On the Cover

The cover photo was taken by Todd Brown at an early-season Minuteman MYC regatta at the Needham, Massachusetts, reservoir. The boat is Al Fearn's Soling One Meter coming in "hot" for a pit stop.

The Soling One Meter is the most popular AMYA model yacht class, having the most number of members with at least one registered boat. Many clubs around the country sponsor racing fleets for this fine model yacht. This is also a "builders" class, so most of the articles include many helpful building tips. You will find this information especially helpful for building any class of model yacht with a plastic hull.

This issue also includes the Nominations and Motions for the 2007 AMYA Ballot. There are significant motions affecting the AMYA Constitution and Bylaws, as well as several classes, that bear careful reading and possible comment, depending on your point of view.

The American Model Yachting Association (AMYA) is a not-for-profit organization dedicated to promoting the designing, building, racing, and preservation of all model sailing yachts and is open to all people who are interested in these activities.

In pursuit of these goals, the AMYA publishes *Model Yachting* magazine. *Model Yachting* is published four times per year in accordance with the AMYA calendar. The staff of the magazine is composed primarily of AMYA member volunteers who devote countless hours of their time to produce this publication. Editorial policy is ultimately determined by the AMYA Board of Directors; however, the views expressed in this publication do not necessarily represent the views of the Executive Board, the Board of Directors, or the majority of the AMYA membership.

Advertising in this publication is encouraged as an informative service to the AMYA members and as a means of helping defray the costs of printing. The AMYA does not take any responsibility for any advertiser's products.

Advertiser Index

Contents of Issue 148

Issue 149 Final Deadline is June 26, 2007 Featuring

US One Meter & ODOM

Assembling a Santa Barbara

Supplement

Graphics like these make it easy to see your boat when racing in a large fleet. Photo by John Richmond.

by Rich Matt

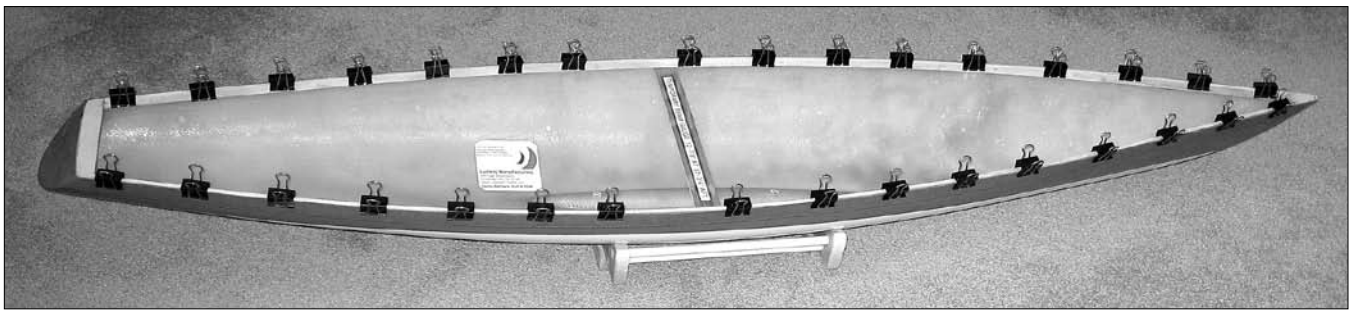
The first half of the article, "Assembling a Santa Barbara OD—Part I," was published in the previous issue (147) of *Model Yachting*. It described what parts and pieces would be needed for building a S/B OD and where to get them. Also covered in Part I were instructions for mounting the removable keel and rudder and installing the wooden parts that would support the winch, radio, servos, and deck.

Part II of the article, which was intended to be included in this issue (148) will describe hatches, spars, hardware, and rigging. It turned out, however, that so much material about the featured class, the Soling One Meter (S1M), was submitted for this issue that there was not enough space to include the second half of the Santa Barbara article. It is not a big surprise that the AMYA's most popular class and its very energetic class secretary, Paul Fixx, provided the editors with an abundance of S1M articles and photos.

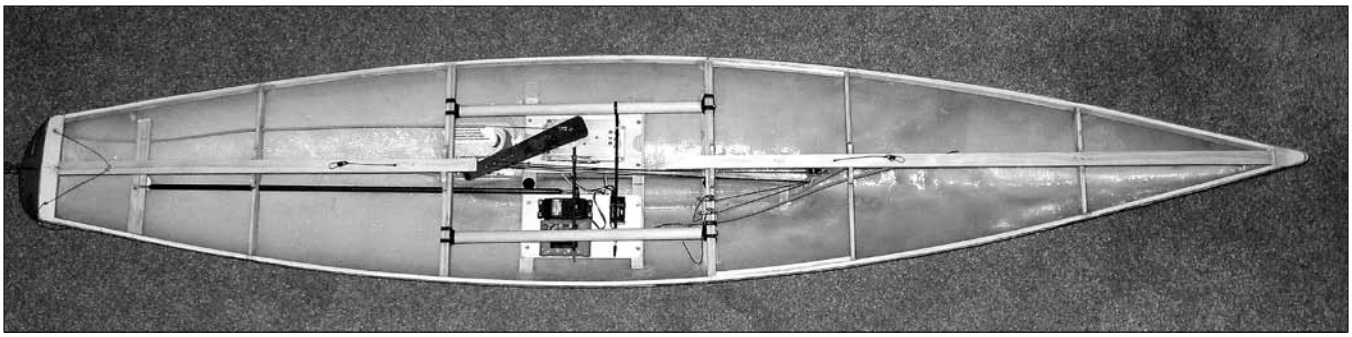
Skipping over to the next issue of the magazine has generated a new deadline for submitting Part II. Time has become available for building a new boat. So, a new boat was ordered from a new S/B OD supplier, Ludwig Manufacturing Co. This is an opportunity to provide a comparison to the Hartman Fibreglass product shown in Part I.

Part II's postponement also allows time to rig the boat using deck and rigging hardware currently available. Since Vortex, Probar, and Fisher, the traditional suppliers of larger-boat hardware are no longer in business; fitting out the deck and sail rig has meant using a lot of homemade, scrounged-up, and improvised hardware. This new boat will have hardware items now readily available from Ludwig Manufacturing and SAILSetc.

Here is a short progress report on the new boat's assembly. The hull, weighted keel, and rudder arrived in a sturdy wooden shipping crate. The two-color hull, white bottom and red topsides, is perfectly fair and glossy. One concern: About a quarter-inch of fiberglass material needs to be removed so as to bring the top edge of the hull down to the scribed line that indicates the gunwale top edge. Sanding away this "flash" by hand is a chore. Removing it with a power tool is risky to both you and the boat. A suggestion: Talk to Larry Ludwig about doing this trimming for you. Like the Hartman S/B OD, some artistic work with a sanding block will be needed to fit the keel top into the hull's keel socket. When the time



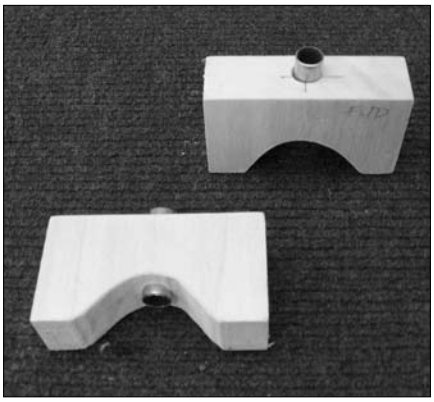
Paper clamps hold the sheer strips in place while the epoxy glue sets. Photo by Rich Matt.



