RIGGING & HANDLING GUIDE FOR BUCCANEER

HARRY R. SINDLE

RIGGING AND HANDLING GUIDE

FOR

BUCCANEERS AND MUTINEERS

NOTE TO MUTINEER OWNERS

The following booklet, consisting of the rigging and handling instructions, sailing and racing techniques, and ideas for updating and revising equipment on the 18' Buccaneer, also applies almost word-for-word to the smaller 15' Mutineer.

Both of these boats were designed by Rod Macalpine-Downey and Dick Gibbs, originally for Chrysler Corporation, in the early 1970s. The boats are almost identical, except for the difference in length and sail area. The Buccaneer is essentially a stretched-out Mutineer, or conversely, the Mutineer is a squeezed-down Buccaneer, depending upon your point of view.

The cockpit size, seat layout, centerboard, and the rudder head and blade are identical in both boats. The Buccaneer mast and boom are longer, and the sails on the larger boat are larger, as might be expected.

So much of the boats are either the same or very similar that it was felt that the information given in the booklet would serve equally well in informing Mutineer owners about the rigging, handling, etc. of their boats as it does for the Buccaneer owners, for whom the writing was originally done.

Harry R. Sindle

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Introduction

The Buccaneer was originally produced in the early 1970s, by Chrysler Corporation. The tooling was sold at the end of that decade to Texas Marine International, a company composed of former Chrysler management. Shortly thereafter, Starwinds, the sailboat arm of Wellcraft bought the molds, etc. from TMI and produced the boat through the early 1980s. In 1984, they sold the molds to Gloucester Yachts, who subsequently, in early 1988 sold the molds to Cardinal Yachts. Cardinal, which is now producing the boats on a custom basis, is providing replacement parts to the more than 5000 owners of existing Buccaneers located around the country.

My name is Harry Sindle and I am the owner of Cardinal Yachts, and am the author of this instruction manual. Formerly, since 1963, I have managed Gloucester Yachts, Lockley-Newport boats, Newport Boats, and Mobjack Manufacturing Company. I have been Buccaneer National Champion twice (1984 and 1986), in the only times that I have raced in that regatta. I have been sailing and racing since 1945 and have a list of championships of which I am quite proud, including six times Flying Dutchman North American Champion, a gold medal in the 1959 Pan American Games, and have represented this country in the 1960 Olympics. I have also won numerous regattas in the Lightning, Thistle, Comet, Jet 14, Albacore, and similar types of small sailboats. I mention this not to brag, but to put a certain authenticity on the following instructions.

My experience in the Buccaneer class is limited to the years 1984 and later. However, through observation and problem-solving while repairing, upgrading, and providing replacement parts for some of these older boats, I have become familiar with the older models. Therefore, I can in most instances, help owners of older Buccaneers to update, improve, and replace their aging parts to keep them functional.

This update of the rigging and handling instructions is precipitated by occasional requests from the owners of older Buccs. It is revised to help them, as much as possible, as well as to help owners of the new boats we're now making.

I. RIGGING AND HANDLING

PARTS OF THE BOAT

Centerboard

The centerboard for the Buccaneer is a fiberglass, clamshell type of molding, although occasionally we encounter a Buccaneer with a wooden blade. Over the years, construction of these boards varied somewhat with the manufacturers, and sometimes one of the older boards will break. This usually occurs when leaning out on the board trying to right the boat after a capsize. The board should be strong enough to take this load, but with the quality of construction varying with the different manufacturers over the years, some will fail. I don't know of any of the boards made during the past few years which have broken, but a number of the older boards have broken. Also, a number of the older boards have worn through and broken in the lower forward corner of the board around the pivot area.

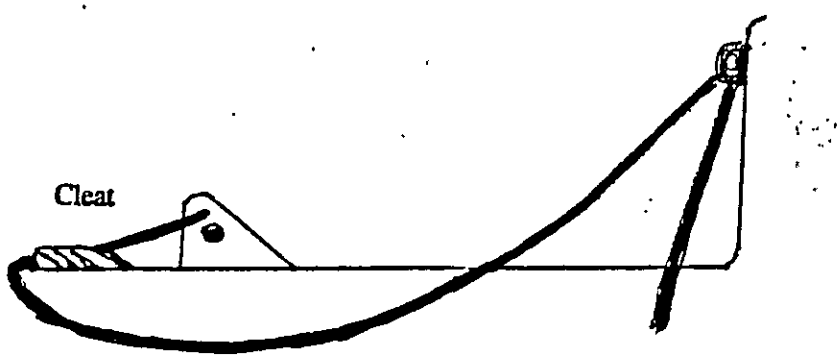
When replacing old centerboards with new ones, we find that while most of the new board fit well into the old boats, once in a while we encounter a problem. This is usually caused by a trunk which has bowed inward a bit, and which will not accommodate the board. These individual boats were probably made that way, and fitted by the manufacturer with slightly thinner boards to make them fit.

Mounting the centerboard in the trunk has changed, too, over the years. The original Chrysler boats, I understand, had slots in the sides of the well, and a spring loaded pin, much like a toilet paper holder, which held the board in place, and around which it pivoted when being raised or lowered. Later, two aluminum castings were used to form the pivot at the lower forward corner of the centerboard. These apparently worked well enough, but would sometimes fail under severe load (hard grounding, for example). They also were installed from the bottom of the hull. To remove the centerboard one had turn the boat over, or at least up on its side, then remove the centerboard flaps and their metal molding before unscrewing the aluminum castings and allowing the board to fall free.

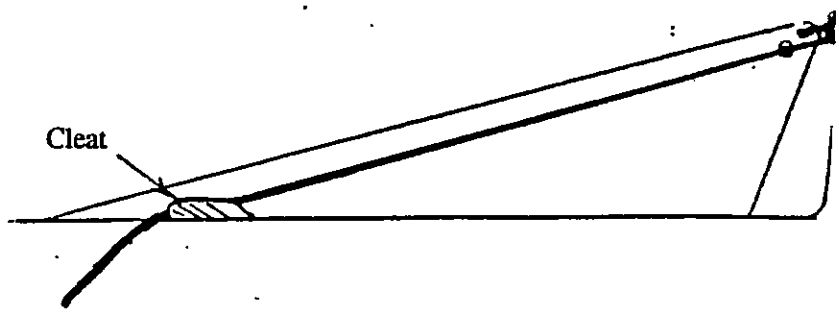
In 1984 we modified this design, and now hang the centerboard from a pair of aluminum hangers which fasten to the top of the trunk, and extend down either side of the trunk to the pivot location. These hangers engage the depressions in the board around which it pivots. The advantage of these hangers is that in order to remove the centerboard from the boat, it is not necessary to remove the flaps, or even to turn the boat over. Simply back out the four screws which hold the hangers to the top flange of the trunk, and lift the board up and out of the trunk. It can be done with the boat on a trailer or in the water. The centerboard itself has not been modified, and the current centerboards should fit into any of the older boats.

The disadvantage of the new hangers is that the 1/16" thick aluminum plates have to go down into the trunk along both sides of the centerboard. Occasionally we find an older boat where there is not enough clearance for this.

Control systems for holding the centerboard in the desired position have varied somewhat, too, with the different builders. We use a single line led from the upper forward corner of the board through a fairlead on the forward face of the cockpit, and then back down to an open clam cleat (without a fairlead) mounted just aft of where the top corner of the centerboard would intersect the trunk when in its fully lowered position. To hold the board up (when broad reaching or trailering, for example) merely cleat the line as it comes from the fairlead. To hold the board down, (for beating, for example), merely bypass the fairlead, and without actually removing the line from the fairlead, cleat the line directly as it comes from the corner of the centerboard.



Line in cleat holding centerboard down



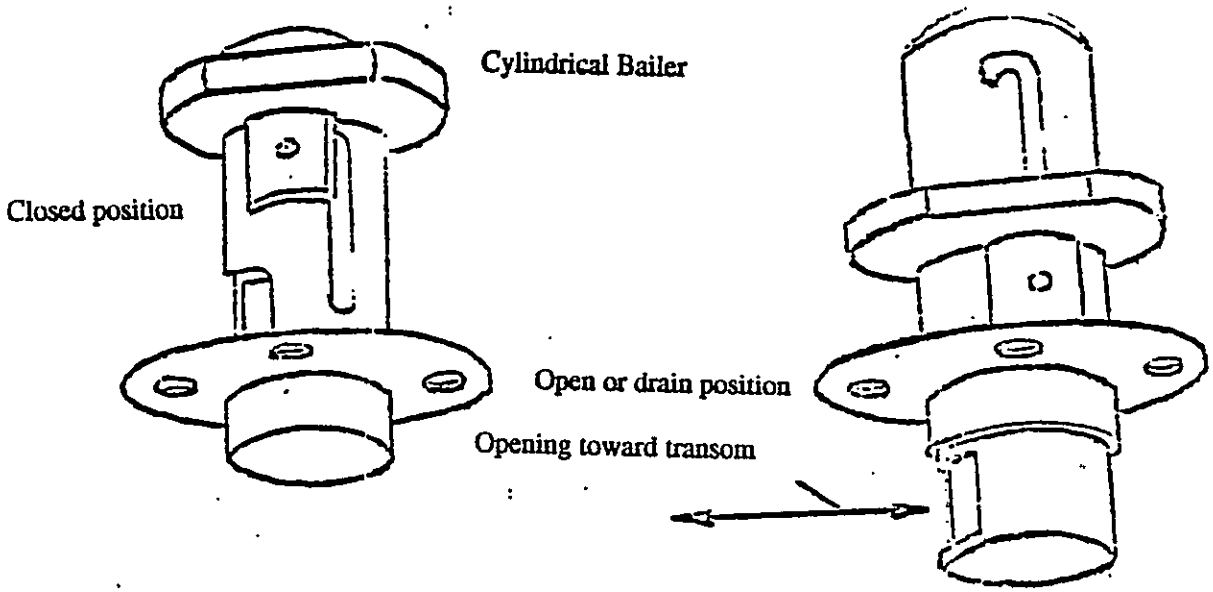
Line in cleat holding centerboard up

Centerboard Flaps

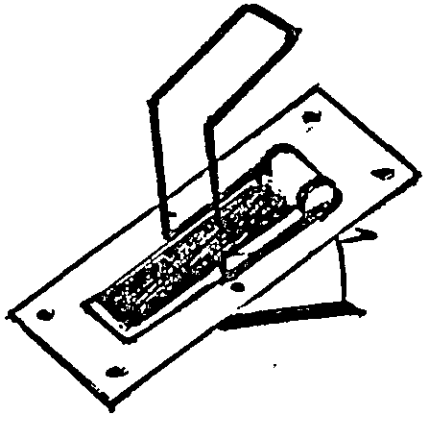
One part of the Buccaneer which needs occasional attention is the centerboard flaps or gaskets. These cover the bottom of the centerboard trunk slot and limit the flow of turbulent water into the trunk. Without the flaps in place, you would get water splashing out of the trunk into the cockpit in windy conditions, and the speed of the boat would be somewhat reduced by the added drag of the turbulent water in the centerboard trunk. Refer to the article on replacing these flaps for more information.

Suction Bailers

The original Chrysler Buccaneers were equipped with two cylindrical self-bailers located near the aft end of the centerboard trunk. To operate these, push down, and accumulated water in the cockpit will be sucked out as long as the boat is moving forward at 4 or 5 knots. If the boat is stopped or moving slower than that, water will back up and enter the cockpit through these bailers. The bailers can be left down (open) when the boat is on a trailer, to let accumulated rain water drain out.



Later Buccaneers have utilized a more modern design of self- bailer, commonly referred to as the Elvstrom bailer. These are rectangular in section, rather than round. In operation they pivot around their front edge, and when lowered, present an inclined plane surface to the water rushing under the hull. The bilge water goes down this surface into the "hole" in the water created by the bailer moving through it, thus emptying the bilge of water. Again, the bailers must be closed to prevent water from backing up when the boat is moving too slowly to evacuate the bilge water, although these bailers have a flap which automatically closes to keep this backup to a minimum.



Elvstrom Style Self-Bailer
In Lowered (Open) Position

The older style (cylindrical) bailers, will operate at slightly less boat speed than the larger Elvstrom types, but they are much less efficient, and consequently slower to bail the boat than the new bailers.

We usually keep a supply of the cylindrical bailers for replacement parts. Replacing the old bailers should be done when they begin to leak excessively. Small leaks can be retarded by the use of Vaseline around the bailer surfaces, in the meantime.

It is important to be sure any bailers are in the retracted position before moving the boat. On a trailer, for example, a trailer part might hit a lowered bailer and damage it if care is not taken.

Replacing either the old bailers or the new style bailers with the same model is relatively simple, involving the removal of the fasteners and the old bailer, and installing the replacement with the same or the equivalent fasteners, taking care to bed in the fitting with a suitable sealant (such as Marine Seal) to avoid leaking around the flange of the bailer. Of course, keep the sealant off the working parts of the bailer so it doesn't seize up and make it impossible to work.

If replacing a new style of bailer which has been damaged, first check to see if only the bailer body has been damaged. If the flange (the part of the bailer which has been bedded and bolted to the boat) is undamaged, you may be able to replace only the bailer body without having to remove the flange at all. The procedure for removing the bailer body is given below in the paragraph which deals with replacing the gasket.

Replacing the old cylindrical bailers with the new style can be done, but involves enlarging the hole in the bottom of the boat to accommodate the rectangular design of the new style bailer. The hull and cockpit floor in this area consist of two separately molded parts, squashed together during assembly with a suitable plastic putty. Be careful to assure that the inner and outer edges of the new holes and the volume between the hull and cockpit floor as well are thoroughly sealed with sealant to avoid water getting in between your hull and deck. If you intend to replace the cylindrical bailers with the new

style, or if you want to replace your old Elvstom bailers with new ones, BE SURE TO GET THE CORRECT MODEL. There are a number of Elvstrom bailers made, some of which install from the outside of the hull, and some of which install from the inside of the cockpit. If in doubt as to your model of Elvstrom bailer, give us a call.

The Elvstrom bailers have an internal gasket which occasionally requires replacing. If the bailer seems to be leaking, your first remedy is to replace this gasket. Removing the locking handle on the bailer will allow you to push the body of the bailer out down through the bottom of the boat. The internal gasket can then be replaced with a new one easily, and the bailer reassembled. Each Elvstrom model has a different size replacement gasket so be sure you measure it before ordering a replacement.

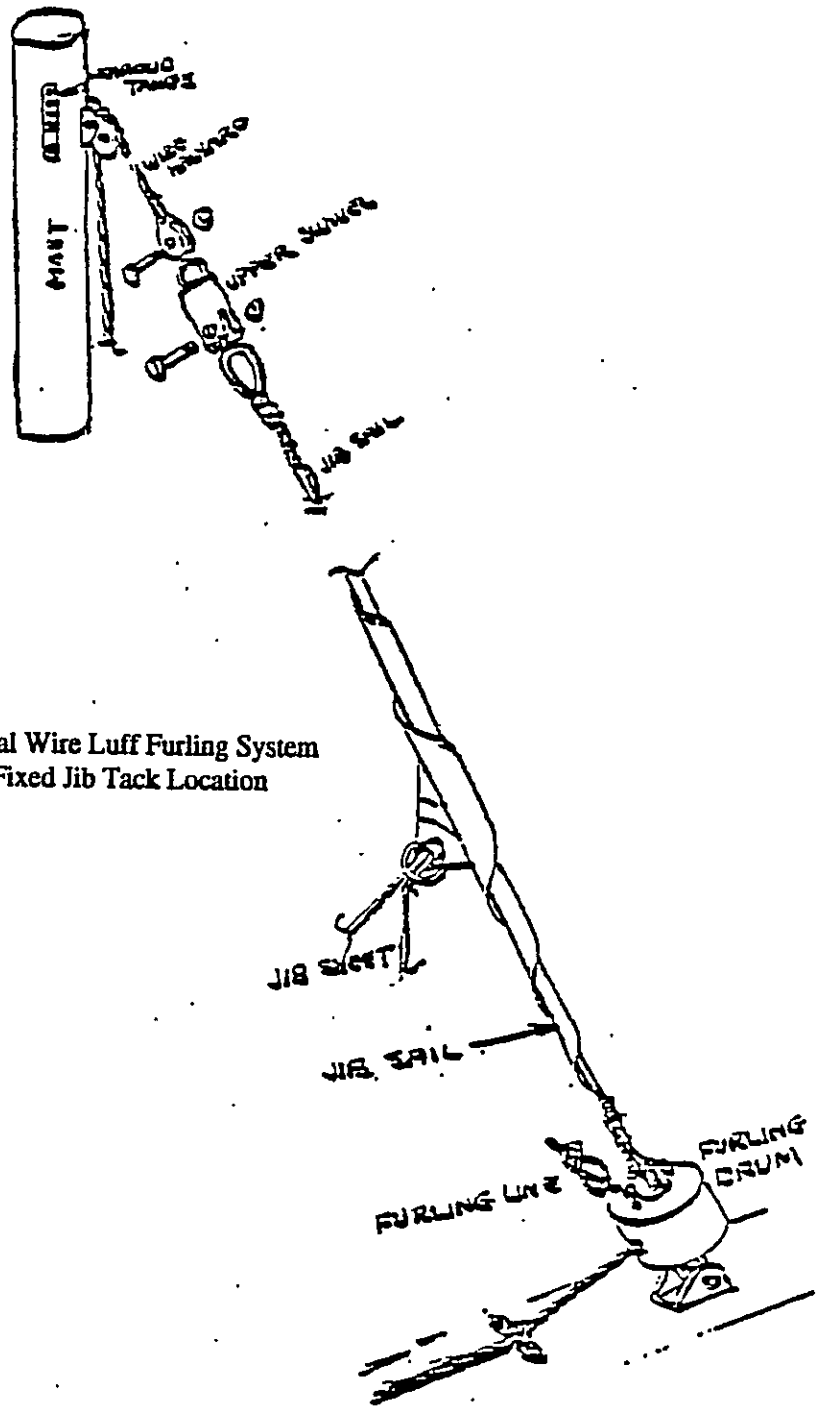
Masts and Booms

The Buccaneer mast is an aluminum extrusion, supported by only three stays---a forestay (or jib halyard), and two sidestays or shrouds. No spreaders or other stays are permitted, nor are they necessary. The original Chrysler masts were quite satisfactory, being stiff enough to stand up well under all conditions. These were used from the beginning of the class until sometime during the Starwind era, at which time a Kenyon spar was used. These Kenyon spars (most of which were painted white, rather than anodized) were not good masts for the Buccaneer. Their lateral moment of inertia was too small to give the required lateral stiffness, so they have a tendency to pump back and forth to windward and to leeward when going to windward in a stiff breeze or in rough seas. When Gloucester first started making the Buccaneer, therefore, we reverted to the original Chrysler extrusion. Because these extrusions had to be purchased in large quantities, however, and because the demand for these boats has diminished over the last few years, Cardinal has gone to another mast. This mast, although not quite as stiff as the Chrysler extrusion, is considerably stiffer than the Kenyon mast, and seems to be completely satisfactory.

The staying system for the mast is, as stated above, very simple, consisting only of three wires, without spreaders. Although the shrouds are the same for all boats (although lengths will vary slightly), the forestay and jib halyard have varied considerably.

The original boats were equipped with a forestay which ran down from the mast through the deck and around a sheave assembly in the knuckle of the bow, then back to the mast step area, where it fastened to a Highfield lever, which when tightened, tensioned the entire rig. The jib was fitted with a sleeve along its luff, and this sleeve was fed over a tube, which had the forestay threaded through it, and which functioned as a furling device to roll up the jib when not being used. Refer to section IV for further information.

The newer boats, made since the late 1970s, use instead, a jib with a wire luff which also supports the entire rig, and has upper and lower swivels at its head and tack. Furling the jib is accomplished by pulling on a line which runs around the lower furling swivel, much the same as with the older rig. The newer arrangement offers a number of advantages and these, and the method of converting the old arrangement to the new is discussed in a later article. With the old arrangement, the forestay was permanently attached to the boat, and supported the mast when the boat was not being used. With the new arrangement, the jib can be removed and stored inside, which significantly contributes to its longevity, but if this is done, a forestay is needed to keep the mast up while the boat is sitting either on its trailer, or at its mooring or slip.

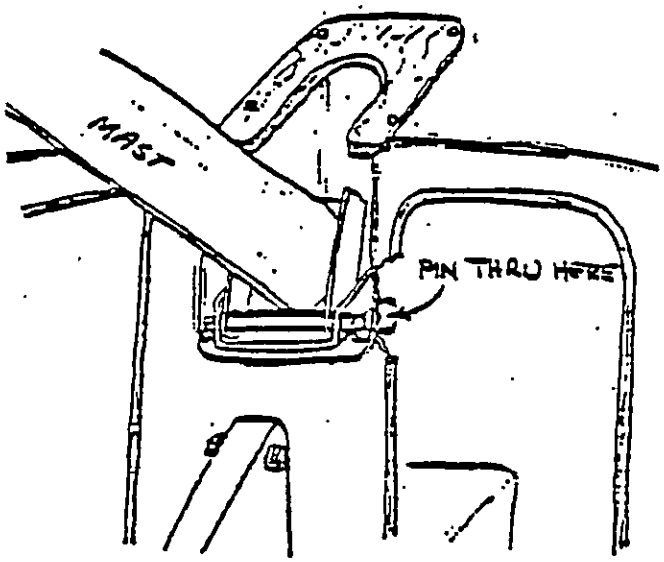


Chrysler Original Wire Luff Furling System
With Fixed Jib Tack Location

Therefore, most of the new boats are fitted with a safety forestay, mounted above the jib halyard on the mast, and in front of the jib tack on the deck. This safety forestay also keeps the mast from falling down in the event of a failure in the jib halyard system.

With the current boats, the rig is tensioned by using a lever (or magic box) mounted on the mast and attached to the end of a wire jib halyard. Some older boats when rerigging for the new system use the old Highfield lever to tension the rig. It makes little difference how you tension your rig, but you must have the ability to do it.

Another item which should be discussed is the mast step, or the arrangement for raising the mast. Over the years Buccaneers have had different mast lengths, with the step of the mast being located at various heights ranging from as low as the centerboard trunk height up to being stepped right on deck. The newer boats have the mast step positioned about 6" below the deck. The advantage of the higher step locations is the ease with which you can raise or lower the mast. When the mast step is located high enough so you can position the foot of the mast at the step while holding the mast near its center of gravity and standing in the aft part of the cockpit, it is easy for one person to raise the mast. If the mast step is too low, the centerboard gets in the way, and raising the mast is made much more difficult. Raising the mast foot location on an older boat is not particularly difficult. Refer to the article, **Raising the Mast Step**, in Section III.



Chrysler Mast Step Showing Hinge Arrangement with Pin

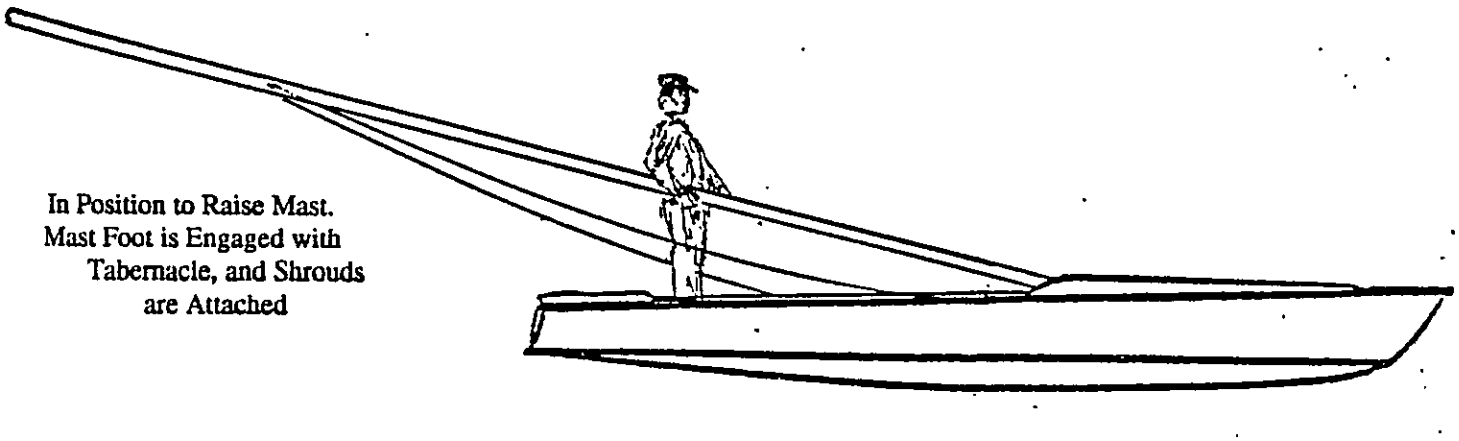
The design of the mast foot and the step also is important. The older Buccaneers were made with an aluminum hinge. Attaching the foot of the mast to the hinge required a second person while the first person held the mast. The new mast step merely involves a pin which runs through the mast from one side to the other, and which engages a slot in the mast step during the mast raising process. This connection can be made from a distance by the person holding the mast without requiring a second person to help. The aluminum mast step fittings often break, and when they do, it is easy to replace the old system with the new. In fact, it is virtually required, since the old fittings are no longer available. A description of this replacement procedure is included in a separate article in this book.

Boom designs have also varied over the years. The original Chrysler boats had booms which were oval sectioned and quite small. We have seen a number of them which, over the years, have developed a permanent vertical bend in them, caused by the downward loading of the mainsheet blocks in the middle of the boom in heavy wind sailing. Later booms used by Starwinds were considerably stiffer oval shapes. Sometimes they used a rectangular section boom, which, while it would bend somewhat while in use, seemed to bounce back to straight when the loading forces were removed. The booms by Gloucester and Cardinal are oval in section, but larger than the Chrysler booms so they don't become permanently bent. The original booms were fitted with sliding goosenecks which fit into the mast groove. Later boats are made with fixed goosenecks which attach to a plate fitted on the mast. These fixed goosenecks allow the use of a Cunningham to control mainsail luff tension.

GETTING READY TO SAIL

Mast Stepping

The mast can be stepped either with the boat afloat or on the trailer. To do this, first place the mast on the boat with the foot of the mast located on the foredeck and the top of the mast extended out over the transom. Attach the side stays to the chainplates on the side deck. This attachment is made using the clevis pins and rings located on the shroud adjusters. The first time you raise your mast, set the stays to be as loose as possible to be certain the mast goes up easily. Next, make sure that the forestay is free and clear. Also check the halyards to make sure that both ends are secured near the foot of the mast, so that you can reach them when the mast is up. Check all cotter pins or rings to be certain they are secure. **CAUTION: BEFORE STEPPING THE MAST, CHECK FOR OVERHEAD POWER LINES!!**



In Position to Raise Mast. Mast Foot is Engaged with Tabernacle, and Shrouds are Attached

If your boat is on the trailer when you are raising the mast, be sure that the bow of the boat is attached to the trailer and that the trailer is attached to a car. Then when you move your weight to the aft end of the cockpit, the trailer tongue and the bow of the boat will not tip up in the air with the stern crashing down to the ground. Then raise the mast as follows: With the sidestays (shrouds) attached, move to the aft end of the cockpit. Pick up the mast at its balance point and engage the mast pin which protrudes on each side at the foot of the mast with the slot in the stainless steel tabernacle. Once you have made this connection (while standing in the stern) it is easy to walk forward and push the mast into the vertical position. Although this can be done without help, if you have a crewmember around, have him make sure the sidestays do not get tangled with the corners of the boat or with the trailer, as the mast goes up.

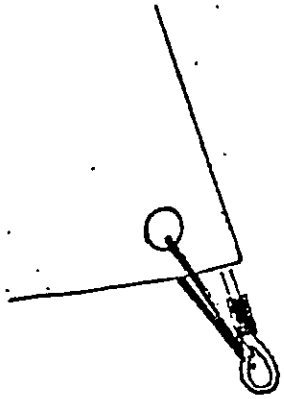
Once the mast is up, fasten the forestay to the forestay tail---a wire which emerges from the deck just aft of the spinnaker launcher tube. Since the mast does not have any support other than the three stays, it is important when you are attaching the forestay (or

if you are adjusting any of the other stays) to hold the mast firmly by hand so that it will not topple over. Once your mast is up, we suggest adjusting the various stays so that the mast has a slight aft rake (tilt) and so that the stays are snug with the mast leaning neither to starboard nor to port. The forestay tail is attached to a cleat near the mast foot.

Next, install the lower jib furling drum to the aft hole in the jib tack strap, just aft of the forestay connection on the foredeck. Prewind the jib furling line (a 1/8" diameter Dacron braid) around the drum, so that it is all on the spool, except for enough to lead the end of the line through the two deck fairleads, and back to the clam cleat on the deck just forward of the mast. Then attach the tack (lower forward corner) of the jib to the upper end of the lower furling drum. Attach the head of the jib to the upper swivel, which is attached to the jib halyard.

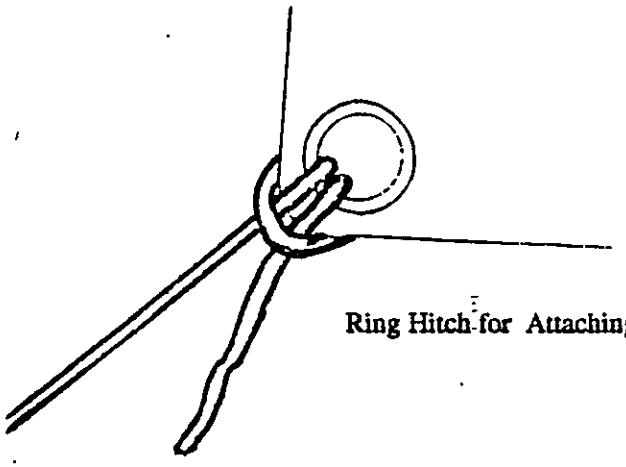
Some jibs are supplied with a grommet at the tack of the sail. A short length of 1//8" line should be used to attach the sail at this corner to the thimble on the jib luff wire so that the sail will rotate and furl itself when the furling line is pulled. If you don't attach the tack of the sail to the luff wire, the wire will merely spin around when furling is attempted, and the sail will twist, being held rigidly at the head, and being unattached at the tack.

Securing Jib Tack to Wire to Permit Furling and Act as Cunningham by Tightening Line



With this short piece of line, you can adjust the draft position in the jib, much as the Cunningham or downhaul control does for the mainsail. Pulling the jib luff tight by hauling down on this line will tend to move the draft in the jib forward---easing the tension will allow the draft to flow aft. In general, tighten for heavy airs, loosen for light airs.

To finish setting up the jib, attach the jib sheet (line) to the clew cringle of the jib using a ring hitch made in the middle of the length of sheet, so that equal lengths of the sheet will go to port and starboard when lead to the leads on the jib tracks on the seats. The jib sheets should be led inboard of the stays.



Ring Hitch for Attaching Jib Sheet to Clew of Jib

To raise the jib, pull on the jib halyard tail, a light line which attaches to the wire halyard until the wire loop where the line meets the wire can be connected to the lever on the mast. Tensioning the rig is then accomplished by adjusting the lever so that when it is snapped down tight, sufficient tension results to make all the stays tight. In order to accomplish this, the stays may have to be adjusted at their lower ends using the stay adjusters (fittings with a series of holes in them). Properly set up, the stays should be quite tight.

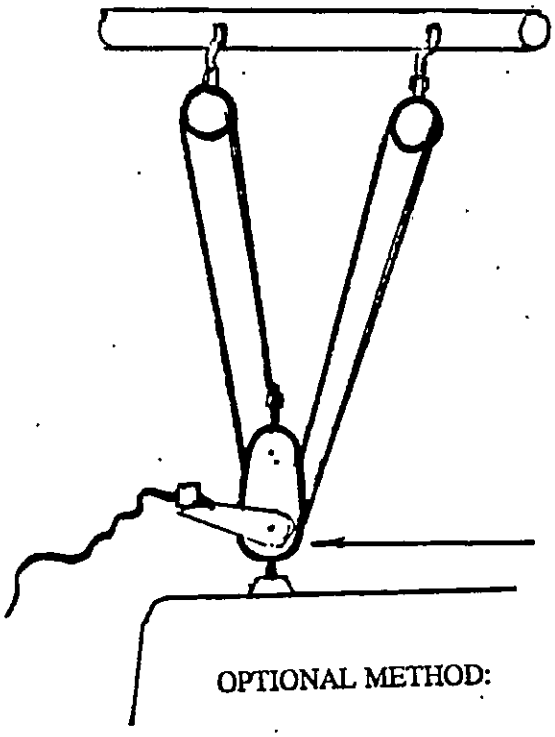
Once the rig has been tensioned, you can furl the jib by pulling on the furling line on the foredeck, and easing off both jib sheets. Then you can continue with the rigging of the boat.

Next, rig the boom by attaching the gooseneck to the mating part on the mast. A large vertical clevis pin connects the mast to the forward (gooseneck) end of the boom, and this is secured by a retaining ring.

