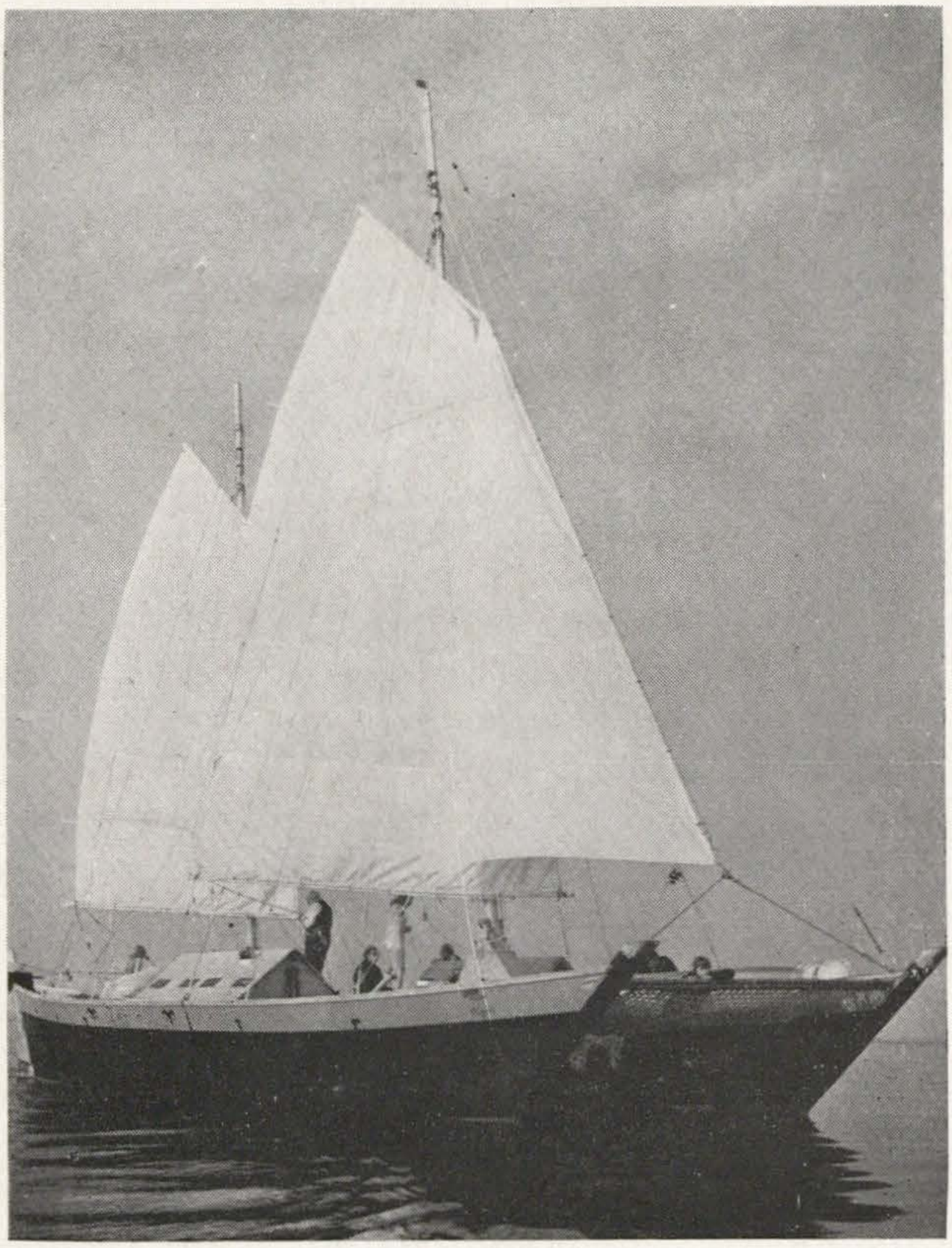
CATAMARANS 1970

AYRS PUBLICATION No. 72



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(Founded June, 1955 to encourage Amateur and Individual Yacht Research)

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The A.Y.R.S.,
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Kent,
England.

Dear Sirs,

1. Please enrol me in the AYRS. $5 or £2 is enclosed.

2. Please enrol our Yacht Club in "Associate Membership" of the AYRS. $25 or £10 is enclosed, for which we understand that 5 copies of each of the AYRS publications will be sent as they come out, and our members may attend AYRS meetings in London or any centre, the room hire being paid for by a collection.

3. Please send leaflets of the AYRS to the name and address below.

*Delete whichever item is not applicable.

Name..... (*Block capitals please*)

Address .....

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Signed..... .....

Cut along line

AYRS AFFAIRS—April, 1970

Increasing the membership

Members are again exhorted to enrol their friends and talk about us at their yacht clubs. The flying hydrofoil break-through is taking place and one can promise new members some exciting accounts of these from now on.

The 'AYRSFOIL Class'

We still want as many people to build flying and other hydrofoil boats as we can, either to their own designs or from those of Don Nigg. Don's plans cost £10 or $20.00 U.S.

The AYRS Burgee

Members are urged to sail under the AYRS Burgee (prices: 5½ in $2 or 14/-, 16 in $4 or 28/-) and put AYRS on the transoms of their boats.

Binders for AYRS publications

These can be got from ESIBIND Ltd., Hartley House, 4 Uxbridge Street, London, W.8, at a cost of £1 1s. 0d. each, post paid. Each binder takes about 20 publications.

Index

This is available, if required.

Change of Address

Will members please tell us when they move. Otherwise, publications go astray.

Members letters

We are too happy to advise members on anything to do with yachting, if we know the answer. Indeed, it is from your letters that the Editorial bias takes shape and often it is the question which is asked which prompts the new discovery.

Material for the publications

This is our primary need. Of course, we welcome new ideas or devices most but new slants to old devices are just as interesting.

Editorial policy

We had hoped to combine Catamarans and Trimarans into one issue, leaving one whole copy for single-hulled boats. Unfortunately, this was not possible this year but we hope to achieve it for future years. However, our October issue will contain a lot about single-hulls, though it may be devoted to Hydrofoil.

Subscriptions

These are due on October the first.

The Grogono flying hydrofoil

James Grogono has this year flown off the water in a *TORNADO* catamaran, fitted with 4 hydrofoils, one near each corner. All foils were approximately the same as each other and resembled the rear foils of Don Nigg's latest craft.

The foils were all fixed and steering was by deep extensions of the normal rudders. This is believed to be the first sailing hydrofoil flight in England. Oddly enough, however, Ken Pearce tried an identical system on his catamaran *ENDEAVOUR* in 1956 but the foils collapsed and he didn't continue with the experiments.

The Grogono craft will be described in a hydrofoil symposium later this year.

A sailing hydrofoil meeting

James Grogono, 38 New Road, London, E.1 is organising an AYRS Sailing Meeting for flying hydrofoils on May 23rd, 24th and 25th based on the Royal Corinthian Y.C., Burnham on Crouch.

David Chinery, who has now flown his craft under sail alone, will be there. Joe Hood and Captain Cockburn are two other hydrofoil builders who we hope will also be present.

This meeting will be of tremendous interest to us all because it will be the first time that we have seen flying hydrofoils.

If anyone who has a flying hydrofoil or a hydrofoil stabilised boat wishes to bring it, will he please write to Dr. Grogono.

In this decade, the flying hydrofoil will dominate yachting and, by 1980, it will be the preferred method for ocean sailing. We may even see one in the 1972 Single-handed, trans-Atlantic Race winning it in less than a week.

The 15 years of AYRS study of hydrofoils has at last brought forth results. We offer our congratulations and thanks to all our 'Lonely Pioneers'.

THE ULTIMATE HYDROFOIL

by John Morwood

Bill Prior, Don Nigg, Dave Keiper, James Grogono, David Chinery and others have shown that it is possible to 'fly' on hydrofoil sailing boats. Let us now put all their ideas together to see if a picture emerges.

1. David Chinery has produced a boat which can be sailed for fun as a displacement boat with all the foils retracted. James Grogono can take off all his foils on his *TORNADO* cat, thus leaving a 'conventional' boat.
2. All hydrofoils which have 'Flown', except that of Dave Keiper, use foils both to weather and to lee to keep aloft. The weather foil therefore acts to *Leeward,* which is an inefficiency. Most now have bow steering.
3. Dave Keiper, on the other hand, while having a foil to weather, only uses it to get off the water. Once off the water, the craft heels some 8°, the weather foil comes out and the boat rides on bow and stern foils, with the foil to lee giving stability in roll. There is thus *no leeward acting force from any foil,* except for the weather foil of the bow complex and the tiny one from the angle of heel on the stern foil. Because the boat essentially sails on bow and stern foils, the pitch characteristics are those of a boat of twice the length. Also, Dave has stern steering. It therefore appears to me that Dave Keiper has won the 'Foil Race'. His system appears to me to be in advance of that of everyone else, with David Chinery a close second.

