails are self-tending. In addition to all the sail combinations for heavy weather, a schooner can double its square feet of sail with light air sails. There was a saying that the only crew a big cargo schooner required to sail the boat was "an old man and a boy." Of course that was after the combustion engine was invented, and the schooners carried a gasoline donkey engine up on the bow to hoist the heavy sails and weigh the anchors. The famous racing schooner "Nina," built in 1928, won the Queen of Spain Cup in the race from New York to Santana, Spain, and also won the Newport to Bermuda race thirty five years later, in 1962, against a fleet of modern sloops. In my not so humble opinion, I think that a schooner is a handsome sight on the water under full sail. The entire course of my life changed forever one Saturday in 1964 after my first sail aboard the schooner "Hindu" with captain Justin Avalar in Provincetown, MA. I have designed several schooners over the years, but I have not had the opportunity to build one... yet.

The disadvantages of the schooner rig.

A schooner can be an intimidating rig for a novice. At first glance, there are many lines and sails to deal with. Hauling up the heavy gaffs and sails on a gaff rigged schooner can be hard work. On the last two wood schooners I have owned, I hid a halyard winch



The Schooner "Hindu" in Key West, Florida

on deck to help hoist the heavy throat halyard on the mainsail. I had the "old man" down pat, but I lacked the strong "boy." Perhaps the biggest disadvantage of a schooner rig, when compared to a modern rig, is the short foremast that affects windward performance. Windward sailing is a function of the length of the "luff," or leading edge, of a headsail or jib and the low foremast prevents a long luff length. Even with a foremast top mast, the multiple headsails are not as efficient as one long, big jib or genoa for windward pointing. Depending on hull shape, a schooner will only point 45 to 50 degrees into the apparent wind. However, on all other points of sail a schooner is a very impressive rig. Of course, the compulsion to buy a parrot and wear an eye patch when sailing a schooner can be difficult to control.

CATBOATS

A catboat is a single-masted boat with the mast stepped up in the bow. One large sail is attached to the mast on a very long boom. Almost all catboats are shoal draft with a large centerboard. Also, most catboats are gaff rigged. At the turn of the 20th Century it was not uncommon to see catboats in the 30 to 40-foot range, but by the 1960's most catboats being built were much smaller. One of the more popular catboats was the 12-foot Beetle Catboat. The

Beetle family had been famous for building longboats for the whaling fleet in New Bedford during the height of the whaling industry. When whaling declined, the Beetles turned to building commercial fishing boats. In the 1920's they came out with the Beetle Cat, and the boat was a huge success. Amazingly, the wood hulled Beetle Cats have been in constant production right up to the present day, with thousands of Catboats built. Breck Marshall took the new building material called fiberglass and introduced the Marshall Cat.

The fiberglass Marshall cats are also still popular and can be found in most harbors in New England. The fact that a new wood Beetle Cat or a new Marshall Cat can still be purchased after so many years says a great deal about the popularity of catboats.

What are the advantages of a catboat?

With only one sail, there is very little work in getting the sail up, even though the boat is (usually) gaff rigged. The shape of the centerboard hull, lacking a keel, makes putting a small catboat on a trailer very easy. The shoal draft hull allows catboats to be sailed right up on the beach. With only three stays holding the mast, setting the boat up is simple. Catboats are quite beamy for their length, which makes them stable; it takes a great deal of careless effort to knock one over, even though it has no ballasted keel.

What are the disadvantages of a catboat?

In spite of the theory that one big sail is more efficient than multiple sails, a catboat doesn't point to windward very well. Also, it takes a surprising amount of effort to hold the tiller or wheel when beating into the wind. The big sail on a catboat is quickly overpowered when the wind pipes up, and reefing early is a must. I learned how to sail on a Beetle Cat, and I was surprised to discover, when I finally got the chance, how much easier it was to sail a conventional 15-foot centerboard sloop. For many years, I thought the problem was the gaff rig until I sailed a 25-foot catboat with a Marconi rigged sail. It sailed worse than a gaff rigged catboat. It is impossible to rig a light air sail on a catboat, because the mast is right up in the bow and the boom reaches the transom. I have a soft spot in my heart for catboats, but I think the rig makes a strong argument for having at least two sails on a recreational sailboat.



The Cat Ketch

CAT KETCHES

Cat ketches, much like the big tail fins on automobiles in the 1950's, had their day and then passed into history. However, there are hundreds of happy owners still sailing cat ketches. Gary Hoyt revived cat ketch popularity in 1975 when he introduced the Freedom 40. I have the pleasure of knowing Hoyt, and he is easily one of the most innovative people in the sailboat business. His original intention for the Freedom 40 was to create a sailboat that was "free" from all the sail handling work and mechanical complications that were permeating, in his opinion, new sailboats at the time. The original Freedom 40 had two masts, roughly the same height, with the foremast stepped up in the bow like a catboat. There were no big headsails to winch, and the conventional booms were replaced with "wishbone" type of booms. The two halves of the wishbone boom were hinged, the sails wrapped around the unstayed masts, and the wishbones could be opened to create big downwind sails, avoiding the need for a labor intensive spinnaker. There was no engine on the original forty-footer; the boat was propelled, when not sailing, by two big 18-foot sweeps, or oars (the beating drum was optional?). Without an engine to charge the batteries, there was

no electricity aboard, so oil lamps provided all the illumination. Every available space below was filled with foam to make the boat unsinkable. Unfortunately, Gary had to sacrifice some freedom to sell boats, so an engine and other complications were quickly added to the model. Both the rig and the wishbone booms made a lot of noise in the late 1970's. Hoyt's background in advertising and marketing didn't hurt the effort to hype the rig. Soon there were several copycat (pun intentional) companies building boats with wishbone booms and unstayed masts.

What are the advantages of a cat ketch?

Once the two-part wraparound sails were abandoned and some reefing issues were resolved, the cat ketch was easy to sail. The theory behind a wishbone boom, to optimize ideal sail shape, is sound. And the need to muscle winches every time the boat tacks is gone, because there are no head sails, and because both sails on the cat ketch are self-tending.

What are the disadvantages of a cat ketch? Like a single-masted catboat, the lack of head-sails adversely affects windward performance. Light air sails are also problematic, although a staysail can be rigged off the aft mast. Furling the sails is another issue. The wishbones require a lot of lines and strings to catch the sails when they are lowered. The evolution of dependable roller furling and two speed, self-tailing cockpit winches for conventionally rigged boats has made the cat ketch's advantages somewhat moot. It was another time and place in sailing history, and I am glad to have witnessed the admirable attempt by Gary Hoyt to make sailing easier.

Sailboats under 25 Feet

While not exactly nautical and glamorous, one of the big issues concerning size is a toilet or "head." Unless you are only going sailing with a bunch of men, buy a boat with a toilet. Most women are far too civilized and intelligent in the 21st Century to use a bucket and are somewhat physically unsuited to urinating over the side. Besides, with the possible exception of the women working in the public men's rooms in Europe, most women don't find watching men urinate a pleasant experience. The same principle holds true for day-

sailers. They should call these small sailboats "hour-sailers," because that's about as long as you go before someone has a call of nature. I am sure that I could plot a graph on the distance a toilet-less boat will travel, based on the number of people aboard multiplied by the amount of liquids consumed two hours before leaving the dock. I don't think that I even need to get into bowel movements to make my point. If you are looking for total solitude, or an exclusively male or female bonding experience, buy a boat without a toilet "head". Unless you have a sailing friend or a yacht club connection, getting started in the sport of sailing takes a little perseverance. The basics of learning how to sail are surprisingly simple. Many good sailing schools will get you past any apprehensions you may have about the skill required to sail. Once you know how sail, if your budget only allows for a very small daysailer, buy it. Anything is better than just sitting on a bridge or a beach wishing you were out on the water sailing. An ironing board with a window shade for a sail would be far superior to watching the boats, and your life, go by. A performance daysailer or a popular racing boat like a J24 will provide great fun within the context of its intended use. However, once the money issue is put aside, there is nothing "easier" about small sailboats. For those who want to take family or friends out sailing, "small" is hardly ever "easy." I have already mentioned the 19-foot Cape Dory Typhoon as an excellent boat to get started. A Pearson 26 is another boat that has put thousands of people on the water. Both boats have a ballasted keel for stability, and a "head" to lengthen the time you can be on the water. Unfortunately, the one "price" of a deep ballasted keel sailboat is it that it is very difficult to trailer, and as a result, it may require a slip in a marina or a mooring, which can be expensive.

A sailboat that can be trailered reduces slip or mooring expense, but unlike a powerboat, requires a certain amount of effort to set it up before the fun can begin. Putting the mast up or taking it down, putting the sails on or taking them off, getting the boat on and off a trailer, and doing all this on a slippery boat ramp every time you want to go sailing takes a certain amount of patience. If it is your only option, it is still far better than watching television or chasing a ball around a hot golf course. If

A Story

A million years ago right after my first sail aboard the schooner "Hindu" in Provincetown, I tried to teach myself how to sail by buying a "how to sail book" and renting tiny Sunfish sailboats. At that time, I did not personally know even one person who knew how to sail. After flipping boats over and getting hit in the head with the boom dozens of times, I knew I had a challenge in front of me in order to master the art of sailing. Based on the lumps on my head, I wondered whether a football helmet was an optional piece of equipment that should have been included with my rentals. My low point in self-taught sailing was taking a girl out with me to impress her with my sailing prowess and not being able to get the Sunfish back to the dock. Finally, after numerous attempts and several capsizes, I had to drop the sail and go in the water at Montauk harbor and tow the Sunfish, while swimming, to get the damn boat back before my rental expired. The harbor was loaded with big sport fishing power boaters who relieved their monotony by laughing and cheering as I stroked by their boats. Needless to say, the young lady was wet, cold, and definitely not impressed. The experience was topped off by the rental guy, who gave me more grief because I had assured him I knew how to sail before he rented me the boat. I began to think that I was not cut out to be a sailor.

By a fortunate twist of fate, I received a free trip to Bermuda through a college program the following spring. I was standing on a pier in the town of Hamilton, in a light rain, when a sloop rigged sailboat, about 30 feet long, came sailing smartly right up to the edge of the bulkhead, not far from where I was standing. The boat turned up into the wind, and a black man stood up and asked if I wanted to go for a one hour sailboat ride for 25 dollars. I told him if I had 25 dollars I would have been at the shops with my friends instead of standing in the rain. "How much you got?" he yelled. I thought about it for a minute and replied, "What about \$10 for a sailing lesson?" He shook his head and looked up and down the mile long bulkhead. Because of the weather, I was the only person in sight. Reluctantly, he pointed over to a floating dock, filled the sails, and took off. I ran over to the float and watched him sail back at great speed, round up, and place the boat right next to me.

Thanks to the kindness of a stranger, and the poor weather, my one-hour lesson turned into over three hours of incredible experience for only 10 dollars. The boat had no engine and had been bought by my wonderful teacher many years before as a wreck from a hurricane. The wood sloop had a ballasted keel and took the gusty wind without any difficulty. I had the tiller the whole time, with him giving me instructions and advice, all with great patience. We sailed between the small islands in Hamilton harbor, and all my questions and apprehension about sailing disappeared with the blowing wind. I have never looked back since that rainy day over 40 years ago. Five years later, I captained a sailboat the 700 miles offshore from New York to Bermuda. After arriving, I looked hard for the kind Bermudian instructor who had changed my life for 10 dollars to thank him, but sadly, I could not find him.

One of the important lessons I learned from this experience was that trying to learn how to sail in the wrong boat is a masochistic exercise. "Small" sailboats do not always make learning easy, because every error is magnified and punished by flipping the boat or scaring the hell out of you. A ballasted keel boat is forgiving and stable. Also, a competent instructor really makes learning how to sail a fun, hassle-free experience.