The mainsheet can then be rigged as shown in the following sketch:

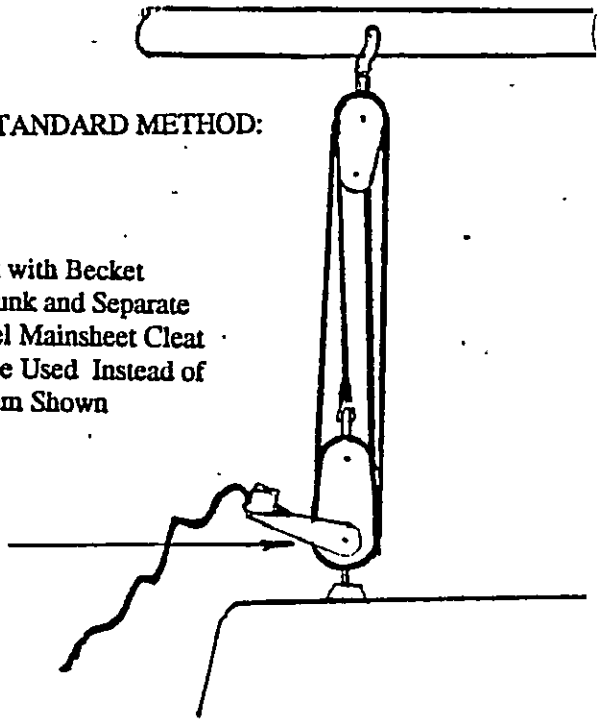
Mainsheet Rigging Systems

With Two Single Blocks on Boom



OPTIONAL METHOD:

With Single Fiddle Block on Boom



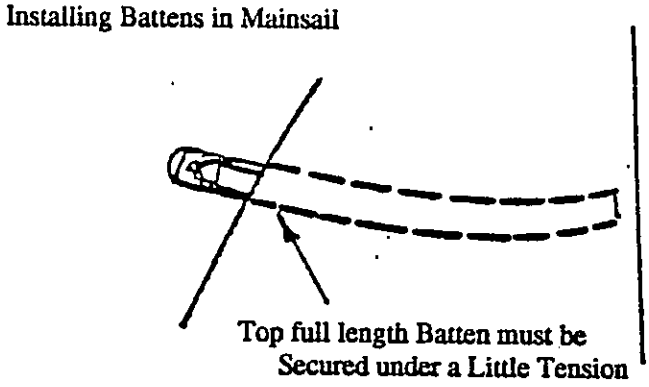
STANDARD METHOD:

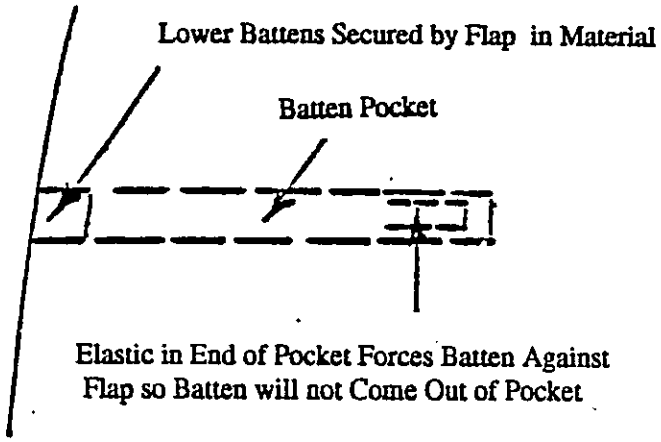
NOTE: Single Block with Becket On Trunk and Separate Swivel Mainsheet Cleat Can be Used Instead of System Shown

Fiddle Block with Becket and Cam Cleat

To fit the mainsail, install battens into the batten pockets. Then run the mainsail out along the foot by pulling the boltrope sewn into the foot of the sail into the slot along the top of the boom. The tack or lower forward corner is attached to the boom by a pin on the aluminum gooseneck casting where the boom meets the mast. The clew, or aft-most corner of the sail is attached by means of a bowline to an outhaul line which goes through a hole in the aluminum casting at the aft end of the boom. This outline line then goes forward along the boom to a cleat, where it is secured. This outhaul is kept snug enough to prevent diagonal wrinkles in the sail going up from the boom toward the mast. It, again, will need more tension in strong winds than in light airs to make these wrinkles disappear. Too much outhaul tension will produce a horizontal wrinkle running parallel to the boom, only a few inches above it. This wrinkle decreases the power shape in the lower section of the boom and flattens the sail excessively.

Installing Battens in Mainsail

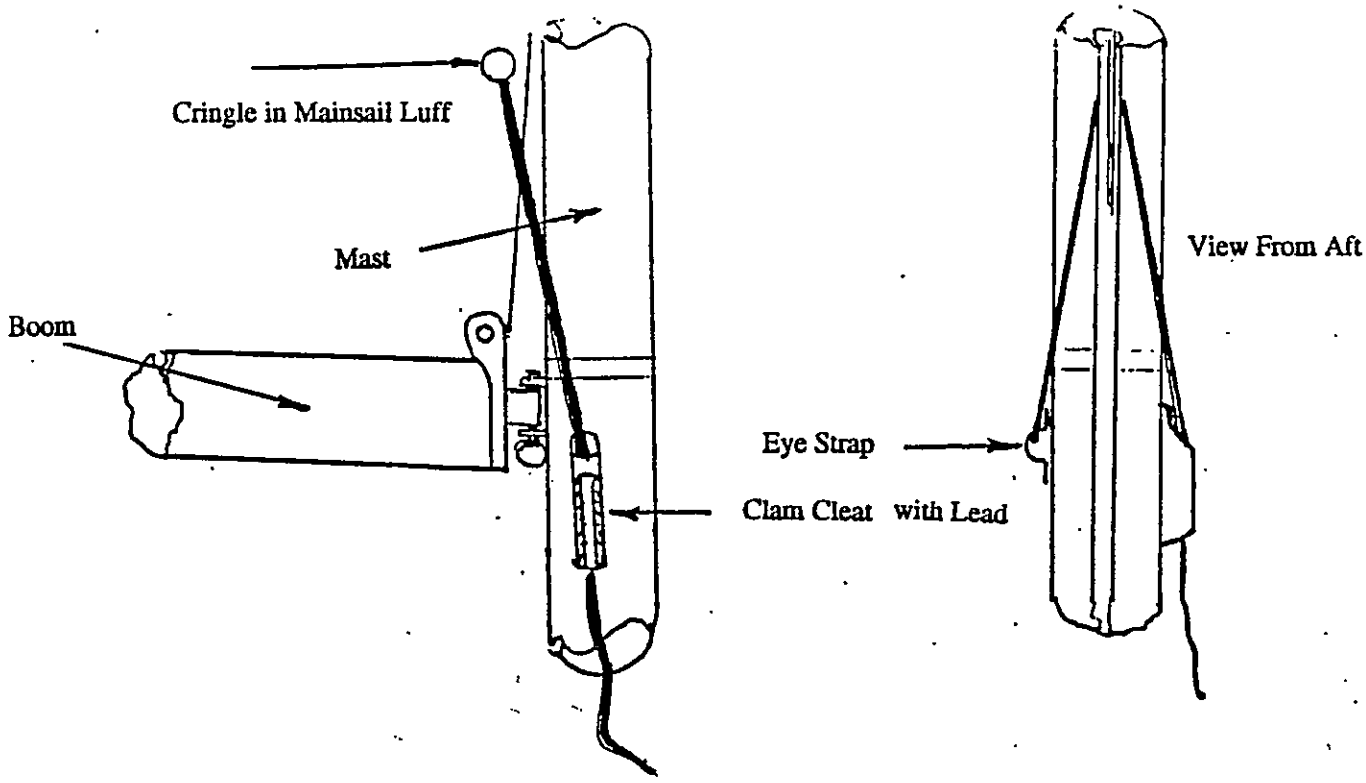




Rig the Cunningham next. This is a control line which tensions the luff, or leading edge of the mainsail. One end of it is attached, with a bowline, to the eye strap located on one side of the mast, just below where the boom goes. This line then goes through the cringle in the mainsail which is located a few inches up the luff of the mainsail from the tack (lower forward corner). This line then goes through the clam cleat located opposite the eye strap mentioned above. Tightening this line pulls the draft in the mainsail forward--loosening it allows the draft to move aft into the middle of the sail. In general, tighten the Cunningham in strong winds, and when going upwind, and loosen it in lighter airs, and when going downwind. The tension on it, in general, should be just enough to remove any fine wrinkles in the sail which go aft and down from the mast toward the boom. Overtightening the Cunningham will produce a wrinkle going right up the mast.

Standard Arrangement for
Mainsail Luff Tension Control
(Cunningham)

NOTE: Cunningham May be Led Aft
for Skipper Control, if Preferred



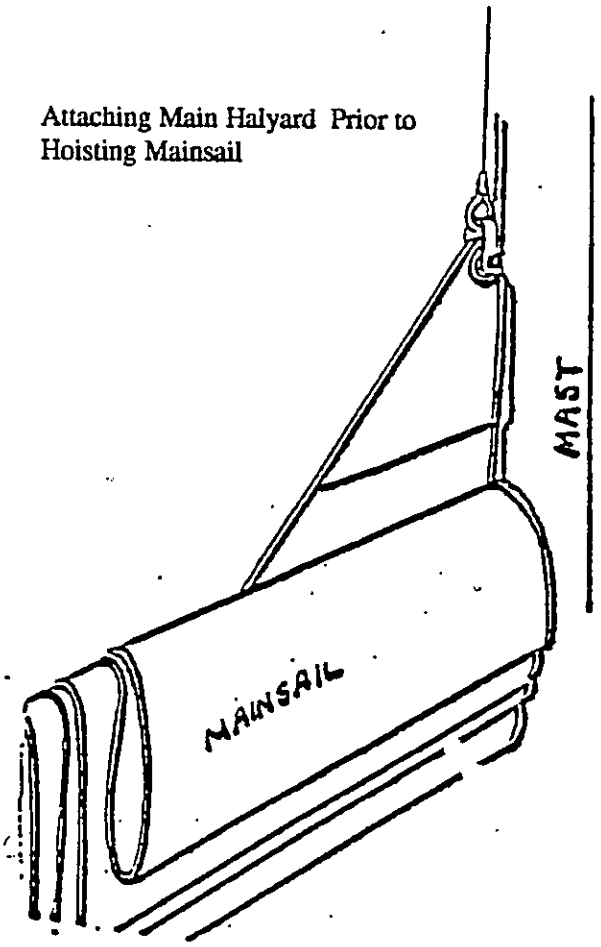
Next, attach the main halyard to the headboard of the mainsail, using the shackle at the end of the halyard. Insert the edge (boltrope) of the top of the mainsail into the sail entry groove in the mast, just above the boom, making sure that the sail is not twisted. Check aloft to make sure the halyard is not twisted either.

Before hoisting the mainsail, make sure the boat is headed into the wind. Release the mainsheet, if it was cleated, and the boom vang, if you have one and it was cleated. Also release the Cunningham.

Next, run the mainsail up the mast by pulling on the main halyard. When it has been hoisted completely, secure it by passing the wire loop in the halyard around one of the hooks on the rack on the side of the mast.

You will find it convenient to stow your halyard tails either in the storage compartments under the foredeck, or in the mast step pocket.

Attaching Main Halyard Prior to Hoisting Mainsail



Launching

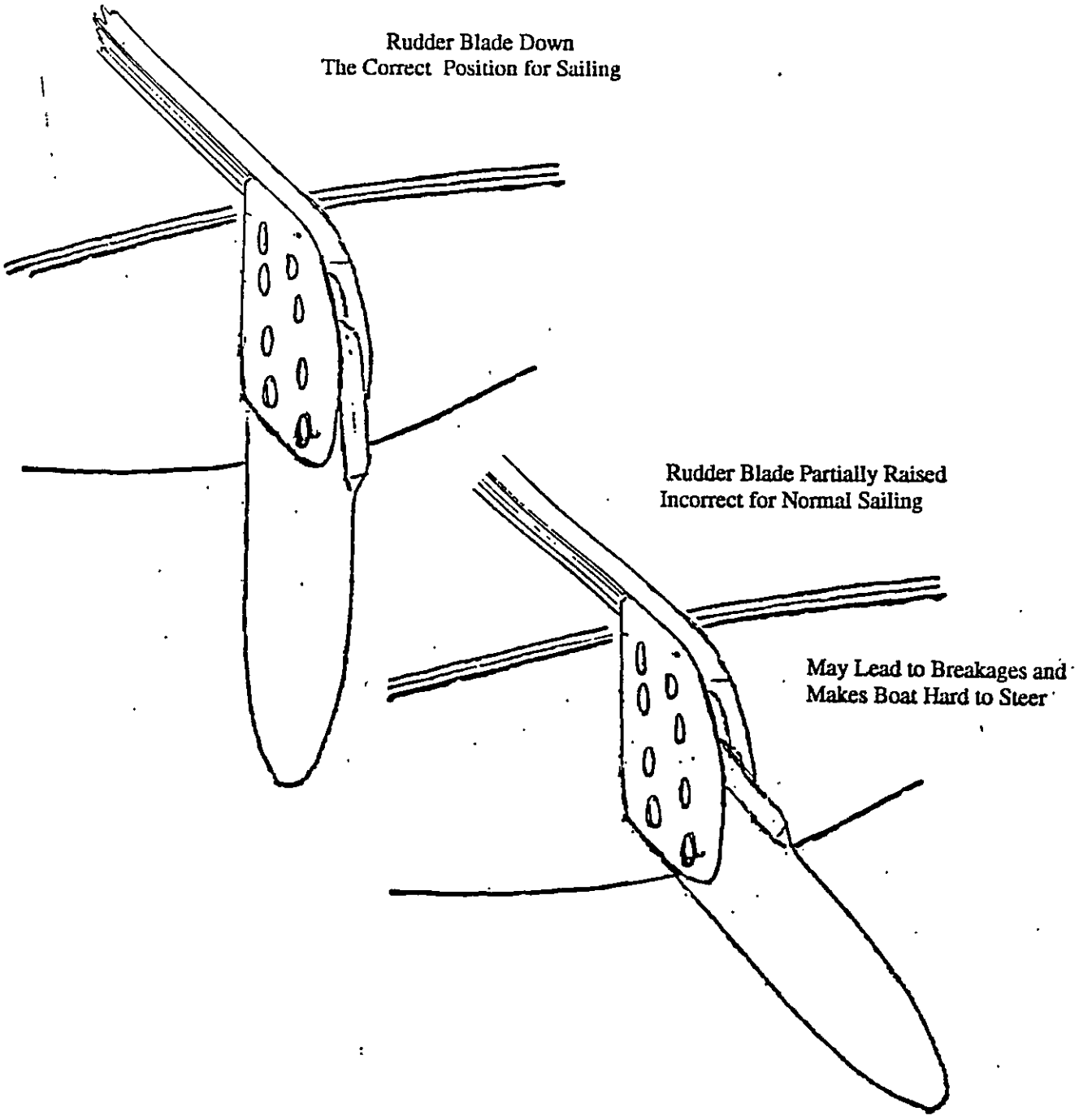
Before launching, drain any accumulated water from the hull by raising the bow and loosening the hull drain plug in the transom. Even a perfectly tight hull will pick up a surprising amount of water through condensation. Any water which has collected in the cockpit can be drained by lowering the suction bailers.

When launching, be sure the centerboard is secured all the way up, the suction bailers are closed (raised), and the hull drain in the transom is tightly closed. If you are launching from a ramp, leave a line on the bow to control the movement of the boat, and be careful as the boat is launched to keep it centered on the trailer.

If you will be launching from a hoist or crane, we suggest you obtain the lifting sling. This is a three part stainless steel bridle which connects to the side stay chainplates and to the eyes on the deck near the transom.

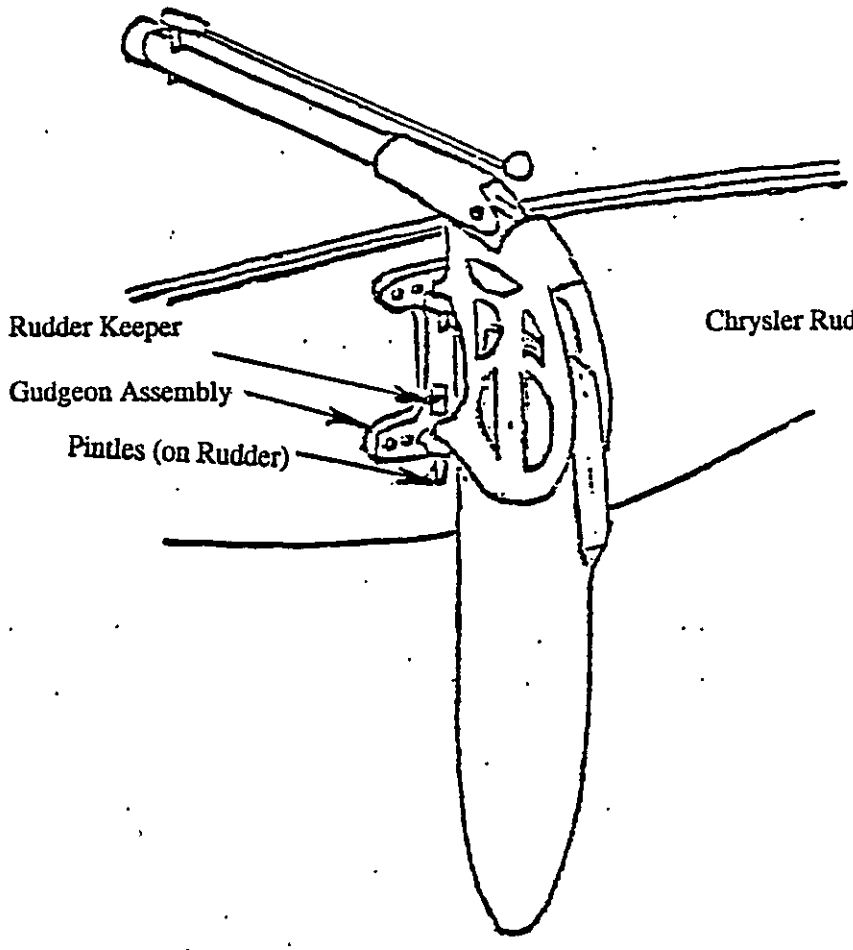
With the boat in the water, fit the rudder and tiller. The rudder is installed by merely slipping the gudgeons in the rudder head into the pintles on the transom. Be sure that the ring is inserted through the hole in the lower pintle so that the rudder cannot accidentally become unshipped from the transom in the event of a capsize. The tiller is then slipped into the rudder head and bolted in place.

The Buccaneer is equipped with a lifting rudder which pivots up for sailing up to a beach or in shallow water. IT IS IMPORTANT THAT THE BLADE BE KEPT IN THE FULLY DOWN POSITION DURING SAILING, and that it be allowed to float up only temporarily during launching or beaching operations, or to slip weeds off the blade. During these operations, do not exert any more pressure on the tiller and rudder assembly than absolutely necessary, since the load on the rudder blade and head increase tremendously when the blade is NOT ALL THE WAY DOWN, and breakage may result.



Also, you will find that your Buccaneer handles much better with the blade ALL THE WAY DOWN. Allowing the blade to lift up only a couple of inches will dramatically affect the pull on the tiller, and will slow the boat down as well as making the helm feel like you're driving a truck!

There is one continuous line on the rudders on the new boats. Pulling one end of the line will lower the rudder for sailing, and pulling on the other end will raise the rudder up. The single cleat under the tiller is used to hold the rudder blade in the position you want. If you accidentally run aground, just reach back and release the rudder control line, so your blade can lift up and avoid damage to it.



Chrysler Rudder and Tiller Arrangement

Older Buccaneers were equipped with a cast aluminum rudder head equipped with two pintles and an aluminum tubing tiller design with two separate control lines. They also had a single cast aluminum gudgeon assembly on the transom, with a spring loaded tang to act as a keeper to avoid losing the rudder assembly during a capsize. Experience has shown that the rudder heads frequently bent and broke (particularly when the blade was allowed to raise up into a more horizontal attitude). The cast gudgeon assemblies also failed, with time, and, worst of all, many of the spring stainless rudder keepers did not function properly so that many, many rudder-tiller assemblies were lost completely during a capsize.

During the Starwinds period, the rudder heads were changed to a fabricated aluminum design, with gudgeons, fitting into stainless pintles on the transom, a design which has been but little changed on the newest boats. Tillers are now laminated mahogany and ash, and the new blades are now fabricated to be stronger than previously. In order to adapt the new rudder assemblies to the original Chrysler boats, a stainless adapting rod can be used which has a securing ring to prevent loss of the assemblies. This pin goes through all four gudgeons--the two on the new rudder head, and the two on the old aluminum transom gudgeon assembly. Refer to the article, **Installing a New Rudder on an Older Boat,** in Section III.

This change can be made without changing any hardware on the boat. If preferred, new style transom pintles are available to replace the old transom gudgeon assembly, which will accommodate the new rudders. The old style rudder heads are not available. The new rudder blades will fit the old boats as is.

Safety

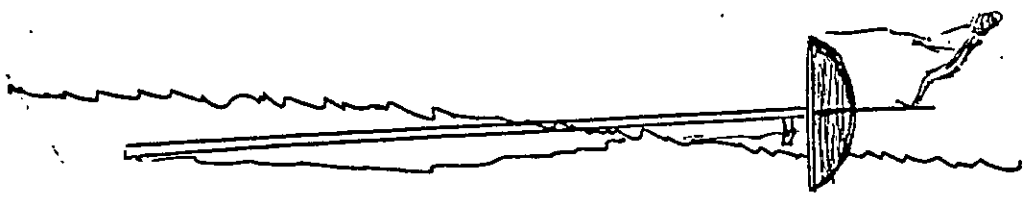
One of the new Buccaneers, with its sealed hull and deck providing both air and foam flotation is about as safe as a boat of this type can be. Nevertheless, proper seamanship and safety precautions should always be followed to avoid accidents.

Wearable life jackets should always be aboard and should be worn whenever winds are brisk and while single-handing the boat under ANY conditions. Coast Guard equipment rules should be followed in this regard.

By far the most common accident in small sailboats is the capsize. In the Buccaneer, this need not be serious most of the time. We suggest that every owner practice capsizing and righting his boat on purpose in moderate or light breezes at first, so that he or she will develop confidence to handle this situation if and when it should occur during a race or in strong winds.

If you should capsize, try not to fall out of the boat into the water. Righting the boat is much easier if you stay aboard and merely crawl over the upper edge of the boat, instead of having to climb back aboard from being in the water. If you stay aboard during a capsize, climb over the upper edge of the boat, grab a sheet (usually the windward jib sheet) and placing your feet on the protruding centerboard, lean out as far as possible. Levering the boat upright again in this way is easier for heavy people than for lightweights, but the same principle applies for all.

Righting the Capsized Boat



Lean out, Standing on Centerboard and Holding on to Jib Sheet or Other Line for Extra Leverage

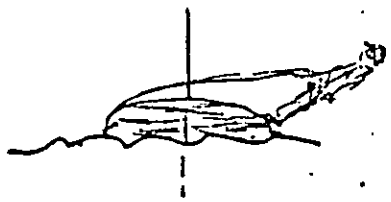
Righting may seem slow at first, particularly if the boat has capsized far enough so the sail has the weight of a lot of water keeping it from floating up to the surface. The speed of righting will increase dramatically, however, once the sail breaks free from the water. Then one of the crew can crawl up into the cockpit as the boat rights itself, and can then help the other(s) aboard. Sailing on a reach with the bailers open will quickly remove the remaining water from the cockpit.

If you fall into the water, swim around to the bottom side of the boat, reach up and grab the centerboard and pull down on it. As she rights, grab the rubrail to steady her, then climb aboard. You may find that climbing aboard is easiest over the transom. Be sure to release the mainsheet and jib sheet before righting if these have been cleated.

If you are sailing with a crew, righting the capsized boat is easier and the crew may provide added weight on the centerboard or aid by pushing the masthead up from the water for a quicker recovery.

Occasionally, the Buccaneer, like other boats, may turn completely "turtle" with the mast pointing straight down. If this happens, the boat can still be righted although it will take a little longer. Climb up on the overturned hull using a free line from the opposite side or grab the protruding centerboard and lean as far as possible to the leeward side. The boat will right herself, first very slowly, then gradually faster. As it assumes a normal capsize position on the way up, continue with the normal righting procedure.

Righting Boat When it Has Completely Turtled



Lean out on Edge of Boat
Using Line from Across Hull

For those with older Buccaneers, see the article, **Make Your Buccaneer Safer,** in Section III.

When sailing in strong winds, always hold the mainsheet in your hand so it can be eased instantly in strong puffs.

When jibing in strong winds (turning the boat so that the stern passes through the eye of the wind), make sure the centerboard is not down more than 1/3. Shift your weight as the boom comes over and start and end the jibe with your mainsheet out so that the boom makes a 60 degree angle with the centerline of the hull. Keep crew weight aft and duck when the boom flies over. Push the tiller firmly and continue to turn the boat so that at the completion of the jibe, you are headed with the wind directly across the beam of the boat. A tight boom vang is recommended during this maneuver.

Practice jibing in light airs, first, and then try it in stronger winds as you become more proficient. If you are not certain of your ability to jibe successfully (without a capsize), turn your bow up into the wind when you turn around, and avoid the jibe entirely.

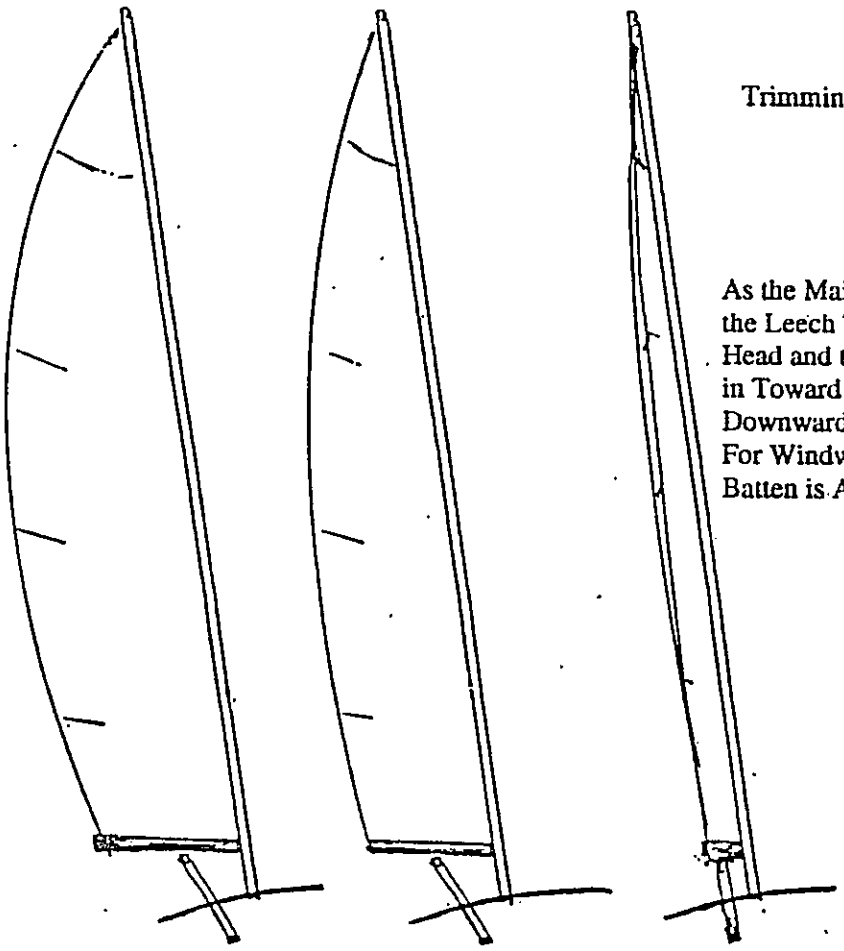
The foregoing material was written to help you understand the various parts of the Buccaneer, and to introduce you very briefly to some very basic techniques of handling this boat. It is not intended to be a basic sailing instructional book, and should be implemented with instructions from a qualified instructor, or at the least, with one or more basic sailing books which are available for this purpose.

II. RACING YOUR BUCCANEER

The following sections are not intended to be a treatise on the technique of racing small sailboats. They are intended to help a Buccaneer sailor who wants to race more successfully than in the past. They deal with trimming and sailing techniques which have proven to work well in this class.

Sailing to Windward in Light and Medium Airs

When racing to windward in light and medium winds, you have to get all the power possible out of your sails. As you gradually trim in your mainsail, your boom will come in closer and closer to the centerline of the boat. As you continue to trim the mainsheet tighter and tighter, the boom stops coming in and starts to move down. As the boom starts to get lower, the leech of the main, which had previously sagged off to leeward in the middle of the sail, will gradually try to assume a straight line between the clew and the head of the sail. Trim in until the next to the top batten points directly aft, or becomes parallel to the boom. In light airs, a little less trim, which allows the main leech to twist off a bit may be better.



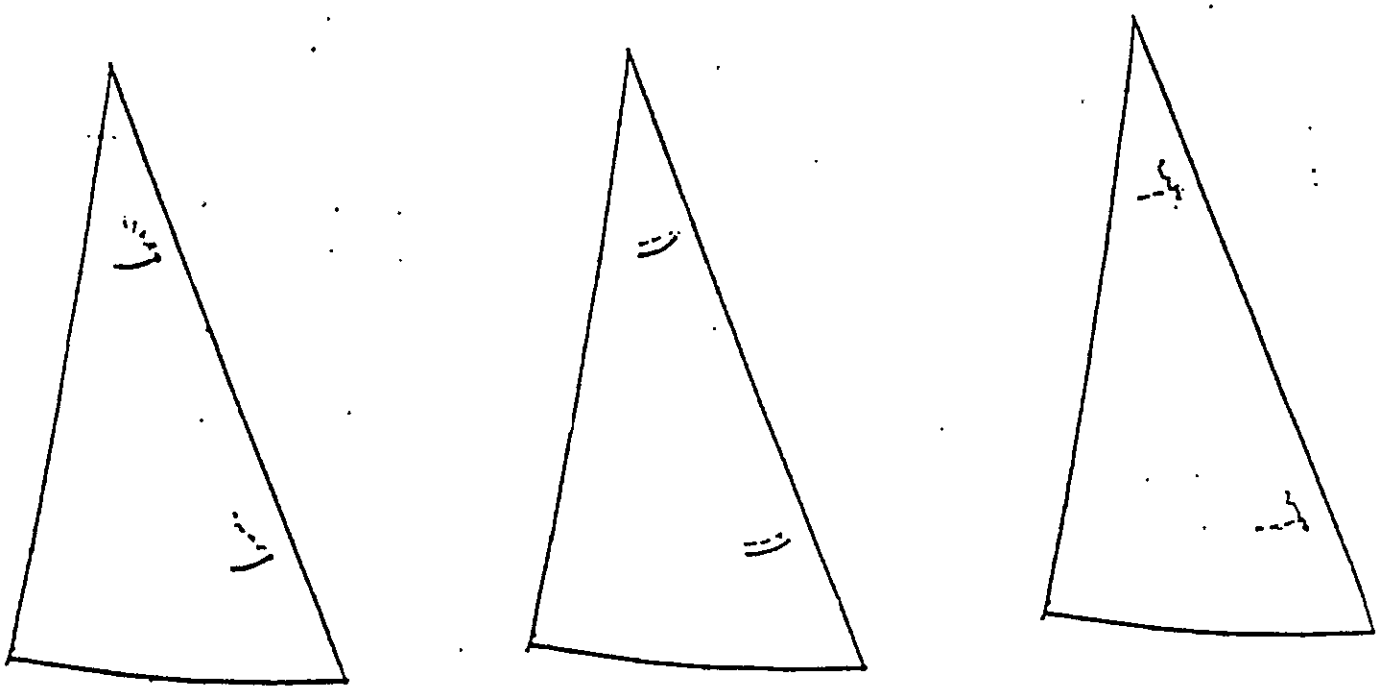
Trimming the Mainsheet

As the Mainsheet is Trimmed in Tighter and Tighter, the Leech Tries to Make a Straight Line Between the Head and the Clew of the Sail. First, the Boom Move in Toward the Centerline of the Boat. Then, it move Downward, which pulls the Leech Tighter and Tighter For Windward Sailing, Stop when the Next to the Top Batten is Aiming Straight Aft.

The cunningham in these conditions should be kept just tight enough to make any wrinkles running aft into the sail from the luff disappear---no tighter. The clew outhaul should be tensioned only enough to pull out any wrinkles running up from the boom toward the center of the sail.

The trim of the jib, in light and medium airs, is perhaps the most difficult trim to describe.

First, your fairlead must be located in the correct position on the track. Use telltales (yarn) attached to the jib, about 6-8" aft of the luff, and about 6-8" long, one on the starboard side of the sail, and a corresponding one on the port side. Locate at least one pair of these yarns within 3' of the tack of the sail, and a second set about the same distance down from the head of the sail.



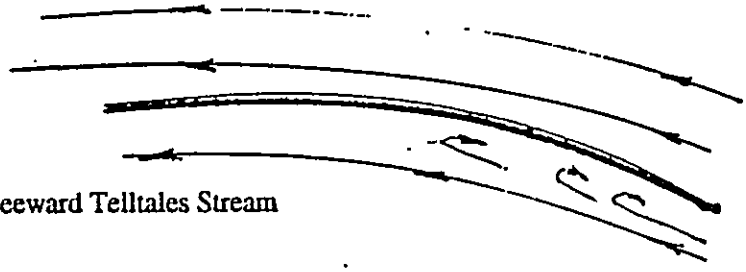
Here you are Looking at the Leeward Side of the Jib.
Windward Telltales are Shown by Dotted Lines, and Leeward Telltales by Solid Lines.