Now that all wooden parts, sail control unit, and radio gear are installed, the boat is ready for the deck. Photo by Rich Matt.

comes, as with any other boat, a rattle-can of paint will be needed to finish the hull-to-deck joint, keel top, and keel edges.

Installing the below-deck wooden parts in the Ludwig boat is the same as that described in Part I for the Hartman hull. Being a one design, you would think and hope so! The only difference is that the Ludwig keel has two mounting bolts instead of Hartman's three. It will be necessary to add to the Wooden Parts List a pair of 1" x 2" x 3" Keel Bolt Mounting Blocks. The bottoms of these blocks need to be shaped to fit the top of the keel socket. A three-eighth-inch hole needs to be drilled down the center of the block, and a length of three-eighth-inch, outside-diameter brass tubing is fitted into the hole. The tubing needs to extend a quarter-inch higher than the block so as to accommodate the Keel Block Thwarts and extend about one-eighth inch under the block so as to fit into the bolt hole in the fiberglass.



Keel Bolt Mounting Blocks needed for the Ludwig Mfg. hull. Photo by Rich Matt.

Both Hartman and Ludwig keels have the threaded bolts securely imbedded down in the keel. There is little risk of having a keel break loose, as might be the case when, instead, the nuts are imbedded in the keel.

The following numbered paragraphs explain the function of the numbered parts in the photo at the bottom of this page.

#1. When carrying the boat to and from the pond, a good deal of weight is carried by the handles. The thwarts, fore and aft the hatch opening, are notched so as to hook under the sheer strip.

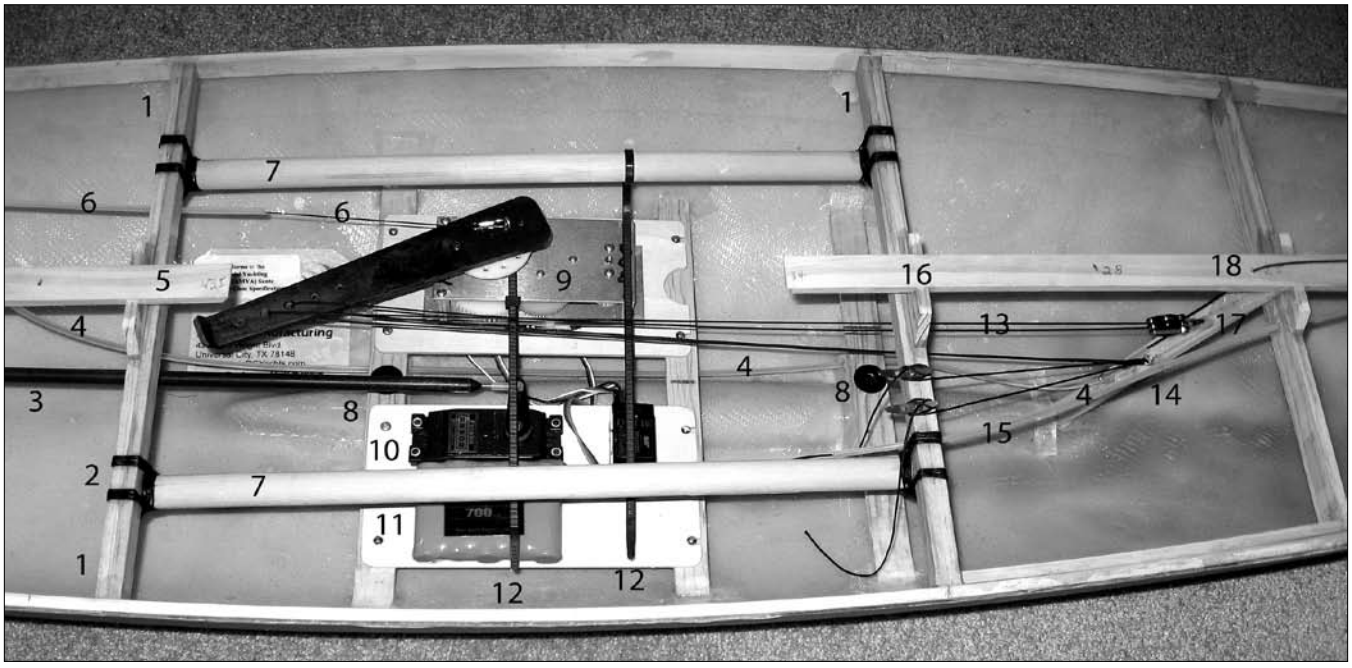
#2. The thin strip of wood acting as a doubler to the handle side of the thwart serves to provide a solid ledge for the top of the handle (#7).

#3. On a S/B OD, it's a long way aft to the rudder. A stiff, kink-free fiberglass arrow shaft connects the rudder servo to the rudder control horn.

#4. Nylon tubing is used as near-friction-free plumbing for the main sheet. From the main sheet exit on deck (outside the photo to the left of the number"4"), the tubing is led low in the hull and under the keel-mounting thwarts. From there it is led halfway up and secured to the Mast Support post.

#5 & #16. The deck stringers rest on notched risers at a height that places them on a straight line above the thwarts from bow to stern.

#6. This length of nylon tubing runs from the thwart, all the way aft and up through the deck at the transom. Notice the line in the tubing: it runs from a clip on the backstay, through the tubing, and is then clipped to a screw-eye imbedded in the sail-control swinging arm. This screw-eye is offset one-half inch behind the swinging arm's pivot point.. As the arm swings forward when easing the sheets, the backstay is eased. As the arm swings aft when



The numbers in this photo are referred to in the above text of this article. Photo by Rich Matt

trimming the sheets, the backstay is drawn tight. It is an automatic backstay adjuster—no thinking or separate servo required.

#7. Launching and retrieving the boat with one hand, while holding a transmitter in the other hand, is a great convenience. These 5/8" birch dowels, port and starboard under the hatch opening, serve as handles.

#8. Rubber faucet washers, tight fitting around the keel bolts, keep the bilge dry.

#9. The Sail Control Unit, an Ozmun Design W-12, uses one leg of a model airplane landing gear as the swinging-arm. The arm, being about an eighth-inch thick, allows for the holes where the sheets pass through to be rounded with a countersink bit. These rounded-hole openings provide a relatively friction-free bearing for the sheets.

#10. Using a big, slow, "quarter-scale" servo to work the rudder on a big boat like the S/B, EC12, 10R, or AC provides turns that are fast enough, but without the servo "putting on the brakes" when given a sharp application of rudder. Then, too, in strong winds there is no risk of water pressure on the rudder overcoming the servo.

#11. The battery pack and receiver are mounted on the radio board with Velcro.

#12. Radio Shack cable ties, positioned over the top of the radio board and under the swinging arm's range of throw, prevent a slack sheet from snagging anything. Many swinging-arm installations use a thin sheet of plastic model airplane windshield material under the sheets—same sort of thing.

#13. The sheets: The main sheet is led from the deck exit hole (#4), through the tubing that runs under the keel mounting thwarts and ends in an upward bend halfway up the mast-step support (#17). From there, the sheet passes through the starboard half of the PeKaBe double-block, also secured to the mast step support. Then, the main sheet goes aft, does a 180-degree turn through a hole in the swinging arm, forward again through a screw-eye (#14) situated low on the mast-step support, and finally through a hole in the deck (#18) near the mast to a deck-mounted cleat. Note: For illustration purposes, two cleats are temporarily mounted on the thwart. When the deck is installed, the two cleats will be mounted just aft the mast.

