CATAMARANS 1962

A.Y.R.S. PUBLICATION No. 42

Y.W. CATS

Photo by Venn Sturton

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EDITORIAL

January, 1963.

A Happy New Year to you all with pleasant winds, fine weather and good sailing.

The British A.G.M. will, as usual, be held on the first Saturday of the London Boat Show at 11 a.m. at the "Cedars," North End Road, near Earls Court. We hope to debate a New Constitution. Matters for the Agenda can be sent to John Long. We have again taken a Stand at the Boat Show and hope to see you there.

The A.Y.R.S. Tie. We still have ties for sale at £1 or $3.00 each. Apply to A.Y.R.S., Woodacres, Hythe, Kent.

Increase in Membership. Membership is still increasing but is still not big enough. We have 640 members in the British Section, many of whom live in countries other than Britain. About the same number are in the American and other groups. Everyone should try to get fresh members and talk about the A.Y.R.S. in their yacht clubs and elsewhere.

A Research Project. Fred Benyon-Tinker will this winter be carrying out a series of tests on his catamaran similar to those done by Edmond Bruce and described in *Yacht Research I.* These figures for a catamaran will be very interesting. Members wishing to do similar research could well contact him.

Sailing Aerodynamics. This book is being published by Adlard Coles, price 30/-. Copies may be obtained from the Hon. Editor. This book was written by me and the first edition was published in 1954. It is expressed in the minimum technical level which will give the main features. In case it is objected that I am taking free publicity here, it may be pointed out that the whole of the profits from the first edition were used to get the A.Y.R.S. going.

Elegant Yachts. George Dibb has, I believe, designed the elegant trimaran. She is of very light weight. The floats are glassed Polystyrene foam and she uses a semi-elliptical squaresail which he says is simple to handle.

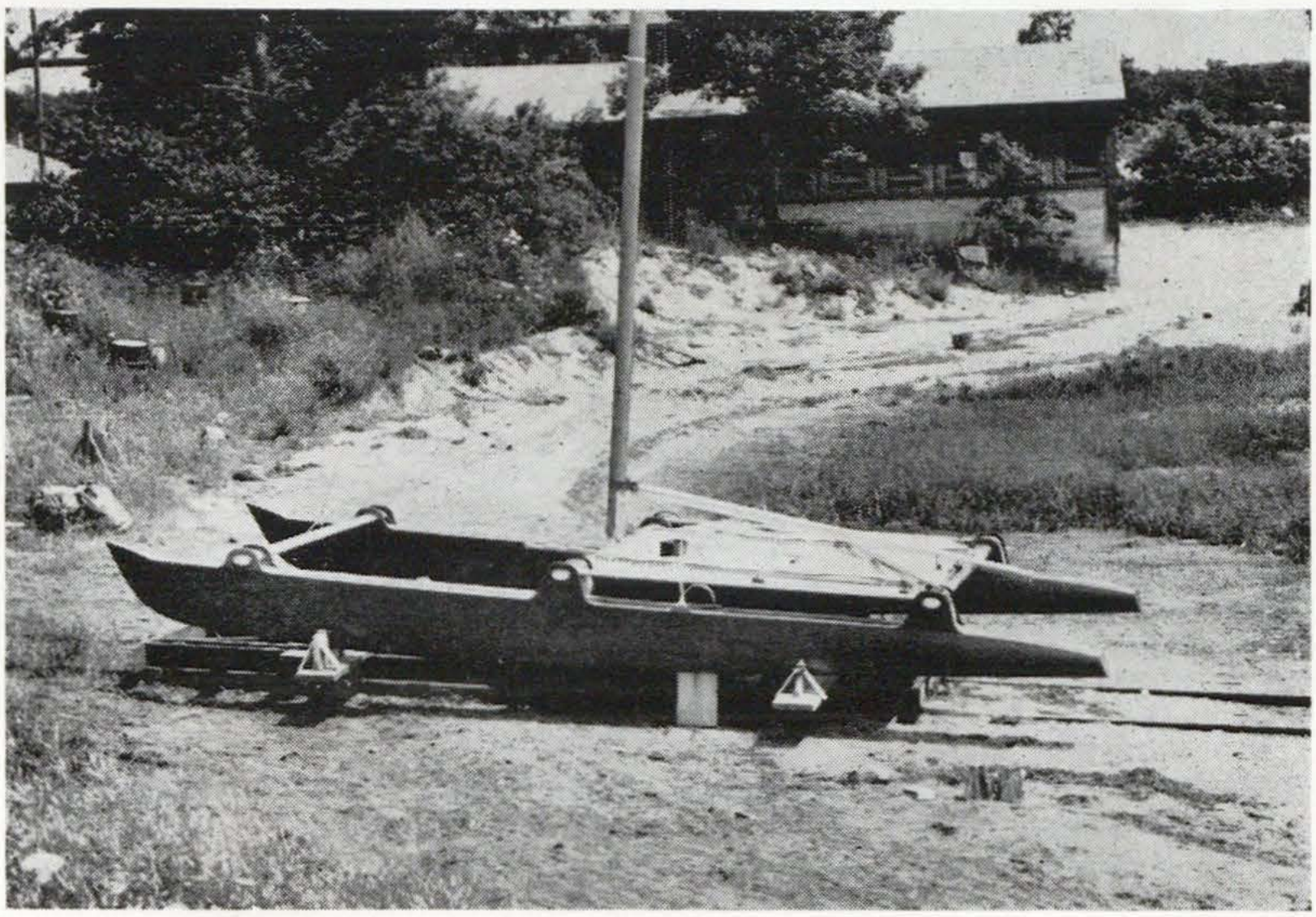
At the Boat Show, I hope to show models of three boats. The first is a single huller of catamaran length to beam ratio stabilised by minimal ballast and high efficiency hydrofoils. It is designed to withstand hurricanes (and even sail in them). The hull is the most easily made I have ever seen. There is an aerofoil mast and a semi-

elliptical fore and aft sail. The self steering is the "Mill gear." The second and third models are lifting hydrofoil boats as described in A.Y.R.S. 36. Incidentally, these three models so please me that I feel that very little gross improvement in boats is possible, though fine details may need attention. I would call the first model "*The A.Y.R.S. Yacht*" as every feature has been partially produced by members, but will wait and see what members think of it. It will be described as well as George Dibb's trimaran in A.Y.R.S. No. 43.

THE INTERNATIONAL CATAMARAN CHALLENGE

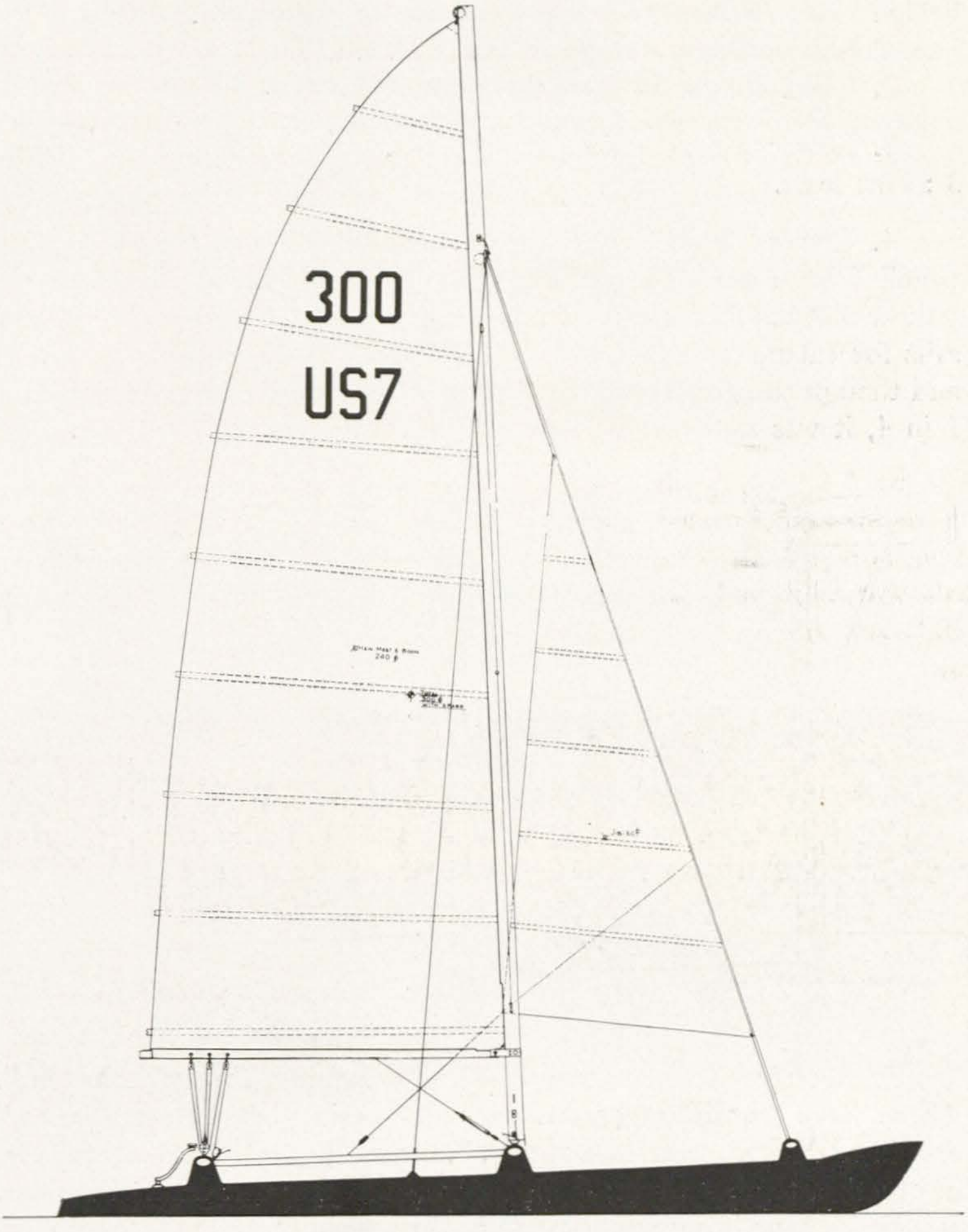
By John Morwood

The races for this challenge took place at Thorpe Bay, Essex, England between the prototype wood *Hellcat*, designed by Rod MacAlpine Downie and *Beverly*, designed by MacLear and Harris. It will be remembered that the British Challenger of last year—the fibreglass *Hellcat*—was sold in the U.S.A.



Beverley.

Hellcat won four of the five races and thus retained the trophy. In the race she lost, she strained her mast and retired, leaving *Beverly* with a "sail round."



Beverley.

Assessment of the boats. Both boats were almost identical below the L.W.L., though *Beverly* was, I thought, a trifle finer forward. The sail plan, too, was almost identical. The reasons I guess for the extra speed of the defender are as follows :

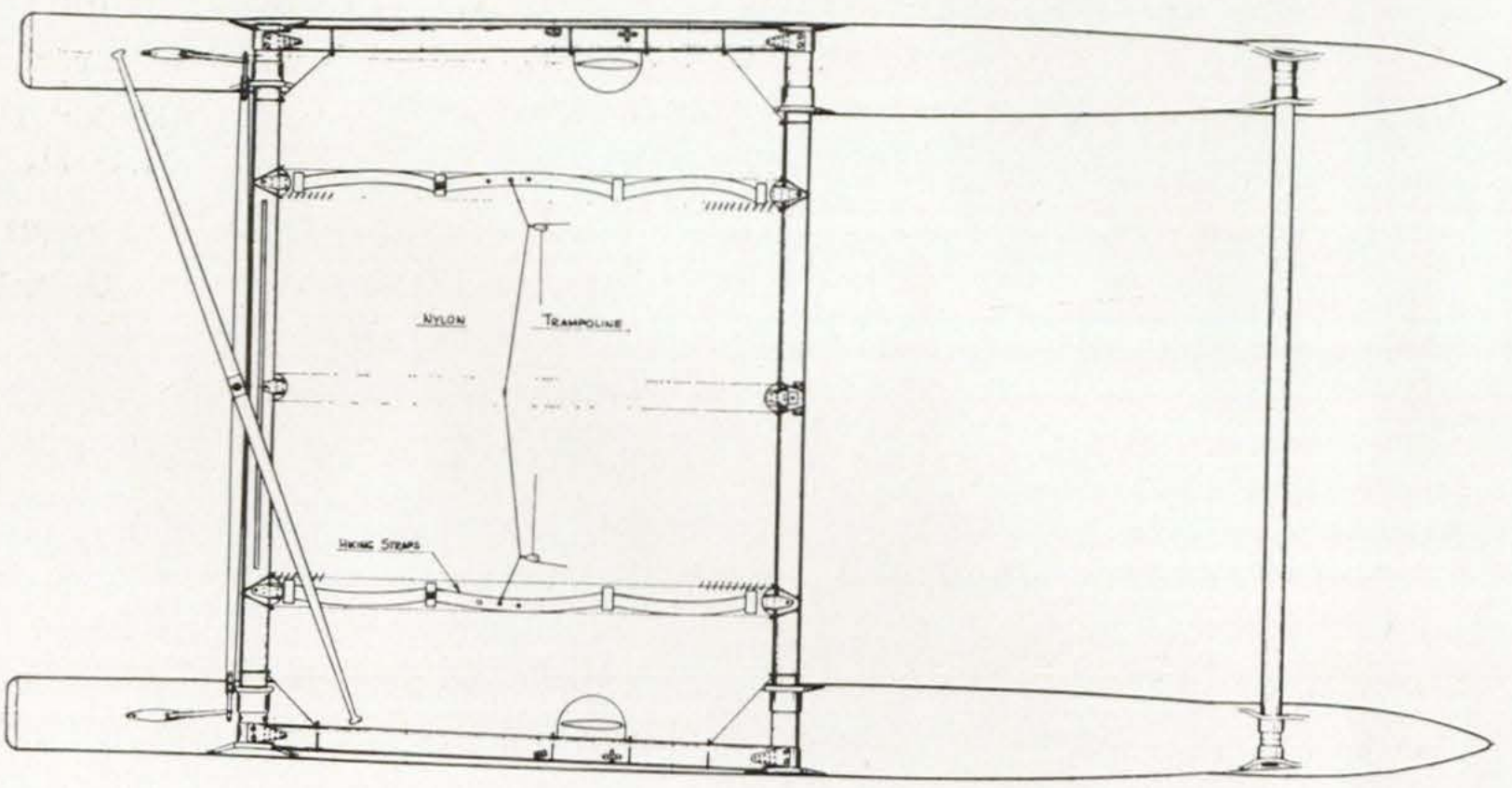
1. Extra windage from the "Lugs" used to support *Beverly's* cross beams. It was an early finding in catamarans that open work

bridge decks ruined their performance to windward. Perhaps we haven't stressed this enough in the A.Y.R.S.

2. Extra weight in *Beverly's* hull.

3. Lower aspect ratio centreboards. These should have been 3 : 1 at least.

4. Lesser "Flow" in *Beverly's* mainsail. From the calculation which I have done and published in my book *Sailing Aerodynamics* I show that sail forces are still increasing with a flow of 1 in 7. Recent sails for catamarans have been ordered with flows as great as 1 in 3 and though the greatest flow of which I have heard being delivered is 1 in 4, it was said that it drew well and was fast to windward.



5. *Beverly* used rudders in trunks coming through the hull. These have certain theoretical advantages in that "Root Losses," should not be so great as a rudder hung on the transom. However, in practice, there seems to be no value in having this kind of rudder. It is heavier and if roughly handled it stops the boat while the theoretical advantage does not appear to materialize.

During her trials *Beverly* was said to have done a "Cartwheel Capsize" by burying her lee hull bow. Extra buoyancy and spray deflectors were then built onto the bow in fibreglass. This looked ugly and could have stopped her in waves but probably not more than *Hellcat's* spray deflectors. The extra weight was alleged to have been very small. However, the very fine bows of both craft seemed to be an excessive feature for the speeds actually achieved, however appropriate for 30 knots they may be.

AUSTRALIAN CATAMARANS

By Ray Dooris

43 Clarence St., Macquarie Fields, N.S.W.

In 1953, catamaran designs in Australia were extremely hard to come by, three only being available in New South Wales. These were all heavy chine catamarans made of plywood and would sail in nothing less than a gale. Having bought a set of plans for a 12 foot cat, I got to work modifying the design, making it lighter by reducing the beam of the hulls and the overall beam. The sail plan was then enlarged from 100 sq. ft. to 140 sq. ft. and a trapeze wire was added. Its performance in light breezes was disappointing. The boat would not point and would go sideways nearly as fast as it would go forward. It was another story when the wind blew hard. The spray from the boat's vertical bows shot 15 feet into the air, while a wash like a speed boat's trailed from her sterns. It was a spectacular sight, but usually ended in what seemed to be a violent explosion. Actually what used to happen, was that the leeward bow buried itself in a wave and would flip the boat into a full mid air spin, landing upside down with bits of boat everywhere.

It might seem strange to some people that I kept this craft for 3 years, but it just goes to show that catamaranning, despite all its faults, is different.

In those three years only one other cat, also a 12 footer, came to sail on Sydney harbour with us. We then heard of two designers in Mordialloc Victoria, Charles and Lindsay Cunningham who had designed and built an 18 foot cat. This was the prototype "*Yvonne*" which was later extended to 20 feet and proved a speedy performer.

Today Australian catamaran designs are among the best in the world. Sizes range from 12 feet to 45 feet and in all shapes. These designs are about equally divided between chine cats and bilge.

After reading previous articles on cats, in the A.Y.R.S. magazines, I get the impression that the *Shearwater* type of cat is the best for all round performance. In Australia we have a few *Shearwaters* racing with catamaran clubs, and none of them seem to be outstanding in any conditions, being beaten soundly by locally designed chine cats, such as *Attunga*, *Yvonne* and *Quickcat*. There is still a lot to learn it seems.

Australian catamarans on the whole are wider overall than English or American designs and tend to carry more sail area. Most of our racing designs carry swinging planks or trapeze and most carry spinnakers. Those that carry headsails generally use an overlapping jib in preference to a normal jib. All use full length batterns.

Australian Design in detail in order of appearance on the Australian boating scene.

Yvonne (A.Y.R.S. 15). This is a sleek 20 foot chine catamaran with high bows, deep vee section forward and flattening out aft coming to a canoe stern. This design is narrow by Australian standards, 7 ft. 6 in., carries 190 sq. ft., in main and jib and 160 sq. ft. spinnaker. Twin balanced rudders and single centre board makes this craft manoeuvre well. *Yvonne* is built of plywood and is suitable for amateur construction. The bridge deck is let into the hulls in the English fashion and the hollow mast is stepped on an X frame. Speeds over 20 knots have been recorded many times and I have heard of one which did 25 knots. Any boat that will do 20 knots is bound to be wet, and *Yvonne* is no exception. At conventional boat speeds though, she is extremely dry and comfortable. For racing, she is held in an upright position by a one man trapeze and for family sailing, with the jib stowed, you have a nice family boat. In moderate weather she will sail without the centreboard and in full racing trim will put a *Flying Dutchman* to shame, even to windward.

Disadvantages. The main disadvantages are that *Yvonne* is hard to store and cannot be carried by two people. If left at a mooring she rides well, but would need heavier construction if left all season.

Quickcat (A.Y.R.S. 15). As with *Yvonne*, *Quickcat* was also designed by the Cunninghams for those who like to build their own craft. She is extremely simple to build and very cheap. This craft is 16 feet long, 6 ft. 3 in. beam, weighs 160 lbs. to 190 lbs. and carries 126 sq. ft. in a single mainsail.

Quickcat has a racing crew of one, and his weight on the end of a swing plank is enough to keep the boat sailing, even in heavy weather. Yet three adults can cruise most comfortably on her.

This craft is built with deep box sections, with flat bottoms and canoe stern. The main strains are taken on a series of struts set in an X pattern, with the centre board case in the middle. The solid mast is stepped on the front of the centre board case and the centre board swings up under the bridge deck when not in use. Twin kick-up rudders are used and an interesting tiller arrangement allows the use of a single tiller and tiller extension as in sailing dinghys.

From a racing point of view, she seems to be faster than the *Shearwaters* in Australia, is righted easily by one man when capsized, and is easily carried by two men. Undo a few bolts and the *Quickcat* is in three pieces, i.e. two hulls and bridgedeck. This is an improve-

ment over *Yvonne* and makes it easy to store. Top speed seems to be around 20 knots, but I think this could be improved with a few alterations. All in all a very nice multi-purpose cat.

Attunga (A.Y.R.S. 28). 20 feet long, approx. 10 feet beam, was designed by Victorians Peter Hooks and Jack Shaw. Starting with deep Vee sections forward the bows are very slim and have little overhang. Amidships the deep Vee flattens gradually and the run aft is fairly flat.

Unlike the *Yvonne* and *Quickcat*, the *Attunga* has a flat stern about 1 foot wide and twin centre boards. Twin kick-up rudders hang on the transoms. The bridge deck is also different. The basic form is that of an aircraft wing lying upside down on the hulls, and this section helps keep water out of the cockpit. Bridge deck splits down the middle for easy trailing. *Attunga* is suitable for amateur building, being chine construction throughout, the hulls being built from five narrow strips. The chines are above the static water line to reduce resistance.

Racing trim consists of a two man crew, forward hand on trapeze. Over 200 sq. ft. of sail, luff pole on the jib and full length battens. Some also carry a very large genoa.

There is great rivalry between *Yvonne* sailors and *Attunga* sailors, each craft seems as fast as the other, and they sail in keen competition with each other.

Attunga is a first class chine catamaran suitable for class racing and family cruising.

X.Y. 16. Another fine catamaran design from the drawing board of Charles and Lindsay Cunningham. This sixteen footer is similar in configuration to the *Quickcat*.

The hulls are made from fibre glass and are bilge type, with full sections throughout running to a transom.

The bridge deck is nearly the same as the *Quickcat* bridge deck, although I have seen a different type used on some. The *X.Y.* is also wider than the *Quickcat*.

Going power is supplied by a single main sail measuring 152 sq. ft. A swing plank, that can be pivoted aft over the quarter on a reach, keeps the one man racing crew out of the water when the going is rough. By shifting the mast aft a jib may be fitted, but I feel the single sail is better.

Lateral resistance is provided in a single centre board, which kicks up beneath the bridge deck. Twin kick-up rudders hang on the transoms. This design can also be taken apart for storage, or left at a mooring.

One could say that the *X.Y.* 16 is a fibre glass bilge version of the *Quickcat*.

To date not very much can be said about its performance, though it comes about extremely well and seems very fast. I think that a well tuned *Quickcat* would at least equal the *X.Y.* around a triangular course. This craft may well improve with some racing experience, and we look forward to some keen racing.

Austral 20. Yet another design from the Cunninghams, this time, 20 feet of racing, fibre glass efficiency.

Considered to be the fastest catamaran in the southern hemisphere, this design appeared only recently and was an outstanding success.