AT LEFT: Leeward Telltales are Streaming Aft, while Windward Ones are Jumping Around. You are Approaching a Luff, and Should Consider Bearing Away, if on a Beat.

AT CENTER: Both Windward and Leeward Telltales are Streaming Aft. This is Good, Especially on a Reach.

AT RIGHT: Windward Telltales are Streaming, Leeward ones are Jumping Around. This indicates a Stall, and means you should Head more to Windward, if on a Beat, or Ease the Sheet if on a Reach.

When sailing to windward, trim the jib in as you normally would, and then head gradually into the wind. Both sets of telltales should react simultaneously. If the upper windward yarn starts jumping around before the lower windward yarn, the upper part of the jib is not trimmed as tightly as the lower part. Therefore, your fairlead is too far aft on the track. Conversely, if lower part of the sail luffs first, as read by the telltales, your fairlead is too far forward on the track.

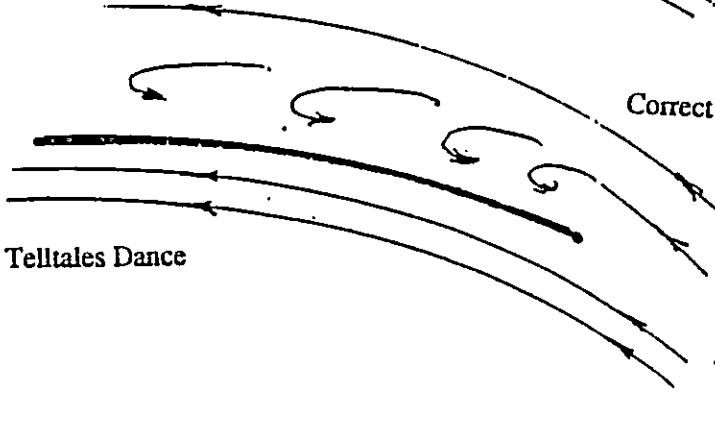


Luffing: Windward Telltales Dance, Leeward Telltales Stream

Wind at a Negative angle of Attack

Correct Trim: Both Sets of Telltales Stream

Correct Angle of Attack



Stalling: Windward Telltales Stream, Leeward Telltales Dance

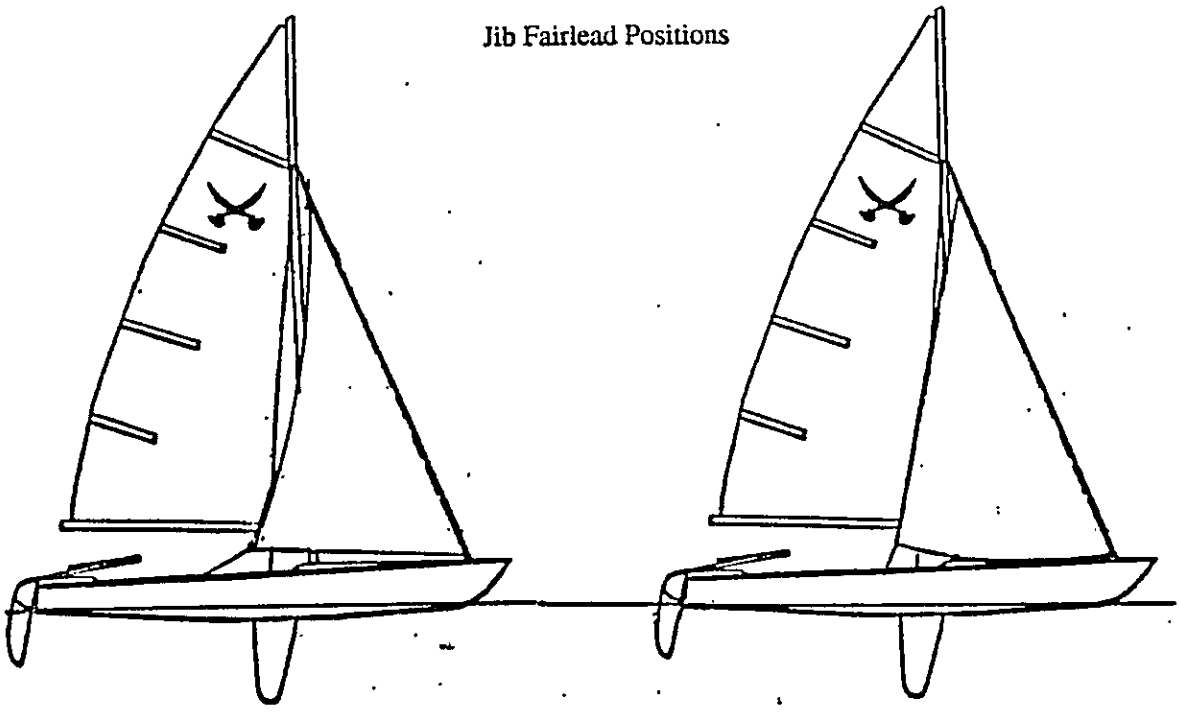
Wind at Too Great an Angle of Attack

If your sheet lead is already at the end of your track and the correction described above would indicate a proper position off the track, there are two possible remedies:

1. Move the track or add extra track to give you the proper lead.

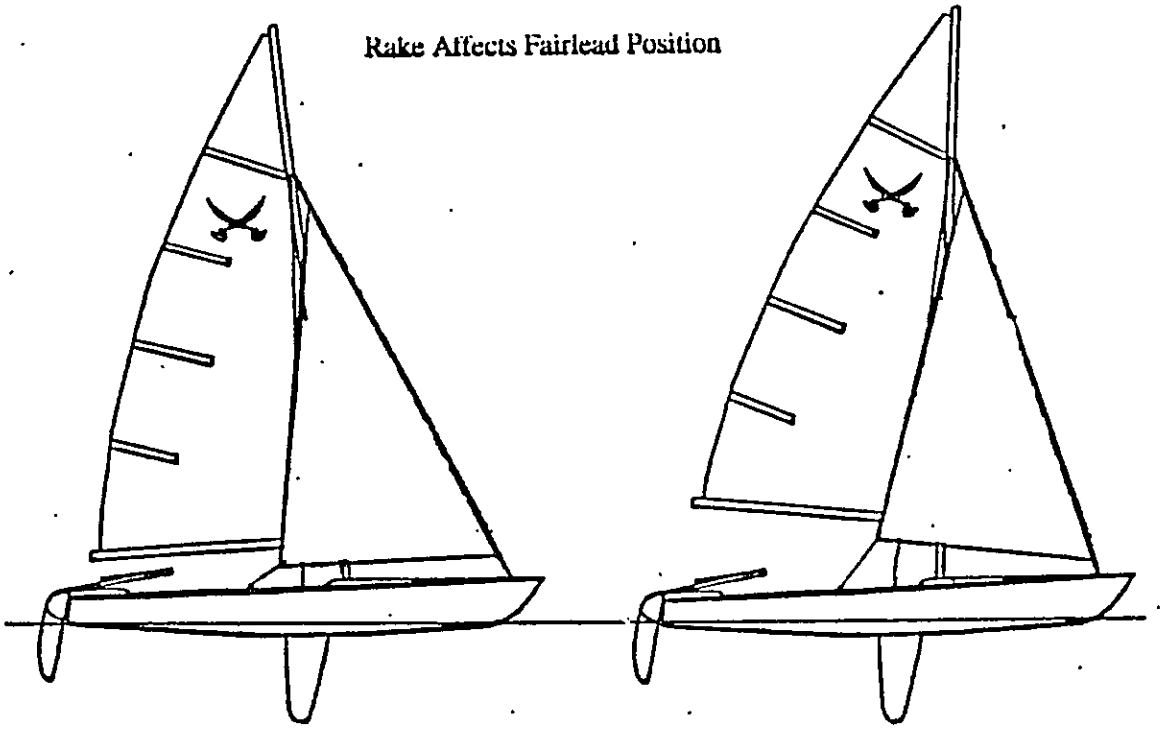
2. Check your mast rake. Raking the mast farther aft will move the correct jib fairlead position farther forward and conversely.

Jib Fairlead Positions



Boat at left has Fairlead too Far Aft. Leech is Slack and Falls off to Leeward. Foot is Pulled too Tight. Boat on the Right has the Fairlead too Far Forward. Foot is Slack and Leech is Pulled too Tight, Closing Slot between Mainsail and Jib.

Rake Affects Fairlead Position

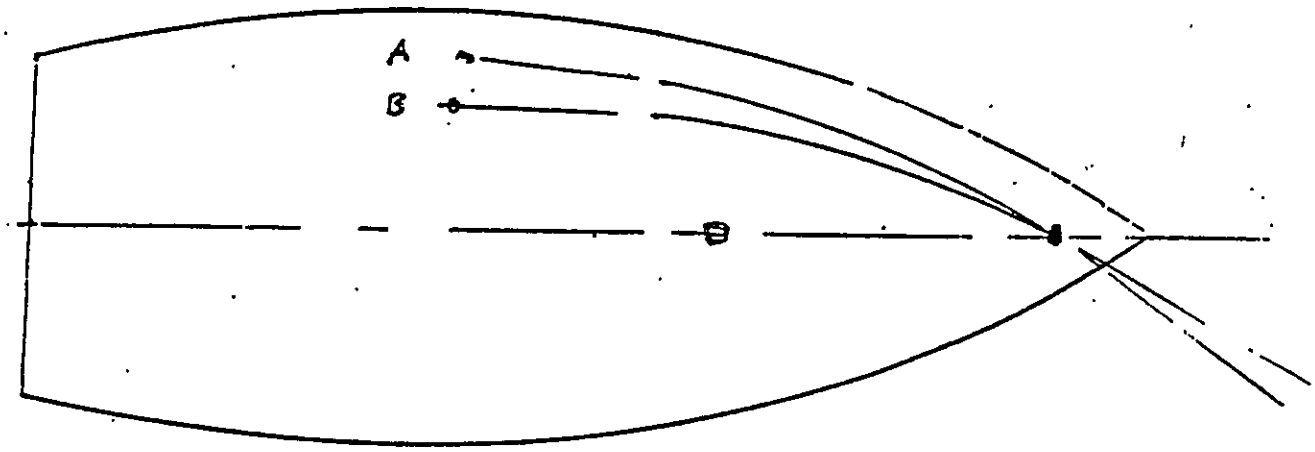


Both Boats have Fairleads in the Same Place, But Aft Rake on Boat on Left Causes Fairlead to be Too Far Aft. Forward Rake on Boat at Right Causes Fairlead to be Too Far Forward.

Some of the older Buccaneers were fitted out with jib sheet tracks located outboard on the seat, or even out on the edge of the boat. The newer boats have the jib tracks located near the inner edges of the seats. Jib leads located outboard make it difficult to point the boat sufficiently high into the wind, particularly in light and medium winds. On the other hand, the inboard leads make the amount you actually trim in on the sheet very critical. It is possible to overtrim the jib sheet, which will choke the slot between the mainsail and the jib, and will slow the boat down considerably.

How Sheeting Angle Affects Pointing Ability

"A" Indicates Sheeting Angle with Jib Fairleads on Rail.
"B" Indicates Angle when Fairlead is on Seat.



I do not know of any easy reference to just how much or how little to trim in the Buccaneer jib sheet, BUT THIS TRIM IS EASILY THE SINGLE MOST IMPORTANT FACTOR IN MAKING THE BOAT SAIL WELL TO WINDWARD, and demands your best efforts to identify it.

Probably the best way to find this trim point is to sail against another Buccaneer in a steady wind. Sail side by side, but at least two boat lengths away to eliminate backwinding and other interference between the boats. Then, with the windward boat maintaining a constant trim and not changing anything, have the other boat sail with the jib sheet slightly looser than normal. The windward boat will slowly work away to windward, pointing higher. Then, trim the leeward boat's jib sheet in until both boats are pointing equally high. If you trim just a little too tight, the leeward boat will slow down as the slot between her sails is constricted too much. In this way you can find out a good trim position for the jib. Mark the sheets with a couple of reference points near where the sheet will intersect the fairlead, so you can regain the best trim at will. I try to trim so that I point only as high as the other boats---no higher, and then ease out the jib a tiny bit for more speed while still maintaining the pointing ability of the others.

The difference between too little trim and too much trim can easily be a fraction of an inch! To illustrate this, trim your sails while the boat is either on the trailer or on a beach, with the boat turned so that the bow points 45 degrees from the wind-- just as if you were sailing on the beat to windward. Notice how much of a difference occurs in the shape of the jib and in the slot between the leech of the jib and the leeward side of the mainsail when you trim and ease the jib sheet very small amounts.

Other things to be considered when racing to windward in light and medium winds are to keep the centerboard down all the way, the rudder blade down all the way, and the crew weight amidships in the fore and aft direction. In very light winds, have the crew move as far forward as is practical to get the flattish after part of the hull out of the water.

Crew weight in these conditions should also be used to heel the boat slightly to leeward---the lighter the wind, the more the heel, up to about 15 degrees in very light air.

Once you have everything trimmed properly--mainsail, jib, crew weight, etc. sail the boat by handling the tiller gently--with two fingers, if you will. Steer by watching the jib telltales, and keep the leeward ones streaming straight aft. Sail too high into the wind, and the jib starts to luff and the telltales on the windward side of the jib dance around. Sail too low, and the leeward side telltales jump around, indicating a stalled airflow around the sails which will slow you up in a hurry.

Move about the boat slowly in the lighter airs----imagine what bouncing around in the boat does to the nice smooth flow of air over the sails we are trying to achieve. Don't try to point too high, but foot as fast as possible in the light air, trying only to point as high as your competitors, never higher, unless you have wind from a different direction than they have.

Generally, "the lighter the wind, the less tension on everything." This includes sheet trim, Cunningham trim, outhaul trim, vang trim, etc.

Sailing to Windward in Strong Breezes

Strong wind sailing in a boat like the Buccaneer separates the men from the boys, as the saying goes. Well sailed Buccaneers will get to a windward mark long before those not being as well sailed. I believe that this is so because nobody has properly explained the correct technique to most Buccaneer sailors.

Competitors who may recall the Nationals at Highland Park Y.C. in 1986 will remember how my wife and I were able to do well in the heavy weather races to windward, seemingly without hiking nearly as much as some of the other crews, and despite our lack of crew weight and comparatively advanced ages.. Here is how it is done!
When we, as beginning sailors, first were learning to race, the experienced skippers invariably said, "Don't let your sails luff if you want to sail fast!" Unfortunately such well-intentioned advice, while appropriate for light and moderate wind strengths, is completely unsuitable for best performance in a blow.

The important thing to concentrate on when sailing to windward in a strong breeze is to KEEP THE HULL MOVING FAST THROUGH THE WATER! We have had the notion of sailing the boat flat---on her feet---without allowing excessive heeling, pounded into our heads, and THIS is good advice. Not letting the sails luff under these conditions is NOT good advice, however.

The primary difference is that in the light and medium wind sailing, WE CAN USE ALL THE WIND POWER OUR SAILS CAN GENERATE. When it is blowing hard, we have, at our command, much more power than we can use. The excess power generated by the strong wind must be dissipated, so that you can adhere to that piece of good advice which says KEEP THE BOAT FLAT.

How to get rid of the extra sail power is the secret. We know that to get to weather we have to trim in the sails quite flat. You'll never get to windward by reaching, even though the boat may be kept flat. Here is how to do it:

1. Set your sails to be as flat as possible to reduce the power which a full sail will give you, and which you do not need under these conditions. This means pulling down hard on the mainsail cunningham (downhaul) control, and out hard on the clew outhaul.

2. Make sure the rig is tensioned adequately, since a sloppy rig is difficult to sail with and not sensitive and responsive to the strong puffs BECAUSE it is loose and sloppy.

3. Make sure your rudder blade (as always) is down all the way for quick response to the helm.

4. You may raise (yes, I said raise) the centerboard a bit, since it will tend to reduce weather helm (pull on the tiller) that tends to occur in strong wind sailing. Lighter crews may want to raise the board more than heavier crews (I would suggest about 6" as a

starting point. Too much board up will cause sideslipping, and too much down makes the boat harder to hold down (sail flat).

5. Get the weight of the skipper and crew out over the side. Comfortable hiking straps help here. Be sure to bunch the crew weight amidships, rather than having the crew forward and the skipper aft. Bunching the crew weight reduces the pitching moment of the boat and will speed you up when sailing in a chop.

6. Trim the boom vang tight, and the mainsail and jib much as you would do on a medium wind day. If you have an athwartships adjustment on your jib sheet, such as a Barber Hauler, it can be trimmed so that the effective lead for the jib sheet is somewhat outboard of the usual location. Too much of this will keep you from pointing high, however, so don't overdo it. Three or four inches outboard might be a good starting point here, and light crews might need this more than heavy crews. In positioning the jib sheet fairlead on its track, it might be moved aft an inch or two more than you normally do for medium winds. This helps prevent closing the slot between the main and the jib too much.

7. Now that everything is trimmed properly and the crew is positioned, start to sail upwind. A strong wind always has puffs and lulls. When a puff hits the boat, it tends to heel over and slow down. To prevent this you must IMMEDIATELY head the boat slightly into the wind to spill the extra power from the sails by allowing the mainsail and jib to luff somewhat. This is NOT done by easing the sheets, but by working the boat up into the wind.

Next the wind will ease off in a brief lull. Use this opportunity to bear off SLIGHTLY to keep the boat from losing speed. When the next puff hits, pinch up again, etc., etc. The secret in doing this successfully is in the timing. There will be a split second between the time you feel a puff on your body, and the time the boat reacts to it by heeling over. In that split second, you push the tiller down and dissipate the extra energy by working the boat up into the wind (which is, after all, where you want to go in the first place). Again, the secret is in the timing. A fraction of a second late in either pointing up or bearing away will result in the boat first heeling over, then pointing up into the wind and losing speed. Slightly quicker anticipation will yield the desired results.

As you get used to this technique you will find that although you will be sailing a somewhat serpentine course,and both sails may be luffing much of the time, the boat will stay flat, move fast, and make good a course to windward equal to or better than your competitors.

You will find, too, that what you are really doing is working the tiller so that the ANGLE OF HEEL OF THE BOAT REMAINS CONSTANT, and this heel angle will be largely what you are looking at. Of course, you should also be watching the waves to try to avoid crashing into one which will slow you down, and also watching the puffs come toward you so you can anticipate them properly.

I was fortunate to have learned this technique a very long time ago, and for years have been listening to two common complaints from skippers who did not understand it:

1. My boat won't point in these strong winds, and
2. I can't hold my boat down--I need more crew weight.

The reason they can't hold their boat down is precisely because they don't point their boat high enough. Pinching up as described (also known as feathering) will solve both their problems at the same time.

If you are not experienced, and want to develop this technique, I suggest that you sail on a reasonably strong day, first with your jib furled. Getting the hang of it this way will allow you to understand it quicker and without as much swimming to distract you.

By mastering this technique, you will seldom need to ease your sheets on the windward leg. However, always hold the mainsheet in your hand, so you can instantly release it IF you are caught by a hard puff and fail to respond to it quickly enough with the tiller. Also have your crew hold the jibsheet for the same reason. These are still your ultimate safety valves if your timing breaks down, or if extra strong puffs strike you and threaten to capsize you unless you ease sheets.

Under the most extreme conditions, during periods of extremely hard puffs, pumping the mainsheet rapidly in and out will help you maintain your speed and control and keep you from excessively heeling or capsizing.

Sailing Reaches and Runs in Light and Medium Airs

When sailing offwind legs, the spinnaker is your primary sail, and a discussion on rigging this and handling it will be found in an article later on in this book.

On reaches and runs, keep the boat from heeling in all winds except drifters, during which a pronounced heel to leeward will help. Pull your centerboard up farther and farther as your course changes from close reach to broad reach to run. Always leave a bit down (say 6") to give a pivot point around which the boat can turn. Trim the hull down by the bow in real light airs, otherwise have crew weight fore and aft so that the bottom of the transom is just touching the water.

Mainsail trim on a reach should be in enough so the sail does not luff, and out enough so it does not stall. Since mainsail telltales are not very effective because the mast affects the airflow around the leading edge of the main, you may have to keep easing the sail to the point where it begins to luff and when trim it slightly in from that point. Keep testing this trim, however, by easing the mainsheet frequently. Having the main trimmed in too tight is a more insidious fault, but it is fully as detrimental to your speed as a luff, and maybe more so.

If you're using the jib on a reach instead of the spinnaker, try to keep both windward and leeward telltales streaming smoothly aft.

When reaching in light airs, and using the jib rather than the spinnaker, have the crew sit to leeward and hold the clew of the jib by hand. This is very effective but the crew should be careful to hold the jib so that neither the foot nor the leech is too tight. Refer to the previous section describing the positioning on its track for the principles involved.

Planing

The Buccaneer has a modern planing hull, and enough sail power to plane easily in a fresh breeze. Learning to plane can put many boatlengths between you and your competitors during a strong wind race. It is also a lot of fun, whether you're racing or just plain sailing around.

The Buccaneer planes best with the wind on the beam, when it is blowing 12-18 knots. When the wind is stronger than 18 knots, a wind direction a bit further aft will provide the most speed.

To plane in moderate winds, sail a course so that the wind is abeam. The centerboard should be approximately half-way up. Having the board down too far will induce weather helm, which increases rudder drag and makes planing difficult. Trim the mainsail and jib properly, as described previously, taking care not to stall the sails by trimming them in too tight. Crew weight should be to windward so that the hull is not heeling, and should be slightly more aft than usual for lighter breezes. The boom vang must be on hard to keep the main from twisting and losing power. For planing, we need as much sailpower as possible.

Light weight is also important to plane. A boat having any appreciable amount of bilgewater, or a large amount of heavy gear aboard is under a considerable handicap on a planing leg of the course.

When a strong puff hits, the sheets may have to be eased briefly and skipper and crew hike out hard to keep the boat from heeling. Then the sheets can be jerked in quickly to cause the boat to plane. Because the Buccaneer is a true planing hull, it will not tend to jump up on a plane, but speed will quickly increase until the rooster tail wake tells you that you are, indeed, exceeding the hull's displacement speed.

As the boat speed increases, additional sail trimming will be required because the apparent wind direction will move forward due to the increased speed of the boat. Any tendency of the boat to heel more than a few degrees should be resisted by easing the mainsail and/or hiking out harder. A heeling boat will soon stop planing and slow down. Therefore constant in and out movement by skipper and crew to maintain a fairly level heel angle is necessary for most successful planing.

In racing, tremendous gains in distance can be made by being able to either start planing sooner, or to maintain the planing speed longer than your competitors, since planing will often double your speed. Since the ability to plane depends largely on the sailing angle (beam reach, broad reach, etc.), large deviations from a straight line course to keep planing will often pay large dividends, and the rule of averaging your rhumb line by driving off to leeward in the puffs and coming back up to windward in the lulls is a good one which will invariably pay off.

When sailing on a downwind leg in moderate to fresh conditions, sailing a series of broad reaches (tacking downwind) rather than on a dead run can often result in planing which will make the tacking downwind course much faster. (High performance boats like the Buccaneer should almost always be sailed downwind on a series of broad reaches rather than on a dead run, whether the winds are strong or lighter.)

Adequate sail power is necessary to plane. Sailing under spinnaker in moderate to fresh conditions will often allow planing when the competition, not using spinnakers, will not generate enough power to do so. Likewise, using both the spinnaker and the jib can result in earlier and faster planing, although it requires good technique to get the most out of the boat using all three sails at one time.

Moment of Inertia

Most everyone who races a sailboat knows that it is important to balance the boat with crew weight to help keep the boat from heeling, and therefore slowing down. Too much heeling destroys the smooth water flow around the hull, the resistance to sideslip that the centerboard offers, the efficiency of the sail plan as the air flows around it, etc.

Not everyone is aware, however, of the effect of a change in the moment of inertia of the system (boat+gear+crew, etc.). Realizing what the moment of inertia is and how it can help or hurt your boatspeed is important.

A large moment of inertia is exhibited by the ice-skater who is attempting to spin around with his or her arms outstretched. The speed of the spin is slow. When the skater moves the arms in close to the body, however, the speed of the spin picks up significantly.

How does that affect sailboat racing? Follow along, and I'll explain.

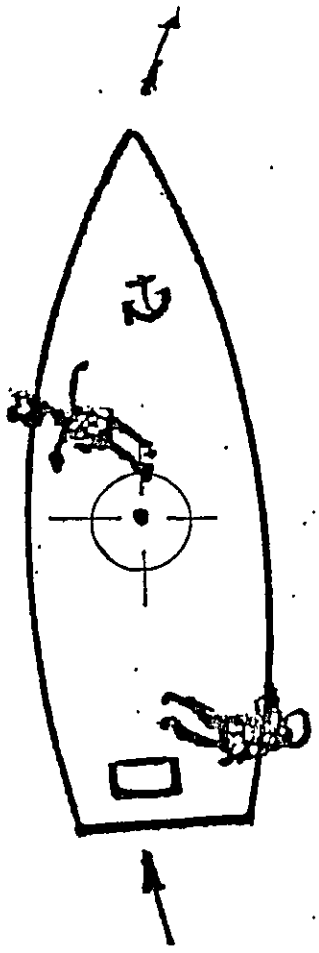
Most articles address only the longitudinal moment of inertia, or the pitching moment. They ignore looking at the lateral moment of inertia (rolling), or the turning moment of inertia. While the pitching moment is undoubtedly the most important of these, we will look briefly first, at the other two.

Simply put, the moment of inertia is the sum of the mass of all the particles in a body, multiplied by the square of the distance from the center of these particles (the center about which the body will tend to rotate). It is important to note that the moment of inertia of a sailboat at any given time includes the mass of **all** the particles on all the items which are on or in the boat. This includes crew, gear, spars, sails, centerboard, beer, etc.

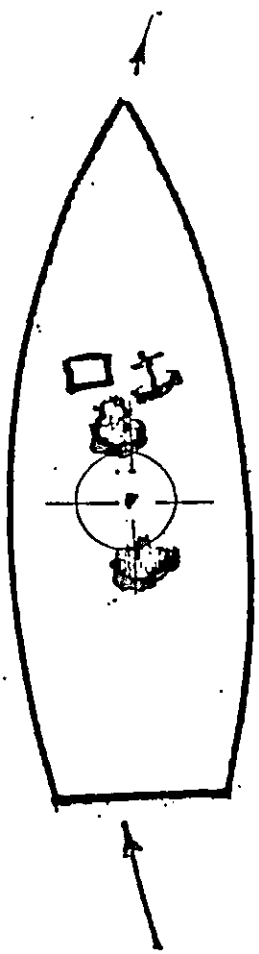
It is also important to note that the moment equals the mass of these particles times the **square** of the distance from the center. In other words, the distance is more important than the actual mass or weight, in determining the size of this moment.

If we look down on the top of a boat, and the crew weight and all the gear is located in the middle of the boat, both longitudinally and athwartships, we would have a small moment of inertia, compared to the moment we would have if the moveable weights of skipper, crew, and gear, were spread out---some in the bow, some in the stern, some hanging over the starboard rail, and some hanging over the port rail.

Turning Moment of Inertia



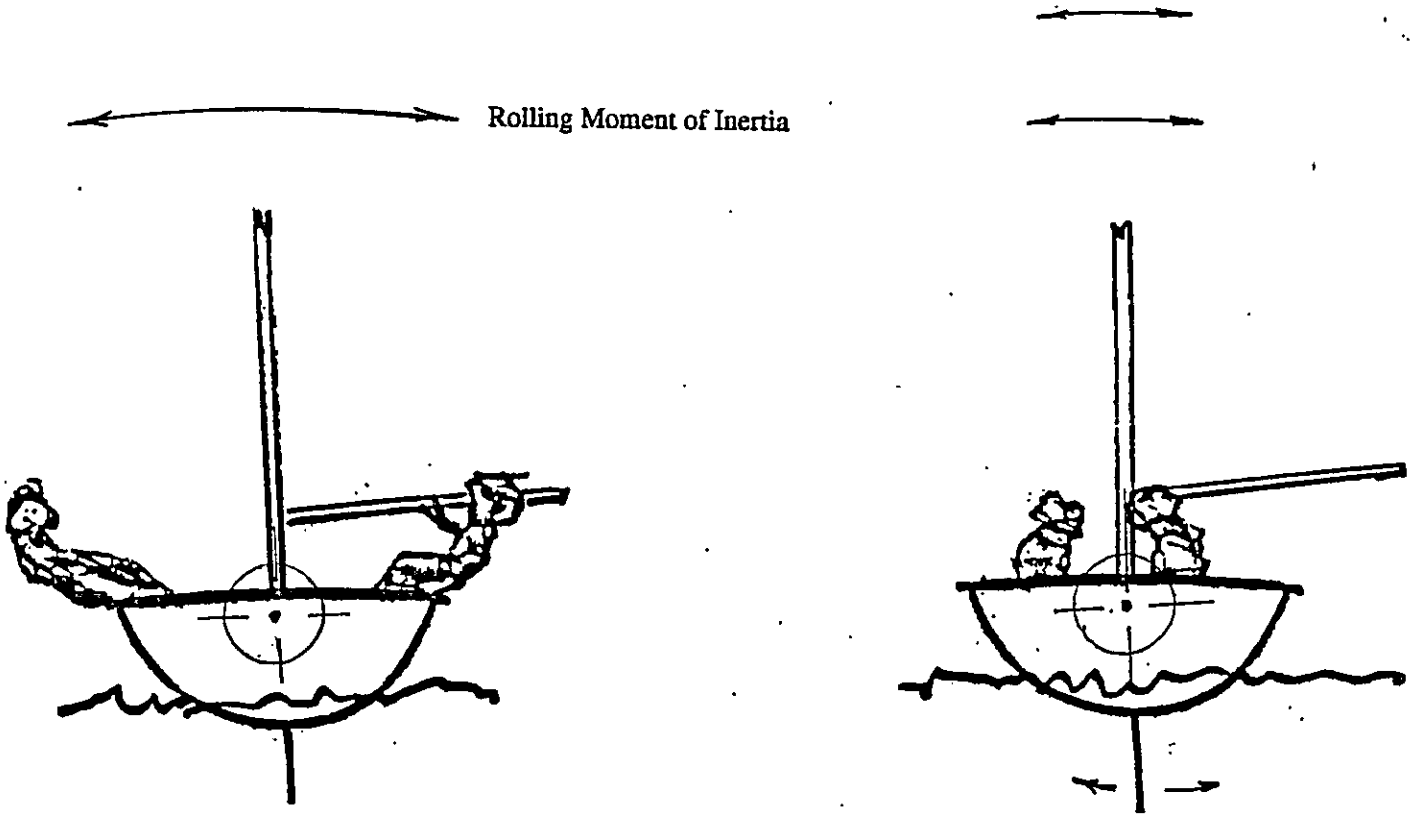
Large Turning Moment---Slows Boat During Turns



Small Turning Moment--Boat Turns Easily

In this latter situation, if we wanted to turn the boat, there would be more resistance to turning, than if everybody and everything were bunched together in the middle. Therefore, more sideward rudder force (or force exerted for a longer time) would be needed to turn the boat. More rudder movement means more resistance, and the boat would slow down more as a result of this than if the moment of turning inertia were kept minimal. Doesn't this make you want to achieve a small turning moment of inertia when you're drifting along and need to make a course change?

In the case of the lateral moment of inertia, let us imagine looking at the boat from the stern. A boat with a small lateral moment of inertia would have the moveable weight (primarily the skipper and crew) sitting right on the centerline of the boat. In the case of the Buccaneer, the crew and skipper would be both on the centerboard trunk. If this boat hit a wake or was sailing in waves, it would tend to roll more easily than if the crew weight were spread out laterally.



Large Rolling Moment--Rolling is Long and Slow

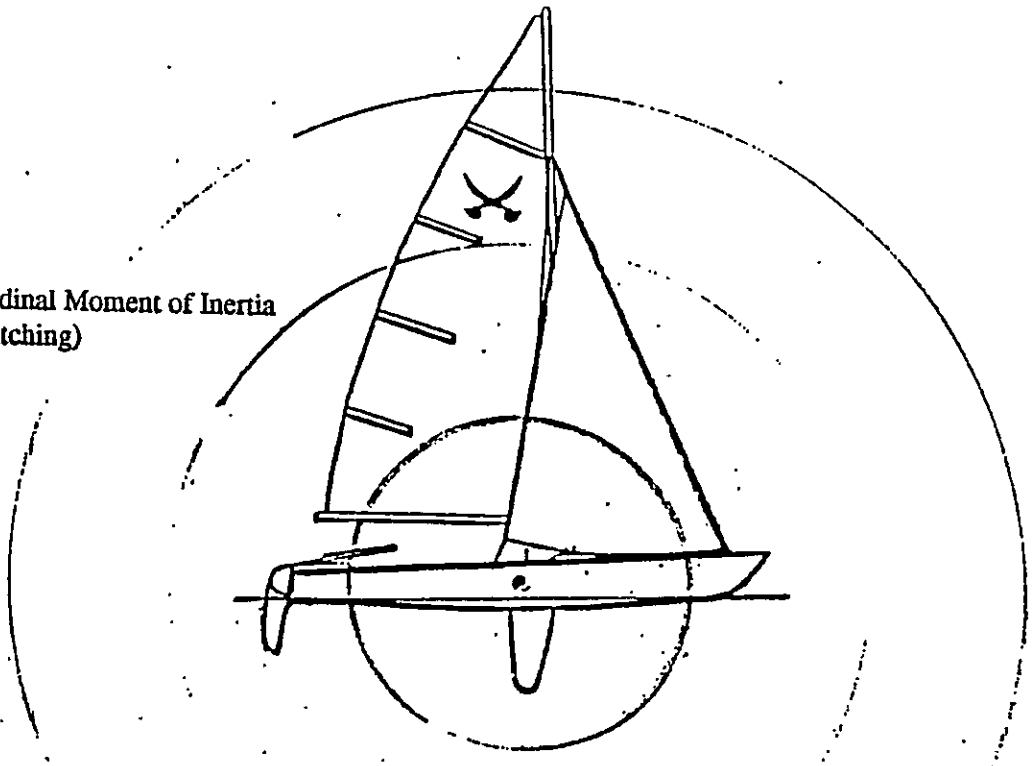
Small Turning Moment--Rolls Quicker and Jerky

With the skipper hiking out over one side of the boat, and the crew hanging out over the other side, the rolling moment of inertia would be substantially increased.