I taught both my daughters how to sail in an old 19-foot Cape Dory "Typhoon" sloop with a full ballasted keel. My oldest daughter, Erin, has been my first mate on numerous offshore voyages on Shannon's since she was 12 years old. My youngest daughter, Bridget, sailed the old Typhoon, many times alone, from age 11 until she left home to attend college. Sailing can be a real family bonding experience if you make it fun, with active participation by everyone, especially your children.

RELAX IT'S ONLY A BOAT

you're trailering, be careful not to get a boat that is too big and heavy. Stepping a mast (putting it up) requires two people, one to hold the mast up and the other to hook up the rigging. Look up to be sure you don't hit any electric lines with the mast! It also takes two people to get the boat on and off the trailer, one with some agility to handle the boat and a second person to pull the trailer on and off the boat ramp. Thousands of people have great fun every weekend with sailboats that are trailered to the water. The key factors are understanding, some practice, and another motivated person.

INBOARD VS. OUTBOARD POWER

Both methods of propulsion have their pros and cons. Obviously, a sailboat with an outboard motor is going to cost less than one with an inboard engine. Today, most small sailboats have inboard diesel engines that cost considerably more than a gas powered outboard. In addition to the cost of the diesel engine, there is the expense of starting batteries, inboard fuel tanks, electrical connections, etc. The good news is that you just turn a key and the dependable little engine starts up to get out of a slip, or home when there is no wind.

It takes some practice to get the hang of a single "screw" (propeller) boat. Since many people buying sailboats under 25 feet are just starting out, the issue of docking and handling adds another dimension to the learning experience. The sailing part is easy to learn, but the powering part can be a challenge to the novice. At first glance, it may seem logical that learning boat handling under inboard power on a small boat makes sense than starting out on a larger vessel. However, the smaller the boat, the harder it is to move around to grab dock lines or a mooring pennant. Small boats are tippy, their side decks are narrow, and they can blow around like a leaf in the wind. Also, a light boat has little forward "carry" or glide, so power has to be carefully controlled. When the engine shifts to neutral, the small boat has very little inertia. Carry is an issue on small boats, both inboard and outboard powered.

With a small sailboat powered by an outboard engine, the propeller turns with the engine, which can



make the boat is easier to handle when docking. In either forward or reverse, the outboard propeller takes the dominant steering role over the boat's rudder during tight maneuvering situations. Of course, this nice feature of outboards only works when the outboard is located in an easy to reach location. If you have to hang off the transom to control the throttle and shift controls on the outboard while trying to keep the tiller/rudder straight with your foot, the whole easy steering notion goes down the proverbial drain. The location and ease of access to the controls on an outboard engine are critical concerns. While I am no big fan of outboard motors (it's a generational thing), I think an outboard motor, properly placed and easy to reach, is a good solution for most folks with a sailboat under 25 feet. Before you buy such a boat, be sure to actually sit in it and imagine trying to get into or out of a tight slip while reaching, turning and controlling the outboard.

Sailboats 25 to 35 Feet

INTERIORS

It might not always be the best plan, but for most people the major qualifier for deciding what sailboat to buy over 25 feet is the interior layout. It may have something to do with our early ancestors struggling to find the right dwelling. If the cave looked roomy and spacious, it didn't matter that a gigantic cave bear was also looking for the same type of accommodations. Strangely, considering that we spend about one third of our life sleeping and two thirds of our time awake, the number of sleeping bunks on a boat often has a higher priority than other considerations. The question, "How many does it sleep?" is the constant mantra at every boat show. So, bowing to market pressure, yacht designers learned a long time ago that they had to jam as many bunks into a sailboat as possible. It doesn't seem to matter if the bunks are too narrow and short for actual sleeping, it's quantity not quality that counts. I am not sure why a husband and wife with two children must have a sailboat that has six so-called bunks. Who are those two other people who must have a place to rest their heads? Perhaps it is a throwback to leaving some space for a grouchy, itinerant bear who may want to join the voyage.

A single bunk in a boat must be at least 30 inches wide and 6 feet, 5 inches long to allow a normal American a good night's sleep. You notice I used the term "American," because Europeans boat designers have a whole different attitude about space. People in Europe often have smaller cars, tiny apartments, cramped showers and even smaller elevators. It's not a question of physical size, it's an attitude. Americans like things to be big, including stuff like cheeseburgers and super size fries.

A conventional double bed in a house is 54 inches wide, but a double berth in a boat under 35 feet usually struggles to be even 48 inches wide. Any "double" berth that is much less than 48 inches might be fine for copulation, but it's a terrible place for two adults to actually sleep. One design solution to this bunk problem is something called a "convertible settee berth." The theory is that people sit on the settee to eat and relax and then put pillows and blankets

down to use the settee for a bunk. It's a great utilization of space, except that a comfortable seat should be about 20 inches to 22 inches wide, and, as I mentioned, a sleeping bunk should be 30 inches wide. So, a good seat makes a terrible bunk, and a good bunk makes a poor seat. What do you do about the 10 inch gap between a seat and a bunk? A boat should have slide-out settees to adjust for sitting and sleeping. If a settee berth doesn't slide or adjust somehow to provide the proper width for sleeping, don't use it while you are counting berths at a boat show, or you will be disappointed. This is especially true if you have been eating a lot of super sized fries.



The vee berth

The "vee berths" up in the forward section of a sailboat have another set of issues. If the vee berths are less than about 6 feet 5 inches long, there is going to be a foot space problem. An average sized man and woman will be tangling feet all night long at the narrow, forward end of the bunk. The culprit is the pillows, which suck up about 6 to 8 inches of length, giving a 6 foot 2 inch bunk only about 5 feet 6 inches of useable lying down space. Unless you're Japanese and can sleep with your head on a small block of wood, you have become accustomed to putting your head in the middle of a pillow, not pressed up against a headboard or bulkhead. Even lovers and newlyweds grow quickly bored with banging feet in the middle of the night. Two straight men will find the vee berth experience even more disconcerting, especially if one of them has

a question about the sexual preference of the other. ***Vee berths should be at least 6 feet 7 inches if two adults are going to be using the bunks.***

“Quarter berths” are found aft in many sailboat interior layouts. Most quarter berths have access only from the front, which means you climb into the berth and then have to turn around to sleep. It is common to call these berths “doubles” meaning two people can theoretically sleep side by side. If you are young, thin and agile, it is possible to climb into the quarter berth headfirst and then turn around without waking someone who is already sleeping in the bunk. Of course you must then retrieve your pillow and hope it does not fall out on the sole (floor) during the night. It is not uncommon to find quarter berths somewhat jammed under the cockpit, leaving very little space between the cushion and the overhead, making the turn-around maneuver even more interesting. If you or your partner has to use the head during the night, resulting from too much liquid consumption before bedtime, the climbing out and back in without disturbing the other sleeping person is next to impossible.

Be realistic about how many adults, teenagers and children are actually going to be sleeping aboard and for how long. It's far better to have four good bunks than six poor ones, if you are only going to have occasional guests. Adult guests are generally a pain in the ass because they will probably be uncomfortable no matter how much you struggle and no matter where you put them. Teenagers are usually very flexible about sleeping aboard a boat, and cushions on the cabin sole (floor) or out in the cockpit can be an adventure rather than an inconvenience. Several children can pack into a double berth, a vee berth, or a quarter berth, although there is probably going to be more noise than sleep. While we are on the subject of juveniles on board, very small children have to be watched carefully to prevent them from falling off a companionway ladder or wandering out into the cockpit and going into the water.

While it may seem obvious, make sure you bring a tape measure with you at a boat show or on a boat inspection. Don't take a salesperson's word for how wide or long a berth is, because there is a real chance that that person has never spent a night aboard any boat. And please resist the compulsion to



Berth configurations

jump on a bunk to “try it out” during a boat show. It's a nightmare for the poor folks working the show to have people or kids jumping into the bunks. Unlike automobile shows, which are primarily designed just to display new car models, boat shows are set up to actually sell boats at the show. Most of the salespeople who work boat shows are there on a straight sales commission basis, meaning they only get paid if they sell a boat. It is tough enough to spend four or five days, ten hours a day, answering questions and not selling anything, without having people tearing through a boat jumping on the bunks.

I've worked boat shows for forty years, all over the county, and believe me when I say that it is very hard work even when you're getting paid. It is the only

place in my life where some fool can say any rude and insulting thing to me without my being able to respond appropriately with a slap.

THE "HEAD" OR LAVATORY

As you may know, we call the bathroom on a sailboat the "head," because back in the days of "iron men and wooden ships" a crew member had to make his way up into the bow or head of a ship and hang his ass over the side to respond to a call of nature. To make the experience really gruesome, urine was collected in buckets to be later used for bleaching the clothing of the officers. The crew may have felt a certain amount of revenge every time they filled a bucket for having to go up in the spray and cold.

Fortunately, historical progress gave us running water in houses, and the chamber pot stored under a bed was replaced by a "water closet" or "WC." It is still not uncommon to see "WC" as an identifier for the head on some boat interior layout plans (I still use it). In the 19th Century a person named Crapper filed a patent for a flush toilet, giving us both a sanitary invention and a polite substitute for the word bullshit.

Today, the civilized private space that has a flush toilet and a sink is still called the "head" on sailboats (although, powerboat people call it the bathroom). We have also overcome the historic belief that washing is unhealthy because it removes natural body oils, so it is common for a head to include a shower arrangement of some sort. The desire to have the toilet area separate from the shower area, as in a house is understandable, but unfortunately, it is difficult to fit (and a big waste of space) a separate stall shower in a sailboat under 35 feet. My personal choice for shower accommodations in a sailboat is to have a lift up cover that converts to a seat over the toilet. A well placed shower curtain protects the rest of the head area from spray. Of course, if the plastic shower curtain is too close to the person showering, we end up with an "attack of the shower curtain event," where the curtain grabs hold of and clings to a wet human body like the wrapping on an Egyptian mummy.

An important concern about a toilet design is that the average person requires 24

inches of shoulder width and a minimum of 12 inches of foot room in front of the toilet. Since boat toilets as narrow as 15 inches wide can be purchased, it is not unusual to see a small toilet jammed into a space that's too small for an adult. While better than clutching the roller furling gear while hanging off the bow, or using a bucket, people don't appreciate the wedged-in experience. Some sailboat designs force the toilet to be pushed up on the hull, making it too high. It's tough to use a toilet if your feet are hanging inches off the floor. Finally, most toilets are placed facing inboard, so the user is leaning back on one tack when the boat heels and falling forward on the opposite tack. It is important to have hand-holds or a bulkhead to brace against, keeping you on the seat. At a boat show, unlike rude jumping on the berths, it is not objectionable to sit on a toilet and try it out for "fit" at a boat show. I realize that using the disgusting portable toilets found at most in-the-water boat shows is probably worse than the old days of going to the bow of a sailing ship, but you still should refrain from using the heads on the boats at the show for actual "testing."



The Galley

SINKS

Depending on the size of the boat, the galley always reflects a series of compromises on sailboats boats under 35 feet. One important issue is the placement of the sink. The sink should be located as close to the centerline as possible to prevent seawater from backing up into the sink as the boat heels. Of course, the sink drain thru hull should also be placed near the centerline, protected by a marine grade seacock (not a screw type gate valve) to shut the drain off at the hull.

If the sink is located outboard on the side of the boat, a drain pump or a gray water tank must be incorporated into the drain hose. Remembering to shut the drain seacock off when sailing and to open it when not sailing gets boring fast. Another solution to the draining problems of an outboard sink is a “check valve” in the drain hose, but check valves tend to jam with galley debris and only work well when placed in an absolutely vertical or horizontal plane.

A shallow sink, less than 8 inches deep, is a real pain in a sailboat, because the dishes don't fit and the water sloshes out when the boat heels or rocks. For some unknown reason, most plates and dishes have a 10 inch diameter, so 8 inches is almost not enough depth. Dual bowl sinks look good at a boat show, but if the sink bowls are too small, they are a waste. Interestingly, during the time when sailors were crawling up to the bow to get their collective asses wet, dishes were square instead of round, because they stowed better. That's where we get the saying “three square meals a day.” I don't know why some enterprising soul has not come out with a line of square sailboat dishware, because the stowage of dishes on a boat still remains a problem 200 hundred years later.