#15. Where to lead the antenna wire is always a problem. You want to get as much wire as high as possible above the waterline. The antenna should also run along the boat's centerline so as to lessen the signal lowering effect when the boat is heeled over. Hard to see in the photos is the antenna being led through a length of nylon tubing.

If it happens that you are well along in planning to order a Santa Barbara OD, or are already building one according to Part I of this article, contact me, and I will forward you an advance copy of Part II. About the time this issue of *Model Yachting* has been edited, formatted, printed, and mailed, Part II should be available. My address info can be found on page 4, The Masthead, indicated as Photo Editor.

On the Cover

The cover photo was taken by Pat Butterworth. In the late afternoon sun, Jim Linville's Talon II (54) just begins to bear off as Herb Dreher's Talon (441) crosses her bow on starboard. Each Talon II, in its entirety, exhibits the fine craftsmanship of Ken Bauser, of Waterbury, Connecticut.

This issue of *Model Yachting* features articles about the US One Meter and ODOM Classes of model yachts. The ODOM is a successful early US One Meter design that was saved by adapting One Design rules, as the Developmental Class, US One Meter boats progressed in their design. Many ODOM boats are dual-registered in both classes. These articles offer significant insight into building and sailing skills for both types of classes and can certainly help skippers in any class in their understanding of model yachting technique and skill.

The American Model Yachting Association (AMYA) is a not-for-profit organization dedicated to promoting the designing, building, racing, and preservation of all model sailing yachts and is open to all people who are interested in these activities.

In pursuit of these goals, the AMYA publishes *Model Yachting* magazine. *Model Yachting* is published four times per year in accordance with the AMYA calendar. The staff of the magazine is composed primarily of AMYA member volunteers who devote countless hours of their time to produce this publication. Editorial policy is ultimately determined by the AMYA Board of Directors; however, the views expressed in this publication do not necessarily represent the views of the Executive Board, the Board of Directors, or the majority of the AMYA membership.

Advertising in this publication is encouraged as an informative service to the AMYA members and as a means of helping defray the costs of printing. The AMYA does not take any responsibility for any advertiser's products.

Advertiser Index

Contents of Issue 149

2007 Ballot on page 63

Issue 150 Final Deadline is Sept. 26, 2007

Featuring

International One Meter

Assembling a Santa Barbara, cont.

by Rich Matt

Once again it is necessary to postpone Part II of the article "Assembling a Santa Barbara." Two reasons: page space in this issue of *Model Yachting* is limited, and Ludwig Mfg. has run into a delay in the production of the new hardware fittings needed to complete the assembly. By the time of the magazine's next issue the anticipated hardware should be available, installed, and have been put to a test.

Part I of "Assembling a Santa Barbara" left off with the hull ready for the installation of a deck. Even though the S/B hull, keel, and sail plan are specified as one-design; the choice of deck style is pretty much wide open. The only real requirement is that the deck construction be made of some sturdy and seaworthy material—food wrap decks like on some open-design boats won't do. When Tom Protheroe first made S/B kits available back in the late 1960s, the deck was a sheet of 1/8 in. mahogany plywood. Both sides of the deck material needed waterproofing with resin or varnish. Hatch covers were made of the same plywood and fitted around wooden side coamings. About 1970 when Vortex Model Engineering took over the S/B, its 300-Series boats featured a deck having a cuddy cabin and cockpit. Made of fiberglass and sporting a few mahogany trim parts, this deck was a big hit in the market place. Along came the 700-Series boats having what was called an "Ocean Racer" deck. Of fiberglass also, and featuring a large clear Plexiglas hatch cover, this style of deck provided a modern look to the boat.

Available currently from our three manufacturers are three different styles of decks. Hartman R/C Fibreglass has a nicely detailed Soling-50 style deck and hatch cover. Ludwig Mfg. offers a version of the Ocean Racer deck. And, Midlife Boats provides already installed on the hull a plain, but neat looking, deck. It's a matter of personal preference which style of deck to choose. Regardless of deck, the S/B remains a proper one-design class.

Another option when it comes to a deck is the kind being described in this article—a 72 in. x 14 in. section of plastic laminate purchased from a cabinet shop. The thin "post forming" grade of plastic laminate makes for a deck that weighs very nearly the same as one made of fiberglass. Laminates are available in a wide selection of solid colors and wood-pattern finishes. Then too, there's nothing stopping you from picking out something that looks like a granite or butcher-block kitchen counter top! The laminate used as the deck on the boat in the photo below is a piece of plastic laminate manufactured by Pionite and labeled as WX031 Suede Pearwood. To most everyone it looks like freshly sanded and unfinished teak.

Notes re. the boat in the photo…

Preparation of the hull for supporting and installing the deck is as described in *Model Yachting,* Issue 147.

The deck stringer running down the center (full length) of the hull needs to be perfectly straight and level. The stiff laminate will then provide a good looking, smooth crown to the deck. Funky things happen to a deck if you try to bend it in more than one direction, as if trying for a sheer as well as a crown.

The hatch opening was "cut" to shape by drilling many 1/16 in. holes, one right next to the other, and then using the same drill to burr away the material adjoining the holes. Using a saw to make the hatch opening runs the risk of splitting the laminate. The section of deck stringer directly under the hatch was then cut away. Use sandpaper to smooth the rough opening.

A raised, and sensible, hatch can be made from 1/4 in. wood and a section of laminate. Cut the fore and aft hatch and hatch coaming wooden parts to match the crown of the deck. Bow the coaming side rails outboard to resemble the curve of the gunwales. Assemble, fasten with screws, and glue the coaming in place around the hatch opening. Then, assemble the hatch cover using the coaming as a mold. During hatch cover assembly, food wrap can be used as masking to prevent the hatch cover from being accidentally glued to the hatch coaming. To assure a proper look to the hatch cover, make a pair of thwarts shaped to match the deck crown. These should be cut short so as to clear the hatch opening's coaming rails and then be glued to the underside of the hatch cover. One thwart goes one-third aft the hatch cover front, and the other one-third further aft.

The (not so sensible) hatch cover on this boat is made of 1/16 in. Plexiglas having been heat-formed to match the crown of the deck. An elongated ring of laminate is glued under the deck to reinforce the deck opening. Another elongated ring of laminate having an inner "diameter" 3/8 in. smaller is glued in place under it to serve as a flange on which the Plexiglas hatch cover is resting.

This is the Santa Barbara being built by Rich Matt. Note the builders cradle with the keel and rudder not mounted for convenience. Photo by Rich Matt.

On the Cover

The IOM starting line cover photo for this issue is by Bruce Lopez. Per Bruce, "Hello! That photo was taken during the 2005 NCR in San Diego. It is right after the start of an Afleet race. The #50 boat is a Firebrace design called a 'Vapour" and is being sailed by George Pedrick. The #187 boat is a KF2 design and is sailed by Doc Hoyos from Barbados. The #49 boat another Firebrace design "Ericca" and is sailed by Engelhard Federico."

This issue of Model Yachting features the International One Metre (IOM) Class. Of course, we have additional articles specific to Santa Barbara and 10 Rater, and all the articles have information applicable to all classes of model yachts.

This is the Winter Issue, and many of our members find themselves with time to read and build.