So what, you say. Well, on a run, a crew sitting on the trunk would allow the hull to roll easier, and therefore, the hull would offer a bit less resistance to the rolling force of the waves which is causing the tendency to roll. On the other hand, the boat with the crew weight spread apart in this situation would have a boat which would roll slower, and therefore the air flow over the sails would be much more efficient. Imagine the top of the mast rolling through a large, quick arc as the hull rolls, and imagine what that does to the smooth, powerful, steady airflow we're trying to achieve. At the same time, a partially lowered centerboard would churn through the water more rapidly in a quickly rolling boat, and would use up energy, thereby slowing the boat down.

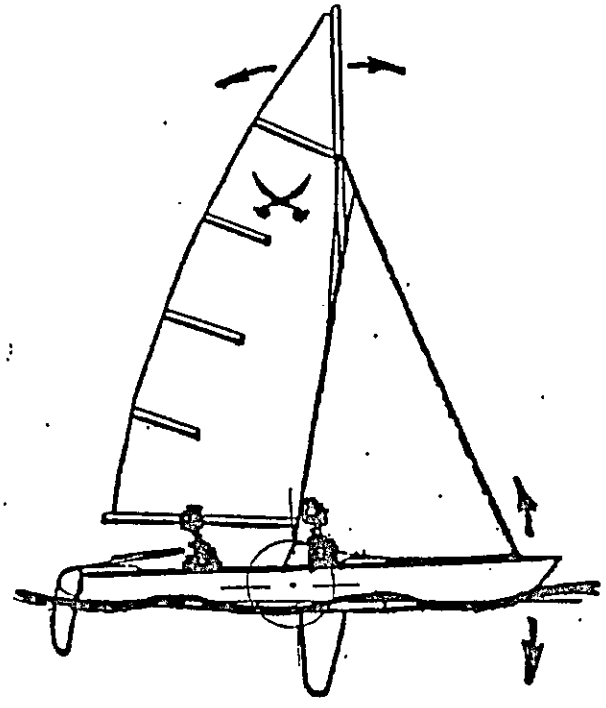
The most obvious and important part of the moment of inertia story, however, is realized when looking at the boat from the side view. Whenever the water has waves, whether they are the seas churned up by the wind, or merely a temporary wake thrown up by a passing powerboat, the pitching or longitudinal moment of inertia comes into play. In such a situation, the bow of the boat dips down into the trough, then rises over the wave, then dips down again into the next trough, etc.

Longitudinal Moment of Inertia
(Pitching)

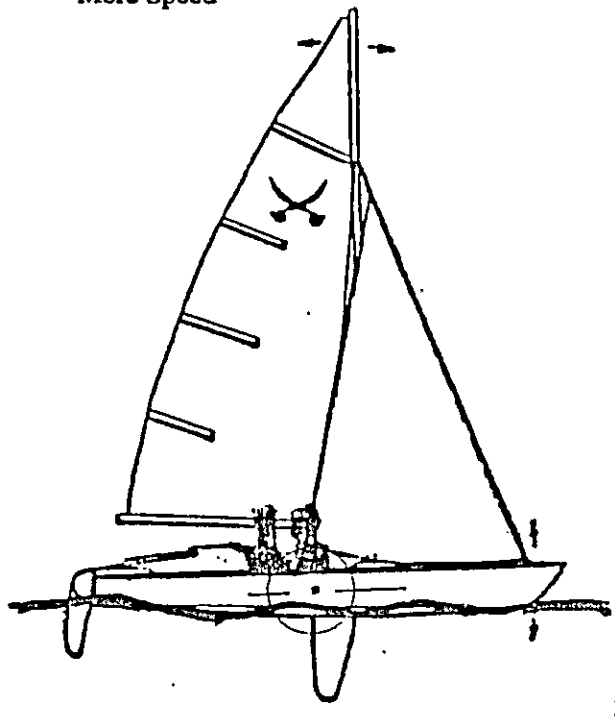


The Circles show Distances from
the Boat 's Center of Mass

WRONG: Crew Weight Spread Apart Means Greater Resistance, More Pitching, and Loss of Speed



RIGHT: Crew Weight Bunched Together Means Less Pitching in Rough Seas, and Therefore, More Speed



In a boat with weight spread out longitudinally (a crew member way forward, a skipper sitting back near the transom, a heavy anchor in the bow, or a full picnic cooler under the after deck), the hull will drive its bow deeper into the wave than will a boat with a small pitching moment. Next, the bow will rise higher (and slower, and longer) before settling down into the next trough. This hobbyhorsing will noticeably impede the forward progress of the boat with the spread out weight, as compared to one where weights are concentrated amidships.

In a strict one-design class, where boats are all built the same, the only things you can do to help the pitching moment is to locate your moveable weights (including crew) in the center of the boat. In classes where rules allow, every effort should be made to make the upper portions of the mast, and the ends of the boat (including the rudder assembly) as light as possible. Where the boat can be built to class minimum weight without sacrificing a stiff hull (which in itself is important for speed) extra weight can be built into the boat in the middle, and the ends made as light as possible without sacrificing stiffness.

In the mid 1960s, we built a number of Flying Dutchmen. We were able to build a stiff hull to class minimum weight, and were able to keep all the excess weight out of the ends of the boat. When sailing in close proximity to competitive models in smooth water, and a motorboat wake was encountered, we could count on gaining at least half a boat length every time.

Some classes, such as the Snipe and the Finn have introduced rules for their classes which control the pitching moment being built into the boats.

In the Buccaneer, we can make our boat competitive within class rules by not adding equipment which has any weight near the bow or the stern (take off that outboard bracket), keeping any excess weight off the mast, and locating the equipment (anchor, etc.) as near to the center of the boat as possible.

The most important thing to remember, however, is to keep your crew weight bunched together, particularly in rough water. Your crew weight is by far the heaviest moveable weight in your boat!

Handling the Spinnaker

In searching through all the copies of the **BUCK** which I could find, I uncovered no articles which dealt specifically with handling that big colored sail in the front which invariably strikes terror to the inexperienced skipper and crew--the spinnaker.

In this article I propose to bring this subject under scrutiny by delving into several related topics:

1. How the new Buccaneers are set up for handling the spinnaker, and why.

2. How we recommend you set up an older Buccaneer for efficient spinnaker handling.

3. How and when the spinnaker should be used.

In selecting and locating spinnaker gear for the new (1984) Buccaneers we tried to make it possible for an owner to be able to add spinnaker equipment to his boat, without much difficulty, at any time after the boat was first purchased. Also, the equipment, in addition to being simple, had to have top competitive ability.

First, we decided to incorporate the spinnaker launchers in all Buccaneers, since it is difficult to add this later. The snout of the launcher is large and molded smoothly into the foredeck just forward of the forestay ferrule and the anchorage for the Harken roller furling jib. Below the deck, the launcher tube is shaped like a large, elongated mail box upside down with a half round lower section and an upper part which is glassed in place on the underside of the deck. This provides additional stiffness to the deck, and forms a giant girder which helps keep the bow from flexing upward under the load of the jib luff.

This launcher tube is of fiberglass, lightly constructed, but virtually water-proof. It terminates at the forward end of the storage box, and any splashing which might enter the boat through the snout in the bow will drain back through the tube, through the storage compartment, and back to the cockpit, where the recessed Elvstrom bailers will remove it.

The spinnaker halyard we use is a 5/32" or 3/16" diameter braided halyard which is approximately 60 feet long and also doubles as the takedown line. Lines smaller in diameter than this are prone to snarl and foul badly. Any larger line is a real disadvantage in light air--weighing the sail down too much. We rig the spinnaker halyard so it passes through a 3/8" hole drilled in the fiberglass just along the side of the mast foot. Then it passes around a sheave cage just above the level of the centerboard trunk top and passes through a bullseye fairlead with a metal bushing in it near the aft end of the centerboard slot. Then it passes forward directly into the storage compartment and launcher tube where it connects to the retriever patch at the center of the spinnaker.

The cleat for securing the halyard is an open clam cleat without a fairlead, located at the top of the trunk as far aft as possible. Since this cleat is almost 8" away from the fairlead, chances of it recleating accidentally when the halyard is released are minimized. Substitution of a block in place of the fairlead and a cam cleat instead of the clam cleat would work, too.

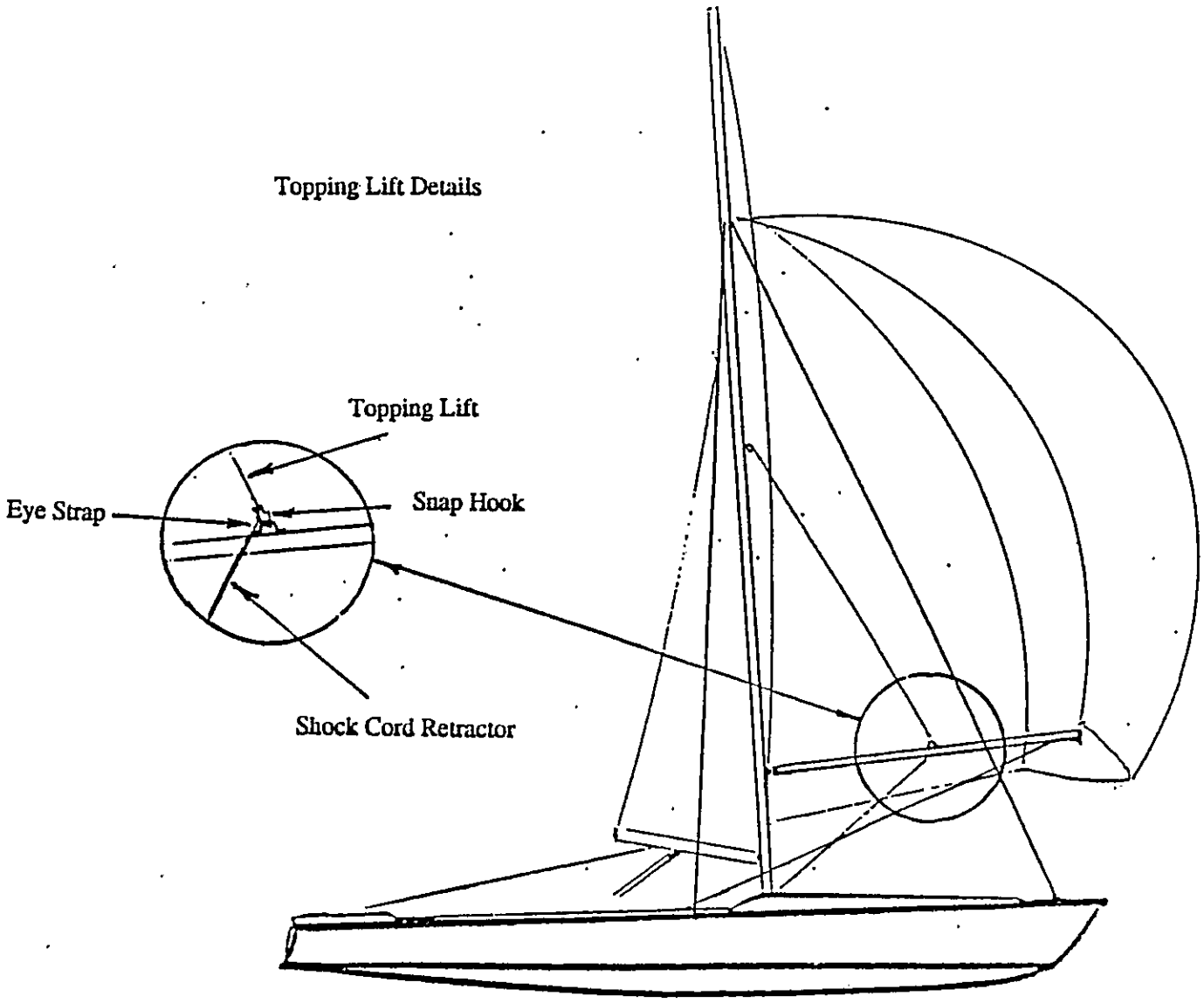
Some of the older chute launching sleeves of fabric terminated in the trunk or under the side seat. Being longer, they provided more friction than the slick molded fiberglass surface we use. They also made it difficult to rerig a retriever line, should that become necessary.

The new launcher also provides a convenient place to store the spinnaker pole. Thrown forward, it lies on top of the spinnaker when not in use. When rigging the halyard-retractor system, simply tie the retractor end to the spinnaker pole, and shove the pole into the tube, where it can be grabbed by the crew by reaching into the snout.

When the spinnaker is retracted, three or four feet of it will be pulled back into the cockpit in order to get all three corners inside the snout. The crew merely grabs this excess and shoves it back into the storage compartment out of the way.

Controlling the height of the spinnaker pole is important for maintaining speed in variable wind conditions. Therefore, we assign this job to the skipper, and lead the pole lift (topping lift) back to him at the aft end of the centerboard trunk. The topping lift is a length of #5 braided Dacron which starts at a snap hook which, in use, snaps into an eye strap at the middle of the spinnaker pole. The lift goes up through a sheave about 10' higher than boom level, and down on the side opposite the spinnaker halyard and follows the same route back to the aft end of the trunk. Here it terminates in a small cam cleat with a fairlead.

We also mount a shock cord retractor to the topping lift, beginning at the snap hook and ending at a small eye strap located as low as possible on the forward side of the mast. This shock cord (1/4" diameter) is weak, and only used to retract the topping lift back along the mast when not being used. It is <u>not</u> a downhaul to keep the pole from accidentally skying.



Some skippers prefer to store their spinnaker pole on the side of the boom, and leave the topping lift attached to the pole all the time. This eliminates hooking and unhooking the topping lift when the spinnaker is set and lowered, but it may require more effort to secure the pole on the boom each time, than to place the pole in its tube under the foredeck. Also, I have developed a personal allergy to windage and to extra weight on the boom, which is always to leeward and potentially harmful in a blow. One advantage to storing the pole on the boom is that the skipper is less likely to have his eye poked out by the crew when the pole is being pulled out from under the foredeck.

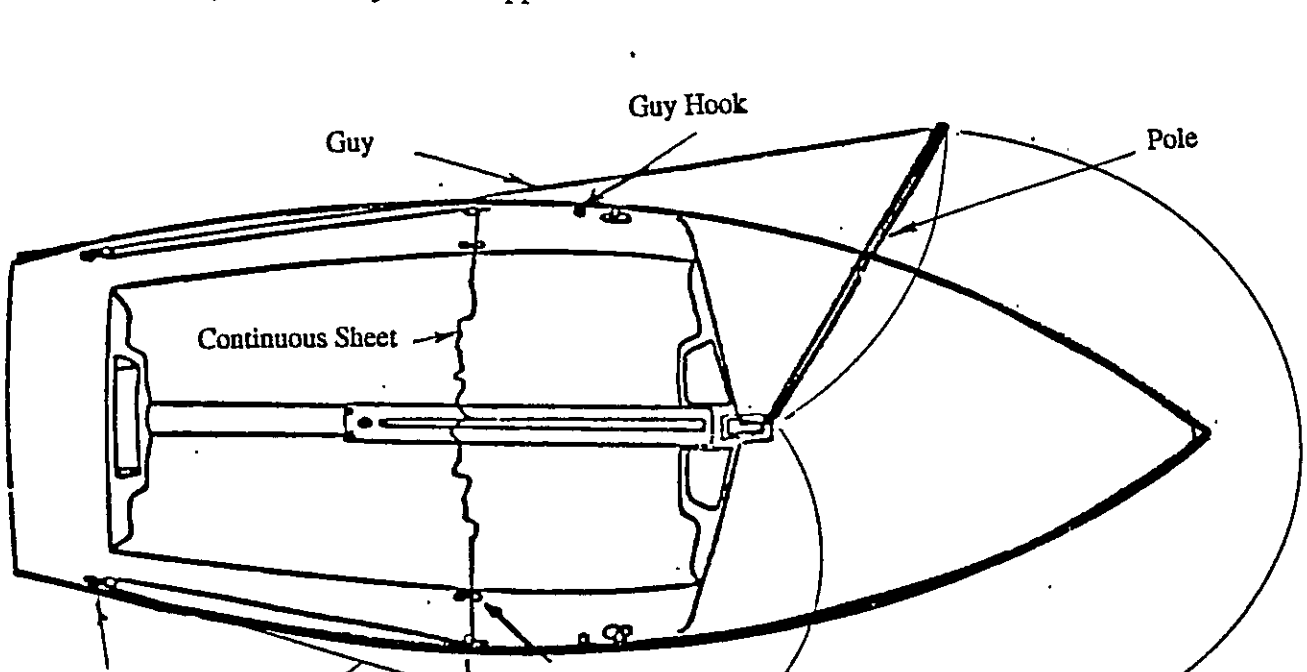
We attach our spinnaker pole eye to the mast about 24" above the boom--low enough so the average crew can reach it conveniently.

We have occasionally seen topping lift / downhaul combinations where the topping lift is a heavy, strong piece of shock cord, and the pole height is controlled by pulling a downhaul line against the pull of the shock cord. We have tried this arrangement and don't like it. The primary objection to this system is that, in any chop at all, the shock cord will cause the pole to bounce up and down, which tends to throw wind out of the spinnaker.

We also do not like the old fashioned way of using a double ended cleat on the side of the pole and adjusting the pole height by using a series of knots in the topping lift which engage the cleat. This method is too slow and requires the crew to do it--leaving his primary job of spinnaker trimming in the meantime.

How do we rig an effective pole downhaul then? By locating small eyes on the side deck, outboard as far as possible and in the general vicinity of the shrouds. The best I've found are made by both Fico and Ronstan, and have rubber tips in them to prevent a sheet or guy from accidentally getting caught in them. In use, the guy (windward sheet) is simply led through this hook on the windward side of the boat. It is only necessary to use this when the wind is strong or on a reach, and the pole tries to lift. Don't forget to release the guy from the hook when jibing.

On our boat, we like and use a continuous spinnaker sheet. This runs from the spinnaker clew back to a block near the stern, then forward to another block on the side deck located just forward of the mainsheet blocks. Then it runs directly across the cockpit, and continues symmetrically on the opposite side.



On spinnaker sheets I think the use of low friction ball bearing blocks is more important than on any other place on the boat, so we use Harkens here. The sheet itself, is a braided fuzzy Dacron, either 3/16" or 1/4" diameter, depending on the wind conditions you usually sail in, and the condition of your crew's hands. A light polypropylene sheet is also good, but may be hard on the hands.

We cleat the sheets with cam cleats mounted on the deck directly across the side deck from the mainsheet block. When on a starboard reach, for example, the leeward (port) sheet would be cleated by the leeward (port) cleat. The guy (windward sheet) would be cleated to weather. I'll explain later why we prefer these locations to others.

Because of the deck flange arrangement on the Buccaneers which have been made for the past few years, it is easy to though-bolt the guy hooks and spinnaker sheet blocks right through these flanges. The sheet cleats can be fastened with sheet metal screws, properly installed, since the load on these fasteners is in shear.

If you have an older Buccaneer, and want to set it up for spinnaker similar to what we suggest, it is necessary that you attach the hardware by bolting. You will have to gain access to the underdeck areas to secure this hardware. This might be relatively easy or quite difficult, depending on the vintage of your boat and the nature of the storage compartment construction being used at the time. Other than obtaining access, installing spinnaker gear is relatively simple.

The way to get at otherwise inaccessible areas under the deck is to cut a round hole in the fiberglass, using a drill and a keyhole saw, hole saw, or jig saw. Then, after installing the fitting involved, close the hole by installing one of the various sizes of plastic inspection ports which are available on the market. These ports range in size from 4 1/4" diameter up, and consist of a flange which fastens to the fiberglass with screws, bolts, or pop rivets, and a screw in piece that fits inside the flange to make a watertight seal. With the inspection port in place, you can open it up and get at what's in back of it conveniently in the future. The flange of the inspection port should be installed with a bedding compound such as silicone rubber, to assure that it makes a watertight joint with the deck.

Naturally, you'll want to choose where you cut the hole (and consequently, where the inspection port will be). Generally, locate it in a vertical panel such as a seat back, since you won't want to sit on it.

The mounting of a chute launcher is a different matter. The old small ones which dodged the forestay and went down one side of the boat seem to have openings which were too small to be effective. Mounting one of the new launcher tubes which run right down the centerline of the boat will give more efficiency, but some structural buildup of the forestay and / or jib furling system must be undertaken so that the load on your jib, mast, and rig doesn't rip the foredeck off the boat. I'm going to cop out on this now by saying that there are a number of ways this rigging load can be transferred from the hull to the deck, just as there have been numbers of variations to the production of the boats,

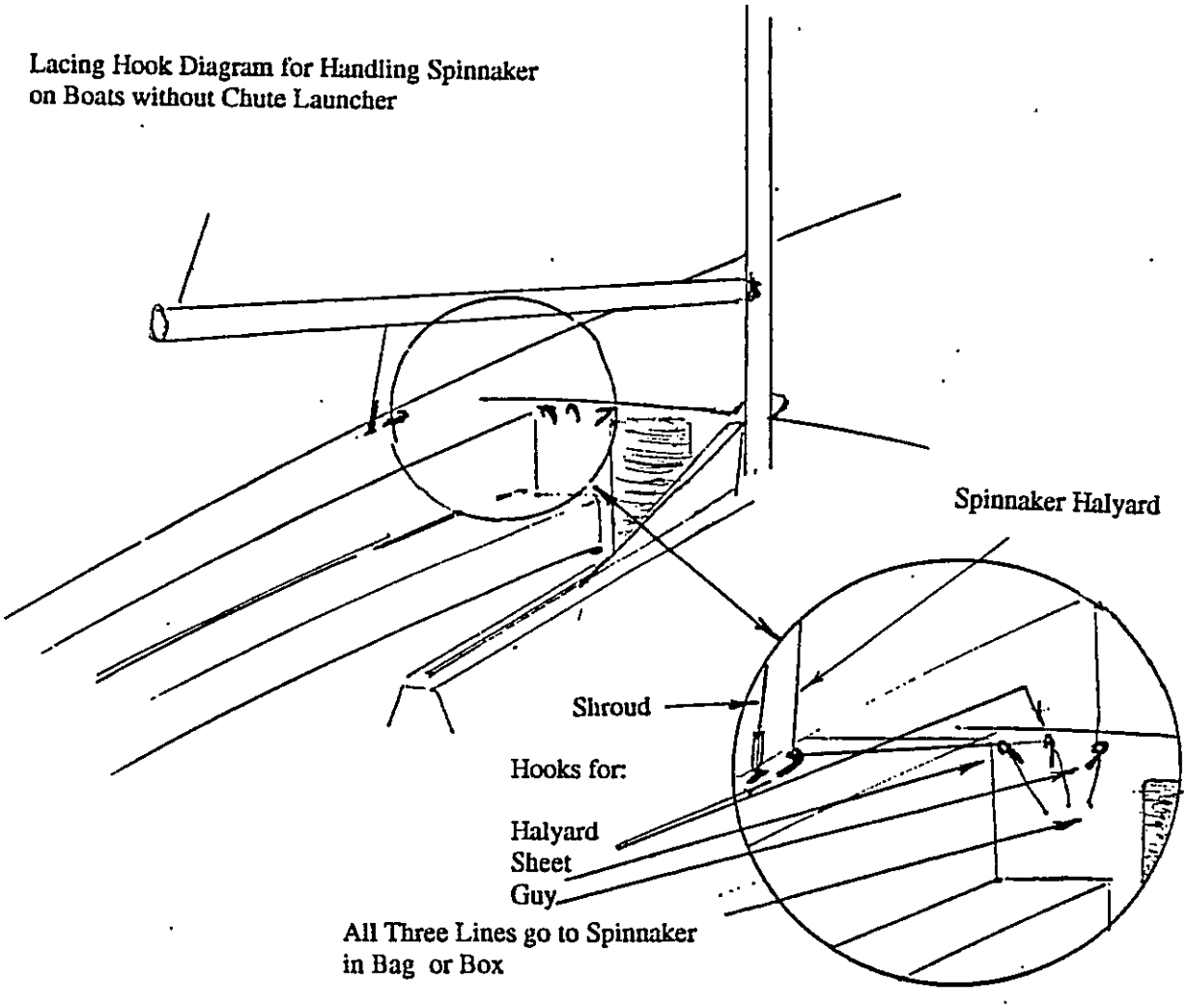
jib furling systems, chute launchers, etc. Once the deck is suitably strengthened to take or transfer the rigging load, a suitable sleeve must be made to carry the launcher system back from the snout to wherever you want to terminate it.

If your boat doesn't have a spinnaker launcher, don't despair. We raced for years before this was invented. All your guys, sheets, topping lifts, blocks, cleats, poles, etc., as described above can still be used, except that your spinnaker halyard could be shorter, since a takedown line is not necessary.

Without a launcher, we suggest that you store the spinnaker in a plastic clothes basket or bucket--large enough to contain the spinnaker yet small enough to fit in a forward storage compartment. Tie the basket with a light line to the boat so you don't lose it overboard.

The only other gear you should install would be some small lacing hooks to secure the guy, sheet, and halyard near the storage compartment in which the spinnaker will be stored. Install one eye near the shroud on the side the spinnaker will stow, and three more, to control the halyard, guy and sheet right at the compartment.

Lacing Hook Diagram for Handling Spinnaker
on Boats without Chute Launcher



Most boats will set these hooks up so that the spinnaker is set from the port side (first free leg of an Olympic course) but there's no reason you couldn't rig up duplicate hooks and have the spinnaker ready to go up (or come down) on either side.

To set the spinnaker without a launcher merely move the basket out on the cockpit floor, release the four hooks mentioned above, and pull it up with the halyard. If the wind is abeam and you have the spinnaker set up to go up on what turned out to be the weather side, you've got a problem of not getting the spinnaker out around the forestay, but instead blowing to leeward inside the forestay. This makes a mess! It can be avoided when caught in this situation by:

1. Having the crew put the basket as far forward on the deck as he can reach.

2. Not furling the jib until after the set.

3. Presetting the pole and pushing it forward so it rests against the headstay.

4. Pretrimming the leeward sheet to take out all the slack before hoisting the halyard.

5. Bearing away just before hoisting, if at all possible, and

6. Hoisting the halyard quickly, and trimming the leeward sheet simultaneously with the guy precleated.

When dropping the spinnaker without a chute launcher it can be doused either from the leeward side or the windward side, and a good crew will learn to do it both ways. Experienced skippers will lower it on the side where they will prefer to hoist it the next time around, regardless of whether this happens to be the windward or leeward side.

To drop the chute to leeward without the launcher, the crew will gather the spinnaker in while the skipper eases the guy and the halyard. The crew gathers the sail in by grabbing the leeward sheet and pulling in the clew first, then the whole sail--pulling it in under the leeward jib sheet and just forward of the leeward shroud.

If the spinnaker is lowered to windward, it is best to get rid of the pole first. Then the crew gathers the sail in on the windward side working from the tack of the sail, and pulling it in under the windward jibsheet and into the storage bucket. In this case, the skipper eases the sheet and the halyard.

Don't worry about repacking the chute between legs. When it's down just secure the lacing hooks so it can't fly by accident. Then leave it alone. When it is pulled back up again just as it was lowered, the chances are that it will go up smoothly and without twists.

The only advantage in having the spinnaker launcher is that it is easier to raise and lower the sail for an inexperienced crew, and that it is slightly faster to do this over the old-fashioned method for an experienced crew. NOT HAVING A SPINNAKER LAUNCHER DOES NOT MEAN YOU CAN'T WIN A RACE!

Here is how we set the spinnaker:

1. While approaching the weather mark, discuss exactly what you plan to do with your crew. This is especially important if your experience with the crew leaves you with any doubts about his or her understanding the procedure.

2. If you are planning to set the pole to starboard and are comfortably on or above the lay line and have no possible confrontations with other boats at the mark, you can preset the spinnaker pole.

First, attach the outboard end of the pole to the guy; second, attach the topping lift, and finally attach the inboard end of the pole to the mast. These functions must be done in exactly this sequence or things just don't work out.

When lowering the pole at any time, this sequence must be reversed. Mast end first, lift second, outboard end last. Try it any other way and it won't work!

3. Assuming the apparent wind will be on or abaft the beam on the next leg, plan to set the spinnaker immediately upon rounding. If you're not sure, wait until you are on the proper course, then check the apparent wind direction by glancing aloft at your masthead wind indicator. (You have to have one of these to intelligently sail with the spinnaker.) If the apparent wind is revealed to be on or abaft the beam, set the spinnaker right away. If it's close, but not quite aft far enough, preset the pole, as explained above. Then if the wind shifts aft during the leg, you're ready to hoist without delay. Also, if the reach is a close one, pass the guy through the downhaul hook on the weather rail before hoisting.

4. As the weather mark is rounded and you bear off on the new course, both jib and main should be eased out to their correct trim for that leg, then cleated.

Once on the new course, the skipper stands facing forward with the tiller between his legs and hauls up the spinnaker, pulling the halyard hand over hand as quickly as possible, then cleating it. Meanwhile the crew attaches the pole, if it was not attached earlier.

A good idea is to mark the spinnaker halyard with a mark that will come close to the halyard fairlead on the centerboard trunk when the sail is all the way up. This saves the time of a glance aloft to verify that the spinnaker is really up. Hoisting is really a speed operation. Hoist--cleat halyard--trim sheet--all as fast as you can do it.

As soon as the spinnaker halyard is cleated, the skipper reaches forward and grabs the spinnaker sheet and guy (one continuous line), and trims the spinnaker to get it drawing. It is important at this point to yank the sheet in several feet or more as quickly as possible. By doing so, you spread the foot of the sail, making it much less apt to hourglass or twist.

Usually, if the pole was not preset, I can have the sail up and drawing before the pole is completely attached by the crew.

Once the crew has the pole attached, he or she can:

1. Furl the jib.

2. Raise the centerboard.

3. Ease the main downhaul (Cunningham) to help the mainsail set properly on the downwind leg.

These jobs should be done quickly by the crew, because meanwhile, the spinnaker is being trimmed entirely by the skipper. Then, the spinnaker can be turned partly or entirely over to the crew, depending upon the delegation of work you wish.

One of the secrets of a quick set is to plan your various assignments according to the principals of motion and time study, taking particular care that the job responsibilities are divided so that no one waits for the other during any maneuver.

A common fault is indecision and procrastination when spinnakers are being set or considered. If the leg is a legitimate spinnaker leg, every minute that you delay setting the spinnaker costs you distance. There are a few tactical exceptions, such as sailing conservatively when you have a good lead, the wind is strong, and you don't think your nearest competitors will set their chutes. However, in most cases, it's smart to get it up.

We also noticed that on many boats, the crew got the pole all set up **while on the run**, while the skipper watched. Then the skipper pulled on the halyard while the crew watched, etc.

On our boat, my attitude is, "The spinnaker is going up **NOW**, and your job is to get the pole on!"

We also have found a widespread attitude in the class that "the spinnaker really doesn't do that much good so why bother?" This is only true when the spinnaker is not being handled well. If you want to win, proficiency in flying the spinnaker is a must. Once you have practiced enough to have mastered it, it's a lot more fun, too. We always look forward to a spinnaker leg as a time to pick up a few places.

The placement of hardware is important for smooth handling. Since you only have four

hands on the boat, as much equipment as possible should be located so it can be reached by all, without getting things too cluttered. For example, some people prefer to mount their spinnaker sheeting cleats way forward--up near the shrouds "so the crew can use them more comfortably." But then the skipper can't reach them at all, so you can't efficiently use my setting technique which requires that the skipper trim the sail while the crew is doing the other jobs the skipper can't do (because he can't reach them).

In the same way, we prefer the continuous sheet, so that you can grab this line from almost any place on the boat and trim or ease either the tack or the clew of the sail. Also, with the continuous sheet, the total length of line is slightly less than if two separate sheets are used, and there are no stopper knots in the ends of the sheets to foul on everything imaginable.

Once everything is up and drawing, settle down and sail the boat. Again, the division of responsibility varies according to the experience of the skipper and crew. A very experienced crew may want to handle both guy and sheet. Conversely, sailing with a novice, the skipper may prefer to fly the chute himself, which can be done provided the equipment of the boat is set up for it.

As skipper, I usually handle the guy since it is easier for me to see the masthead fly from aft a bit, than it is for the crew who is usually way up near the mast. I usually let the crew trim the sheet, except in very light and variable airs when I prefer to handle the entire sail myself.

Of course, the skipper should control the pole height. This is easily done from his station with much less time and disruption of the boat than if the crew has to drop whatever he or she is doing and adjust the pole height.