The sink should have a manual hand or foot pump as a backup to an electric pressure water system. If the pressure water pump fails (and it will someday), it is almost impossible to access any of the water in the boat's tanks. A foot pump is best, because it frees up both of your hands. The manual pump is hooked up to the cold water line before the pressure pump. An inexpensive in-line water filter should also be placed in the hose to prevent any debris



The double sink

from clogging the pumps.

WATER TANKS

A frequently asked question when making a boat purchase is “How much water does it hold?” ***While water tank capacity is important, it is more important to realize that one should never drink water from boat tanks.*** After 40 years, I am very sure about the poor quality of the water found on most docks in marinas and about the cleanliness of the water tanks. Sipping water out of a street drain in Calcutta is probably healthier. Glasses, cups, pots and dishes should be rinsed with boiled water after cleaning. Boat tank water is barely acceptable for washing your hands, assuming you use anti-bacterial soap. I firmly believe that bottled water should be used for drinking, cooking, dish and pot washing, brushing teeth, and cleaning any cuts or injuries. I am not even really sure about the quality of bottled water sold in stores. I can't help wondering if some grunt isn't just filling the bottles out of a dirty garden hose connected to an uninspected and untested well. Regardless, bottled water has to be safer than boat tank water. The alternative to lugging gallons of bottled water aboard is to have a sophisticated water purifier and filter system installed. ***Now that bottled water is twice as expensive as gasoline, more exotic and effective water filters are coming on the market.***

THE ICEBOX

A top loading icebox, whether it has a refrigeration unit or not, presents another set of issues. We use built-in top loading iceboxes on sailboats because the side loading styles allow the cold to escape when the side door is opened. This is not usually a major problem on powerboats, because the engines and generator are always running when the boat is not plugged into shore power. However, on a sailboat the cold air must be trapped in the box to prevent the ice from melting too quickly or the refrigeration unit from running too much, depleting the batteries. Since cold air goes down



Top and bottom loading icebox

and hot air rises, the door on the top of the icebox makes sense. The problem is that most galley counters are about 34 inches high, and homo sapiens don't have arms as long as orangutans to reach the bottom of the box. Icebox "diving," trying to reach something on the bottom of the box, has been a complaint of my wife for many years. A side door in the icebox is a nice feature to reach the stuff in the bottom, but it should be equipped with a latch hidden inside to prevent quests and kids from repeatedly opening the side door

letting the cold out. Lacking a side door, the hatch on top should be big enough to really get your head and arms into the box to reach the bottom. A folding step is another nice feature to help reach the bottom unless you are a professional basketball player. And finally, the icebox drain should never drain into the bilge. A quart of milk that spills in the box when the boat heels and makes its way into the bilge is a smelly mess that is very difficult to get rid of and very conducive to seasickness. It is also good idea to place a stopper or plug in the icebox drain, because cold air, like milk, will escape down the drain.

The insulation around an icebox is a major component in determining how long ice will last or how often the refrigeration has to run. On many older boats the insulation is generally poor to non-existent. Styrofoam insulation was once common and installed with only about 3-inch thickness all around. Then, just to make sure you could watch the ice cubes melt before you could get them in a glass, the iceboxes were placed near the hot engine. Market pressure from non-British buyers who like to drink cold beer caused the marine industry to switch to urethane foam, which has a much higher insulating factor. It was an improvement, but there still wasn't enough urethane foam thickness. A good icebox, refrigerated or not, should have a plastic vapor barrier on the outside, about one inch of air space, and then at least 4 inches of urethane foam covered by a fiberglass or Formica liner. Unfortunately, using five inches of space all around the interior volume of the icebox is difficult, because either the useable interior space becomes too small or the whole box becomes too large. Since most sailboat buyers only look inside the icebox for volume and fancy shelves, insulation thickness has been compromised by many builders. To gain interior volume, I have used 2-inch vacuum bagged exotic insulation that is supposed to be superior to 6 inches of conventional urethane, but the stuff is incredibly expensive and very difficult to install.

STOVES

In my opinion the only safe cooking fuel on a sailboat of any size is propane. A properly designed

propane system including a switch near the stove to shut the bottles off at the remote bottle locker and a safety sniffer is the only way to go. I have been installing propane stoves on Shannons since 1975 without incident.

All of us designing boats over 30 feet cram in stoves with ovens because it sells boats—not because it is an especially good feature. The reality is the oven is rarely used except for diehard live-aboard folks who enjoy freshly baked bread.

Sweating in a hot kitchen while trying to bake a pie is what most women and some men go recreational boating to avoid. Although I have sailed with a couple of women and one man (Monk Farnum) who were able to put gourmet restaurants to shame using the oven. Typically, the oven becomes a place to stash pots that are seldom, if ever, used. It would be far better to use the space below the top burners for really effective galley and food storage. Personally, I like to use the space for a microwave oven that cooks faster and without heat. I have even rigged up gimbaled microwave ovens that swing with the burner top. Using a 12 volt DC/120 AC inverter to power the microwave does not suck up much battery juice because it runs for only short periods. If battery capacity is a concern, start the engine for the few minutes the microwave is running. There is nothing better than a hot bowl of chowder at 2 AM that only took two minutes to prepare. Being able to “nuke” food instead of actually heating and/or cooking, has kept my wife sailing with me for the past twenty years.

Here's a food tip that I have been using for over 30 years on my offshore passages. First, my wife makes fabulous meals at home like pasta, stew, chowder etc., which she then divides into individual servings and puts into special boilable plastic bags that are sealed with an electrical heat-sealing device made by several manufacturers. The one she uses is called “Select Seal and Save” made by Kenmore. These individual meal bags are then put into the house freezer and turned into ice bricks. For a trip, we then load them into the boat icebox or refrigerator. When it is time to eat, we just boil water and drop in a meal bag. A boat that has a microwave aboard makes the whole process really fast. If I am running watches, then those who are ready to eat get a bag. In a few short minutes, they are eating a great meal and have not dirtied one pot,



A vacuum sealer for preserving food

since the food is heated right in the plastic bag. During storms and general bad weather, I have been known to eat my chow right out of the plastic bag, but usually we dump the food onto paper plates. The water we use to boil the bags is then used for making coffee. I realize that this may seem very uncivilized, but I have never had a complaint from any crew members. In bad weather, no one wants to be screwing around in the galley trying to get everyone fed at the same time or struggling with dirty pots and dishes. Home cooked food and no hassles. Plus, the frozen food ice bricks help keep the icebox cool. And finally, just to make the approach more appealing to me, the plastic bags are rectangular, not round, so they pack and stow easily.

GARBAGE

When I am on a long offshore boat passage I'm always amazed at how much garbage we people in the Western World generate. It is no wonder that dump sites all over the country are packed. A few weeks ago, I was on a road trip to one of my wood boat projects, and we stopped at a drive thru window at a McDonald's fast food joint for lunch. It is unbelievable how much garbage four men could create from just one lunch! We had burger boxes, paper wrappers, plastic cups, cup trays, napkins, straws and other debris all over the truck. The whole inside of the vehicle looked like a US Federal Super Fund contaminated landfill site.

If we had stopped at an old fashioned diner or restaurant and eaten the same lunch, we would have only created four paper napkins as garbage after the plates and glasses were washed. For larger yachts with a 120 volt AC generator and space we have installed household trash compactors which helps the volume issue. I really don't have any special advice about dealing with garbage aboard a boat except not to throw it in the water. I just wanted to comment here on how wasteful we are when dealing with waste.

DISH, POT AND FOOD STORAGE

Since we still don't have square dishes, like those of the old square rigger days, and since pots also happen to be round, storing dishes and pots in rectangular lockers creates a great deal of wasted space. To aggravate the problem, we also put food and drinks in cans and bottles that are also round. I completely understand why cups, glasses, and rum bottles are round, enabling them to be easily held in our hands and brought quickly to our lips. But, I am completely mystified why a cooking pot or a can of beans is round. Personally I have never had the need or desire to take a sip out of a can of beans or a hot pot. Unfortunately, we are stuck with our evolutionary compulsion to make food things round, so we are stuck with trying to fit these things aboard a boat. Of course the big exception to the round shape is a cereal box, but unless you are under 10 years old or happen to like the taste of buffalo chips floating in milk, there is not much call for major cereal box stowage.

Basically we are stuck with the "cram and slam" technique for galley stowage aboard a sailboat. Well thought-out dish lockers can be helpful, along with hooks to hang coffee mugs and keep these items from crashing around the boat. Frying pans and pots can be stowed in the seldom-used oven if the boat has one. My wife enjoys cooking on a boat using a frightening thing called a "pressure cooker," which is not only round, but also big and heavy and has the added attraction that it could blow up if the little pressure relief gizmo gets stuck. The chow is great and fast to cook, but the miserable pot has given me nightmares over the years trying to find a place to stow it. Unless you are into gourmet cooking on a boat, it is possible to get

away with only carrying four pots aboard: a small frying pan, a 2 quart pot with a top, a one quart pot that stows in the 2 quart pot, and, of course, a coffee pot. I know that this pot selection will sound like "camping out" to many, but I have seen far too many boats with fancy pots and pans that have not been used for years stuck in every nook and cranny

LOCKERS AND STORAGE

Regardless of the size of a sailboat, there never seems to be enough useable storage. Once mass marketing got a firm grip on the fiberglass sailboat industry, it didn't take yacht designers long to respond to the pressure for a "big spacious" interior. The easy solution was to push everything below out to the hull to create the impression of volume below. The casualty of this wide open look was that hanging lockers, storage lockers, and drawers became very shallow. And speaking of hanging lockers, too many of them were installed, all over the interior, because they are cheap to build and look good at a boat show. If you are living aboard a sailboat for months at a time, there is a need for an unlimited number of hanging lockers. However, most people use their sailboats on weekends and occasional two-week vacation cruises. Other than some dress clothes for dining out that are put on hangers, the space taken up by a hanging locker is not conducive to general storage. People tend to bring underwear, socks, tee shirts, hats, shorts, bathing suits, jeans and all sorts of fun, casual stuff for a boat trip. None of these stow very well in a hanging locker. It is possible to install shelves in a hanging locker to make it more practical, as long as you don't open the big door when the boat is heeling.

Storage space below is subject to mildew and dampness. Since most fiberglass boats are built using an IGU (interior glass unit) liner for the interior foundation, there is very little opportunity for the free flow of air. Borrowing a shirt from some smelly "wino" who has spent the night sleeping on a park bench in the rain, has to be far more pleasurable than taking a clean shirt out of a locker on many boats. Clothing, along with bedding material, sucks up dampness like a sponge. Any fabric that is shut up in a locker or drawer for more than a few days on a boat may become

unusable for those not used to sleeping in a cardboard box at night. My wife has purchased an assortment of different sized plastic zippered storage bags to encapsulate clothing that is stored in lockers and drawers for any length of time. Since I totally lack a civilized approach to the problem, I tend to leave my clothes in my seabag and stow the duffle on the cabin sole at night and on my bunk during the day. It's not pretty, but my shirts and shorts are dry when I need them. Cabin fans are an inexpensive solution that goes a long way to reducing dampness and mildew. Although fans may not be attractive or quiet, they move air, which is the major key to repelling dampness. Of course, for fans to succeed, the lockers and drawers cannot be shut tight. Even tiny computer cooling fans can be placed right inside a clothes locker, if the locker door has vents or louvers. The point of all this talk about dampness and mildew is that all the stowage lockers, hanging lockers and drawers placed all over the boat are worthless if they are not ventilated effectively

VIDEO: Ventilation is critical

Sailboats 35 Feet and Up

Everything I've said previously about sailboats from 25 feet to 35 feet applies to all sailboats, regardless of size. The real difference is that a bigger boat will have more cabins and bunks. And, no doubt, it will also have more complicated machinery that will eventually break. It is my opinion, based on real world experience, that 60 feet is the upper limit in boat size that two average, middle-aged people can safely handle. Beyond 60 feet, additional crew is a constant necessity. Forget about depending on teenage children or enthusiastic friends, they are always busy doing something else. The paradox for those that can afford big yachts is you need a boat larger than 85 feet to have paid crew aboard. There is nothing worse than to be jammed into a yacht with disgruntled employees. Who says that the rich have it easy?