Last fall, Dave Keiper set off from San Francisco to sail to Hawaii, in his flying hydrofoil boat. Unfortunately, he met head winds and had to cancel the trip. However, the fact that such a trip could be seriously considered shows that we are on the eve of flying hydrofoil OCEAN SAILING BOATS.

Assuming that Dave Keiper has indeed produced the best possible flying hydrofoil configuration, I will now give the steps which I myself would take to make a day-sailing *hydrofoil stabilised* as well as a *flying hydrofoil* sailboat.

1. Buy a 20 ft two-man paddling kayak, in fibreglass.
2. Strengthen the stem and stern posts and the parts which take mast and other strains.
3. Fit 'Bruce Clark' hydrofoil stabilisers, mast and rudder. Set as much sail area as one dares and get the sailing balance right. Fortunately, James Grogono's foils, which are founded on those of Don Nigg, are commercially available in England from Alan Bell Catamarans, Sea Wall, Whitstable, Kent and they are just right for this, though they are rather expensive.

At this stage, one has a perfectly satisfactory *hydrofoil-stabilised* sailing boat of good performance, though the canoe stern will squat at speed. If now, one wants to fly, the following would be made:—

4. The rudder would be changed to an inverted T foil system made to pivot up when coming ashore but fixed down with pins whose position can be be altered to change the angle of attack of the foil.
5. Add a bow foil or foil system which will automatically align itself with the water flow. I myself favour a 'Hook' variable incidence foil with water surface 'feeler' but other systems seem to work. If I did not use a 'Hook' system, I would copy Don Nigg's. The plans are available from Woodacres, Price: £10 or $20.00.

One would now hope to be able to 'fly' the craft. Once this had been accomplished, the lateral foils would have to be varied in distance from the canoe and also in their vertical height for optimum performance.

EDITORIAL

by Dudley Soulsby 24 Lambourn Close, Furnace Green, Crawley

It may seem that we have rather too much of the 'conventional and commercial' craft in this issue, and if this is so, I must apologise.

We are extremely short of information on original experiments carried out by members of the Society. Most people appear reluctant to put pen to paper and thus we all miss much valuable information.

I am sure that many of our members could write something for the benefit and information of the AYRS. Photographs are easy to take and add enormously to the interest of an article. Do not let your inability to make a line drawing keep you from writing an article, because, provided we have a rough sketch and accurate dimensions we can produce a drawing which is suitable for printing.

This is the second publication I have edited and I now appreciate the vast amount of work which goes into the collection, preparation and typing of material, even before it is in the printers' hands. It takes at least six months

to produce one AYRS publication. Three months are needed to edit the articles and have them typed in a suitable format for the printer to read. Then we have to give the results to the printer for his work to begin. After the printer has prepared the rough copy this has to be checked for any omissions and mistakes and then corrected before it is ready for printing.

All this takes time, and for an April issue date we had to have all our work prepared and in the hands of the printers by January.

Be this as it may; we cannot continue to bring forth publications without the help and support of our members in providing the articles for us.

Let the AYRS know of your ideas however wild and controversial, your plans, experiments, designs and even boats-a-building!

Write to Woodacres and let the Society see the results in print.

Dudley Soulsby.

WEIR WOOD MEETING: 18/19th October, 1969

by Dennis Banham Blackstones, Redhill, Surrey.

The annual meeting at Weir Wood this year started off in great style. Members, lured by the sun, started bringing their boats along for decontamination at 8.30 a.m. Saturday morning, and it wasn't long before a steady stream of craft was being launched into the reservoir.

L to R: *KELEK*, *WAYFARER*, Cat (name not known), *WIND CHEETAH*, *CHEROKEE*, *GOONRAKER*

True, the wind was very light but there was enough of it to make the boats skim across the water and enable the crews to derive considerable pleasure in the performance of their craft.

Meanwhile, members' wives, if not sailing with their husbands, lay back on the grassy banks and rested after the strenuous tasks of humping masts, outiriggers etc. to the water's edge, whilst keeping control of and a watchful eye on the children. Sometimes I wonder if we fully appreciate the backing we receive from the ladies; the lonely evenings whilst we make our boats in the garage, and often, when things aren't going right, the word of encouragement which enables us to put that little bit extra into our work. Bless them for their understanding and for their patience during the long car rides—often all through the night—to a stretch of water where we hope that our boats will (but sometimes don't!) perform in the way we desire.

By midday on Saturday, most of the boats had arrived and were being put through their paces. The following craft were present at this year's meeting:

Trimarans:

1 Rodney Garrett's	18 ft Mosquito *SULU* (with foils).
2 Kenneth May's	16 ft 6 in *KELEK* with inflatable outriggers.
3 John Partington's	16 ft *CHEROKEE*
4 Dennis Banham's	18 ft *WINDCHEETAH*
5 Paul Dearling's	22 ft 6 in *MAPHEPHUKHA*
6 Richard Hopkins'	16 ft *THISTLE* (with front foil).

Catamarans:

1 George Newton's	14 ft *CALCULAS* ('Lynx' Class).
2 Eric Scott's	*FLYING KITTEN.*

Hydrofoils:

1 David Chinery's	16 ft *MANTIS.*

Single Outrigger:

1 Don Rigg's	14 ft 9 in *GOONRAKER.*

Mono Hulls:

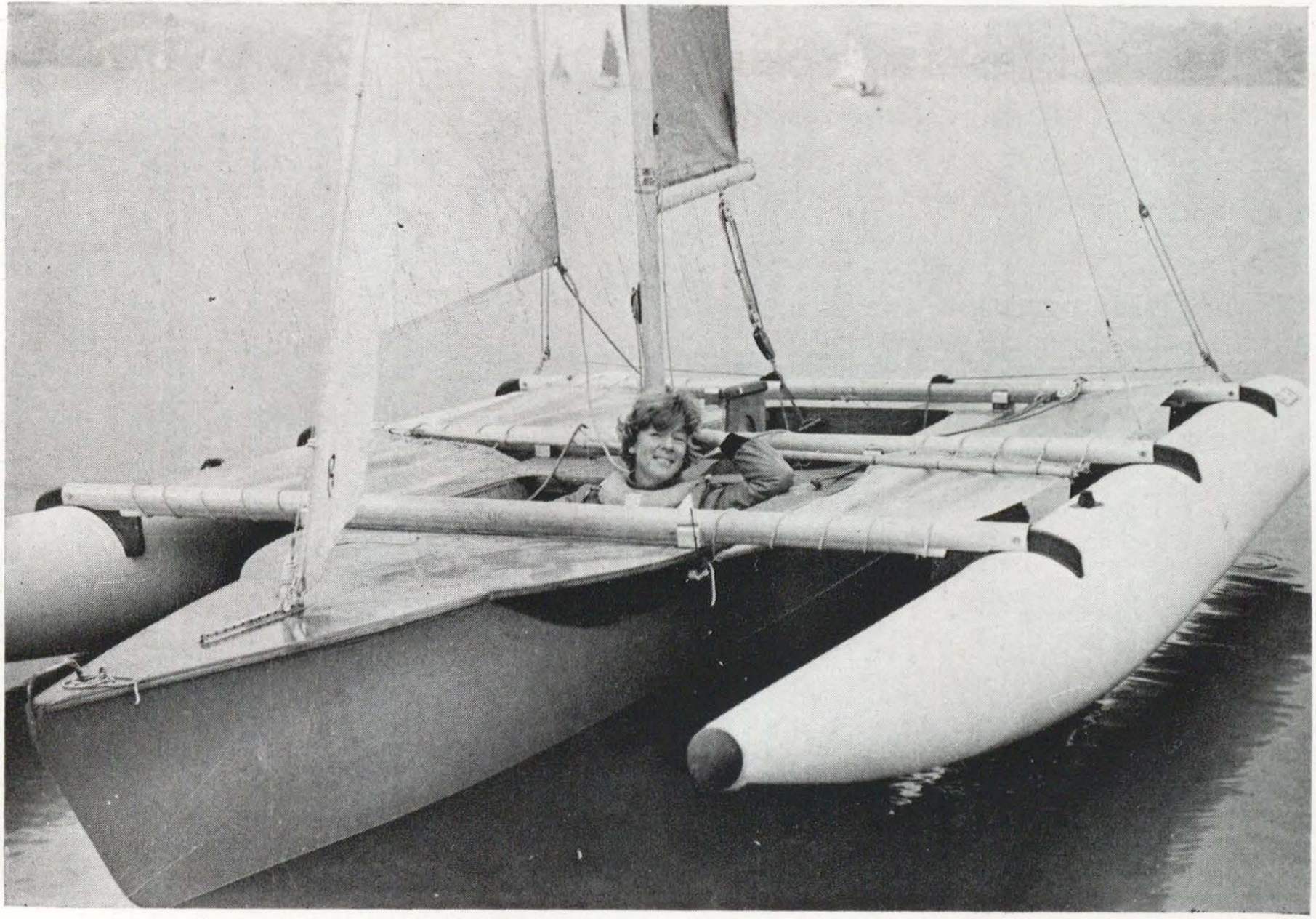
1 Jack Banham's	Mirror Dinghy *JAKLYN.*
2 Alan Banham's	Wayfarer Dinghy.
3 Tony Watt's	Merlin Rocket *WOTNOT.*