Jibing the Spinnaker

When jibing, I usually handle both sheet and guy and grab the mainsheet by all its parts and throw it over, again with the tiller between my legs. The crew can disconnect the pole from the mast as the boat bears away, then duck under the boom, catch the pole on the new windward side after the boom comes over, attach the pole to the guy, release the trip line which frees the old guy (now the new sheet), and attach the pole to the mast again.

In doing this, the crew has several things to be careful of:

1. If the guy was in the hook on the rail, this must be released as the boat turns downwind for the jibe.

2. The pole should be kept reasonably horizontal during the maneuver, so the spinnaker does not collapse. This means lifting the new guy up to the pole and, not bringing the pole down to meet the guy.

3. When the pole is engaged to the new guy, the old sheet is dropped out of the pole by the ripcord, and the pole is hooked again on the mast eye. The crew must push the pole forward, toward the bow rather than pushing it out to windward. This eliminates any tendency for the luff to back or collapse as the bow of the boat swings towards the wind. It also puts the end of the pole in close proximity to the tack corner of the spinnaker, rather than leaving the pole back several feet from the sail.

4. After the pole is swung forward, the crew can then engage the downhaul hook on the guy if you are now on a close reach. Then resume trimming the spinnaker as before.

To jibe the spinnaker in a strong wind, merely jibe the boat first, taking care not to head too far upwind after the jibe. Have the crew change the pole around after the jibe is completed.

If you have a spinnaker launcher and are afraid to jibe the spinnaker in a strong wind it's easy to lower the spinnaker, change the pole over to the new side, jibe the boat and then rehoist the spinnaker. Very little is lost this way, as long as the spinnaker is not kept stowed too long.

This is how we lower the spinnaker at the leeward marks:

1. The crew performs the necessary adjustments in preparation for the windward leg, trimming the cunningham, lowering the centerboard, and uncleating the jib furling line so the jib can unwind when the sheet is trimmed.

2. Normally the pole is unhooked and thrown back in the cockpit so that you don't have to do this on the beat. Sometimes in light breezes, depending upon the tactical situation, we may leave the pole up until after the mark has been rounded. An example of such a situation may be if you are trying to get an inside overlap for rounding and want to keep the spinnaker drawing as long as possible.

3. Assuming, however, that the pole has been taken off, the skipper then tells the crew to gather the sail in, and he or she pulls the sail down using the retractor line, until the sail is completely housed in the bow. Then the crew stuffs the middle of the spinnaker (now in the cockpit) back into the storage compartment, and then trims the jib.

4. While the crew is pulling the spinnaker, the skipper uncleats the halyard and lets it slip out a little faster than the rate at which the crew is retrieving it. It also helps, if the skipper pulls on the guy and sheet (easy with the continuous arrangement) so that the spinnaker tends to break over the forestay. Adjusting the sheet and guy so that both corners are about equidistant from the bow as the sail comes down also helps getting the sail stowed easily.

One hazard which can occur at any time, but seems to happen most frequently during the spinnaker lowering, is that somebody steps on a line (usually the spinnaker halyard) and everything comes to a halt. Whenever somebody in the boat steps on a line, our standard procedure is for the person first noticing the problem, to call out "Feet, feet, feet!" Upon hearing this, everyone dances up and down, releasing the trapped line much more quickly than by somebody saying, "Pardon me, dear, but I think you're stepping on the spinnaker halyard," whereupon the offending party starts looking for the spinnaker halyard!

5. If all has been properly planned, the spinnaker has been stowed and the pole thrown into the launcher tube on top of it at just about the time the mark is reached. The crew trims the jib, correlating the speed of trim with the skipper, who is trimming the main and hardening up on the wind at the same time. Once the boat is on the wind and sailing well and up to speed, and only then, the final tidying up and cleating of sheets, guys, and halyards can be done. But don't forget to do it!

One little Gremlin peculiar to the Buccaneer is the tendency for the retractor line to foul itself on the bow eye or the forward deck overhang while the spinnaker is set. We've seen a number of quick fixes using coat hangers, duct tape and the like to minimize this tendency--at the price of extreme ugliness. I have recently designed a plastic "fix" for this problem which fits over the towing eye on the stem. See the article, **Anti-Fouling Spinnaker Device**, in Section III. Meanwhile, watch the line carefully toward the end of the run--often a quick tug on the retractor in the cockpit will free it, and keeping excess slack out of it will help. If it is fouled, be sure to allow extra time for the crew to go forward and clear it before you have to get it down!

As Buccaneer sailors become more proficient with their spinnakers, we will see more instances where jibs are flown inside the spinnaker. We used to do this often in the Flying Dutchman when conditions were favorable. It is tricky, though, and if not done well will slow you down. Flying all three sails is best done when reaching, and is best in moderate or stronger breezes, but can be done with reasonable success in lighter airs if you are careful. The secret to doing it well is to get as much distance between the sails as possible. Lower the spinnaker halyard 12" - 14", raise the outboard end of the spinnaker pole so that it is perpendicular to the luff of the jib, and fly the chute right out on the edge of a luff. As you can see it requires a certain amount of wind to fly it this high. Trim the jib so that it is no luffing but not stalling either and trim the main so that it is almost, but not stalling. Hike, if necessary, to keep the boat flat. Properly done in planing conditions, this will result in a horizon job!

There are many good books on how to sail with the spinnaker. I have tried to dwell primarily on doing this in a Buccaneer. For a quick reference, following are spinnaker sailing rules in their briefest form:

1. Trim of guy---Perpendicular to apparent wind as shown by masthead fly.

2. Trim of sheet---Ease as much as possible, carrying tiny fold in luff, and keeping an indication of this at all times.

3. Trim of halyard---Within a couple of inches of maximum hoist in light airs. Can be eased out in stronger winds and on reaches as much as 24" or more.

4. Trim of pole lift---Outboard end of pole should place tack of spinnaker at same level as clew. This means lower pole position in light airs, higher in stronger breezes.

Symptoms of Spinnaker Collapse

1. The windward edge of the spinnaker starts to collapse with a regular looking reverse curve or fold.

SOLUTION: Trim sheet to remove this folding over. Also, check guy. It may have to be eased forward. The problem is caused by the wind direction being too far forward for the way the sail is trimmed. You may also have to turn the boat somewhat downwind.

2. The spinnaker looks like there is less wind in it than there should be, and it starts to slide off to leeward and down.

SOLUTION: This is the opposite of the first problem. Here the wind is coming too far aft, nearer the leech of the spinnaker. It is being blanketed by the mainsail. Trim the guy aft and / or let the leeward sheet out as necessary to get the sail full again. You may also have to turn the boat slightly into the wind.

3. There is not enough wind to fill the spinnaker.

SOLUTION: Pray for wind! Seriously, if this happens when you are on a run, try heading up to a broad reach. Your apparent wind could increase enough to fill the spinnaker. Very light weight sheets and a low set pole will also help. In these conditions, don't be afraid to tack downwind, bearing off when stronger puffs come in, and heading up a bit if the spinnaker threatens to collapse on the lower course. You will go a lot farther this way, but you'll get down to leeward a lot quicker than by sailing dead downwind (which you should never do anyway).

In summary, learn to use your spinnaker. Practice with it enough to feel comfortable with it. It will help you win races and you'll have a lot more fun doing it.

Centerboard Trim

In use, most people understand the basic idea of centerboard trim. Generally, keep the board fully lowered going to windward, roughly half-way down on a beam reach, and almost all the way up on a run. There are, however, a few exceptions to these general rules, and these are the primary purpose of this article.

In going to windward in light and medium air, **do** leave the centerboard all the way down. However, when the wind blows up, you will find that you may want to raise the board somewhat for best performance. It is difficult to make a precise recommendation because different people sail the boats differently. They have different crew weights and different hiking abilities, and they may have different cuts to their sails, all of which cause the boat to balance slightly differently.

Under these conditions, with the boat moving fast through the water, the full area of the board is not required to prevent the boat from slipping sideways. If you raise your board somewhat, you accomplish several good things:

1. You move the center of lateral resistance aft substantially, which reduces the tendency to develop speed-robbing weather helm.

2. You decrease the heeling leverage produced by the centerboard, making it much easier to keep the boat from heeling too much.

3. You decrease wetted surface and the resistance it causes.

4. You decrease frontal resistance of the board.

Overdoing this board raising will result in sideslipping, and this will slow you down, but a judicious amount of it will make the boat easier to sail and faster. When I raced the Flying Dutchman, it was common practice in strong winds to sail with the board raised 25% or more. Experiment with this and see.

On a broad reach, just keep enough board down to prevent slipping. Never pull it up all the way, though, even on a dead run. A board with 6" of depth left beneath the hull provides a fulcrum against which the rudder will act, facilitating steering without sending hull through the water sideways---a big energy waster.

Another important centerboard maneuver takes place when approaching the jibing mark in a strong breeze. Jibing with the board all the way down is an invitation to disaster, because a fully lowered board provides a low fulcrum about which the boat heels or trips. Try jibing in a strong wing with the centerboard up 3/4 of the way, and then do it again with the board fully lowered (carefully). If you survive the second jibe without capsizing you'll notice that, at the least, the boat tends to heel more, and wants to round up into the wind, go out of control, and broach--all of which are bad things.

Another occasion on the race course which might call for different centerboard trim than you may be doing is in approaching the leeward mark in a strong wind. Most people will lower the board for the following beat to windward before getting to the mark. This does two bad things:

1. It stops you from planing (if you had been planing) before the end of the reach.

2. It causes the boat to heel excessively as you turn around the leeward mark.

Consider an alternative I like. Approach the mark with the board in the normal broad reaching position (2/3 to 3/4 up). Plane right up to the mark. As you harden up and trim sails in the act of rounding, leave the board as it is, and shoot the boat to windward of close hauled for a second or two. Then, just as you bear away to your normal beating angle, with the jib trimmed and cleated, have the crew pop the board down to where you want it for the beat. Lowering the board is easiest at the instant when you are bearing away, since there is no pressure on the board when the tiller is jerked to windward in the act of bearing away. Also, the boat will not stop planing until the mark is reached, and will not heel as excessively in rounding up as it would if the centerboard were all the way down. A further advantage is that by shooting up briefly into the wind, you pick up half a boat length to windward.

Here is one final thought about the centerboard. If you ever get caught out in a squall where the wind is completely overpowering you, proper use of the centerboard can help keep you from capsizing. In the Buccaneer, of course, with its roller furling jib, the first thing you might want to do is to furl it. Then, if you pull the centerboard up so that not more than three or four inches of it remain below the hull, trim the main in, and head up on a close reach (almost a beat), the boat will tend to sail flat rather than heel, and it is relatively easy to keep it from going over. You'll sideslip like mad and probably average a beam or broad reach course. Keep enough headway to maintain steering control and you most likely will be able to ride it out provided there's enough sea room. I can recall surviving a 50 knot thunder squall in a Laser without capsizing by pulling up the daggerboard as far as I could and still have the top of it clear the vang and boom. It was a ball, and at no time did I feel out of control as long as I kept the wind forward of the beam.

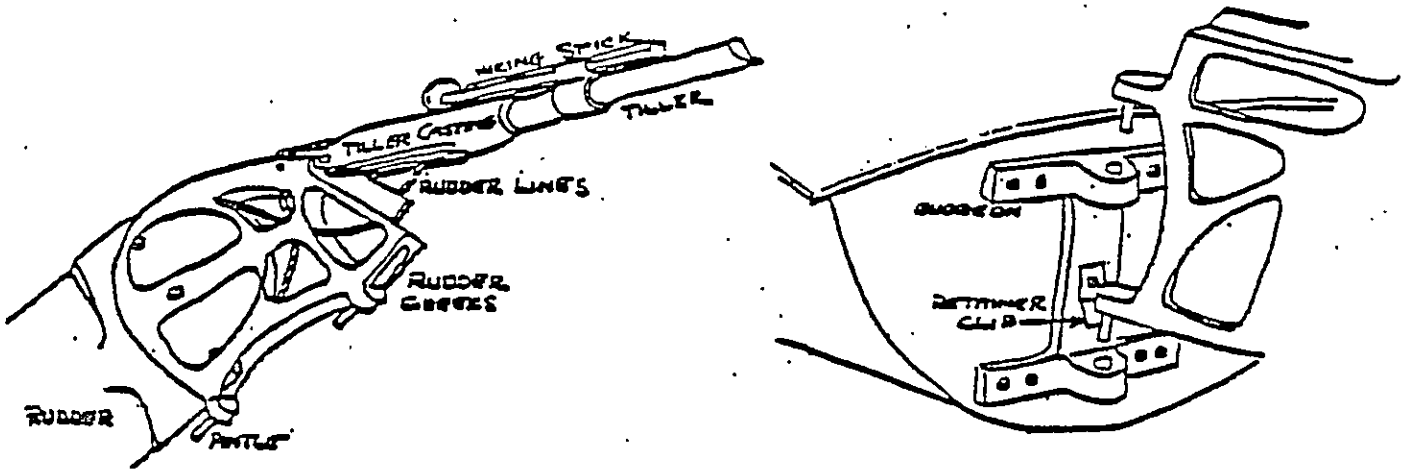
All these suggestions regarding the trim of the centerboard should be practiced, of course, as much as possible to determine the various positions and for you to evaluate just what happens and how much, when you adjust this important piece of equipment. As with other pieces of sailing gear, familiarity breeds confidence.

III. IMPROVING YOUR BOAT

Installing a New Rudder on an Older Boat

Most Chrysler Buccaneers and Mutineers came equipped with a cast aluminum rudder head, a fiberglass blade, and an aluminum tiller, with two cleats and two control lines. The rudder head had pintles on it, which fit into a gudgeon assembly on the transom. A spring steel lock was used to hold the assembly in place in the event of a capsize, to prevent loss of the rudder and tiller assembly.

Details of Original Chrysler Rudder and Transom Hardware



In the early 1980s, the rudder head and tiller were redesigned. The rudder head is now a fabricated aluminum assembly, considerably stronger than the old casting. While the fiberglass blade is the same, the tiller is now a wooden tiller which is not interchangeable with the old rudder head.

The new rudder head has gudgeons (holes) instead of pintles (pins), and the newer boats have pintles on the transom. A ring through a pintle prevents loss after a capsize.

To mount the new rudder on the old Chrysler boats without having to change the hardware on the boat, we provide a stainless steel pin or rod which will go through both sets of gudgeons---those on the new rudder head, and those on the old transom hardware. A ring on each end of the pin keeps the assembly from accidentally unshipping.

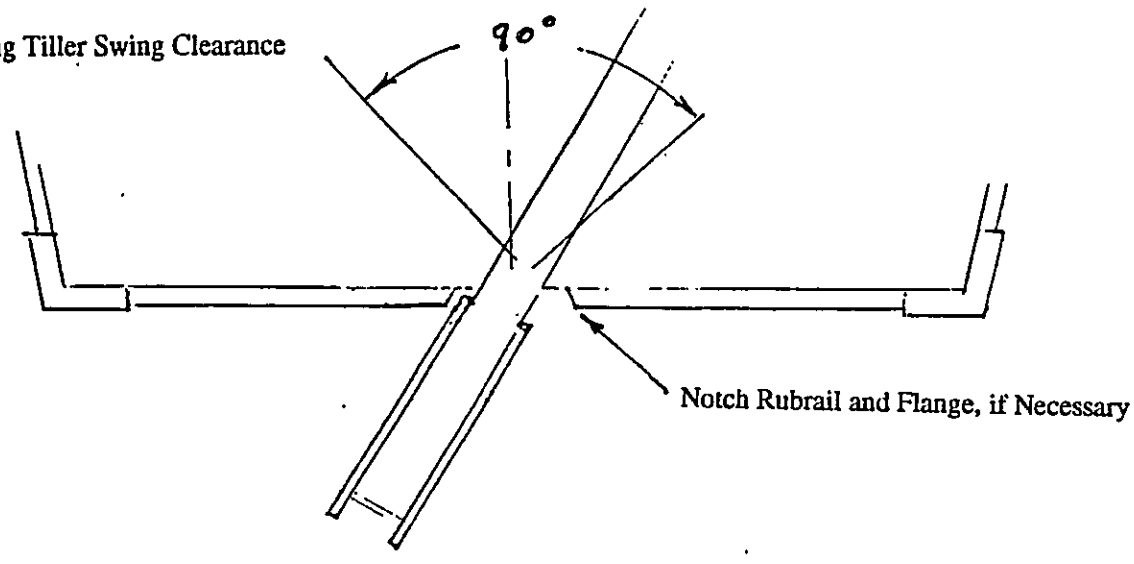
Most Chrysler boats will allow this pin to be installed from the top. However, sometimes the aluminum rubrail across the top of the transom will prevent the pin from being installed in this manner. In this case, the pin may be installed from the bottom. This is not as convenient to use as having the pin installed from the top. If you prefer the latter, merely cut a notch in the rubrail to provide the necessary clearance for the pin. This will not appreciably weaken the structure.

Occasionally we find an old Chrysler boat in which the transom hardware is mounted too low to give tiller clearance above the deck for the new rudder-tiller assembly. Sometimes, locating the top gudgeon on the rudder head ABOVE the top of the top transom gudgeon will give sufficient tiller clearance. This will look a bit peculiar, because the lower gudgeon on the rudder head will then be located midway between the upper and lower gudgeons on the transom hardware. However, the 3/8" diameter stainless steel adapting pin seems to be strong enough to allow this fix to work.

If you are uncomfortable with this arrangement, either move the existing transom gudgeon assembly up higher on the stern, or remove this piece of hardware, and substitute the new style transom pintles for the adapting pin and the old gudgeon assembly.

Occasionally, we encounter a boat where the new rudder head, when turned, will not allow sufficient swing of the rudder, with interference caused by a projecting aluminum rubrail. If this situation exists, notching the aluminum rubrail (and/or the underlying fiberglass flange) will provide adequate swing clearance without appreciably weakening the structure. If you plan to relocate the transom gudgeon assembly, or provide new pintles, check to make sure, before the installation or relocation of this transom hardware, to make sure you will have adequate swing clearance. If you won't have the necessary clearance, you will need to mount the transom hardware on a block of wood (or metal or fiberglass) to extend the hardware out far enough to give good clearance. The tiller should be able to swing at least 45 degrees from each side of the centerline without interference.

Obtaining Tiller Swing Clearance

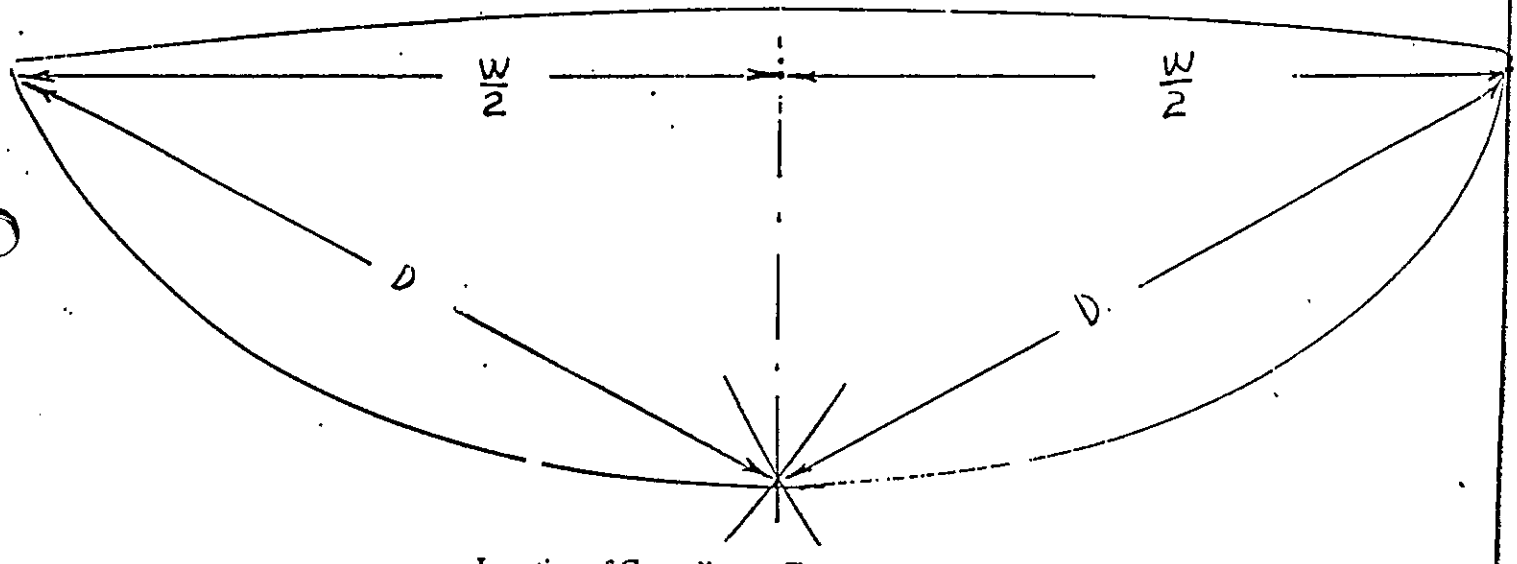


90 Degrees is Minimum Clearance

If you are going to relocate or replace your existing transom hardware, here is how to do it:

1. Place the rudder and tiller assembly on the afterdeck of the boat. Place a spacer block under the tiller which will provide adequate vertical clearance for the tiller to clear the deck and any projecting parts (such as the trim on the after deck hatch). A clearance of 3/4" to 1" should be adequate.

2. Locate the centerline of the transom, and mark this in pencil on the transom. This can be done by measuring the width of the transom just below the rubrail, and dividing this measurement in half. This measurement will give you a point on the centerline of the transom, near the top (point A). Then, using the same two end points at the intersection of the transom with the topsides (port and starboard), swing arcs of equal length which will intersect the transom near its lower edge. Where these two arcs intersect will give you the lower point (B) on the centerline. Connect these two points (A & B) and you have the centerline.



Location of Centerline on Transom

1. Measure Transom Width, and Divide in Half to Get Upper End of Centerline.
2. Swing Eual Arcs from Corners of Transom, until they Meet Near Bottom of Transom to determine Lower Point on Centerline. Then Connect the Two Points.

3. Center the upper pintle on the centerline, and locate it so that its upper bearing surface bears on the lower bearing surface of the upper rudder gudgeon. Drill holes through the transom where the pintle fasteners go, and loosely install suitable (1/4") stainless bolts.

4. Locate the lower pintle in the same way, with its bearing surface against the lower bearing surface of the lower rudder head gudgeon. Drill holes and loosely install this pintle as with the upper one.

5. With the rudder blade lowered, and using it as a guide, verify by looking from astern that your rudder is hung properly and is not leaning either to port nor to starboard.

6. Once you are satisfied with the alignment, remove the rudder, back out the machine screws (bolts) and install them permanently, bedding them in with a bedding compound such as Marine Seal, to make them watertight, and installing a backup plate made of wood, aluminum, or fiberglass laminate on the inside of the transom to distribute the load. Nuts should be either self-locking aviation nuts or P-M nuts which will grip the backup plate and not loosen up. If you use regular hex nuts, bedding compound around the protruding threads on the bolts should keep them from loosening up.

7. Most Buccaneers and Mutineers have access to the inner side of the transom by means of either hatches or inspection ports. If your boat doesn't allow access to the inside of the transom so the pintles can be securely bolted through, you will have to provide such access. The easiest way to do this is to cut a circular hole into the aft vertical face of the deck or storage compartment, and after the new pintles are attached, covering this hole with a watertight inspection port. Never depend on screws to hold rudder hardware. Machine screws (bolts) and nuts are the only safe fasteners to use.

The Chrysler two cleat arrangement for the rudder control lines was very awkward to operate, since when pulling on one line, the other had to be physically loosened behind the cleat to permit adjustment. The tubular jam cleats used for this purpose would jam when it was not wanted. The single, open clam cleat located under the tiller of the new assembly permits one hand adjustments instantly, and the continuous control line will drop out of the cleat with a single pull, and allow the blade to move immediately---an important feature when approaching a beach or shallow area.

Care of Your Centerboard

The fiberglass centerboard of the Buccaneer is one piece of equipment which may require a bit of finishing to prepare it for the best competition. This is made using a clamshell mold, with the two halves made separately, then bonded together using a special polyester putty formulation.

Some boards, made during the Wellcraft-Starwind era, were made using a polyurethane foam core. We were not comfortable with this construction, having seen centerboards and rudder blades made this way which had failed. Sometimes these will shear off where the centerboard emerges from the hull when fully lowered, or in the case of the rudder blade, where the blade emerges from the rudder head.

When you examine a new board, you will notice the joint running completely around the centerboard where the two halves are joined together. It is usually advisable to do a little extra shaping on the leading and trailing edges to give you the best shape possible from these parts.

The ideal shape for the leading edge of the centerboard is a parabolic curve something like that shown in the sketch below:

Leading Edge of Centerboard----Parabolic Shape

This shape allows the water to flow smoothly around the board's leading edge without causing too much turbulence. A board with a sharp leading edge will cause turbulence and drag, a very blunt edge will also slow you down, so try to get your board's leading edge to be free from bumps and humps and nicks and to generally wind up with a parabolic leading edge as shown.

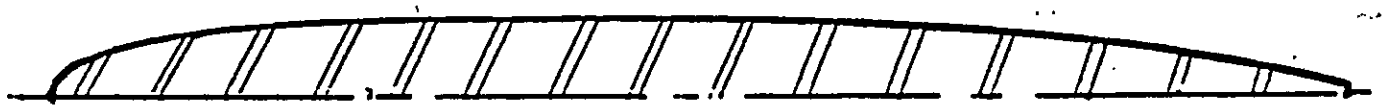
The trailing edge of the board should be faired and ground off so that it is about 1/8" wide. The corners should be left sharp as shown below:

Trailing Edge of Centerboard----Sharp Corner

This shape allows the water to pass cleanly off the board with a minimum of resistance.

Too fat a trailing edge will sometimes increase the resistance of the board to a point where it will hum or vibrate as the boat gets up to speed. The most frequent source of vibration is caused by incorrect edges of either blade (centerboard or rudder). Usually, vibrating boards and rudder blades are too fat, and usually, but not always, the trailing edge is the culprit.

Theoretically, the best shape for a blade is a constantly changing curve with maximum thickness slightly forward of the center of the blade, and the aft sections tapering gradually to a fine trailing edge. Unfortunately, this shape is virtually impossible to get with the clamshell molds used in the production of the boat, so you should compromise and get the best shape possible without damaging the structural integrity of the board. See the diagram below:



Practical Compromise Shape for Centerboard

To fair up the board you can use a file, sandpaper, or a sanding machine (if you're good). You probably will sand through the gel coat near the trailing edge. This is not serious, but looks bad, so you'll want to spray a little paint on these surfaces to make them look better and provide a little protection against the weather. If, when you are sanding or filing, you start to see strands of fiberglass sticking up, STOP! Any further reduction of material will weaken the board.

Remember to carry a reasonably thin edge around the lower end of the centerboard. When you're reaching and the board is partially raised, this becomes the trailing edge.

You may encounter minor voids, particularly in the joint between the two halves as you sand. These voids should be filled and then sanded smooth. Gel coat, surfacing putty, body filler, etc., are all O.K. to use here.

When the shape of the board is good, you might want to sand the entire underwater area of the board and rudder with fine (600 grit) wet and dry sandpaper, kept wet by dipping it in water. This results in a very smooth finish which attracts water, and is thought by most authorities to be faster than a waxed or water repellant surface.

Installation of Centerboard Gaskets

Centerboard flaps or gaskets are designed to minimize turbulence and drag caused by water flowing into and out of the centerboard trunk as your boat sails.

Originally made of rubber, or rubber-cotton laminates, these would often develop wrinkles, which would cause greatly increased drag. They would also tear and wear out frequently.

The new flaps are made of a tough, resilient polyurethane plastic, reinforced with terylene (Dacron). This material is especially made for centerboard gaskets, will not develop wrinkles, and should last a lot longer than the older materials.

To install the new gasket, first remove the metal moldings which surround the bottom of your centerboard trunk. If these moldings were originally installed with screws, merely back them out. If they were installed with pop rivets, they will have to be drilled out. Be careful while drilling not to drill a deeper hole than necessary to remove the old rivet, since this can cause your boat to leak. Use a piece of tape on the drill bit as a guide to limit your drilling depth.

Cut the new gasket to the exact length of the recess in the hull where it goes. Using the old moldings as a drilling jig, predrill carefully through the gasket before installing the gasket on the boat. Line up things so that you can use the old holes in the hull, if the original gasket was installed using screws. If the old gasket was installed with pop rivets which you have now drilled out, drilling holes in new locations is better. Try reversing the metal strips end-for-end in hopes that the new holes will indeed be in new locations.

Once the gasket has been predrilled, fill all the old holes in the hull where the screws or pop rivets have been removed, using a flexible bedding compound such as polysulfide or silicone rubber (Marine Seal), to prevent leaks. Then mount the gasket over the slot in the bottom of the boat, and reinstall all the moldings, using flat head stainless steel screws fitted into the same holes as they were removed from. If using the old screws, they should tap into the same threads as they came out of. Do not overtighten the screws, as you may strip the threads in the fiberglass. As you start each screw, put a small dab of bedding compound on it, to further seal against leaks.

When all the screws have been reinstalled, take a sharp razor blade and a straight edge, and slit the new gasket down the center of the slot to allow the centerboard to pass through it.

If the old fastener holes do not have decent threads for the reinstallation of the screws, turn the moldings end for end to locate the holes in new places, and then drill new holes in the hull, being careful not to drill too deep. Drill using a drill bit the size of the root diameter of the screws. Then the screw will tap its way into the fiberglass and be secure.

Converting Chrysler Jib Furling to Wire Luff System

The original Chrysler Mutineers and Buccaneers were equipped with a furling jib system which consisted of a plastic tube which fitted over the wire forestay, and which rotated by means of a line passing over a plastic drum secured to the bottom of the plastic tube. The jib was constructed with a sleeve in the luff or leading edge, which fitted over the plastic tube. With this system:

1. The forestay and tube with jib attached had to be raised along with the mast, which was inconvenient due to the added weight and complexity.

2. The extra weight, windage, and pitching moment induced by the luffspar tube was detrimental to racing efficiency.

3. Since the jib could not be lowered, it suffered from continued exposure to the sun,and deteriorated prematurely.

In newer Mutineers and Buccaneers, the jib has a wire luff, which substitutes for the original forestay. Swivels are used at the head and tack of the jib, the lower of which has a furling spool which furls the jib. A halyard makes it possible to lower the jib when not in use, and a separate forestay is usually used for extra safety.

To convert the old system:

1. Remove the old plastic tube-forestay-jib assembly by detaching it from the mast.

2. Remove the forestay from the tube and install the lower end of it in the boat, passing it through the foredeck, around the fitting in the bow, and back to the lever near the mast.

3. Cut the forestay a few inches above where it comes out of the deck, and swage an eye in the wire, using a nicopress sleeve and a thimble to form this eye. You may have to have a dealer form this eye for you if you do not have access to the nicopress tool. Cut the wire at a point where the eye will be as close to the deck as possible when the downhaul lever is in the tightened position.

4. If your boat does not have fairleads and a cleat for the furling line, install these, locating one fairlead about 6" aft of the eye you just formed, and the second directly aft on the deck, a few inches forward of the cleat which will secure this line. This cleat should be easily reached by the crew.

5. Fasten the furling drum to the eye. Thread the 1/8" diameter line through the small hole in the drum, and prewind about ten feet of this line on the drum. Lead the rest of the line through the fairleads to the cleat.

6. Install the jib halyard block to the tang on the mast where the forestay previously was located. Put the wire halyard through it, with the upper furling swivel on the wire as it comes from the forward side of the halyard block. Attach the rope tail to the other end of the wire halyard, using a bowline. The end of the wire halyard with the smaller loop and thimble installed attaches to the swivel.

7. Raise the mast. If you do not have a forestay installed, use the main halyard run forward to the bow of the boat and secured, so the mast cannot fall backwards.

8. Attach jib to the upper swivel on the halyard, and to the furling drum. Raise the jib, and note where the end of the wire halyard comes to on the mast.

9. At this point, the method of tensioning the jib must be decided upon:

A. If your boat has a lever under the deck near the mast, this can be used to tension the rig. A cleat or halyard hook can be installed on the mast to secure the halyard. A halyard hook should be installed so that the wire loop engages the hook. The hook must be located accurately on the mast so that the halyard can be hooked with the underdeck lever in the loose position. Then, tightening the lever will tension the rig adequately. It is important to have plenty of tension on the halyard when sailing, for best performance.

If, instead of the halyard hook, you want to use a cleat install this so that a minimum amount of the rope tail is under tension, to avoid having the halyard sag under sail.

B. Some sailors prefer to have a tensioning device on the mast. This is necessary if you do not have a lever under the deck. The tensioning devices most often used are a lever or a magic box. Install either on the mast so that they hook up to the loop in the end of the wire halyard, and when they are tightened up, they give plenty of tension to the rig.