The hulls are made of fibre glass and decked with ply. A relatively fine entry forward with a semi circle amidships and continuing to a transom. The first few boats to appear, of this class, carried an eight foot beam and twin swing planks. Later boats, went to ten foot beam and did away with the swing planks. There seems to be little difference in their performance and as the extra beam adds to the deck area, I think it is the better. Generally speaking, catamarans with excessive beam tend to nose dive. This is not the case with the *Austral*, for she has never shown any tendency to bury the lee bow, under any conditions.

Speed through the water is taken care of by 240 sq. ft. of sail, main and jib being used. A spinnaker is also carried. Lateral resistance is provided by twin lee boards attached to the inner sides of the hulls, under the bridge deck. These are made of ply and are held in place by two bolts, one of which they pivot on.

The bridge deck is very simple, consisting of two square sectioned beams fore and aft, and a sheet of ply, suitably braced from beneath. Speeds well in the excess of 20 knots, are common and she comes about quite well. A very fine catamaran.

Small Cats. There are several small catamaran designs in Australia today which are extremely good for their size. Among them are the Cunningham designed *C-Cat* and *Uni-Cat*, the *Fast Twin* and the New Zealand designed *Kitty Cat*, all being 12 footers. The *C-Cat* is a fibre glass cat and bilge design, while the *Uni-Cat* is chine and therefore suitable for home construction. Performance of the two seems about equal. Not much is known about the *Fast Twin*, although she is chine design and built of plywood. The *Kitty Cat* is the star of the 12 foot field and she carries 150 sq. ft. of sails in main and jib, and she also carries a spinnaker. *Kitty Cat* uses twin centre boards in the hulls and twin kick-up rudders on the transoms.

The hulls are made from flat plywood but are actually bilge designed and there is very little rocker.

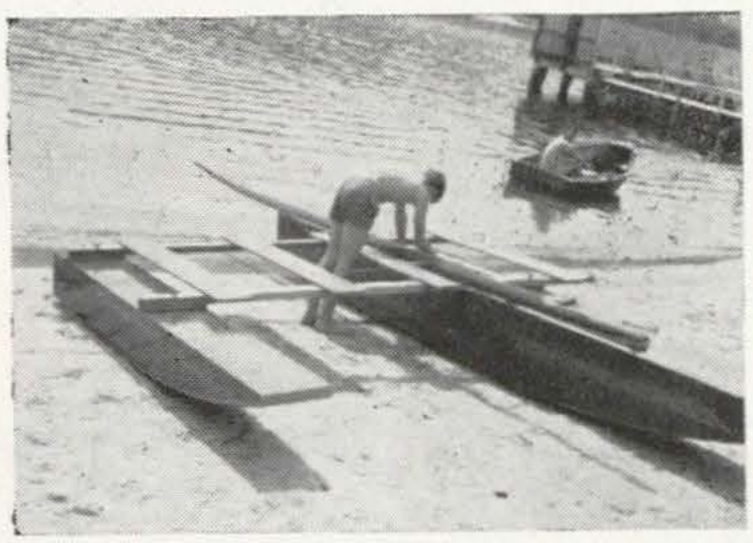
The other 12 foot designs, centre mainly around this design and are fairly similar, some being chine and others being bilge and all are equally as fast as the other.

Summary. There are many other designs being developed in Australia such as the 16 foot *Manta* by Cunningham, the *Allouette*, a 35 foot cruising cat, which is basically an enlarged *Quickcat*, also by Cunningham. In Tasmania there are a few 45 foot cats under construction, and in Sydney there is a *Lodestar* trimaran being built. In South Australia, I believe there are some hydrofoil experiments going on, though I haven't any reports on them.

All the Cunningham designed craft can be bought in kit form, with fibre glass shells supplied. There is a fair bit of class racing going on among all the mentioned boats and some times interclass racing. The fastest is the *Austral* followed by *Attunga*, *Yvonne*, *Quickcat*, *X.Y.*16, *Shearwater*, *Kitty Cat* and so on.

Any one wanting additional information please write to the Australian Secretary, A.Y.R.S.

Many of our members sail catamarans, and Ken Berkely now sails a *Nugget* class trim, with the Cruising Yacht Club in the J.O.G. division. At this time I don't know how Ken's trim goes in the J.O.G. races. Only time will tell.



Ray Dooris' Polynesian Craft.

Last sailing season I experimented with a polynesian outrigger, 16 ft. O.A., 9 ft. extreme beam, 18 in. hull beam, 9 in. float beam, and 9 ft. float length. Both hull and float were flat bottomed and box sectioned, which made them look like two coffins. Cross beams were

2 in. x 2 in. and I had to strengthen the forward one, as it broke twice. This allowed the float to work in a sea way and was fairly light. As can be seen from the photos the craft is fairly simple in design, for I was mainly interested in the configuration. The sail was 80 sq. ft. Moth sail and this proved far too small. I designed it to carry about 130 sq. ft. Due to financial failings I have never tried this large area of sail, but I am sure the craft could carry it.

Sailing. A very pleasant craft to sail, she puts about easily and points very high. In light breezes everything passed her, but in a good breeze it is possible to obtain 15 knots. An interesting observation was made of the float, in as much as it would plane readily, even to leeward with crew weight on it.

In my opinion, the Polynesian configuration would make a very good class racer, being lighter, cheaper, and if built properly, faster than all other multi-hulls. I found it to be very unstable with the float to windward and quite easy to capsize if not carefully handled.

CATAMARAN CRUISE SHIP FOR THE VIRGIN ISLANDS

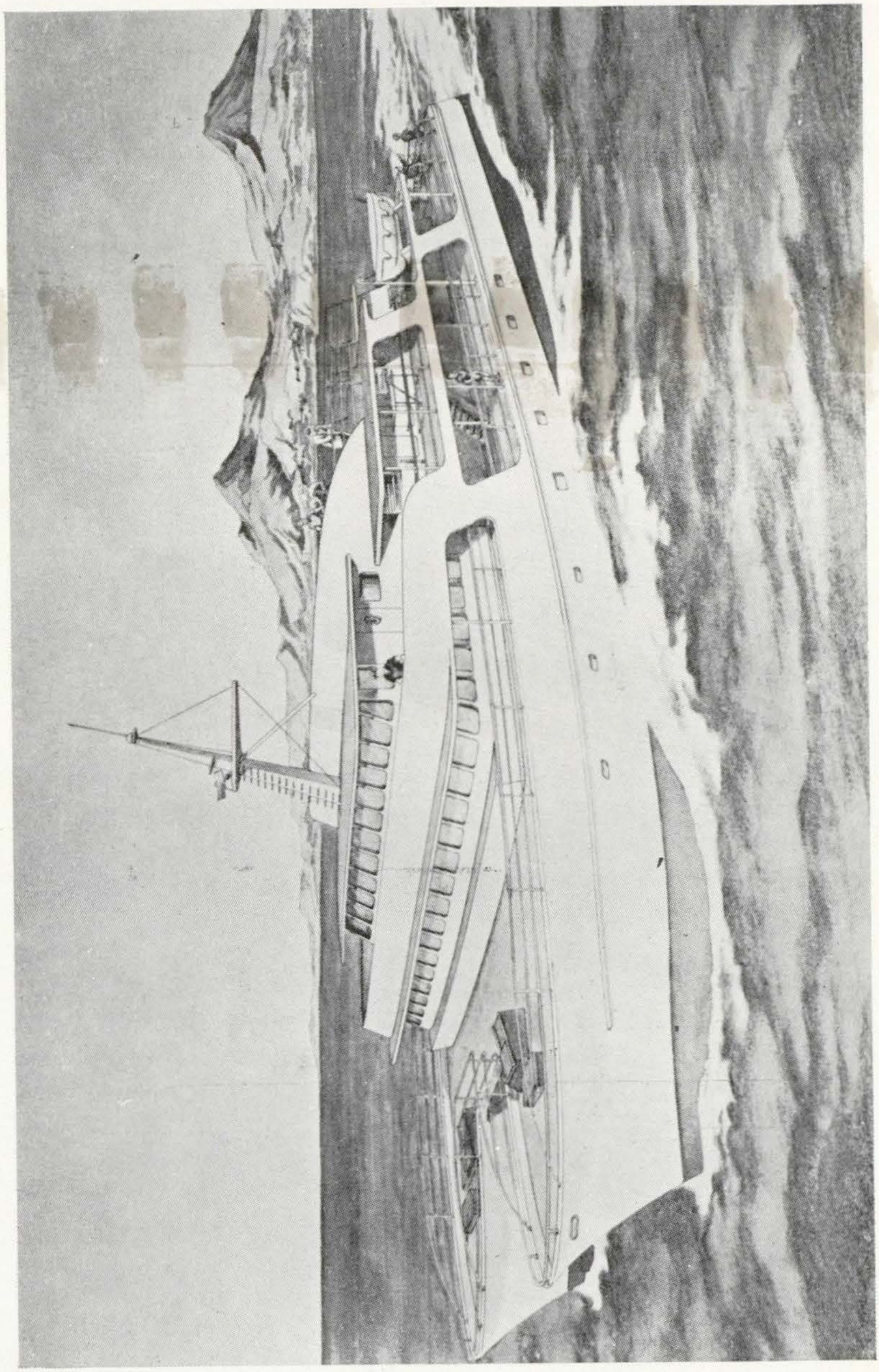
Length : 132 feet Beam : 45 feet

Designers : MacLear and Harris, 366 Madison Ave., New York, 17, N.Y.

This craft will be manned by a crew of 10 and carry 40 passengers in twenty staterooms. Each stateroom will be provided with a private bath.

Cruises will leave weekly for a six day cruise to Caribbean islands of various nationalities. The craft will spend each day in a different port or anchorage.

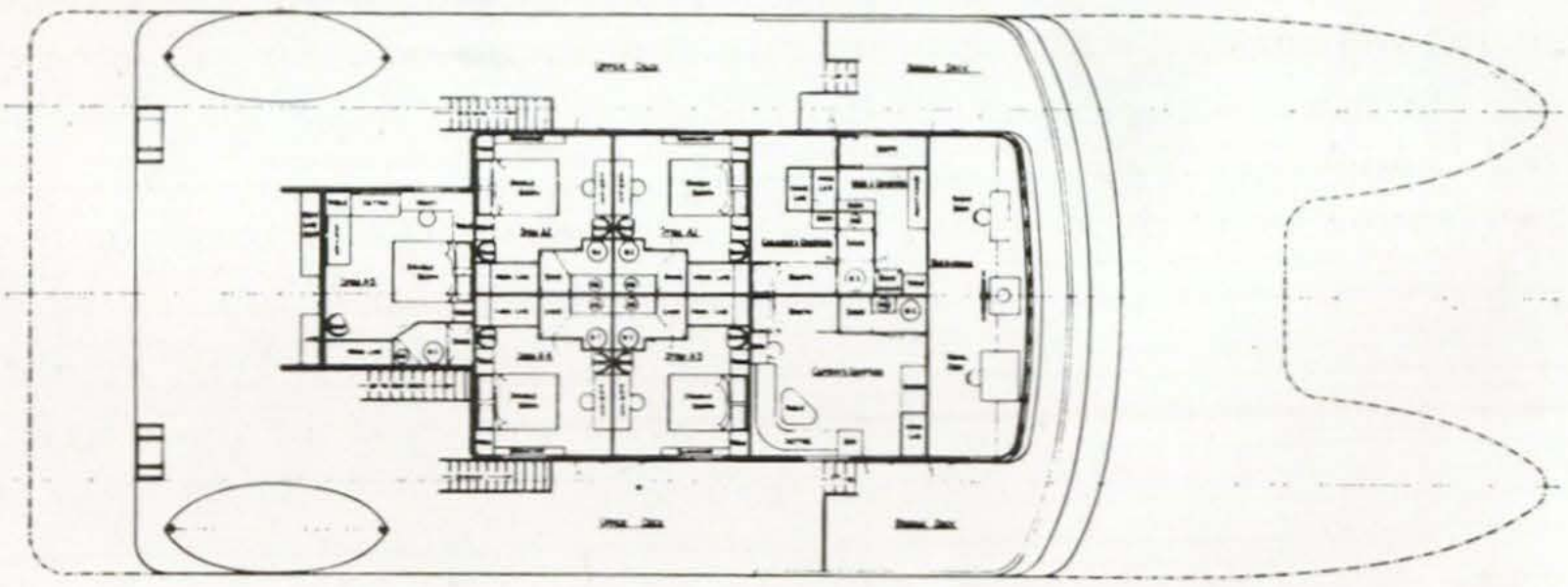
Why a Catamaran? The question immediately arises, why a Catamaran, rather than a single hulled vessel. The primary reason for the Catamaran configuration is that it can house far more people more comfortably in a given length, than a single hulled boat. The craft is 132 feet long and 45 feet of beam which provides a great deck area and large expanses for lounging. It is estimated that it would require a 180 foot single hulled vessel to provide equivalent square feet of floor and deck space. Furthermore, the Catamaran configuration does not get into cumulative rolling and the craft would remain on an even keel even when anchored in a roadstead with a little sea running. Another advantage to the Catamaran configuration is that this craft will draw less than seven feet while a 180 foot single hull vessel would draw considerably more water (possibly 9 to 12 feet).



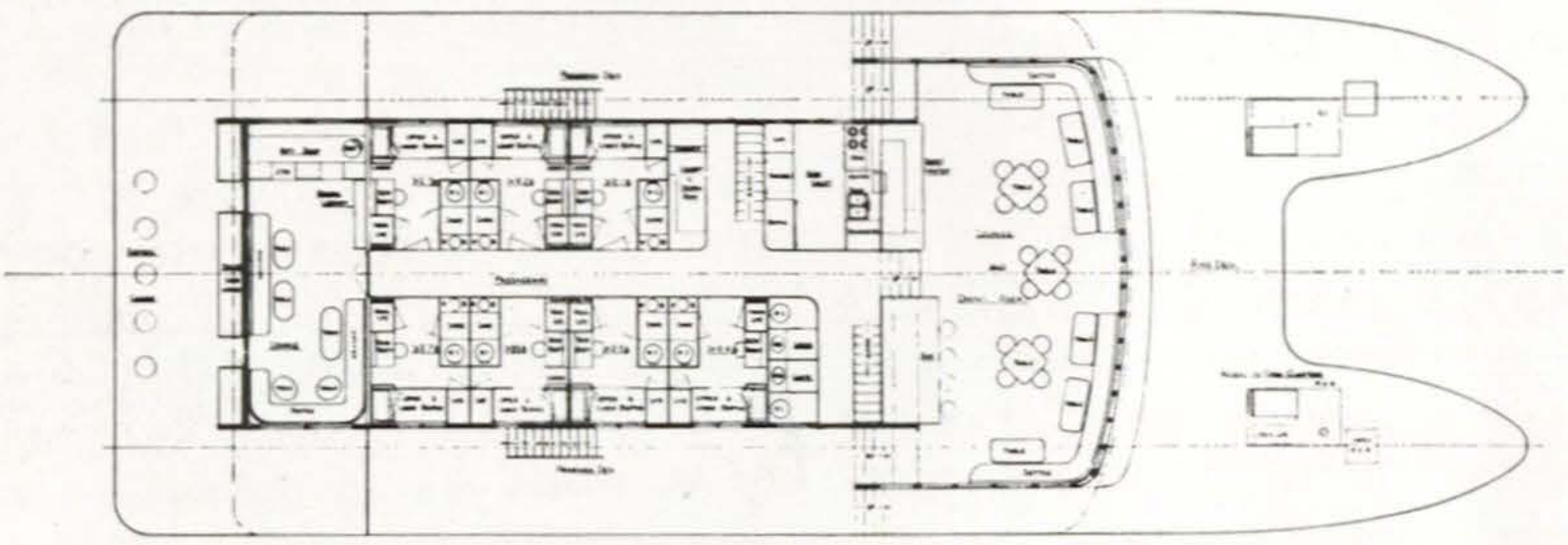
An added advantage of the shallow draft is the saving in insurance that results.

Nils Antonsen, who developed the original concept for such a Catamaran cruise yacht, went to the New York Naval Architecture firm of MacLear and Harris for the design of this craft because of their extensive experience in power and sailing Catamarans. The United States Army Corps of Engineers had also selected these designers to design the aluminium Catamaran *Johnson*, for the United States Lake Survey. This latter craft is believed to be the largest self powered Catamaran that the United States Government has in commission to date.

While the *Johnson* is made of aluminium, it was decided to build the 132 foot cruise ship of steel for economy, strength and durability.



The craft will have only one class, although three different grades of cabins will be offered. There will be boat deck cabins, main deck cabins, and hull cabins. The main lounge will have a buffet on the starboard side, and a bar on the port side. The buffet will be kept open from eight in the morning until 1.30 p.m. and passengers may help themselves to breakfast, "brunch," and lunch any time between these hours. The evening meal will usually be taken ashore.

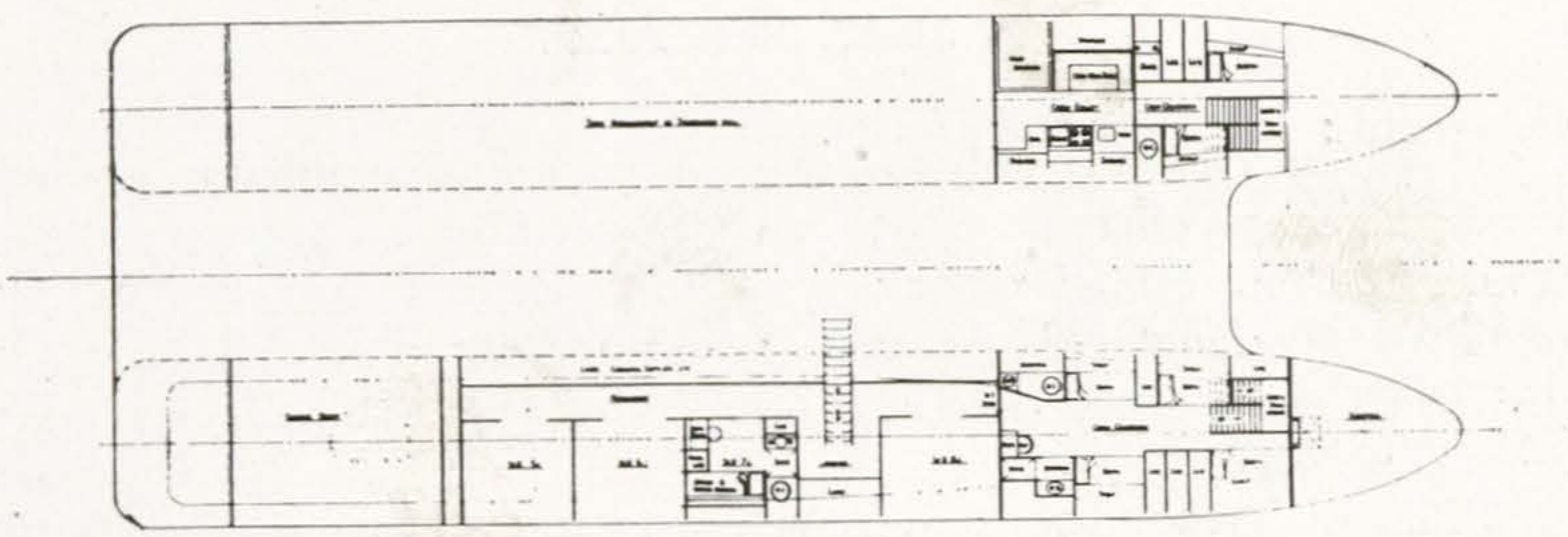


Mr. Antonsen plans to operate one vessel for one year and then expand the operation by building more craft. It is firmly believed that the whole Caribbean area could support at least ten vessels of this type, not to mention other cruising areas.

The craft will operate at a cruising speed of 14 knots, but will be able to go considerably faster. The craft will be very self-sufficient and will be able to cruise in any area in the world. The Caribbean area selected is ideally suited to this type of cruising since islands of various nationalities including American, British, French and Dutch are all within short cruising range of one another. It is presently anticipated that the craft will have its headquarters in St. Croix, in the American Virgin Islands.

Decks. The wide expanses of deck will be allocated to various forms of relaxation and recreation. The upper deck will have deck tennis and shuffleboard, while the fore deck can be used for sunbathing and the after deck will have sportfishing chairs for those who wish to troll underway or bottom fish while at anchor. The boat deck will be a promenade deck, giving shelter from the sun, yet being in the open air.

Small boats and fishing. A variety of small boats will be carried on board the Catamaran and will be made available to the passengers.



Sailboats, outboards, and sailfish, can be used for informal races and for spearfishing and angling.

Interior arrangement. Aside from the main lounge forward, where meals will be taken, there will also be an after lounge with a library and a gift shop and card tables. The Captains quarters will be well appointed and it is expected that he will entertain in his quarters from time to time. The whole cruise will be run in an informal but well organized basis. Passengers will be offered many alternate things to do. A specific effort will be made not to militarize the passengers in any way, but rather to give them the feeling that they

may do whatever they wish, almost as though they were on their own yacht. Many ports will be visited where no comfortable overnight hotel facilities exist, so that the passengers will be able to see places otherwise not accessible to the casual tourist.

Itinerary. Although the exact itinerary will be determined only after several months of varying cruises, it is anticipated that aside from the American Virgin Islands and the British Virgin Islands, that other islands touched on will include St. Martins, which is half French and half Dutch; Saba, which is Dutch; St. Kitts, which is British; Antigua, British; Montserrat, British; Guadeloupe, French; Dominica, British; Martinique, French; St. Lucia, British; St. Vincent, French; and Grenadines, British.

Mr. Antonsen is now considering taking several partners in this undertaking, and plans to syndicate the operation by making available two thousand five hundred dollar ($2,500) units.

STARLIGHT

A 26 FOOT AUXILIARY FAMILY CATAMARAN

By MacLear and Harris

Naval Architects and Marine Engineers, 366 Madison Avenue, New York 17, New York

Designers : MacLear and Harris.

