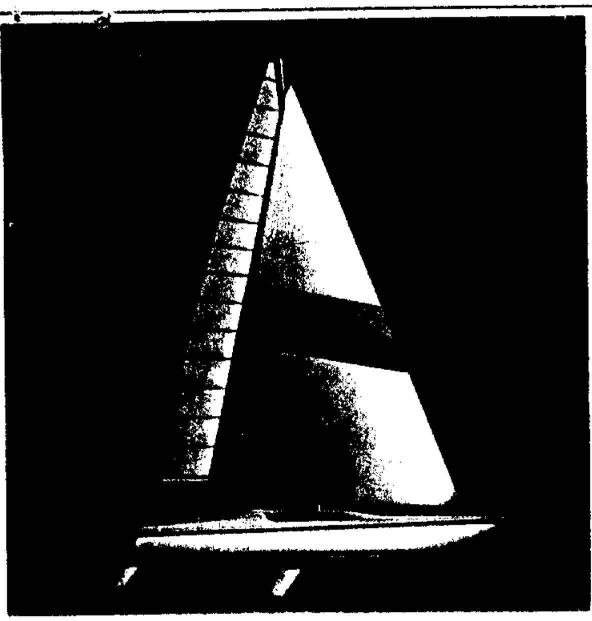


MacGREGOR 36′ CATAMARAN

MacGREGOR CATAMARAN CORPORATION
1631 PLACENTIA • COSTA MESA, CA 92627 • (714) 642-6838

The new 36′ MacGregor Catamaran has proven to be the fastest production cruising sailboat ever developed. It combines the ultra-high performance of the big day-sailing catamarans with the safety, luxury and comfort of conventional cruising sailboats.

The boat easily exceeds 25 mph on reaches, and over 14 mph close into the wind. It points extremely high and tacks easily. The high speeds under sail or power greatly expand the weekend cruising radius.

MacGregor 36′ Catamarans were first to finish in the 1976, 1977 and 1979 Los Angeles to San Diego (110 mile) races, each time beating 300 of the best ocean racing monohulls and multihulls on the west coast. In the '79 race, the second multihull in was also a MacGregor 36. Another MacGregor 36 was 3rd to finish in the rough 800 mile 1979 Tradewinds race, being beaten only by a 60′ catamaran and the 60′ trimaran "Rogue Wave."

In the unlikely event of a capsize, a unique system developed by MacGregor enables the crew to right the boat and continue sailing without outside assistance. This is rare among the big cats, and is an essential safety feature.

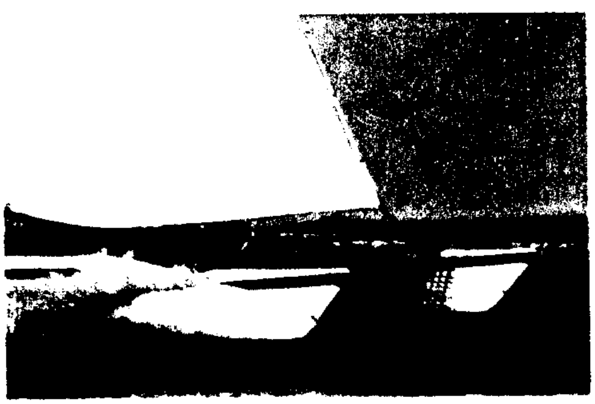
The shallow draft permits easy beaching and allows the boat to be sailed where most conventional yachts cannot go.

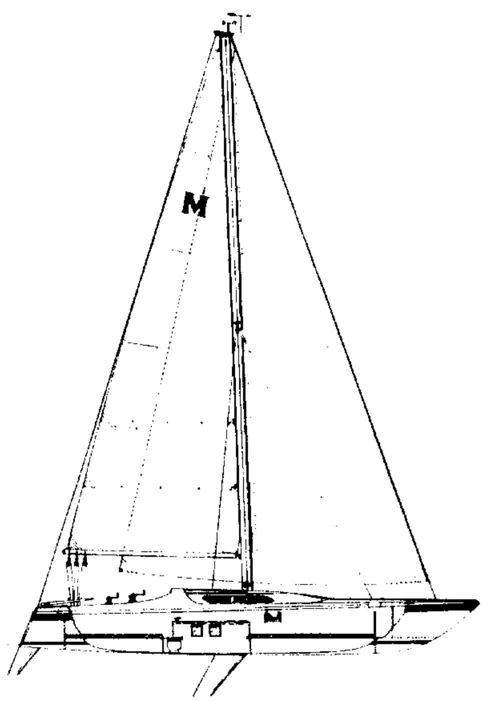
The MacGregor 36 can be dismantled, and carried on a trailer in an 8′ wide package. It is long, but light, and can be towed behind a standard car. It takes two men about three hours to assemble the boat, and it can be ramp launched.

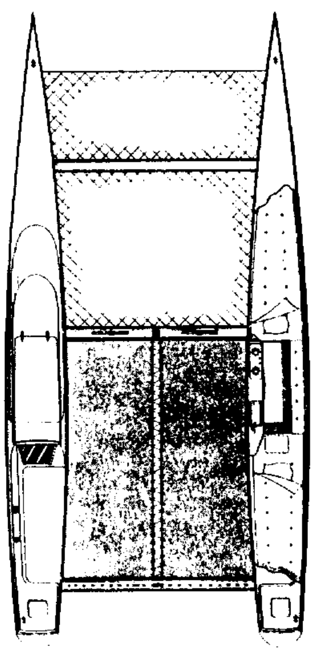
The hull interiors are self bailing, except for the relatively small area between the bunks. In the event of flooding or damage, the boat will stay on its lines and continue sailing.

Each hull contains two bunks that are wide enough to be considered snug doubles. The starboard hull has a galley. The port hull has an area for navigation and electronics. Each hull can be equipped with a head. The twin cabin concept makes for real privacy for couples. There is full standing headroom beneath the raised hatch over the galley and navigation areas.

We believe that this spectacular yacht offers the finest sailing to be found anywhere.







Length	Beam	Weight	Draft — Board Up	Main	Jib	Spinnaker	Genoa	Mast Length	Beam — On Trailer
35′6″	18′	3000 Lbs.	24″	295 Sq. Ft.	239 Sq. Ft.	1283 Sq. Ft.	469 Sq. Ft.	44′	7′10″

Inventory

When you receive the boat, unpack everything that is not permanently installed in the hulls and do a complete inventory. The packing list that you receive with the boat gives a list of everything you should have.

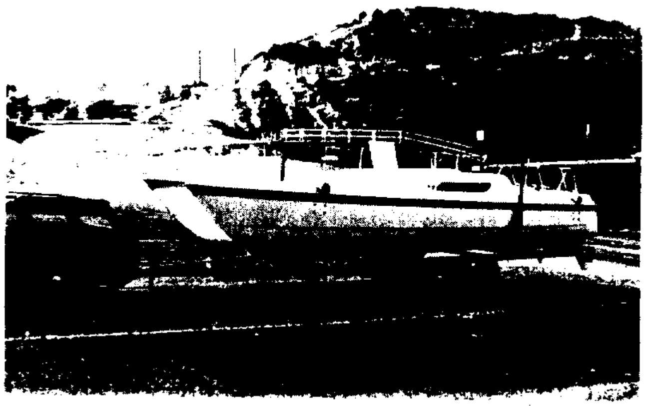
Tools Required

You will need these tools for assembly:

Medium size common screwdriver (1); 1-1/16" wrench (1) (for 3/4" bolts and nuts); 15/16" wrench (2) (for 5/8" bolts and nuts); 3/4" wrench (2) (for 1/2" bolts and nuts); 9/16" wrench (2) (for 3/8" bolts and nuts); and 7/16" wrench (1) (for 1/4" bolts and nuts).

Crescent, box or end wrenches will work OK, but socket wrenches with a ratchet handle will really speed things up.

Trailering configuration



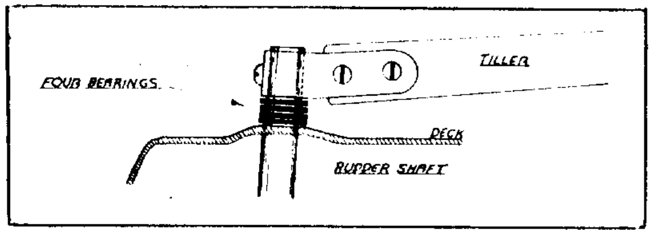
The hulls will be bolted to short front and rear cross tubes, making a solid catamaran that is slightly under 8' wide. This package can be carried around on its own trailer or on a simple flat bed trailer.

Rudders

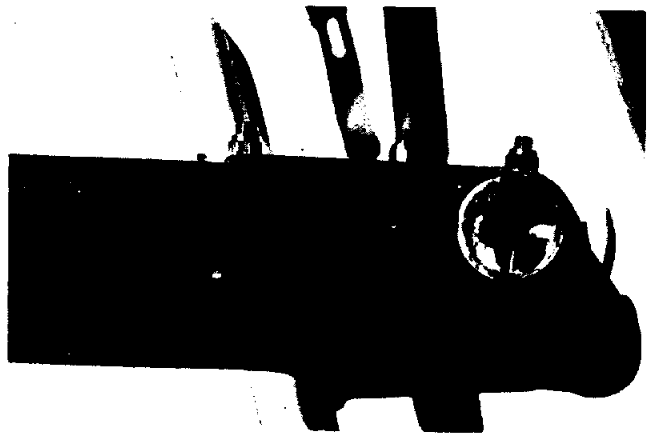
Rudders and tillers will normally be installed on the boat when you receive it, and need not be removed for carrying the boat around on its trailer. However, some methods of shipment will required that we remove the rudders and you will have to put them in before launching the boat.

There are 3 ways to install the rudders. The easiest is to launch the boat and slip the rudder shaft up into the hole in the hull (about 18" forward of the transom). Make sure the rudders go in the proper hulls (they are marked port and starboard). The stern will have to be in at least 6 feet of water, and the job is easy if you work from a raft or dock.

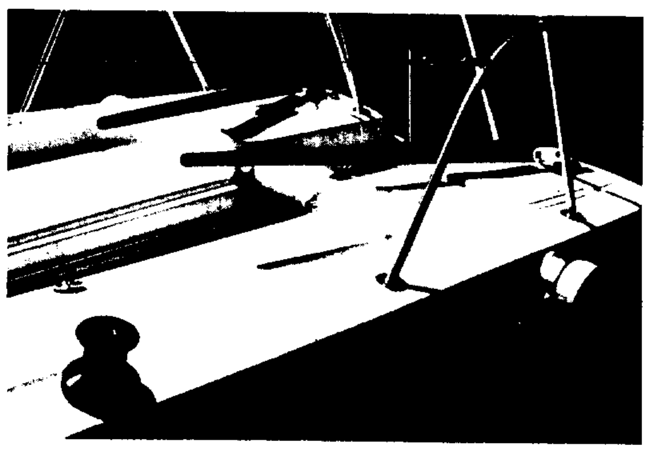
Push each rudder shaft up thru the hull and out the hole in the deck. The rudder shaft should protrude from the deck by about 3". Make sure the rudders are pressed up tight against the hulls.



Place four rudder bearing washers over each shaft. (These are 1/8" thick, 2" inside diameter black washers).



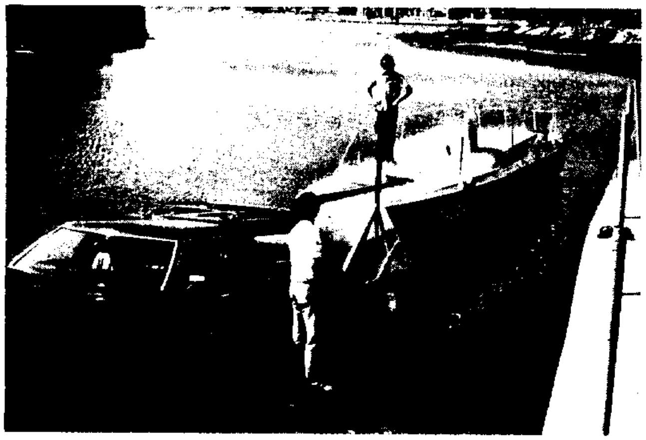
Bolt the tillers to the shafts. The proper bolts will be shipped in their holes in the tiller fittings, so you won't have to grope around for the proper fasteners. Tighten these bolts really tight.



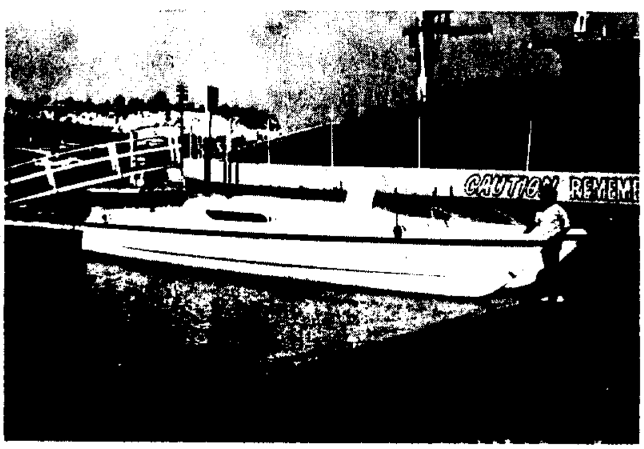
The tillers will point inboard when the rudders are straight. This gives room to sit on the seat, and allows the inside rudder, on a turn, to take a tighter radius than the outboard rudder, which substantially reduces drag.

The rudders can be installed on dry land either by lifting the rear of the boat with a hoist or by backing the stern of the boat over a hole, edge of a ditch or depression to give the necessary 6' clearance.

Launch the boat



Undo all lines that hold the boat to the trailer. Tie a 30' line to the nose of the boat, back the trailer into the water and let the boat float free. (be sure to remove the lights from the trailer before launching). Notice that it is not necessary to get the car in the water on a normal ramp. The trailer rollers let the boat go off with virtually no effort. (Don't untie the boat from the trailer until you get near the water's edge. On a moderate ramp, the rollers work well enough that the boat may roll off before you reach the water).



You can pull the nose of the boat up on the beach. The rudders will not hit unless the ramp slope is extremely gradual. Remember, all the time the cat is bolted together with its short shipping cross tubes, and you have a narrow but stable catamaran. You can tow or power the cat to another area for assembly if that is more convenient.

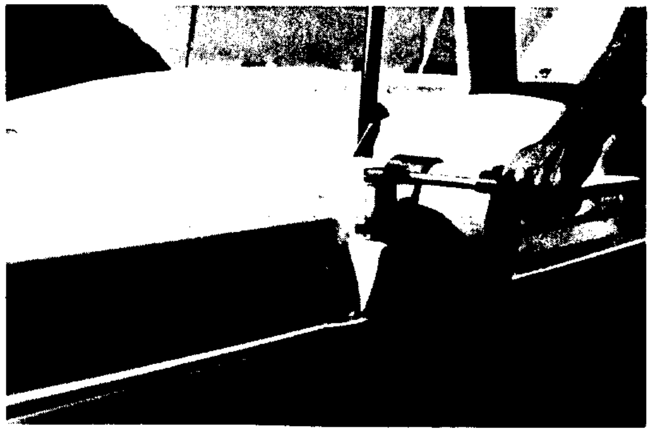
Opening up the boat

Installing the cross tubes and opening up the boat is done in the water, because there is virtually no friction to deal with. Doing this in a strong current or high wind can get a bit sporty, so pick a calm day and a calm place.

The following procedure can be carried out with the boat's nose on the beach, but it is a lot easier when it is tied to a dock. Tie the port side to the dock.

Each of the three cross tubes will be marked so you know which end is which, and where each tube goes.

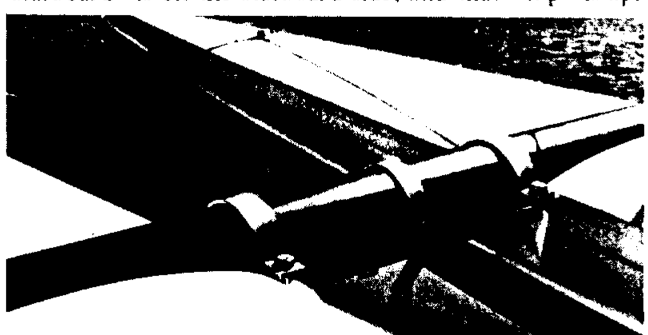
Front Cross Tube



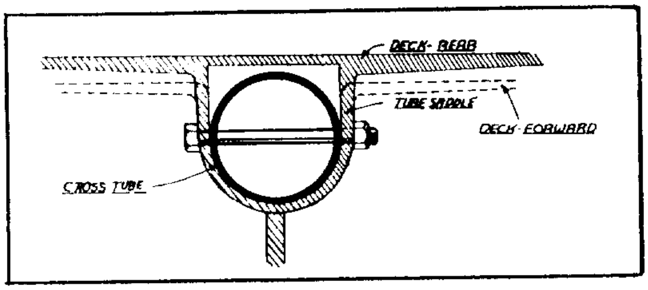
Put someone inside the boat, armed with a screwdriver. Have him insert the screwdriver between the 3/4" nuts and the cross tube chainplate to keep the nut from turning while a second person, using a 1-1/16" wrench, removes the 8 bolts that hold the forward shipping cross tubes to the hulls. Remember where each clamp goes. It is important to get them back in their original locations. Whenever you deal with large diameter (3/8" and up) stainless bolts and nuts, oil the threads. Stainless steel fasteners sieze up occasionally, and have to be cut loose. Oil will help.

Warning: do not loosen the rear tube clamps until the front tube is permanently and solidly clamped in place. The rear shipping tube will keep the boat together and stable while the forward tube is changed. Without at least one tube clamped solidly in place, each hull will try to roll over.

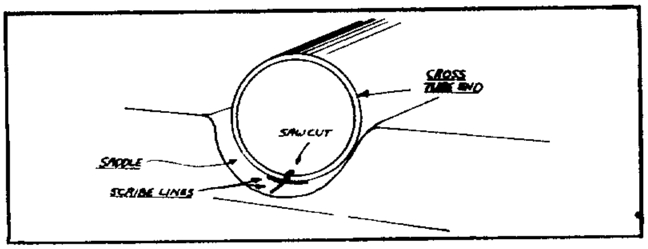
Remove the short shipping tube and set the forward tube (16' 6") in place. Make sure that the end marked "starboard" is on the starboard side, and that "top" is up.