Advertiser Index

Contents of Issue 150

2007 Ballot Results on page 59

Issue 151 Final Deadline is Dec. 26, 2007

Featuring

The 75th Anniversary of the Marblehead Class

Assembling a Santa Barbara OD

Part II

by Rich Matt

Part I of this two-part article was published in *Model Yachting,* Issue 147, pp. 9–19. It provided a description of the wooden parts and other items that were needed when assembling an S/B"short kit." It was intended that "Assembling a Santa Barbara Part II"would be included in the following issue of *Model Yachting*. However, mostly because of a limit on the number of pages available, this Part II has been spread out across the next three issues of the magazine. Issue 148, pp. 30–32, described the layout and installation of the parts and equipment that are required down inside the hull. Issue 149, pg.. 42, described how to install a deck made of plastic laminate, rather than doing it the easy way by ordering a molded fiberglass deck from Hartman R/C Fibreglass or Ludwig Mfg.. This issue (#150) concludes Part II by describing one method of putting the sail rig together.

Rich Matt's new Santa Barbara OD. All article photos by Rich Matt.

By"short kit,"it is meant that a manufacturer makes available only the fiberglass hull, keel, and rudder. The home builder finishes putting it all together. Of the three current S/B suppliers, Hartman provides the short kit only. He does not offer hardware or sail rig items. Ludwig offers the option of providing a short kit or providing the boat in any state of completion the buyer prefers. This includes the sail rig. Ludwig has available all the spars and hardware needed. He can put it together, or you can order the parts and put it together yourself. Midlife Boats, which provides the boat assembled and does not offer a short kit, will also leave assembling the sail rig as a buyer's option.

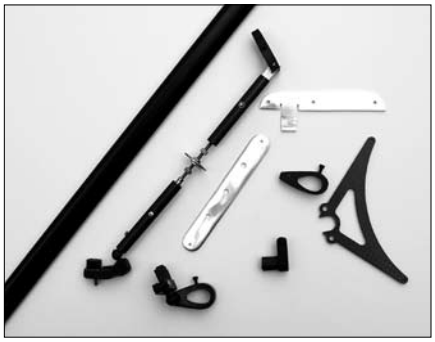
Incidentally, as an alternative to a brand new boat, you could revive an older one. There are hundreds of twenty- and thirty-year-old S/Bs out there. New sails and updated hardware are usually all that are needed to make even the oldest S/B a regatta winner.

The supply chain for sail rig and deck hardware has grown and evolved over the years. The legendary AJ Fisher Co., now gone, made brass hardware fittings that were popular on all classes of boats from vane-sailing days until the 1990s. During the seventies and eighties, now gone also, ProBar Design provided complete one-stop shopping for top-notch stainless steel (SS) hardware fittings, carbon-fiber spars, swing-arm winches and everything else (except sails) that was needed as R/C sailboat hardware. Nowadays, a number of new suppliers have taken over where the late Bob Irwin of AJ Fisher and the late Don Prough of ProBar Design left off.

A search of the *Links* shown at the AMYA website (www.ModelYacht.org) indicates numerous sources of hardware. More than two-dozen suppliers are listed. It is a bit of a pleasant surprise that there are that many out there involved in offering model boat hardware for sale. With all the available options, it is not easy for anyone to say whose hardware is best and whose hardware is best for use on a particular class of boat. Choice of deck and rig hardware is not a factor with the S/B Class Measurement Specifications. This article describes using some of the products provided by Midwest Model Yachting, LLC; by Ludwig Mfg; and by the local fishing tackle shop and local hobby shop.

A boat larger than the one-meter classes, like the S/B OD, uses a mast long enough to require upper shrouds, lower shrouds, spreaders, and a jumper strut. These rigging items keep the tall mast straight. Most model yacht sails are intended to be used with a straight, rather than "bendy," mast. A mast that is kept from bending will also allow a tight backstay that in turn allows a tight jib forestay. For fast sailing to weather, that tight forestay keeps the right shape in the jib, and it also provides the tension needed for a properly working jib topping lift. The rigging plan and hardware for supporting and controlling the mast is very much like that used on full-scale people boats. It is interesting that the rigging plan of the S/B has gone unchanged since Tom Protheroe first produced the boat back in the late 1960s.

Suggested Parts List



From Ludwig Mfg:

(1) Mast: 72" black-anodized aluminum (comes teardrop shaped with sail groove).
(1) Main boom: 24" matching the mast section.
(1) Gooseneck, Mast Base, and Vang Assembly.
(1) Boom End Fitting.
(1) Jumper Fitting.
(1) Masthead Fitting: polished aluminum.
(1) Mast Step Deck Plate: polished aluminum

From Midwest Model Yachting LLC:
(1) #188, Pack of ten, KDH 11.5 x 6 mm Screw eyes with Washers.
(1) #200, Pack of eight, SAILSetc Bowsies.
(1) #226, Pack of ten, #4 x 3/8" SS Pan Head Screws.
(2) #260, Pack of two, KDH EZ Hook Single Turnbuckle
(1) #268, Pack of two, KDH Stay Rack 80 mm (shroud chain plates)
(1) #285, Pack of four, KDH Fairlead
(2) #282, Pack of four, KDH Tang (eight #2 x 1/4" SS screws incl.)
(1) #283, Pack of four, KDH Cleat (eight #2 x 1/4" SS screws incl.)

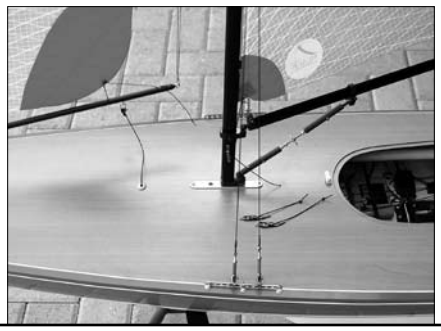
From the local hobby dealer or mail-order hobby dealer:
(1) Pack of two, 32" fiberglass arrow shafts labeled "Fiberglass Pushrod System PRDS-5400" by Dave Brown Products, Inc. (For use as Jib Club)
(1) Pack of three, 12" x 1/8" outside diameter (OD) SS Tubing by K&S Engineering (For use as Spreaders).
(1) One 12" length of 3/32" SS Rod by K&S Engineering. (For use as Spreader Bar).

(Photo in lower left column.)
From the local fishing tackle shop:
(1) Pack of four, Size 4 Ball Bearing Swivel with Interlock Snap by Bass Pro Shops. (For use as jib swivel clasps and securing sheets to booms).
(1) Spool of 30 lb. test, braided Dacron to use as sail grommet tie-offs.
(1) Spool of 50-60 lb. test braided Dacron to use as sheets.
(1) Spool of 30 lb. test braided SS leader cable, plastic coated (For use as mainsail luff to mast jackline)..
(1) Pack of Single Barrel Sleeves (black) (For use as attachment of jackline to mast)…

The Deck Hardware

Starting at the bow, install three KDH #188 Screw Eyes on the deck centerline, one at 11-1/4"aft the bow, one at 12, and another at 13-3/4 inches.. These three screw eyes will serve as the jib-tack deck fittings. A rack about 3" long, and having a sequence of holes 1/4" apart, is another way to do it. Use a drill bit as large as the screw eye's thread to make the hole in the fiberglass deck so as to avoid having the screw cause the deck material to chip. Stop drilling just short of piercing the deck, and then use a smaller drill to prepare the wooden back-up, below it, for the screw's thread. On windy days, you will attach your jib tack swivel to the forward eye. The middle eye is for average wind conditions. And, on days when the winds are light, the aft eye is best. The deck, mast-step plate and the chain plates will also have three available positions, three-quarters of an inch apart, for moving the mast fore or aft without the need to readjust the length of the"quick-disconnect,"shroud turnbuckles.