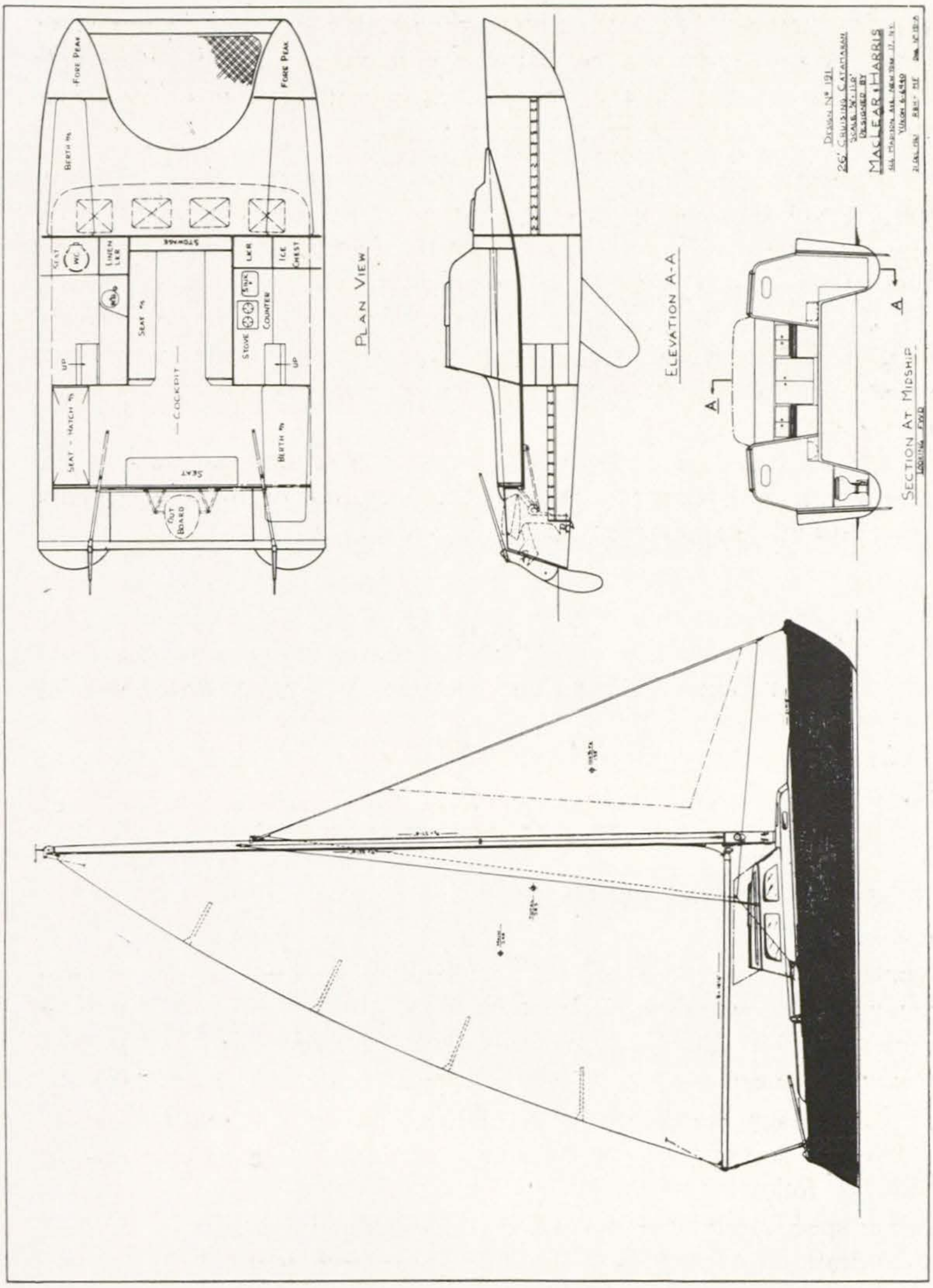
Dimensions

Length overall	26 ft.	Beam, extreme	13 ft. 8 in.
Length datum waterline	23 ft. 6 in.	Draft, board up	1 ft. 3 in.
Beam each hull (at counter line)	3 ft.	Draft, board down	4 ft. 0 in.
		Displacement, half load	3000 lbs.

This design was prepared in answer to an ever increasing number of families seeking an inexpensive, simple family auxiliary cruiser with the following requirements :

Higher speed under sail and power	Light displacement
Shoal draft	Large deck area
Beaching ability	Simple, economic rig
Variety of auxiliary power options	Safety, stability, seaworthiness
Sleeping accommodations for 4-6	Enclosed head and simple galley

The sailing speed made good to windward of this 26 footer will average out at approximately 10-40 per cent faster than a monohull centerboarder of equal length, depending on wind velocity, and she will reach from two to three times faster.



Starlight.

She will be capable of speeds under power similar to semi-planing monohull power boats given as much power. Her ability to maintain a higher sustained cruising speed up-wind in choppy water will be markedly better than that of the monohull.

Headroom—5 ft. 9 in. in each hull under twin cabin trunks. The seating area between the trunks may be covered with a folding navy

top, and converted easily to twin or double bed sleeping, or left open for one large cockpit seating area. In addition to this a boom tent may be used for further protected sleeping on the cockpit seats. The navy top may be left up under sail, allowing sleeping accommodations underway from 4-6 persons and 8 in port with the boom tent.

Auxiliary power—Outboard or inboard-outboard (Z drive) from 10-100 H.P. Batteries are charged from the propulsion units in the usual manner.

Nylon webbing—Between the hulls forward makes an excellent place to lounge in fine weather and serves as a vented deck area from which to handle headsails and ground tackle.

Anchor—Will stow neatly up into the underside of the leading edge of the wing between the hulls, thus eliminating one of the most irksome stowage problems on the monohull.

Stock plans—Amateur construction calls for a light plywood shell and deck covered and reinforced with fibreglass over spruce and mahogany framing. Plans for professional stock building in moulded fibreglass or aluminium may be had upon request. Amateurs or others wishing to build a one-off all fibreglass and plastic sandwich construction or for a super light boat may also be furnished with special plans upon request.

Price of stock plans, $250 U.S. *Inspection plans and specifications*, $35.

POLARIS

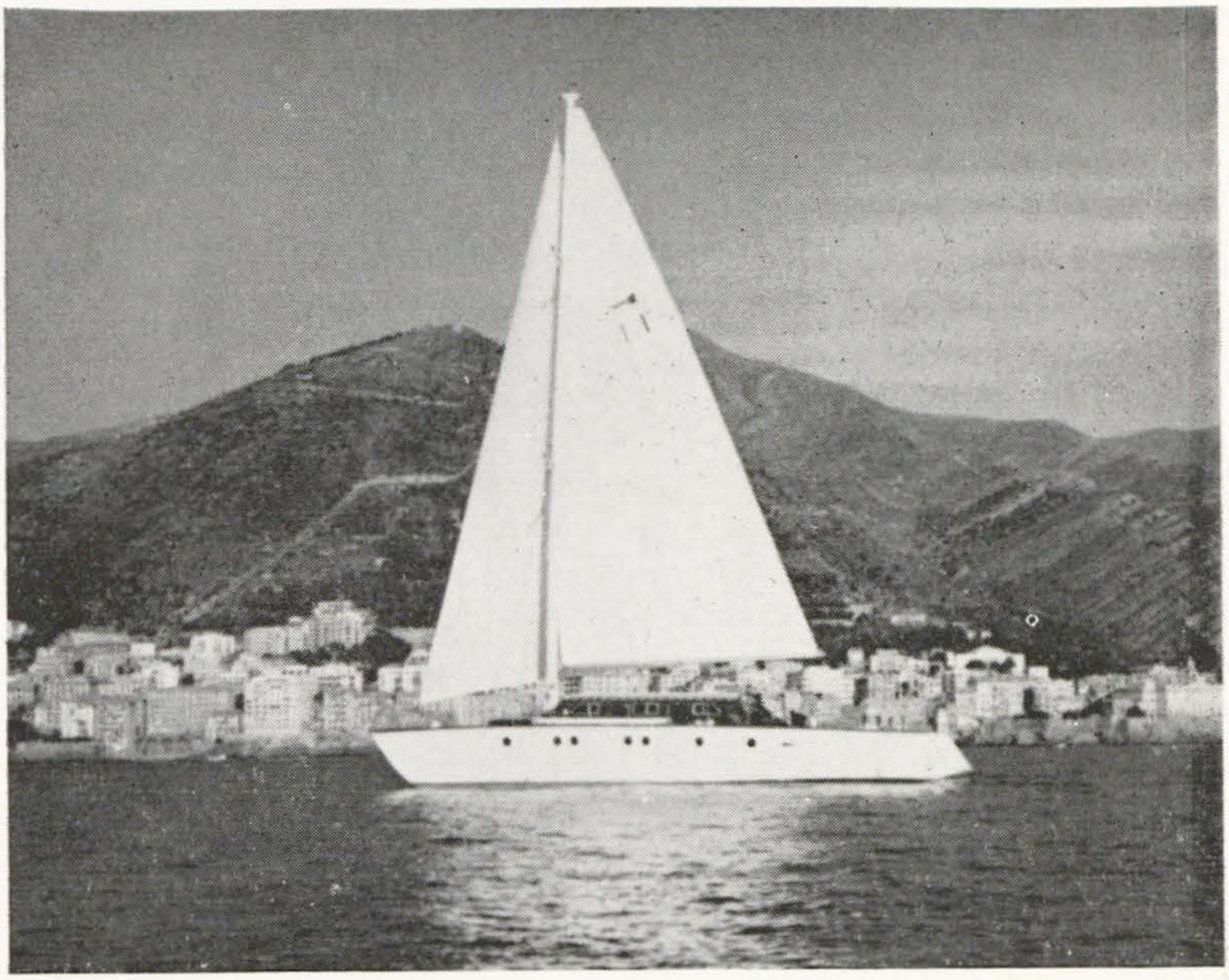
By Captain Dario Salata
Rapallo, Piazzale Funivia, Italia

L.O.A.	60 ft.	Sail Area	2100 sq. ft.
Beam	20 ft. 6 in.	Engines, two Diesels of	35 h.p. each
L.W.L.	47 ft.	Speed under power	10 knots
		Speed under sail	18 knots

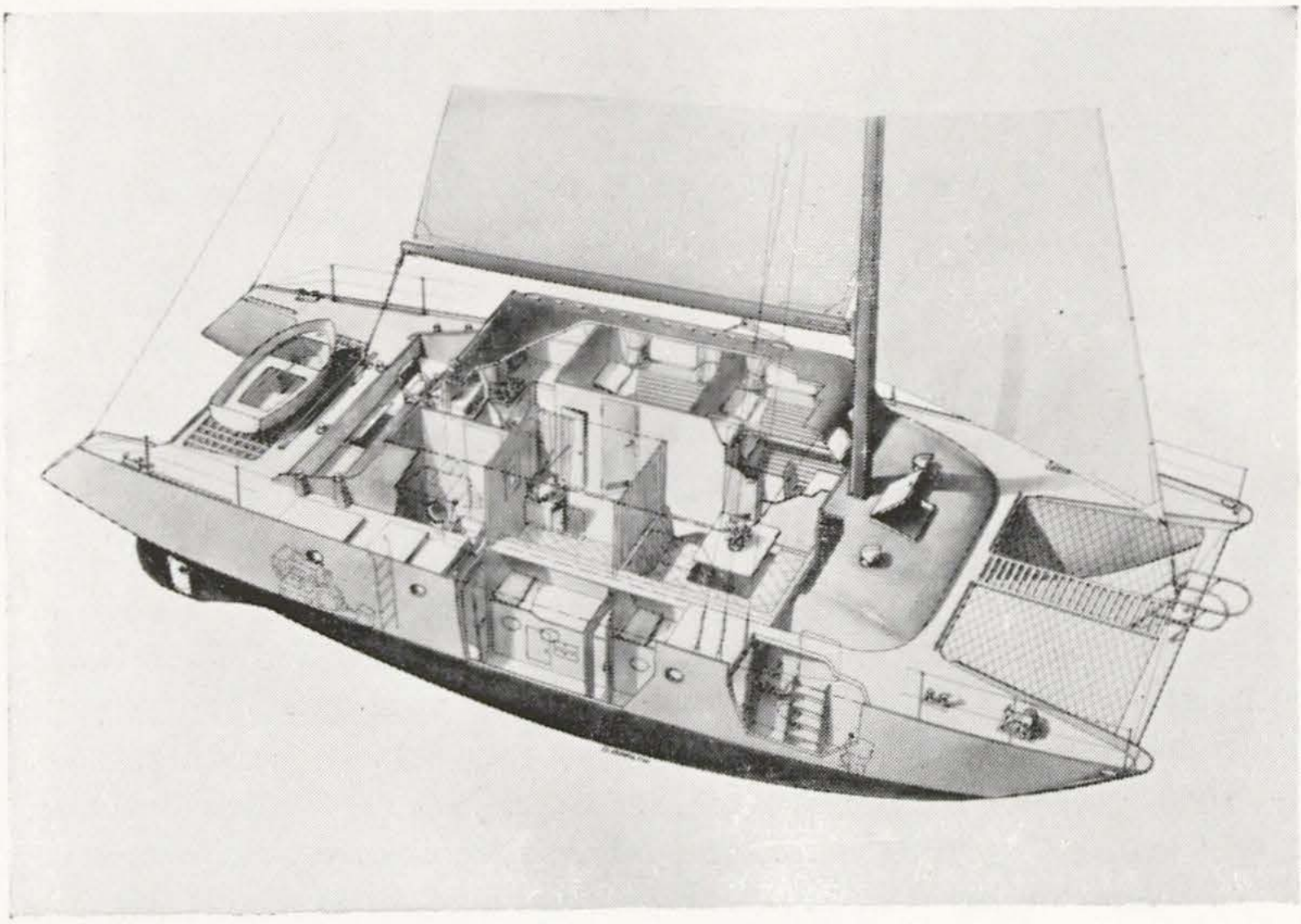
Displacement 11 tons
Designer : Captain Dario Salata.

I think this is one of the biggest catamarans in the world. *Polaris* has two two-berth cabins, four single-berth cabins, three toilets, one dining room, one drawing room in which two persons can sleep and a large galley and plenty of room for sails, storing, etc.

I have designed the *Polaris* after having studied for a long time the shape of the hull (particularly the asymmetrical shape), the construction and all the other things which are especially important in so big a catamaran. The appearance of the boat is very agreeable and the cabin is not too prominent, though the height inside is 6 feet 6 in.



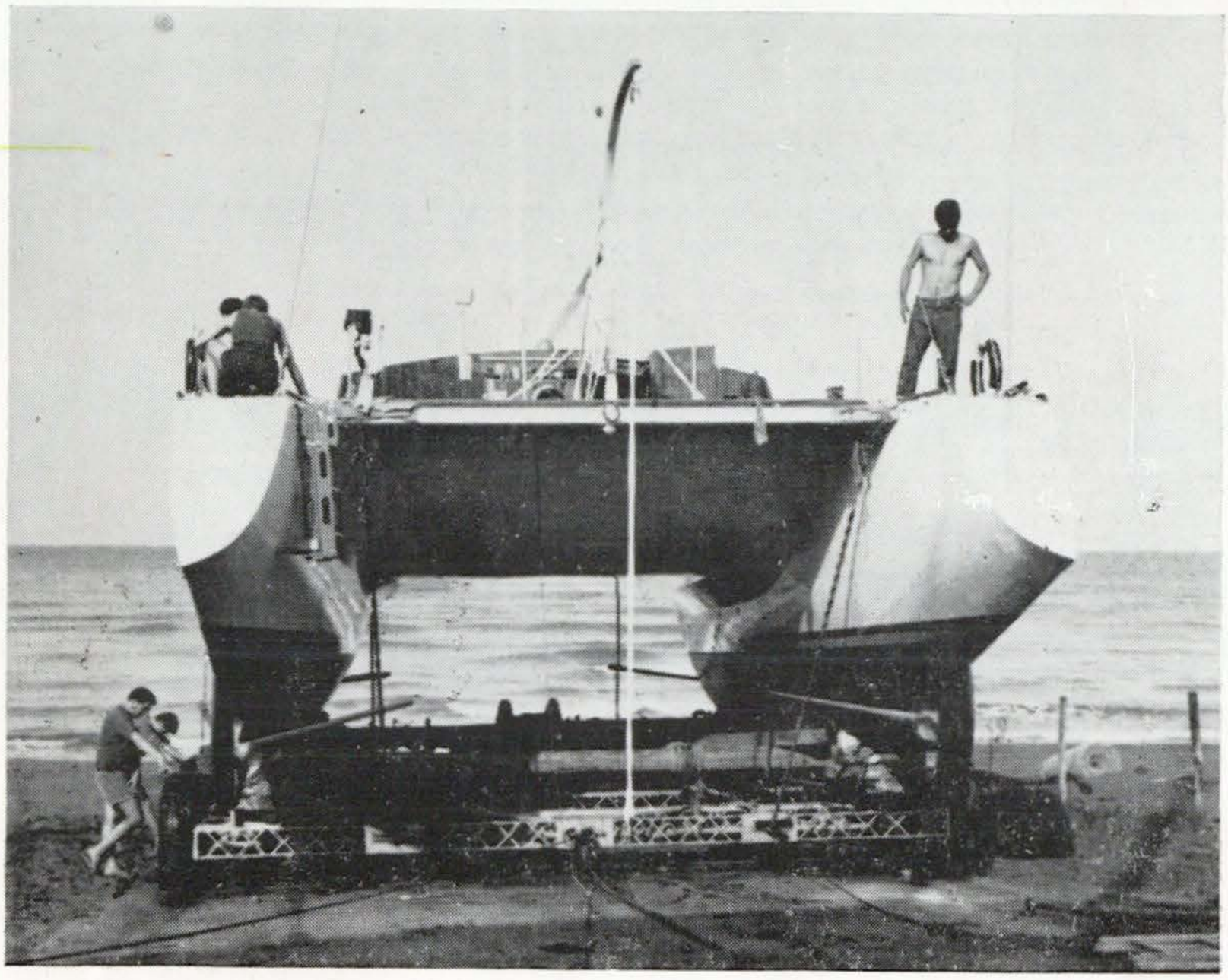
Polaris.



Polaris.

Performance. *Polaris* can be easily steered and can reach very high speeds. Her performance is much better than in an ordinary single hulled boat. She is an excellent racing boat with all the comforts of a very fast motor sailer.

Polaris is seaworthy. The tendency to pitching is normal and not at all excessive. If she were smaller, however, this might be greater



Polaris.

but with her L.W.L. of 47 feet, and with the distribution of weight and the shape of the hull, it is easy.

Owing to the shape of hull, putting about is easy and when sailing to windward, she has reached a speed of 10-12 knots with a real angle from the true wind direction of 46°. The wind speed on this occasion was 12 meters per second (24 m.p.h.).

Polaris is faster than racing and cruising single hulled boats both close hauled and reaching. She has a very big spinnaker of about 2600 sq. ft. which gives her good performance running.

The mast is an aluminium spar made in Italy. The construction is in a special laminated wood and plywood planking.

Polaris was built by Cantiere Navale di Doncratico (Livorno). The sails are, of course, Salata Sails.

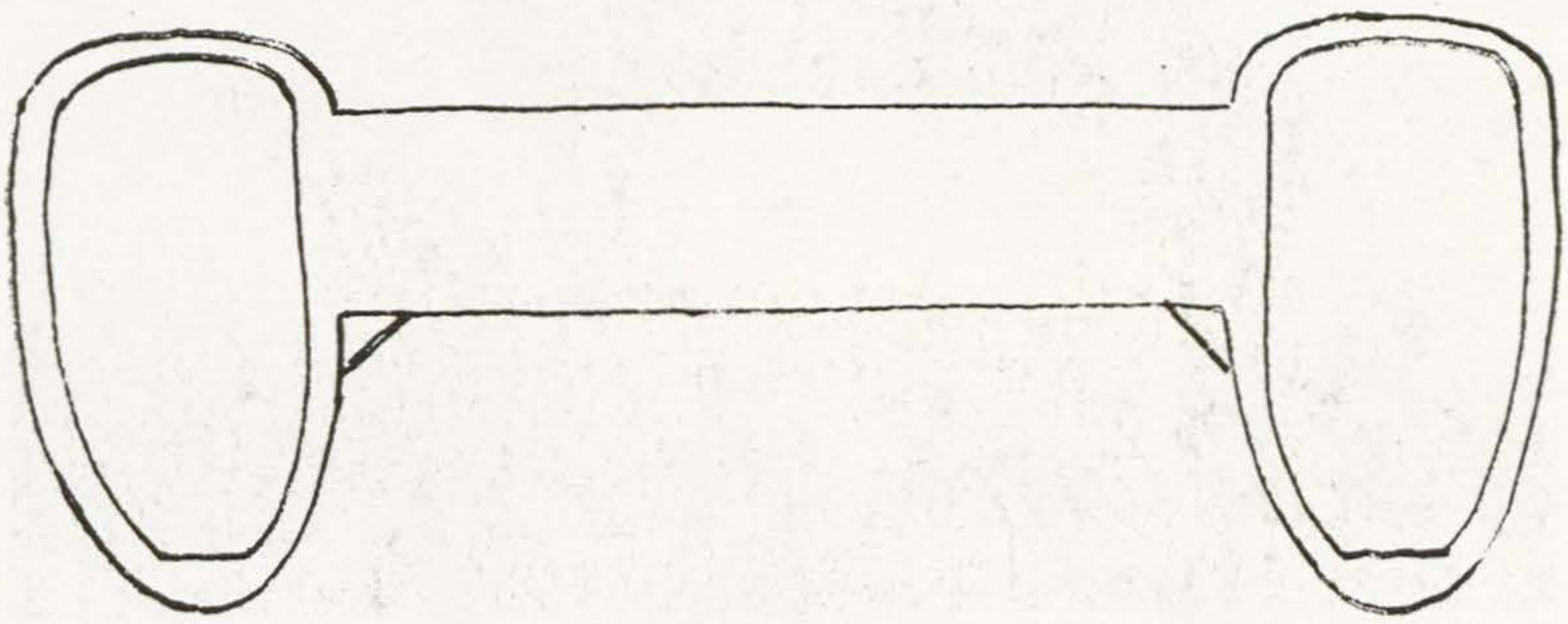
BLUEFIN

L.O.A.	29 ft. 3 in.	Draught with C.B.	5 ft. 10 in.
L.W.L.	28 ft.	Clearance of centre section	2 ft. 2 in.
Beam	14 ft.		
Beam on W.L.	2 ft. 1 in.	Weight empty	3400 lbs.
Breadth between centrelines	10 ft. 6 in.	Rig: Masthead Bermudian with Genoa	340 sq. ft.
Draught light	1 ft. 1 in.	Mast height above deck	38 ft.
Draught loaded	1 ft. 4 in.	Speed under power on measured mile	7 knots

Engine: Johnson 10 h.p.

Designer, builder and owner: Tom Dowling, 24 Wimpole Street, London, W.1.