VENTILATION

Obviously, it's nice to have private cabins if you are expecting to travel with guests or teenage children. However, jamming multiple cabins into a sailboat can turn the interior into a claustrophobic, damp, fun-house. As the interior is chopped up, the need for the free flow of air becomes increasingly critical. My comments above about dampness and mildew in the storage areas also apply to private cabins, which, after all, are just big lockers with bunks fitted inside. Hot air rises and the hot air in the cabin is further heated by the sun beating down on the deck and trunk cabin top. Unlike houses, 95% of boats have no insulation anywhere, so the temperature on the outside of a fiberglass boat easily transfers right into the cabin. We generally use boats in places where the ambient humidity is already normally high, and the air is therefore saturated with water molecules. If that hot, wet air is trapped in a cabin, locker, or on your shirt neatly stored on a hanger, the moisture will make you miserable. Although the temperature difference between the top of your head and the soles of your feet is barely measurable while you are standing in a cabin, the slight difference, in fact, compounds the whole dampness equation. Stagnant air will make everything it touches wet eventually. The only hope is to move the air and keep

the temperature gradient between the overhead and cabin sole as close as possible. Let's forget all this bull about water molecules and ambient temperature. Did you ever notice that on a hot day the moisture on the outside of a glass of your favorite alcoholic beverage, filled with ice cubes, is less if there is wind blowing? If your answer is "no," you are drinking the stuff too fast, which is okay, but it screws up my illustration.

Moving air around in the cabin is not a simple thing to achieve on a boat, because we have constantly changing conditions. When the boat is moving or the wind is blowing from the bow to the transom at an anchorage, we have one set of conditions. If the boat is stationary at a dock with the wind coming over the transom, there is a completely different air flow. If there is no wind from any direction, it's time to think about the ice cube capacity for the glass of rum and forget about moisture on the glass.

When an object, boat, automobile, or pick up truck moves down the road or across the water, the movement of air across its surface can create low pressure, or reverse airflow. For example, you can sometimes see the hair on people in an open top sports cars blowing forward, toward the windshield, instead of blowing back toward the trunk as the car moves down the road. On pickup trucks with a sliding rear window across the back of the cab, the wind and any dirt come in the cab; the air does not flow out. On most boats with a trunk cabin, the area at the back of the trunk cabin has reverse airflow, meaning that the air in the boat's interior wants to travel from the companionway forward toward the bow as the boat moves. Naturally, the pressure is a function of the speed, and a sailboat moving at 5 knots is not going to create the same back pressure as a car moving at 50 mph. But the natural airflow from transom to bow is still there.

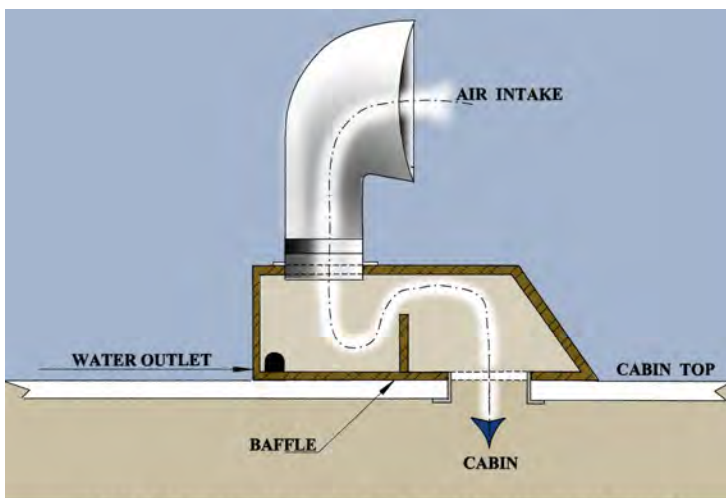
So, if you accept the fact that interior air flows aft to forward when a boat is moving over the water, what do you do with this informational tidbit? If you have numerous opening port lights, then air will come in an open companionway hatch and exhaust out of the ports. The old time wood boat designers and builders knew this, and that's why most wood boats had opening portlights or "ports". Unfortunately, fiberglass construction encouraged large, fixed plastic windows and damn few, if any, opening portlights for natural

ventilation. To overcome any marketing resistance to the lack of ventilation below, the sailboat industry started using numerous overhead opening hatches on cabins and decks. The problem with most of the fancy opening hatches is they are only hinged on the aft side. While these hatches do a good job of pushing air down into the cabin as a boat moves forward, they also do a better job of letting rain and spray into the cabin. If the hatches were double hinged, with the ability to have a hinge on the forward side and the open part facing aft, then they could contribute greatly to creating a natural exhaust outlet as the boat is moving. If opened just a small amount, aft facing hatches will also keep most of the spray and rain out of the interior. When the boat is stationary, the hatches are opened using the aft hinges, assuming it is not raining. I've tried for many years to get commercial hatch manufacturers to make dual hinge hatches, but the added cost and lack of demand doomed my efforts. We hand built, using wood and plexiglass, dual opening overhead hatches at Shannon, but they did not look as sexy as the semi flush aluminum hatches found on most other boats. Compounding my problem with dual opening hatches is the fact that most upscale buyers of expensive sailboats never had a pickup truck with a sliding rear window experience. So the concept of reverse airflow sounds both vague and unimportant.

If a boat does not have opening portlights, and all the overhead hatches are hinged aft, then some method of auxiliary airflow must be found. The obvious solution is cabin fans to keep air moving. I don't know why 12 volt boat fans are designed to be so ugly, and noisy. Today, we have slick looking overhead hatches with built in screens and sunshades, but the cabin fans still look like they belong in a 1953 Winnebago motor home. The key to the efficient use of cabin fans is locating them to maximize airflow throughout the boat. Too often fans are placed to blow air on people instead of circulating air in the various cabins. Fans should be located to move the air in all the dead end places on a boat like the forward end of a vee bunk or the bottom of a quarter berth. One desperate way to determine where fans should be located is to follow the dampness trail. As I mentioned above, small computer cooling fans can be located in hanging lockers provided the door has vents or louvers. Of course you must take

into consideration the drain on your batteries if you try to create a wind tunnel with cabin fans.

Another method of creating some air flow in a boat when the overhead hatches are closed is a thing called a “dorade vent.” Basically a dorade vent is a nautical looking vent or scoop placed on a deck box that has a water trap baffle inside. Named after the famous ocean racer “Dorade,” designed by Olin Stephens in the 1930’s, a dorade-type vent allows air to enter but keeps most of the water out even in the worst conditions. It is a great idea because you can twist the vent to face the wind no matter the direction, or face it aft to use the Venturi effect to exhaust air from the cabin. While I have built boats with computer fans placed in the boxes for additional circulation in stationary situations, usually a dorade vent does not require any electrical battery power.



DORADE TYPE VENT WITH BAFFLE

Air conditioning is also a great solution to dampness and air flow on a boat. Unfortunately, air conditioner units run on 120 volt AC current, not 12 volt batteries. This means that air conditioning is either plugged into the dockside shore power or an auxiliary 120 volt genset, which of course must be running while the a/c is on. Sound insulation for gensets has advanced tremendously in the past decade, but there’s no complete escape from the sound of a genset thumping away all night at a peaceful anchorage on boats under 60 feet. I should mention that there are some companies working on small 12 volt air conditioning units that don’t require a genset, but at the present time the battery drain is still very high. This may be the future for air conditioning for sailboats.

When it comes to ventilation I can’t help think of the late heiress Doris Duke’s famous line, “you can’t be too rich or too thin.” Well, my line is you cannot have too much ventilation on a boat. Boats with large fixed windows and only overhead hatches for ventilation can easily turn into damp, smelly caves when it rains or the boat is closed up for periods of time that even a cave bear would quickly vacate. The free flow of air is the only solution for mildew prevention.

Finally, I would like to point out that it is almost impossible to obtain real sound privacy on a boat less than 85 feet. All those small cabins jammed into an interior may look great at a boat show when counting bunks, but closing up an interior with multiple doors is a surefire mildew machine. Boats designed for the charter fleet only have people aboard for short periods of time and multiple small cabins are a necessity for economic reasons not comfort goals. A door made out of half-inch plywood will stop airflow, but it will not stop sound. Even a center cockpit 50-footer with cabins at both ends of the boat is a problem because the engine room becomes a big air block, not to mention a potential source of heat. A diesel engine operates at about 180 degrees Fahrenheit and it takes a long time to dissipate the heat. Think hard when considering cabins. If you are too embarrassed to let your guests see you in your underwear or pajamas, do you really want to have them aboard for a weekend?

My Last Word on Buying a Sailboat

If you are reading this chapter you are probably either really interested in buying a sailboat or very bored locked up in prison. Assuming you are not incarcerated, the best advice I can offer is do not wait. I have met far too many people who have waited for their 401K funds to accumulate, children to get out of college, house mortgages to be paid off or have come up with a thousand other excuses to put off buying their first boat or moving up to the boat size they really want. Health and age have no financial boundaries. Young wealthy people get sick and die regardless of their bank account. Age and infirmity come to us all very quickly. An automobile accident can change a life in an instant. I doubt that there are many people who think about the money in their bank accounts in the last few lucid moments before death. I believe the worst possible hell is filled with regrets for the things you wanted but did not try to do.

Things to Avoid on a Sailboat

- **Teak decks** Teak decks that are screwed down can easily become an expensive nightmare, especially on an older boat. The teak deck planks are screwed into an under layer made of plywood (hopefully marine grade plywood—but who knows?). The wood expands and contracts depending on the climate conditions working the area around the screws. The screws become slightly loose allowing the teak planks to move and “cup”. The seam compound also wears out and separates allowing water and humidity into the plywood. Once the plywood starts to break down there’s nothing that can be done but pull all the teak up and replace the plywood. There is no way a marine surveyor can determine the condition of the plywood until it’s way too late. Besides, teak decks are hot to walk on barefoot and the added weight above the waterline isn’t too good either. **Teak that is glued down over a fiberglass deck** It seems that the people we left behind in Europe during the great immigration to the USA have a real genetic hang up with teak decks, but I can’t imagine why. May-

be it’s the climate over there or the lack of UV rays? It’s become some weird European boat building trademark. At least most of the builders now epoxy the stuff down instead of putting hundreds of screws into the deck. It is true that teak is an excellent non-skid surface. But, the problems with glued teak are almost the same as screwed teak. Teak is a dark color which means it’s not only hot on your feet, but it also heats up the cabins below. While glued teak is much thinner than screwed teak it still adds unnecessary weight well above the waterline which is strange because the builders hype the fact that they use light weight rigging and masts to keep weigh down. Then there’s the whole constant maintenance thing to keep the wood looking good. If you let the teak go “natural” (read; dull gray) then you have to confiscate all suntan lotions and oils from family and guests because the teak stains. Obviously, by now you realize that that I think the whole teak deck thing is just another silly sales hustle.