Inflatables:

1 John Long's	Rescue Boat (10 ft 6 in *VITESSE*) Fred Benyon-Tinker design.

Trimarans

Rodney Garrett and Derek Norfolk turned up with their lovely *SULU*, immaculate as ever both in looks and performance. An article has already been written by Rodney for publication in the hydrofoil symposium this year so I will simply say welcome back *SULU* to our annual meeting. It was delightful to see you again at Weir Wood.



Betty and Kenneth May's *KELEK*

Betty and Kenneth May arrived with their trimaran *KELEK* complete with inflatable outriggers. Details of this craft were given in last year's issue with several new innovations designed by Kenneth. True to tradition, this year the centre-board case had an excellent idea for stopping the board floating up when sailing, and also to prevent water coming in over the top of the case.

Betty had designed a very cunning cover that consisted of two pieces of rubber fixed to the centre-board case, but the inside of the rubber, down through which passed the centre-board, was made of 'Velcro' and one had only to slide two fingers along the outside of the rubber, to seal the pieces together. To retract the centre-board, a finger slipped along the centre of the joint, parted them and allowed the centre-board to retract. A very neat idea and the sort that I have come to expect from Betty and Kenneth who travel all the way up from Salisbury to attend our meetings.

John Partington brought his *CHEROKEE* all the way from Cheshire. As usual, his craft was beautifully painted and polished and shone like a new pin. It always seems to me that John must spend his whole life polishing

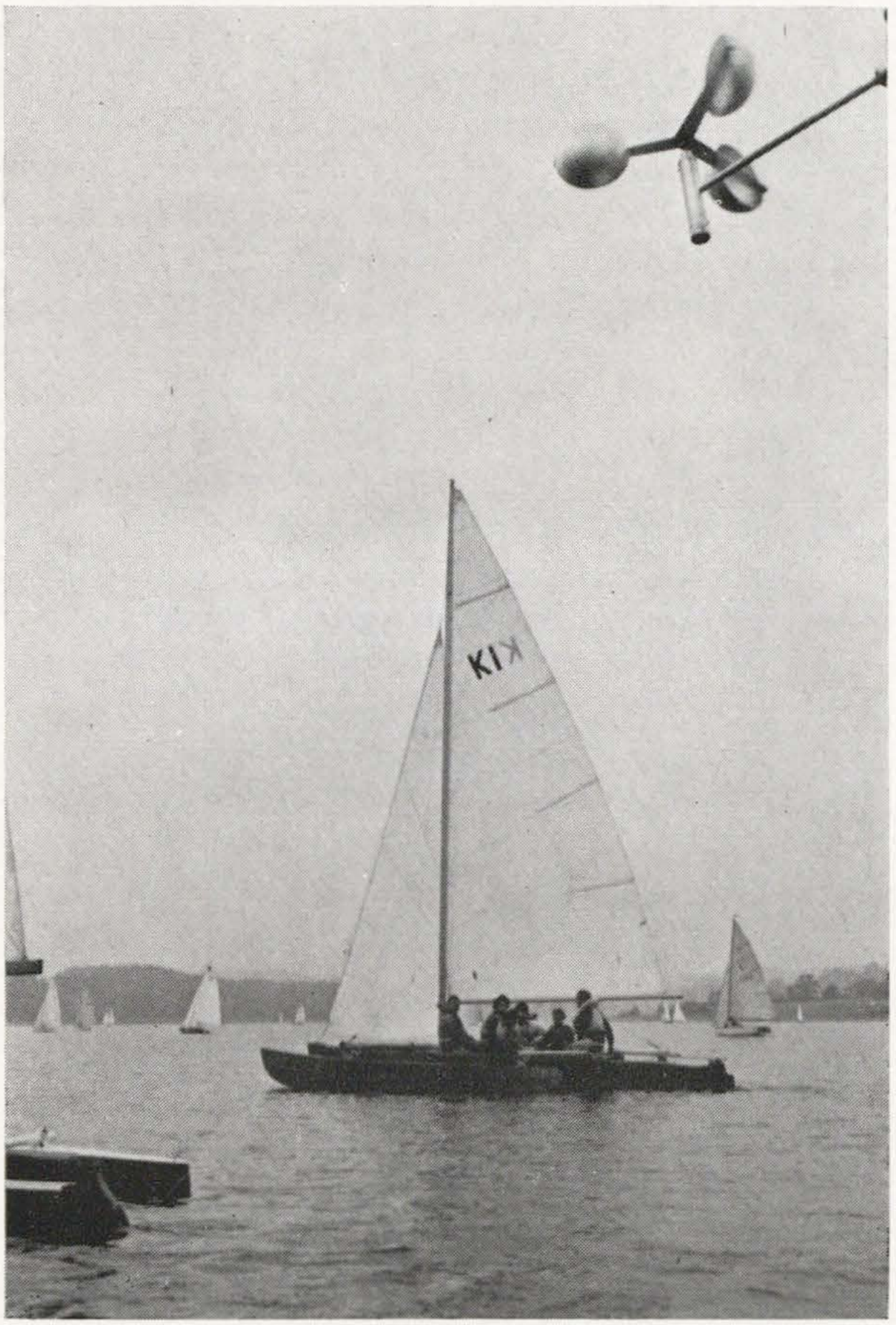
John Partington's *CHEROKEE*

his beloved *CHEROKEE!* Whether he does or not, his boat is a credit to him and he can be justly proud of its looks and performance.

Dennis Banham's *WINDCHEATER.* I helped to launch my boat on Saturday morning and haul it ashore on Sunday evening! Apart from this, I only caught brief glimpses of it during the weekend as members sailed past and appeared to be thoroughly enjoying themselves. With such a varied collection of people apparently completely at ease handling *WINDCHEETAH* it must prove something, if only that it is an ideal boat for the family.

Construction details, performance etc. have already been sent for inclusion in the next issue of the Journal.

Paul Dearling and Mike Sutton-Pratt's new trimaran *MAPHEPHUKHA* (Zulu for 'Gone with the Wind'). Last year, Paul and Mike sailed their P.B.K. canoe *LONGFELLOW* (with Clarke hydrofoils) to destruction. In fact, one of the foils broke on the Sunday afternoon. This must have been



Paul Dearling and Mike Sutton-Pratt's *MAPHEPHUKHA*

the deciding factor for them, because I have it on no less an authority than Paul's wife that they had hardly arrived home late on Sunday evening before rolls of drawing paper were produced and the design of a new boat (a trimaran) were begun.

It's all the more amazing (since, like most of us, they have household and garden chores to do) that between them they designed and built their very large, 22 ft 6 in, trimaran, and had it ready for launching at this year's meeting. Champagne was poured on the bows (just a few drops!) and we all cheered and drank success to *MAPHEPHUKHA* and then launched her.

Paul and Mike appeared to have their fingers crossed, but they need not have worried. She floated level and true, and the water line was where they had intended it to be. With a 30 ft Tempest mast and 225 sq ft of sail, there was no doubt that their craft had enough potential to make life interesting, to say the least! In fact, from what I saw of her, she handled well, and, in spite of her size and massive construction, appeared to give little cause for anxiety when sailing through the Weir Wood Sailing Club's fleet of 200 boats, all jockeying for position during one of their races.

A very neat arrangement was the way the two outriggers rode on the trailer, alongside and low down beneath the main hull.

Certainly Paul and Mike could hardly have made a bigger contrast to their P.B.K. canoe! Although they have taken their craft home for modifications, they have promised to return again before long for further testing. I look forward to that day and wish them every success with their new boat.