Construction. Moulded fibreglass hulls 5 mm. thick with compound curvature virtually throughout, offered up to sandwich construction beams of fibreglass on Onazote, six in number, each being



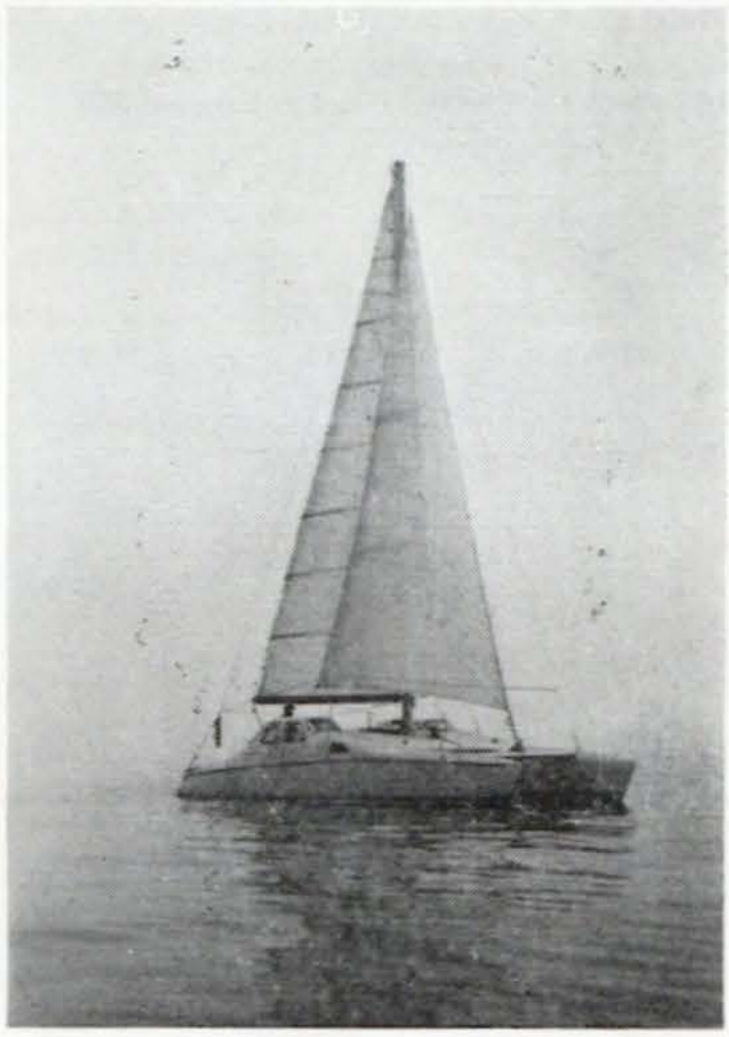
one piece from side to side as in the drawing. These allow unobstructed hulls throughout the length. There is local stiffening to the hulls in the form of shelves, furniture or battens throughout. The deck is an Onazote plywood sandwich between centrelines in the centre section only.

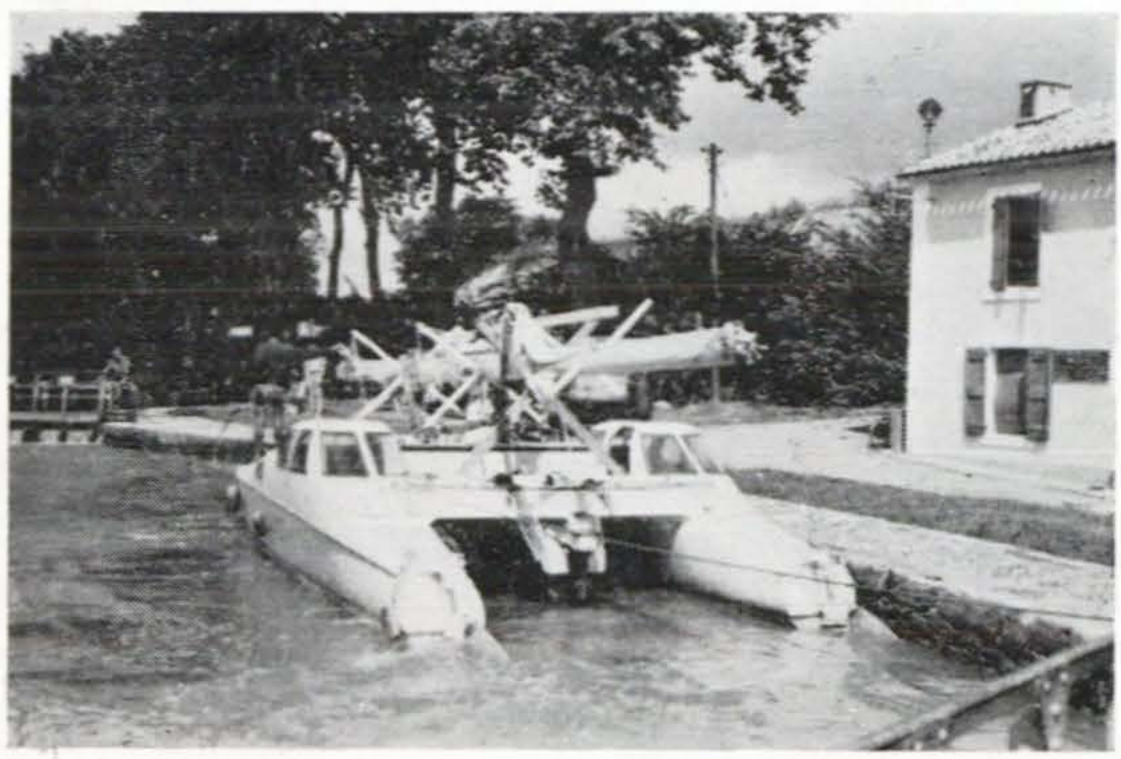
Hull form. The entry is very fine running into a "Sewer section" and out into a flattish run off aft. The transom is a semi-oval below. The deepest part of the keel line is 11 feet aft of the bow.

The centreboard is hung in an open support work below the centre section. It is pivoted and when lowered, the upper end rises in a keel-box in the centre section to the level of the deck.

Accommodation. The hulls are separate to keep the height and windage down and to leave a large unobstructed deck and cockpit

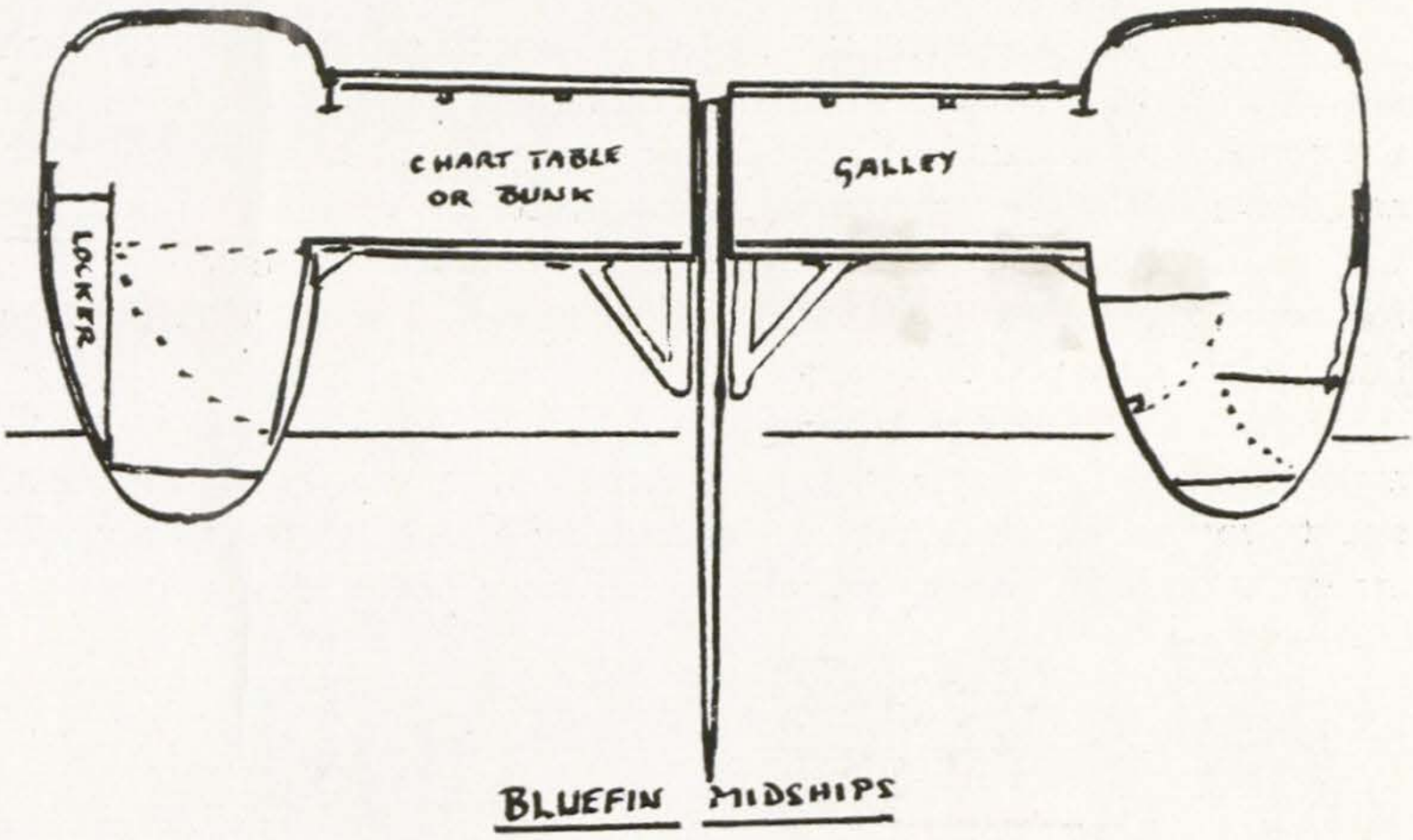
area between. There is headroom in each hull where the entrances from the cockpit are and for two feet forward of this, giving headroom for cooking and navigation. Each hull has a bunk in the stern. The port hull has the galley which is placed in the bridge deck. The cook stands in the hull with the working area (4 ft. 3 in. by 3 ft. 3 in. by 2 ft. 2 in.) towards midships. Forward of this are folding tables and seats for eating. The next bay forward of the galley is storage and in the bows is a bunk.





Bluefin.

On the starboard side, opposite the galley space is a chart table convertible to a double bunk athwartships with access forward underneath. Forward of this is the sail locker, heads and stores.



History. Designed and built by the owner in Malta as a fast cruiser, she was finished last year but too late in the season to get further than St. Tropez. She was therefore pulled up on the beach for the winter during which modifications were made to the keel. This Spring, she made the passage to the U.K. via the Midi Canal and Bordeaux without incident. The crew varied between solo (for 220 miles) and five, but three or four are found to be best. The motor was never used at sea.

Performance. Maximum speed so far is believed to be 15 knots. The windward performance is much the same as a normal yacht up to 50 square meters, better in a lop.

Editor. Two points are of a great interest in *Bluefin.* The first is the efficiency of the roller reefing gear which allows the whole sail to be set from the stowed position in half a minute or less. The sail can be reefed or stowed in even less time. The second point is that the original mast 38 feet long and one foot in fore and aft length by two and three quarters inches thick was a good enough aerofoil to sail the boat on a beam course without any sail whatever being set. Onlookers thought that there was an inboard engine. The value of this is that aerofoil masts can be of value if only slightly larger than the one used here.

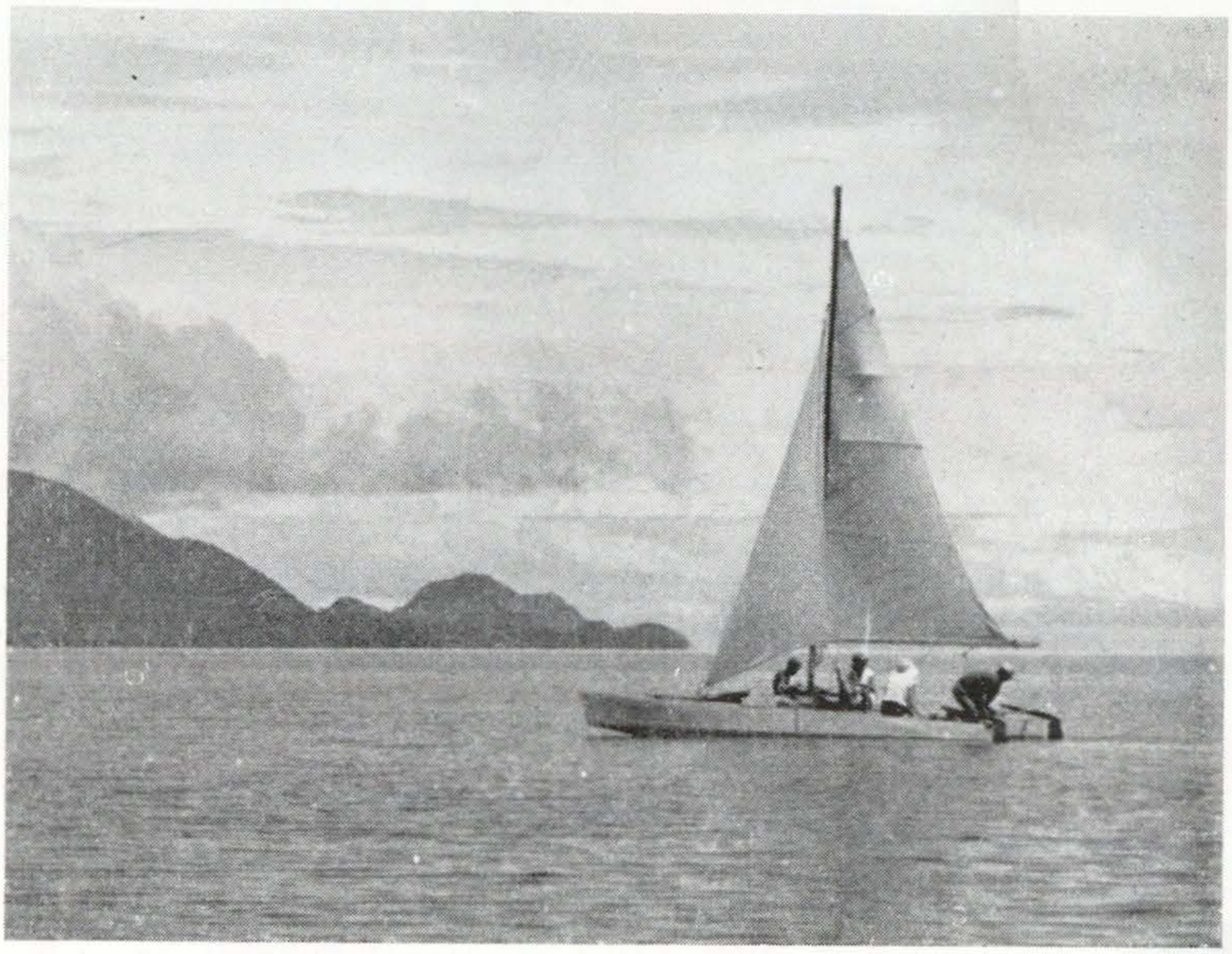
AN ENLARGED TAMAHINE

By P. U. Young

P.O. Box 383, Blantyre, Nyasaland

As you will see from the photos of the foreshore, the approach is very shallow. It is also obstructed by numerous underwater stumps, the remains of an ancient flooded forest, so that I have to approach and leave the shore on marks. This made me decide to build the Cat without dagger boards. While some manoeuverability and performance to windward has inevitably been lost, I am still sailing the boat on her V shaped hulls only.

When I first saw your design in A.Y.R.S. No. 18, I was immediately struck by its simple and cheap construction, practical conception, and to my mind, suitability for a cruising Cat. There is only one other Cat on Lake Nyasa, and although I have never seen it, it would



The Enlarged Tamahine.

seem to be built from plans drawn either by Manners or O'Brien, and is about a 16 footer. At the time I laid down my Cat, this boat was in use some 80 miles away (by water) from my proposed cruising grounds, and therefore any hope of competitive sailing was ruled out.

This combined with the magnificent stretch of cruising water offered by Lake Nyasa, decided me to construct the Cat primarily as a cruiser. With this in mind, I took the liberty of drawing out your plans to 20 foot overall by 10 foot beam. However, no sooner was work started than the future here became increasingly uncertain, and I went all out to complete the boat as quickly as possible. This led to the elimination of a cabin, and I am afraid, to a rougher finish than I would have liked, but it has at least enabled my family and I to enjoy a considerable amount of very pleasant sailing.

Three of us worked together to build the Cat, a neighbour, my late Father and myself, and I must say it went together very easily. It was built in approximately eight months of spare time. Very rarely were all three of us on it together, and work was frequently stopped when I went on tour. At no time did we spend more than a weekend continuously on the boat. It is very difficult to give you an estimate of the man hours required to build it, but I would say that two men, with a reasonable knowledge of woodwork could put it together in a fortnight to three weeks, even if they had to make all their own fixtures and fittings as we did.

We suffered from another time waster, and that was lack of suitable materials, even seasoned wood for the frames. Most of our fastenings had to be adapted from the building trade. About the only genuine yacht items I was able to find in Blantyre were: two sizes of copper tacks, aerolite glue and rigging thimbles. Hunting for suitable materials and fastenings consumed quite a lot of time. All spars and sails are home made. Standing rigging was made from galvanised steel wire. Eye splices being formed by bending the wire round the rigging thimble and slipping the end through a short length of copper tubing thus clamping it to the length of the stay, the tip of the free end was then turned over hard against the end of the tube. I have found that as long as the tube fits securely round the two thicknesses of wire, the splices will not move. For copper tubing I had to use petrol feed lines from the Car Breakers.

I have used this form of rigging whilst in South Africa, sailing on the coast. If properly looked after it did not seem to suffer from electrolysis, and of course it is a very quick method of rigging a boat.

In one photograph I sent you I was using split palm fronds as sail battens. These are fine whilst new and green, but shrink badly and tie themselves in knots as they dry out. They need renewing daily and are on the heavy side whilst green, but the palm frond is the only suitable material for sail battens available on the Lake shore.

I have no speedometer, and can only estimate the speed, but I am quite satisfied that I have done well over ten knots in reasonable

weather, and as you can judge from the photographs (all taken by my brother standing up to his neck in the water while I manoeuvered the boat round him), the Cat goes ahead and remains manoeuvereable in anything but a flat calm.

The Cat is due to be brought to Blantyre for general overhaul, and I intend to add two false keels of about 6 inches in depth to her hulls. This I think will be adequate to improve her performance to windward and still make it easy and safe for me to bring her ashore.

I have only one comment on this design, and that is that it could possibly do with a flatter run aft, or alternatively a deeper V section and therefore more beam at the transom, as crew and passengers aft tend to push the stern down and in certain weather conditions there is a slight tendency to hobby horse.

Finally, I would like to say that a great many people have sailed with me on "The Cat" (as it is known along the lake shore), all of whom have been extremely interested in the boat both as a pleasure and fishing boat. (It performs extremely well under power doing about five knots with the smallest Seagull outboard). There is little doubt that had the future been more settled, you would have received many requests for plans, and by now there would have been a small fleet of Morwood Cats at the Southern end of Lake Nyasa.

THE BRIDGE FERRULE

By Herman Berger

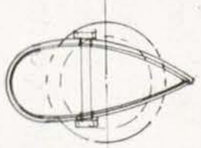
27 Emerson Avenue, Amityville, L.I., N.Y.

During the summer of 1961, I was at Jones Beach Marine Theatre enjoying the show. Towards the end, a large catamaran came on the scene. The sight of it made my hair stand up. I had no interest in boats at this time but the idea of two hulls seemed logical. You get stability without ballast, much more speed with lots of room; and deck space as a premium. I began to read about them avidly gobbling up the meagre information available. I somehow got wind of the A.Y.R.S. and joined it. As I went about harvesting these little titbits of information, the figure eight kept popping up in my mind like a pesky fly. No matter how I flailed at it, it kept coming back.

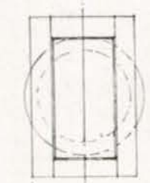
By the time the Sea Cliff Races took place, I knew enough terminology to classify myself as a "catamaniac" (a form of insanity). At the qualifying races, I felt like a clumsy mongrel puppy among thoroughbreds, curiously poking my nose all over those bird-like boats. There was the *Va Vite* and the *Pacific Cat*, both under 8 feet wide.

SECTION

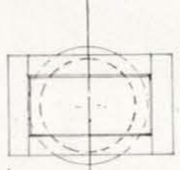
girder



BOW GIRDER



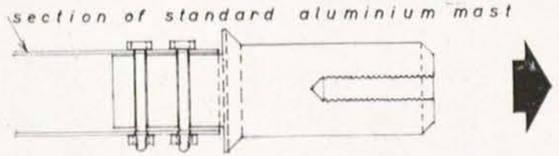
MIDDLE GIRDER

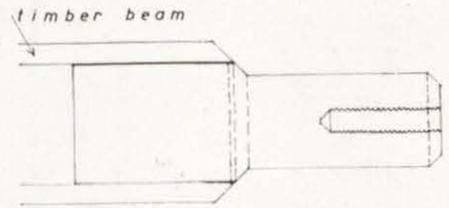


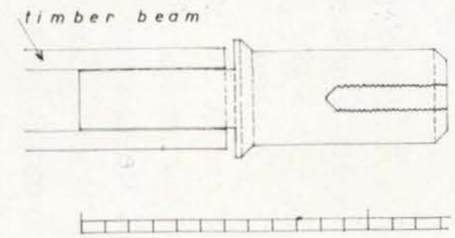
AFT GIRDER

PLAN

girder and male ferrule



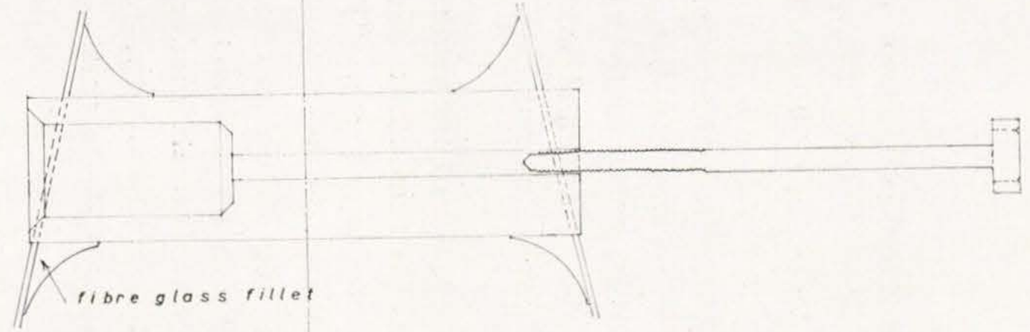


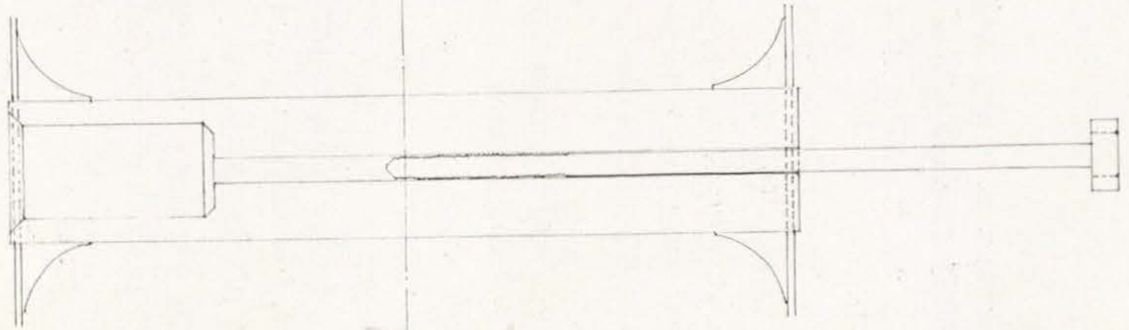


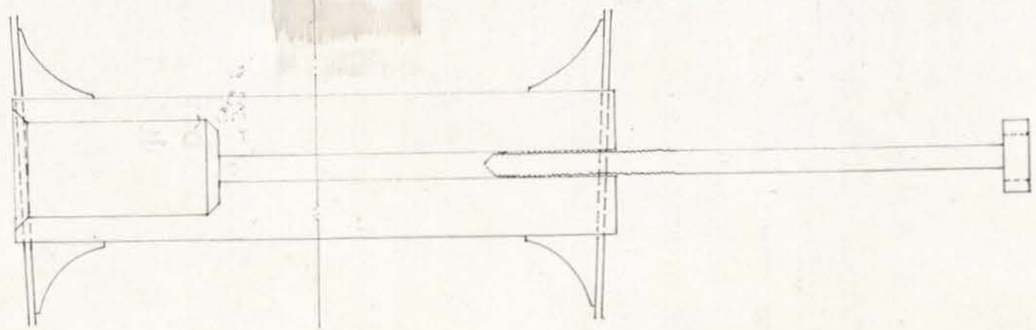
PLAN

hull and female ferrule

bolts







The *Wild Cat*, 11 feet wide was transported 3,000 miles standing on one hull. They all seemed to have the same problem. To reach a maximum sail area of 300 sq. ft. and still have stability, the boat had to be over 8 feet wide. To stay within the highway limits of no more than 8 feet of width, this boat had to be transported at an awkward angle or standing on one hull. The *Hell Cat* overcame this by detaching the hulls from the bridge girders. However, many of the sixteen bolts holding it together were difficult to get at. This boat would be too much of a chore to put together for one day's sailing.