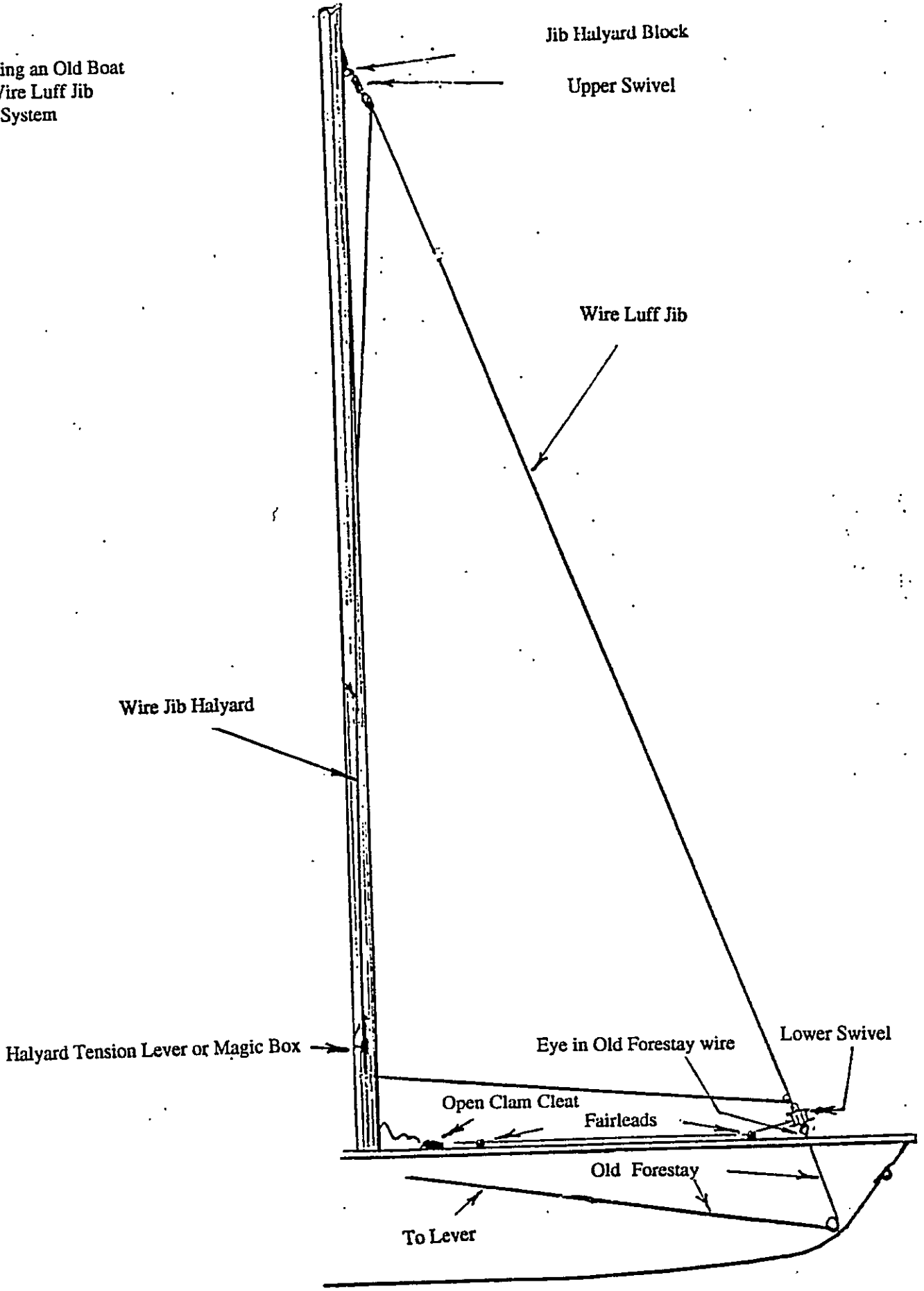
10. If you want to install a forestay:

A. Since it is a safety device, make sure that both ends are securely fastened, and will hold up the mast when the boat is sailing in strong winds without the jib being hoisted.

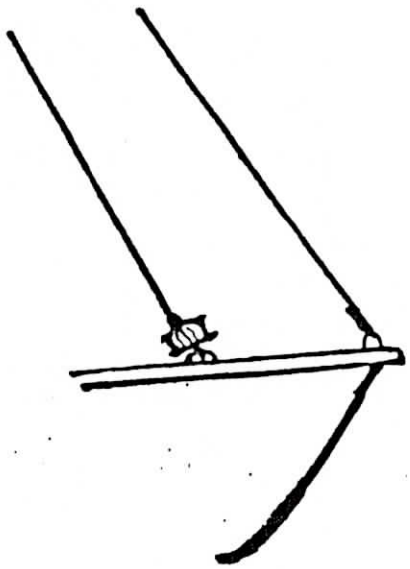
B. Make sure the forestay is located at least 3-4" in front of the jib, and that it will not sag into the jib when sailing, or you will not be able to furl the jib completely. Locate the forestay attachment on the mast 6-8" above the jib halyard attachment point to help avoid this problem. On the bow, either run the forestay all the way out to the bow if you do not use a spinnaker launching tube, or use shock cord to pull it out of the way.

Since the boats have been equipped differently over the years, there are different problems and solutions possible. Call for further advice.

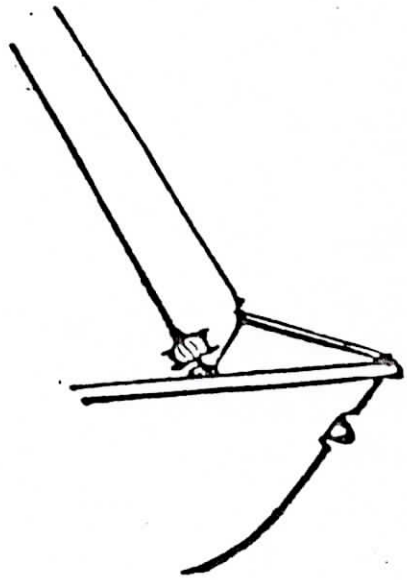
Converting an Old Boat
to the Wire Luff Jib
ling System



Keeping the Forestay Away from the Jib Luff



Attach the Forestay to the Bow Eye
if your Bow Eye is on Deck



Mount a Small Eye Strap on the Bow and Use
Shock Cord to Pull the Forestay Forward

NOTE: If your Boat is Equipped with a Spinnaker Launcher, These Solutions will not Work, and You will have to Shock Cord Load the Forestay Below Deck.

Jiffy Reefing

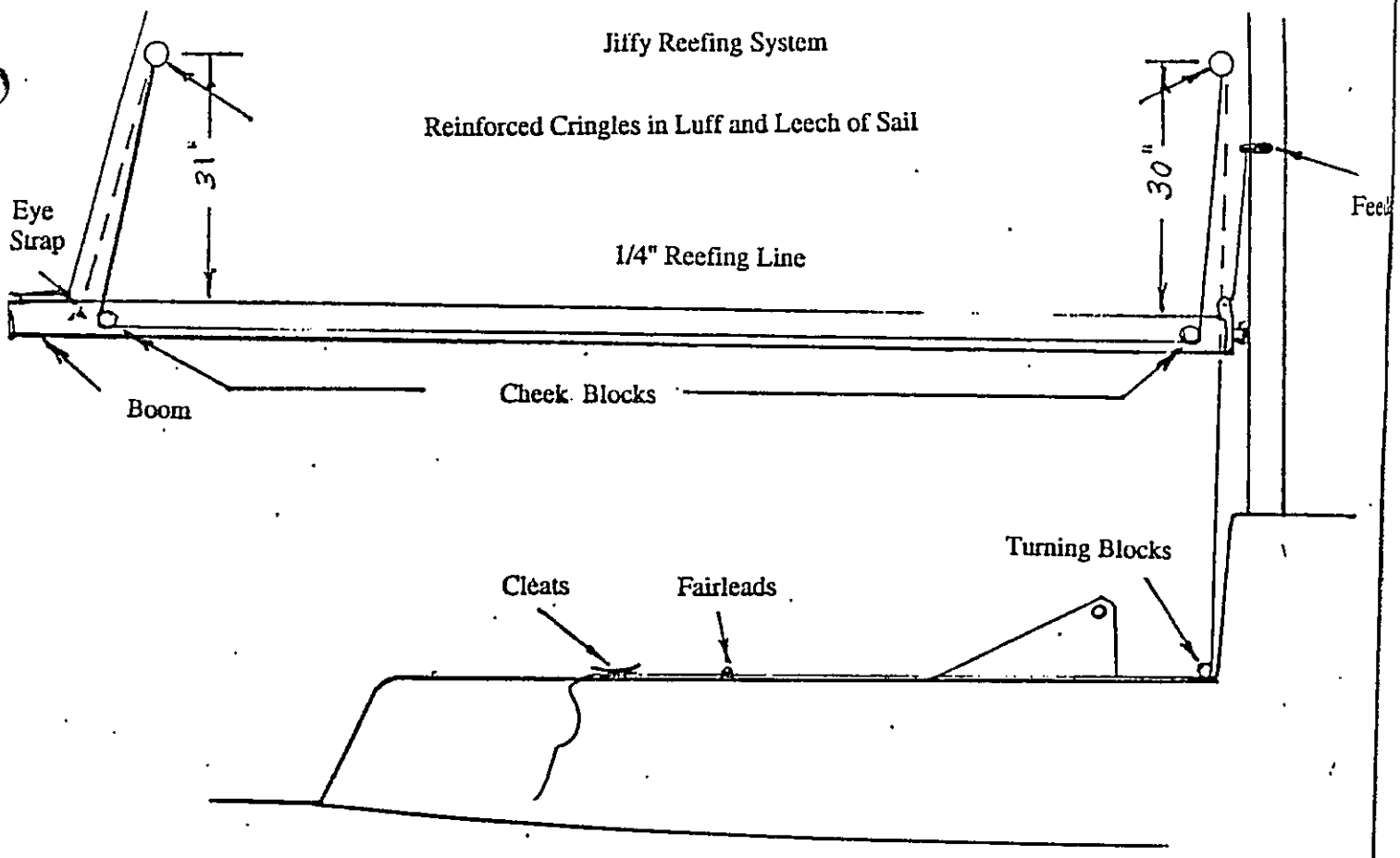
Serious racers really have no need to reef the mainsail in the Buccaneer or Mutineer. Those who are not as accomplished, or who are more interested in a comfortable sail when the wind is strong, or who like to single handed under these conditions may find that reefing the mainsail is a great idea. Strong wind sailing with a reefed main, either with the jib drawing or with it furled, makes heavy wind sailing more comfortable and safer.

Modern racing boats in the larger sizes practically all reef their mainsails using a jiffy reefing system. Properly set up, the Buccaneer can be reefed by one person in a matter of seconds. The procedure for reefing is as follows:

1. Lower the main halyard a predetermined amount, depending upon the depth of reef desired, and cleat it. The illustration shows a 30" reef, which would decrease the sail area by about 22 square feet. It also lowers the remaining sail area so that it decreases the heeling effect. The halyard should be led aft to a location on the top of the centerboard trunk convenient to the skipper, where it can be easily cleated. A mark on the halyard will allow the correct amount of halyard to be lowered without guessing.

2. The reefing line is pulled tight. This line snugs the mainsail down to the boom by pulling down on a cringle on the leech and at the same time, pulling down on a cringle on the luff of the sail. No additional reef points are needed. The reefing line can be led aft to a location on the trunk top opposite the main halyard tail, so cleating is convenient.

3. To shake out the reef and regain full sail, reverse the procedure, releasing the reefing line first, then hauling up on the halyard. One caution: You must have the mast fitted with a feeder so that the luff boltrope goes into the mast groove without catching. You will also need to have your mainsail equipped with reinforced grommets at luff and leech where you want the reef to be located. Other than that, a few simple blocks and line, as shown in the accompanying sketch are all that is required.



1. Reinforced grommets installed in mainsail, one in leech, one in luff. Depth of reef can vary. 30" deep reef is shown.

2. Eye strap for end of reefing line. Mounted on port side of boom, 3" aft of where reefing grommet would be when sail is reefed.

3. Cheek block mounted on starboard side of boom opposite eye strap (2).

4. Cheek block mounted on starboard side of boom located as far forward on boom as possible.

5. Turning blocks, port and starboard, for reefing line and main halyard tail.

6. Cleats, mounted port and starboard on centerboard trunk cap.

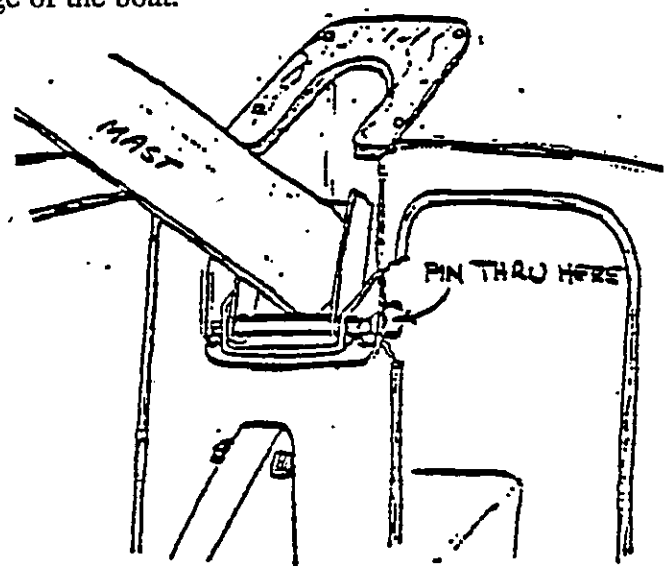
7. Fairleads mounted 6" forward of cleats, to contain lines.

8. Feeder on aft side of mast to feed boltrope of sail into groove.

New Style Mast Step

Chrysler's original Buccaneers were made with the mast step located down at the level approximately at the top of the centerboard trunk. The early masts sat on a mast step which had a vertical peg, unlike the hinges used on later versions. It also seems that the hinged mast step came along a bit later, and that most of the Buccaneers were fitted with this hinged step.

In this model, the foot of the mast extrusion had an aluminum insert going up inside it, which was welded to the top half of an aluminum hinge. The mating half of the hinge was permanently installed on the boat---either at deck level or below, depending on the vintage of the boat.



Chrysler Mast Step Showing Hinge Arrangement with Pin

In order to raise the mast in these earlier boats, it was necessary to have someone engage a hinge pin through both halves of the mast foot hinge, with the pin going from port to starboard aft of the mast itself. While this pin was being engaged, a second person was necessary to hold the mast foot half of the hinge in close proximity to the part of the hinge mounted on the boat. Depending upon the height of the mast step, this usually had to be accomplished with the mast in a partly raised attitude. Therefore, raising the mast by yourself without additional help, was extremely difficult.

Occasionally owners of boats equipped with these early hinged mast step arrangements would break the hinge, usually when the mast got away from the crew during the raising or lowering procedure. When this happened, with the original hinges no longer being available, we have suggested to the owners that they replace the old hinge arrangement with the system employed on the new boats.

This newer design allows one person to engage the mast with the step while standing in the rear of the cockpit and holding the mast near its center of gravity. Once engaged, the mast can be easily raised (or lowered, later) without the need for another person to be around, making it real handy for those who enjoy single handed sailing.

For more detailed instructions about stepping the mast using this new hardware, see the article, **Mast Stepping,** in Section I.

Installation of the new hardware on an older mast is quite simple, and is as follows:

1. Remove the old mast step from the boat and the old mast foot from the bottom of the mast. The foot of the mast extrusion should be left completely open. Then, if you should capsize and fill the mast with water, upon attempting to right the boat, the entrapped water will run out quickly from the open bottom end of the mast, thereby expediting the righting of the boat.

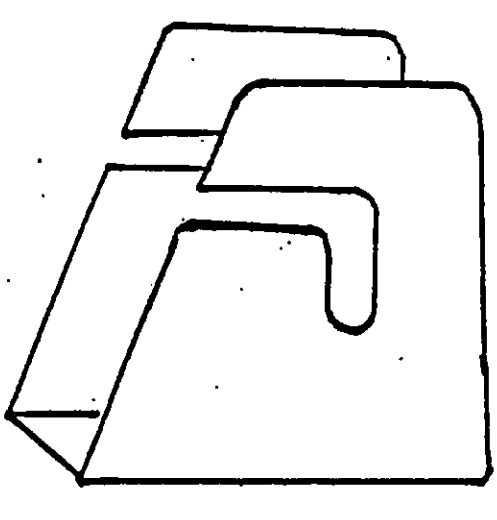
2. Cut a 45 degree bevel in the aft corner of the mast at the foot. In the original Chrysler extrusion, this cut can start just aft of the web in the extrusion which separates the sail groove from the main part of the extrusion. Use a hack saw and cut up and aft from this point, cutting away a portion of that sail groove right at the bottom of the mast. This cut enables the corner of the mast to clear the tabernacle while raising the mast.

3. Drill a 5/16" diameter hole through the mast from port to starboard. This hole should be located with its center 1-5/8" up from the bottom of the mast. In the fore and aft direction, it should be drilled at the center or widest point of the mast. Install the mast pin in this hole, locating the tubing spacer inside the mast extrusion, and pinning this tube in place using the cotter pin provided. This will center the pin which will then project an equal amount on either side of the mast. This pin, of course, is what engages the stainless steel tabernacle.

4. Install the tabernacle on the boat in place of the old mast step, with the slotted part of the tabernacle facing aft. This can be bolted in place, or attached with sheet metal screws, since the load on the tabernacle is mostly in compression, with some shear, but without significant tension stresses.

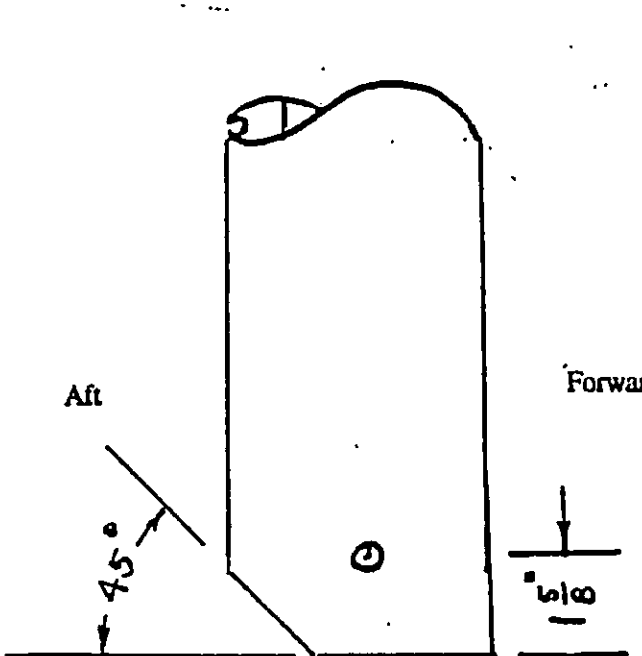
You'll be pleasantly surprised how much easier this makes raising and lowering the mast.

The New Style Mast Tabernacle



Aft Side

Forward Side



Side View

View Looking Forward

Raising the Mast Step

One factor contributing to the difficulty in raising and lowering the mast on the older boats has to do with the location of the height of the mast step. The newer boats have the mast step about 6" below the deck, but some of the older boats had the mast stepped down at a level approximately even with the top of the centerboard trunk. This location made stepping the mast much more difficult because of interference with the centerboard encountered when attempting to raise the mast from a horizontal to a vertical position. The most practical way to step the mast with this low mast step is to raise the mast to a vertical position alongside the boat, then lifting it bodily up, while still vertical, and positioning it on the step. Naturally, this has to be done without any stays attached, and requires two people, unlike stepping the mast with the newer step location and hardware.

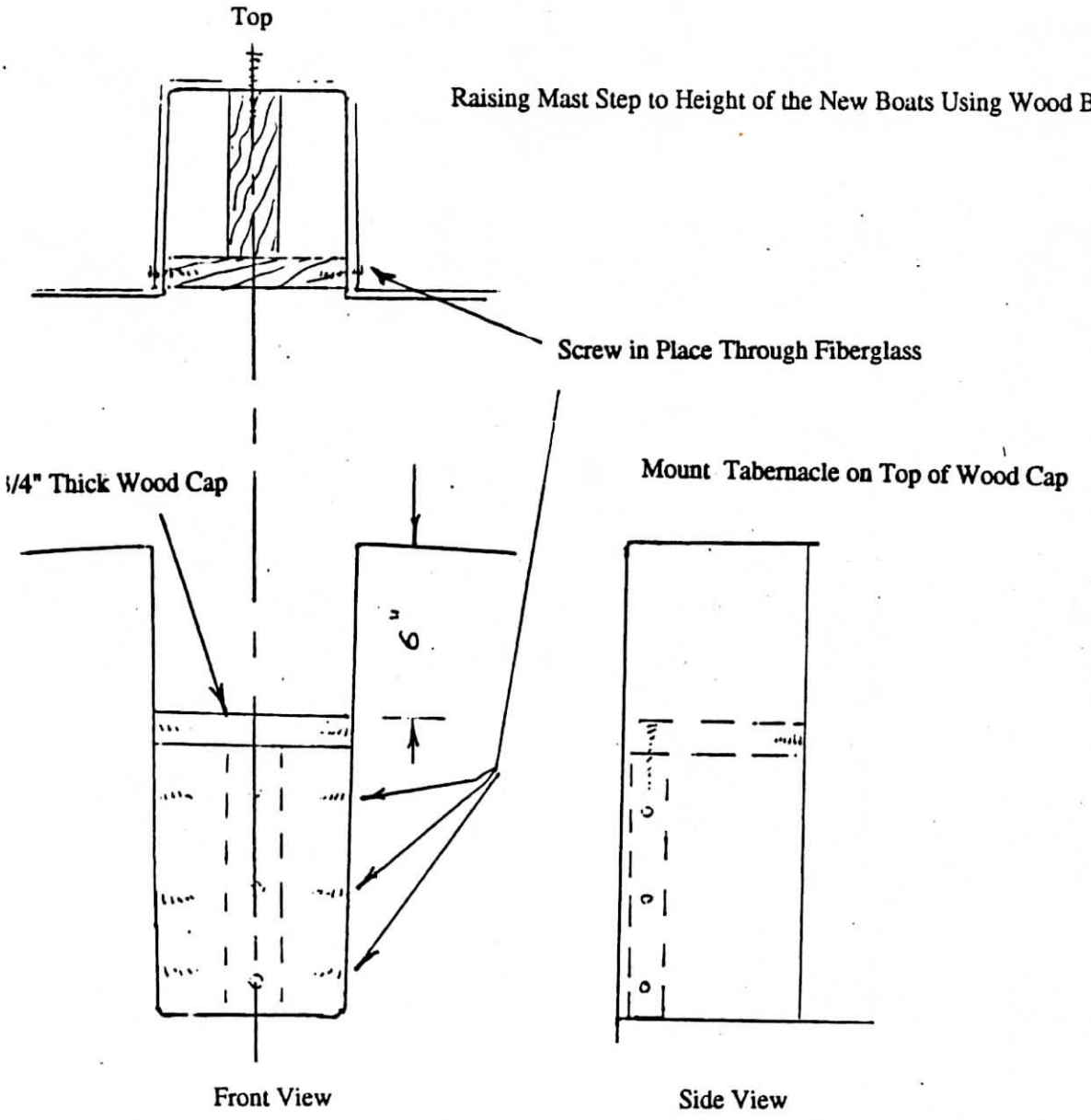
It is not particularly difficult to raise the mast step up to the new location (about 6" below the deck) by building up a wooden platform at that height for the mast tabernacle to sit on. You must, of course, tie in the platform with the structure of the deck to prevent it from moving, but the most important factor in raising the step location is to have a continuous column directly below the new location which runs right down to the old mast step.

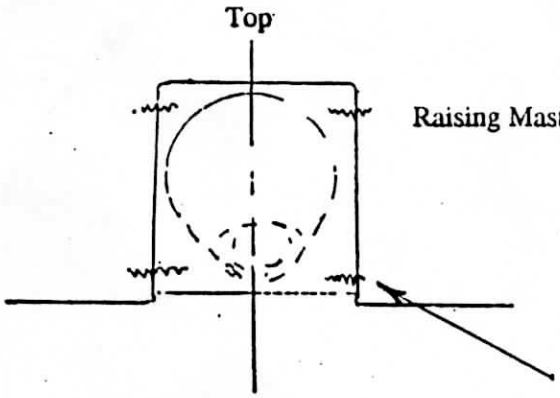
The easiest way to do this is to use the cut off section of your mast for this purpose. When you shorten your mast, make sure that you shorten it by exactly the same distance as the distance between the old and new mast steps. That way, your present stays will still fit. Also, your halyard blocks will still be the same as they were, and not made class illegal by raising their location relative to the hull.

Then use the cut off mast extrusion to provide the structural column, shortening it only by the thickness of the wooden platform so that when you are finished, the mast will be the same height above the hull as it was previously.

Used in conjunction with the new style mast step, mast raising and lowering will be made much easier than with the lower mast step location.

Raising Mast Step to Height of the New Boats Using Wood Blocks



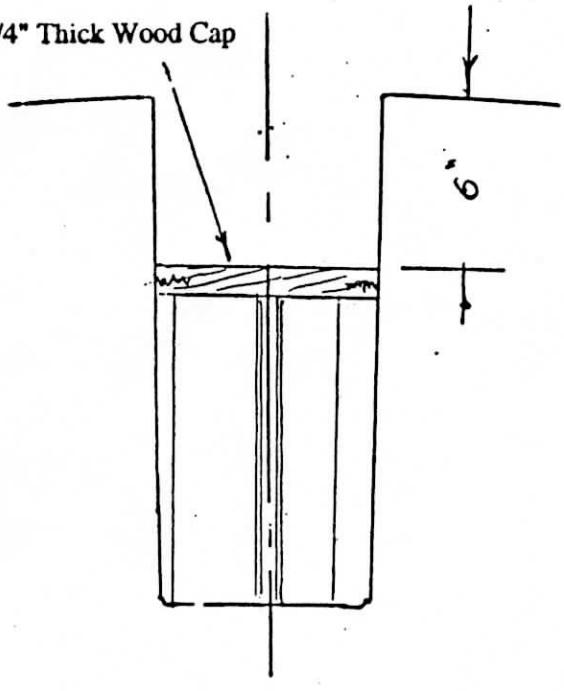


Raising Mast Step to Height of the New Boats Using Cut Off Part of Mast

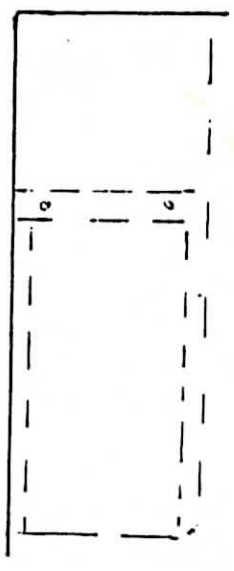
Screw Wood Cap in Place Through Fiberglass

3/4" Thick Wood Cap

Mount Tabernacle on Top of Wood Cap



Front View



Side View

Installation of Hiking Straps

Hiking straps vary greatly according to individual preferences, and one's physical size, leg length, etc. Therefore, it is impossible to design one strap system which will be completely satisfactory for everyone. What we suggest is a simple system, suitable for the average person, and may have to be modified to suit an individual's taste.

All hiking strap hardware **must be through-bolted**, with backup plates located behind the fiberglass walls of the seats and/or storage compartments. If not through-bolted, the fasteners for the strap anchorages will eventually pull through the laminate when under load, and the crew may go overboard.

At the end of this article is a basic diagram showing where the straps should be anchored to the boat. The forward anchorages are best located on the front face of the cockpit, as far below the storage compartment openings as possible, still being able to bolt them through the fiberglass and get the nuts on inside the compartments. The aft anchorage is on the centerline of the boat, below the after deck storage compartment in the Buccaneer---again, located as low as possible to provide rigidity, still being able to secure the nuts and locate the back up plates.

The aft anchorage for the Mutineer, since it has no after deck storage compartment, will either be the small eye strap which on the newer boats is through bolted through the floor near the aft end of the cockpit, or, an anchorage installed on centerline, low, in the aft cockpit face, with access for through bolting being obtained by means of a plastic inspection port. Many of the older Mutineers had such ports. If your boat does not have such access, contact us for an inspection port.

On the new Buccaneers, hiking strap anchorages are also provided on the front of each seat , between the seat and the floor. If your boat does not have such anchorages already installed, you should install these. They are located just forward of the mainsheet cleat. To install them, use plastic inspection ports located in the vertical seat face to obtain access so they can be through-bolted.

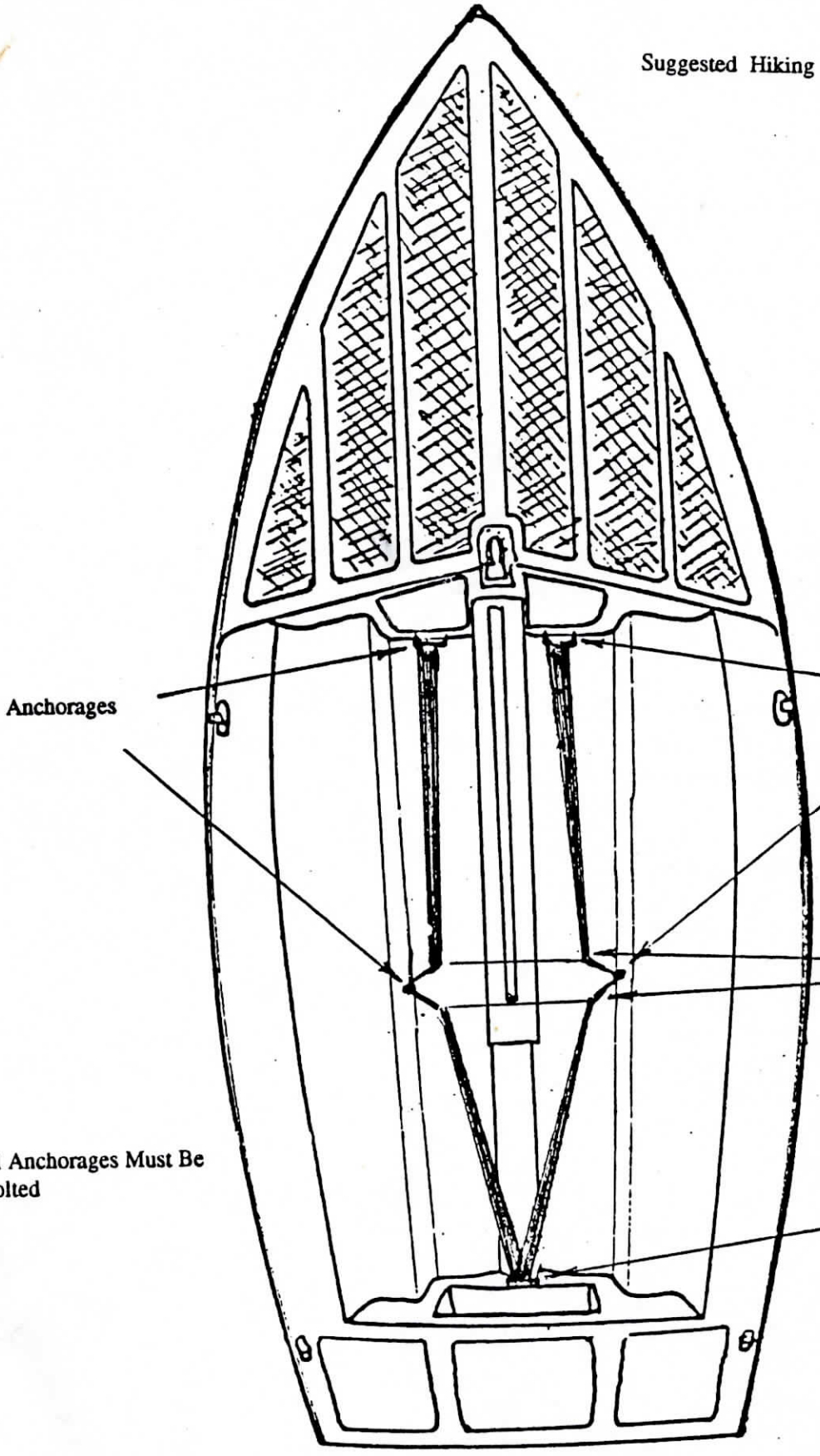
The inspection ports referred to are two piece plastic covers (actually a cover and a flange). To install one, cut a circle out of the fiberglass to the size of the inside flange diameter, and secure the flange with either screws, bolts or pop-rivets, after bedding the flange in place with a suitable flexible sealant such as Marine Seal, to prevent leaks. Then, the cover screws in place, providing a water-tight seal, and assuring future access to the area behind the port.

Once the anchorages are bolted in place, run the hiking straps through the anchorages, starting at the forward starboard compartment, and ending at the forward port compartment. Make a loop in the strap at each end, and clamp the ends of the loop with plastic clamps, bolting them together for security.

As a final touch, to maintain or vary tension, and to keep the straps away from the seat fronts far enough so that it is easy to get your feet behind them, we suggest tying the port and starboard straps together with a small line running across the boat just behind the centerboard trunk, as shown in the diagram.

For additional comfort, you may want to install flexible plastic foam covers over the straps. These may be purchased at a plumbing supply house where they are sold as pipe insulation.

Suggested Hiking Strap Arrangement



NOTE: All Anchorages Must Be Through Bolted

Rigging a Trapeze

Both the Mutineer and the Buccaneer are good candidates for a trapeze system, as both hulls are reasonably stable and the masts are strong enough to support any extra loads which the trapezist might impose on them.

To install a trapeze system on your boat, you will need the following items of equipment:

1. Two mast tangs, including a bolt and nut long enough to go completely through the mast athwartships. These should be attached to the mast a few inches above the shrouds.