Needless to say, with such a large boat, Paul and Mike were in great demand, and on many occasions I saw at least 8 and sometimes 12 people aboard without any apparent appreciable change in trim or performance.

Richard Hopkins' *THISTLE.* It was late on Saturday afternoon that Richard arrived with his new trimaran *THISTLE,* and he was unable to complete her assembly until Sunday morning.

Well, we just had to be patient and wait until everything was bolted together, the mast erected and she was ready to sail. Certainly, our patience was rewarded, for Richard has made a beautiful craft. Painted green and white, she looked every inch a thoroughbred and soon proved to everyone that she really was one. With 135 sq ft of sail, on a length overall of 16 ft and 11 ft beam, *THISTLE* was soon flying across the water in a most satisfactory way.

The main hull is constructed in two halves. The bottom half is made of fibre glass and the top of marine ply. It was interesting to see that the top half was an inch—or more—wider than the lower half, acting in the manner of a 'built in' spray deflector running the whole length of the boat. Richard has also designed a very neat and effective self draining transom. A further innovation is the self draining compartment in the bows for warps, small anchors etc. Wide side decks (each bolted on in one piece) provided an ideal, dry and comfortable platform for the crew to sit on.

Richard kindly offered to let me go out in his boat but unfortunately, due to pressure of matters needing attention elsewhere, I was unable to take advantage of his offer. However, I look forward to sailing in *THISTLE* in

Richard Hopkin's *THISTLE*

the not too distant future and taking note of other ideas incorporated in Richard's lovely new boat.

Richard says about THISTLE: The cold moulded hull has a very fine entry with pronounced knuckle and a very straight run and flat transom nearly as wide as the midship section. The double ended floats also have an unusually fine entry with chined 90° vee bottoms. Seating is plywood between the cross beams and almost full width, giving a total cockpit and seat area 8 ft × 6 ft. Very comfortable, but rather weighty for the purists. Initial impressions are that she may be faster than some multis in lighter winds, but in strong winds, though exciting, she may not be all that fast. At a guess, she will do 15 knots, but the fine ends result in a greater midship cross section which probably holds her back. However, bonus points are an almost total absence of spray at any speed (unless the cross-beams touch the water, when all hell is let loose and water flies in all directions) and no pitching or nose diving. She has sailed hands off for ten minutes on a close reach. Having no multihull experience I cannot say whether this is unusual, but shows that my 'guesstimate' of mast/C.B. positions was correct. Perhaps if the mast were rather further aft and there was some weather helm, it would indicate that the rudder was contributing some useful lateral resistance.

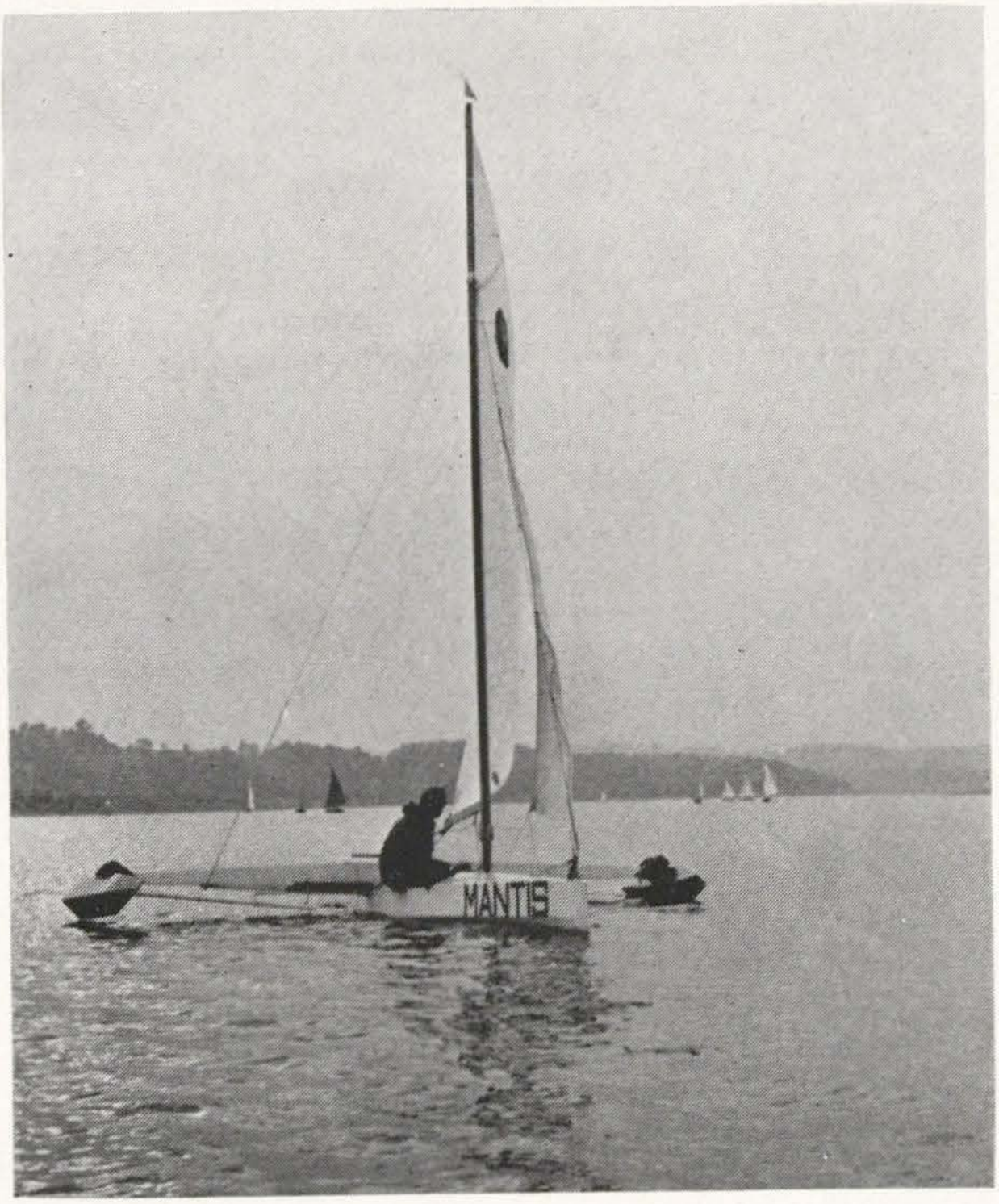
She refuses to tack without the centre-board, she only weathercocks due to leeway causing the bow to bite whilst the stern slides to leeward, though once moving she will point but not very well.

An improvement would be longer floats with rather more buoyancy. As designed with about 300 lbs each, 11 ft long and with an o.a. beam of 11 ft 0 in I had thought they would be adequate, but in a strong blow the crew is out at the end of the cross beam and one is still apt to dip the lee beams occasionally. Great fun, but not really acceptable for the young family for which it was designed.