This idea came to me while setting up a brake drum lathe, used for trueing automotive brake drums. Most drum lathes have an arbor, which assembles in about the same fashion as the "Bridge Ferrule," shown in the drawings.

The drawings show how the male ferrules slip into the female ferrules at the bow girder, the middle girder and the aft girder. In each case, a bolt is slipped down the female ferrule and is screwed into the end of the male ferrule, thus holding the two ferrules firmly together.

Various alternative ways to assemble this hardware are possible and readers may contact me about them, if they wish.

All the measurements are arbitrary. They should be calculated by a stress engineer. One set up of this hardware should be strong enough to hold together any sized boat from 15 feet to 30 feet. It should take two men about 15 minutes to assemble this boat.

The Bridge Ferrule will lend itself to refinement to make it lighter. Dies for making castings of it can easily be made on a lathe in a few hours.

Roderick MacAlpine Downie, designer of *Hellcat*, has designed an efficient hull. Coupled with the Bridge Ferrule, I envisage a man being able to buy basic hulls and bridges of various sizes depending on the size of his pocket book and the type of performance he wants. He will be able to add a trampoline or regular deck or buy a prefabricated light plastic cabin made up in sections no more than 8 feet wide or long to fasten to the bridges or hulls.

Summary. This hardware should make all catamarans *Hellcats* or better because we will be able to make them up to 30 feet in length and still be able to transport them in light trucks or ordinary trailers.

SOME THOUGHTS ON STABILITY OF "FLYING A HULL"

By J. H. Th. Wonder

Koningsplein 44, The Hague, Holland

Seeing many devices in A.Y.R.S. publications of righting a catamaran after a 180° capsize there is apparently a feeling of uneasiness concerning stability in extreme conditions.

Therefore it seems wholly justified to have a closer look at the conditions when "flying a hull" starts. From photographs this does not seem to be a very lasting procedure (*Yachting*, March 1957, page 54).

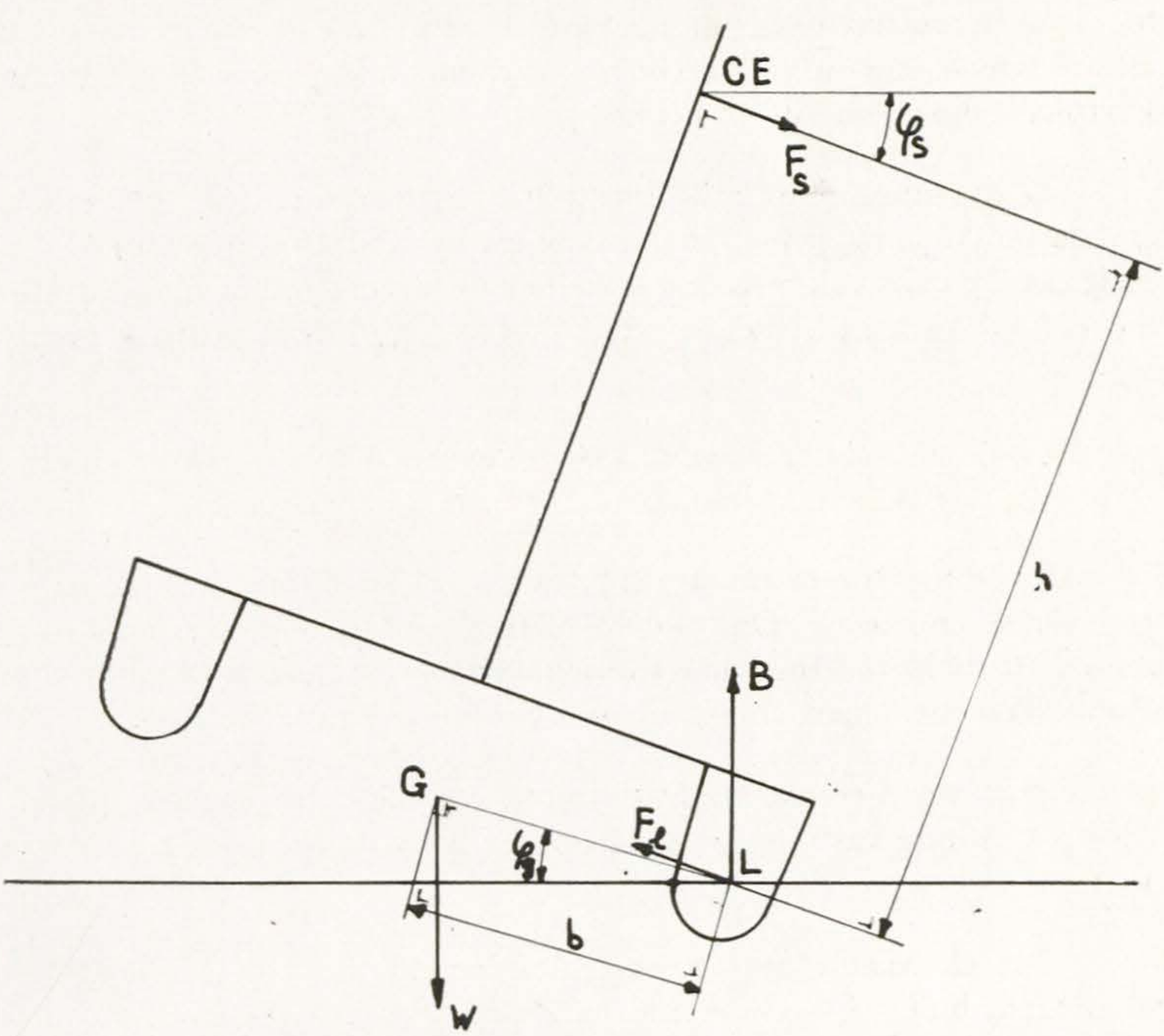


FIG. 1

Let us examine the moment when a hull becomes airborne. Immediately the athwartship moment of inertia of the load water plane is reduced to a small figure, but this need not concern us too much, because a 10 sq. Meter Canoe manages to sail happily with just as small a figure. So this does not seem to be of paramount importance.

Fig. 1 gives a little sketch of the situation.

L is the point of momentary rotation in the leehull.
CE = Centre of effort of the sail(s).
F_s = Athwartships component of sail forces assumed to be perpendicular to the mast and proportionate to the projection of the sail area on a vertical plane.

So :

$$F_s = F \cos \varphi_s \quad (F = \text{constant.})$$

G = Centre of gravity of the boat and crew.
W = Weight of the craft.
B = Buoyancy (equals weight) and is assumed to act through L.
F_1 = Lateral force also assumed to act through L (applies fairly well on a catamaran of type *Manu Kai*) in other cases an hypothetic h_1 may be introduced correcting for a lower point of action of F_1.
φ_s = angle between horizontal and F_s.
φ_g = angle between horizontal and L — G.
h = Distance from L to F_s (perpendicular F_s).
b = Distance from L to G.

If we now take the moments of the forces acting about L, then there is an overturning moment

$$M_O = F_s.h$$

and a righting moment

$$M_R = W.b. \cos \varphi_s$$

and as $F_s = F \cos \varphi_s$,

$$M_O = F.h. \cos \varphi_s$$

If we subtract these values and name this $G(\varphi_{g,s})$ it can be seen what will happen.

$$G(\varphi_{g,s}) = M_R - M_O = W.b. \cos \varphi_g - F.h. \cos \varphi_s$$

If $G(\varphi_{g,s}) = 0$ there is a balance in the moments and we can say

$$G(\varphi_{g,s}) = W.b. \cos \varphi_g - F.h. \cos \varphi_s = 0$$

$$W.b. \cos \varphi_g = F.h. \cos \varphi_s \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

But this does not yet imply stability, because therefore it is required that by small changes of φ_g and φ_s by an equal amount $d\varphi$

$G(\varphi_{g,s})$ must become *positive* by *increasing* φ_g and φ_s.
$G(\varphi_{g,s})$ must become *negative* by *decreasing* φ_g and φ_s.

In other words the graph of $G(\varphi_{g,s})$ plotted against $\varphi_{g,s}$ must be an increasing function of $\varphi_{g,s}$ at the considered point.

In Fig. 2 is a drawing of the situation that is desired at a heel of β degrees there is an equilibrium, because

$$G(\varphi_{g,s}) = M_R - M_O = 0$$

If the heel decreases to $\beta - d\varphi$ then $G(\varphi_{g,s}) = M_R - M_O$ becomes negative and our boat tends to heel more.

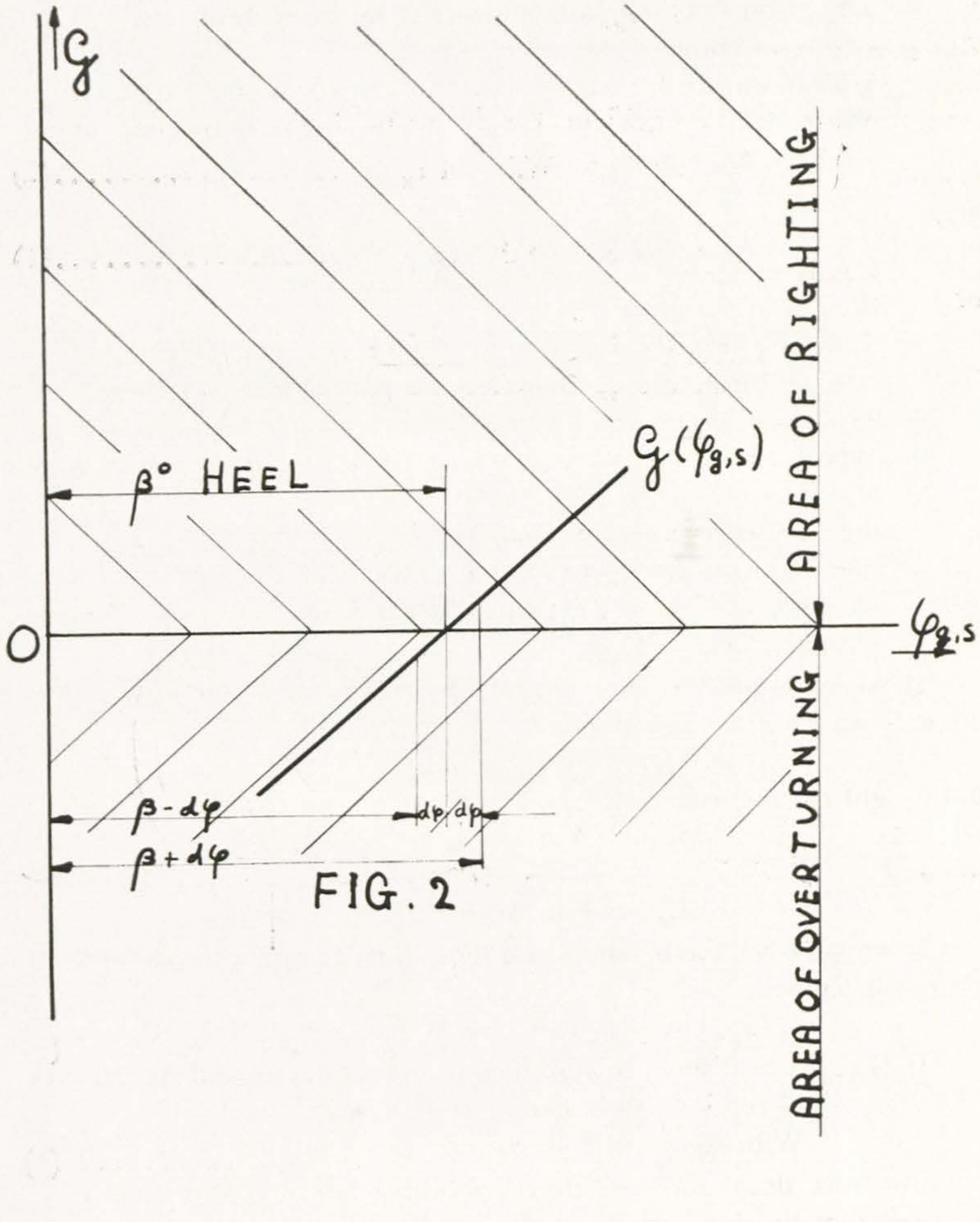


FIG. 2

If the heel increases to $\beta + d\varphi$ then $G(\varphi_{g,s}) = M_R - M_O$ becomes positive and our boat tends to heel less.

The steepness of the curve $G(\varphi_{g,s})$ combined with the boats athwartship moment of inertia governs the willingness to come back to the stable β degrees of heel.

So if any stable heeling is to be expected when flying a hull it is paramount that $G(\varphi_{g,s})$ is an increasing function of $\varphi_{g,s}$ or mathematically

$$G'(\varphi_{g,s}) > 0$$

this means

$$G'(\varphi_{g,s}) = -\text{W.b. } \sin \varphi_g + \text{F.h. } \sin \varphi_s > 0$$

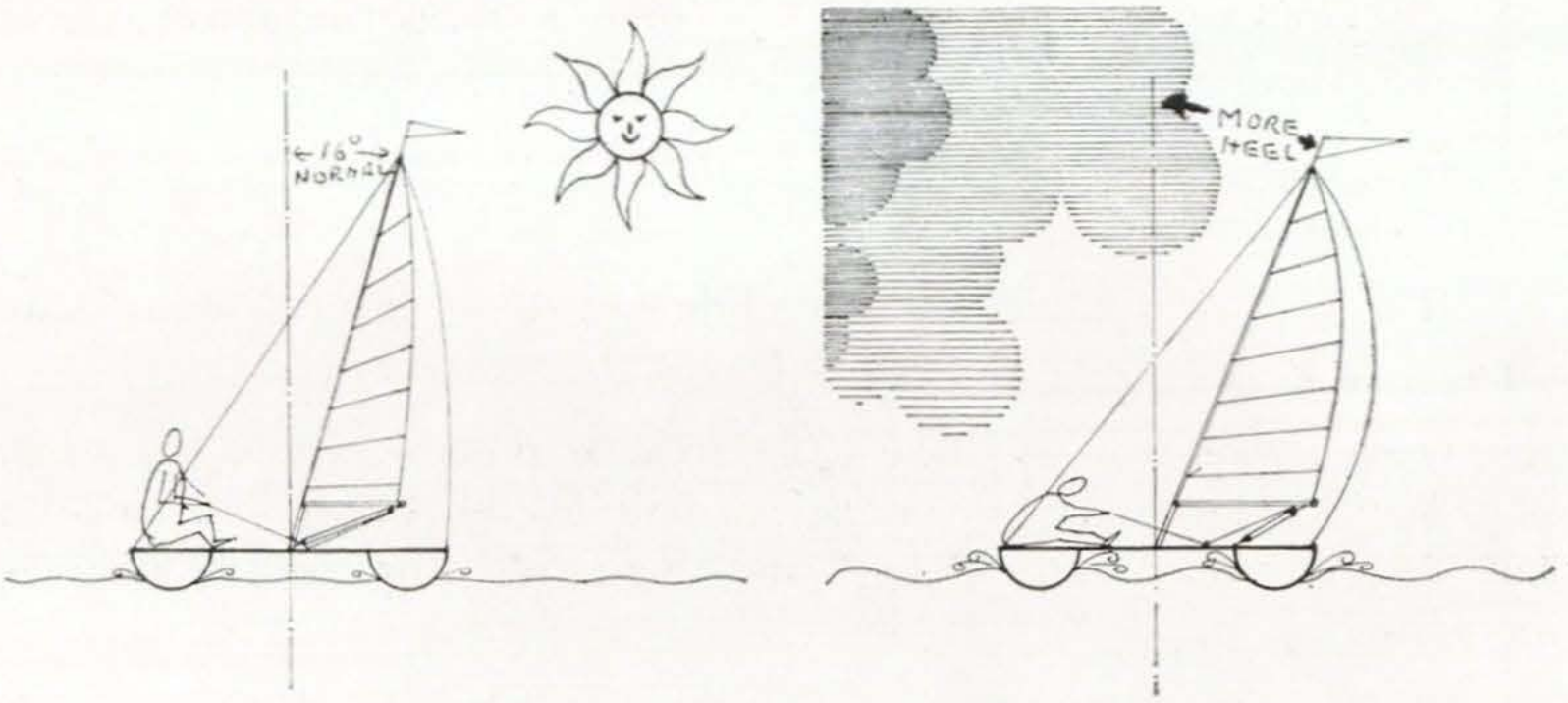
$$\text{F.h. } \sin \varphi_s > \text{W.b. } \sin \varphi_g \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

and

$$\text{W.b. } \cos \varphi_g = \text{F.h. } \cos \varphi_s \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

or

$$\frac{\text{F.h. } \sin \varphi_s}{\text{F.h. } \cos \varphi_s} > \frac{\text{W.b. } \sin \varphi_g}{\text{W.b. } \cos \varphi_g}$$



$$\tan \varphi_s > \tan \varphi_g \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (*)$$

which means for us :

$$\varphi_s > \varphi_g \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (*)$$

(*) For $\cos \varphi_{g,s} > 0$; so $-90° < \varphi_{g,s} < +90°$.

It is interesting how this result has already been applied :

A. By Michael Hendersons, Misty Miller (*Yachting World*, March 1961, page 48-9) by putting ballast under deep fin keels, G is lowered and hence φ_g is reduced, however at the cost of ballast and strengthening the construction to carry it.

B. Ice yachts (*Life*, January 19, 1962, American ed. cover). As it is impossible to carry ballast under the ice surface as conventional

yachts do under the waterlevel φ_g can't be decreased so to increase φ_s the masts are heeled by about 16° from vertical when the boat is level.

I have seen photographs of pre-war ice yachts with vertical masts. Some clever man must have discovered that such built-in safety does pay in handling and probably speed as you can go closer to the limits and "flying" a skate becomes possible; thus this must be considered to be an improvement.

Easing the shrouds to heel the mast to lee seems to be a practice wholly suitable for catamarans, trimarans and other outrigger craft.

If you do not trust the weather it would be very easy to give the mast some degrees more heel and sail with greater safety.

The amount by which φ_s and φ_g differ governs the sensitiveness to small changes in heel in the stable "flying" position.

If $\varphi_s = \varphi_g$ the equilibrium is indifferent, in practice this will mean capsize.

If $\varphi_s < \varphi_g$ any equilibrium is labile and this will mean immediate capsize as soon as a hull or float leaves the watersurface.

It would be wise to make φ_s as great as possible and φ_g as small as possible. Deep narrow hulls, a small overall beam will cause a considerable heel before "flying" and this is more or less the same as increasing φ_s.

Shallow draught hulls and a great overall beam will be the craft most needing to increase φ_s as a safety device.

It may seem a rather strange idea to sail with a mast that has already say 16° heel with a level boat, but again ice yachts do pretty well in this situation and it looks better than the other alternative of carrying much ballast under deep fin keels.

And may we hope that with this easily applicable knowledge capsizes can be prevented and it will no longer be necessary to righten a catamaran after a 180° capsize as catamarans can be wholly stable till the mast touches the watersurface, a virtue until now only held by conventional keelboats.

Remarks. Not considered are: dynamic forces, waves and wind catching of the flying hull and bridge deck, but this does not seem to be too important as :

1. Surfaces are considerably less than sail area.

2. Much closer to the watersurface, hence producing a smaller overturning moment M_O than the sails do.

3. Probably the coefficient of resistance and lift of exposed hull parts will be much smaller than the same coefficients of the sails, the latter purposely made to be great.

4. If the lee hull would "dive" the whole theory would hold true as long as the weather hull would have negligable buoyancy so from this point of view there seems no improvement in building a catamaran with "drowning" hulls—moreover it is hard to see how to prevent a forward capsize with as little reserve buoyancy.