Slip the lower forestay ring over the tube as shown before installing clamps.



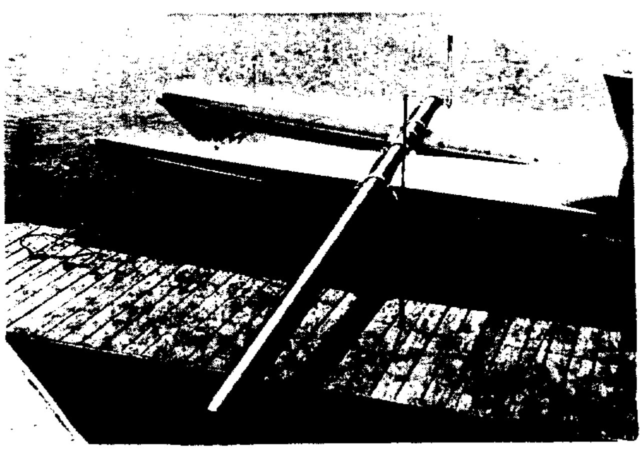
You will notice holes in the center of the deck saddles and corresponding holes in the cross tubes (parallel to the waterline). These holes hold 5/8 x 10" bolts that keep the tubes from rotating or sliding out. Position the tube so that the holes in the starboard hull align with the holes in the tube.



As an aid to assembly, there is a scribe line in the saddle that shows the position of the end of the tube. A saw cut on the end of the tube should align with another scribe line on the deck to tell you if the tube is rotated properly. When these scribe lines are aligned the 5/8 x 10" bolt will slip into place. Install the bolt and lock nut in the starboard hull.

After the bolt is in place in the starboard hull, install and tighten the 2 clamps that go over the tube and hold the tube to the starboard hull. Then install the 2 clamps on the port hull, but leave them loose. Get the nuts started, but leave ½" of slack.

They should be loose enough to allow the tube to slide thru the port hull, but secure enough to keep the port hull from flopping around while the rear tube is being changed.



At this point, things should look like this.

Rear Cross Tube

Remove all the hardware from the 16' 9" rear cross tube, except for the 23 trampoline studs shown above. When the rear tube is rotated correctly, these studs will pass thru keyway notches in the port deck. Pay strict attention to how the hardware fits on the tube, so you can get it all back together properly. (There will be some photos later to help out).

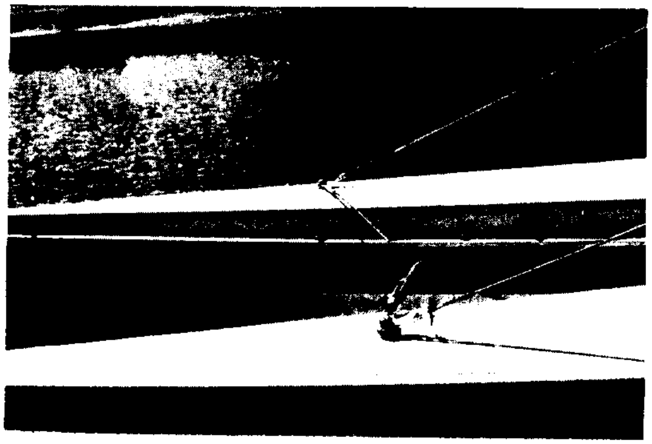
The tube is heavy and getting it in requires some muscle. Watch your fingers! You will need about 17' of clearance on the port side of the port hull.

Slip the short shipping tube out thru the port hull. Install the rear tube thru the outboard hole in the port hull, thru the port hull and on thru the starboard hull. If you don't have a wide dock or 17' of clearance, tie a line to the stern and push the stern out about 8'. You can then start the rear tube into the hull. Once it is started, pull the stern back against the dock and push the tube on through.

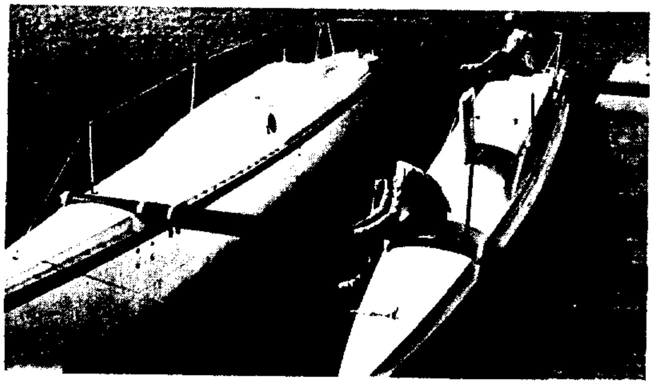
Install the 5/8 x10" bolt thru the starboard hull saddle and tube. Install and tighten the starboard hull clamps. Install the port hull clamps but don't tighten them. (Follow the same procedure as with the front tube). Note that the inboard rear tube clamps are extra heavy. These must always go on the inboard side of each hull, where the rear cross tube loads are greatest.

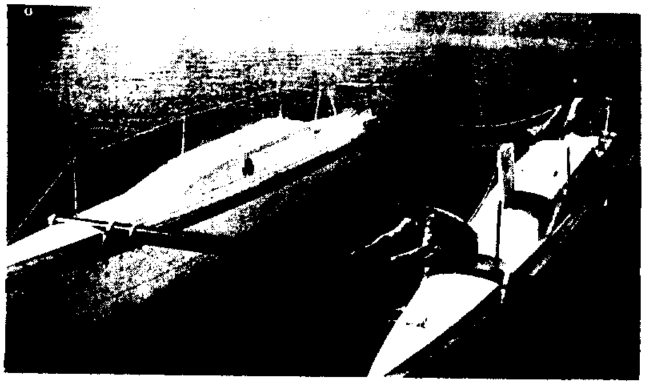
You now have a boat that looks like this.

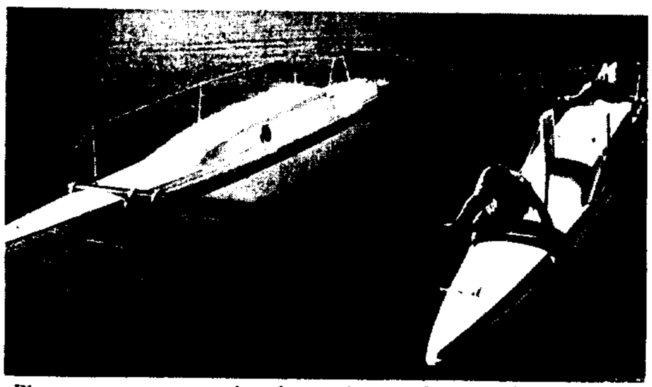
Opening up the boat



Connect the forward safety net wire as shown in the photos to keep the nose from opening too far. Secure about 5 threads at each end of the turnbuckle. (The turnbuckle and wire end will be connected to the deck at the factory).





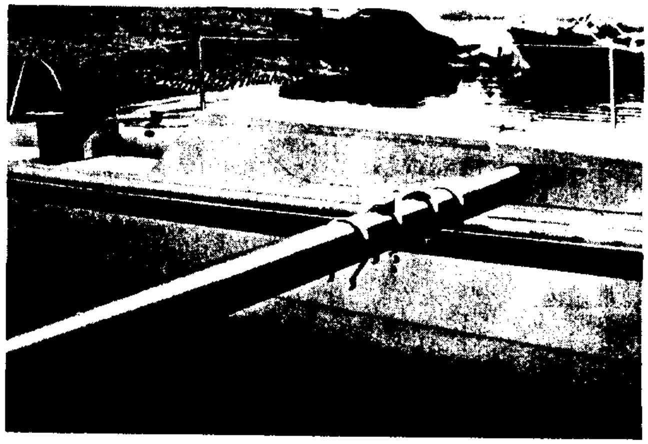


Place a man over each tube as shown above and push on the tubes to open up the boat. It will go easily. Don't go too far. Keep the hulls parallel to avoid binding.

When the scribe lines on the port hull saddles align with the port end of the tube, install the 5/8" x 10" bolts thru the saddles and tubes and tighten down the clamps that hold the tubes down into the saddles.

Install the Center Tube

Remove all hardware from the center tube. It is not necessary to remove the trampoline track. There are keyway slots cut into the port hull to permit the tracks to pass thru the hull as the tube goes thru the hull.



After the tube passes thru the port hull, but just before it goes into the starboard hull, slide the 2 shroud rings and 2 mast hinge rings on the tube so they will end up as shown in the photo.

Finish sliding the tube into the starboard hull and secure it with 2 5/8 x 10" bolts in the port cabin and 2 in the starboard cabin.

With a little practice, 2 men can do everything up to this point in from 30 minutes to 1½ hours. The first time thru, go easy, think about what you are doing, and allow most of a morning.

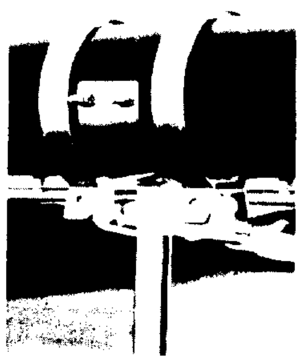
We provide a tube of silicone sealant with the boat. Put a good bead of sealant around each clamp bolt where it enters the deck, and seal the head and nut end of each 5/8 x 10" saddle bolt.

Dolphin Striker Assembly

The dolphin striker carries the downward thrust of the mast. The post bolts to the center cross tube with 2 ea. 3/8 x 8' bolts and lock nuts. The nut end goes toward the rear of the boat.

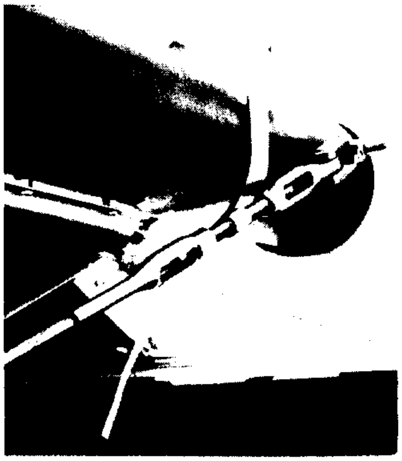
The wire terminals and turnbuckles bolt to the cross tube with 5/8 x 10" bolts and lock nuts. Tighten these cables, but not tight enough to bow the cross tube up in the center. They should have equal tension. Put cotter pins in the turnbuckle.

The cables should lay beside each other in the saddle at the bottom of the post, and should be held in place with a ¼ x 2½" bolt and lock nut. This series of photos shows how the assembly looks when you are finished.

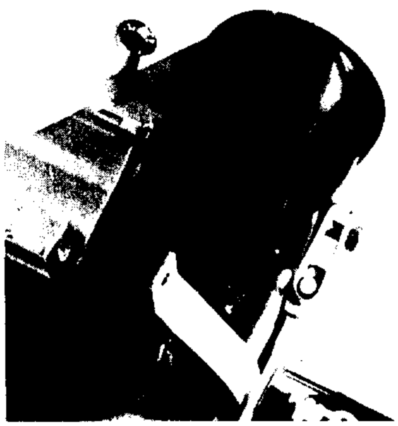


Port side - looking down

Port side – looking up



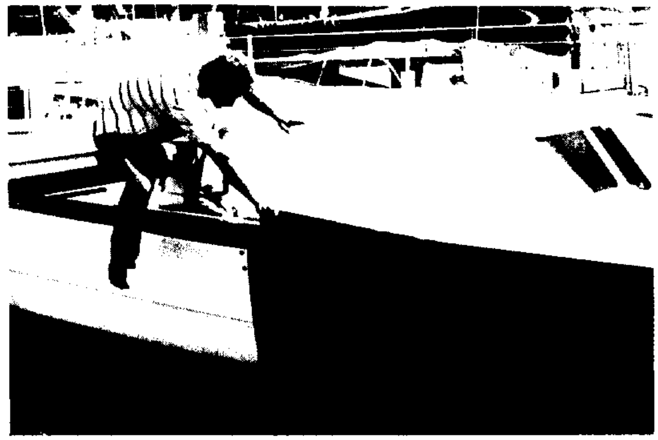
Starboard side – looking down



Starboard side looking up

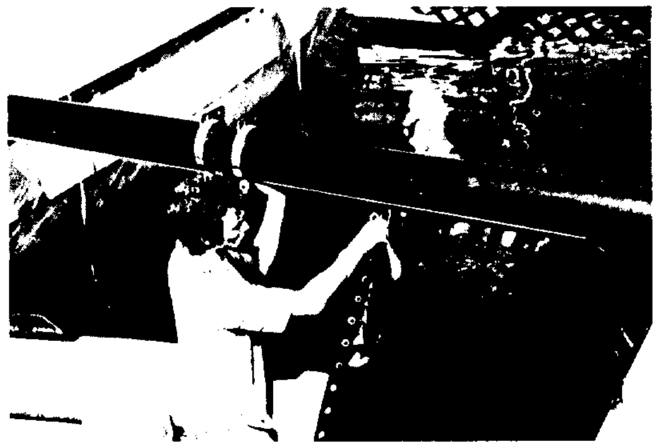
Trampoline

The notch in the corner of the trampoline goes to the forward outboard corner, and the exposed seam edges go down.



Slip the outer edge of the trampoline into the slotted track. Start at the rear and work forward. Have one person feed the roped edge into the track while another pulls at the forward edge.

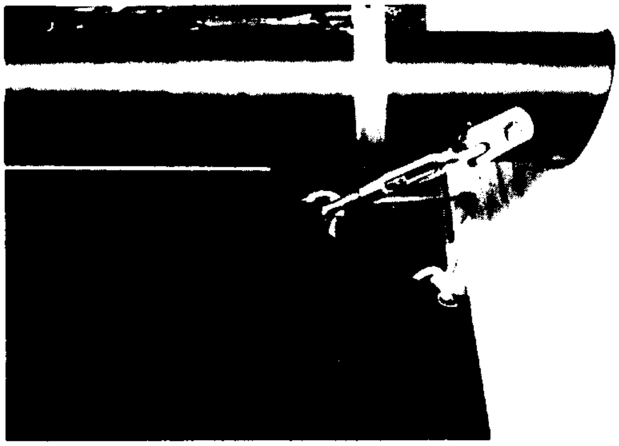
If you need some power to pull the trampoline thru the track, tie a line to the forward outboard grommet, pass it under the center cross tube, back over the tube and to the genoa winch.



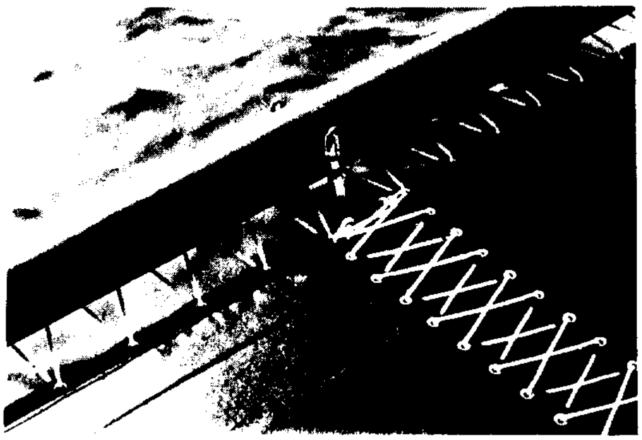
Next, slide the forward roped edge into the track on the center cross tube.

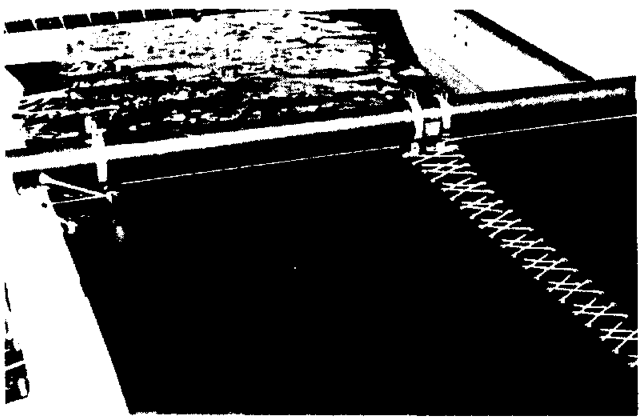
Install the port side in the same manner.

Lace the rear edge with a 40" length of 5/16" line as shown in the photo.



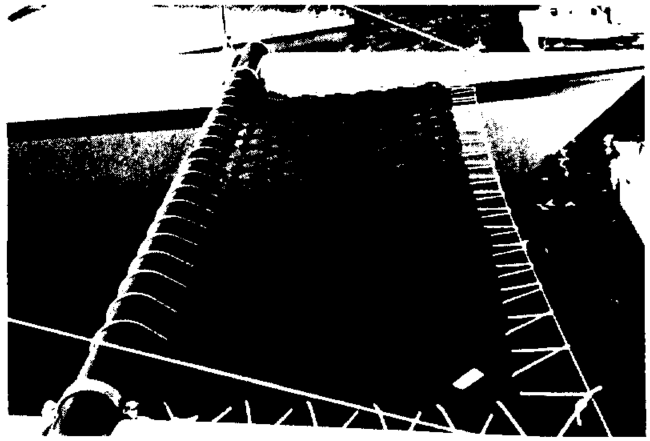
Tie the forward outboard corners with 5' length of 5/16 line. Tighten these lines really tight.



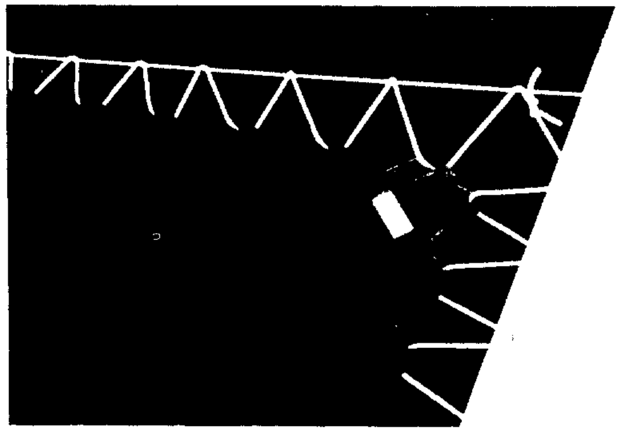


Using two 40' lengths of 5/16 line, lace down the centerline as shown.