Install jib sheet and mainsheet exit guides to provide minimum friction pass-through in the deck for sheets that come and go at different angles. What works well is one KDH #285 Fairlead mounted on deck and another, back-to-back, on the underside of the deck. Using a drill bit that matches the fairlead's base, make a hole through the centerline of the deck, 25" aft of the bow, for the jib-sheet exit. The mainsheet fairlead goes 48"aft the bow.



Using the holes provided in the fore and aft ends of the Ludwig Mfg. polished aluminum Mast Step Plate, screw it down on the deck centerline so that the plate's center hole is 29" aft the bow. The three mast positioning holes will then match the 3/4"spacing of the jib-tack screw eyes. To maintain the spacing and make reattaching shroud turnbuckles easy when moving the rig fore or aft, install the KDH #268 Stay Racks so that the center screw mounting holes are 30-1/2"aft the bow and 3/8" inboard the gunwales. Rather than this 30-1/2"measurement being made in reference to the deck centerline, it is made by hooking the measuring tape over the bow and going back on an angle to the gunwale. Doing it this way, rather than drawing lines at right angles to the deck centerline, is quick and accurate. Note: In order for the hook of the KDH #260 Turnbuckle to fit into the holes on the KDH #268 Stay Rack, it will be necessary to file or drill the holes a bit larger.

Two, 3/32"holes drilled in the deck area, two inches to port and two inches aft of the mast step, will provide exits for the adjustable dead-ends of the jib and main sheets. Install two KDH #283 Cleats, one for each sheet, to either side of these holes. Depending on the material used as decking, it might be necessary to install wooden back-up for the screws. Sheltered in this area, near and aft the mast, there will be little chance of the running sheets snagging on one of these cleats, yet the cleats will be easy to reach for adjustment between races.

Installation of a backstay attachment device completes the deck hardware installation. By far the most popular method is a screw eye installed on the deck centerline 1/4"in from the transom. However, many skippers claim that easing the backstay a little when going downwind helps allow the jib to go wing-on-wing more readily. Some S/Bs have a servo-operated adjustable backstay. The servo is mounted on the radio board. A line running aft from the servo arm is led up through a hole in the deck where the backstay is then connected. Or, as on this boat, the backstay is adjusted automatically. The automatic backstay adjuster was described on page 31 of *Model Yachting,* Issue 148. A screw eye is installed on the sail winch swinging arm about one-half inch offset the arm's pivot point. A line tied off to this screw eye is led aft through nylon tubing, up through one corner of the deck near the transom, and then tied off to a screw eye mounted in the opposite corner of the transom. Enough slack is left in the line so that it forms a bridle about six inches in height. With the backstay clipped to the bridle and when the swinging arm goes

forward to ease the sheets, the backstay is eased. As the arm swings aft when trimming the sheets, the backstay is drawn tight. Now is a good time to finish leading the jib and main sheets from the winch arm. If you are starting at the running end of the jib sheet, first fit it out with a fishing tackle snap clasp. A touch of cyanoacrylate adhesive (CA) will make the knot permanent. Pass the sheet down through the deck fairlead and down through the port half of the double turning block mounted on the deck support beam, and then lead it aft to the winch arm. Pass it up through the hole 4" out on the arm, then forward and up through the hole in the deck near the cleat, and tie it off to the cleat. As with the jib sheet, a fishing leader snap clasp needs to be tied to the running end of the main sheet. Don't forget the dab of CA on the knot. Once fitted out with this snap clasp, the mainsheet runs down through its fairlead and forward through the long length of tubing installed through the radio board support beams. From there it goes to the starboard sheave of the double block, aft to the winch arm, up the hole 5-1/2"out on the arm, back forward again, then up through the deck exit hole, and to its cleat.

The Spars

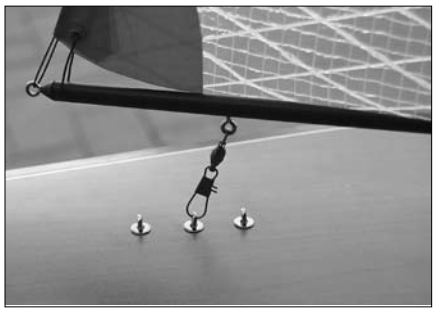
S/B OD Class Rules allow masts and booms to be made of all popular and available materials: wood, fiberglass (FG), aluminum, or carbon filament (CF). A practical mast choice in terms of looks, usefulness, cost, and convenience is the aluminum, airfoil-section shaped mast like the one available from Ludwig Mfg. Made of T-6 6061 aluminum, it is adequately stiff. A 72" length weighs a mere 4.6 ounces. And, the black anodized coating looks good.

Boom material is also a matter of personal preference. A 1/4" diameter fiberglass arrow shaft makes for a good jib boom. However, something stiffer is needed for the much longer main boom. The typical S/B fleet will provide examples of all sorts of different booms. A boom should be sturdy, stiff, and light in weight. An S/B jib boom is about 18" in length, and the main boom, 24"in length.

Many classes, the S/B included, disallow the use of curved or doglegged booms even though no racing advantage is apparent. A bent jib boom that meets the curve of the sail's foot might improve the overall appearance of the boat. Perhaps what should be specifically disallowed on booms are any cleats or sharp-edged hardware that could reach out and snag the rigging of a competing boat when in close-quarters, downwind mark roundings. The same goes for a slug-shaped wad of lead that extends on a rod way forward of the jib club… Sure, this device might help a boat to go wing-and-wing more readily, but they also do wonders to latch on to the rigging wire and spin out any boat that comes near. The resulting two-boat tangle usually results in both boats being dead last or logging DNFs. Perhaps it is because of this concern that only a few S/Bs are seen having a forward-extending jib counterbalance. *(Please excuse the rant. As a repeat victim of boom-claw attacks in other classes, the time, mood, and place were right for it. — RM)*

The Jib Boom

Typical jib boom hardware consists of: 1) something at the forward tip for securing the jib luff wire, 2) a free-swiveling jib-tack fitting to connect the jib boom to the jib-tack deck fitting, 3) a screw eye for attaching the jib sheet, 4) a device of some kind for adjusting the jib outhaul, and 5) a screw eye on the aft end of the boom to connect the jib topping lift.



The hobby shop–available Dave Brown Products FG arrow-shaft pushrods come two to a package. These stiff, sturdy, and lightweight FG shafts are ideal as jib booms. Also in the package are six, plastic, arrow-shaft "tips.." Two of the tips, having holes pre-drilled in their pointy ends and fitted with screw eyes, are used as the boom's forward- and aft-end plugs. Two of the other plugs, once the flared pointy-end is cut away, are used inside the shaft as back-up blocks for the screw eyes that hold the jib-tack swivel fitting and the screw eye to which the jib sheet attaches. Insert one of the back-up plugs inside the shaft so that its center is about 2-1/2"in from the forward end.

If using the KDH #188 screw eyes, use a #50 drill to make a hole at that 2-1/2"mark. When drilling the hole, stop short of going all the way through the shaft. Then install a screw eye for the jib-tack swivel fitting. Avoid the risk of breaking off the screw eye by creating a thread for it—by alternating a half-turn in with a quarter-turn back out.