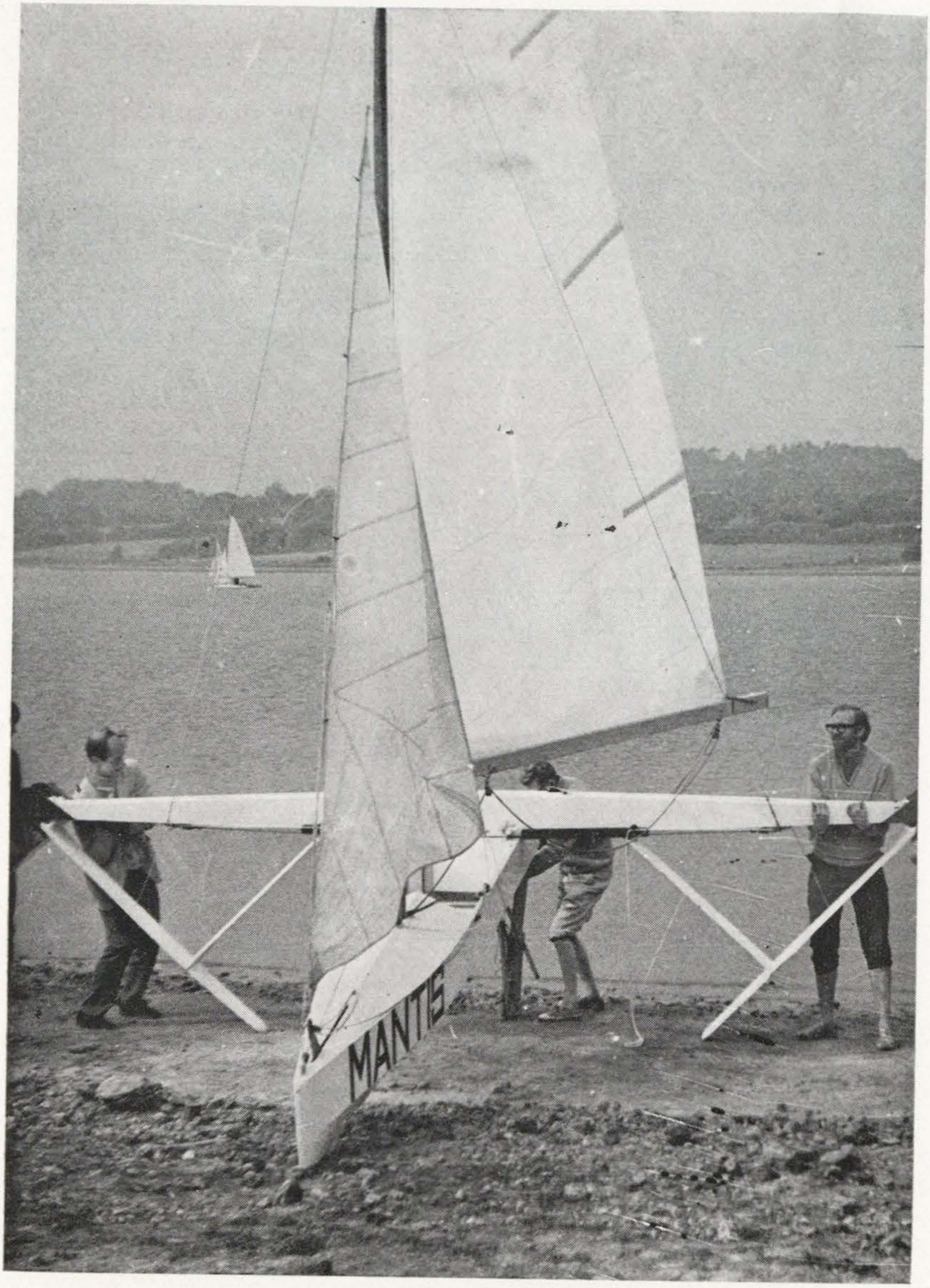
My rig is fully battened with a two-part Proctor mast. It comes from an unheard of cat class called a 'Waverider'. The rig is a bit dated and heavy and the mast needs to be adapted to swivel. But it was cheap, indeed the whole craft cost no more than £100. However the man hours would look frightening if I had bothered to record them.

George Newton's *CALCULAS*. She was the only catamaran taking part in the meeting because Eric Scott's *FLYING KITTEN* spent the weekend on shore, as Eric was unable, due to pressure of work, to launch her.

CALCULAS cruised quietly up and down the reservoir, showing a nice turn of speed when the fitful breeze came her way. First of the new 'Lynx' Class, George's boat looked very smart and handled well. I am hoping George will write an article on his craft and her construction for the Journal. May we see many more of the 'Lynx' Class catamarans taking part in future meetings.

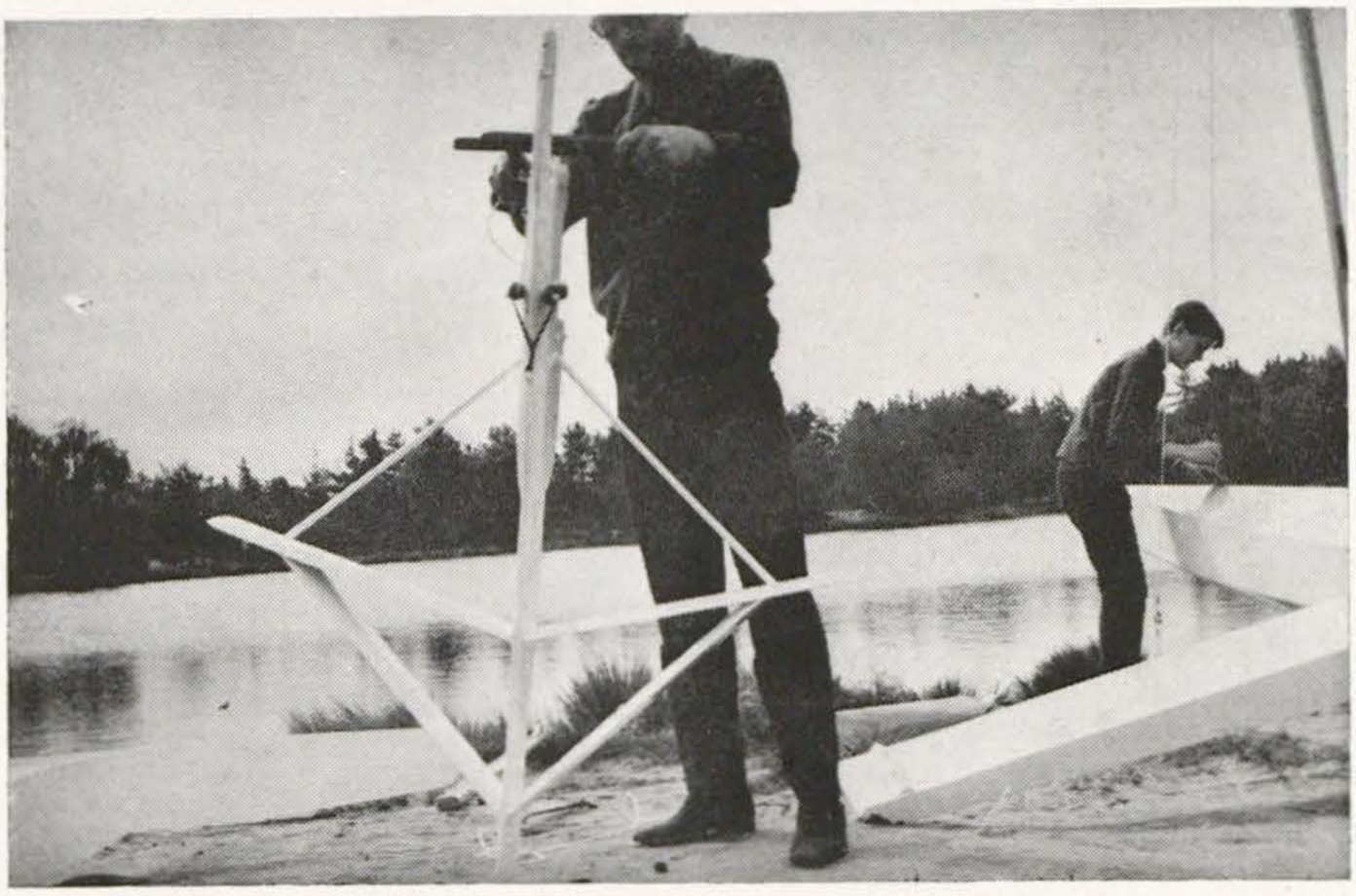


David Chinery's *MANTIS*—foils retracted



MANTIS showing stern foils down

David Chinnery's *MANTIS* Hydrofoil. About the most successful Hydrofoil we have had at one of our meetings so far. David was first at the reservoir, and soon had his new craft on the water sailing with the ease of a normal boat while the foils were still retracted. Unfortunately, the wind was not strong enough for the boat to get up on to its foils by wind-power alone. However, the W.W.S. Club's rescue boat kindly offered to tow *MANTIS* around and provide the necessary power.