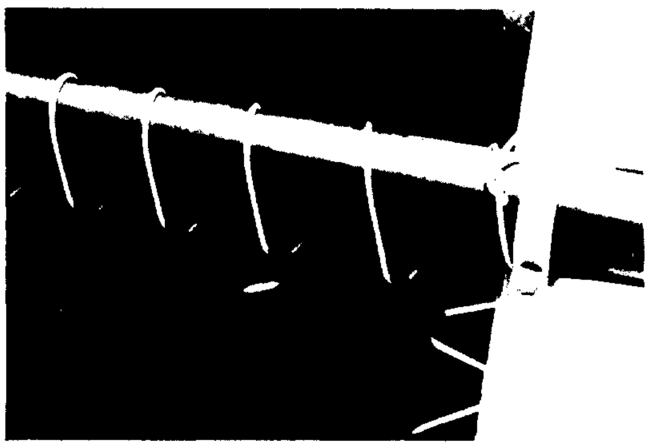
Now go back and really tighten all laces up tight.



Allow a small amount of slack in the safety net wire, and lace the net as shown above. The widest side of the net goes forward. The proper lengths of 5/16 line are shown below. Side 9'; front 22'; rear 40'. Make sure the lower forestay ring is in the center of the tube and lacing.



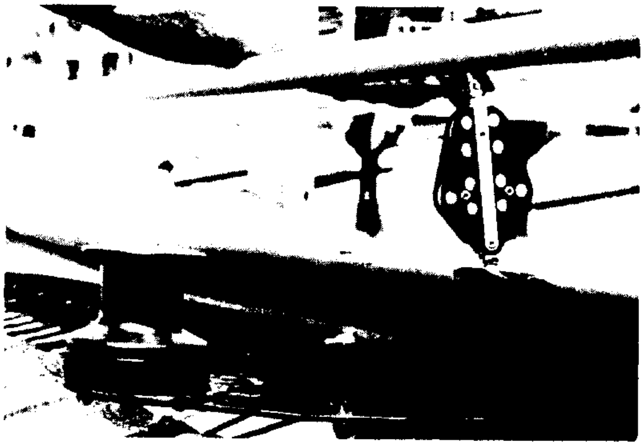
This photo shows the front starboard corner. Both front corners are tied off like this.



This is the way both rear corners are laced. Use square knots at all four corners.

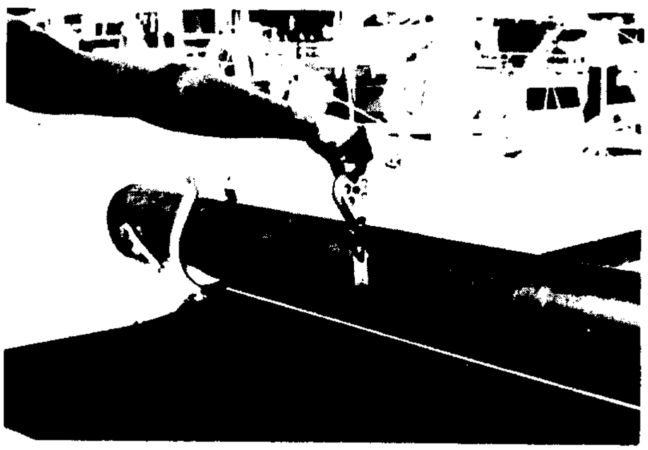
Now go back and tighten up all lines. Try to center the net. To finish off, tighten the turnbuckle fairly tight. Over the years, watch the trampoline and safety net ropes for signs of wear, and replace them as necessary.

Mainsheet Blocks



The mainsheet block , attached to tang , bolts to the center of the rear tube, as shown, with a 1/2" x 8" bolt.

Jib Fairlead Blocks



The port and starboard jib blocks and tangs bolt to the center cross tubes with 1/2" x 8" bolts.

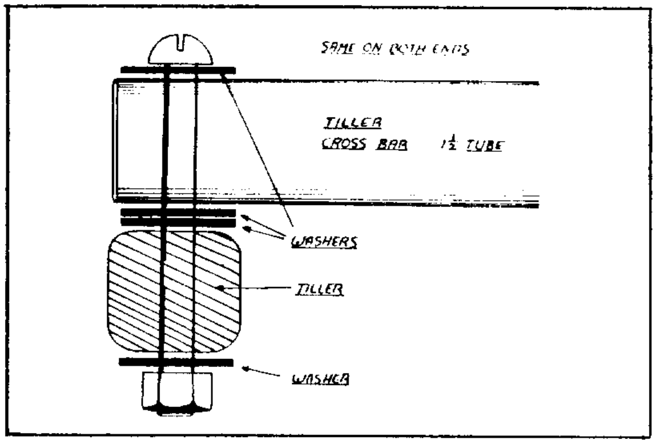
Genoa Fairlead Blocks

Tangs for the genoa blocks attach to the rear tube in the same manner as the jib fairleads. The tangs stay on the tube, but the blocks are moved back and forth from center to rear tube as you switch from jib to genoa.

Centerboard

A 3/8" pin holds the board in the full up position. It will stay where you leave it in most other positions. The head of the board should not go more than 3' below the deck level. Tie the line to the cam cleat eye to keep it from going beyond 3' down or from coming out of the top of the trunk.

Tiller Cross Bar

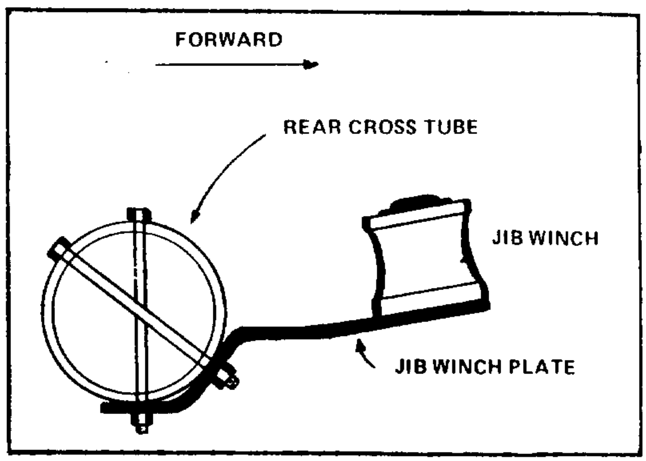


Use a 3/8 x 4" bolt and lock nut. 2 washers go between the tube and tiller, and a washer goes under the head and under the nut.

Jib Winch

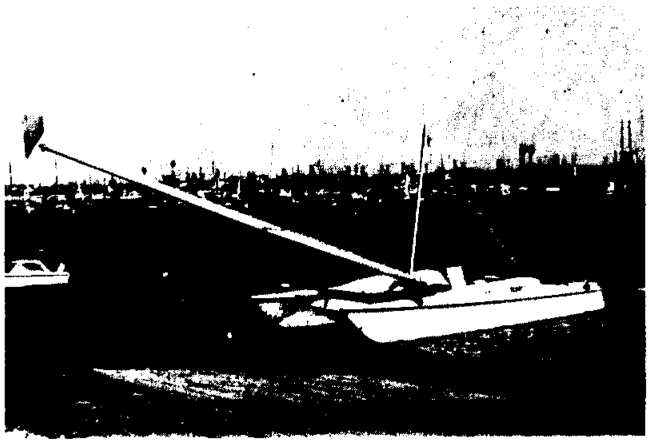
The jib winch and its plate bolts to the underside of the rear cross tube on the center of the boat. Use 4 each 3/8" x 8" bolts and lock nuts as shown.

The jib sheet leads from the winch to the cam cleat on the windward cockpit seat.



Raising the mast – Summary

Stepping a 44' mast on any other sailboat is a monster job, usually requiring a crane. The cat is engineered so that the mast can be raised and lowered easily, even when the boat is underway, using only the hardware that is permanently installed on the boat. It is quite possible and practical to lower the mast to get under low bridges, giving the boat versatility that most sailboats don't have.

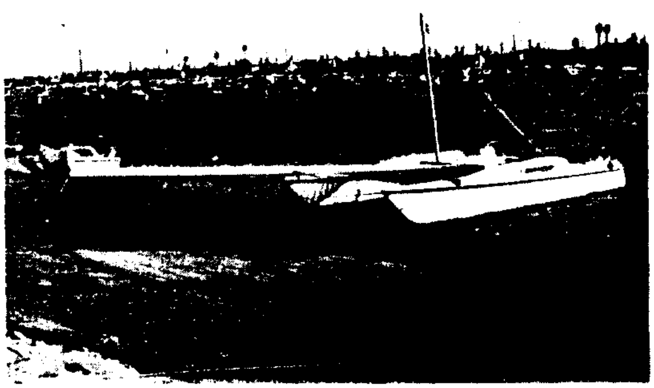


In summary. The system works like this: The mast base and main shrouds are attached to rings that go around the center cross tube. Since the mast base and side shrouds rotate on the same axis, the shrouds stay tight and provide total sideways support whether the mast is up, down or anywhere in between. All that is left is to provide fore and aft control.

The lower shrouds go from the mast, at the spreaders, to the end of the boom.

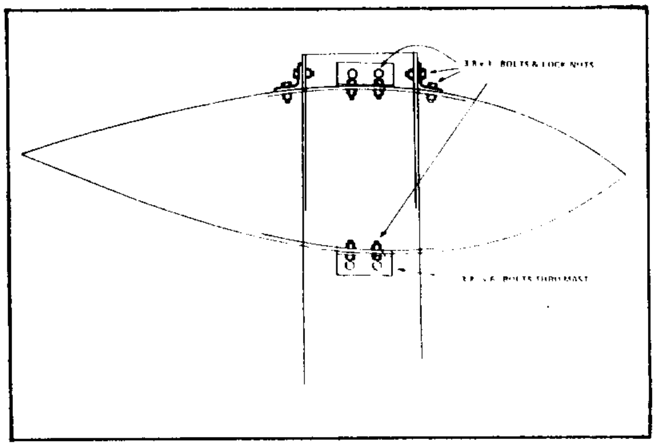
The mainsheet system goes from the end of the boom to the rear cross tube. To raise the mast, simply wrap the end of the mainsheet around a jib winch and start cranking. The end of the boom will be pulled down and to the rear, and the lower shrouds will pull the mast up with the boom acting as a lever. The forestays are left connected so the mast cannot go too far aft. When the mast is up, simply connect the backstay and rear lower shrouds and you are on your way.

Here are the details of each step:



With the nose of the boat on the beach, and secured so it won't drift away, carry the mast to the boat so that the foot of the mast is at the center of the center cross tube, and that the mast lays along the fore and aft centerline of the boat with the masthead way out in front of the boat. At this point, it would be best to have something on the beach to set the mast top on (a chair, car top, trash can, anything solid) so that the mast can be bolted to the center cross tube without it laying on the forward cross tube. At this point make sure the sail track side of the mast is up. You will feel pretty stupid if the mast goes up and you find that it is backwards.

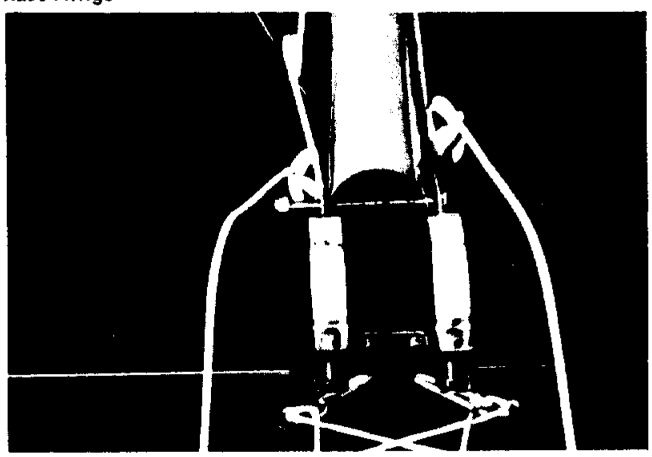
Mast Float



Masthead Float

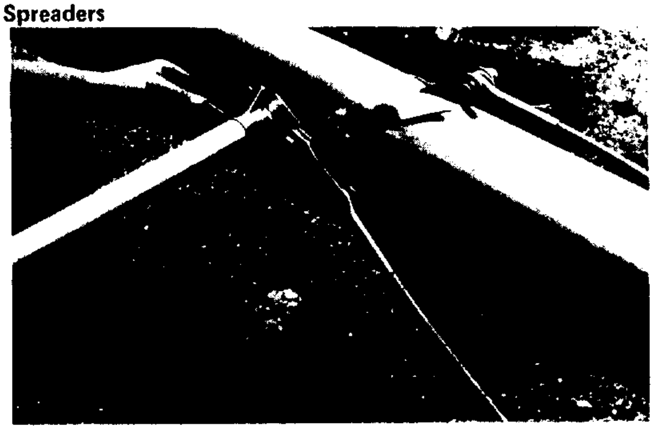
The mast float slips over the mast and is held in place as shown in the drawing. There is a top and a bottom. Make sure the nose tips down, not up.

Mast Hinge



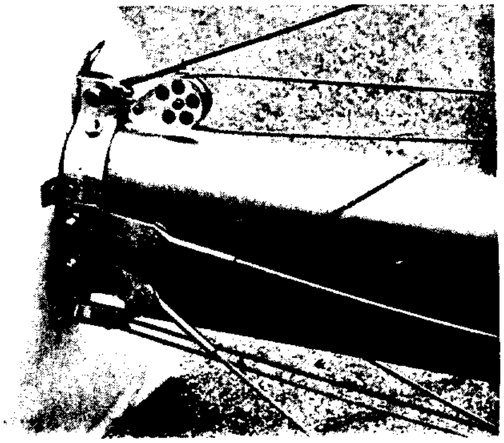
Bolt the mast base to the mast hinge rings with 5/8"x6" bolts and lock nuts. ½"x2½" bolts and lock nuts clamp the rings to the main cross tube as shown. Don't tighten these tight, because the rings must rotate on the tube when the mast goes up.

Spreaders

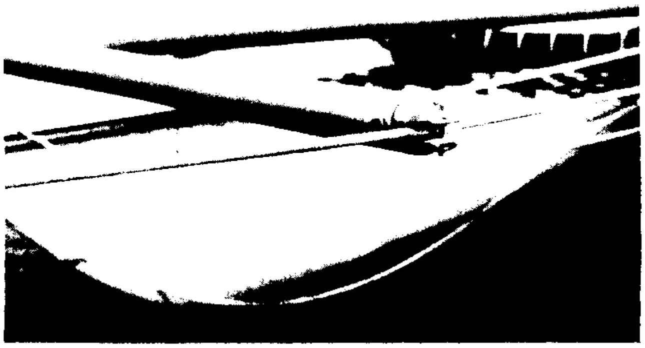


The spreaders are held in their sockets with ¼"x2" bolts and lock nuts.

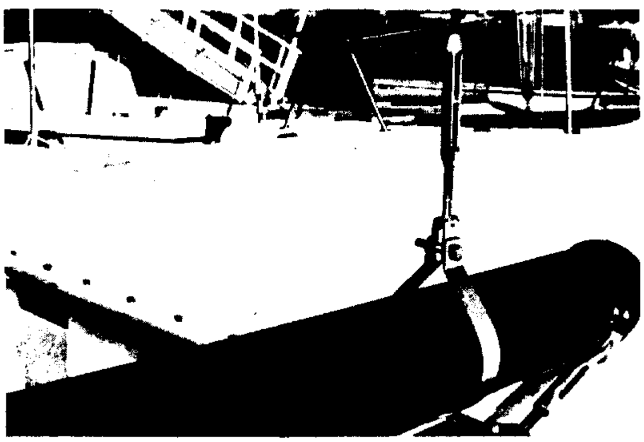
Upper Shrouds



The upper shrouds attach to the straps at the masthead, as shown, with ½" clevis pins and cotter pins.



The shrouds pass over the spreader ends and are held in the spreader tips with #10x1½" bolts and lock nuts. The nut goes on the aft side of the spreader. It is a good idea to tape and pad the spreader tips to avoid wear and tear on the genoa.

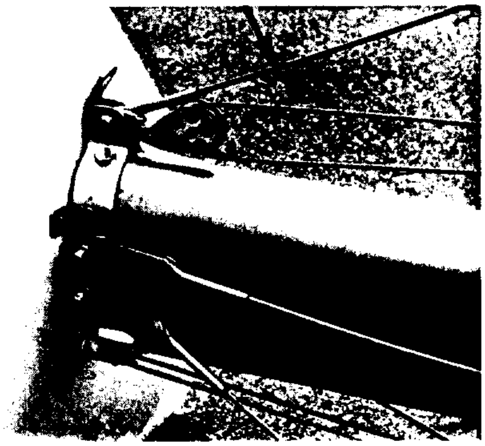


The bottom ends attach to the shroud rings on the center cross tube. Make sure the shroud rings are just outboard of the rails. These rails prevent the rings from sliding toward the center of the boat. Tighten the ½x2½" bolts so that the bolts go thru the lock nuts, but loose enough so that the rings are free to rotate as the mast goes up. Tighten the turnbuckles so that the mast is straight and lays exactly down the fore and aft centerline of the boat. The shrouds must be snug, but not piano wire tight. The mast will be properly centered if the same amount of adjustment is taken up on each turnbuckle.

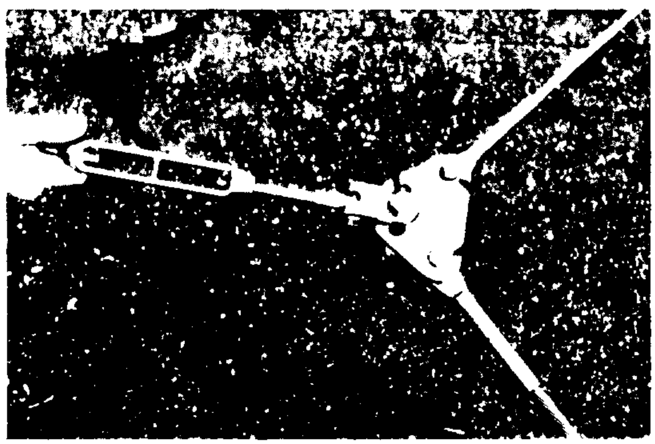
Forestay Bridle

The forestay bridles attach to the bow of the boat with ½" clevis pins and cotter pins.