A ROTATING MAST

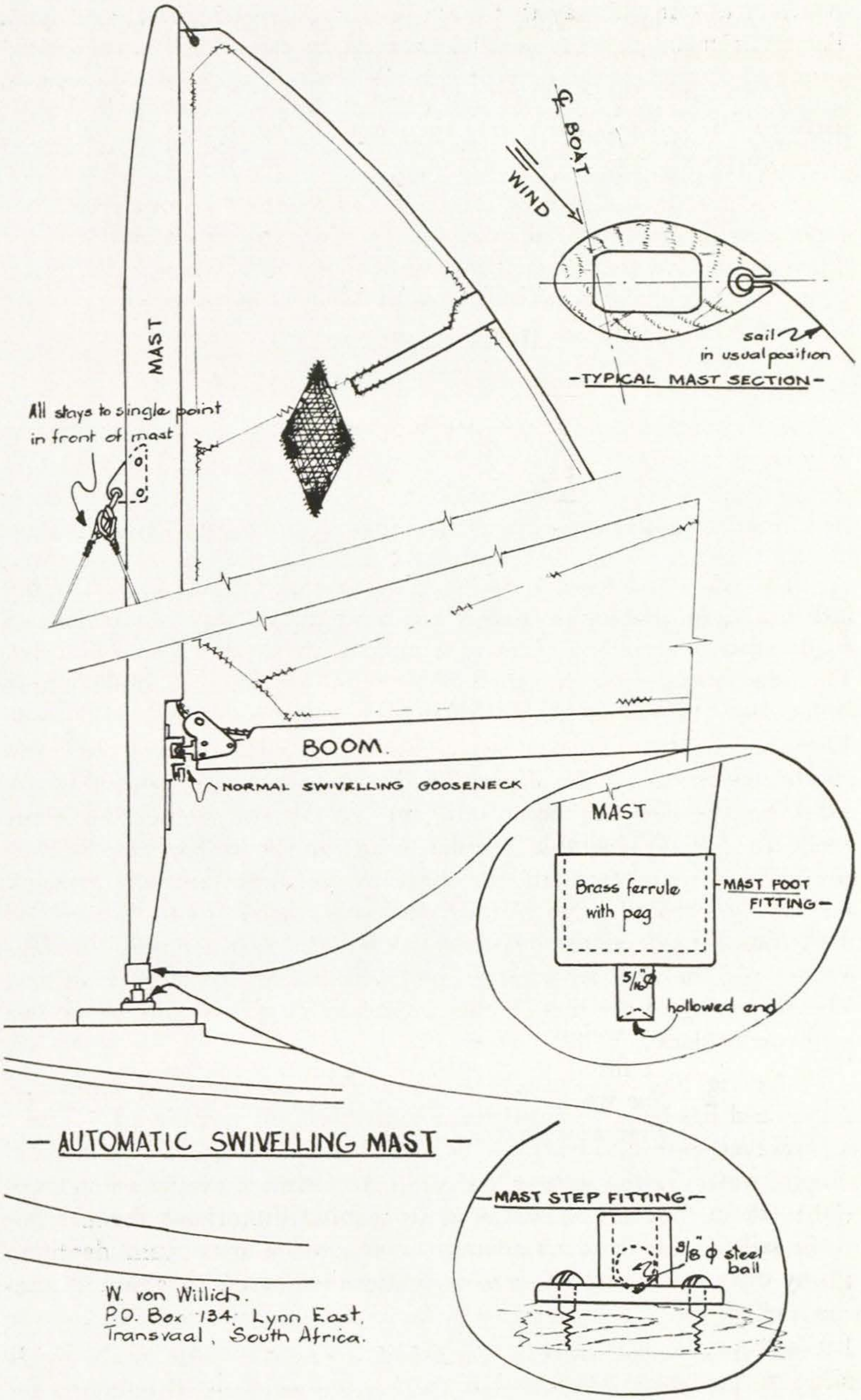
By W. von Willich

P.O. Box 134, Lynn East, Transvaal, South Africa

The idea is simplicity itself. The mast is mounted on a 5/16th inch brass pin, bearing on steel at the foot, and all stays are taken to a single shackle attaching them to a tang in the mast at hounds level. The mast itself is of elongated teardrop section and is pulled more or less into the line of the luff of the mainsail by the pull of the sail. There is a tendency to over-swivel due to the side thrust of the boom on the gooseneck. The degree of this over-swivel is controlled by adjusting the sheeting point fore and aft on the boom, but some over-swivel seems desirable in order to line up the lee sides of the mast and sail. This gives a smooth curve to the important low pressure side of the aerofoil. No serious eddies are liable to be formed on the windward side as the discontinuity is at or near the point of stagnation, and the area is, in any event, subject to converging airflow. The swivelling of the mast is not hampered by the lee shroud as this is normally slack.

The rig has been tested in all conditions, including some real blows, and has behaved itself remarkably well, all considered. There is, however, one disadvantage to my present set-up, to wit that in choppy water during lulls in the wind, the mast tends to swing back and forth in time to the waves, spilling what little wind there is out of the sails. This does not affect me much as the mast can be steadied by my crew but a friction damper arrangement could be used to stop this oscillation.

As far as performance is concerned, I rate the value of the rig at about 30 per cent additional sail area in the mainsail, although other



— AUTOMATIC SWIVELLING MAST —

W. von Willich.
P.O. Box 134, Lynn East,
Transvaal, South Africa.

members of our club say that I am just having a streak of good luck. The fact remains that my boat has won all the races she has completed (four out of five) in the current season. One of these races was won in spite of a recall which cost me a full leg in a race of four laps on a three-leg course. The race not completed was due to a retirement after an argument over water at a buoy.

A PLANING CATAMARAN

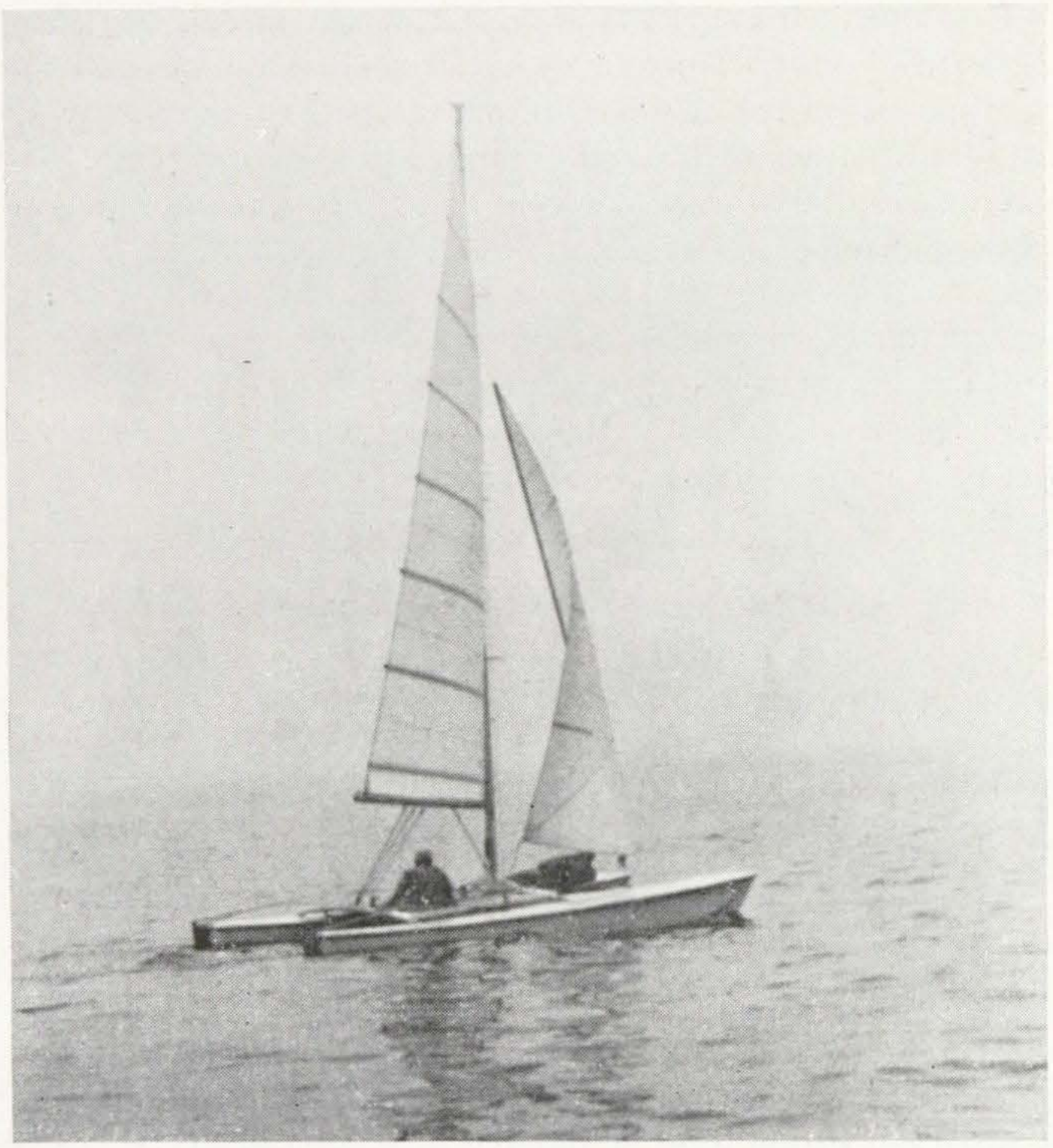
By Harold Boericke, Jr.

Foot of First Street, S.W., Washington 24, D.C.

A short chronicle of the development of the planing catamaran may be of interest. In the event that it is, I am appending the story of the catamaran and its racing career. All this, of course, is closely tied in with the defence eliminations for the 1961 International Catamaran Challenge Cup. One of the candidates for the defence, the 19 foot *Simba-Sue*, owned by Phillip Le Boutillier, was, I believe, the first successful catamaran of a true planing type.

The tale of how this and other catamaran features were developed leads back to the fall of 1959 when they were incubated. I had met Lt.-Col. Charles E. Cornwell, USMC, through mutual interests connected with hydrofoil boat development. When our discussion turned to catamarans, Col. Cornwell's conviction that a successful planing catamaran could be built coincided with mine, and he asked me to design an 18 foot plastic catamaran, which was later built by Robert Kilbourn and Gilbert Koch. The hull form, which was of a planing motorboat type stretched out like taffy, planed well only when the weight was located aft. Modification of the bottom forward to a dead-flat of 22 inch width gave a form which planed readily under almost any weight conditions, particularly with the two deep "fences" which I fitted as downwards extensions of the chine. The 19 foot *Simba-Sue* was built by the same builders to these ideas for Phillip Le Boutillier, as a defence candidate for the 1961 Challenge Cup.

The hulls of this catamaran were flat-bottomed everywhere except right forward, where they faired up into a motorboat form. The fences, extending below the bottom, reached a maximum depth of three quarters of an inch, and were later increased to one and one-quarter inches. These ridges trapped oncoming water under the flat bottom to give a very high planing lift so necessary under the slender catamaran form. At a wind speed of 8 knots, *Simba-Sue*



Simba Sue.

was able to plane off in a very abrupt and unequivocal fashion, reaching boat speeds of equal or greater than wind speeds.

Combined with this was Col. Cornwell's concept of a lightweight welded aluminium bridge which was intended to be fairly flexible torsionally. In effect, then, each hull had to take care of itself in pitch while planing, and make its own pitch adjustment. The combination of planing hulls and flexible bridge worked well in practice. Although the movement of the hulls transmitted itself to the rig, causing considerable vibration, it was not injurious, although it took a lot of getting used to.

The Defence eliminations were held in the light weather conditions which are prevalent in Long Island Sound in early September. In winds less than of velocity 8 knots, *Simba-Sue* was not fast. Her rig was 7 per cent smaller than the 300 square foot limit, and the greater wetted surface of her flat bottoms told against her. Although faster

in light weather than the 235 square foot stock catamarans, she was slower than the other candidates in this weather. As soon as the weather breezed up past 8 knots, however, *Simba-Sue* became a new boat with spectacular capabilities. Her leaping action when planing off from a sudden puff of wind has to be seen to be believed. While planing at from 5 to 12 points off the wind, she can considerably exceed wind speed, and could pass any of the candidates to windward or to leeward. Thus she may be a close approach to the goal Col. Cornwell and I set ourselves at the outset, of building the fastest sailboat in the world. We believe we have sailed this boat in wind speeds of eighteen knots at speeds of well over twenty knots.

Such a performance is very exciting and unfortunately, very wet, beyond anything the author has experienced in round-bottomed

Catspaw.

catamarans. In 1953, the author designed, built, and raced the 20 foot catamaran *Catspaw* (see cut) in events in the Chesapeake Bay and elsewhere, winning second prizes in a number of hard-fought regattas against the best single-hulled competition, in the era 1954-56, proving herself to be the fastest catamaran in the Middle Atlantic States. This narrow-hulled craft of length beam 18 : 1 had a bow wave composed of fine spray which was annoying rather than disastrous. The planing catamaran, on the other hand, sails in a dense layer of white water, about three feet high, and extending right across the boat.

It is often necessary to slow down to see where one is going, as standing up is too hazardous. The water escaping from under the fences was under high pressure, and feels like the discharge of a fire hose at close range. It is a brave man indeed who dares to flatten the sheets and give this boat a sail full of wind. But as anyone knows, the faster you go, the wetter you get.

There are limitations to the planing catamaran concept. The hulls are of necessity somewhat wider than today's round-bottomed catamarans, to get sufficient planing area for lift in light-moderate winds. Wetted surface is usually somewhat greater. The wider hull has to be forced through a head sea, on the wind in a rough sea. A considerable length of sharp bow has to extend forward of the planing section to ease the entry through the water under those conditions. This part lifts out while planing. However, one unexpected result of flat-bottomed afterbodies on catamarans is a really marvellous manoeuverability. Provided that way may be maintained, any manoeuvre possible in a single-hulled boat, including the tightest turns, can be managed. This is particularly true of that nasty manoeuvre, bearing off in strong winds, which can be done with ease and confidence.

To observe the 1961 Defence eliminations at Sea Cliff, N.Y. was to witness one of the remarkable events in recent yacht design history. Here were perhaps four of the fastest sailboats in this country; each consistently sailing faster than the wind on a reach; each a discrete and significant design concept which had carefully been brought into practicality. Only by racing against topnotch rivals such as these could the designer understand the strong and weak points of his concept. Then when the splendidly designed and tested challenger came to sail with us and carried away the Trophy, we all learned another and very salutory lesson which none of us will forget.

There can be little doubt that the 1962 Catamaran Challenge Cup will prove as interesting as the first. Most of the principals in that contest will be there again with new boats and with, in addition, a years' time to test out the many interesting concepts which the first contest uncovered, and some new ones besides. Two new candidates are now under construction for Phillip Le Boutillier to my designs; one of a round bottom hull shape, and the other of an improved compromise planing shape of patented features. It is Col. Cornwell's purpose to whet one boat against the other, to a fine hollow-ground edge, so that both will be in fine fettle by 1962 Elimination time.

THE Y.W. CATAMARAN

L.O.A. 15 ft. 6 in. Sail area 175 sq. ft.
Beam 7 ft.
Designer : J. R. MacAlpine Downie.
Builders : John Fisk, The Parkway, Canvey Island, Essex.
Class Hon. Sec. : Miss M. Fleetham, 22 Weigall Road, Lee Green, London, S.E.10.
(*See Cover Photograph*).

The majority of the larger yachting magazines sponsor certain dinghies and yachts of various kinds, thus ensuring their acceptance as firm classes. The *Yachting World* is the first British yachting magazine to sponsor a catamaran class with the Y.W. Catamaran.

The Hull. This has the usual MacAlpine Downie curved and fine bow turning into a flat ellipse for a maximum section and running with straightish buttock lines up to a wide transom. This catamaran carries relatively more sail area than the *Thai IV* by the same designer and so is relatively faster, which explains the flatter maximum section and wider transom. However, these features also produce greater manoeuverability.

The Sails. These are of fairly high aspect ratio, large flow and are fully battened—all features which we know give the greatest speeds.

Portsmouth Number. The Y.W. Catamaran sails at a Portsmouth number of 75 which is the same as that of the *Shearwater III* indicating an equal speed.

Summary. The Y.W. Catamaran is a pleasant, fast and manoeuverable craft which should give satisfaction to an owner. The hulls are made of glass fibre.

THE CHEETAH CLASS (GLASSFIBRE)

Length	14 ft.	Sail Area Main	118, jib 42,
Beam	6 ft. 6 in.	Total	160 sq. ft.
Draught ex C.B.'s	7 in.	Weight with rigging	292 lbs.
Draught with C.B.'s	2 ft. 4 in.		

Designer and builder : G. H. Brookes & Co., 3 Rawreth Industrial Estate, Rayleigh, Essex.
Class Secretary : c/o Catamaran Yacht Club, Minster, Sheppey, Kent.
Price (ex sails) : £205 0s. 0d.

For the last three years the British *One of a Kind* races have been graced by this handsome catamaran with its pretty red terylene sails.

The Cheetah Cat.

However, we have not been able to get a photograph or information about it till this issue.

The *Cheetah* cat is fourteen feet long and is therefore not as fast as the larger cats but she is no sluggard and can often beat the occasional larger cat boat for boat.

As compared with other fourteen foot catamarans, the *Cheetah* is as fast as any and has often put up the best showing. She can confidently be recommended, not only on account of her performance but also because of her construction and fittings.

The *Cheetah* is now produced completely in glass fibre with Alloy mast and boom together with Alloy centreplates making it a maintenance free craft.

Arthur Piver's V4 Catamaran.

THE 14 FT. V-4 CATAMARAN

By Arthur Piver

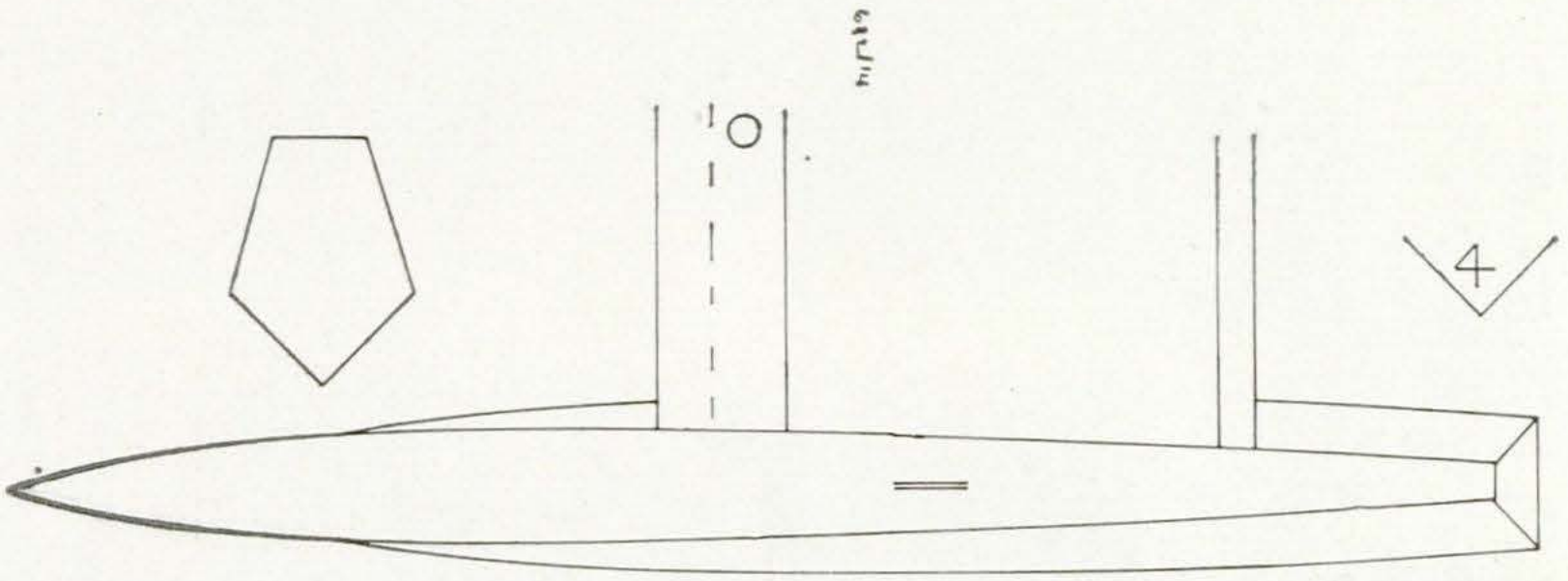
L.O.A.	14 ft.	Hull Beam (Chine)	20 in.
Beam	7 ft. 4 in.	Draft	9 in.
		Sailing Wt.	200 lbs.

Designer: Arthur Piver.

The 14 ft. V-4 Catamaran is an enlarged version of the 12 ft. model (A.Y.R.S. 38). Two other models, 16 and 18 ft., are also now available via plans.

Built at a material cost of $200, the 14-footer is constructed of plywood, fibreglass-covered. It utilizes the 90-degree V amidships, and has a particularly fine entrance, with a wide stern. Pronounced tumble-home minimizes width (and weight) of decking.

A balanced jib is used—the self-tending feature being particularly valuable when single-handing.



Mainsail is cut with no draft at all—the draft being furnished by the shelf-type foot—which has a 1/20 draft ratio. It is not yet known how efficient is this sail as compared with the usual fully-battened type, although it is far simpler to use. The battens need no manipulation after being inserted. The shelf shape is maintained by a 1/8 in. nylon tension line along the length of the boom.

This boat has defeated (over race courses), at one time or another, all the fastest catamarans manufactured in California. The largest of these has been the 18 ft. 9 in. *Pacific Cat*. The larger boats have had as much as double V-4's sail area—plus trapezes.

An interesting comparison was observed at a Regatta in San Francisco in June, 1962. Five catamarans started toward a mark simultaneously. These were: two *Wildcats*, two 17 ft. *Catalinas*, and *V*-4. Over a mile-and-a-quarter reach (in moderate conditions), the five boats raced the entire distance neck and neck—being still together at the far mark.

KITTY (New Zealand)

L.O.A.	12 ft.	Weight of stripped hull	180 lbs.
Beam	6 ft. 9 in.	Sail area 150 sq. ft., Main 100, jib 50	
Hull depth	1 ft. 10 in.	Spinnakers 330 sq. ft. (usually 200	
Draught (ex C.B.)	6 in.	sq. ft.)	

Designer: Jim Young, Needles Eye, Birkenhead, Auckland.

This account was kindly sent us by G. B. Stanton, 11 Chilcombe St., Fendalton, Christchurch, New Zealand, who is the convenor of

Kitty.

the 12 foot sub-committee of the Canterbury Catamaran Squadron, New Zealand.

I have read with great interest the A.Y.R.S. publications and am writing to acquaint you with a very successful catamaran class here in New Zealand. This is the 12 foot Catamaran or *Kitty* class of which there are at present over 100 in this country and Australia.

The Class was formed early in 1959 after a 12 foot catamaran named *Kitty* had won the Interdominion open 12 foot Championship (similar to the Interdominion 18's) by such a wide margin that catamarans were henceforth barred. *Kitty* with borrowed undersized sails and no spinnaker won each race by an average of eight minutes.

The Class was born with restrictions only on length, sail area and mast height and up to date more than 90 of the boats are to the original *Kitty* plan. The rules allow the crew to be either one or two as desired.

The hulls are continuously moulded from gunwale to gunwale in two 1/10th inch veneers and there are no keels, frames or bulkheads. The general layout is similar to *Shearwater IV*.

In light and moderate winds, these craft are faster than a *Shearwater IV* but in heavy winds they are slower because of their shorter waterline length. They are capable of speeds in excess of 20 knots.

The photograph is of my own *Kitty* whose layout is different from the original, though the hull lines are the same. She carries 128 square feet which has now been increased to 150 sq. ft. in a high aspect ratio rig.

One point of interest is that my boat under the 128 foot rig was capable of pulling a waterskier from a conventional deepwater start even in quite moderate conditions (20 m.p.h. wind) and maintaining the skier at a very good skiing speed. The primary reason for my change in sail area is to enable me to tow two waterskiers if it is possible.