2. Two stainless steel trapeze wires, long enough to extend from the hounds to a point about 18" above the deck at the shrouds, with eyes in each end of the wire, and with means to attach to the mast tangs described in (1). 3/32" diameter 7x7 or 7x19 wire is strong enough for the job.

3. A block and tackle system with line and a ring which attaches to the lower end of each wire. This enables the trapezist to adjust the height of the hook for various wind and sea conditions. The trapezist should be able to get parallel to the water at the lowest position.

4. Three fairleads, two of which are installed just aft of the shrouds near the outboard edge of the deck, and the third of which is installed on the centerline of the foredeck a few inches aft of the jib furling drum.

5. A length of shockcord which runs from the lower end of the trapeze wire through one of the fairleads near the shrouds, then forward through the fairlead on the foredeck, and then aft on the opposite side of the boat through the other fairlead near the other shroud, and then up to the other trapeze wire. This shock cord serves as a retractor to keep the trapeze wires in place when not in use.

6. A trapeze belt with a suitable hook to engage the rings described in (3). There are a number of different types of belts on the market.

CAUTION: Buccaneer Class Association rules do not permit the use of the trapeze in class racing.

Making Your Buccaneer Safer

Our policy regarding safety on small capsizable boats has always been that they should be able to be rescued by their crew without outside assistance, in cast of a capsize. This self-rescuing ability, of course, depends upon things other than the design and construction of the boat. The ability to recover after a capsize depends largely upon the capability of the crew. For example; it is difficult, and sometimes impossible, for children or lightweight adults to right a boat as big as a Buccaneer in storm conditions.

The purpose of this particular article is not to dwell on the righting techniques, since these are covered quite thoroughly in several of the newer sailing and racing books which are on the market. (Also, see the article, **Safety**, in Section I.) One point should be emphasized, however. You should, in nice weather and warm water, in close proximity to help or shore, practice capsizing and righting your boat until you are comfortable with how to do it.

Even before this practice, however, you should try to make your boat itself as rescuable as possible. Two areas of concern should be noted:

1. Control of water in the cockpit and between the hull and deck.

2. Security of your equipment.

The new Buccaneers (since 1984) have been designed and constructed with the aim of keeping water entirely out of the space between the hull and deck should the boat be capsized. The hull-deck joint is sealed, the forward and aft storage compartments and the spinnaker launcher tube are glassed and sealed to the deck, and there are no holes except for the hull drain plug and cockpit drain plug (used to check for water trapped between hull and deck) where water could enter this space. In theory, it should be virtually impossible for water to enter the space between the hull and deck.

Unfortunately, ours is an imperfect world, and to build and maintain a boat like the Buccaneer so that water never appears inside the hull is almost impossible. A number of holes are made in this structure for rubrail, hardware, etc., which require fasteners to be bedded with sealant during assembly. Also, a surprising amount of condensation will form inside the hull over a period of time--particularly when the boat is subjected to extreme temperature changes. That's why we have the drain plugs--and why the entire system is backed up with positive foam flotation--just in case.

The key is, of course, the time factor. The hull and deck structure should resist the entry of significant amounts of water for a reasonable length of time, regardless of whether the boat is upright, capsized, or completely turtled. This is what we have tried to achieve in fitting out the new Buccaneers.

Many of the previously built Buccaneers were not constructed with this kind of safety in mind, and it is toward their owners that this article is aimed.

If I owned such a boat, I would make every effort to make it as watertight as possible, without adding appreciable weight.

The biggest problem areas in the older boats, as I see it, is the storage compartment areas. I have seen a number of variations on these.

The old boats had, in many cases, a large hatch in the after deck. If this were displaced or lost during a capsize, water could enter the inner hull through this opening. I would suggest two possible remedies for this condition:

1. Make sure the lid is secured so that it would be watertight in rough weather. Hinges and hasps, a shock cord closure, or a gasketed edge would all help here. Also, tie the hatch cover to the boat with light line so that you can't lose it.

2. Construct light bulkheads going across the boat in the plane of the aft end of the cockpit so that water getting into the stern storage compartment cannot get forward. This can be constructed of 1/8" plywood, using fiberglass mat and resin to bond it to the hull and deck. It shouldn't add more than two or three pounds of weight. Be sure to provide a drain plug or two at the bottom of this bulkhead so that water won't be trapped forward of this area forever.

Constructing light plywood bulkheads under the side decks just aft of the forward end of the cockpit to prevent water trapped in the bow area from going aft would help if your boat were constructed so that water could move from the bow area aft.

If your bow is completely open, however, it is recommended that you provide additional flotation there to prevent the bow from submerging when the stern part of the boat <u>does</u> keep water out. We have even seen Flying Dutchmen with aft tanks and no buoyancy forward which floated stern up after a capsize, like a nun buoy!

Additional flotation can be installed using several methods:

1. Foamed-in-place plastic foam. This is usually a two part polyurethane foam. Mix them up, pour it in the place you want to add buoyancy, and it foams up to provide flotation.

I do not like this solution for the following reasons:

A. Many polyurethane foam formulations will soak up water, reducing flotation and adding weight.

B. Some polyurethane formulas, when foaming, forms toxic gas.

C. While foaming, it can exert tremendous pressure on closed containers, and could result in a distortion of your hull or deck.

D. It may close off the area without limbering and therefore can trap water which cannot get out.

E. It is expensive.

2. Expanded polystyrene foam (Styrofoam) can be installed for extra flotation. We like this better than polyurethane, but it still has drawbacks:

A. It is difficult to fit properly without losing potential buoyancy because of the irregularity of the spaces being filled.

B. It must be securely fastened in place. If under water, it exerts tremendous force on its attachments, and can break loose, rendering it ineffective.

C. It will add weight--usually two pounds per cubic foot, plus the weight of the attachments.

D. Polyester resin will melt it, so if you elect to bond it in place with straps of fiberglass and resin, you will have to insulate it from the resin, with cardboard, paper, or something similar.

3. Buoyancy bags can be installed. A triangular bag could be fitted under the foredeck, and other shapes are available which would fit in other under deck areas. These provide maximum buoyancy for their weight, and it is easy to see visually whether they are working, or if they are leaking and have collapsed. They, like the Styrofoam, must be securely fastened (or trapped in areas where they cannot escape if submerged). While they do not provide the ultimate non-sinking guarantee of the foam flotation your boat was originally built with, they can offer valuable <u>additional</u> buoyancy, which will displace water inside the hull, and therefore make the swamped boat easier to handle.

Care should be taken in modifying the boat not to endanger water-tight integrity. For example, the rubber circular hatch covers which were in the old boats in the seat backs near the shrouds should be replaced with watertight, screw type plastic inspection ports, properly bedded in place. Often, after a capsize, and due to the distortion of the deck in that area, the old rubber "plugs" would pop out and allow water to enter.

Try to avoid piercing the deck when rigging lines or wires and their hardware in any way that would allow water to enter the space inside the hull and deck.

Of course, it is important for fastest and safest rescue after a capsize to be sure your self-bailers are working well. While the new boats have the large Elvstrom bailers, the older boats had circular plunger type self-bailers, which we now carry in stock for the benefit of the owners of these boats. The bailer, as prescribed in class rules, fastened with a light line to the boat so you don't lose it, will help get rid of water in the cockpit quickly. Any boat full or partially full of water is very vulnerable to a recapsize.

Your rudder and tiller assembly should be secured to the boat so it doesn't slip out of the gudgeons during the capsize and become lost. In addition to being expensive to replace, it's difficult to steer the boat without it.

When sailing in weather conditions in which you could capsize, secure all equipment such as paddle, cooler, spinnaker pole, etc., so that none of it is lost if you should dump.

When one capsizes in fairly shallow water the top of the mast can get stuck in the mud. While this is rarely life threatening, it also makes it virtually impossible to self-rescue, and one usually has to resort to a power boat or, if no power boats are available, another Buccaneer.

Avoiding the turtled attitude is vital, of course. However, it is often difficult to prevent, particularly since it can happen so quickly. A capsized boat is most vulnerable when the crew falls in the water and cannot exert immediate righting leverage on the centerboard to keep the boat from turtling.

It is a mistake to think that filling the mast with flotation will keep the Buccaneer from turtling. It may help a little, but the buoyancy available in this way is so small compared with the force of a submerged mainsail being driven downward by the force of the wind on the capsized hull that it is not effective. The best solution is to leave the bottom of the mast completely open, so that water in the mast will not be trapped inside, but will run quickly out of the foot as soon as the mast head is again located higher than the foot during the righting process. For masts which have foot castings, a couple of 1/4" holes, near the foot of the mast to drain out the water will help.

Weighing Your Boat Using A Bathroom Scale

If you plan to race your boat, it is nice to know what it weighs, particularly in comparison to other boats of your class.

The Buccaneer has a minimum weight of 500 pounds. This weight includes the mast, boom, spinnaker pole, stays, halyards, main and jib sheets, centerboard, rudder, tiller, jib, and all permanently attached hardware. (Notice that this weight does not include the weight of the mainsail, battens, spinnaker, spinnaker sheets, anchors, anchor line, paddles, life jackets, or anything else not specifically included in the above description.)

If the boat is found to be underweight, additional weights must be added before racing to bring it up to the minimum weight.

Since most sailors do not have access to overhead scales, here is a method by which the boat, sitting on its trailer, can be weighed quite accurately. We have used this method to weigh a number of different boats over the years, and feel that the accuracy of such a method is as good as the accuracy of your scales and the measurements you use.

Before weighing the boat, make sure that you have all the required equipment on the boat, but none of that which is not allowed as part of the weight. Everything on the boat will be weighed with this procedure. Then slip the bathroom scale under the trailer tongue (or under the wheel of the tongue jack, if your trailer is so equipped.)

Record the weight registered on the bathroom scale. (W2)

Next, simply move the boat aft on the trailer from its normal position. The distance aft which it is moved is optional (usually from one foot to two feet), but the arithmetic becomes simpler if the boat is moved exactly one foot aft.

Record the weight registered on the scale with the boat in this position. (W1)

Then measure accurately the distance from the center of the trailer axle to the bearing point of the trailer tongue (or wheel) on the bathroom scale. (L)

The weight of the boat, if the boat has been moved exactly one foot aft, will be this distance (L) (in feet) times the difference of the two scale readings.

The formula for ascertaining the weight of the boat can be derived easily by the use of simultaneous equations, but quite simply, it works out as follows:

$$\text{BOAT WEIGHT} = \frac{L \times (W2 - W1)}{L2 - L1}$$

12.75'

where L = the distance between the center of the trailer axle and the center of the bearing

point of the trailer tongue on the bathroom scales.

W2 = the reading on the scale with the boat in the forward position.

W1 = the reading on the scale with the boat in the aft position.

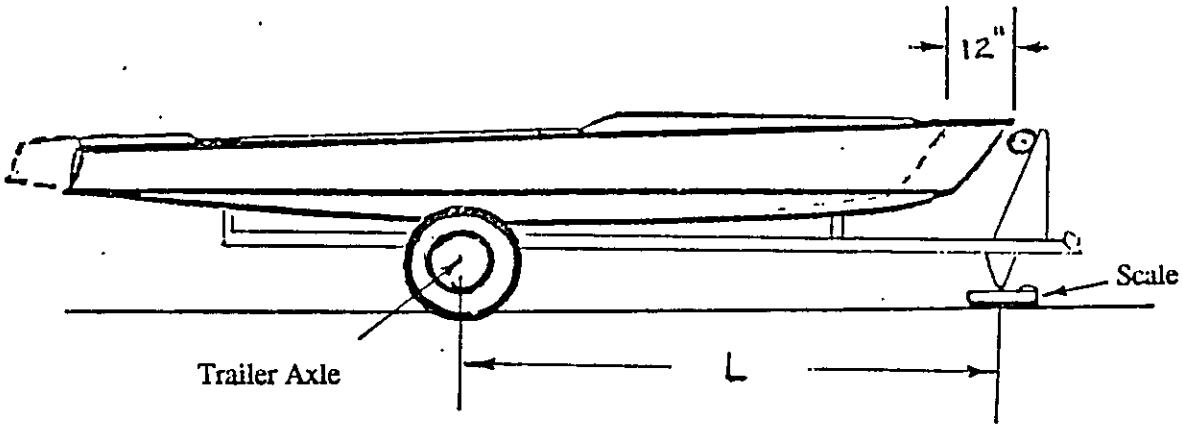
L2-L1 = the exact distance that the boat is moved.

Both length measurements should be in the same dimensions (either feet or inches).

As you can see, if the L2 - L1 dimension (the distance the boat is moved) is in feet, and is exactly one foot, the denominator in the formula becomes one, and disappears from the calculations.
This simplification is the only reason for the 12" or one foot recommended move.

Example, if your L = 14.5', your scale reading with the boat in the forward position is 60 pounds and the reading with the boat aft is 25 pounds, your boat (including all the equipment moved with it) weighs 14.5 x (60 - 25) = 507.5 pounds.

Weighing the Boat with a Bathroom Scale



Locating and Fixing Leaks

The biggest problem in taking care of a leaking fiberglass boat such as a Buccaneer, is in locating the leak. This takes a bit of detective work. Once the leak is found, it usually is a simple matter to eliminate it. The following procedure is the best way to do this:

1. Make sure that the boat is on its trailer, and the space between the hull and deck is free from water by tipping the bow up and opening the stern plug to eliminate any water which might have been trapped in between the hull and deck.

2. Next, level the boat again and close the stern drain plug, the self-bailers, and any plugs in the cockpit which join the cockpit to the space between the hull and deck. Run water into the cockpit with a hose. Allow the cockpit floor to fill to a depth which will completely cover the self-bailers.

3. Visually inspect the underside of the hull for water dripping out onto the ground. This will show up any leaks which may occur from the self-bailer.

4. Run additional water into the forward compartment and the aft compartment, IF these are sealed boxes, as in the newer boats. Before doing this, temporarily plug the limber holes which will prevent the water from draining into the cockpit.

5. Allow the water to drain from the boat by opening the self-bailers and unplugging the limber holes to the compartment. Then, tip the bow up again, and open the transom drain plug. Water found coming from inside the boat will indicate a leak or leaks in the lower portions of the bow or stern compartments. If this is found, repeat step 4 for the forward compartment, and later, repeat for the stern compartment, checking each time to determine which compartment has the leak.

6. After draining the inside of the boat again, open the drain(s) in the cockpit which allow water to go between the cockpit and the hull-deck space. Close the transom drain and the self-bailers. Then run water into the cockpit and allow it to drain into the space between the hull and deck. Visually inspect under the boat after a few inches of water has been allowed to accumulate in the cockpit AND the between hull-deck space. Any leaks caused by fasteners in the centerboard flap metal pieces or in the lower part of the centerboard trunk itself will show up at this time by dripping water from the offending fastener(s), or pointing out the leaking area of the trunk.

7. If the leak still has not been located, run additional water in between the hull and deck as described in the paragraph above, and allow the water to reach a depth equal to the top of the centerboard trunk. You might want to block the trailer frame with cinder blocks to protect the tires when you do this. Visually inspect under the boat again. Dripping water from the centerboard trunk will indicate a leak higher in the trunk--usually at either the front end or the rear end. When removing this water, use the self-bailers until most of the weight of water has been eliminated, then tip the bow up and allow what water is left to run out the transom drain plug. At this time, any leak around

the rudder hardware and / or stern plug will be found.

8. The only additional place where a leak is apt to occur would be around the edges of the boat at the hull-to-deck joint. These leaks, while occurring very infrequently, are best treated by a visual inspection. If no obvious leak has been found, put the boat in the water and tip it on its side--first on one side, then on the other. Then haul the boat out and check for water by raising the bow and observing water coming out of the stern drain plug.

It is virtually impossible to make a boat like the Buccaneer that will be 100% watertight between the hull and deck molds, to protect against the admittance of any water after a capsize or a turtling. The important thing is that any water which finds its way into the boat during these misfortunes, should only do so at a rate which will be slow enough so that it is possible to right the boat and sail it to shore in a reasonable period of time, as opposed to the unmanageable situation when the boat, full of water cannot easily be rescued or righted.

Under normal sailing conditions, however, there is no reason why the boat should leak at all.

Once a leak has been located, fixing it can usually be done very quickly and easily. For leaks around fittings, or centerboard gasket trim leaks, removal of the offending screw, rebedding with a flexible bedding compound (silicone rubber, Marine Seal, 5200, etc., etc.) and reinstalling the fastening will solve the problem. The same material can be used to seal suspicious-looking places in the rubrail area, and to fix small voids in the centerboard trunk area.

If the leak is in the self-bailer, a replacement gasket might be all that is required. The rectangular "elvstrom" type bailers, now imported by Andersen, are disassembled by removing the handle, which makes the gasket accessible. The older boats, with the cylindrical bailers, might require replacement of the complete bailer.

If new gaskets do not solve the problem with the leaking bailer, rebedding them usually will. However, if the bailer has been damaged or distorted, the entire bailer may have to be replaced.

Anti-Fouling Spinnaker Device

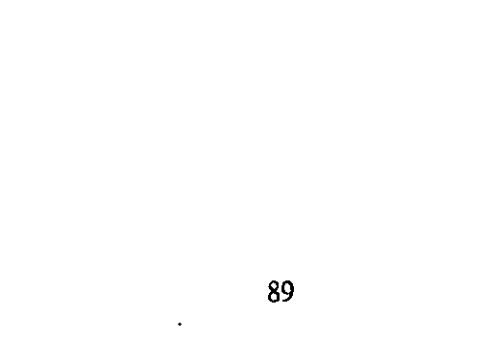
One of the most annoying things to happen repeatedly when racing the Buccaneer is that the spinnaker retractor line becomes fouled under the bow during the downwind leg. In order to clear it, many times the crew has to go forward and free it by hand.

Here is a device which mounts over the bow eye and will almost completely eliminate this problem. Naturally it can only be installed on Buccaneers where the bow eye is mounted in the stem of the boat. (Many early Chryslers had the bow eye up on top of the deck.) However, the problem occurs more frequently on boats with bow eyes mounted in the stem, because the bow eye itself is one of the protrusions which cause the fouling. The other cause, of course is the overhang of the deck at the bow.

The most commonly seen remedy for this sickness is an unsightly homemade contraption made of duct tape and a wire clothes hanger. The following sketch shows a device which can be made of two plastic or metal sheets bolted through the bow eye and through the sheets of plastic or metal. The exact outline of the device can be cut to fit your particular boat, and will eliminate fouling on either the bow eye or the bow overhang.

You will have to remove this device before hooking up your trailer line or painter to the bow eye, but this involves merely undoing a single bolt and nut. Installing this device will save you the potentially embarrassing situation of having to send your crew up to the bow to clear the spinnaker retractor line as you come into a crowded leeward mark.

Guard for Spinnaker Retractor Line



Improvements Over Older Models

We are frequently asked about the differences between our new Mutineers and Buccaneers and the older versions made by Chrysler, TMI, Starwinds, and Gloucester.

While the same basic design has been rigidly maintained, a number of details have been improved upon, resulting in greater potential safety, superior layout for easier handling, and improved construction details.

Both of these models, Mutineer and Buccaneer, have the following changes compared to some of the older boats:

1. Flush gasket moldings around the centerboard flaps.

2. An improved centerboard flap material which does not ripple, and lasts longer than the old rubbers.

3. Shroud chainplates which are strong enough to lift the boat, and which have special holes for attaching a lifting sling.

4. A stiff hull which does not deform around the chainplates when the rig is under normal sailing loads.

5. Virtually no plywood or other wood is used in construction which could rot or pick up weight due to water absorption.

6. Foam flotation which does not absorb appreciable amounts of water.

7. Vinyl rubrails to protect the hull (and nearby boats) against damage. The hull and deck joint is a rolled flange design (similar to the Laser), which allows the boat to be lifted more easily than the previous flat flange design.

8. Basic watertight integrity between hull and deck, allowing boat to be rescued by its crew after a normal capsize.

9. An anodized mast extrusion providing correct bending characteristics under sail.

10. Roller furling jib using a wire luff and swivels instead of the older tube furling device.

11. Spinnaker equipment (optional), which can be attached securely to the hull by the owner after the sale, if desired.

12. Inboard sheeting for higher pointing.

13. Strong, fabricated aluminum rudder housing, and laminated wood tiller.

14. Strong clamshell molded fiberglass rudder blade and centerboard. Microballoon core material in these, rather than foam plastic, which is weaker, and prone to break.

15. New type centerboard hangers which allow the centerboard to be removed from the trunk without turning the boat over or having to remove the flaps.

16. On the Buccaneers only, a molded-in all fiberglass spinnaker launching tube is provided, extending from the bow into the forward storage compartment. Water does not leak in between the hull and deck if it should get into the launching tube, but drains into the cockpit where the self-bailers can remove it. The spinnaker pole can be conveniently stored in the launching tube.

17. On the Buccaneer only, the sheet blocks and roller furling gear is by Harken.

18. Mainsheet blocks, cleats, and other hardware on the top of the centerboard trunk are attached using stainless steel sheet metal screws into an aluminum plate laminated into the underside of the trunk top. Therefore, this hardware is very secure, yet can easily be removed and replaced by the owner, if desired.

19. The centerboard trunk is made so that a separate cap is not required. On many of the older boats, a separate cap were used, and pop-riveted in place, which gave trouble after a while.

20. The new boats are made with a biaxial fiberglass material which, together with a sandwich type of construction, gives a hull which is not only strong, but very stiff and lightweight.

21. The bailers are mounted flush with the outside of the hull, for least resistance.

22. Except for the varnished tiller, there is no wood on the boat to weather and require varnishing.

23. Large storage compartments are located under the foredeck, and, in the Buccaneer, under the afterdeck, as well. These compartments are sealed and limbered, so that water getting into them will drain into the cockpit, and can be removed by the bailers.

24. A drain plug is provided in the cockpit to allow any accumulated water between the hull and deck to drain into the cockpit, and another drain plug is provided in the transom to drain any water from inside the hull when the boat is ashore.

25. The boom is of a stronger design than the original Chrysler extrusion.

26. The mast is stepped high enough (about 6" below the deck) so that it is easily raised and lowered by one person, especially with the new tabernacle arrangement, and not having to lift the weight of the jib and jib furling tube, etc.

27. There is no need to go forward under the deck to reave and attach the forestay, as in the original Chrysler design. Rig tensioning devices are on the mast, and used with the wire jib halyard.

28. The jib is hoisted with a wire halyard and may be lowered, and stored out of the sun when the boat is not in use, thereby prolonging the life of the sailcloth.

29. A safety forestay is provided to prevent the mast from coming down if a failure occurs in the jib halyard linkage.

30. The main halyard is controlled from the lower part of the mast, unlike the masthead lock in the original design. No more crawling out on the bow to get the mainsail hooked or unhooked.

31. There are no rubber inspection ports to provide access to the shrouds as in the original design, since these would often pop out during a capsize and allow water to rush between the hull and deck.

32. The new transom pintles are of stainless steel, and will not break or wear excessively, as the old aluminum cast transom hardware was prone to do.

33. A soft vinyl rubrail extends around the bow and aft corners of the boat, providing protection in those vulnerable areas for your neighboring boats, instead of the aluminum castings previously used.

34. On the Buccaneer, the jib fairleads are inboard, adjustable, and we have changed the mold slightly so that they are recessed into the seat for more comfortable sitting, and are angled upward at just the right angle to work the cam cleats from the weather rail. If ratchet blocks are preferred, this is no problem.

In general, then, you can see that a number of improvements, some minor, others important, have been made in these fine designs since their inception in the early 1970s. We firmly believe that they are among the finest day-sailor and racer one-designs available on the market today.

IV. RIGGING INSTRUCTIONS FOR CHRYSLER BUCCANEER

The following pages are taken from the original Chrysler Owner's Manual. It is hoped that the information and drawings reproduced here will help owners of these boats to understand how the boats were originally produced.

FORWARD

BUCCANEER RIGGING INSTRUCTIONS

Congratulations on your choice of boat!!

You have just acquired a thing of beauty - a Chrysler sailboat - which has been conceived for the express purpose of giving you many hours of carefree pleasure on the water.

We have given considerable thought to the design and construction of each boat. We have gone out of our way to provide you with a quality product, second to none.

A vigorous owners association is in existence, with the object of stimulating the class and keeping people who own Chrysler sailboats in touch with each other. You have a free subscription to this organization for the first year. We hope that you will continue it in the years to come.

We have written the following Rigging Instructions for your convenience, so that you should be aware of our suggested way of putting the boat together.

RIGGING INSTRUCTIONS

Let's assume that you have your boat on a trailer when you take delivery from your dealer.

Start off by taking the mast and boom package off the boat and the two packages out of the boat and lay them along side the boat. Then you will need a small selection of tools to put the boat together. It's suggested you have:

1. A 7/16 inch closed end wrench (a cresent wrench will do the same job)
2. A Phillips screwdriver
3. A pair of pliers
4. An ordinary screwdriver or even a dime will do.

THE RUDDER PACKAGE

Take the rudder out, and you would also find a set of battens, a sailbag containing the sails, and another cellophane package containing miscellaneous items.

THE MISCELLANEOUS PACKAGE

In this package, you will find two shrouds and one forestay (the forestay is the coil which is the most flexible stainless steel wire). You will also find two hose clamps, one ordinary shackle, two shroud adjuster plates and three clevis pins (one of these clevis pins is one inch in length and the other two are one-half inch). Lastly, you should have a cotter pin for each of the clevis pins. (Refer Detail Arrangement Dwg. -1-)

MAST PACKAGE

This consists of the mast, boom, and the roller reefing gear, which in turn consists of an aluminum tube inside a plastic tube.

SAILBAG PACKAGE

Undo the sailbag package and lay out the parts which are enclosed.

1. A large coil of rope which is the mainsheet.
2. The second largest coil of rope which is the jibsheet.
3. The longest length of 3/16" line which is the main halyard.
4. Two short lengths of 3/16" line, one is the tack down haul, and the other is the clew out haul.
5. The jib sail.
6. The main sail.

The pivoting centerboard is already fitted in the boat. Should you need to take it out, first check the detail arrangement drawing #12. This will show you the components involved. To withdraw the centerboard, you have to insert two thin screwdrivers or pieces of metal up the centerboard slot from underneath, press the pivoting pin assembly together and withdraw the centerboard [illegible] the pivoting pin assembly in the hole in the center-

whole unit up into the centerboard case, having first established where the pivoting pin locates. The pin assembly will expand when it reaches its location point and the centerboard is ready for operation.

RIGGING PROCEDURE

Start, first of all, with the mast. Beginning from the top, take the main halyard, which is 3/16" line, and one shackle, and with a bowline knot, tie the shackle onto one end of the main halyard. Then, tie a figure eight knot in the halyard at a point 9" from this shackle. Take the free end of the halyard and pass it through the fitting at the top of the mast, from the back(grooved side of the mast) through the fitting at the top of the mast, and down again, on the front side of the mast through the small fitting (halliard lock) which is mounted a short distance from the top of the mast (the chrominum plated or polished fitting with a hole in it), and pull it right down to the bottom of the mast. Just for convenience, you should take both ends of the halyard to the bottom of the mast and attach them to the cleat, this will keep them out of the way before the mast is stepped (raised). (Refer D.A. -2- Drawing)

Next, take the shrouds, that is, the two coils of wire that are similar (the other coil of wire, which is flexible, is the forestay). Take the pair of pliars and proceed to the point on the mast where there are three tangs sticking out, and with your pliars gently bend the tangs away from the mast so they are approximately one inch from the mast so that you can get the female fitting on the shrouds into them more easily. Undo the coiled up shrouds and fix the female fittings to the tangs on either side of the mast. Using the screwdriver, make sure that you open out the cotter pin so that it does not come undone (don't forget to do both sides). (Refer D.A. -3- Drawing)

ROLLER REEFING GEAR

Start off by taking one of the hose clamps and thread it on one end of the plastic tube assembly and slide it all the way to the bottom (that's the end with the two white plastic flanges). Now, take the jib, or small sail, unroll it and fit it onto the plastic and aluminum roller reefing tube assembly. Before passing the pocket or sleeve of the jib over the aluminum tube, it is advisable to check to see if there are any small burrs which might tear the sail. If there are any, they should be scraped off with a fine file or knife. Having put the sail on, roll it up around itself, and when you finish, tie a clove hitch knot around it using one of the short lines provided, to keep it neat. (Refer D.A. -4- Drawing)

NOW, ATTACH THE ROLLER REEFING UNIT TO THE MAST

Take the other hose clamp and pass it over the top part of the rolled up sail and secure it, using the ordinary screwdriver, with the top of the sail approximately half an inch from the top of the plastic tube. The bottom hose clamp is left loose at the present time. Now, take the flexible wire forestay and put the male end fitting in the end of the aluminum tube which has the slots and hole in it (in other words, the opposite end to the nylon flanges) and pass the wire forestay all the way through it. You are now left with the female fitting, that is the fork end, at the top. (That is the same end as that of the aluminum tube with the hole going through it and the slot in it). Now get the 1" clevis pin and pass this through the aluminum tube, forestay fitting and the tang. Finally, put the cotter pin through the hole in the end of the clevis pin and open up the end of the cotter pin with your screwdriver so that it doesn't come loose.

Next, take the two plastic tubes which came out of the miscellaneous fittings package, and pass them on to the shrouds (that is, the two wires coming down from the tangs or hound fitting). Attach one of the chain adjuster plate fittings (the 6" "U" shaped plates with holes down both sides) onto each end. Connect the wire shroud into the fitting at approximately the seventh hole down. You are now ready to put the mast up, but first of all, take the lazaretta cover in the rear deck and slide it down into the boat so that you don't damage the woodwork on top of the cover. (Refer D.A.-1- Drawing)

Then, in sequence, place the mast on top of the boat with its base under the shaped wooden plate which is secured to the foredeck at the mast enclosure [illegible] the shrouds and shroud adjusting fittings to the chain plates (Refer D.A.-6- Drawing)

which come out of the boat. Next, take the flexible forestay, the male fitting end, and go to the front end of the boat. There you will find there are 2 lead lines coming out of the holes in the deck. Take the forward one of these, that is the largest hole, and attach the lead line from it to the forestay fitting, making sure there is rather a large loop before you tie a bowline knot. Pull the lead line, which in turn pulls the wire forestay through the hole in the deck. It passes through the pulley or block which is attached to the stem in the forward part of the boat and comes back to the lever adjustment fitting, which is on the righthand side of the mast, inside the righthand access hole to the foredeck. (Refer D.A.-7- Drawing)

NOW YOU ARE READY TO RAISE THE MAST

Ideally, this should be done with two people - one person in the boat and the other person outside. Start with the person holding the mast outside the boat and walking it up, passing it over to the person inside the boat, to continue the maneuver. The person outside the boat then goes forward and takes hold of the forestay assembly and roller reefing gear. The person in the boat completes his maneuver of pushing the mast to the to the upright position, making sure that the shrouds are not fouling any part of the boat while he is completing this maneuver.

The base of the mast has a square hole in it and should locate on the square peg fitting which is attached to the boat at the base of the mast enclosure. The person inside the boat remains holding the mast while the other person outside the boat should be steadying the mast by holding the forestay assembly and roller reefing gear. The person in the boat now takes hold of the right hand lead line, (this is found looking into the right hand access hole to the foredeck and should be attached to the lever adjustment fitting), and pulls the forestay through into the boat, while the second person outside the boat, guides the forestay into the hole and then when it is through, the aluminum tube as well. Now, attach the male end fitting of the forestay into the lever adjustment fitting. You will find there is a clevis pin already through this fitting and you should attach the male terminal fitting on the forestay to the hole adjustment point approximately five holes from the pivoting point of the fitting, putting the clevis pin in to retain it in that position. Secure the clevis pin by inserting a cotter pin and don't forget to open out the ends of the cotter pin, and tension up the forestay by moving the lever to the rear of the boat. You should note that it is preferable to retain the lead line attached to the lever fitting so that you can use it to move the lever. You also have the line retained for when you want to lower your mast, in which case the above procedure is then carried out in the reverse manner. (Refer D.A.. -8- Drawing)

ATTACHING THE ROLLER REEFING LINE

You will find that the roller reefing line is already in position in the boat - one end being attached to a cleat which is fitted on the outside of the mast enclosure, the other end coming out of the small hole in the foredeck and being attached to the other lead line. (A small point that you should notice, here, is that it is preferable when disconnecting the lead lines to tie a figure eight knot in the ends to stop them from running back into the boat.) Take the end of the reefing line coming out of the rear of the two holes in the deck, and pass it twice around the white plastic flange fitting at the base of the roller reefing assembly, and then up through the hole in the upper flange through inside the hose clamp which is over the bottom of the sail, and tie a figure eight knot in the end of it. Using the ordinary screwdriver, tighten up the hose clamp, having first pulled down the pocket or sleeve of the jib sail to eliminate any wrinkles. The reefing gear is now secure and ready for operation. (Refer D.A.-4- Drawing)

Now, take the rope jib sheet (the second largest coil of 3/8" rope) and pass it through the clew of the jib sail, halve the length of rope end to end, and with two knots (two half hitches), tie the rope to the sail at the central point. Then, take each end of the jib sheet and pass it through the jib sheet fairleads going outside the shrouds on the way. (Some people prefer the jib sheets inside, some outside. In rough weather, you will probably have them outside, in light days on the inside.) Don't forget to put a figure eight knot in the end of the sheets! (Refer General Arrangement Dwg.)