Upper Forestay

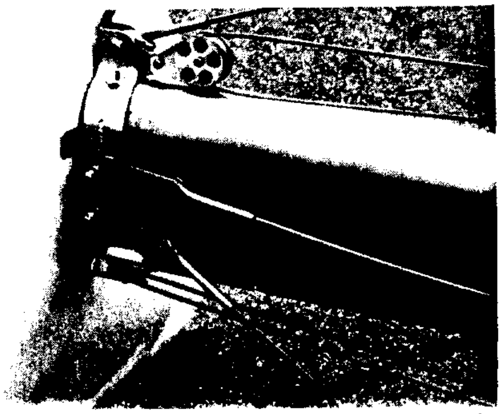


The top end of the upper forestay attaches to the masthead with a ½x 2½bolt and lock nut.



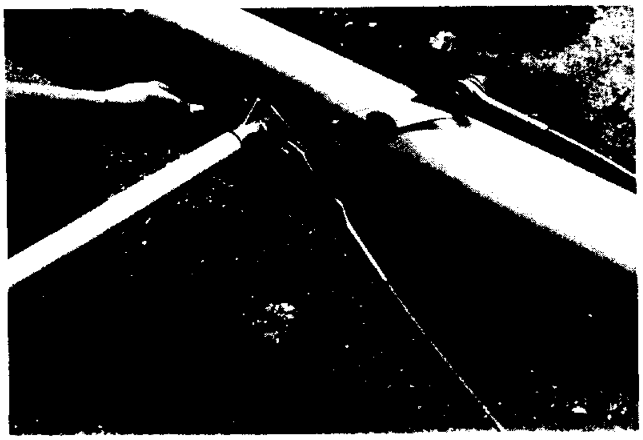
The other end and the forestay bridles attach between the two bridle triangles as shown with ½x1½" bolts and lock nuts. Tighten these fasteners tight. Make sure at least 2" of threads are engaged in the turnbuckle barrels.

Backstays

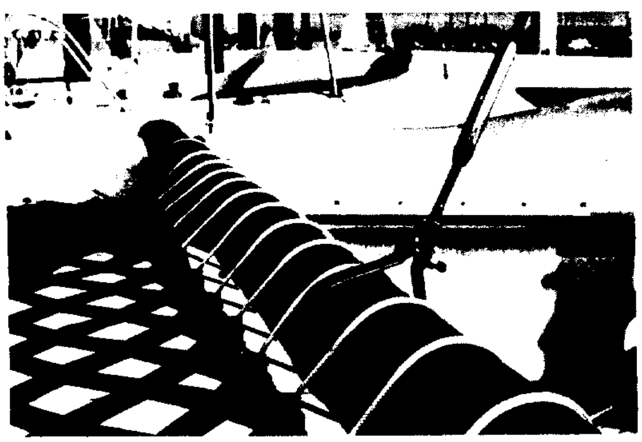


The two backstays attach to the masthead, as shown, with ½" clevis pins and cotter pins. The other ends hang loose until the mast is up.

Lower Forestay

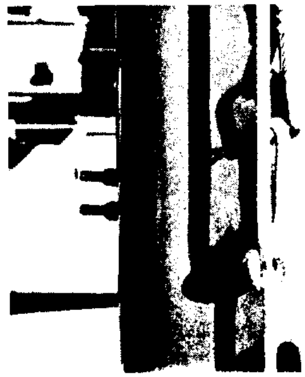


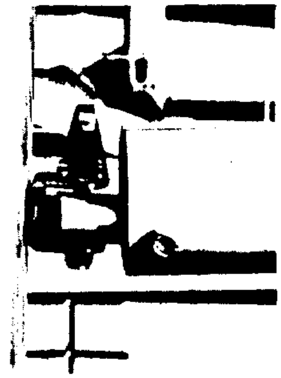
The top end bolts to the lower forestay straps, as shown, with a ½X2½" bolt and lock nut.

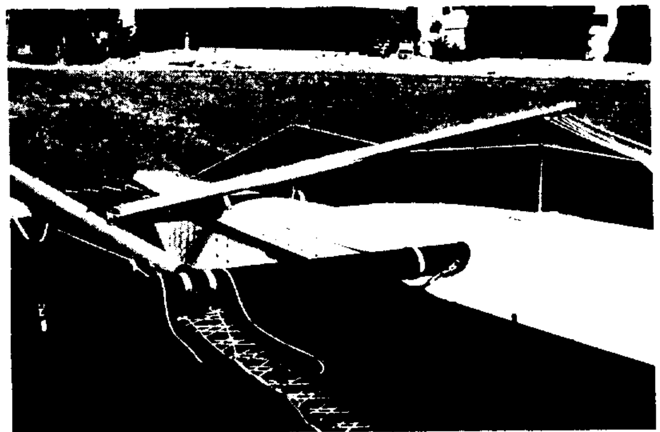


The lower end bolts to the ring at the center of the forward cross tube with a ½"x2½ bolt and lock nut. Open the turnbuckle so that 2" of thread is engaged in each end of the turnbuckle barrel.

Gooseneck

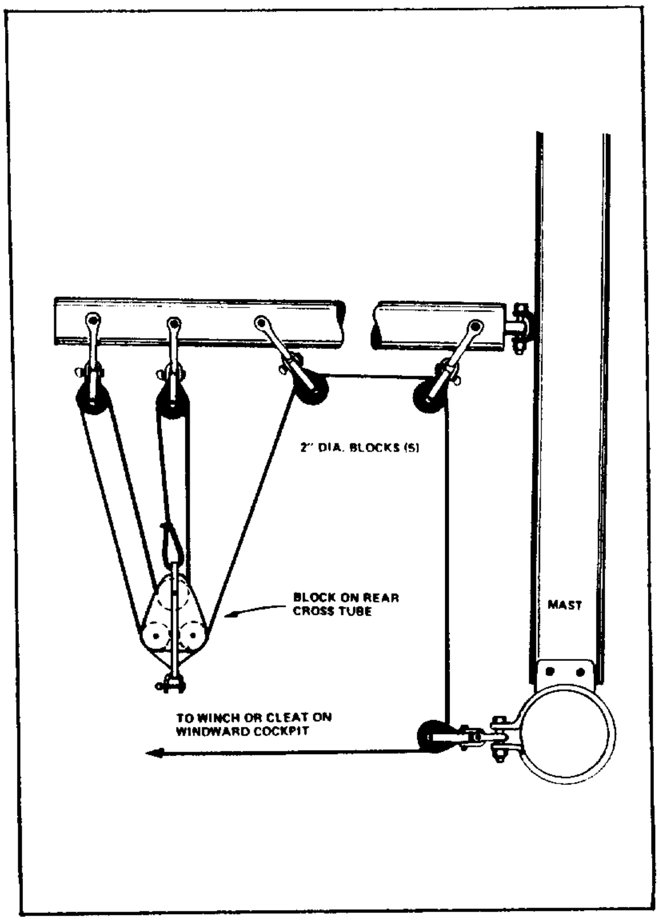






Connect the boom to the gooseneck with a ½x3" bolt and lock nut. Lay the boom over the starboard hull. The mainsheet blocks should point aft.

Mainsheet

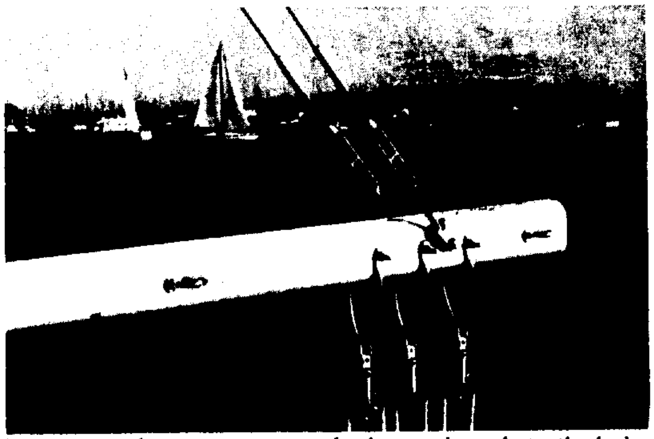


Route the mainsheet as shown.

The mainsheet provided with the boat is 100'long, which is not enough to reach the end of the boom when the mast is down. You will need 150' of 7/16 or ½" line for this job. (using 150' of mainsheet would make the boat look like a snake farm) If you plan to go under a lot of bridges, use a 150' mainsheet and learn to live with the excess. Otherwise, use your anchor line as a mainsheet for raising the mast.

Lower Shrouds

The lower shrouds attach between the double straps just below the spreaders. Use ½" clevis pins and cotter pins. See the spreader photo on page 8.



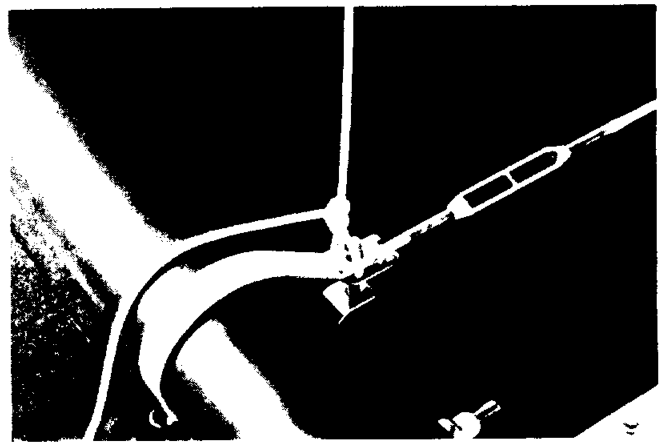
For raising the mast, connect the lower shrouds to the hole near the end of the boom with a ½"x6" bolt and lock nut, as shown. Adjust the turnbucklesso 2" of thread is engaged in each end of the barrels.

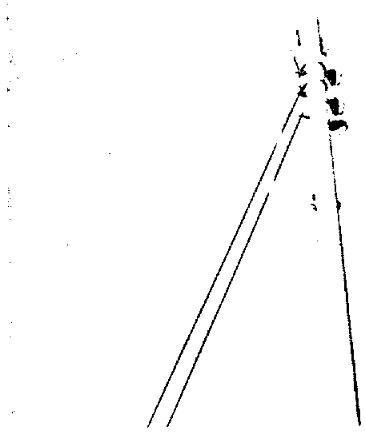
Main Halyard -Jib Halyard

The shackle end of the wire comes off the aft end of the block. The wire and rope tail come down the mast beside the sail feed track (aft of the spreaders) and cleat to the lower starboard cleat.

The jib halyard block attaches to the ½" bolt that holds the forestay to the masthead. The shackle end of the wire comes off the forward side of the block. Wrap the tail around the winch and cleat it to the port lower cleat at the mast base. Tighten and safety wire the shackles that hold the halyard blocks to the masthead.

Raise the Boom





Lift the boom so it points straight up. To hold the boom straight up, it is necessary to use a line from the boom end outhaul eyes to the port and starboard shroud rings. The lines will stay tight as the mast goes up. If the boom falls to either side, the mast will fall - tighten the lines tight. Adjust the lower shroud turnbuckles so the tension is equal on both shrouds.

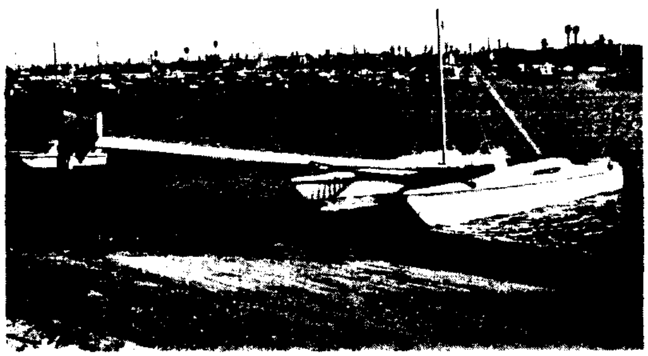
Pull the mainsheet tight, pulling the boom hard against the lower shrouds. Wrap the mainsheet clockwise around the jib winch and cleat it securely.

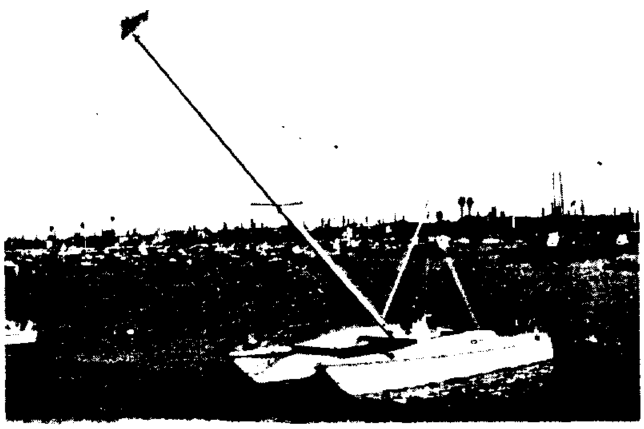
Check over everything. Make sure all bolts are secure, all cotter pins are in place, and properly bent, turnbuckles are engaged properly and cables and halyards are located properly. Make sure that shrouds, forestays, backstays and halyards are run properly and not messed up so that a trip up the mast in a bosn's chair is necessary to realign things. Be particularly careful to see that halyard, halyard tails and backstays are on the proper side of the spreader. Double check the forestay connection.

Raise the mast

Take at least 3 wraps of the mainsheet around the jib winch and start cranking. The winch gives extra power when cranked counter clockwise. Have one person tailing and one person cranking. Don't stand under the boom or mast as it goes up.

The very worst loads are at the beginning. As the mast goes up, the load gets less and less, until they are zero when it reaches vertical. When it gets near vertical, the weight of the boom will tend to pull it full up and against the forestays.



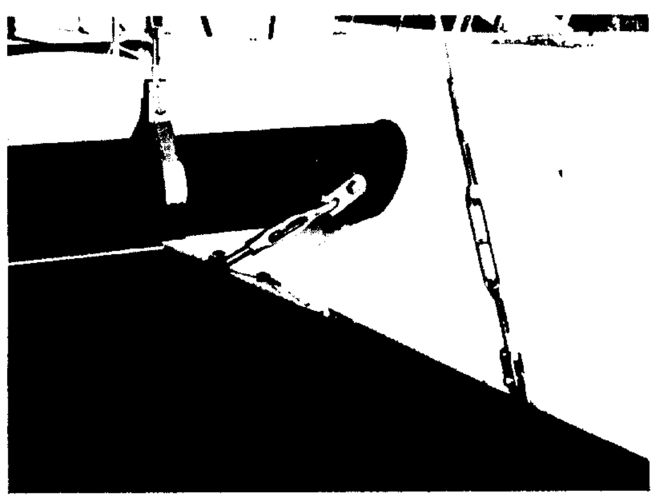


At the start, raise the masthead about one foot and have someone bounce it a bit to check the strength of all of the connections. If something is not right it is best to find out now. Don't stand in line with loaded fittings or cables.

As the mast goes up, make sure all rigging is free. It is easy to have the backstay, lower shroud or virtually anything hook up under the boat or on a fitting. If you keep cranking under such circumstances, something may fail.

When the mast is up do not release the mainsheet until at least one backstay is hooked up. Pin both backstays and forestays with clevis pins & cotter pins.

Connect lower shrouds



Connect the lower shrouds to their chainplates with ½" clevis pins and cotter pins.

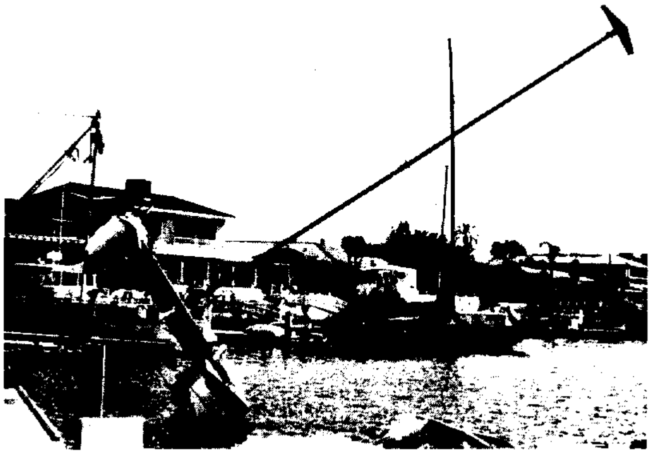
Lowering the mast

To lower the mast, reverse the process. Gravity is on your side. Keep at least 2 wraps of the mainsheet around the jib winch and ease it down. You will never be able to hold the sheet without at least 2 wraps on the winch. Remember the load gets worse as the mast gets lower. To get the mast started down, it will be necessary to have someone pull on the forestay.

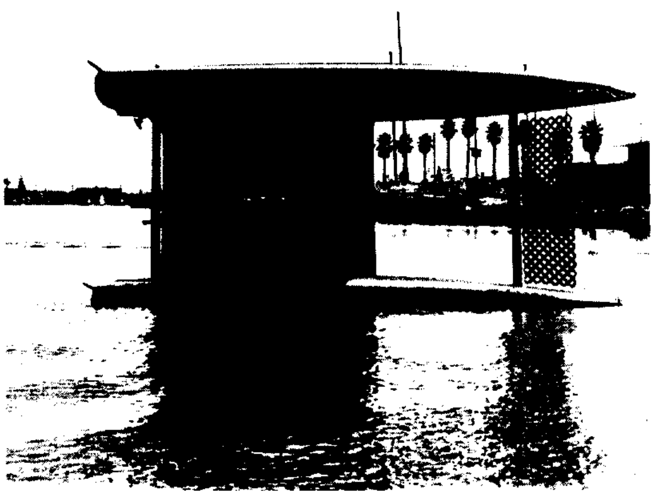
Don't let the initial light loads fool you. Keep those wraps on the winch or expect a big unpleasant surprise as the mast gets lower.