Bow foil not used at Weir Wood

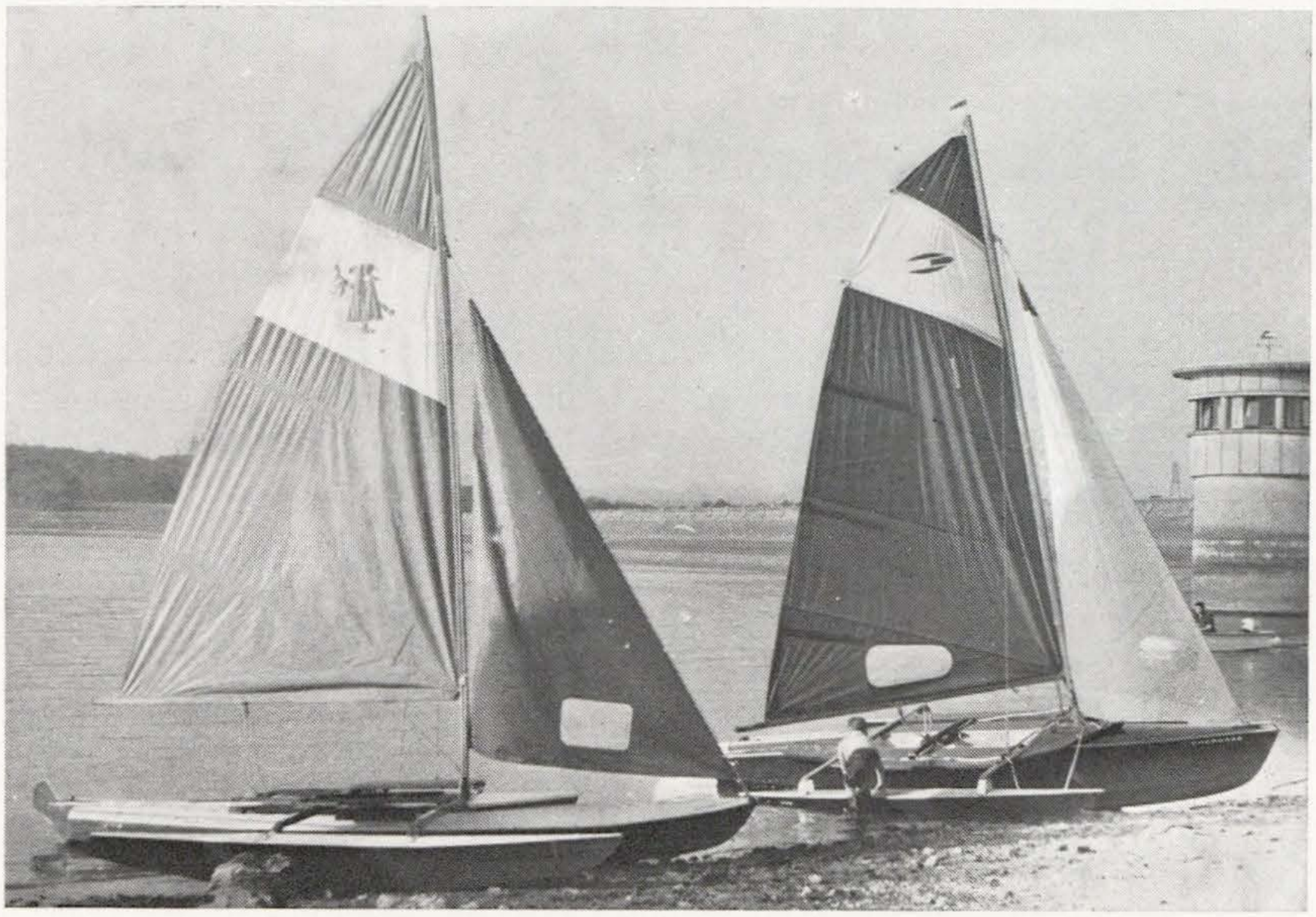
MANTIS did indeed rise on to her foils, and after adjustments to the front foils' angle of attack, John Long, on the Sunday was also able to lift the craft on to its foils, with his smaller boat, the inflatable *VETESSE.*

David tried very hard but, without really strong winds, was unable to achieve his objective and 'fly' his boat. Still, he did manage to have plenty of normal sailing and, indeed, when David invited me to sail *MANTIS* I found her very easy to handle for so unconventional a craft. Keep at it, David, for you certainly seem to be on the right lines and may yet achieve your ambition of flying *MANTIS* with a larger sail area.

MANTIS being towed up

Don Rigg's *GOONRAKER* outrigger. Once again, it gave us much pleasure to see Don and his charming wife bring their neat little craft all the way from Cumberland.

With a new upswept bow, and the increased sail area from 65 sq ft to 95 sq ft, *GOONRAKER* had a really rakish look and certainly stepped up her performance. The new bow prevented burying and the new sail area was carried quite happily. *GOONRAKER* was very stable and easy to handle. It was nice to see Don's wife and Paul Dearling's wife sailing her with every confidence and having great fun together. We look forward to seeing Don, his wife and *GOONRAKER* at our meeting next year.



Don Rigg's *GOONRAKER* and *CHEROKEE*

Jack Banham turned up with his new Mirror Dinghy *JAKLYN* and many were the people who had fun in it. It was nice to see a conventional boat have so much care lavished upon it. So often do we find a craft designed and built by a commercial firm used for a time and then sold or disposed of without any maintenance done upon it.

Alan Banham and his wife also turned up with their Wayfarer and many members sailed this sturdy craft during the weekend. Not for Alan the humping and pushing to get his boat out of the water. Just wheel up the trailer, hook on the winch, a few cranks on the pulley and he was ready to go. I mentioned how nice it was, but what of the expense? Alan grinned and said he really couldn't afford it and felt very guilty, but the whole outfit was "jolly good, wasn't it?"

Tony Watts also brought his beautifully kept Merlin Rocket *WATNOT* and he and his family appeared to be really enjoying their weekend. It was

unfortunate that I was kept so busy meeting newcomers and accepting invitations to sail the various boats by their proud designers and builders, that, apart from welcoming Tony and his wife, I was unable to chat to them about their boat. Anyway, it was nice to see them and we look forward to seeing *WOTNOT* again next year.

John Long kindly brought his inflatable *VITESSE* (Designer—Fred Benyon-Tinker) complete with outboard motor to ensure that we would be independent of the Weir Wood Sailing Club and their rescue craft. However, the weather being so nice we did not need rescuing and John spent some of his time towing David's Hydrofoil around. The rest of the time on Sunday, he anchored his boat in the centre of the reservoir to form a stable platform for John Hogg to take measurements from. A weird sight it looked too, with instruments stuck up into the air and topped by an anometer, the cups of which were spinning round bravely in the light breeze.

Thank you for your help, John. It was nice to see you and your wife taking part in the AYRS meetings again. John has taken a film of this year's meeting, and I am hoping he will be able to arrange for it to be shown at one of the monthly London meetings.

John Hogg and his son came up from Southampton and spent most of Sunday taking measurements of the various boats as they sailed past him. Before we had things properly organised, they were passing thick and fast and from all angles, making John's task almost impossible. However, after sorting things out, I understand some useful information was obtained and John departed for Southampton promising to send a detailed report to Hythe for inclusion in the next issue of the Journal.

Other Members who attended the meeting included our old friends Mr. & Mrs. Sully, all the way up from Wadebridge, Cornwall, and Kay and Brian Gilmore (plus their three small children) from Newbiggin, Northumberland. Last, but certainly not least, John and Pat Morwood came on Saturday and Sunday. They seemed to enjoy themselves chatting to the members and discussing details of the boats. I'm sure we all realise just how much we owe to these two for all the pleasure and interest we get from being AYRS members. What a wonderful idea it was of John's fourteen years ago, and how fortunate for us. The Weir Wood meeting took up the first two days of their annual holiday, so may the remainder of it be all sunshine and fun.

One or two members have suggested that, as well as sailing at the Weir Wood meetings, we should have an evening's get-together on Saturday where we could talk to our heart's content about our craft and ideas over a pint in a local Hotel. With so much time taken up during the day in sailing, we have little time to talk to each other: it wuold also give our wives a chance to meet for a social evening instead of passing by dressed in muddy sailing gear, or dragging boats in and out of the water.

If you consider this a good idea, please let me know. If sufficient support is forthcoming, I will scout around for a suitable venue for our next meeting.

Incidentally, other members have also suggested that we should have another meeting before the finish of the Winter season at Weir Wood: say, the last weekend in March? I am prepared to arrange this with the Weir Wood Sailing Club if enough support is given to the idea.

We were sorry that Fred Benyon-Tinker was unable, due to pressure of work, to bring his new inflatable 'Tusker' Class catamaran along, but hope he will be able to come to our next meeting. We also missed Chris Hughes and his delightful Proa *KIA KIA*. If anyone knows his address, would they please contact him for there is a letter waiting at Hythe to be sent on to him having been returned marked 'not known' from his previous address.

Well, we had a lovely weekend. The weather was kind, and let's hope we will be as fortunate for our next meeting, be it in March or October.

TEHINI

Designer: James Wharram S. C. Tehini, Deganwy, N. Wales

Weight	$3\frac{3}{4}$ tons approx.
Loading capacity	3-4 tons.
TEHINI Junk Rig	Sail area to wetted surface ratio, cruising rig: 3 : 1.
Sail area to wetted surface ratio, light wind rig: 4 : 1.	
Sail area to the ton displacement, at 6 tons displacement, 170 sq ft to one ton displacement.	
With light wind canvas, nearly 270 sq ft to one ton displacement.	