From the aft end of the shaft, insert the back-up plug intended for the jib sheet so that its center is located 15"aft the forward end of the jib boom. To install the jib swivel, first pry open a screw eye enough so as to insert the jib swivel's split-ring, squeeze it back closed, then drill the hole and thread in the screw eye. Note: All measurements regarding the placement of sheet exit guides and sheet attachment points on the booms are with the assumption you are using a swing-arm sail control and will be using differently spaced holes on the swing-arm to adjust for sheet travel lengths. Don't forget; being double-ended, the sheet will be readily adjusted at a cleat on deck. This allows the use of a snap clasp tied at the running end of the sheet—no need for a jib sheet bowsie or adjuster on the boom.

The jibstay wire, which is embedded in the jib luff, will pass through the screw eye installed on the forward end of the jib boom. The luff wire will then be looped through the screw eye and swaged snug with a crimp sleeve. Insert this screw-eye equipped plastic tip into the boom so that the screw eye is vertical and in line with the jib-tack swivel screw eye. A small touch of CA will secure the tip in the end of the boom. Drill a 1/16"hole clear through, side-to-side, about a half-inch back from the very tip of the boom so as to provide for a loop of line that will serve as the jib-tack downhaul.

Next, make a circle of fishing line running through the eyelet in the jib tack and through the hole in the jib boom directly below. This loop should be large enough to allow the foot of the sail to be clear of the boom. A one-inch difference between eyelet and boom should work. Using a toothpick as an applicator, apply CA to the knot.

Insert the other plastic arrow tip into the aft end of the boom so that the screw eye is vertical, and then secure it with a touch of CA. The jib boom will appear to be a few inches longer than needed. This aft extension will provide clearance between jib leech and the line used as the jib topping lift. The last step in building a jib boom is to provide an adjustable jib clew outhaul. What works well are four, 1/32"holes drilled vertically through the boom, starting just forward (clear) of the topping lift's screw eye and going forward in a

row about 1/8" apart. A loop of line goes from the jib leech grommet around the bottom of the boom and back up to the grommet. From the grommet, where the knot is held fast with a drop of CA, the line is then led down through the first of the four holes. The line is then fed up the next hole, down the next hole, up the fourth hole and is then tucked under one or two of the new loops made by the hole-to-hole weave. The outhaul then has an adjustable bowsie built in to the boom.

Finish off the jib by fitting out a fishing swivel clasp that is needed for attaching the jibstay to the mast. There will be about 5-1/2" from the head of the jib up to the jibstay tang on the mast. Overall, from screw-eye tip of the jib club to the jibstay fitting on the mast, it will be 55 inches. Half of a 12" length of line should be passed through the split ring end of a fishing swivel and knotted. One of the 6" tails is passed through two holes of a bowsie, through an eye swaged in the wire jibstay, then back through the bowsie's third hole and knotted. The other 6" tail goes from swivel's ring down through two holes of a bowsie, through the jib-head grommet and back up to the bowsie and knotted. The bowsie knots should be located so as to allow at least one inch of adjustment in either direction. These bowsies will make it easy to adjust mast rake and jib luff tension.

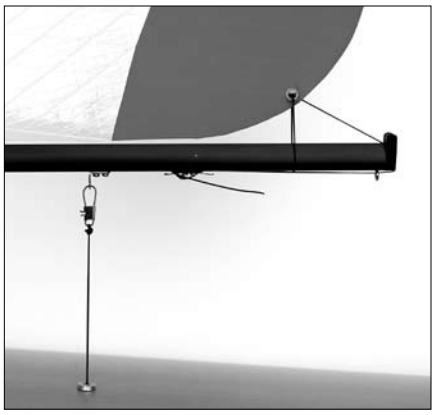
Using a 55" length of lightweight line, two small fishing tackle clasps, and a bowsie, prepare a jib topping lift. An adjustable topping lift is needed to give a proper shape to the jib leech when sailing to weather. Without a topping lift, the vang effect of a taut jib forestay would close the jib leech and interfere with the important "slot" between jib and main. Tie a clasp to one end of the line. This gets hooked into the jibstay upper swivel's split ring. Fit the other end of the line with a bowsie by first passing the line through two bowsie holes; lead it through the top end of the other clasp and then back up to be knotted off at the bowsie's third hole. This clasp will be hooked on to the screw eye in the aft end of the jib boom.

The Main Boom

Main boom hardware consists of: 1) the gooseneck for attaching boom to mast, 2) a boom-vang fitting about 6" aft, 3) a tang 17-1/2" aft for attaching the main sheet, and 4) a boom end fitting that provides an adjustable outhaul arrangement for the mainsail clew.

The gooseneck/boom-vang assembly, now available from Ludwig Mfg., is very impressive. S/B and other fellow "big-boat" sailors have been waiting and hoping for just such a thing. Made of a reinforced hard plastic and SS parts, it is sturdy, lightweight, and nicely crafted. The large sized ball-socket swivel joints are surprisingly friction free and are unlikely to disconnect even in the wildest sailing conditions. Important to many sailors is that the entire assembly is salt-water useable. The gooseneck portion consists of a setscrew-equipped collar that is a perfect fit around the Ludwig mast, a boom end fitting that provides a mainsail tack attachment point, and a ball-socket pivot connecting the two. Another set-screw-equipped collar, perfectly shaped to fit the main boom, provides a connection to the boom vang. The boom vang fitting serves also as a mast base, and it has a pin to fit the deck-mounted mast-step plate. The vang itself, the six-inch-long assembly that connects the mast to the boom, is well designed and well crafted. A turning wheel about 3/4" in diameter, locked to a threaded rod, provides a convenient means of extending or reducing the length of the vang. Round, knurled nuts on the threaded rod lock any adjustment in place. Being a "stiff" vang, it will not only prevent the main boom from rising, it will also prevent the weight of the boom or pull of the sheet from pulling down and causing the leech of the main to be affected.

One modification you might consider (and, Ludwig Mfg. is also considering) is to avoid scratches on the mast step plate by replacing the 1/8" x 1/2" metal roll-pin in the bottom of the vang fitting with a 1/8" x 1/2" plastic or even a wood dowel. When the time comes for final assembly of the rig, plan on using epoxy to set the vang fitting securely in the base of the mast. Or, use a small screw through the fitting and into the mast to keep it in place. Likewise, a screw through the boom and into the boom end fitting will be needed.



A KDH #282 Tang having its larger hole opening bent down ninety degrees and then screwed to the underside of the boom about 17-1/2" aft the mast will serve as the attachment for the mainsheet clasp. No device for adjusting the length of the mainsheet will be needed on the boom. Like the jib sheet, the mainsheet is double-ended and tied off to a cleat on deck, making any adjustment quick and convenient.

Slip on a Ludwig Mfg. Main Boom End Fitting and secure it with a KDH Screw Eye. The screw eye, like the other boom hardware, goes underneath the boom.

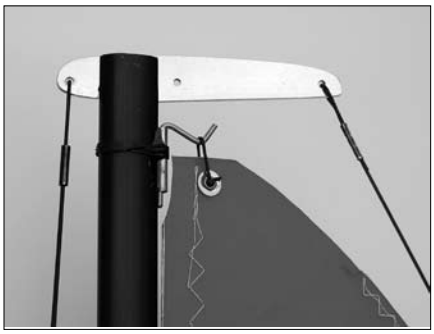
About an inch aft of the mainsheet tang, install a KDH #283 Cleat to the underside of the boom. This cleat will provide adjustment and tie-down for the mainsail outhaul. Like the jib outhaul, the most popular mainsail outhaul is a loop of line through the clew grommet and around the boom. The loop is usually large enough to keep the sail foot just making contact with the top of the boom. A long tail of the knot will be led from the grommet and aft on an angle to a hole in the boom end fitting. From the boom end fitting, the line is then led forward through the screw eye and then to the cleat. This simple outhaul set-up will provide complete adjustment control for the mainsail foot camber. The knot in the line needs to be kept stationary up inside the grommet; use CA to keep it there.