- **Fake or simulated teak decking.** The stuff is made from recycled something (cardboard?). While the stuff is supposed to be “maintenance free” it is still dark and hot. Perhaps my biggest objection to fake teak is it looks like it is made by someone that has never had the opportunity to look at a piece of real wood.
- **A boat that’s a real “bargain”.** There is no such thing—it’s a hoax to snag the dope that’s looking for a “deal”. This is especially true for boats built in the Far East. New or used there are always real and significant reasons why a boat is cheap. Boatyards and anchorages all over the world are littered with bargain boats that turn out to nothing more than broken dreams. Not only are dreams broken but everything on the boat is broken at an alarming, frustrating and expensive rate.
- **Deck stepped masts** This applies to sailboats over 30 feet. The only reason a mast is “stepped” (placed) on deck as opposed to running the mast down to the hull/keel is to create an “open and airy” optical illusion or to help a badly designed interior layout. They put a skinny compression post on these boats to offset the tremendous loads created by the rigging which is trying to drive the

bottom of the mast down. There is a constant microscopic flex whenever the boat is sailing that can create havoc over time with the deck laminate. If you can't stand the sight of an aluminum mast running through the interior... start reading the section on Buying A Powerboat.

- **Balsa cored hulls** See the Fiberglass Construction section concerning balsa core.
- **Engines and gensets that cannot be removed without a chainsaw** I am always amazed at how many boats I see where the engine or 120 volt generator was installed before the deck was installed at the factory with no hope for future removal. This is especially true of center cockpit boats. If you think that a new engine or generator is going to last for years and years then it's time to start investing big money in Powerball Lottery tickets because the odds are better. Take a \$2 tape measure to be sure the things can come out of the boat someday.
- **Plastic ports or windows in the hull** These things terrify me. I'm talking about the plastic fixed "windows" they cut into the sides of a hull. We're back to builders trying to create the "open and airy look". The problem is if a boat suffers a "knockdown" (the boat heels over putting the spreaders in the water) the shock loads on the hull are tremendous. There have been incidence where sailboats in knockdown situations have had plastic port lights way up on the sides of trunk cabin blow in. This is a totally unnecessary "sales feature" that looks good tied to a dock. The fact that I have only been in two knockdown situations in 50 years and 50,000 miles of sailing doesn't make me feel any better about cutting big holes in the sides of a hull and filling them with thin plastic or Lexan which flexes under load. Sailboats heel over so you are either looking at the clouds or the water under-way. If you want to see fish buy an aquarium
- **In-the-mast roller furling** I know this is going to make a lot of people upset but here's my opinion. My axiom is "on a boat if it is mechanical, electric or just turns it will fail someday, usually at the worst possible time". Well, in-the-mast roller furling for the mainsail has two (or three if it's electric powered) of my sure to break things.

Unlike headsail roller furling where you have a chance to drop the sail by releasing the halyard if (when) the roller furling gear jams, with in-the-mast mainsail furling a jam can be a catastrophe. There's no fast way to get to the mechanism to un-jam the thing. A mainsail that jams all the way out or partially "in" can be very dangerous if the wind pipes up in a storm or line squall. All you can do is cut the outhaul line and let the sail flog itself to shreds. Not a pleasant situation for family and friends. PLUS, to make the dumb thing work a sail maker has to cut the sail very flat with a hollow leach, like a window shade, reducing the necessary shape for any kind of sailing performance. In-the boom furling is OK because you can drop the sail on deck by just releasing the main halyard if the mechanism fails. Also, the sail shape is not as compromised with in-the- boom furling. My current favorite for simple, safe and easy mainsail handling is the MAX PACK system which incorporates a clever and fast to use mainsail cover, properly cut mainsail and conventional reefing, but I may just be old fashion or just plain old.

- **Touch Screen Electronics** Another dumb idea for a boat that jumps and moves around a lot. Touch screen activation may be alright for a cell phone or a navigation unit in an automobile, but it's a disaster on a sailboat in any kind of seaway. Plus, they make you scroll through several steps just to add a waypoint making the whole exercise, even for a brain surgeon with super steady hands, a nightmare. Knobs may not be very "hi tech" but at least you have a chance to operate the equipment. If there's no way to turn off the touch screen activation and use knobs I would leave the electronics on a store counter, the only place you can actually use the stuff, and buy something else
- **High gloss varnish on a cabin sole (floor)** If the sole is finished with fake plywood that looks like separate teak and holly boards/planks or if the sole is finished with real teak avoid high gloss varnish. I know it looks great, but it is very slippery and dangerous when wet. Trust me when I say, no matter how careful you are the cabin sole will get wet.
- **Fake plywood teak and holly sole.** There are

multiple grades of faux teak and holly flooring from very cheap to passable. The very inexpensive stuff (read; junk) is like a photograph of teak planks printed on very thin cellophane. A scratch or dent that is caused by a dropped pot or winch handle will stay with the boat for life because there is no way to repair the stuff. If you have ever wondered why they make you take off boat shoes to board a boat at a boat show it's because the builders/dealers are paranoid that a hundred or so people walking through the cabin will wear right through the thin veneer. So, they make you go barefoot or just wear slippery socks. Not very hygienic or safe.

- ***Carpet or rug anywhere on a boat*** They call the material "indoor/outdoor carpet". Notice they never say "boat carpet". I think the carpet is good on houses and patios, but it doesn't cut it on a boat. Maybe it has something to do with the issue that boats are closed up for periods of time. "Not a problem", says the boat salesperson, "all you have to do is pull the carpet out and replace it every few years". Nope, the old carpet goes but the smell stays. Somehow the odor gets into the cushions, wood, bedding and other places. You end up buying all sorts cleaners and deodorizers and end up making the interior of the boat smells just like an oil refinery in New Jersey.
- ***Mast height over 64 feet*** If you are planning to coastal cruise anywhere on the east coast of the USA between the Chesapeake Bay and Key West, Florida. The Federal government set the bridge clearance for non-opening, fixed bridges at 65 feet. Who knows how they arrived at that magic number? But it's a fact and you have to deal with it. Yeah, yeah, I've heard the rejoinder many times, "I'm not going to jerk around with the Inland Waterway—I'm going to sail offshore and pop in at various places without bridges". The issue is that boat's break and you need to get to boatyards and service places. Many of these places always seem to be a few miles up on the wrong side of a 65 foot bridge. Plus, if the weather turns bad offshore (and it does) you are precluded from running inshore for a stretch because of mast height.
- ***Draft over six feet*** The average inshore water depth between Eastport, Maine (at the Canadian

border) and Brownsville, Texas (at the Mexican border) is 3 feet. So it's not just my opinion it's a reality that anything over six foot draft is a constant hassle. You're either following the same deep channel used by cruise ships or tearing through tide charts to be sure you are not on a moon tide day as you look for a place to anchor. Going to Europe? I've been aground so many times in England, Ireland and northern Europe with five foot draft (centerboard up) that I've been thinking about designing a boat with retractable, motorized mud tires.

Buying a Powerboat or Trawler

This should be an easy section for me to write since there are only two big issues to resolve when buying a powerboat. One big issue is how much money do you have to spend on a boat? The other issue is how fast do you want to go?

Of course, there are other ancillary factors like whether you want to trailer a boat to the water or keep the boat in the water at a marina. What about trawlers? Do you want to just putt around in the bay or plan to cruise extensively in offshore waters? Then there is the issue of outboard power or inboard power. Should the new boat burn gasoline or diesel fuel is another issue. What about the hull shape: should the boat have a planing, displacement, catamaran or a cathedral hull? Another factor is the advantages and disadvantages of a flybridge. Come to think about it, I guess there are a number of real issues concerning buying a powerboat and this section is not going to be so simple after all. Forget what I just said about only two big issues—I must have been momentarily dizzy.

I have been designing and building power boats since 1985 and sailboats since 1975 and I can say without a doubt that powerboat people are much easier to deal with than sailboat people. For some genetic reason powerboat buyers do not challenge things like how many seacocks are below the waterline, the fiberglass laminate schedule, the hull-to-deck joint technique and other building issues. Powerboat folks are polite even when they see or hear something they don't like. Even more amazing is powerboat people usually only board a boat they are interested in and can afford at a boat show. On the other hand, sailboat people always seem to be in some weird contest to see how many boats they can get on and how many drawers and lockers they can open. I have always been grateful that the Annapolis Powerboat Show is one week after the sailboat show because the public in attendance are so gracious and considerate. Powerboat people must release all their aggression by pushing the throttle forward in their boats and making engine exhaust noise.

I think the recent "trawler" popularity thing is really great. Many people who would never buy a conventional powerboat, mostly because of appearances, have bought some variation of the trawler theme. Trawler people have their own boat shows, magazines, rendezvous, websites and gatherings. Many trawler

people really use their boats to go interesting places. Plus, every model whether it imitates a tugboat, a lobster boat or a rugged fishing vessel is distinctive and actually looks like a boat. My only regret is almost all of the various trawlers on the market are built in the Far East or China. To use a Chinese saying, it's like "death by a thousand cuts" as we ship thousands upon thousands of American jobs into China and other cheap labor countries. America is currently the major buying source taking advantage of inexpensive clothing, manufactured goods and boats. However, without American manufacturing jobs eventually we will become a fifth rate economy with only memories of what we use to be. Very tragic for our children and their children.

The following sections on various issues concerning buying a powerboat or trawler are just one man's opinion—mine. Hey, everyone is entitled to their own opinion. For example, there are actually people out there that believe a bag pipe can make musical sounds. Go figure.

Speed

Speed under power is definitely a very subjective subject for power boaters. There are people that are only happy if they are doing 50 miles an hour or more. Then there are those that are content to be chugging along at 6 knots on a trawler. By the way, power boaters that go faster than 18 mph measure their speed in miles per hour (probably because it is a higher number). Trawler and lobster boat people use "knots" for speed measurement (probably because it sounds more salty). The easy way to determine the type of hull a powerboat has is by looking at the advertised speed. A deep vee planing hull will go in excess of 30 miles an hour with twin inboard engines or multiple outboard motors. A modified vee planing hull will travel between 18 miles an hour and 30 miles an hour with twin engines. A semi-displacement hull will obtain speeds between 10 and 15 knots usually with a single engine. A power catamaran, depending on weight, should travel at speeds of 10 to 15 knots. Finally a full-displacement hull will top out at about 8 knots with a single diesel engine, depending on the length of the waterline.

The real fuel burn numbers on various engines are not a Manhattan Project-type top secret. The fuel burn and RPM (Revolutions Per Minute) engine information is readily available on the Internet. Today, everyone has a big, elaborate website, including the guy working out of his basement sharpening toenail clippers. The engine manufacturers are no exception. Getting past the charts and graphs on fuel burn numbers is a little tedious, but well worth the effort. Even if the engine manufacturers numbers are somewhat optimistic using ideal laboratory conditions, it's better information than advertising claims written by some copywriter trying to impress his client. Always personally sea trial any boat (new or used) before buying to obtain the actual cruising speed and engine RPM.

What about having a fast boat capable of doing 25 knots and just cut the throttles back and run at slower speeds for increased range and fuel economy? It's a nice concept, much like the tooth fairy, but eventually reality, or a dentist, takes over. A combustion engine, especially if it is diesel, must be run at 80% of full power a minimum of 80% of the time. In spite of claims, the new common rail injection systems do not really change the equation or the reality. Running an engine at 50% power for long periods creates all kinds of problems. Actually, an engine should be run up to 100% loaded power occasionally for short periods of time. Pick your desired cruising speed at 80% of full power, find a boat with the correct engine(s) and be happy if you get anywhere near the advertised fuel burn.

PLANING HULLS

The obvious issue with high speed is high fuel burn and very little has been done to make recreational fast planing powerboat hull design more efficient. In the past fifty years the price for speed is paid at the fuel dock. Thanks to the automotive and truck industry, engines have gotten better at fuel efficiency, but underwater hull design has remained relatively static. Other than a major disaster on the sales radar screens in the 1970's during the "Energy Crisis" and recently when fuel hit the \$4 a gallon price there has been little market pressure on the planing powerboat industry to make any serious effort towards fuel-efficient hull

designs. Much like the monster SUV vehicles that the automotive industry profited from until fuel prices spiked, the fast powerboat industry also decided to ride the wave of relatively cheap fuel. Personally, I think that the theme song for some powerboat builders is a verse from the old Eagles' "Hotel California" rock song: "Mirrors on the ceiling, the pink champagne on ice...and she said we are all just prisoners here, of our own device..."