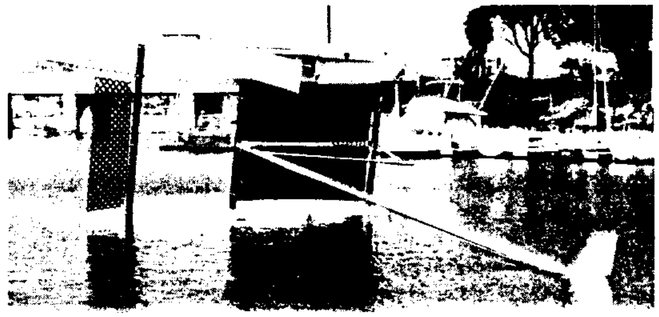
CAPSIZE AND RECOVERY

In the unlikely event of a capsize, here is the procedure for righting the boat and getting under way again.



These photos show how we flipped the boat with a crane. The 1st photo shows the boat just before it reached the balance point and started to fall on its own. The second shows the masthead at impact. With the sails on, it hits with less impact. In a typical sailing capsize, if there is such a thing, forward speed is usually very low by the time the masthead hits. If the boat looks like it's going to capsize, the crew should slide to the lower side rather than try to hang on to the upper side and risk a rather long fall later.



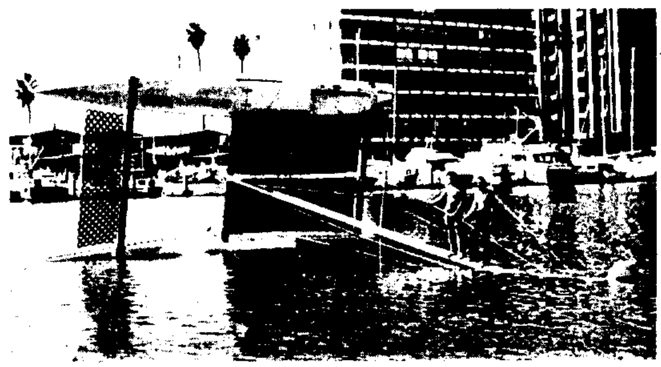


Stay with the boat. It is going to float and will provide a stable platform. The lower hull will flood about 60% full.

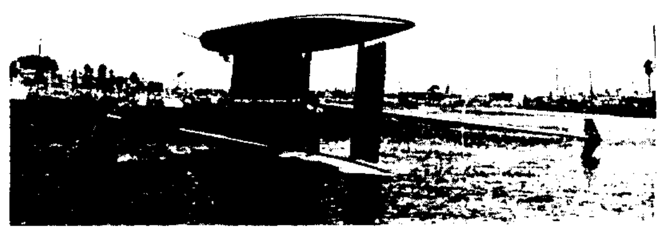
Release the halyards and pull the mainsail down the mast and pull the jib down the forestay. Let the sails hang in the water. They will serve as something of a sea anchor, and keep the boat from sailing away suddenly when it is back on its feet. Removal of the sails will make the boat much easier to right.

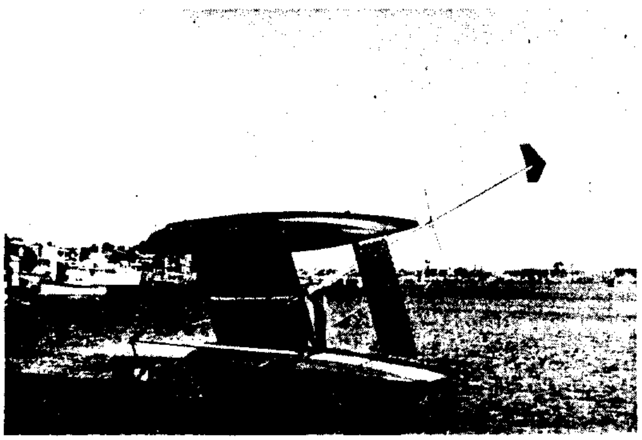
The float system should provide protection in most capsizes. However, there is a possibility that a capsize can be so violent (particularly a wave induced flip) that a mast failure could result, or the boat could be forced completely over. In the vast majority of multihull capsizes, the rig stayed intact, probably because the boats are light and the rigs didn't have to contend with having to stop the enormous inertial loads of a massive keel as the boat goes over. If the boat goes mast down, it will stay afloat, but you will need outside help to right it.

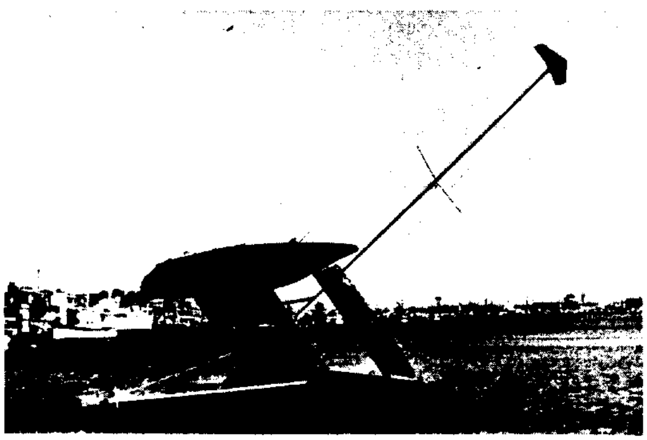
If the boat is on its side, and the weather is really nasty, the upper hull will provide dry shelter until you are ready to right the boat.

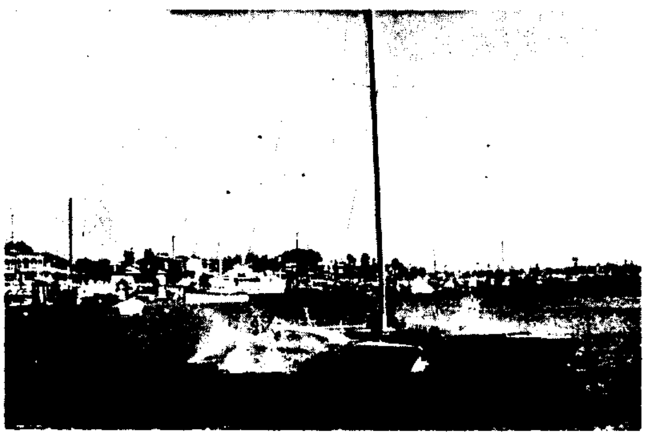


Note that a considerable amount of reserve buoyancy remains even with substantial load near the mast head.









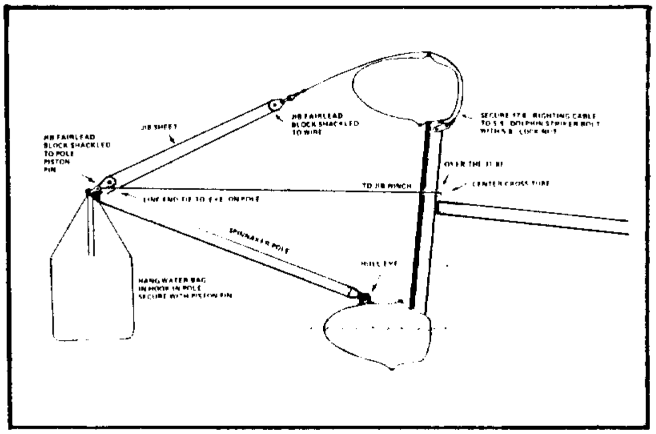
This series of photos shows how the righting system works. The bag, which is an extra heavy sail bag, holds enough water to bring the boat up.

Here is the procedure: Hook the spinnaker pole to the eye on the boat and lay it along the hull. (the photo shows it extended).

Connect the 17' 6" righting wire to the top dolphin striker bolt as shown and throw the other end over the top hull (but under the lifelines).

Connect the water bag to the pole as shown and swing the pole out at a right angle to the boat.

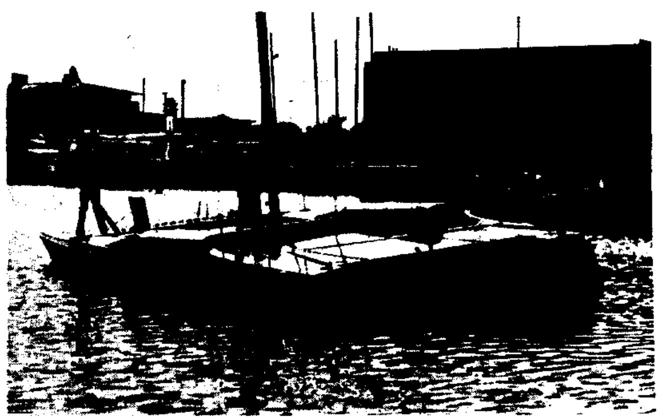
Tie off the pole so that it cannot swing forward or astern.



Dip the bag in the water a few times to get it full of water. Wrap the line around the jib winch and start cranking the pole up. Push the hands away from you (if the handle comes out while you are pulling toward you, you may get it in the teeth).

At first, the winch cranking will not be particulary easy. As the boat goes up, the load will get less, until it can be pulled without the winch. Waves will help. As each wave lifts the masthead, take up the slack on the line. As the boat falls back on its feet, simply step from the hull to the trampoline and you will end up standing on the boat and not floating in the water. (Note that our fearless crew did not so much as get their feet wet.)

Caution: try not to stand in line with loaded lines or in the direction something will fly if anything lets go.

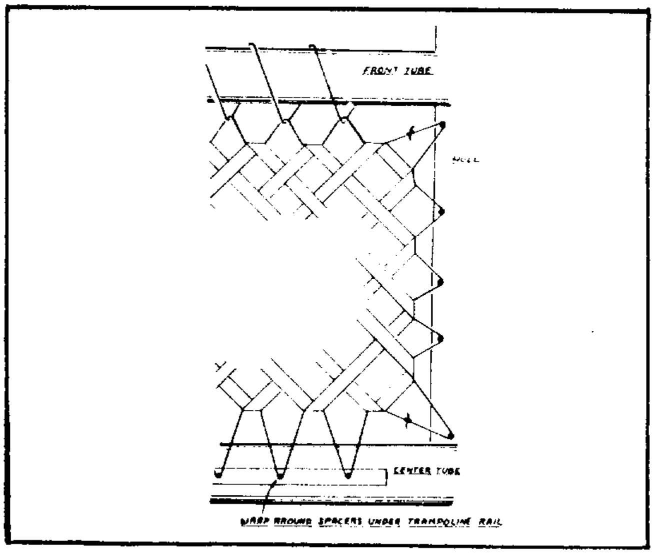


When upright, the hull that was on the lower side will be flooded. Remove the bailing plug just below the bunk level. The foam under the bunks will force the hull up and the water out. The boat will rise by itself from the rather unwholesome looking level of the first photo to the high and almost dry position in the last photo in about 10 minutes, without your having to lift a finger. If the seas are rough, close the hatches to keep new water out. The other hull should stay dry.

There will be some water in the walking area between the bunks that will have to be bailed out manually. It will take 1 man and a bucket a few minutes. The amount is small and the boat will sail well even before this water is removed.

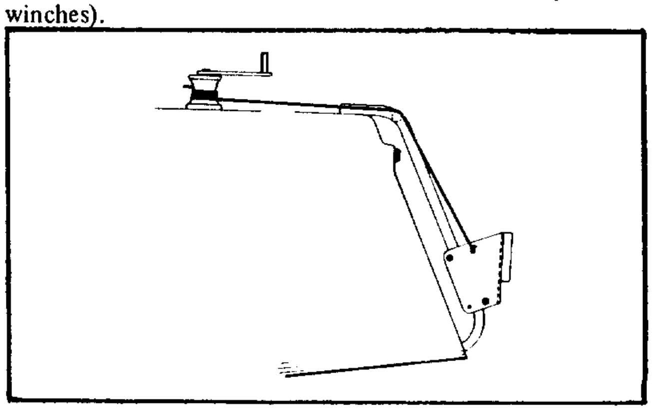
The attitude in the final photo of the series is where the hull will normally end up floating, even if the hull is punctured.

Intermediate Safety Net
The net is laced as shown.



Outboard bracket

These photos show the bracket in the up and down positions. A 12' length of 3/8" line ties to the center of the 3/8" bolt that goes across the top of the black bracket. The line passes over the top rung of the ladder and goes to the spinnaker winch on the starboard rail (or to a smaller winch that we provide if spinnaker winches are not ordered). The bracket will take a 25 h.p. outboard. We recommend a 20 h.p. electric start and remote control mercury with a 9" propeller with 7" pitch. The control box, with choke gearshift, ignition and throttle, bolts to the seat back just forward of the helmsman (and forward of the spinnaker winches).



In smooth water, a 10 hp will give you about 7 mph, and a 20 will give about 10. It doesn't take much power or fuel to run along at a good clip.

Spinnaker

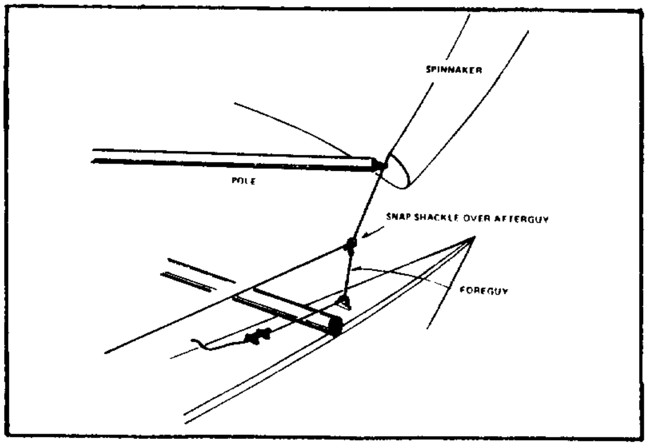
The spinnaker halyard swivel block (with stainless steel cheeks) shackles to the strap that protrudes forward from the masthead fitting.

The halyard (90' of 3/8 line) cleats to the port side of the mast, just above the jib halyard winch. A snap shackle is attached to the other end (with a bowline or a good splice) to receive the head of the sail.

The fairlead swivel blocks (also with stainless steel cheeks) shackle to the eyes on the rear decks, just forward of the rear cross tube. The sheets (2 each, 75' of 3/8 line) lead from the spinnaker winches on the rail, thru the blocks, outside of the lifelines and to the sail. The lines connect to the sail with bowlines.

The topping lift block, a 2" diameter swivel block with black aluminum cheeks, shackles to the same bolt that holds the lower forestay to the mast. Make sure the block goes between the mast straps. One end of the topping lift (a 45' length of 3/8 line) cleats to the mast on the starboard side just above the main halyard winch. Tie or splice a snap shackle to the other end to pick up the ring on the pole bridle.

The only thing unusual about this set up is the double foreguy, which serves also as a very effective and greatly simplified reaching strut. It is rigged as shown in the drawing. There is a 10' length of 3/8" line, with a snap shackle, through the eye on each foredeck. The snap shackle is snapped over the after guy (spinnaker sheet) on the windward side of the boat. When the boat is reaching, the foreguy is pulled tight to draw the afterguy downward and outward. This keeps the pole from climbing up and acts in the same manner as a 10' long reaching strut to eliminate most of the load on the pole.

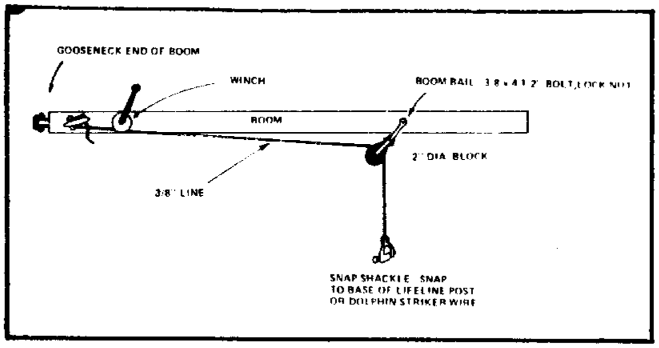


When running, release the foreguy just enough to keep the pole from sliding too far aft on the afterguy.

Reaching with the chute can be really hairy if there is much wind. When it is necessary to carry the pole forward of the windward bow, drop the chute and use the genoa. You will go faster and the risk of capsize is greatly reduced. If you have any doubts as to whether or not to carry the chute, don't carry it. This goes along with a general theory that the best time to shorten sail on a cat is when you just begin to think about it.

Vang

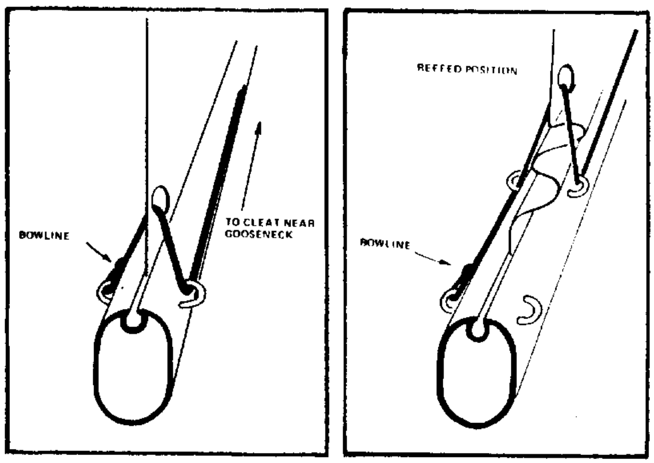
The boom vang is used to take excessive twist out of the mainsail, and to stabilize the boom when running down wind. The vang is rigged as shown in the drawing.



Sails

The sails are set in the same manner as on any conventional boat. 3 each screw pin shackles are provided to connect the halyard to the head of each sail and the tack of the jib to the holes in the forestay bridle.

The outhaul is rigged as shown in the drawing.



Reefing

To reef the main, release the halyard so the proper reef grommet (there are two reef levels) can be hooked into the gooseneck. Re-tension the halyard. Thread the outhaul line as shown in the drawing. To gather up the excess sail, use 3' long lines to tie thru the grommets along the reef position. These lines should be left loose enough so that there is no load on any grommet. All of the load should be on the gooseneck ring and the outhaul ring.

The jib has one set of reef points. Lower the sail until the reef ring can be shackled to the bridle plate. Re-tension the halyard. Tie the jib sheet to the reef ring at the rear of the sail and you are on your way. Use 3' lines thru the reef grommets to gather up the excess sail.