The original *Kitty* has decisively beaten the *Flying Dutchman* during 1961.

THE " HYDROCAT "

Outboard version :

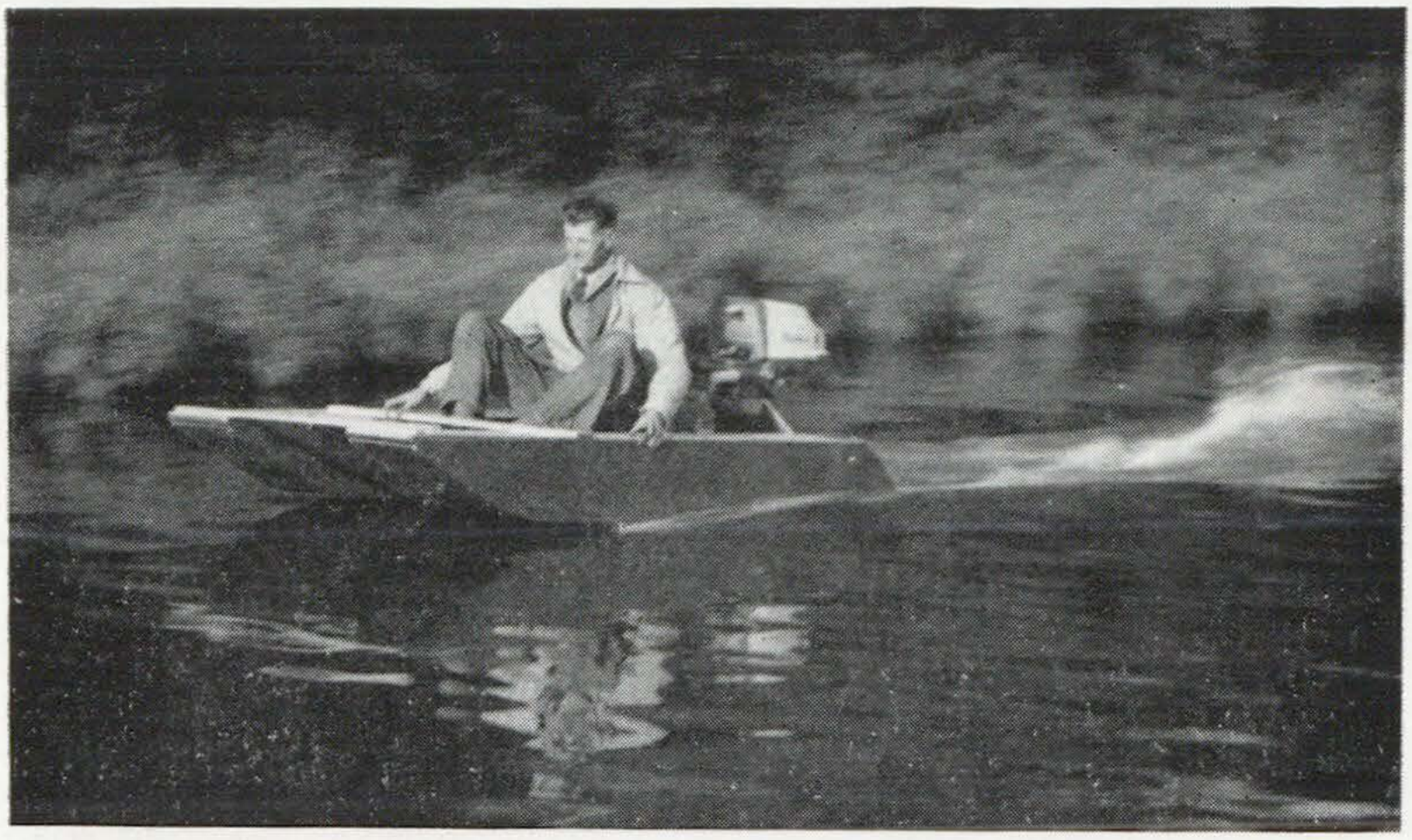
L.O.A.	9 ft.
Beam	3 ft. 7 in.
Weight	86 lbs.
Draught	1 in.

Price : £29 10s. 0d. (primer), £36 15s. 0d. (painted).

Designer : C. Morrey, 72 Fairview Road, Penn, Wolverhampton.

The photograph shows the prototype of the craft which I have designed, built and am now selling.

I set out to design something which would bring a bit of speed within the reach of the person whose pocket was not deep enough to afford high powered, high priced motors, and which at the same time would be safe enough to be used by a beginner.



The "Hydrocat."

The photograph shows the *Hydrocat* doing approximately 23 m.p.h. with only a 6 h.p. motor, and it is so stable that deliberate attempts to overturn it by pushing the tiller hard over at full speed met with no success. She will take motors up to 16 h.p. but needs 6 h.p. Perkins or equivalent to get planing.

Manufactured in mahogany and resin-bonded ply, the *Hydrocat* has the stability and safety of the catamaran, plus a Hydroplane-like performance, speed with safety.

THE SKI-SAIL

By A. H. Fremont

7301 N. E. 5th Ave., Miami 38, Fla., U.S.A.

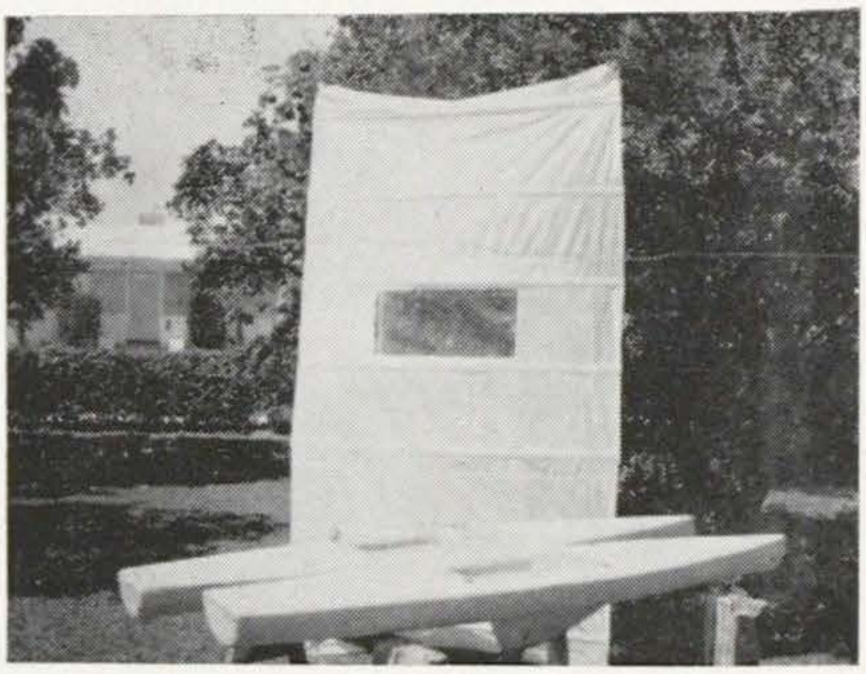
The *Ski-Sail* is an attempt to travel and manoeuvre on water with a pair of flotation skis for support, and a sail for propulsion.

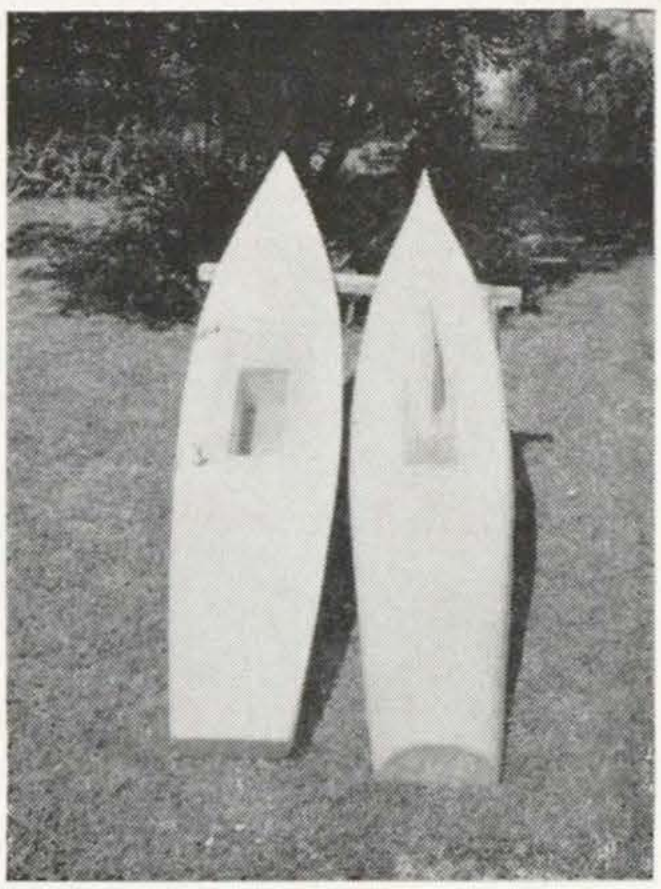
The hulls, or skis, are expanded polystyrene, covered with glass cloth and epoxy resin. They weigh $5\frac{1}{2}$ pounds each. They are 8 feet, OAL, and a beam of 1 ft. 3 in., and a total depth of 6 inches.

Waterline length, beam, and wetted surface vary with the shifting of weight from one foot to the other. They are held together by two tight lines at about 4 inches distance, or about 19 inches centre-to-centre. In earlier attempts, no lines were used between the hulls. Reader, please . . . *please* . . . don't try this! Use connecting lines. Splits are for athletic dancers.

In the earlier model, standard water-ski bindings were used. They didn't work. The hulls were too tender, due to their extreme lightness, and round characteristics, and the fact that total displacement was from their deck upward. They wanted to flip, and did. In a later model, dropping the feet into wells to the bottom corrected this. Also, after testing, the bindings were found to be hazardous. In an upside-down position, it is much easier to get out of the wells.

Present location of the wells provides approximately $8\frac{1}{2}$ inches of side-pressure aft of CLR for hull control by twisting the feet. It doesn't work. Some sort of rudder control is now considered necessary, though how it will be handled, I don't know. Perhaps a sliding plate under the heel, coupled to some sort of linkage to independent controlled rudders.





The Ski-Sail.

The fastest of moden, light displacement sailing craft have a gross-weight to sail area ratio of between 3-and-4 to 1, each square foot of sail driving between 3 and 4 pounds. The sail for the *Ski-Sail* is 50 sq. ft., including roaches, to drive a total weight of 200 pounds of skier and rig. With winds above 8, it is totally uncontrollable, even on land, and turns the operator every way but loose.

In use, the sail works wonderfully, developing great drive and lift—literally lift, when held horizontally.

Righting-arm in any sailing vessel is an important and very critical factor. In the Ski-Sail the righting-arm—literally, "righting arm," is too high up. About 5 feet too high up. On any point of sailing, other than a dead run, in winds above 8, over I go. A "knock-down" puff of wind takes on a slightly different meaning on the *Ski-Sail.* It's literally a "knock-down," as in a prize ring.

In sailing to windward, the hulls have a tendency to pay off to leeward, due to the lift of the sail on the skier. Within one or two seconds you are dead aback, and sailing backward. The writer has not discovered a method of correcting this backward sailing, except to let go of the sail. However, the hulls are about as manoeuverable backward as forward.

On a dead run, the rig develops a speed of about three or four knots in moderate breezes, which I feel is very poor. Even though the hulls have relatively fine lines, a good fair entrance, a straight run aft, and an easy exit at the stern, they pass through the water and leave a wake like two egg crates.

If the Ski-Sail can be perfected, it will be the beginning of a new, and fascinating water sport. It combines the skills of sailing and skiing, and requires good coordination, balance, and considerable strength. It's a rig you can lash to the top of a car, and store in a closet. There is only one real drawback.

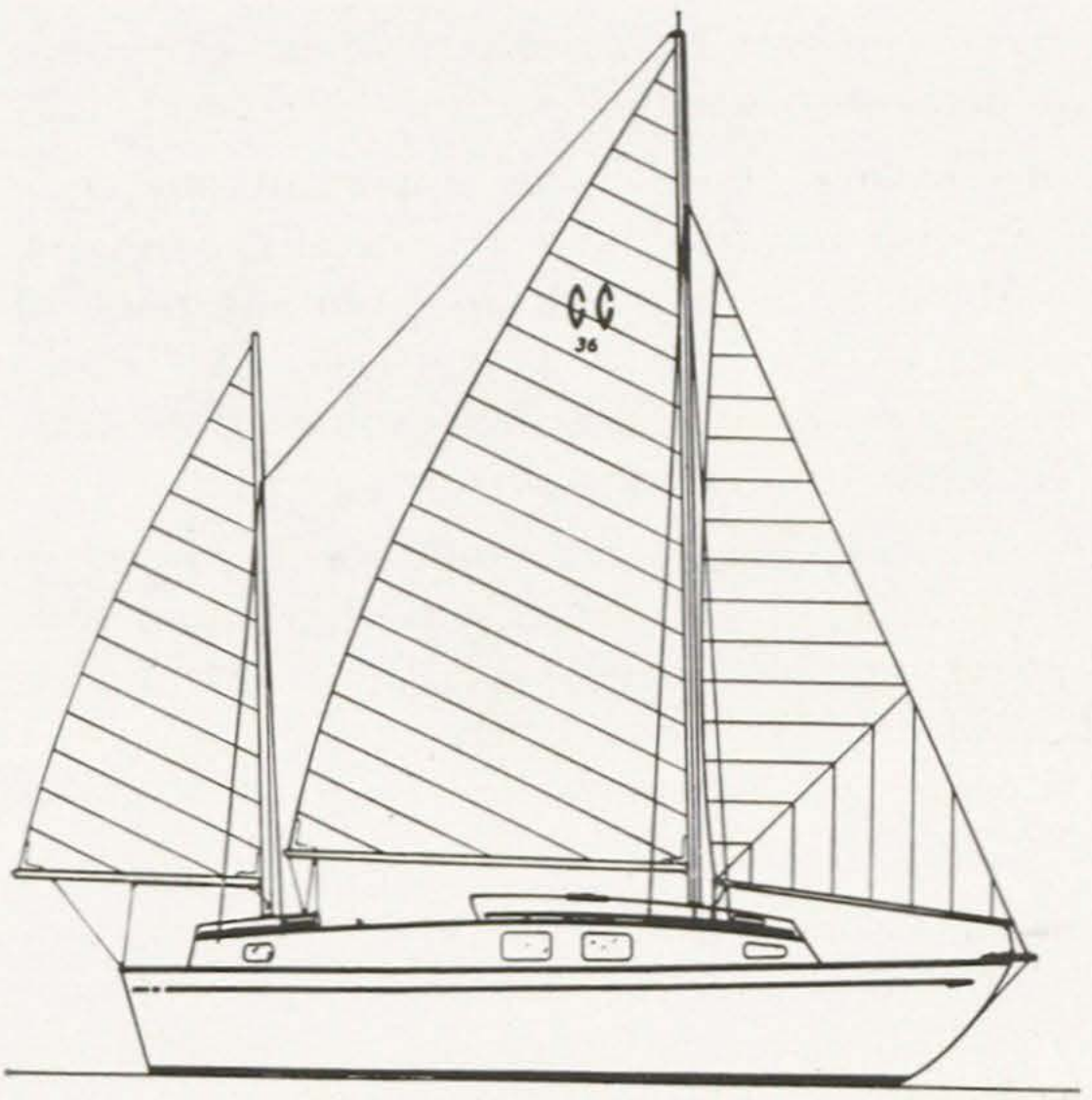
It doesn't work!

LETTERS

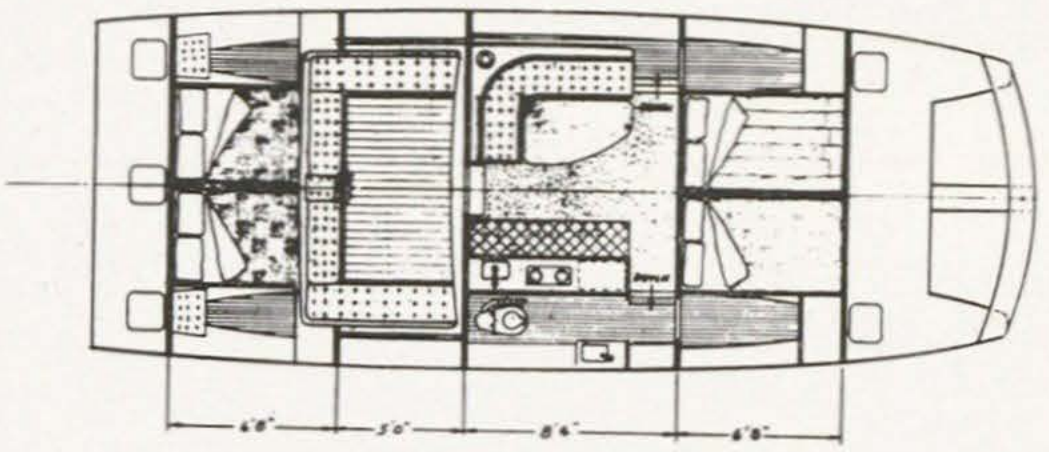
Dear Sir,

Here are some drawings and a photograph of a 36 foot catamaran sailboat built in San Diego by Frank Perugini in two years of spare time. It was launched last June (1961) and we have been running it around under power only. The rigging and sails will be installed this winter.

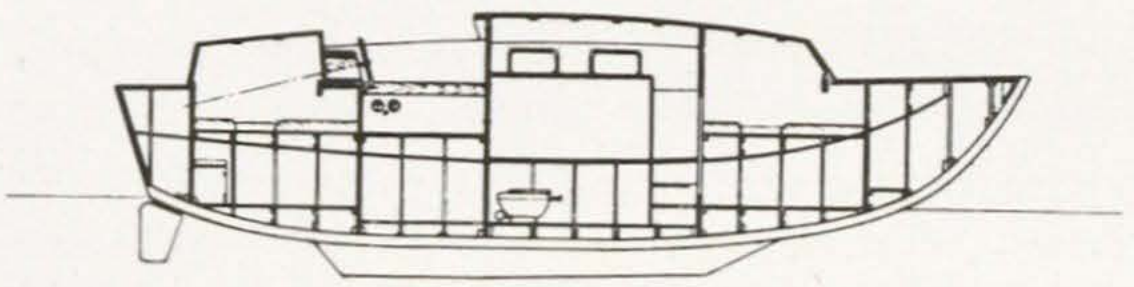
The hull is made of fir frames, fir and plywood bulkheads. The skin is double quarter inch plywood 12 inches wide, diagonally planked and fibreglassed. This makes for a nice easy compound curved hull. She has an 8 h.p. air-cooled Lister diesel engine and cruises about 6 knots. It is amazing the amount of room and privacy that this boat has. Six foot of headroom in the main cabin and 6 foot 6 inches in each stateroom of which there are four.



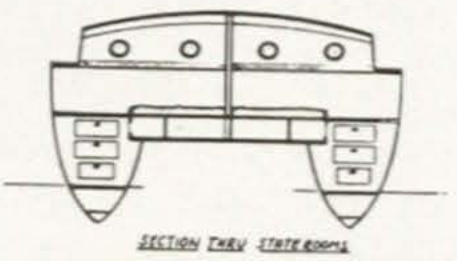
SIDE PROFILE



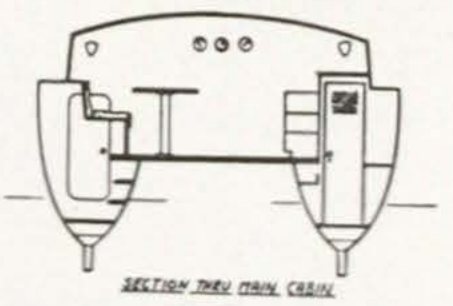
GENERAL ARRANGEMENT - PLAN VIEW



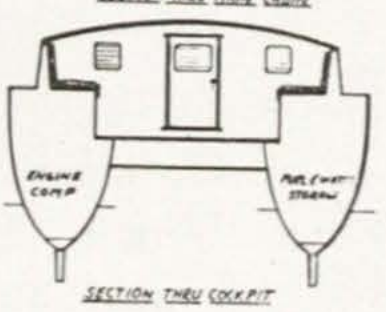
GENERAL ARRANGEMENT PROFILE



SECTION THRU STATEROOMS



SECTION THRU MAIN CABIN

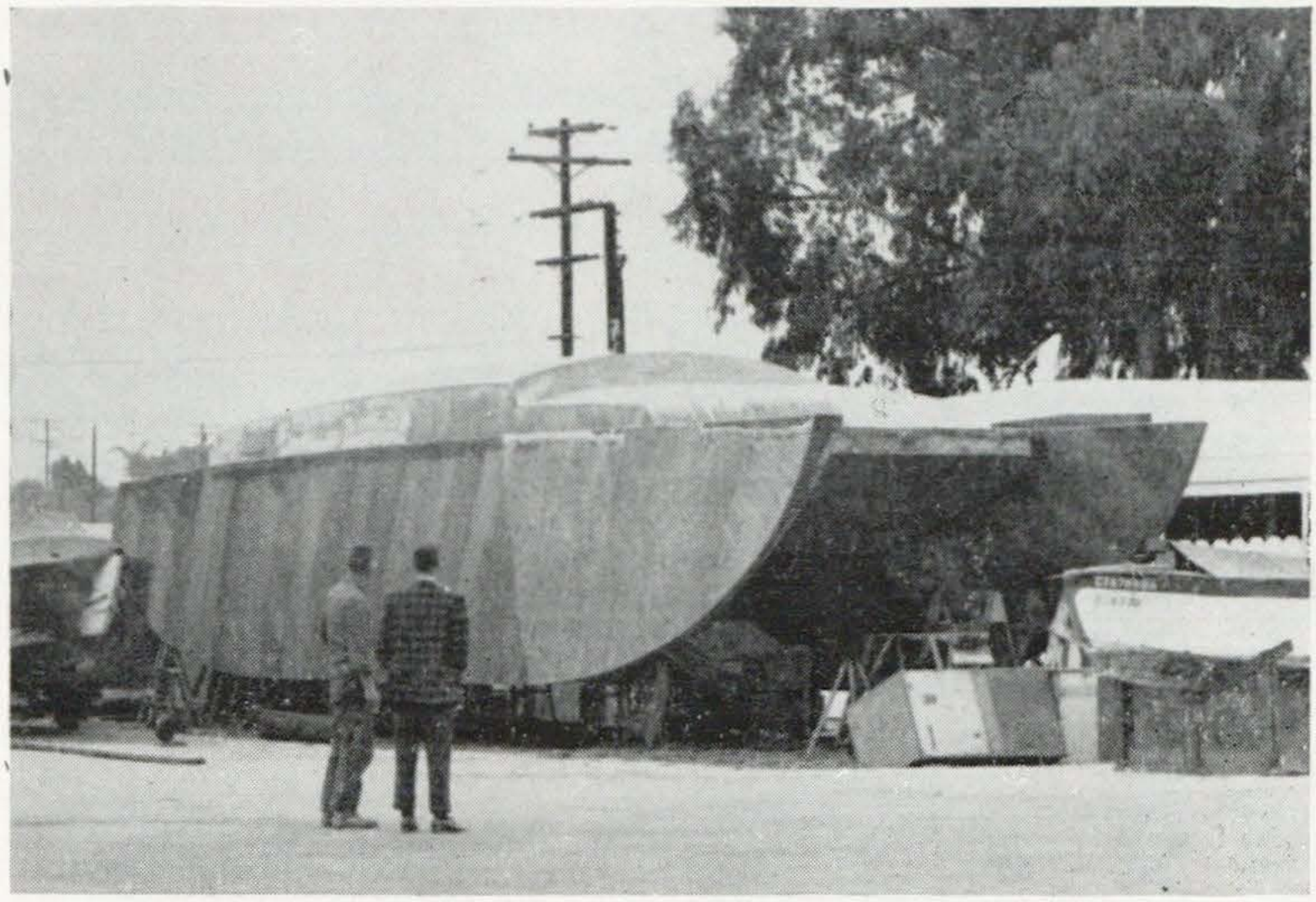


SECTION THRU COCKPIT

Frank Perugini's Catamaran.