When buying a planing powerboat be very careful about the advertised top speed, fuel burn and range of a specific boat. It is not unusual for some clever marketing people to use the top speed of a vessel with one set of big engines and fuel burn based on the same boat with smaller engines. Even the top speed numbers can be "juiced" by running the boat without full fuel or water in the tanks in dead calm seas. It would not surprise me to hear that some companies use former horse race jockeys as captains for speed trials just to keep the weight down. Boating magazine reviews can also be misleading concerning speed and fuel burn despite their efforts to be honest.

I know of one powerboat company that "adjusted" the fuel gauges on a boat during a magazine review to read half tanks when there was no water in the tanks and only enough fuel to get through the two-hour speed trials.

SEMI-DISPLACEMENT HULLS

Semi-displacement hull designed boats fall somewhere in between fast planing boats and slow trawlers in terms of speed. The semi-displacement boats call themselves trawlers, tugboats, down-easters, lobster yachts or whatever works for the sales and marketing people. Deck configurations are different, but the hull designs are basically the same. Advertised speed is the real determining factor regardless of deckhouse design. If the builder claims the boat will go between 10 and 15 knots it is usually a semi-displacement hull (or a really terrible planing hull). It is also common to find many semi-displacement hulls with a single diesel engine. While I personally don't think a single engine is a good idea for yachts because even new engines tend to stop running at the worse possible times (usually on a Sunday). I

also question the fuel efficiency of a big single diesel over two smaller engines. In any event, semi-displacement hulls burn less fuel than most planing hulls. The price for some fuel efficiency is less speed compared to a planing hull. The important factor is buying a semi-displacement boat that maximizes the fuel efficiency and still is able to obtain acceptable and advertised speeds. While the engine fuel burn rate can easily be obtained from the Internet, the gear reduction ratio of the transmission and the propeller diameter and pitch are critical for obtaining optimum cruising performance and fuel burn. Since sea trials for prospective buyers usually only last for a couple of hours it is not uncommon to find semi-displacement designs set up for maximum speed at full RPM. It is almost impossible for a buyer to know if the boat is obtaining the best fuel burn rate at cruising RPM (80% to 85% of max. RPM). Added to the transmission ratio and propeller size issues are factors like hull design, weight of the vessel and windage/drag components created by high deckhouse structures. Always remember that all boats, including semi-displacement designs, are not created equal. There is a speed/fuel burn penalty for overweight boats with high deckhouse structures. The whole object of buying a semi-displacement boat, besides just looking like a tugboat captain or a commercial fisherman, is obtaining maximum fuel efficiency at an acceptable speed. Take the time to check out the numbers personally during sea trials. **Forget about getting accurate numbers from current owners of the same model.** Everyone wants to believe that they made the right decision, especially after spending a great deal of money. Chances are good that all you will hear is advertising brochure claims. Builders and dealers know this fact and will gladly give you the names of owners to contact. They know the odds are in their favor that all you will hear is a tape recorded response validating their advertising claims.

CATAMARAN HULLS

Using two skinny hulls on a boat instead of one fat one has been around a long, long time. High powered racing catamarans reach incredible speeds well over 100 mph. There are two power catamarans on the market: one is a former or current sailboat with the

masts removed, the other is a relatively narrow catamaran designed just to be a powerboat. In either case, the width or beam of the catamarans are still pretty wide for most marina slips. The big issue with any catamaran hull concerning speed is weight. A catamaran cannot be overloaded without suffering a massive penalty in obtainable speed. Advertised cruising speed, size of engines and fuel tankage must be carefully scrutinized and sea trialed before buying. A catamaran is not a boat for a "pack rat" type owner that likes to carry a lot of stuff, extra parts and jerry cans of fuel and water all over the deck. Depending on the engines and the length of the catamaran they should travel at semi-displacement hull speeds between 10 and 15 knots if loaded properly.

DISPLACEMENT HULLS

People that buy full-displacement trawlers expect to go slow so speed is not an issue. However, some trawler builders tend to "polish" the proverbial apple when it comes to how far their vessels can go at "cruising" speed with the available fuel tankage. A trawler "cruising" at 8 knots will have a different fuel burn than the same boat powering at 6 knots because the engine is running at a lower RPM. It seems like a very obvious hustle, right? Well, I have listened to people who actually own a trawler and brag to me about how little fuel they burn and "range" (distance between fuel stops) quoting impossible numbers based on brochure copy they read before buying the boat. Take the real fuel burn per hour at cruising RPM (from the Internet) and divide the number into gallons held in the fuel tanks. That gives you hours of "running time." Multiply the cruising speed by the hours of "running time" to obtain the range of a vessel. That's as far as the boat will go without screaming for a fuel dock.

The one thing you don't have to worry about concerning full-displacement trawlers is weight or displacement. They pour tons of concrete into the bottom of a trawler hulls to increase the weight. Trawler buyers love weight and have been indoctrinated to equate pounds with sea worthiness. The concrete is supposed to help reduce rolling motion to offset the high deckhouse configurations. Naturally, the concrete really doesn't stop the boats from rolling so you need to add

expensive active vane stabilizers or paravanes to the hull and price tag. Of course, vanes create drag underwater increasing the fuel burn and/or slowing the trawler.

Fast powerboat sailors may wonder what's the big deal whether you are going 6 knots or 8 knots in a "crawler"? The biggest reason for buying a trawler is the ability to go long distances, so range is a critical factor. A trawler doing 8 knots of speed will theoretically travel 192 nautical miles in 24 hours. If the vessel only moves at 6 knots at the same RPM and fuel burn it will travel 144 miles in 24 hours. That equates to a 48 mile difference per day. On a 10 day offshore passage that's a 480 mile range shortfall! I doubt any tow boat services will answer that call for help. With that said, if you intend to cross an ocean in powerboat or need a range of 2000 miles or more without fuel stops then a full displacement hull traveling at 6 to 8 knots is your only choice.



The Grand Banks Trawler

The Sea Trial

Always take a boat (new or used) away from the dock and see how it handles and determine the true cruising speed. Push the throttle to maximum RPM and note the number on the tachometer. Reduce the RPM by approximately 20% (example: 3000 max. RPM x .20 = 2400 RPM) to cruising RPM. Note the speed on a GPS because that is the speed you will be traveling if you buy the boat. If the fuel and water tanks are full add 10% to the speed, if tanks are low deduct 10%. Now that you know the real cruising engine RPM and boat speed go home or to your

office and turn the computer on and go to the engine manufacturers web site. Find the right graph for that engine and you will find the fuel burn at the cruising RPM for the boat. Divide the fuel burn into 90% of the boat's fuel tank capacity to get useable "running" hours. Multiply running hours times speed to get the actual range of the vessel. This simple exercise will totally eliminate any "smoke and mirrors" concerning cruising speed, fuel burn and range.

Not the Last Word

OK, that's enough of all this neutrality bull on the subject of powerboat speed. Here's my totally biased opinion on powerboat speed. Going 8 knots in a sailboat is an exciting and exhilarating experience. Going 6 or 8 knots in a powerboat really sucks because it's boring and a painfully slow way to get places. Traveling at 10 to 12 knots isn't too bad because at least your passing those jerks in sailboats who might be having an exhilarating time (if it's not raining) Moving over the water at 15 to 20 knots is very nice especially if the weather is good. Pounding on the water at speeds over 30 knots in seas above six inches high should be left to teenagers and people suffering a mid-life crisis. That's basically my whole take on the subject of speed in a powerboat.

Motion

While it is seldom mentioned in advertising brochures or magazine reviews the motion aboard a powerboat is a critical component of enjoyment. If a boat is pounding or rolling around in a moderate sea, family and friends are not going to be happy. Your spouse is not going to be thrilled about the money being spent on a boat that everyone is afraid to take away from the dock. Since approximately 90% of the population suffers from motion sickness to some degree, including astronauts, boat motion is a real issue.

Motion sickness or seasickness is a reality that no one in the boat business likes to talk about except troublemakers like me. I'm going to have to wear a Halloween mask just to walk around a Power Boat Show for even mentioning the taboo subject.

A Story

If I was writing this section 25 years ago I would probably be leaning toward semi-displacement hull design as a good personal middle ground between speed, seaworthiness and fuel burn. Then something significant happened that changed my whole outlook on hull design. Thanks to terminal jet lag and temporary insanity I found myself in the Molokai Straits off Hawaii on a powerboat. I was out there commissioning a new 36-foot Shannon twin diesel, modified vee planing boat that was shipped to Honolulu in a big container. Once we put the boat together it had to be moved to the owner's house. It was March and the winter winds were still blowing. The engines had less than one hour of test running before we left. About two hours later I slammed into the second worse seas I have ever encountered in over 40 years on the water (my all time worse seas to date, were off Fastnet Light in the Irish Sea in a 28-foot sailboat). The water at Molokai is like a huge washing machine with vertical breaking seas 12 to 15 feet high coming from all directions. My first reaction was to cut the speed down below planing speed to less than 10 knots. Some seas were breaking over the flybridge and others were breaking over the cockpit. Fortunately we had inside steering below because it was simply awful outside. We were being tossed all over the place and the motion was terrible. I finally found that running the boat at low planing speeds (about 12 knots) the hydrodynamic lift settled the motion down somewhat. By using the throttles on the twin engines I was able to steer into the worse of the waves. The whole experience only lasted a couple of hours but it seemed like days. Two of the windshield wipers were ripped right off by a waves and a cabin fan just missed my head when it broke off a bulkhead. My whole attitude and opinion about the seaworthiness of planing hulls and the attributes of twin engines changed that fateful day in Hawaii.

PLANING HULLS

Contrary to what some people think and say, planing powerboats have a pretty good all-around motion in most sea conditions. Planing hulls obtain their stability from the hydrodynamic forces that allow the boat to come up out of the water on planing configuration. The acceleration of the boat moving through the water actually creates a lifting moment as the boat goes on the "Step" or planing mode. Naturally, it takes a great deal of energy or power to get a boat upon the Step which translates into fuel burn. This whole planing thing has been around almost as long as the advent of combustion engines at the end of the 1800's. The big breakthrough came after World War II as engines became more powerful, smaller and lighter. The entry of fiberglass into the boat industry in the 1950's gave designers a flexibility for hull shapes that could not be found in wood construction.

The big issue with planing boats concerning motion is the speed that must be maintained to keep the hull planing. Pounding into a four-foot head sea at 20 miles an hour can be very punishing on the crew and the boat. If a boat requires 15 miles an hour to remain up on the Step then that is the minimum speed that positive hydrodynamic stability can be obtained.

If the speed is dropped down to 10 miles an hour because of sea conditions the boat is no longer planing and the motion aboard is not great. A planing hull running slow will pitch, pound and roll in a sea-way during high sea conditions. I hear a lot of people bragging about the top end speed of their boats, but

very little dialog about how slow they can go and still maintain planing configuration. Yet, the bottom end of the planing speed curve is far more important when the seas or the weather kicks up. Keeping crew and company aboard as comfortable and happy when (not "if") the weather turns ugly on a Sunday afternoon and you have to get back home is a big deal. If you are buying a boat just to be used as a stationary water-side condo or summer bungalow then motion and step speed are not important. However if you want to avoid the "Dock Rat Syndrome" and actually travel to fun and interesting places with your family on a boat then focus on low end planing speeds to obtain comfortable motion. Pay attention to weather forecasts and avoid, when possible, wind and sea conditions that will prevent you from running at slow or bottom end planing speeds.

While I am on the subject of motion I have to mention the "flybridge affect." It is very unfortunate that most planing hulls can only be steered from the flybridge. The "flying bridge" became popular in the 1930's as a second steering station up high for spotting fish. The primary steering station remained below protected from the weather behind a glass windshield with windshield wipers. Very civilized... Somehow in the 1970's the lower helm station was dropped from most planing hulls leaving the flybridge helm the only place to steer. Forget about the problems of seeing out of sea spray and rain covered plastic curtains, the motion on a boat is increased every fraction of an inch a person moves above the waterline. Forcing people to steer and operate a boat eight feet higher than neces-

RELAX IT'S ONLY A BOAT

sary has kept many planing boats tied to docks waiting for sunny days and calm seas.