Cruising catamaran development in Britain seems to be at a standstill at present. Well tried designs are produced but very few new designs have appeared this year. One of the few is James Wharram's 51 ft *TEHINI* ocean cruiser. This craft, built by the designer at Deganwy, North Wales, is constructed in accordance with the well proven design principles which have been developed by him over the past fifteen years.

The longest of his designs, *TEHINI* was intended for a Round the world cruise taking place during the winter 1969-1970. Unfortunately, owing to her late completion, this was not possible. But we may see her in the Round Britain Race, instead. Jim writes:

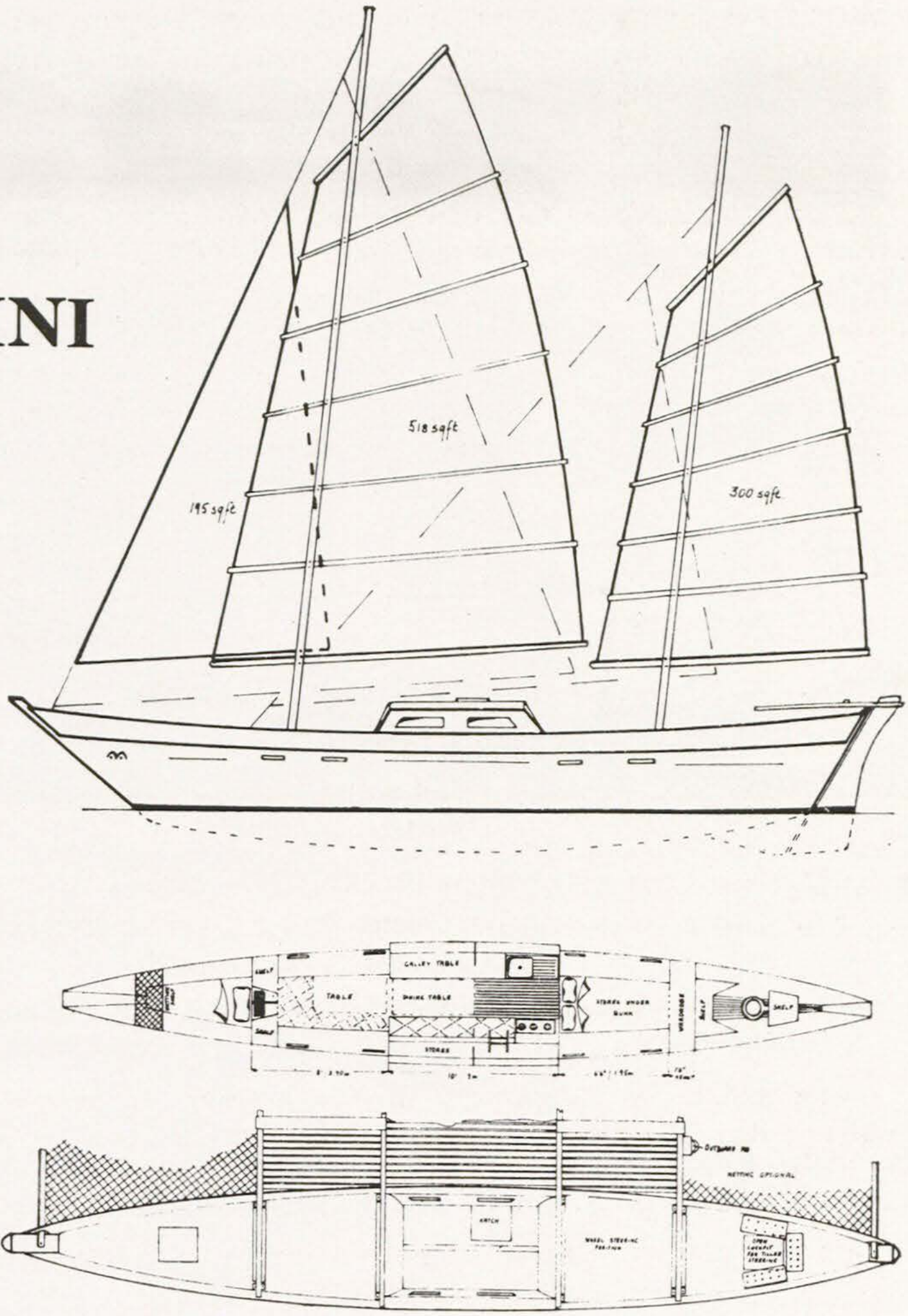
On the data available, I think that *TEHINI* is going to be a superb ship, easily comparable with Choy's 58 ft *SEASMOKE.*

On the basis of information on our existing designs and on the Choy designs (which are similar enough to bear comparison), the *TEHINI* is going to be a very fast all-round ship.

Interior layout

The interior layout of *TEHINI* is similar to that of our other larger designs. In the port or chartroom hull, there is a single cabin at the stern, a double bunk cabin with a wardrobe, a 10 ft long chartroom, with a 2 ft 6 in wide cabin sole, 6 ft 4 in headroom, and capable of seating 8 people in comfort,

TEHINI



a double bunk cabin also with a wardrobe forward, and another single bunk cabin in the bow. It would be possible to put an extra bunk in the chartroom, so that 6-8 people could be slept in one hull and 5-7 in the other, without considering the extra accommodation a deck tent could provide. The layout of the starboard or galley hull is similar except that the first cabin in the stern is a toilet which could be adapted for the use of a shower, though we personally, will always rig up a temporary shower in the galley cabin because of the extra space.

Deck layout

There will be tiller and wheel steering. The wheel steering will be protected by a canvas 'dodger cabin', over one of the aft double bunk cabins. In harbours, we will erect a deck tent, 6 ft 9 in in height, 15 ft 6 in long and 9 ft 6 in wide, on the deck.

TEHINI after launching

Engines

The freeboard from the underside of the deck beam of *TEHINI* is tha same as the *ORO*'s and it is feasible to use a 20 hp or 40 hp Evinrude, with a lengthened shaft, which will operate in a lifting 'pod'. Inboard engines could also be used with the correctly angled drive through the skeg.

Rigs

Bermudan Ketch, Bermudan Schooner, Gaff Rig, and the Chinese Junk will be available, (for racing, we will increase the working sail area from 1,000 sq ft to 1,500 sq. ft).

A TRIAL TRIP IN *TEHINI*

by John Morwood

On the 20th October last, Pat and I, having seen the sailing at Weir Wood, were on our way to Ireland. A previous letter to Jim Wharram had warned him of our impending descent upon him, and we were sitting in a cafe watching a boat sailing in the sunlight which we soon realised was no less than the celebrated *TEHINI* herself.

We watched her head towards Deganwy, and going down to the beach were soon spotted and picked up. By this time the wind had dropped and we motored out in the sunshine.

Unfortunately the wind never did pick up and our maximum speed with one puff was four knots, during which the wind was so light that a lighted match was not blown out. We sailed around a bit in the slightest of zephyrs.

When we were describing the first of Jim's new designs in the AYRS we

noted the fact that the level platforms between the hulls were suitable for day sailing parties and for gales in the ocean—not that I should want to be in *TEHINI* in a gale or for that matter any other yacht. To be sitting on the bridge under the blue skies, as a large party talking and being sociable in the warmth of the sun—picnicking too—seemed so much more pleasant than squatting in the hulls and corners of a catamaran with a large 'kennel' on the bridge deck. Jim actually has a large tent for putting on the bridge deck if he is becalmed in the Tropics or elsewhere, and the accommodation inside this must be superb.

Accommodation in the hulls

Each one has about 7 ft of headroom over a length amidhsips of some 8 to 10ft. Fore and aft of this centre part are two cabins each with a 4 ft berth stretching right across it and with about 4 ft 6 in headroom. Thus, Jim has not tried to cram multiple berths into *TEHINI*, but has rather gone for maximum comfort for a few people.

Handling *TEHINI*

TEHINI handles well and answers the helm quite positively even in the lightest of winds. Putting about was good but needed the jib to be backed in the extremely light wind. With these long hulls the centre of effort moves aft as the speed falls below two knots and tacking is sluggish. In stronger winds there is no problem.

Reefing and furling the Chinese Type Sail

I had never sailed with this rig before and was amazed at the simplicity with which simple slackening away on the main halyard reduces the canvas either by one batten or altogether—whilst hoisting the halyard resets the sail.

Jim's masts are stayed at the top and should not suffer the fate of the unstayed masts of other boats, such as *GALWAY BLAZER, ILALA* etc. In this connection I rather suspect that the Chinese unstayed mast took the halyard to the weather side of the boat on a long tack in order to steady their unstayed masts, and wonder if the reason for the loss of masts with this rig could be due to not doing so.