The Mast

A trip to the sailing site will show that there are very few boats having the exact same ideas about which mast hardware makes the ideal rig. The basics are all the same. The rig needs to be sturdy, light in weight, aerodynamically efficient, and straight in all wind conditions. Starting at the top and working down towards the base of the mast, here's a description of one way to put it together.

The Masthead Fitting available from Ludwig Mfg. is a flat aluminum T-shape that is intended to slip into a notch cut 3/8" down into the top of the mast. A hacksaw and a

small, narrow, flat file are needed for a neat installation. A hole for the jumper (diamond) rigging wire is provided on the forward end of the fitting. A hole in the long, aft end of the fitting accommodates the backstay. The hole just aft the mast is there for the main halyard. However, instead of the traditional line tying off the top of the sail to the immoveable masthead, you might want to try a currently popular way of securing it. This new method allows the main's headboard to readily swing fully from side to side, rather than hold it nearly rigid fore and aft. A 1" section of brass tube is lashed and glued to the mast's sail groove and a Z–shaped, 1/16" wire is loosely fitted into the tube. The one leg of the Z that fits into the tube is about 1" long. The middle of the other leg is bent into a V, with 1/2" legs to complete the Z-shape. The halyard now consists of a small loop of line from headboard to center of the V. The headboard is now free to swing in line with the entire sail. No longer will there be a strange twist to the upper portion of the mainsail when sheets are eased.



The groove built into the aft edge of the mast is there to accommodate a boltrope-equipped mainsail. Boltrope mains, in spite of discussion of their aerodynamic superiority when sailing upwind, are not as popular as the other method of attaching the mainsail to mast. This method uses sleeves on the mast, sleeve-matching notches cut in the sail luff, and a wire jackstay passing through the sail luff and through the sleeves. The sleeves and notches should be exactly six inches apart. In order to secure the sleeves to the mast, use a toothpick to transfer small drops of CA glue from the bottle. Once the CA has cured, use a toothpick, again, to spread a tiny drop of 5-minute epoxy as a second coating and fillet to both sides of the sleeves. Once the sleeves are secured in the grove, it is a good idea to verify the spacing measurements with the mainsail luff before cutting the notches. Secure the headboard in position; line up the luff with the aft side of the mast; and using a fine-point marker, make dots on the luff where the centers of the notches need to be. For neatly cutting notches in a sail luff, use an Exacto knife with a sharp and "pointy" #11 blade. Notches, filed 1/8" deep and 1" long, in the edge of a plastic ruler can make a handy template for the cuts. On a 12-inch ruler, center a template notch at 3 inches and another at 9 inches.. Matching one notch on the template with one previously cut in the sail provides accurate placement for the next notch. Covering the backside of the ruler with blue masking tape helps keep the ruler/template from sliding out of position when held down on slick sail cloth.

Now would be a good time to drill a small hole about 2" down from the top of the mast and into the "back wall" of the groove. This hole will serve to anchor the top end of the mainsail jackstay.

Twelve inches down on each side of the mast install a KDH #282 Tang for the upper shrouds (sidestays). Be careful to select the proper sized drill bit when making the holes for the SS self-tapping screws. It is a good idea to use a tang for attaching the shrouds on a boat that is large and heavy like an S/B. On a smaller, lighter boat, most shrouds are attached to the mast by knotting the wire and passing it through a drilled hole or by looping and swaging the wire around a screw. Using tangs presents fewer sharp cutting edges to the rigging wire.

Install another tang on the forward side of the mast so that it's upper holding screw is no higher than 53-1/2" up from the mast base. This tang will be the jibstay attachment.

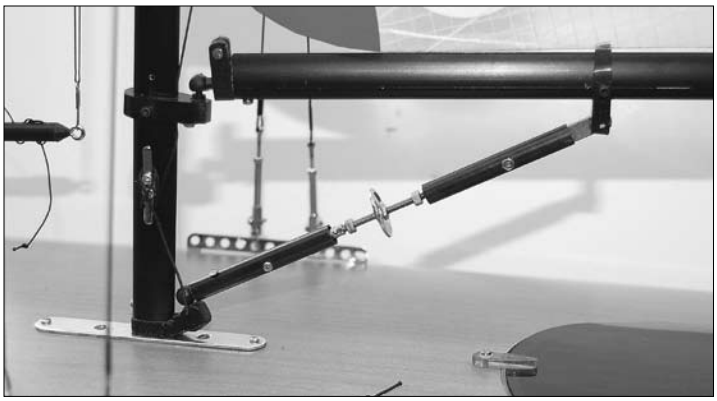
If you are planning on using the newly available CF jumper fitting, wait to install it until the rigging wires are being fitted.

At the thickest part of the mast's cross section and 26-1/2" up from the base drill a 3/32" hole clear through the mast for a 3/32" x 2-1/2" spreader bar. Install a tang to each side of the mast. The spreader bar will pass through the tang's center hole. The lower shroud will be attached to the already-large hole in the angled-away portion of each tang. Each tang's remaining upper hole is used for the screw that fastens the tang to the mast. Note: Drill that hole for the tang mounting screw a little bit towards the forward edge of the mast. Visualize lining up the tang with its top cocked a little forward so as to line up with the jumper wire and its bottom so as to line up with the lower shroud that will attach down on deck about 2" aft of the mast base. A touch of CA where the spreader bar contacts the tangs will keep it from sliding in and out. Prepare the slip-on/slip-off spreaders by cutting the SS 3/32" inside diameter tubing into 5-1/2" lengths. Fold a pair of 6" long pieces of rigging wire in half. Insert one folded-over wire into one end of each spreader tube so that only an eye about 1/8" in diameter extends. The upper shroud will pass through this eye when the mast is rigged on deck. Long, thin cotter pins could be used instead of the folded-over wire.

Rigging Wire

Black, plastic-coated, multi-strand, 45 lb.-test fishing leader will make good rigging wire. In addition to leader wire, fishing tackle stores also have available different sizes of swage sleeves, which are used to pinch together and hold tight any formed tie-off eye loops. These sleeves come in different sizes. It turns out that different manufacturers use different methods of describing sizes. Pick out sleeves that are no bigger than necessary to accomodate two sections of 45 lb.-test wire. In your quest to have neat and tidy eye terminals, you might get away with using a smaller size sleeve if you first gently "oval it" a tad with pliers in order to insert both wire parts. When swaging an eye in the end of a wire use the smooth, not-serrated, portion of long-nosed pliers to first squash the sleeve flat. Then with small wire cutters, gently put two dents in the flattened sleeves. These dents are to be parallel with the flat, not at right angles to the flat.

With the mast on the workbench, first install the jumper wires. Cut off a section of wire 100" long. At 50" pre-bend it 180-degrees. Insert the wire right up to the bend in to the forward hole in the masthead fitting. Install a swage sleeve over the two wires and slide it up tight against the masthead fitting. Do not crimp this sleeve. It will serve as a sliding device to adjust mast bend. It will elimi-



nate the need for clumsy-looking telescoping jumper struts or jumper turnbuckles installed at the spreaders.