SEMI-DISPLACEMENT HULLS

Unlike a planing hull, a semi-displacement design does not jump up onto a hydrodynamic step. A semi-displacement hull does obtain some lift from hull form shape so it's not a full-displacement hull chained to the waterline length for speed. So we end up with the "semi" appellation to describe the hull shape. There are those that believe a semi-displacement hull is the perfect compromise between going real slow and going real fast. Then there are those that think a semi-displacement hull offers the worst attributes of planing hulls and full-displacement hulls. There is a motion penalty for a semi-displacement hull not found on a planing hull because they do not receive as much hydrodynamic stability from hull shape. Designers started to add chines, or sharp flat corners to round bilge semi-displacement hulls about 40 years ago. This was a definite improvement because it helped the hydrodynamics and most of all helped the rolling motion of the boat. Round bilge (the area right below the waterline where the hull turns inward toward the keel) roll terribly, especially in beam seas. While chines add a certain amount of drag they are well worth the small increase in fuel burn. Even most commercial offshore fishing boats adopted the use of chines to improve motion at sea. Chines are by no means the "cure all" for rolling motion but they sure beat round-bilged boats. Many, if not most, offshore commercial fishing vessels with chines are also equipped with big, manual paravanes to increase stability in offshore conditions. Some of the more expensive semi-displacement hulls sold as yacht trawlers offer expensive, electronic active fin stabilizers to control rolling motion.

The nice thing about semi-displacement hulls is they run the same at 5 knots as well as 12 knots. This is a nice feature when the weather turns bad. There is no concern of falling off the planing Step by going too slow, as in planing hulls. While the 80% of full power 80% of the time engine rule still applies for fair weather powering, the ability to slow right down in bad seas is a good feature of semi-displacement hulls. In spite of all the advertising claims and hype the overall motion

attributes of a semi-displacement hull are not great. However, semi-displacement hull motion is... well, it's "semi-good" in most sea conditions.

POWER CATAMARAN HULLS

Since catamaran powerboats come in two types: converted sailboats and designed for power-only cat hulls, there are slightly different motion characteristics for each. However, both types of cat designs have a very unique motion in a seaway that you either love or hate. For people that have experience in conventional monohull powerboats there is definitely some transitional period necessary getting used to the motion of a cat powerboat. The motion is difficult to describe and all I can think of is a square raft for an analogy. With a cat dual hull configuration, it feels like each of the four corners of the boat are riding on different seas all at the same time. It's not terrible just very different than a monohull. The other unique issue is the sound of the water battering the platform section under your feet that holds the hulls together. Once again it's not terrible, but it takes getting used to for those not accustomed to the noise.

Perhaps the biggest issue concerning power cats is the lack of buoyancy in the bow sections of the hulls. Simply put, cat hulls have a tendency to pound badly in head seas. Unlike many planing monohull powerboats, which also pound badly when smashing into head seas at great speed, a cat hull is an equal opportunity pounder at any speed. The good news is there is no point in slowing the cat down to reduce pounding, so it is just a matter of getting used to the motion and the noise. Anyone interested in buying a power cat, including those with offshore experience in sailing catamarans, should absolutely, unequivocally sea trial a power cat in rough seas before purchase. If the motion and other quirks of a power cat are acceptable then you have found your dream boat.

FULL-DISPLACEMENT HULLS

Thanks to the magic of marketing and the copycat effect, just about every full-displacement trawler on the market uses round-bilge hull designs. As I mentioned earlier, round-bilge boats roll, roll and

then roll some more. It is imperative, even if just as an anti-seasick device, to equip a round-bilge, full-displacement hull with some sort of anti-roll equipment. Manual paravanes, electronic active fin stabilizers or both are a must. The price to reduce rolling motion is dragging either paravanes or fin stabilizers in the water which slightly affects the speed (or fuel burn) of a displacement trawler. For those full displacement trawler aficionados that look down their collective noses at planing hulls in terms of seaworthiness should always remember this; on a planing powerboat you can get mirrors on the ceiling, probably pink champagne on ice too, but you usually can't get active fin stabilizers because the hulls don't need them to prevent rolling when they are moving.

Compounding the motion factors of round-bilged displacement boat is many of the boats have very high deckhouse and freeboard (height of the hull above the waterline) designs to increase interior volume. This design feature puts the wheelhouse high off the water. While the captain gets great visibility he/she also gets to sit on top of the swaying pole. Remember those circus acts that used to have people doing aerobatics on top of high, flexible poles? Well a boat has the same affect the higher you get away from the waterline. It's called vertical center of gravity. The motion of any type of hull is increased the higher you go. People in the flybridge of a powerboat, regardless of hull design, are going to experience far more motion in a seaway than those sitting down in the cockpit. The wheelhouse in a high trawler has the same motion issues as any boat with a flybridge

The added weight of a full displacement vessel, large fuel tankage, structural stuff and concrete, does keep the boat from being thrown around, compared to a lighter vessel, in big seas. If all the anti-roll equipment and the single engine keeps working, a full displacement trawler has the ability to punch through seas with relative ease. While the 8 knot cruising speed may drop down to 5 knots or less, the boat can keep going in tough weather. There have been some impressive long distance, offshore passages completed by recreational full-displacement trawlers. One of the most dangerous pieces of water on the planet, Cape Horn at the tip of South America, has been traversed by full-displacement yacht trawlers, no small feat for

a powerboat. This is certainly a testimony to the sea keeping ability and motion aspects of full-displacement trawlers. I should also mention that a few years ago a kid sailed around Cape Horn standing on a surfboard holding onto a sail, so there is no escaping the dumb luck factor when it comes to anything traveling on the water.

The Sea Trial

Personally sea trial a boat (new or used) before purchase. Try not to be swayed by brochure copy, sales people, magazine articles, Internet websites and blogs, the "expert" at your marina, a friend or your brother-in-law. Forget about all the other things you like about boat and focus on how the boat handles away from the dock. **Pick a day when the weather is not good.** You don't have to be an experienced boater to evaluate boat motion characteristics. There is far more common sense required than boating experience. Take your spouse and children on the sea trial if possible because they will be more objective than you. Once away from the dock find a wake from another powerboat or make a wake by making a series of tight circles at full RPM. Once you have some wake put the boat perpendicular to the wake and bring the boat to a full stop using reverse if necessary. Then wait. (If the boat is equipped with electronic active fin stabilizers shut them off because they will break someday usually when you need them) **When the wake hits the stationary boat broadside it will rock. The rolling motion you feel is only a small fraction of what will be felt in a real beam sea.** Make your purchase decision based on the reality of actual motion, even if it is only momentary, it will tell you all you need to know about the boat. If the salesperson, captain, or owner refuses to allow this simple exercise buy something else. Never let anyone sprinkle fairy dust in your eyes about motion.

For those interested in a power catamaran forget the above mentioned rolling motion test. **You must test the boat by powering directly into seas greater than three feet at cruising speeds.** The hard part is the logistics of finding the right wind and sea conditions and a willing sales person.

Still Not the Last Word

Here's my opinion for what it is worth. People buy boats primarily because of appearance. Some folks love the swept back, fast "Euro" look and others like boats that look like tugboats. The next big issue is interior layout and cabin configuration. Does the interior resemble a condo with plenty of overhead mirrors or does the interior look like you need to take the "anchor tattoo on your arm" option? Unfortunately, way down on the "must have" list, after galley counter color choice, is the boat motion issue. Why do I think this is true? Because there are so many boats sold that have a terrible motion underway. Yet, once the boat is purchased motion is one of the biggest factors in whether the boat mostly tied to a dock or used as a vehicle for having fun and going places on the water.

Take a reality check about how fast and how far your next boat is expected to travel. Are you really going to be banging away at 35 miles an hour? Is twenty or more days crossing a big, stormy ocean something your spouse really wants to do? Do you or your "significant other" get seasick? What was it about your last boat that made you want another boat? There are important questions that should be addressed that will eventually lead you to motion underway issues. With absolute honesty and sea trials you will find the boat of your dreams.

Fuel Efficiency

We have reached a crossroads with our planet. Hopefully, climate change and extreme weather patterns are just detour signs, not end-of-the-road barricades. For those of us that are old enough to remember the "energy crisis" period of 1973 and 1978 with long automobile lines at the gas pumps and no gas at marina fuel docks, it seems amazing that so little has been done to make cars and boats more fuel efficient. Sure, there has been some progress in the past three decades, but it is literally a drop in the old oil bucket. The good news is people are actually talking about the problem. Perhaps the reality of today's global warming will succeed where the dim specter of running out of oil some day in the distant future failed. I know that mentioning things like carbon footprint and pollution may

not exactly be uplifting for those considering buying a powerboat for recreational use. Take comfort from the fact that recreational boating pumps enormous sums of money into the economy in the form of taxes both directly and indirectly from the taxes generated by people (like me) who make a living from the boat business. In 1989 the dumbbells in Washington passed a thing called the Federal Luxury Tax which was supposed to "tax the rich" who had the money to buy boats over \$100,000. The tax was written to sound good to all those "poor voters" back home. Well the "rich" either bought foreign built boats or bought nothing at all. The Luxury Tax put over 100,000 middle class Americans involved in boat building and boat infrastructure out of work in the first year. Many of those jobs have never come back. During the four-year period of the ill-advised tax from 1989 until repeal in 1993, the federal government actually lost money, instead of raising revenue, because of the job and business losses in the boat industry. I mention the Luxury Tax because hopefully some of the revenue raised from recreational boating will be used by the "brain trust" in Washington to invest in real solutions for the boat industry for energy efficiency and pollution issues. Using my somewhat biased logic, riding around in a powerboat for fun is part of the solution not the problem.

We are all prisoners here of our own device and the device is called the combustion engine. After thousands of years relying on the horse for getting around and pulling things, the gasoline and diesel combustion engines came on the scene only a little over a hundred years ago. It is only an eye blink on the time line of history when everything changed dramatically with the advent of the combustion engine. Unfortunately all the positive things that the combustion engine brought came at the price of dependency on oil and pollution. During the first 50 years of the combustion engine oil was cheap and there were relatively few automobiles and trucks on the planet. It really didn't matter that only 30% of each gallon of fuel was actually converted into energy by the combustion engine. I am old enough to remember when gasoline cost 25 cents a gallon and the friendly, English-speaking attendant washed my windshield, checked the oil and gave me a nice drinking glass as a gift so I would return again. No one, including me, cared that my old

1950 Ford with over 100,000 miles on the engine, left a big cloud of black smoke when I left the gas station.

Everything started to get complicated during the second 50 year history of the engine. The Arabs traded their camels in for new Rolls-Royce automobiles to get out of the sun. The big oil companies realized that giving gifts to people buying their desperately needed gasoline was silly. A big cloud settled over Los Angeles called "smog" caused by "topography." There was bumper-to-bumper traffic on the still unfinished new interstate highway system. Politicians became desperate for special interest lobby dollars to remain in office. Even the gypsies in Ireland stopped using horse drawn caravan wagons and replaced them with comfortable camper trailers pulled by air conditioned automobiles. The fact that 70% of potential energy in each gallon of fuel was totally wasted in a combustion engine became a topic of polite conversation only by environmentalists and other radicals.

Every boat that has an engine, has a combustion engine. The marine industry is the mute stepchild of the automotive industry because all marine engines, with the exception of outboard motors, are converted car and truck engines. Engine manufacturers can barely find the inboard marine segment of their global market on a balance sheet because it is so small. We have seen 4 cycle outboard motors come on the scene to replace oil and gas mix 2 cycle outboards that increase fuel efficiency and lower pollution. There is no question that marine inboard engines are far more fuel efficient with less pollution than the engines put in boats a decade ago. Computer driven common rail fuel management systems in diesel engines are slowly replacing straight injector systems which increase fuel efficiency and lower emissions. We are doing a lot better, but the basic dynamics of a combustion engine in terms of extracting most of the energy out of a gallon of fuel still remains dismally poor.