Jib and Genoa sheets

In order to reduce the amount of excess line on deck we use a double ended 90 foot continuous jib or genoa sheet. One end of the line ties to the clew of the sail with a bowline. The line goes aft, outside of the shrouds, through the jib or genoa fairlead block, across the boat thru the other fairlead block, then forward and around the shrouds and lower forestay. The end then ties to the clew of the jib or genoa with a bowline. As the boat tacks, the genoa pulls the excess line with it and reduces the amount of loose line that needs to be handled.

THE MacGREGOR CATAMARAN: DESIGN AND ENGINEERING

The following discussion will be divided into 3 sections. The first deals with why we selected a multihull rather than a ballasted monohull.

The second describes why we are building a catamaran, and not a trimaran.

The third section explains why we chose the existing design over the many other possible catamaran configurations.

WHY A CATAMARAN AND NOT A BALLASTED MONOHULL?

1. SPEED

We set out to build the fastest production cruising sailboat, and we now have it. The speeds attainable by this craft under power or sail are not attainable with any existing production monohull configuration.

Nathaniel Hershoff once wrote the following passage: "To me, the pleasure of sailing is almost in direct proportion to speed."

Monohulls suffer the major disadvantage of hull speed limitation. They are rarely able to sail over the enormous bow waves that they create, and, are thus limited to the speed of the wave system that they generate, about 7 knots for a 36' boat.

There is much talk of the "hot" or "superfast" IOR racers. The fact is that even the best of these boats are fast only in relation to their ratings. Basically, they remain slow. . .often slower than similar sized boats designed years ago. For example, the first to finish honors among monohulls, in west coast racing, frequently go to the Virginia, a 45' sloop designed and built in 1913.

There is nothing in the sport of sailing to match the exhilaration of literally flying across the water at speeds in excess of 20 knots, or the pleasure of sailing close into the wind at speeds twice those attainable by conventional monohulls. Once catamaran speeds have been experienced, it is a rare sailor that will ever again be content with the performance of a ballasted monohull.

Even the most casual sailor will admit to the basic fact that when two sailboats are headed in the same direction, there is a race, and we figure that as long as that condition exists, you might as well have the fun of always winning, particularly if the boat will do it without extra work or without sacrifice of comfort.

Aside from the pure fun of sailing fast, and the pride of having a known flyer, there are some significant advantages of having a fast and easily driven sailboat.

Speed, under power or sail, makes it possible to reach cruising areas, or race areas that could otherwise not be reached within the time constraints of a typical weekend or limited vacation.

Speed can reduce exposure to unfavorable weather or sea conditions. A fast boat has a better chance of completing a passage within the limits of weather forecasts, or of effectively seeking port to avoid impending storms.

If caught in nasty conditions, a fast cat can effectively run away from the violence of breaking seas, with minimum danger of broaching, and with minimum danger of having a really big one break over the stern of the boat.

For leisurely daysailing or cruising, a fast, easily driven boat will make satisfactory speed with small, easily managed sailplans. With main only, or jib only, or reefed main and jib, a fast cat can equal the speed of most overcanvassed monohulls. Winch loads are less, and crew fatigue is reduced.

This type of reduced power sailing is effortless, comfortable and safe.

Although this is a sailboat, we also wanted a boat that is extremely fast under power. 10 to 12 knot crusing speeds in calm water are attainable with light weight, low horsepower, easily maintained engines. and fuel economy is sensational. Very few sailboats or motorsailers can reach these speeds under power.

Sailing is supposed to be an idyllic and leisurely sport, and one might logically ask why all this speed is necessary. However, since it is available with no increase in work, discomfort or noise, why not have it? Why settle for leisurely wallowing along, under sail or power, at 6 knots when you can just as leisurely slice along at 12 knots?

2. POSITIVE FLOTATION

The single most important safety issue is whether or not a boat will float if it is damaged or flooded. I have never been comfortable on the open sea in a boat that can simply disappear. I have no desire to bet my life on the adequacy of every thru hull fitting, hull fastener, keel bolt or plank. Nor have I any interest in playing Russian Roulette with unseen logs, oil drums, or other objects that could open a hull to the sea and sink the boat.

The yachting industry is somewhat in the position of the early aircraft industry, when it was considered necessary to add lead here and there in aircraft to compensate for basic design imbalances.

I have often considered the following: Suppose the past 150 years of naval architecture had concentrated on multihulls, to the same degree that it has concentrated on the ballasted yacht. Suppose that a designer now comes forth saying "I have the answer to the problem of safety. Let's hang tons of lead on the bottom of our boats." They would stone him.

There have been literally thousands of cases of ballasted yachts going to the bottom, often with catastrophic loss of life.

As a result, years ago, we decided that we would never build boats without sufficient reserve flotation to support the boat and crew. 15,000 boats later, we still think it was the smartest choice that we could have made. It is important enough that Federal law requires positive reserve flotation on all power boats under 20 feet.

Over the years, our competitors have occasionally bleated "If it were a good boat, it wouldn't need all that flotation." This is incredibly poor logic. Even the strongest of boats can be damaged or swamped, so why not have this extra insurance.

The positive flotation should make your insurance company a lot happier, since you will probably have something to tow home in the event of an accident.

This catamaran has 39 cubic feet of foam in each hull. The mast is also foam filled. This provides about 5000 pounds of positive bouyancy, more than enough for the boat, equipment and crew.

The foam is located in the area ahead of the front cross tube, and under the front bunks. Foam is omitted from the stern. (As will be explained later, the capsize recovery system precludes the use of foam in the sterns). Even so, if one hull is torn open and allowed to flood, the boat can still be sailed. If both hulls are damaged, it is possible for the capsize recovery system to keep the transoms at the surface and the boat afloat, right side up.

Foam is placed low in the boat. If one hull is damaged or flooded, the upward pressure of the foam's bouyancy will force water out of the hull drains located just below bunk level. The bouyancy of the stern of the undamaged hull can keep the stems up until the damage is repaired and the remaining water is bailed out. (Water below the level of the hull drain must be bailed out manually.)

If the hull is damaged on almost any other cat or tri, the hull will fill and sink to the level of the deck, or roll completely over under the weight of the deckhouse and rig. Most of these boats will stay on top of the water when flooded. They cannot be returned to sailable or liveable condition without outside help. They become as useful and habitable as a half tide rock.

As with most conventional boats, the decks and cockpits on the MacGregor catamaran are self bailing, and the hatches seal up to keep the spray and rain out of the hulls.

3. LEVEL RIDE

Even the dullest of sailors recognizes that it is a lot more pleasant to sail on a level boat than to sail on one's ear. Catamarans sail level, and monohulls, no matter how large, frequently sail at unmerciful angles of heel.

It is pure joy to set a beer can on the deck, or a pot on the stove, with the reasonable anticipation that it will stay put. Living, eating, sleeping and cooking are a lot easier when the floor, bunks and galley are level.

Cats have a total lack of cumulative rolling, the big misery suffered by monohulls as they run down wind with a spinnaker in a good breeze. Once the chute ocillations start and the boat begins to roll, it frequently gets worse until the rails are awash on one side and then the other. This is far less likely on a well designed cat.

4. LARGE DECK AREA

One of the major benefits of a cat is the enormous and comfortable deck area. Except in the most severe climates, the crew is usually sailing on deck except for cooking, sleeping and using the head. Even on the largest monohulls, the crew usually ends up crammed together in the cockpit. This cat offers about 600 square feet of deck space, more than most 70' monohulls. The crew can (and almost always does) spread out, and large crews can be carried without crowding. There is room for an inflated raft and all the other paraphenalia that accumulates. When racing with lots of bulky sails, there is room to keep them in their bags, tied on deck and ready for instant use, clearing out the cabins for use by the crew.

5. SAFETY ON DECK

A very high percentage of accidents and loss of life on sailboats involves falling overboard, or serious falls on deck.

The deck of a monohull is filled with hazards. Decks slanted at 45° can be treacherous. Sudden broaches can set the decks at 90° many times during a race or passage. Sails can go over the side, dragging crew members with them, and sudden and frequent violent deck angle changes can pitch slippery footed humans into lifelines, winches, vents and hard fiberglass corners, or off the narrow and unprotected bows.

A catamaran offers a lot better footing. The decks are usually level. The crew is not working at the extreme edges of the boat. Most sail handling is carried out on the trampoline and nets, not on a pointed bow. There is a lot of boat outboard of them that they have to clear before going over the side.

Sails tend to stay on the big decks when they come down. A fall on the nets is a lot less serious than a fall against hard fiberglass.

The trampolines and safety nets are strong and easy to walk on. They will support a small army. They offer blessed relief from hard fiberglass deck surfaces. They are easy to snooze on although it often is hard to keep a racing crew alert when they have a comfortable place to drowse and sunbathe.

6. SAILING COMFORT

In the search for comfort, many designers and manufacturers have gone wild on interiors. This catamaran is not the Queen Mary as far as interiors are concerned, and cannot match the roominess and exotic decor found in many of today's good monohulls. These interiors would be impractical on a cat, since the weight and bulk would slow the boat down to where it would have no real performance advantage over a monohull.

The cat interiors are simple, functional, and somewhat spartan. We have aimed at providing a warm, dry and comfortable place to cook and sleep, to get out of the wind and rain, and that looks inviting enough to be a pleasant retreat.

The most important function of an interior is to provide a quiet place for sound undisturbed sleep. Most monohulls require narrow bunks, at best about 21" wide, because, with all the rolling of the boat, a human in a large bunk simply flops around like a solitary bean on a plate.

In a cat, without the heeling and rolling, very large bunks are practical and desirable. The forward bunks are snug doubles, measuring 11' x 3'3", and have full sitting headroom. The rear bunks are 8' x 3'2", but do not have full sitting headroom. They are large enough to allow you to really sprawl. . .and they stay level.

Several of the books on multihulls, particularly Rudy Choy's excellent *Catamarans Offshore*, make a big point of the fact that it is impossible to sleep in a hull of a cat at high speed because of the gurgling, crashing and other God-awful noises created by the rush of water past the thin hulls. They therefore recommend that all bunks be located on the wing bridges. These authors have probably never been below at high speed in a boat whose bows, under water areas and under bunk areas are solid foam.

The boat interior is absolutely quiet at high speed, to the amazement of every experienced sailor who goes below. Even at speeds over 20 knots, the interiors are quiet. I have wakened, after a long night's sleep during an offshore race, with my senses telling me that the boat is moving very slowly in light air. Upon opening the hatch, I was met with 30 knots of wind and a boat that is moving along at over 20 knots. This extreme quiet is more than just an interesting bonus. A windy ocean is a frightening and noisy place, and it is absolutely necessary to be able to escape to a place of peace and quiet. No monohull can match the stillness below that this boat offers.

The starboard hull has a good galley, and the port hull has a head and an area for navigation. The interiors are well finished and nicely upholstered.

Since the bunks are quite long, there is a very large storage capacity at the forward end of the front bunks and the rear end of the rear bunks.

The big hatches hinge at their forward ends, and provide full standing headroom between the bunks. A dodger can be fitted over the raised hatches for additional protection. The hatches can be fully opened (180°) to completely open up the cabin. In their normal open position (45°), they can be used to direct ventilating air into the bunk areas.

Catamarans, when beating into heavy seas or steep chop, do not pound as hard as does a monohull. A fat monohull, or a sharp entried racer when heeled over, pounds unmercifully. A cat simply knifes thru with minimum fuss. The crockery smashing pounding of a monohull is something we have all experienced, and it more than offsets, in my opinion, the interior comforts of most single hulled boats.

The lack of pounding also means dryness for the crew. As a monohull falls off a wave, and slams down into the trough, it shoots spray to windward and to leeward. The windward sheet of water frequently blows back across the boat. . .right at the crew.

Far less spray is thrown from the bows of a cat, and the windward hull is as dry, or dryer, than on a monohull. The leeward hull, at high speed, gets a lot of spray, but the crew in such conditions is always on the windward side. If you wish to throttle back, reduce sail and get back to monohull speeds, the cat is as dry as most comparable monohulls.

The soft trampoline and nets make a great place to sleep on warm nights, and a simple boom tent provides a warehouse of space. Even at sea, in mild weather, someone usually ends up sleeping on deck.

True comfort, even on the most luxurious yachts, often is best found at a quiet anchorage, drinking a beer, waiting for all the rest of the fleet to finish thrashing thru a tough race. The further ahead of the fleet you are, the more comfortable the boat seems to feel.

Another catamaran plus is privacy. Most monohulls (except for the large, center cockpit, double cabin jobs) have a large cabin in which everyone gets to be best of friends quickly, without any secrets at all. This is not necessarily good. On this catamaran there can be a *totally* private cabin for each couple, or a separate private cabin for parents and for kids. On passages with kids, it is often best to leave their nest forgotten. No matter how messed up the kids side may get, the parents can ignore it and retreat to their shipshape cabin without fear that the chaos will ever reach them.

Comparable monohulls and trimarans have the appearance of having more space than a twin cabin cat with equal interior volume, because you can see almost all of the space at a glance.

7. TRAILERABILITY

We consider it essential that a boat can be moved over land easily. Coast to coast delivery should not require a long sail via the Panama Canal, or a 2 lane wide truck trip. The MacGregor 36 can be dismantled, and carried on a trailer in an 8' wide package. It is long, but light, and can be towed behind a standard car. It takes 2 men about 5 hours to assemble the boat, and it can be ramp launched. Although not the kind of thing you would do every weekend, disassembly and trailering can mean lower cost for winter storage, a trip to a distant lake for a vacation, easy transportation to a special race, or an occasional change of sailing areas without the hassle of expensive trucking and overwidth permits.

A monohull of comparable size can only be launched with a crane or marine railway, and can be moved on the highway only with heavy duty commercial equipment.

We can haul two of these cats on one truck from our California plant to the East coast, and the savings in freight alone, to the ultimate buyer, can be several thousand dollars.

8. SHALLOW DRAFT

This catamaran can sail where most other boats of comparable size cannot go. The draft of the hulls is about 8 inches, and the rudders draw 26". It won't quite sail on wet grass, but about 2 feet of water is the next best thing.

The boat can easily be beached. It is so long, and the rudders are so far aft, that the nose will slide up on almost all beaches before the rudders hit bottom.

For top performance, the hull bottoms must be smooth and clean. With a monohull a pre race scrub means a long session with the frog-man suit. Every point on the underbelly of the cat can be reached from a raft with only an arm getting wet. A minor thing, but a great convenience.

Shallow draft also means safety in heavy seas. With the centerboard up, a breaking sea from abeam will push the cat sideways, relieving the impact. A deep draft monohull or multihull can only sit there and take it with the structures having to take the full energy of the sea.

9. LIGHTWEIGHT

Light weight tends to have its own rewards.

The tons of lead required to keep a monohull on its feet impose enormous structural loads and require massive reinforcement. Keels are forever trying to pry themselves sideways off of their hulls. Or, when a monohull slams down off a wave, the hull stops hard, but the keel trys to keep right on going.

On the other hand, a light multihull tends to be easy on itself. The power needed to drive a light boat is less, and the boat can get by with lighter engines and smaller rigs. The lighter engines and smaller rigs require lighter structures and fittings which leads to an even lighter boat. The even lighter boat now imposes less racking strains on the crossmembers, which can now require less massive supporting structures.

A light boat is less likely to be damaged in collisions. It tends to be drier since it can go over, and not thru, oncoming waves. It can be pushed sideways by breaking seas rather than just having to sit there and take it.

It is almost impossible to provide enough flotation material in a large ballasted monohull to assure that it will stay on top in the event of flooding. It is quite possible to do with a light boat.

A light boat will be easier to launch, trailer and store, to manhandle at moorings, to anchor and to steer. Above all, light boats are fast and fast boats are fun.

10. LOW COST
With a catamaran or trimaran it is possible to get a lot more boat for the money than with a monohull.

Unless you get into the exotic materials, such as carbon fiber, titanium, etc. to keep weight down, a lighter boat is going to cost proportionally less than a heavier boat (unless you get involved with a very inefficient builder)

The ballast for a monohull is expensive, and the structures necessary to support the ballast are heavy and expensive. As a weight goes up, the requirement for more power goes up, engines get heavy, and the cost and the structures necessary to carry the heavy engines get heavy. The whole works just keeps escalating, and every pound costs.

12. EASE OF ANCHORING
The boat has a small frontal area and good streamlining, so the windage loads at anchor are relatively small.

Since the fine bows tend to cut thru oncoming waves, rather than pulling up hard against the anchor rode, the anchor is far likely to stay put.

The boat does not have a monohull's tendency to roll uncomfortably at anchor. You can always spot a cat at anchor in the midst of a group of monohulls. Masts will be swaying wildly in all directions, but the cat's mast will be steady.

Since the boat is light and has very shallow draft, it will tend to swing more rapidly to follow each wind shift than heavier monohulls. It is best to allow it a little extra room. This unfavorable characteristic can usually be offset by using less scope than the monohulls, since the anchor loads will be less.

11. EASY MOTION AT SEA
Only a well designed multihull, and especially a catamaran, can give the smooth even, stable and jolt free ride that makes windward sailing really comfortable. I have commented on their resistance to heeling. Equally important is their ability to knife thru chop with little fuss or pounding. Monohulls slam down hard off waves, and slow radically with each impact. A multihull does not experience anywhere near this "crash-stop-start and crash again" syndrome.

DISADVANTAGES OF A MULTIHULL

1. CAPSIZE
The most obvious disadvantage of a multihull is its ability to capsize. Just as I have no desire to go offshore in a yacht that can sink, I do not wish to sail beyond the range of outside help in a yacht that doesn't have a good chance of being righted and sailed away, by the crew, after a capsize.

With virtually all large multihulls, a capsize means an upside down boat that is nothing more than a slippery, wet raft that can't go anywhere. This is better than a boat that sinks, but not much better.

A capsized multihull can be recovered and righted, usually with a ship or shore based crane assuming that someone comes to the rescue. The damage, in most cases, is considerable, due to towing, collisions with the rescue boat, damage to the rigging as the boat is brought to shallow enough water for access to a crane, and a host of other difficulties, not to mention crew exposure and wear and tear as the boat goes over.