This is the second catamaran built to my designs. Charles Barrett of Coronado, Calif. built a 44 foot and is just waiting to install sails and mast. Gill Galer of Los Angeles has started to build a 41 footer also of my design and there is a 26 foot cat on the board now.

I enjoy designing catamarans and would like to attempt a trimaran. I had a chance to buy a 24 foot Piver trimaran last Spring which was



Frank Perugini's Catamaran.

a year old. It has the old style outriggers on it which I hope to change this winter.

I have really enjoyed and have benefited greatly from all the A.Y.R.S. publications.

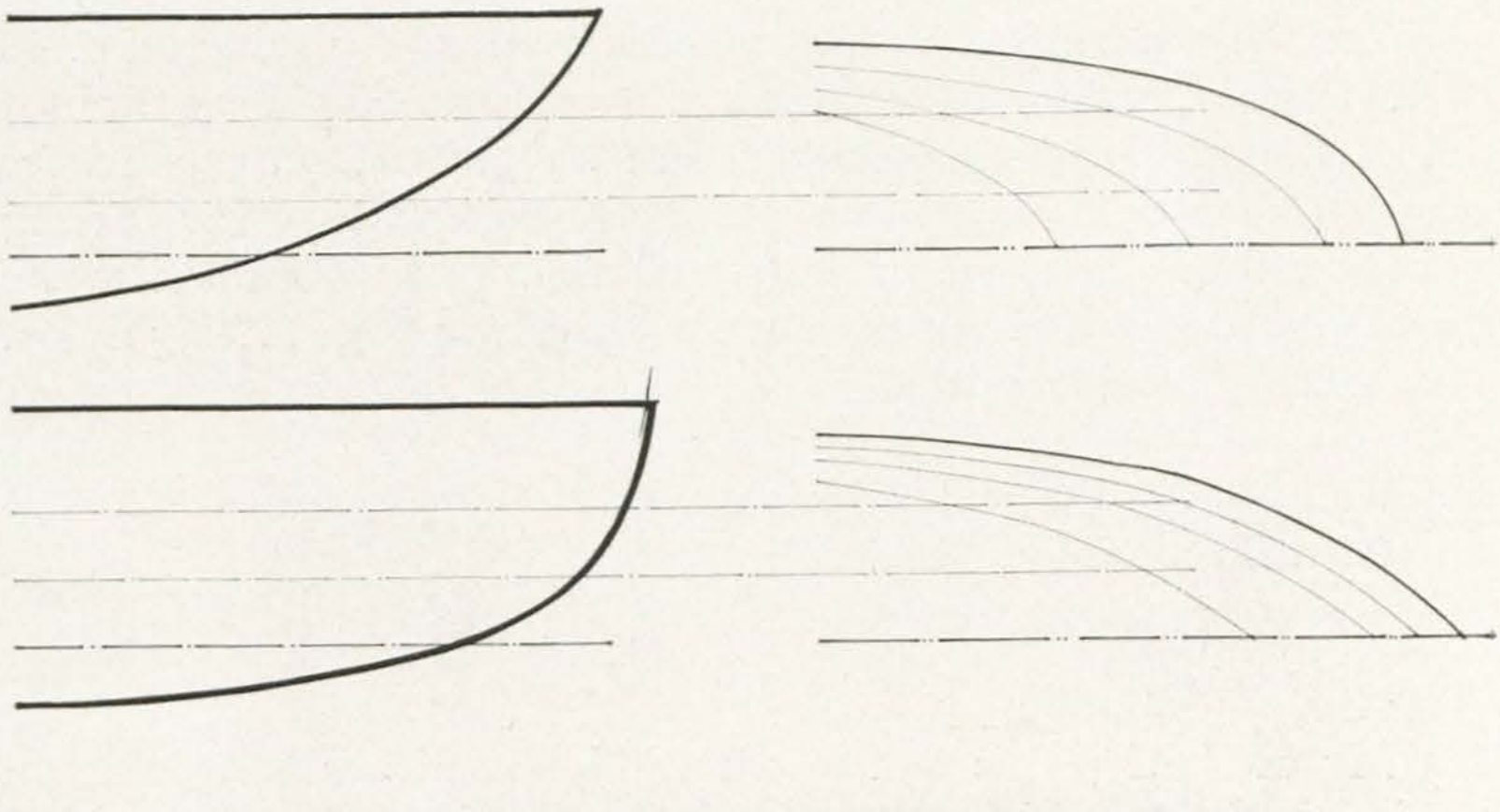
NORMAN A. CROSS.

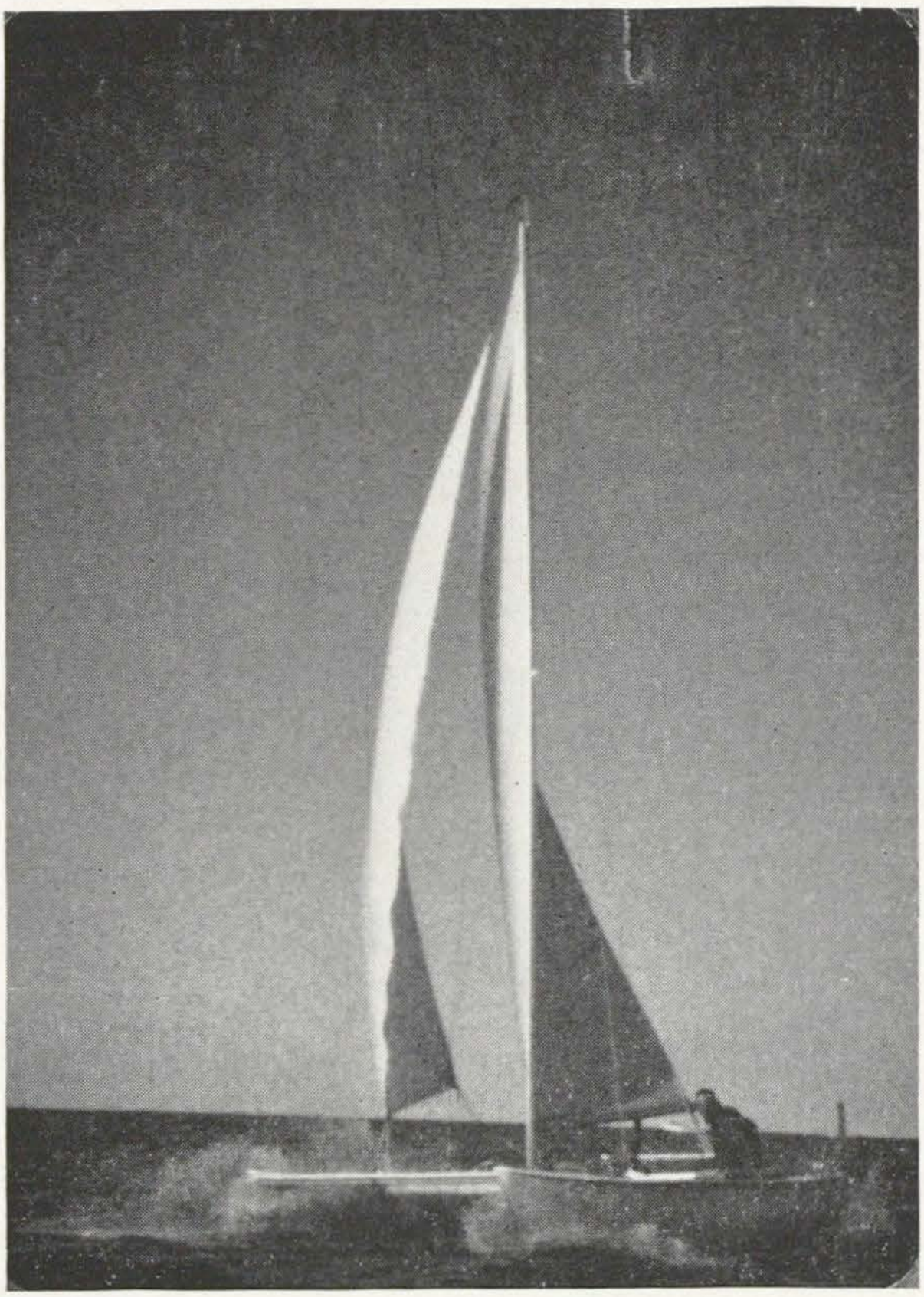
4326, Ashton, San Diego 10, Calif.

Dear Sir,

I have a very good French Canadian friend, Georges Rouleau, with whom I have traded labour in our boat building projects. Almost two years ago, he finished construction of a 20 foot catamaran of 10 foot beam, 287 square feet of sail area and around 600 lbs. displacement. The original hull shape included a highly rounded spoon bow which greatly limited speed because of a water lifting and throwing activity, as opposed to the cutting action of fine bows. My estimate of top speed the first year was 13 m.p.h., based on *Shearwater III* performance. He could beat the *Shearwater* in a light to gentle wind but in a moderate wind the *Shearwater* could pull ahead easily.

This year, Georges reshaped the bows to something similar to the *Shearwater* by building on fine bows over the existing ones with a great increase in speed, now comparing well in performance with the *Cougar*.





George Rouleau's Cat.

For the gentleman who questioned the value of planing on p. 48 of A.Y.R.S. 37, hydrodynamic lift decreases resistance by lifting the boat out of the wave-making region; a slim hull bypasses the need for planing by not making much wave to start with. Wavemaking resistance drops sharply at the start of planing; frictional resistance rises as speed increases but not quite as sharply as wavemaking drops, thus making planing possible.

BILL BAUR.

813 Wellham Ave., Ferndale Heights,
Glen Burnie, Md., U.S.A.

Dear Sir,

My cat "Miga" is almost ready. I had plenty of trouble in making the fittings which are not in the market for 700 miles around!

Have now painted the sides and bottom blue, sheer line in red and deck and cabin yellow. I cut 3 feet off the mast (. . . because of my wife!) and the rudders are mounted in a very original way, I suppose.

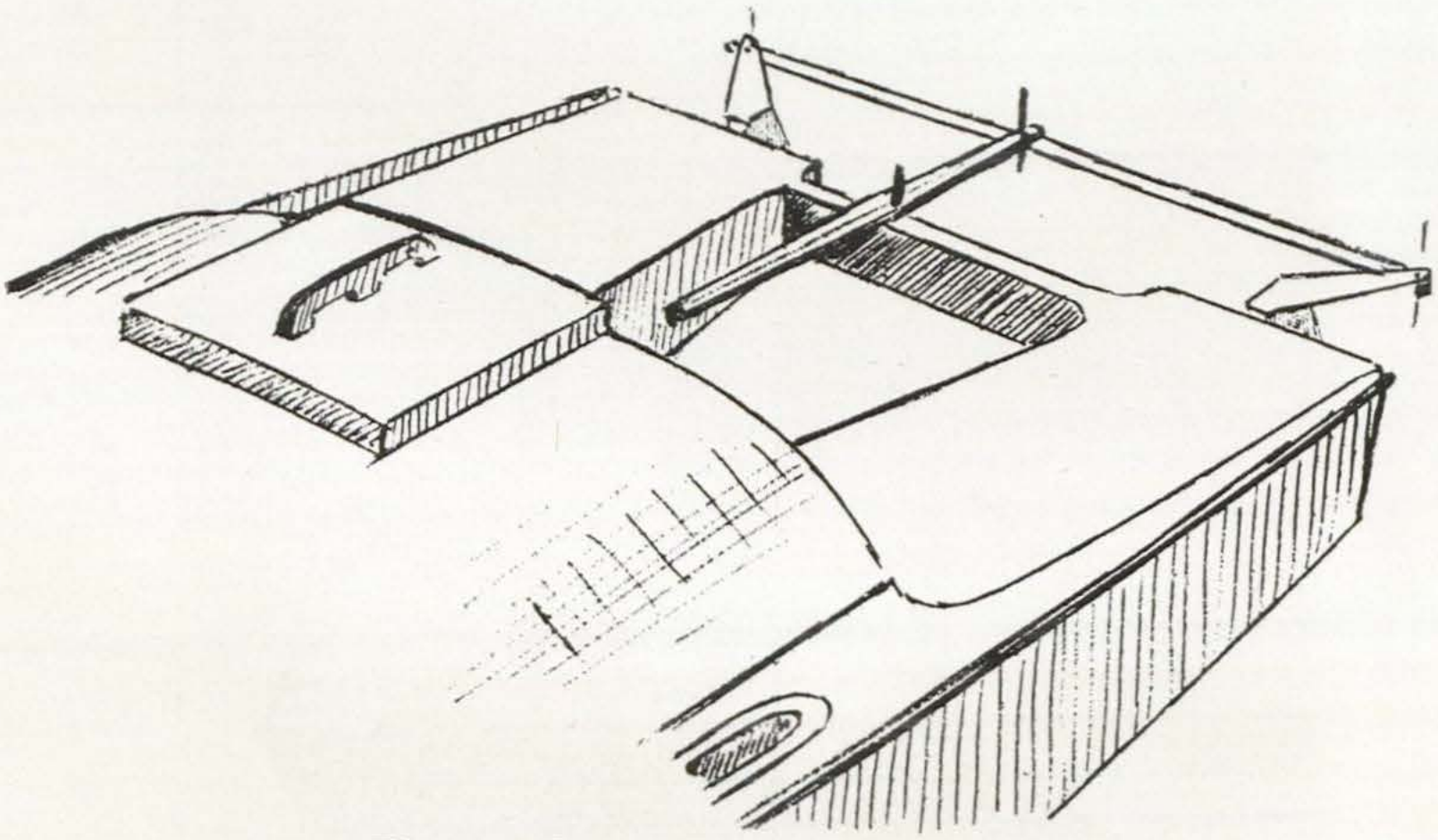


Fig. 5. *Miga's Cockpit and Tiller.*

I want with this system of rudders and tillers to have the decks completely clear. I suppose it is necessary when blowing hard because the crew can move and stay just on windward transome. I repeat : the first report of my cat will be for the A.Y.R.S., but I don't say when !

JOÃO MENDONÇA.

Nacala-Porto, Portuguese East Africa.

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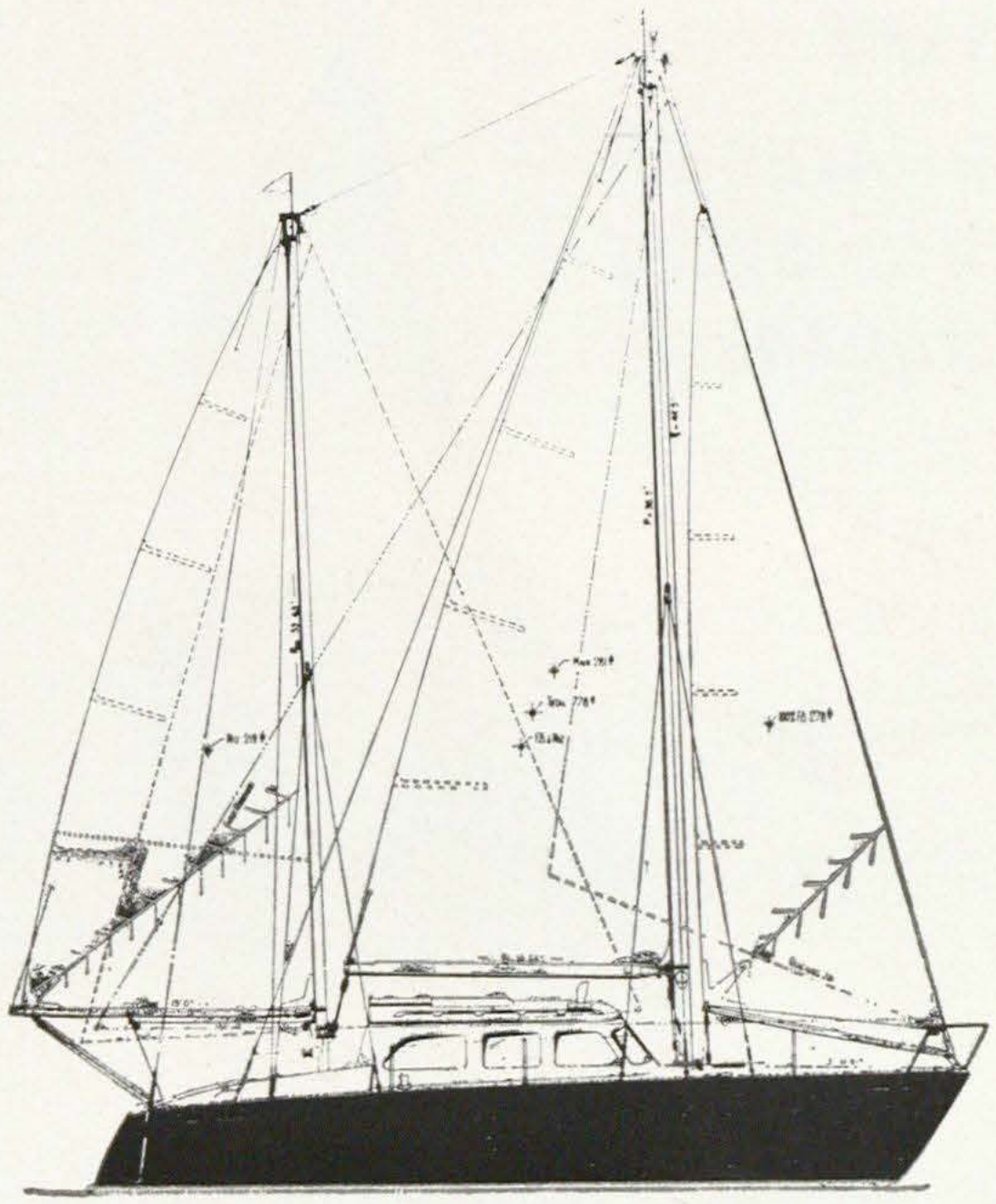

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Photograph by courtesy of "Lilliput" magazine

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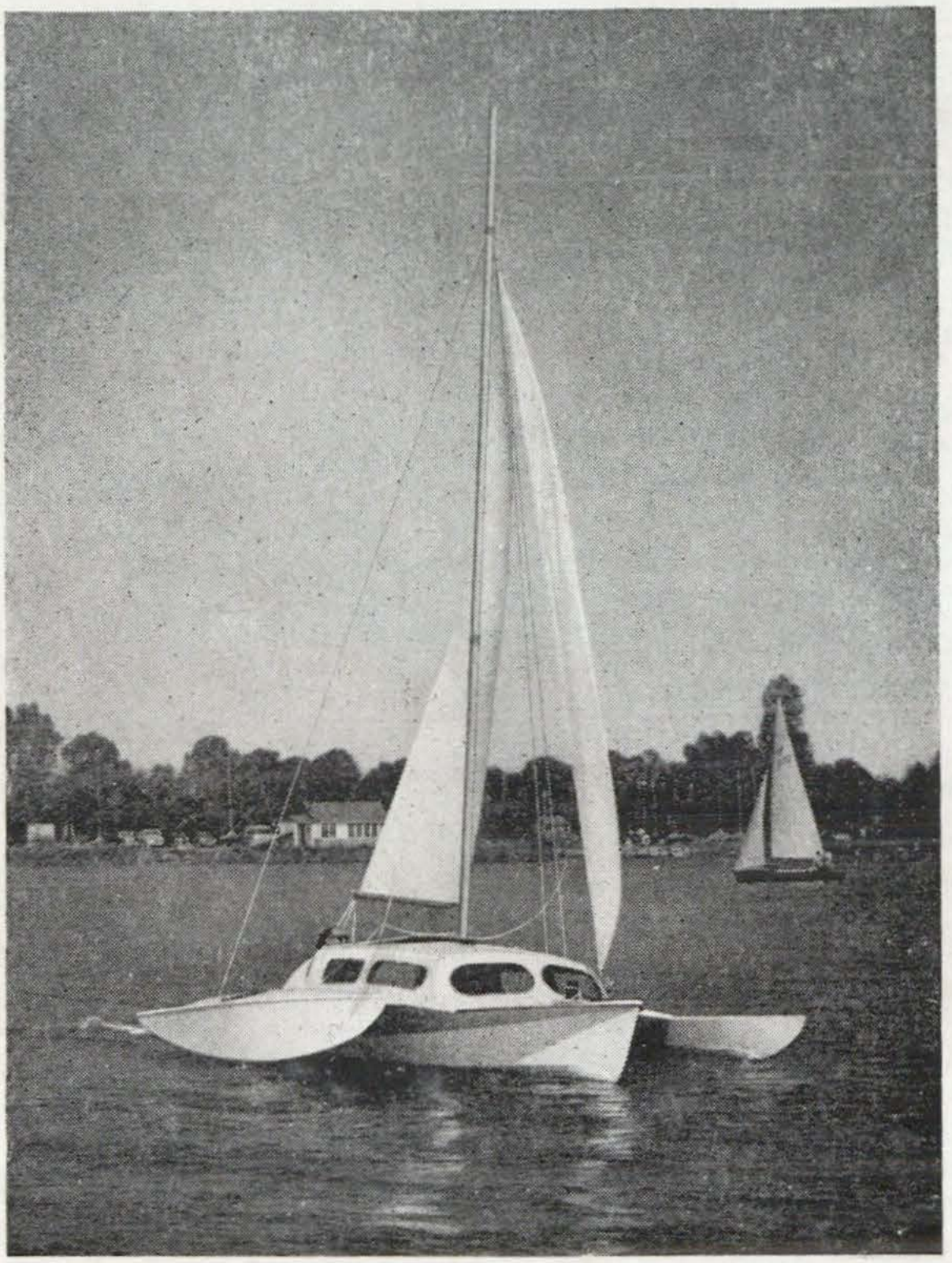

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