Next, take the boom and insert the goosenack fitting in the opening in the mast provided, and slide it down the slot. Now, take the main sheet (the largest coil of 3/8" rope), uncoil it and start threading it through the main sheet jammer cam cleat fitting, underneath the pulley, up and around the pulley on the boom, (the one which is furtherest away from the mast), pass it through the pulley going towards the mast and come down to the pulley fitting which is attached to the end of the centerboard trunk. Pass it through under the pulley, once again, towards the mast, now come up once again, to the pulley on the boom which is nearest the mast, and pass it through going towards the rear of the boat, and then down, again, to the top of the pulley fitting (the backett), which is mounted on the rear of the centerboard trunk, and attach it with a bowline knot. Finish up by putting a figure eight knot in the other end of the main sheet! (Refer D.A. -9- Drawing)

You should adjust the angle of the main sheet jammer fitting so that if you took a line from the pulley through the jammer, you would just clear the side deck on either side. This gives you the correct angle. You then tighten up the center spindle with your 7/16" wrench.

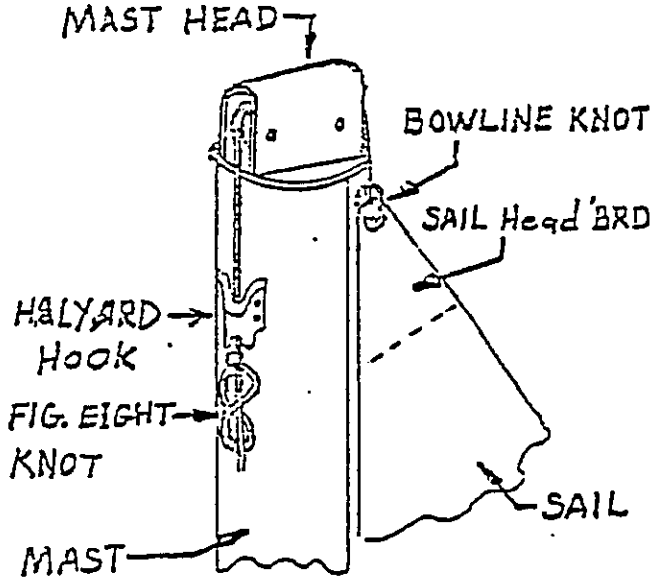
YOU ARE NOW READY TO PUT THE MAIN SAIL UP

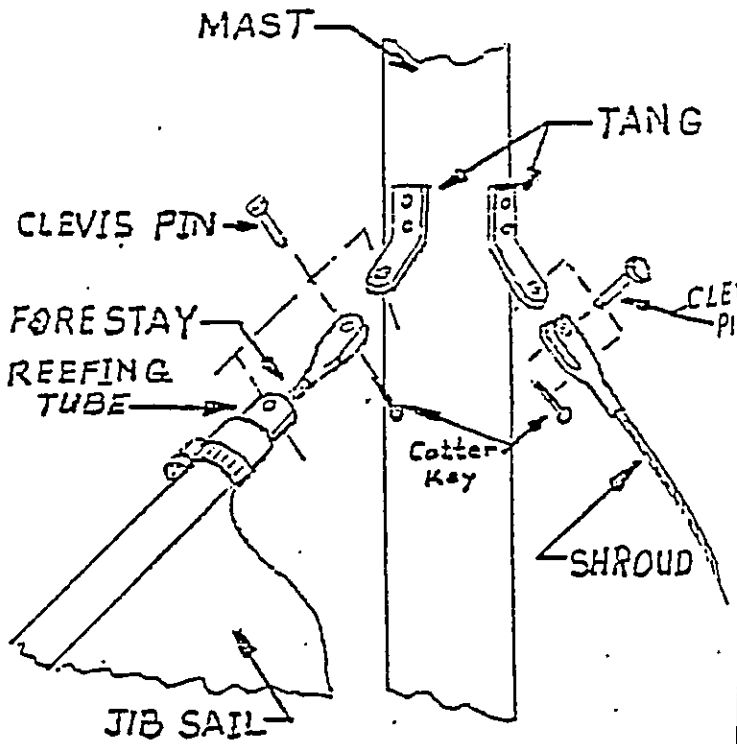
First, put all the battens in the sail, starting with the long top one. This batten is what is called a shaping batten, which means it holds the contour of the sail to a pre-set shape, which is determined by how you tension the batten into the pocket. You should insure that the angled end of the batten is inserted the correct way so that the angle of the batten end fits the angle of the end of the pocket. Next, insert the other three battens. These battens are of a different type and they are merely to stiffen the trailing edge of the sail. You will find that there are two short ones and one longer one, the longest one being in between the other two. To insert them, you merely put them into the pocket and push against the elastic, which you will find mounted in the inner end of the pocket. Push against it and allow the other end to slip back into the pocket. You are now ready to put the sail into the boom. Pull the bolt rope of the sail into the grove on the boom and pull it along towards the outward end of the boom, that is towards the rear or stern of the boat. Fasten the sail to the boom at the tack point with the pin provided, pushing the pin through the grommet in the sail and twisting it to secure it in position. Now, fit the claw out haul, attaching one of the pieces of 3/16" line to the sail, using a bowline knot, then passing it through the grommet in the sail. Go back and forward a few times to take up the slack and tie off the line, using two half hitches around itself. (Refer General Arrangement Drawing)

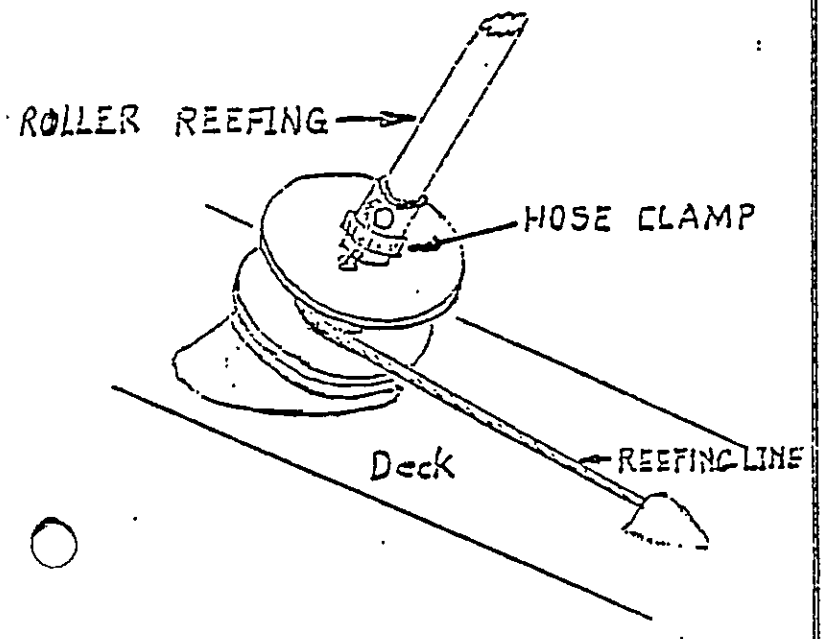
You are now ready to raise the main sail. Take the main halyard and attach it by means of the shackle to the top or head of the main sail. Put the bolt rope or leading edge of this main sail into the grove of the mast and pull the main halyard down, with one person guiding the sail into the mast and up the sail goes. Keep on pulling, and if you look up, you will see that the knot in the halyard has appeared out of the mast head fitting at the top of the mast and is now in front of the mast, coming down again. You then move the halyard towards the bow of the boat and let the halyard go back up the mast again, slightly. The knot will then jam into the mast lock, which you can check by tensioning the sail down. Take the other end of the halyard and attach it loosely to the cleat at the base of the mast so that it can be taken off again easily. Then, take the last piece of 3/16" line that you have left, which is the tack down haul, and attach it to the ring underneath the goosenack fitting with a bowline knot. Pass the other end of the line down around a cleat which is just below it mounted in the after side of the mast, (It is sometimes possible that you may need to readjust the position of this cleat, which you can do, using your Phillips screwdriver); pass the down haul around the cleat, once, up through the ring again and finish off with the inevitable two half hitches round the rope itself. (Refer D.A.-2- Drawing)

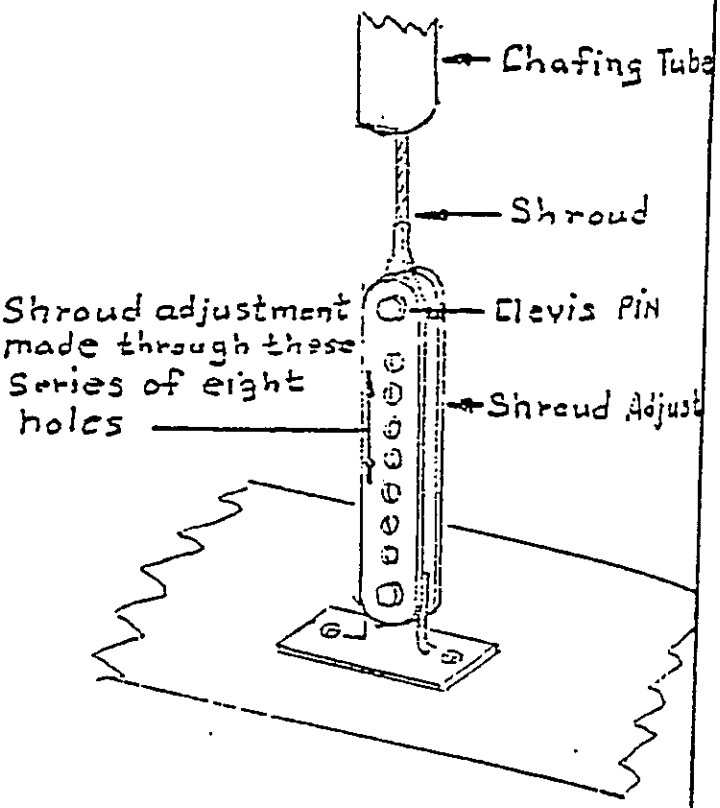
The next step is putting the rudder on, which is quite a simple operation. The male fitting (pintles) go into the female fittings (gudgeons), but you must remember to turn the lock which stops the rudder from coming off should you capsize. Notice that on your rudder, you have two lines attached on the tillar section. One of these lines is for pulling the rudder blade down, and the other to pull it up. (Refer D.A.-11- Drawing)

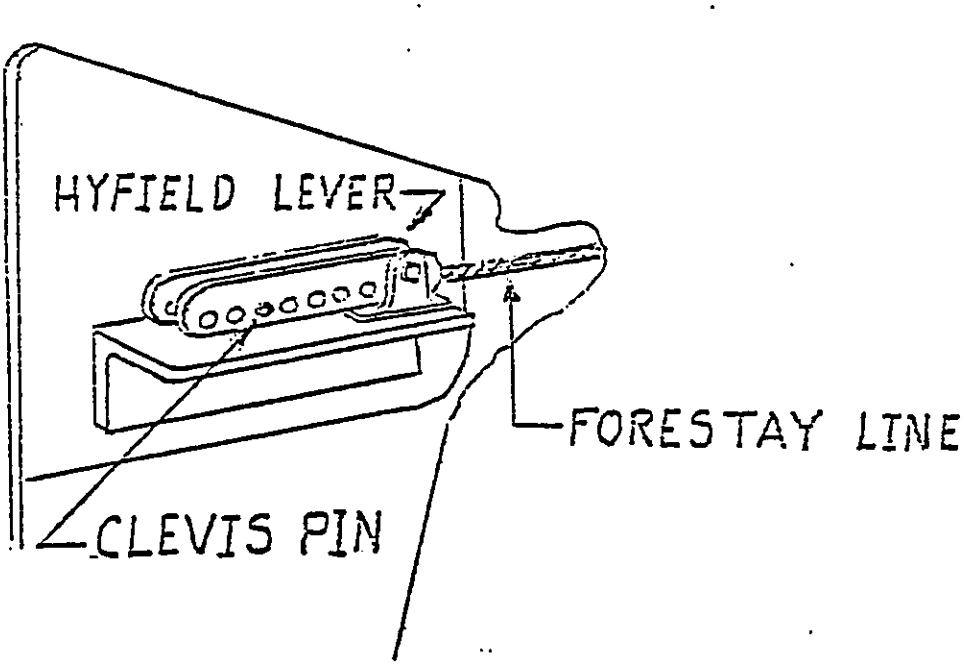
Now put the lazarette cover back in position and the boat should be ready

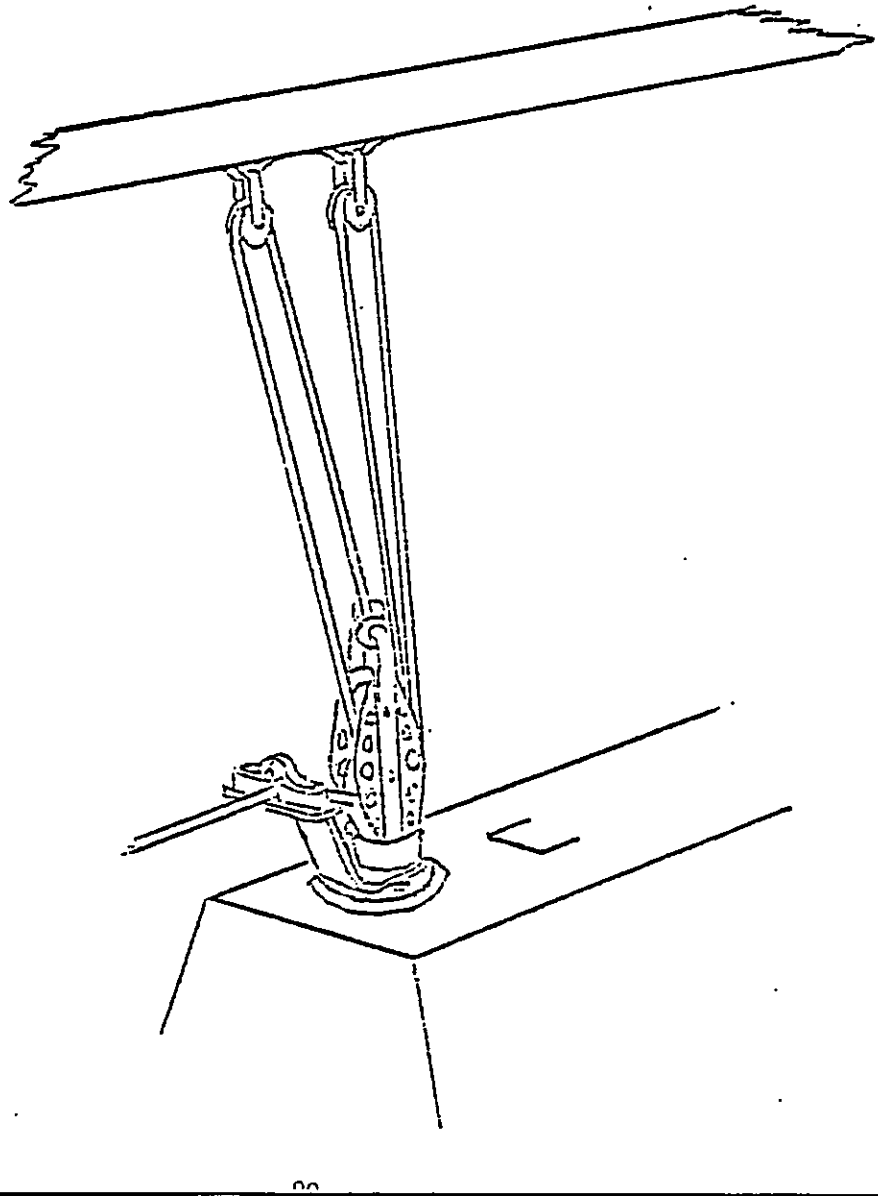

MAST HEAD
BOWLINE KNOT
SAIL Head 'BRD
HALYARD Hook
FIG. EIGHT KNOT
SAIL
MAST

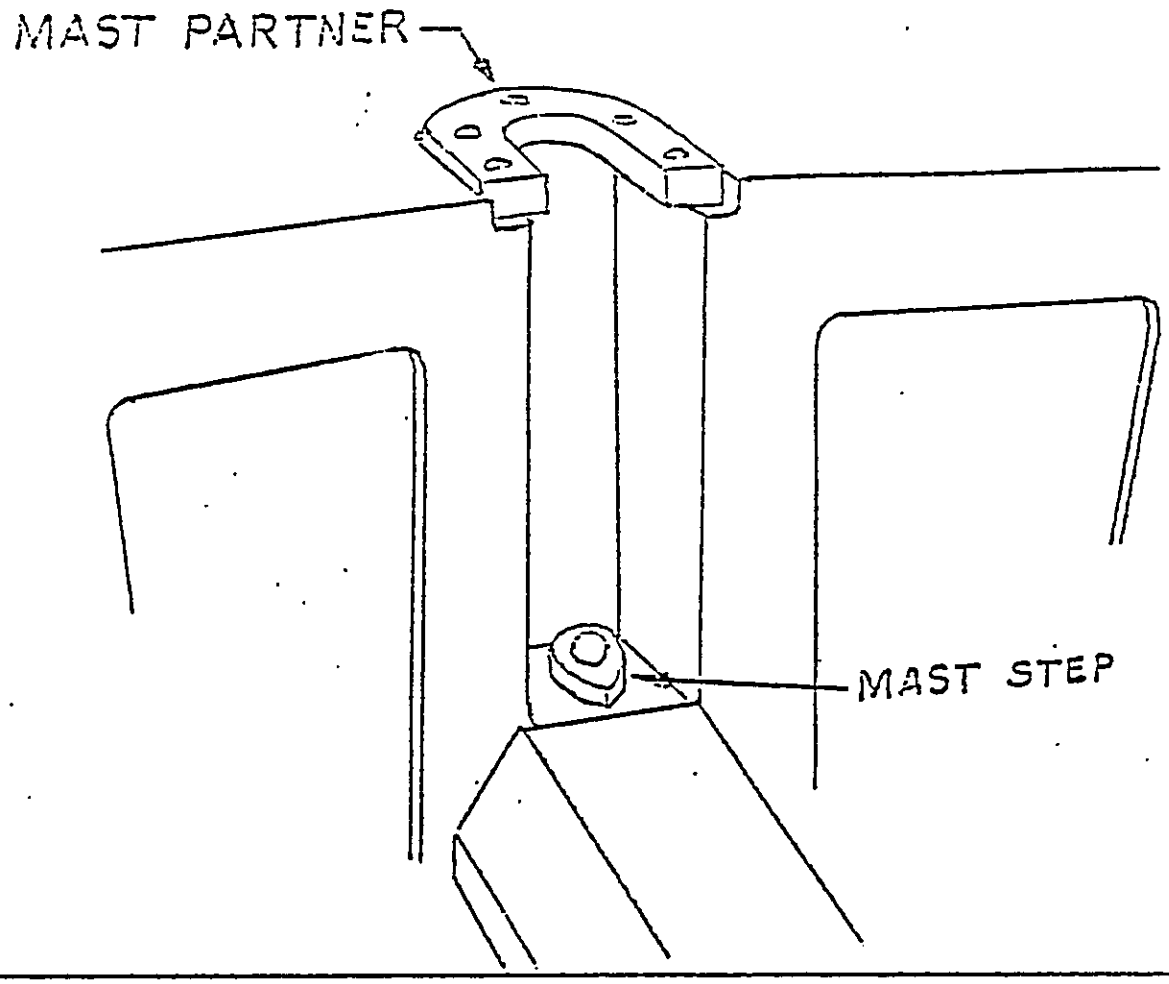

MAST
TANG
CLEVIS PIN
FORESTAY
REEFING TUBE
Cotter Key
SHROUD
JIB SAIL

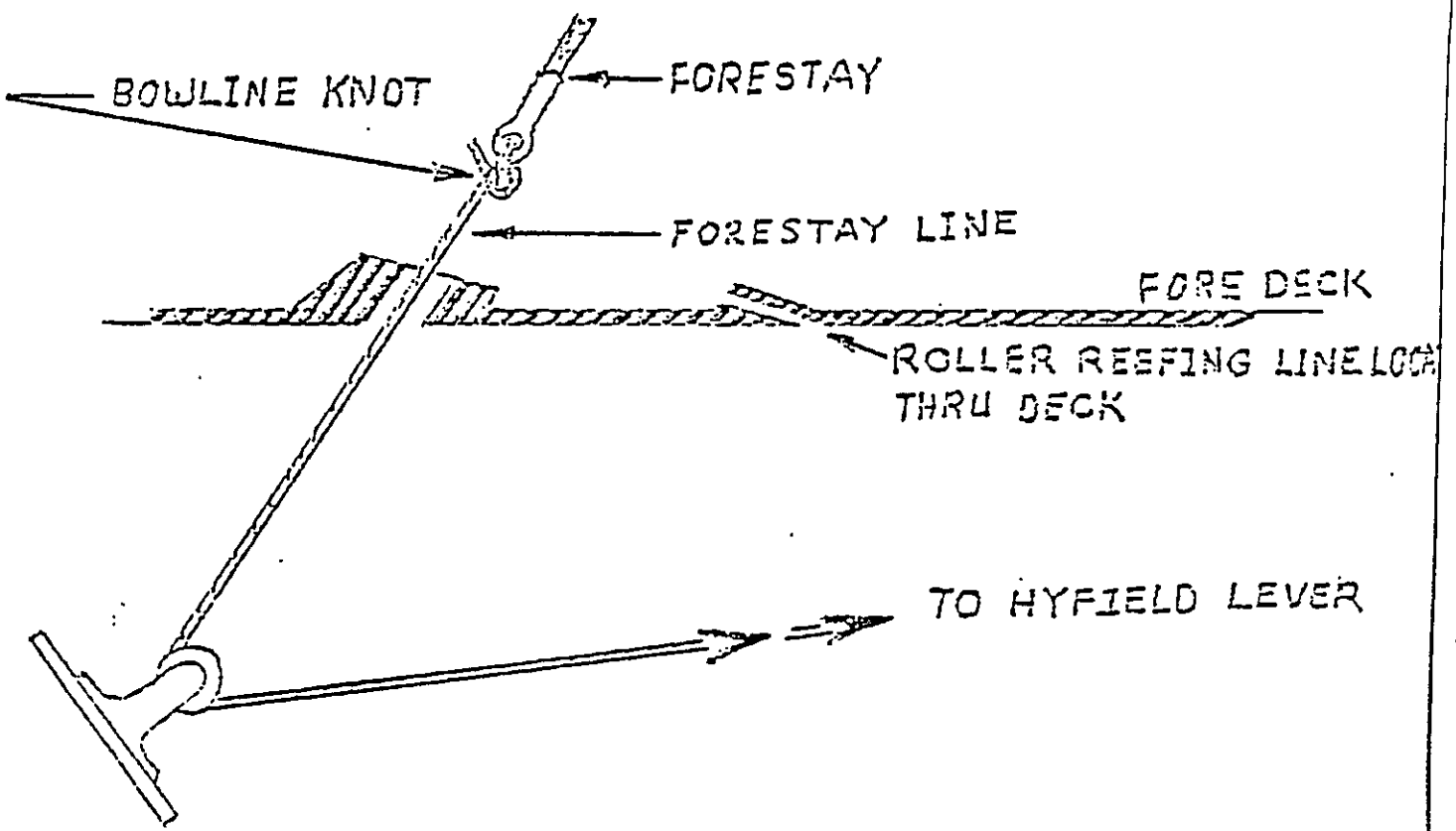

ROLLER REEFING
HOSE CLAMP
Deck
REEFING LINE

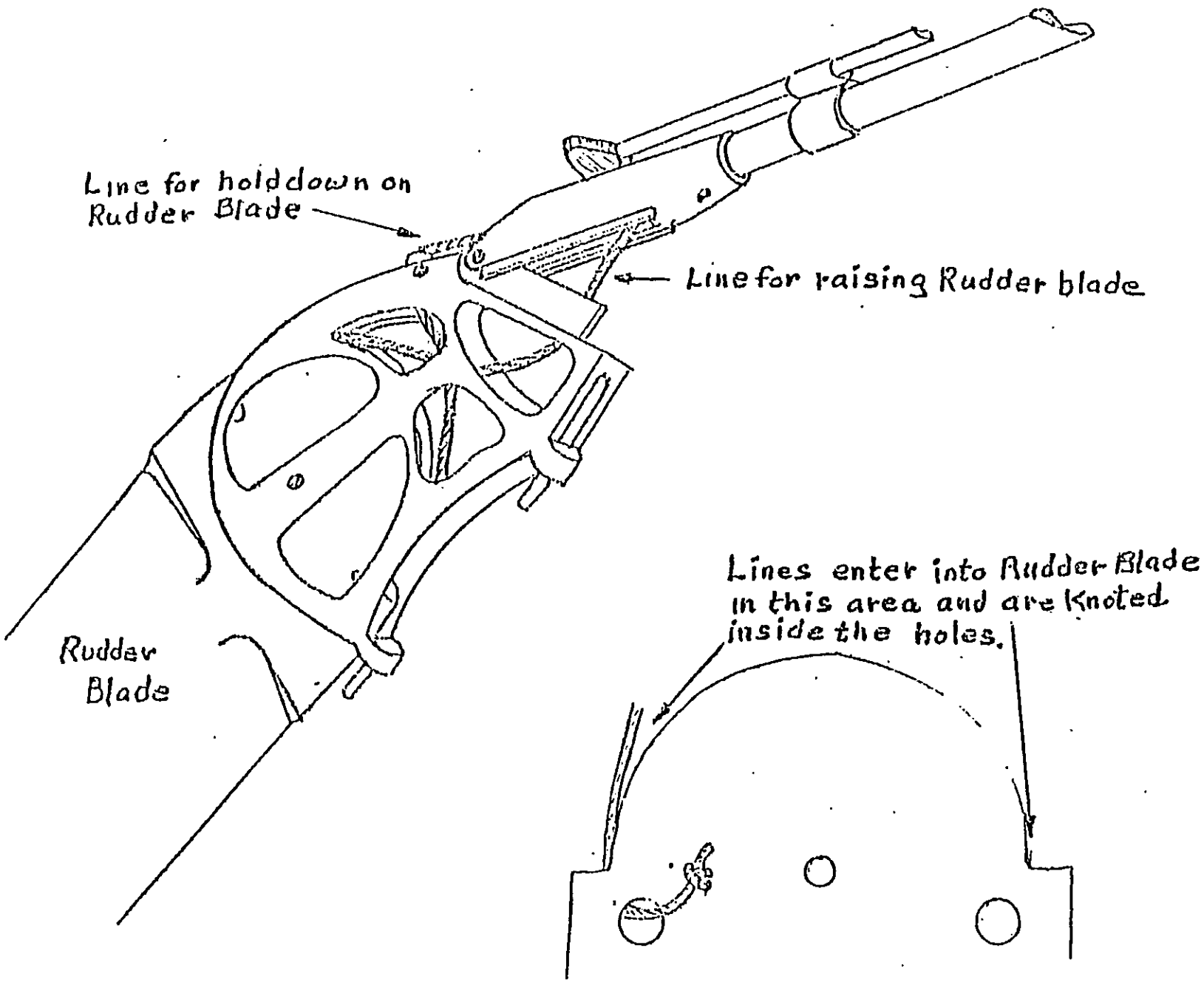

Chafing Tube
Shroud
Shroud adjustment made through these Series of eight holes
Clevis PIN
Shroud Adjust


HYFIELD LEVER
FORESTAY LINE
CLEVIS PIN




MAST PARTNER
MAST STEP

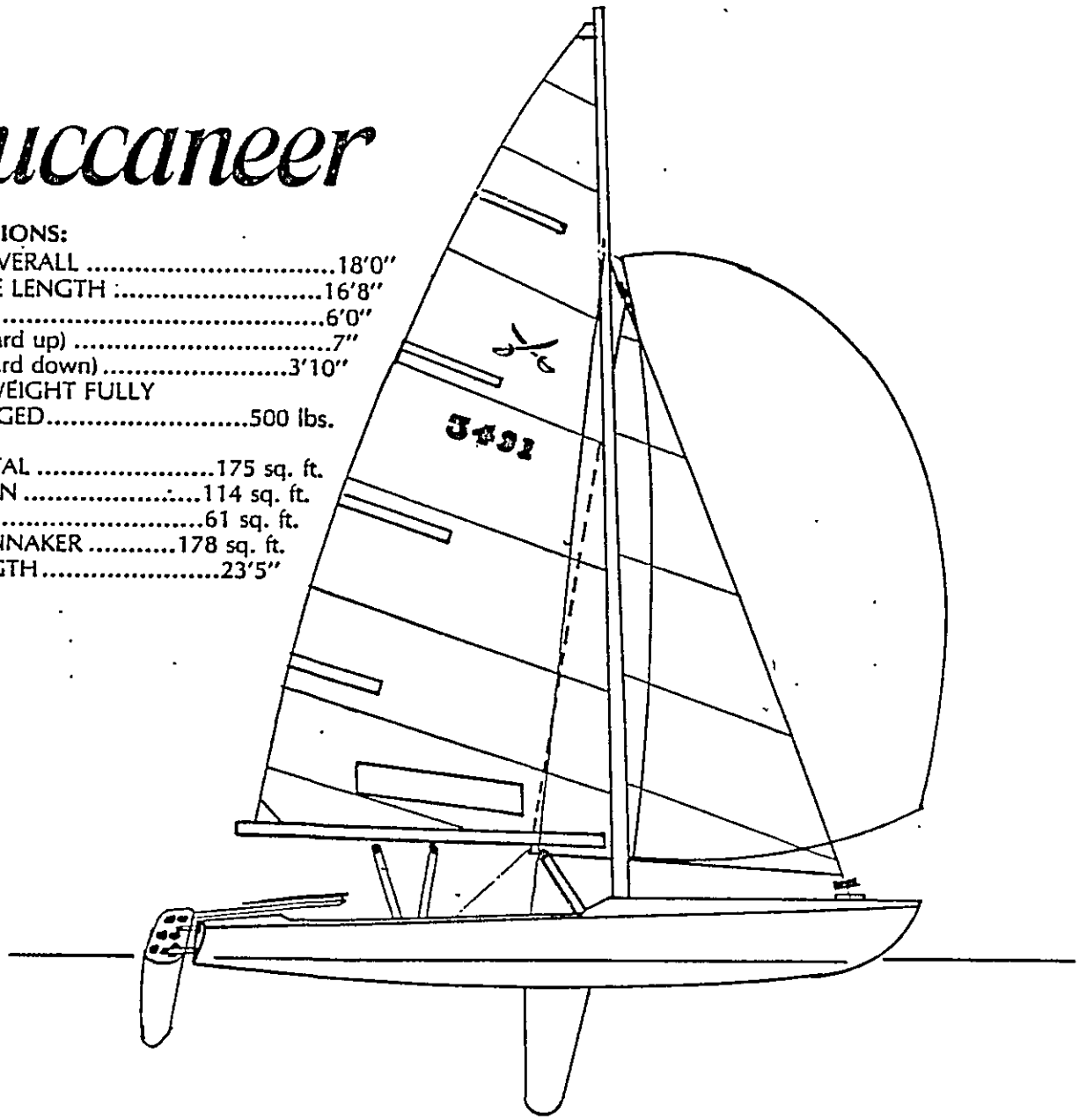

BOWLINE KNOT
FORESTAY
FORESTAY LINE
FORE DECK
ROLLER REEFING LINE
THRU DECK
TO HYFIELD LEVER

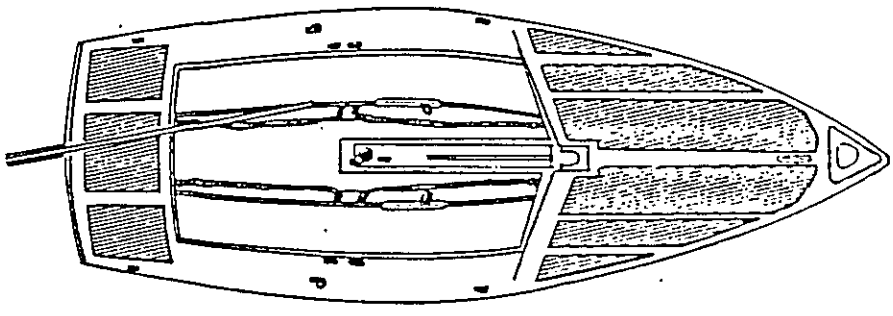

Line for holddown on Rudder Blade
Line for raising Rudder blade
Rudder Blade
Lines enter into Rudder Blade in this area and are knoted inside the holes.

Buccaneer

SPECIFICATIONS:

LENGTH OVERALL .....18'0"
WATERLINE LENGTH .....16'8"
BEAM .....6'0"
DRAFT (Board up) .....7"
(Board down) .....3'10"
APPROX. WEIGHT FULLY RIGGED.....500 lbs.
SAIL AREA:
TOTAL .....175 sq. ft.
MAIN .....114 sq. ft.
JIB.....61 sq. ft.
SPINNAKER .....178 sq. ft.
MAST LENGTH.....23'5"





Mutineer

SPECIFICATIONS:

LENGTH OVERALL .....15'0"
WATERLINE LENGTH .....14'1"
BEAM .....6'0"
DRAFT (Board up) .....8"
(Board down).....4'1"
APPROX. WEIGHT FULLY RIGGED.....410 lbs.
SAIL AREA:
TOTAL .....150 sq. ft.
MAIN .....100 sq. ft.
JIB.....50 sq. ft.
SPINNAKER .....166 sq. ft.
MAST LENGTH.....22'0"