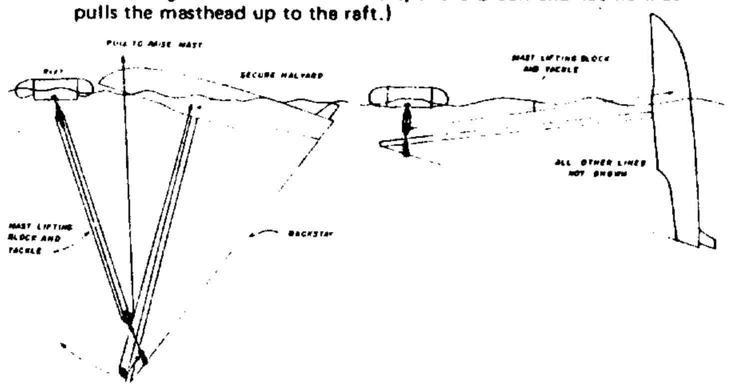
Most multihull enthusiasts brush aside the risk as one of lifes little problems that they hope will pass them by, just as the keel boat sailor chooses to accept the risk that his boat won't be rolled, holed and sunk.

Unfortunately, the designers of large multihulls have done very little, in fact, virtually nothing,to minimize the consequences of a capsize.

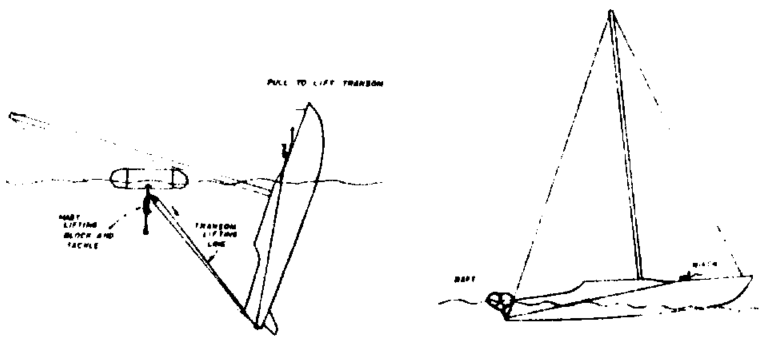
On the other hand,the sailors of small cats, such as Hobies, capsize their way thru life with nothing more than a good soaking.

The MacGregor 36 is one of the only large catamarans that can be righted, by the crew, after a capsize. The procedure is as follows.

a. As with any other multihull, the boat will end up, after a capsize, with the mast pointing straight down. The hulls will be almost completely above water, with the cross tubes and nets slightly below the water level. The boat is held up by built in flotation and by air trapped in the hulls.
b. The nose of the boat, and the area beneath the front bunks is filled with solid foam flotation. The mast is also foam filled. There is no foam in the stern of the boat. Air vents in each hull are opened, and the sterns are allowed to sink. The boat will end up with the noses pointed straight in the air, as shown below. If the boat is loaded nose heavy, it is necessary to use a halyard to pull the masthead to the surface, using a standard Avon (or equivalent) life raft. (The capsize recovery equipment includes a fabric sling that secures to the raft, and a block and tackle that pulls the masthead up to the raft.)



c. Using a separate line to a winch on the foredeck, (also part of the capsize recovery equipment), the raft then is pulled down to backstay, which brings the transom of the boat to the surface.



The foam beneath the bunk and the upward pull of the raft force water out thru the vents in the hulls. The water level will end up at about the level of the bunks. The effort required to lift the transom is not too great since the weight of the stern is counterbalanced by the weight of the front half of the boat.
d. The hull vents are closed, and the remaining water is bailed out. The boat can then be sailed away. All of the above procedures can be carried out by one person. Very detailed procedures for capsize recovery are provided with the boat.

If the mast is lost, the process becomes much more complicated. A spinnaker pole, boom or remains of the mast can be jury rigged to substitute for the mast to pull the sterns down. Pulling the transom to the surface with the raft will then be relatively easy, because it is no longer necessary to lift the mast out of the water as the transom comes up.

In this boat, the rig is more likely to stay intact during a capsize. However, anything that man builds, the sea, at one of its moments, might take a part. We have all read how monohulls get rolled and come up without their spars. It is a rare multihull, however, that loses its rig in a capsize. The difference is weight. Once a heavy keel starts to go over with the boat, it takes an enormous amount of strength to stop it. The rig trys as it is pushed sideways thru the water, and very frequently fails.

With a light multihull, the enertial loads are far less, and the rig generally survives. (They are, however, frequently mangled by well meaning rescuers). Above all, the boat must be *light* and the rigging *strong*. Heavy, high cabined or over loaded multihulls will impose loads that even stout masts cannot handle.

Most multihull capsizes are sideways and by the time the mast hits the water the forward speed is way down, so the impact loads are not as severe as one might expect.

A high speed pitch pole, which is very rare, will impose extreme loads and the chances of keeping the rig intact are far less. It is, however, a disaster that is less difficult to avoid.

2. MULTIHULLS REQUIRE RESTRAINT
There is no question that a big multihull, driven hard, requires a higher standard of seamanship than a monohull. The high speed that these boats generate requires faster crew reaction and anticipation, along with considerable restraint.

Multihulls are seductive. If you add sail and increase power in high winds you go faster and faster, and the only limit is the stability of the boat. There is a strong urge to get 100% out of the boat and sail on the ragged edge of lifting a hull, particularly when racing.

The temptation is not so strong on a monohull, because their speed is limited to hull speed and when carrying too much sail, they just heel over and slow down.

Restraint in carrying sail is essential, or you will find the boat on its side, or worse. You don't drive your car at its 100mph potential wherever you go. Even the craziest race car driver slows up to keep within the stability and cornering characteristics of the car.

3. REPUTATION
One of the biggest problems facing multihulls stems from the fact that they are relatively new on the scene.

Multihulls have earned an unfortunate reputation because many have been poorly designed and built. They have been "one of a kind" with very little testing in substantial volume. The exact opposite is true of monohulls.

Many amateur and professionally built boats have been incredibly ugly, miserably slow, and in many cases, dangerous.

4. STORAGE
The wide beam requires the use of a mooring or end tie.

WHY A CATAMARAN AND NOT A TRIMARAN

Trimarans, although quite fast if kept light, have a severe and basic disadvantage relative to catamarans. As wind increases, more and more weight is shifted to the leeward outrigger from the main hull. The load is shifted from the longest, most efficient hull to the shorter deeply buried and far less efficient outrigger, and speed suffers. The cat on the other hand, always carries its weight on its longest, and most efficient hull.

As far as the ocean is concerned, a trimaran can properly be viewed as a very narrow catamaran with a small leeward hull (the outrigger) and a large main hull. The windward outrigger is simply a large appendage that hangs out in the air. This appendage does exert downward force, but also provides something for the wind to get under to blow the whole works over.

There is no question that a wider boat has a little more stability; sideways stability. However, if you add enough sail to take advantage of the sideways stability of a wide tri, then fore and aft stability becomes a serious problem. Catamarans have generally settled into a 2 to 1 length beam ratio to give good fore and aft reserve stability. Pitch poling, or a forward capsize, is my idea of a real marine disaster, and we prefer lots of length and full bows to minimize the possibility. A wide tri can be loaded with sail, appear stable sideways and give the crew lots of confidence, up to the point of sudden pitchpoling. This problem is aggravated by the fact that the outrigger hulls are generally short and narrow, and offer little protection against a capsize over the leeward bow.

An empty tri has a small advantage over an empty cat as far as sideways stability is concerned, simply because it is wider. On boats in the mid 30 foot range, the weight of the crew (usually on or near the windward hull) gives a cat the stability advantage. You almost never see the crew of a tri on the weather outrigger, because it is a very inhospitable place to be, and because the tiller, sail controls and accommodations are a long way inboard.

There has been much talk about submersible trimaran floats. (i.e. floats that are small enough that they will not support the weight of the boat when the boat starts over). The theory is that the float starts to be driven under when too much sail is carried, giving the crew warning. This sounds great, except that as the boat's leeward hull starts to go under, it tends to turn hard into the increased drag and the possibility of pitchpoling increases. It can still capsize sideways.

The submersible float simply cuts down the sideways stability of the boat, and increases the risk of capsize. The proponents of submersible floats have been a bit subdued after many of their "non capsizeable" tri's have indeed capsized. The concept, in effect, trades real stability for warning.

You can duplicate the "submersible float" by half filling one hull of a catamaran or trimaran with water. This would be idiotic, but basically this net effect is what is being propounded for trimarans as "safety."

It is argued that it is easier to detect over canvassing in a tri because it heels. However, a trimaran heels even in light wind. The only warning it gives is when the outrigger really digs in, which in itself is dangerous.

Trimarans seem more vulnerable to a wave induced capsize. As a big wave strikes the side of the tri, it is pushed sideways and the relatively low buoyancy outrigger tends to dig in. Further sideways motion is stopped, and the outrigger acts as a pivot over which the boat can capsize.

Many authors have extolled the virtue of trimarans over catamarans. The fact remains that the cream of the trimaran crop have been lost at sea, including the famous Three Cheers, Triple Arrow, Gulfstreamer and a host of others. (Some of these losses were the result of long distance single handed racing. The idea of going below to sleep, without leaving a crew member on deck, while the boat is sailing along a good speed, is our idea of asking for it. This makes as much sense as having a solitary person in an airplane set it on autopilot and snooze.)

Catamarans have faired far better. The big ocean racing catamarans of Hawaii and the west coast have been cruising and racing for decades without similar losses. There have been a few capsizes, but not one of these big cats have been lost, and there have not been any serious injuries or loss of life aboard these boats. Their safety record has been remarkable.

There are no comparable trimarans around that come close to matching the speed of this cat. When one does beat us, I will seriously start looking at them. Theory is great, but winning races in the ocean is the best proof. And we are winning.

TRIMARANS HAVE OTHER PROBLEMS:

THEY TEND TO BE WET when going to weather. The bow of the outrigger on windward hull is directly upwind of the crew, and whatever spray is thrown usually ends up in the laps of the crew. On a cat, the bow spray usually blows across the deck forward of the mast, and the crew, usually on the windward side, stays drier.

MOORING DIFFICULTIES. The extreme beam of a tri severely limits where it can be moored. A cat is bad enough, but a tri is worse.

ACCOMMODATIONS ARE LIMITED ON A TRIMARAN. Except for the berths in the area over the wings, the center hull is only slightly larger than the hull of a comparable cat. The outriggers are usually uninhabitable, but do offer some storage. The people-carrying volume of the cat is greater. Unfortunately, the living areas are long and slender in a cat, and it is a bit more difficult to make it all useable.

APPEARANCE
Again, this is subjective and personal. To me, most tri's (there are exceptions) look ungainly at rest, and even worse under sail. There is just too much stuff, and it all tends to sail at a weird angle, with the windward float flying strangely thru the air.

ROUGH MOTION IN A CHOP
On bumpy seas, tri's tend to bounce back and forth between their floats. Tri's with floats that are out of the water at rest are particularly unpleasant in this respect.

THERE ARE MORE THINGS TO GO WRONG
There are more hulls and 50% more cross tube conncections to worry about. One exception to this is rudders. The two rudders on a cat add to the complexity, but if one fails, the other will steer the boat. One good tri, Valkyrie, recently abandoned the transpac race due to rudder failure. A cat probably could have continued.

TRIMARANS COST MORE
A symetrical cat needs only one hull mold for production. Only two hulls have to be built, not three. Cross tube connections are simplified, since there are fewer things to connect together. For a given amount of enclosed volume, three hulls require more skin area, which costs.

WHY THIS CONFIGURATION RATHER THAN THAT OF OTHER CATAMARANS?

WHY 36 FEET?

If the ratio between length and hull width (measured at the waterline of each hull) gets much less than 15 to 1, the boat will create a lot of waves and be slow. If each hull is much less than 4 feet wide, the interior space becomes cramped and virtually uninhabitable. 36' is just about the smallest boat that can meet both of these limits, and the largest boat that can be easily trailered and manhandled.

The waterline length and sheer size of the boat gives it sufficient speed to beat just about anything. A smaller boat would be slower and less comfortable and a larger boat would be more costly, complex, unwieldly and require too large a crew. A smaller cat is too vulnerable to crew weight and can't carry typical weekender type loads.

WHY A "TUBE BOAT," WITH TRAMPOLINES?

Many cats have a solid wing bridge with a full cabin on top. Even though this type of boat offers excellent accommodations, they also offer a very high center of gravity, excessive windage, too much weight, excessive cost, and will present an almost impossible package to move over land. The high center of gravity makes the boat easier to capsize. Once capsized, it will be more difficult to right.

A 6' high, 8' wide cabin gives 48 square feet of frontal area. A 25 knot wind over the deck, which is just about what you get going to weather at 10 knots in an 18 knot breeze, gives about 2.5 lbs. per square foot of pressure, or 120 lbs. of drag. This really messes you up sailing into the wind. A 40 knot wind, yielding 6.4 lbs. per square foot, gives drag of 307 lbs. This can be nasty while trying to beat off of a lee shore in a real storm. Good streamlining will help, but it is pretty tough to streamline a short center mounted cabin. We have discussed weight before and these bridge decks don't come light. Towing experiments have shown that a 30% increase in a cat's weight results in a 20% increase in drag.

The major trampoline is a heavy polypropelene fabric (used on almost all Tornados, C, and D class cats. It is technically called mesh, and about 30% of its area is open so that water can flow through the material back into the ocean. Our first boats had solid fabric trampolines, like a Hobie cat, and they were pure misery. The water would always run to where you were standing or sitting, and there was no escaping the puddle. The mesh material drains almost instantly, even though it appears solid.

In the event a wave strikes the underside of the trampoline (which is not a common occurence) a fine mist will be blown through the fabric, and not solid water. Water hitting the underside of a solid deck is noisy and conducive to damage. The trampoline has held as many as 15 people, so it is plenty strong. It is very easy to walk on. The forward areas are covered with a net with 2" square openings so they can quickly shed any water that comes aboard. A solid deck or trampoline could momentarily hold tons of water in the event the boat punches its nose into a big sea. On a high speed cat, this load could be very dangerous.

WHY NOT HAVE A FULL BATTENED MAIN AND ROTATING MAST?

Design of the sailplan and rigging for a catamaran opens the door to a lot of controversy. The first reaction one might have is to simply blow up the rotating mast, full batten mainsail system that has worked so well on smaller cats; Hobies, Tornados and the C class boats.

We started with this approach, and built the 1st prototype with a 500 square foot full batten mainsail with a 50' rotating mast. The results were totally unsatisfactory. The big mainsail and rotating mast were unmanagable, and, in our opinions, dangerous in heavy weather. With the huge roach, backstays were impossible and the main shrouds had to be well aft of the mast to keep the mast from going forward. As a result, the boom would go out only about 60°, not enough to relieve the excessive power the sail would generate unless the nose was brought close into the wind. This got pretty scarey in heavy seas. The mainsheet loads exceeded 2000 lbs. when we sheeted down hard enough to take the twist out of the sail.

We shortened the mast and added a ¾ rig and jib to get the main down to safe size. Without backstays, the jib luff could not be tightened enough to get great performance into the wind. But the boat was safer and faster.

We finally ended up with permanent backstays and a main without much roach, so the heavy, full battens could be eliminated. We went to the masthead with a big genoa, and could tighten the backstays and take the sag out of the luff. In other words, we ended up with a conventional IOR type rig. The boat was even faster than before. With this rig, we were first to finish in the 1976 Los Angeles to San Diego race out of 350 of the best ocean racing monohulls and multihulls on the West coast. The boat was faster than ever.

The main is small, with the bulk of the area and power in the genoa. Genoas, generally, are much more efficient than mainsails. There is no bulky mast to clutter up the flow at the leading edge, and shape (camber) of the genoa can be controlled better than the shape of the main. The IOR troops have known this for years. Genoas can be doused quickly, upwind or downwind.

We believe that a rotating mast is inefficient when used with genoas. By the time the air flow from the genoa reaches the mast, is is nearly parallel to the boats centerline, and the mainsail is on the verge of luffing. Rotating the mast crossways in this flow in the slot simply increases drag.

It is generally very difficult to have a rotating mast with permanent backstays, and rotating masts are quite tough to keep in the boat. The permanent backstays, by the way, are a requirement of the Ocean Racing Catamaran Association.

Once committed to big headsails, and therefore to backstays to assure a sag free headstay, full battens become unnecessary. The backstays prevent a large roach on the main. The only real reason for full battens is to support large roaches. Eliminating battens eliminates a lot of trouble, chafe and weight aloft, and yields a smoother sail (the air flow across the sail rarely coincides with the direction of the battens). On the first boat the battens alone weighed 25 pounds.

In general, the boat has a lot of sail for its weight and size. The great majority of the sailing in the world is done in light airs, and very few boats have enough sail area to do really well in light airs. You can always shorten sail as the wind increases; by changing down to smaller jibs or by reefing. The modern reefing systems (slab reefing for both mains and jibs) are so good, and the resulting sail shapes are so effective after reefing, that no real penalty results from reefing.

WHY "JIBING" CENTERBOARDS?

This catamaran features jibing centerboards. The centerboard trunk opening is somewhat larger than the board.

As the boat sails to windward, the water pressure forces the leading edge of the board toward the windward side of the boat, at a 4° angle of attack to the centerline. Since a centerboard or keel can generate no lift until it moves an angle of attack relative to the water, a boat must crab sideways to give the centerboard or keel a "bite." (most boats sail with anywhere from a 5 to 10 "crab," or leeway angle. When the board is given an angle of attack, the lift can be generated without the hulls having to sail at an angle of attack. Total drag is less, and the sail plan can sail with the wind at a more favorable angle. The MacGregor hulls will sail to windward with virtually no crab angle or leeway, and can outpoint just about anything. The centerboard will automatically reset itself with each tack. Many one design classes, such as the International 14, have used this concept for years with great success.

WHY NOT HAVE KICKUP RUDDERS?

The boat does not have kickup rudders for several compelling reasons. The first, and most important is that the transom mounted rudders can cavitate at high speed (over 20 mph) and can become totally useless, resulting in a boat that is dangerously out of control. When the rudder is turned, one side experiences high pressure and the other side experiences low pressure. If there is no hull or plate to block out the air, the low pressure side will suck air down the side of the rudder and kill its turning effectiveness. Placing the rudder under the hull blocks the suction effect, greatly increases rudder efficiency, and reduces drag.