There is a great deal of activity by the automotive industry to overcome the inefficiencies of a combustion engine by coupling up electric motors. The combination of combustion and electric, called "hybrid", is an improvement.

Electric motors are unique because they have 100% torque or power 100% of the time the instant they are activated. Electric motors are incredibly effi-

cient. The horsepower rating you hear about combustion engines are only achieved once the engines reach peak RPM. The problem with electric motors is obtaining the electrical power source once a boat moves away from the shore power on the dock. For reasons beyond my ability to comprehend, the battery manufacturers are currently stumped over weight, size and capacity of direct current, DC, batteries. For those who have not read my section on boat electric there are two types of electric current, alternating current AC and direct current DC. Alternating current found in houses, offices and the box on a dock cannot be stored in a battery. You need to plug into the national electric power grid to obtain alternating current. Only direct current DC can be stored in a battery. The batteries in all cars and trucks are DC mostly 12 volt. Hybrid and electric cars use DC batteries. It is possible to charge a DC battery with alternating current by using a converter box called a battery charger. So, hybrid or total electric car and boat propulsion systems are totally dependant on battery technology which has big problems. To put this whole battery issue in perspective back in 1893, before Rudolf Diesel perfected his engine and the gasoline engine was in it's infancy, a boat company named Elco was running a fleet of battery powered 30 foot launches around the lake at the Chicago Exposition. Thousands of people were able to get a ride on this new invention. In 1893 most people were still lighting their homes with gas or oil lamps! While we have put a man on the moon and use battery powered cell phones the size of credit cards, we still use the same "high tech" 1893 chunk of lead technology when it comes to high capacity batteries. There have been advances in battery technology but we still have a long way to go before electric propulsion becomes a viable option to the combustion engine.

The wake is the clue to a boat's efficiency. When yacht designers get together to talk about fuel efficiency there are always a few laughs about some of the photographs that appear in various boat manufactures ads in marine magazines. You should know that the photos are usually chosen by some golfer in an advertising agency looking for exciting shots to show the boat off. The fact that the photograph shows the boat plowing a huge bow wave or the white water and stern wave are simply terrible is lost in the quest to show

the woman on the boat in a dramatic photo. The bow and stern wave along with churned up water around the boat tell everything about a boat's hull design and fuel efficiency. For example, take two people paddling a canoe at a fast rate and you will see little to nothing in terms of wake. A sailboat sailing at hull speed will generate very little wake. Wake and white water are the by-product of wasted energy to move the vessel through the water. To put it simply, the bigger the wake the bigger the fuel burn. Stern wake and bow wave are exaggerated when sheer engine horsepower is used to overcome inefficient design or large engines are used to obtain high speed. The obvious example is a planing hull traveling at speeds over 20 miles an hour pushed by big engines. The compensation for the tsunami sized wake coming off a planing boat that rocks your world and spills drinks is knowing that the owner of the culprit is sucking up a lot of fuel. The same holds true for semi-displacement boats that are pushed beyond their designed speed by a big engine or engines. A semi-displacement hull that is designed to travel at 10 knots will start to plow some serious water at 15 knots. It is also not uncommon to see a full displacement trawler traveling at only 8 knots kicking up a big bow and stern wave. If a displacement trawler has a hull similar to a sailboat and is traveling at sailboat speeds what's with the big bow and stern wave? It's a combination of weight and beam/length ratio. Compared to a sailboat of a similar waterline length, displacement trawlers are incredibly heavy and wide. They need the weight and beam to accommodate the thousands of pounds of fuel necessary to travel very long distances under power. It is an interesting fuel efficiency paradox. A 50 foot cruising sailboat of average displacement/weight will power at 8 knots with an 80 horsepower engine. A 50 foot displacement trawler usually requires at least twice, if not three times, the horsepower and fuel burn to obtain 8 knots. So, a displacement trawler has to have more horsepower to push the increased weight created by the fuel burned by the bigger engine. It will make your head hurt if you think about this conundrum too long. The point is boat wake will tell you all you need to know about real fuel efficiency of any powerboat.

If history is any indication of future events then the oil industry will keep the retail price of fossil

fuel just low enough to discourage too much effort in finding alternative fuel solutions. Even hybrid electric or total electric is somewhat of a joke if people are plugging extension cords into the national electric power grid that is mostly powered by "clean" coal. The unfortunate events at Three Mile Island and Chernobyl nuclear power generating plants a long time ago have put the USA way behind the nuclear power curve compared to other countries today. The nuclear disaster created by the earthquake in Japan isn't going to help the future of nuclear power either. The fact that the US Navy has been using nuclear power for all kinds of vessels since 1955 without incident has not helped the public's negative perception of nuclear power. I can't help but think that the fossil fuel industry somehow keeps rolling out the 1970's "China Syndrome" movie every time nuclear power for generating electric gets any popular attention. There is a China Syndrome and it is not a Hollywood movie, it has to do with exporting Americans jobs and exporting pollution. Exporting our pollution problems to the Far East or anywhere south of Texas is not a solution- it's an illusion of pollution abatement. We are all inhabitants of this tiny blue planet and share the same proverbial boat and air. Thanks to short term quarterly profits, the momentary stock market index and massively funded lobbies in Washington, the USA seems to have lost it's ability to confront real threats to our national security. Taking our shoes off at an airport is just another illusion of security that requires very little effort or money. The fact that a good portion of our oil comes from unstable countries run by repressive petro dictatorships is an undeniable and real American national security issue.

The Sun and Weather

The whole object of pleasure boating is getting outdoors with family and friends. Most people are forced to spend a great their time stuck inside buildings, offices and schools. The opportunity to spend time outside is a rare treat. The problem with the whole back to nature thing is sometimes the weather really sucks. The sun can be oppressively hot with the added attraction that it causes wrinkles and cancer. Also, it seems to only rain on weekends even during a drought. Then there is the whole bug and mosquito issue. The

whole object of civilized advancement over the centuries has been to make our lives easier and more comfortable. Thus our power boating experience should be an outside and a pleasurable experience. I see far too many powerboats and trawlers on the market that seem to forget the basics of an outside, yet comfortable experience. Forcing people into a hot, plastic and dacron greenhouse up in the flybridge is great for those interested in growing orchids, but not exactly comfortable for most folks. Pumping an air conditioner to cool the flybridge is a painful lesson in the dynamics of humidity, defrosting and forever fogging plastic. When it rains trying to see the great outdoors through blurry, scratched and rain spotted plastic curtains is an optometrists dream. In spite of the non-ferrous material,



The flybridge

plastic zippers on dacron/plastic flybridge curtains stick and jam making the “roll up” procedure an exercise in perseverance with a large dose of patience. If the only place to steer the boat is up in the flybridge looking through a plastic curtain windshield you quickly understand why the automotive industry perfected the glass windshield with wipers and washers to sell cars to people who wanted to travel at speeds in excess of 3 miles an hour.

Strangely, I think they got it right in the 1950's and 1960's when most powerboats had both inside and flybridge steering riding. Then some jerk invented the plastic zipper on dacron fabric and everything went to hell. Equally as strange, the hull designs below the water did not change very much in the

past fifty years. Planing boats are still using the basic underwater shapes that Ray Hunt designed for Dick Bertram in the late 1950's. Semi-displacement boats haven't changed much since the 1940's except adding chine's. Full displacement trawlers are still using hydrodynamics that were abandoned by most steel constructed, offshore commercial fishing vessels by the 1960's. I guess the power of clever marketing and hype should never be underestimated.

The Last Word (maybe)

Powerboats and trawlers are wonderful vessels. They are one of the last vestiges that allow people to have fun and also express desires and taste. An accountant trapped inside walls of numbers during the week can become the skipper of a tug boat on weekends. A business person compressed by the weight of the economy and employees is set free at the wheel of a powerboat. A person with little money in a small powerboat gets to share the same water and outdoor experience as the multi-millionaire riding around in a mega yacht. A boat of any size and shape used solely for recreation is the ultimate testimony to the success of capitalism and a free society.

There are a lot of books, boating magazine articles and Internet information espousing the importance of being practical about buying a powerboat. I say screw being practical about buying a boat. Life is already chock full of decisions that must be made for practical reasons. An informed decision is helpful up to a certain point. However, don't get bogged down with practical stuff. Boating is the opportunity to break the chains of practicality. Buy the boat that makes your heart beat a little faster. When the opportunity comes, ignore all the so called “experts” (including me) and purchase the boat you really want to own. There is no such thing as the “wrong” boat. There is only the sad life experience of having no boat or no dreams. Sure money is always a factor, but it is far better to be riding around in a little rowboat with a small outboard than standing on the shore letting precious minutes and sunny days slip away never to return.

Things to Avoid when Buying a New or Used Powerboat

- **Narrow Side Decks** If you can't get from the stern to the bow easily then the boat is dangerous. Designers and builders push the interior cabins out to the sides of the hull to create "big" interiors to sell boats. They don't care that the tiny, skinny side decks are a hazard. Boats have to be docked, sometimes under difficult conditions. Fenders and docklines have to be set. Forcing people to navigate around narrow side decks that would challenge a Chinese acrobat is not safe. If someone falls into the water while the captain is preoccupied during a docking drill the result could be fatal. Skip the few inches of "optical" cabin space so you and your family can move around outside safely.
- **Boats with balsa wood cored hulls** See the section on balsa in Fiberglass Construction.
- **Engines and generators that cannot be removed without a chainsaw**, This "stuff" is installed at the boat building factory before the deck is joined to the hull. If you want to dramatically increase the odds that an engine or generator will terminally drop dead put it in a boat that makes removal almost impossible and very expensive.
- **Appliances that cannot be removed and replaced without dynamite**. Things like washer/dryers, dishwashers, trash compactors, refrigerators etc., are made for household/camper use not marine use. The front may be made of shiny stainless steel but the parts you cannot see are mostly made of mild steel and salt air corrodes the steel. Like engines and generators this "stuff" is also installed before the deck is landed.
- **The "latest and greatest" electronics**, You don't want to be the "test chump" for the latest new model or upgrade of marine electronics especially radar/chartplotters. The competition faced by electronic companies today is brutal and fierce. The marketing people are driving the engineers to push product out without any real world testing. When the staff screws up on consumer's boats the engineers start to "fix" the problem (if they can). But by the time they get it right, the company rushes out a new model and the whole cycle starts all over with the consumer taking the hit. Plus to compete, the electronic companies are making the units stupidly complicated offering "new features" that are rarely used, if ever, which is overwhelming the engineering/software people. I never consider buying a new piece of electronic equipment unless the model has been out on the market for a minimum of 12 to 18 months.
- **A boat that has no 12 volt DC lighting**. Many powerboats only use sexy 120 volt AC house/condo interior lighting. The lights are fine if you are plugged into the dock or if the AC generator is running. If you get caught out in the dark and the AC generator doesn't start (which is when it usually breaks) it's time to find out if you have new batteries for your flashlight. Family and guests are usually not comfortable using a flashlight in the toilet or galley. Removing the dark with lighting is an American birthright.
- **A boat that has no 12 volt DC fans** Things break and usually at the worst possible times. Most powerboats have little ventilation except for overhead opening hatches. Recreational fun time is limited and you don't want to spoil it trying to sleep in a stifling hot, airless cabins when the air-conditioning stops conditioning or the juice goes off at the dock and it has been raining for days.
- **Bridge clearance over 20 feet** If you intend to use the boat anywhere on the Inland Waterway someday. It's also called "air draft". Anything over 20 feet air draft means you have to wait for bridge openings jammed with sailboats and big yachts waiting for inconvenient bridge opening times. Measure from the waterline up to the highest non-lowering thing. Don't believe advertising claims they use "special" measuring tapes.