Place the Ludwig Mfg. Jumper Fitting on the mast so that it is just touching the top of the jibstay tang. Being a perfect wraparound fit, the jumper fitting stays in place nicely. Pass the two wires down through the tips of the jumper fitting. Slip a swage sleeve on to each wire. Back out halfway the screws holding the spreader tangs. With just enough tension to not cause bend in the mast, wrap the wires 180-degrees around the loosened screw and under the tang. When satisfied that both wires have equal tension and that no mast bend is taking place, then crimp the swages, cut away excess wire, and tighten the screws.

In order to secure the CF jumper fitting in position, make sure it is snug against the top of the jibstay tang and apply some CA glue around where it meets the mast. Wraps of thread around the wires above and below the fitting, and then coated with CA, will solidify the jumper.

Cut two, 32" lengths of leader wire to use as the lower shrouds. Form and swage a 1/4" loop at one end of one wire after first passing it through the big, lower hole in a spreader tang. Repeat with the other wire and other tang. For now, let the lower ends of the shrouds go unfinished.

Cut two, 62"lengths of leader wire to use as the upper shrouds. Form and swage a 1/4" loop at one end of one wire after first passing it through one of the tangs fitted 12"down from the masthead. Do the same with the other 62" wire and the other tang. As with the shrouds, let the lower ends go unfinished for now.

Cut an 80" length of leader wire to use as the backstay. (If instead of a screw eye on your transom you have a bridle, make your backstay leader wire 74"long. This presumes a 6"bridle.) Attach one end to the hole in the aft end of the masthead crane fitting by looping it through and swaging it. Form a 1/4" loop in the free end of this wire, 72"down from the masthead (66"for use with a bridle), sleeve it, and crimp it. Tie one end of a 16" length of line to this loop in the lower end of the backstay. Run this line through two adjacent holes of a bowsie, through the top of a snap clasp, and then loop it back to the remaining hole in the bowsie. The final position of the stopper knot and the ultimate length of this line will be readily determined later once the boat is rigged.

Bending the Sails

With the jib assembly set aside and with the mast lying across a tabletop, it's time to attach the main luff to the mast with a jackstay. Run one end of a 74"length of plastic-coated rigging wire through the hole drilled in the mast groove wall 2" down from the masthead fitting. Push the wire up through the top of the mast; put a tight knot in the wire; then pull the wire back down snug against the knot. Feed the wire down through the uppermost sleeve glued to the luff groove. From the first sleeve weave the wire down into the uppermost notch in mainsail luff so that it comes out the sail at the next notch. Weave the jackstay wire inside the luff from notch through sleeve for the full length of the mast. The jackstay is not to be inserted inside the luff at either the top or bottom few inches of the sail.

Temporarily remove the cleat previously installed 2"up from the base of the mast. Slide the gooseneck assembly up from the bottom of the mast, and position it so the top of the main boom will be about 1/2"below the mainsail foot. Reinstall the cleat, but do not tighten the two screws. Pass the jackstay wire from the last sleeve, not back into the luff, but into the mast groove. Run the wire behind the gooseneck collar, back out from the groove, and then pass it under the loosened cleat. Draw the jackstay snug and secure it by fully tightening the screws. Cut away excess jackstay wire leaving a 1/4" of the wire extending out forward from under the cleat. This cleat will also serve as the tie-off for the mainsail downhaul. The cleat will allow the downhaul to be adjusted so as to eliminate puckers in the mainsail luff when sailing, and it will allow release of the downhaul when the boat is not in use so as to avoid permanently stretching the sailcloth.

In order to keep the mast-base vang fitting permanently fixed in place, a screw is needed on the forward edge of the mast. This screw will be only about 1/8"up from the bottom of the aluminum mast where it will then penetrate and secure the vang fitting.

Tighten the main downhaul to put some tension on the main luff and tie it off to the cleat. Use the vang adjustment wheel to position the end of the main boom at a proper height. Slight contact of the mainsail foot with the top of the boom is okay. As was done with fitting out the jib outhaul, fit out the mainsail outhaul. Make a loop of line going from the clew grommet and under the boom. Glue the knot into the grommet and run the line's tail aft through the Ludwig Mfg. Boom End Fitting. Pass the line forward through the screw eye under the boom, holding the end fitting in place, and tie it off to the cleat mounted under the boom.

Rigging the Mast on the Hull

Now comes the tricky part: fitting the shrouds to the turnbuckles so that they are the correct length. Figure out a way to solidly support the mast in position while you measure, cut, and swage the shrouds. Having the boat in a cradle, with the keel attached for stability, and adjusting the height of the cradle so that the masthead fitting can be taped to the ceiling is one method. Another method—even though it makes for awkward working condi-

tions—consider parking the hull on the floor in the middle of a door opening and using tape to hold the top of the mast in position. The foot of the mast should be stepped into the center hole of the deck-mounted mast step plate. Using a carpenter's level abeam the hatch opening, center-up the bubble. Use the level alongside the mast so as to have it perfectly vertical, side-to-side. Use a tape measure and the following measurements to set the mast with a few inches of aft rake: Assuming the crown of the deck has a 5/8" rise from level of the gunwales, it will be 79" from tip of bow to top of mast and 80-1/2" from top of mast to a screw eye in the transom. Use books, saved back issues of *Model Yachting,* and padding wedged around and under the hull to keep it in place.

Attach the jib-tack swivel clasp to the center jib-tack deck screw eye. Set the stopper knots in the jibstay and jib luff bowsies so that the bowsies are in mid-range of their adjustment ability. The distance from jibstay tang down to the center jib tack screw eye should be 56 inches.

Attach the backstay snap shackle to the backstay fitting on the stern or to the bridle if you have one. To finish the backstay, position the bowsie so that when you draw the backstay bowsie taut, you have a 3" range of adjustment in either direction and set the stopper knot. Now, tighten the backstay so that it is taut. The mast will now be held firm, fore and aft.

Preset the four KDH #260 Turnbuckles to the same length. Thread the turnbuckle top so that it is one-third the way inside the turnbuckle barrel. Tighten the locking nut. After some sailing, the rigging wire will stretch a bit. In time, the turnbuckles will need adjustment, and this will provide plenty of take-up thread to be held in reserve. Another step in preparation for attaching the shrouds to the turnbuckles is to ready the crimping sleeves on the wires before putting any bends in the wires. Slip a sleeve on each shroud wire, run it a foot up out of the way, and hold it there with a fold of masking tape.

Place a turnbuckle in the center hole of each chain plate; these will be for the upper shrouds. Place the turnbuckles for the lower shrouds into holes 3/4" further aft. Using a tape measure from chain plate to the spreader tang to check that the mast is perfectly vertical. Trial fit the lower shrouds to the tops of their turnbuckles by using folds of masking tape on the wires as markers. Compare the marker tapes, one to the other, by bringing the wires together at the foreside of the mast. When all is checked out and ready, use pliers to put 90-degree bends in the wires, pass each wire through its turnbuckle top, bend it up, bring down the sleeve, and crimp it. When at the pond, quick-disconnect turnbuckles on equal-length shrouds make an easy matter of setting up the boat, knowing that side-to-side mast alignment is correct.

Install spreader tubes on the spreader bar. Lead the upper shrouds down through the wire eyes on the ends of the spreader tubes, then down to their turnbuckles. Use the same techniques as with the lower shrouds for measuring and attaching the upper shrouds to their turnbuckle tops.

The mast will now be self-supporting. Do away with that masking tape on the ceiling. Turn on the radio, put on the hatch cover, and go sailing.