Second, a shaft mounted rudder, with the shaft passing thru the hull and deck is substantially stronger and lighter than a transom rudder or kickup rudder.

Third, since the boat is long and the rudders shallow, the nose will normally touch the beach long before the rudders hit, eliminating the basic requirement for a kick up system. On the MacGregor catamaran, the forward edge of the rudder is raked aft at a severe angle. This angle, combined with the boat's light weight, tends to bounce the stern over solid objects. One thing about a cat. . .if a rudder is damaged, the second rudder will control the boat quite well.

Fourth, the submerged rudders make for a less complicated, better looking boat.

These rudders are constructed with a urethane foam with the density of mahogany. The foam is cast around the 2" stainless steel shaft. The stainless shaft has welded stainless plates to keep it from turning inside the rudder.

The rudders are balanced with about 30% of the area ahead of the pivot point (rudder shaft). I prefer a light tiller load because it is less tiring on a long passage and the balanced rudders give really light loads, even at speeds over 20 knots. Some sailors may prefer more tiller "feel," but I am not among them. Reaching at 20 knots with main and genoa gives almost no measurable load on the tiller. It will self steer for a while at these speeds.

CAN IT POINT HIGH?

The reason that most sailors seem to believe cats don't point well is that they seldom appear to sail, when racing, as close into the wind as monohulls. This is true, but only because a good cat sailor will not try to point as high as a monohull. When a cat or monohull points at 30° off the apparent wind, which both can easily do, the speed of either type of boat rarely exceeds 6 knots. If the monohull falls off 5 to 10 degrees, it may pick up a knot or two. If a good cat falls off this much, it will get up to 10 to 12 knots, more than making up for the extra distance that must be sailed.

When you really have to pinch to get around a competitor, you will find that this cat, or any other well designed cat, can point as high, or higher, than almost any good monohull.

WHY ROUND HULLS, RATHER THAN THE DEEP V CONFIGURATION?

Many cats and tris have gone to deep V or rounded V hulls. Virtually all of the high performance boats use the configuration of the Tornado: a V shaped entry, half round sections from the mast aft and rather straight runs. This configuration, at reasonable speed, will ride higher in the water than when at rest. As speed increases, the hulls ride higher and higher, until the water flows cleanly off the transoms in the same manner as a power boat when planing. The deep V hulls, on the other hand, have no horizontal surfaces on which the water can push upward. As speed increases, they simply settle deeper and deeper into the water, making bigger and bigger waves. The drag increases and their speed potential is less. The rounded hulls also offer lower skin friction because a circular section offers the least amount of skin surface for a given volume.

Some will argue that the deep V hulls prevent sideways slipping. The deep hull is a very inefficient lifting surface because of its very low aspect ratio (or ratio of length, fore and aft, to depth) This is why you never see an airplane wing, centerboard or rudder shaped like a catamaran hull. As the deep V hull moves thru the water at a slight angle of attack (about 5° to 10°, typical of most sailboats) some lift is generated, but an enormous amount of drag is created as the water tries to flow from the high pressure side, around the sharp keel, to the low pressure side. The rounded hull gives very little lift, but a lot less drag. Virtually all lift must be created by the centerboard, a true wing of very efficient lifting shape. The combination of round hull and good centerboard provides the lowest possible combination of lift and drag. All this theory is fine, but it is supported by the simple fact that the MacGregor 36 will outpoint and go faster to weather than any comparable boat with a deep V hull configuration. In fact it will point higher and go faster than any production cruising boat, regardless of hull configuration. Facts such as this take a lot of wind out of the sails of those who advocate alternate configurations for this reason or that.

The deep hulls can be dangerous in heavy beam seas. With the centerboard up, a light, round bottomed cat can slide sideways, away from the full force of the sea, when laying hove to. A deep V will resist sideways shove and is more likely to trip over its leeward hull and capsize.

A well designed cat with full bows and sterns will hobby horse fore and aft a lot less than a conventional monohull. The fine ended deep V cats hobby horse so badly in a sloppy sea that the relative wind angle changes wildly with each pitch, and constant sail trim is necessary as each wave passes.

Asymetrical hulls have proven to be relatively inefficient. You don't normally fly a hull on a big boat like this, and the inboard lift produced by both hulls cancels itself out, and a whole lot of drag has been generated for nothing.

The bows have been kept unusually full to reduce chances of a nose dive in high winds.

CROSS TUBE DESIGN

Most cats and trimarans have their primary structural cross members (either tubes or solid bulkheads) quite close together. The front one is under the mast, and the rear one is near the stern. Their bows are long and unsupported. The closer these members are together, the more heavily they are stressed by the independent up and down motion of the hulls.

The MacGregor boat has the primary structural cross members as far apart as possible; one near the stern and one near the bow. This wide separation gives greater ability to reduce twisting forces and cuts the loads at the tube attachment points down to nearly 60% of what is experienced on most cats of comparable size.

The center tube carries virtually none of the boats twisting loads, and is used exclusively to carry the mast loads. The mast, dolphin striker system (which offsets the downward thrust of the mast) and shrouds are all attached directly to the center tube, and a relatively small percentage of the rigging loads are transmitted to the hulls.

On other cats and trimarans, there have been numerous structural failures resulting from failure of their forward tubes. On these boats the forward tubes were designed only to keep the bows from squeezing together under the load of the forestay bridle. As the boats twisted, resulting from light and closely spaced main tubes, the bow tubes failed from fatigue, since they were too light to stop the twisting by themselves.

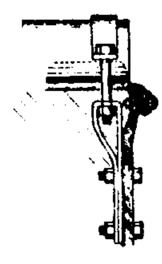
Cross tube connections are the most critical part of catamaran or trimaran design. However, it is just as tricky to keep a heavy keel in a monohull as it is to keep cross tube connections secure on a cat or tri. In either case, the answer is good engineering and a lot of testing.

Many builders mold sockets into the hulls to take the cross tubes. This offers some significant drawbacks. If the sockets are loose enough to allow the boat to be assembled, the joints will be loose and contribute to wear and racking. As fiberglass structures continue to cure with age, as all of them do, they try to change shape slightly. What may be a loose tube connection at first may eventually become a jammed up connection that cannot be assembled or disassembled. For this reason, we prefer to use heavy clamps that can be loose enough for assembly, yet tightened enough to absolutely prevent any movement.

Aluminum cross tubes tend to be more reliable than wooden wings or fiberglass structures. Aluminum is a far more uniform material than wood or fiberglass, and is far less likely to have weak spots resulting from bad grain, voids, cracks, improper cure or bad glue lines.

The tubes are 6 5/8" diameter black anodized aluminum extrusions with very heavy walls. They are secured to the hulls with chainplates with 3/4" and 5/8" diameter stainless steel bolts and lock nuts. The chainplates bolt directly to the inside of the hull laminate, which is extra thick at the attachment points. In addition, heavy bolts pass thru the tube saddles and the tubes to prevent twisting of the tubes in their saddles.

The following drawing shows how the chainplates attach to the hulls.



When the boat is driven hard in rough seas, there is no significant independent motion of the hulls. It is solid. To prove the structure, we placed 2,000 lbs. on each of three corners of the boat and lifted the 4th corner with a forklift. The structure was tough enough to lift the 2,000 lbs. on the opposite nose, and the 2,000 lbs. on the stern. Only a small amount of twisting of the structure was measured and nothing let go. This is far more strain than we expect the boat to ever have to deal with. I doubt that most modern cats or trimarans could pass this test. I also doubt that many big cats or trimarans could be picked up, even without the extra weight, by one corner.

We also built a boat with a 50' mast and lighter hardware and crc tube attachments. Everything else remained the same. Even with the increase in sail area and lighter rigging, we have experienced structural problems, which is another excellent proof of the strenr the standard production boat.

LAYUP

We have stayed away from foam sandwich or wood construction in the hulls. A solid, single skin laminate is stronger, less likely to delaminate than a sandwich (which can be a severe problem, as many builders have learned) and will soak up less moisture than any other form of construction.

We have avoided honeycomb structures for two big reasons. (1) The cells can fill with water, particularly if surrounded by thin skins) causing the boat to become very heavy in a very short time, and (2) the edges of the honeycomb make a very small bond area, and it is too easy to peel off the skins.

We use only hand layup, and never use chopper guns. Chopper guns make a low cost boat, but the resulting laminates are so heavy, weak and brittle that we believe they have no place in any kind of a sailboat.

Don't assume that a boat is strong just because it feels solid when you pound on it. Resin is inherently quite rigid but weak, and glass reinforcement is as strong as steel, but flexible. A resin rich, low glass content layup may feel solid as a rock, but be relatively easy to break. A high glass content layup may be quite flexible, but extremely strong. (A fiberglass bow for shooting arrows is a classic example of a high glass content, strong, yet very flexible item.)

We chose fiberglass, rather than wood, for a number of obvious reasons.

1. Low cost and ease of construction.
2. Ease of maintenance.
3. Better, smoother finishes.
4. Better freedom to create shapes of compound curvature.
5. Lack of joints which preclude structural continuity.
6. Higher strength to weight ratios.
7. Lack of water absorption, rot, swelling, marine borers and general deterioration common to wood construction.

The fiberglass or wood debate was generally resolved years ago, with wood now being used where volume doesn't justify the development of expensive molds.

WHY NOT HAVE A FORWARD HATCH?

The leeward nose of a cat gets a lot of spray, and I don't have much confidence in the ability of foredeck hatches to keep out water. A useful hatch also requires a big hole in the deck, and a lot of extra beefing is required to compensate for the cut out. Weight is critical, and this was a good place to save a lot of it.

The small flexible cowl vents made by nicro-fico are a good solution to ventilating the front bunk. They can go just about anywhere on the foredeck, and can be turned to the wind or away from spray.

AUXILIARY POWER

We chose outboard, rather than inboard power for the following reasons:

1. Lowest drag undersail. An outboard's prop can be pulled completely out of the water.
2. Easy maintenance. When something goes wrong, just the motor, and not the whole boat, goes to the repairman.
3. Low cost.
4. Simplicity
5. Lowest weight for a given horspower.
6. Safety. Fuel leaks go over the side and not in the bilge.
7. Minimum noise below.

We recommend a 10 H.P. Honda. They are quite, extremely fuel efficient and reliable. They provide about 8 knots in still water. However, any good outboard of equal power will do the job.

WHY NOT BUY OR BUILD A CUSTOM BOAT?

Getting a production boat has some monumental advantages. Lowest cost is a big one. Of greater significance is the amount of testing and reliability offered by a production boat. The more boats of a given type that are sailing, the more likely that difficulties will be discovered and corrected. A "one-off" yacht generally receives little testing compared to a long series of production boats, and a good track record is the best assurance of sound construction. Insurance companies are more likely to insure proven production sailboats.

HANDICAP RACING - THE RATING RULES

The boat is eligible to race under the popular International Ocean Racing Multihull rule (the IOMR), however, I have always chosen to totally ignore rating rules, since they are artificial restraints that have contributed very little to speed, comfort and safety. In fact, over the years, they have resulted in fleets of rather weird boats that are complicated insults to common sense. Worse yet, they divert the abundance of naval architectural talent away from the problems of sailing better and faster.

Sailboat development has been relatively stagnant over the past century, since most design effort has been directed toward "does she sail to her rating" rather than "does she sail well."

The most publicized racing is in the IOR fleet, among custom boats that cost several hundred thousand dollars. Production boats cannot compete. The popularity of this type of racing is declining, to where there are only about 1900 IOR certificated boats in the United States. I consider the top caliber IOR racing, with quickly obsoleted boats, to be a dying pasttime. In reaction, virtually all production builders have gone to comfortable, slow cruising boats. Here a "breakthrough boat" is one that has a new radius on its dinette table.

The net result of our concern for speed is a relatively high rating for the MacGregor catamaran. It is usually the highest rated boat in any fleet, and all our effort is aimed at the first to finish trophies, which is a lot more fun. We have not set the world afire as far as handicap racing is concerned, although we have picked up a good share of the handicap honors. Our first to finish collection, however, is quite impressive.

APPEARANCE

A sailboat should be a treat to the eye and a source of pride. Don't get an ugly one. Most cats and trimarans have been breathtakingly ugly, which accounts for some of their lack of acceptance among the yacht club set. There is an old engineering axiom that an attractive object probably will work better than an ugly one. If the designer had the judgement and sense to create a lovely sailboat, he probably had the judgement and sense to make it perform well and hold together.

SPINNAKERS

On a cat, the afterguy and spinnaker sheet fairleads are so far apart that the chute will stay open even without a pole. The afterguy can be led thru a block or snap shackle on the windward bow and take most of the compression off the pole and mast when reaching. In effect, the boat itself becomes a very effective reaching strut. Off the wind, with a spinnaker, we are able to beat the best of the C or D class catamarans. Since the boat moves so fast, the apparent wind loads on the chute are far less than on a conventional boat. For example, a 7 knot boat in a 20 knot wind (from behind) will have 13 knot wind loads on the spinnaker. In the same wind, the cat will go between 12 or 15 knots, so the spinnaker will see winds of 5 to 7 knots. Sail handling, particularly jibing, is a lot easier.

CAST FITTINGS VS MACHINED STAINLESS STEEL FITTINGS

Some builders use castings (aluminum or bronze) for such critical highly stressed items as goosenecks and mast fittings. Castings may contain voids or cracks that are not visible, but which may cause failures. Boat castings are not usually X-ray inspected (castings for aircraft are) to detect these flaws. This catamaran has hardware made from stainless steel bar stock and plate rather than castings, for critical structural parts. They are stronger, less brittle, more reliable, and less subject to corrosion.

MAINTENANCE

We have tried to keep the boat extremely simple and as maintanance free as possible. There is almost no wood to refinish, no complex systems to keep tuned, and minimum corrosion or electrolysis problems. An occasional polishing and waxing, care of the sails and outboard, a good bottom scrub now and then and a careful periodic inspection should be all that is required.

COLORS

We build only one color combination -- white hull, white deck and a dark blue sheer stripe. (If ordered, we use a matching dark blue bottom paint). A colored boat (any color but white) fades, makes for a hot deck and hot cabins in bright sunlight, and is almost impossible to match when trying to repair the inevitable dings and scratches.

We have a strong interest in having your boat look good after many years (the boats that have been around awhile are our most conspicuous advertising) A white boat will look better longer. One of the Herrshoff's once said "there are only two colors for a sailboat. . .black and white and only a fool would have a black boat."

A white boat costs less to build, and if it costs the builder, you can be certain that it will cost you. We buy white by the truckload, and colors, particularly in small quantities, are very expensive. Colors are more transparent and a thicker gel coat is required to hide the layup underneath. Thick gel coats are far more prone to cracking and crazing.

RUB RAIL

There is a good heavy rubber rail around the boat. Anything else will get chewed up pretty fast against docks and in normal use. Fiberglass alone will chip and look like the devil in no time.

MANUEVERABILITY AND TACKING

The most common question asked is "how does it tack?" Recent sailing history is filled with deep V multihulls, from Hobie 14's up thru 60 foot cruisers, that are really difficult to bring around. The reasons for their difficulties are as follows.

1. The deep V slab sides have enormous directional stability, and have to push a lot of water when they turn.
2. The absence of good, well shaped centerboards around which the boat can pivot.
3. The absence of lots of weight that keeps the boat moving forward, with steerage, while the sails flap through the eye of the wind. The problem of light weight and lack of "shoot" or forward momentum, will always be with light boats, whether they are multihulls or monohulls. They must be put around quickly in order not to lose steerage.

Modern catamarans, such as this boat, Tornadoes and the C and D class boats, tack quickly and reliably. Their round bottoms don't shove lots of water aside as they turn, and the centerboards keep the boat from sliding sideways after the turn is completed. It is not necessary to backwind the jib to come around, as was the case with the older cats. When racing, however, we frequently hold the jib on the original side for a few seconds to speed the turn.

The turning radius is greater, about equal to a good 50' monohull. It is slower to come around than a typical IOR boat of equal size. However, it accelerates so fast that you will never lose a tacking duel with a monohull, even in a narrow channel where there is not enough room to really get it rolling at its best after each tack.

There are some places where a cat has manuevering advantages over a monohull. They sail just great backwards and we frequently use the technique to back into a lee shore dock or out of a crowded mooring.

WEIGHT CARRYING LIMITATION

We make no pretense that this boat is intended for long, live aboard passages across oceans. It is a coastal cruiser, which is the only type of sailing that 95% or more of us will ever do. Weight required for sufficient stores for the really long passages would degrade performance significantly. For this type of live aboard sailing, you would probably be better off with a monohull.

In a reasonably small boat, under 40', you cannot have both an ultra high speed, high performance yacht and a roomy, cargo carrying long distance "truck." No one yet has been clever enough to create one. The "trucks" are available by the thousands, and we have chosen the other path, because the rewards of high performance are too compelling to resist.

My own preference is for coastal sailing, with 2 to 4 days aboard to be just about right. I like an occasional quiet harbor, to watch the coast go by, to be dry and comfortable, and to beat any boat that sails near me.

This catamaran was designed to do this type of coastal sailing better than any boat on earth.

PRICE AND VALUE

You get what you pay for? Not necessarily. Not if the price includes the boat of a builder's inefficiency, lack of purchasing power, overly complex designs, large advertising expenditures, high overhead, poor inventory control, wasteful financial practices, or a wide range of other costs that are of no benefit to the buyer.

Pay more for superior design and quality, but satisfy yourself that you are really *getting* superior design and quality, and not just the waste associated with an inefficient business operation, or an overly complex design.

The MacGregor boats, catamarans and monohulls, have outsold all other cruising sailboats because they offer the most value for the money. We have built nearly 15,000 boats and this wouldn't have happened if the value wasn't there, and proveable.

The boating industry is a garden of unfounded rumor and puffed claims, billed as "fact" by over-enthusiastic salesmen. Before deciding on this or any boat, talk to the people that own them, and, above all, try to arrange for a sail.

This catamaran is really different; unlike anything you have ever experienced. I hope you give us a chance to prove to you the accuracy of our claims.