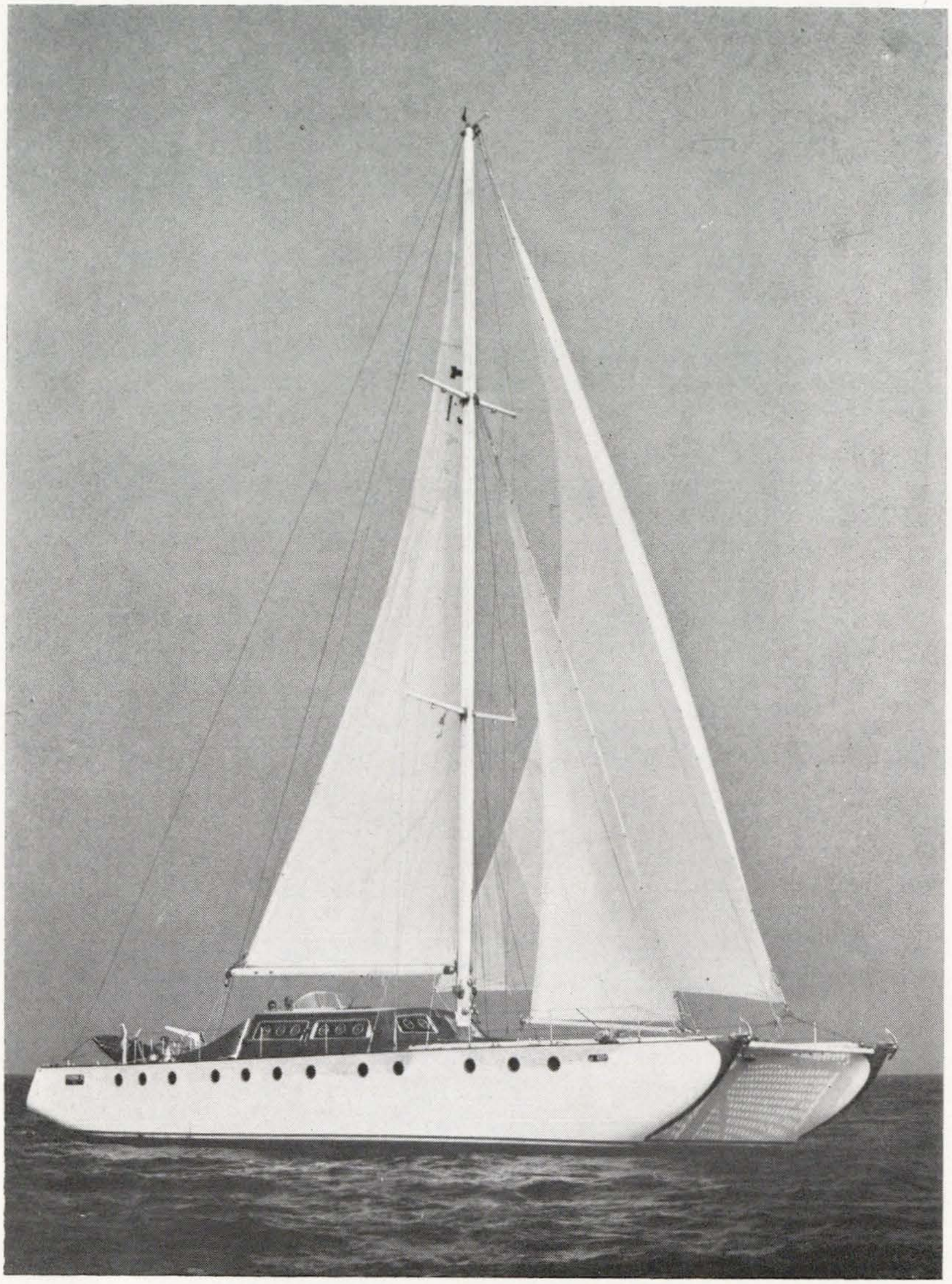
Summary

I think Jim has a delightful boat, fast and easy to handle. The accommodation is excellent, and the overall cost gives a lot of boat for a relatively small outlay of money.

POLARIS RACING

Owner and Designer: Dario Salata 16035 Rapallo, Piazzale Funivia, Italy

LOA	21 metres	LWL	15 metres
Draft	1.50 metres	Displacement	16 tons
Beam	7.50 metres		

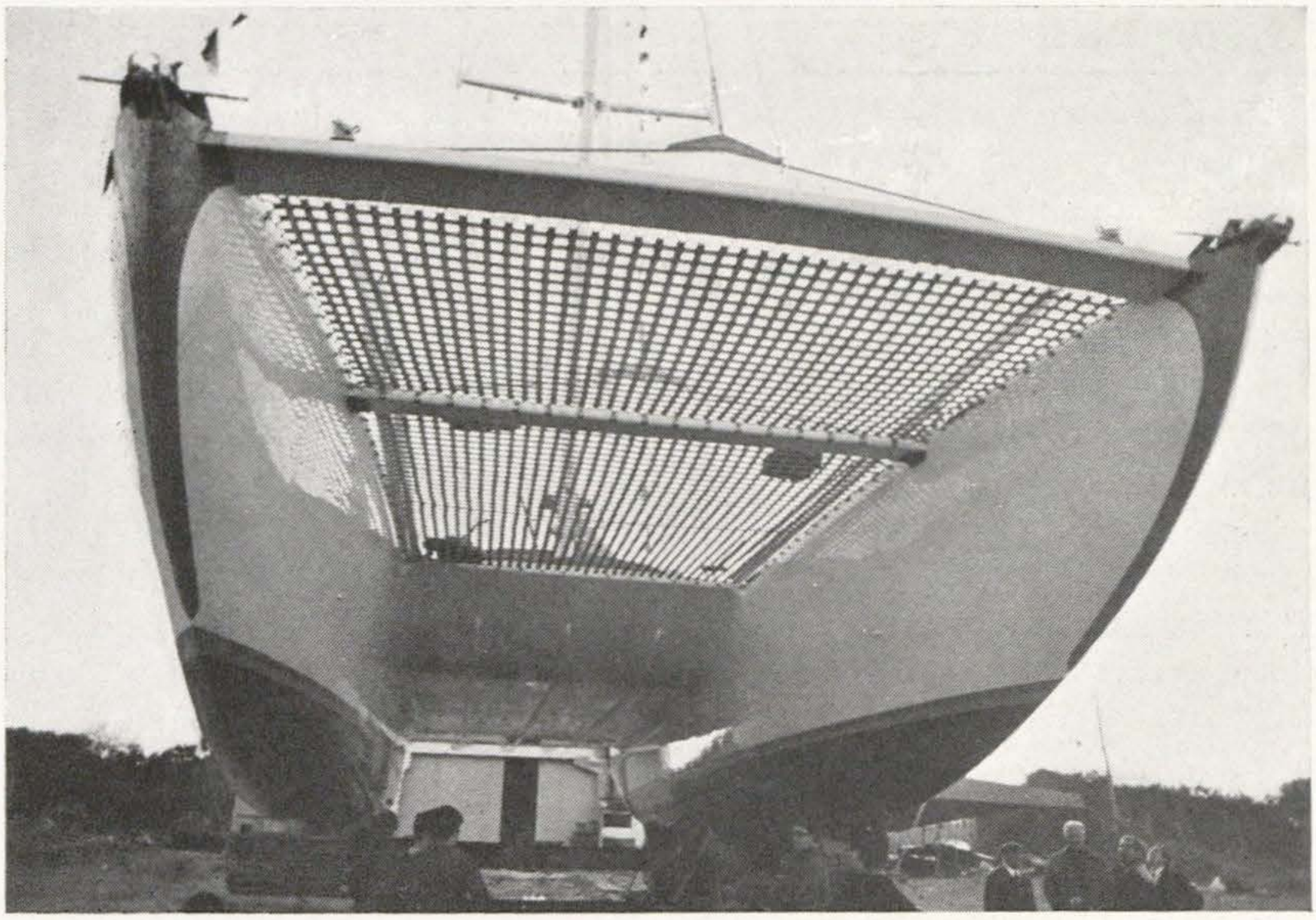


POLARIS racing—Dario Salata

Sail Area:

Mainsail	94 sq metres	Genoa	152 sq metres
Yankee	62 sq metres		
No. 1 Jib	84 sq metres	No. 2 Jib	61 sq metres
Staysail No. 1	36 sq metres	Staysail No. 2	26 sq metres
Trysail	28 sq metres		
Spinnaker	450 sq metres	Flat Spinnaker	280 sq metres

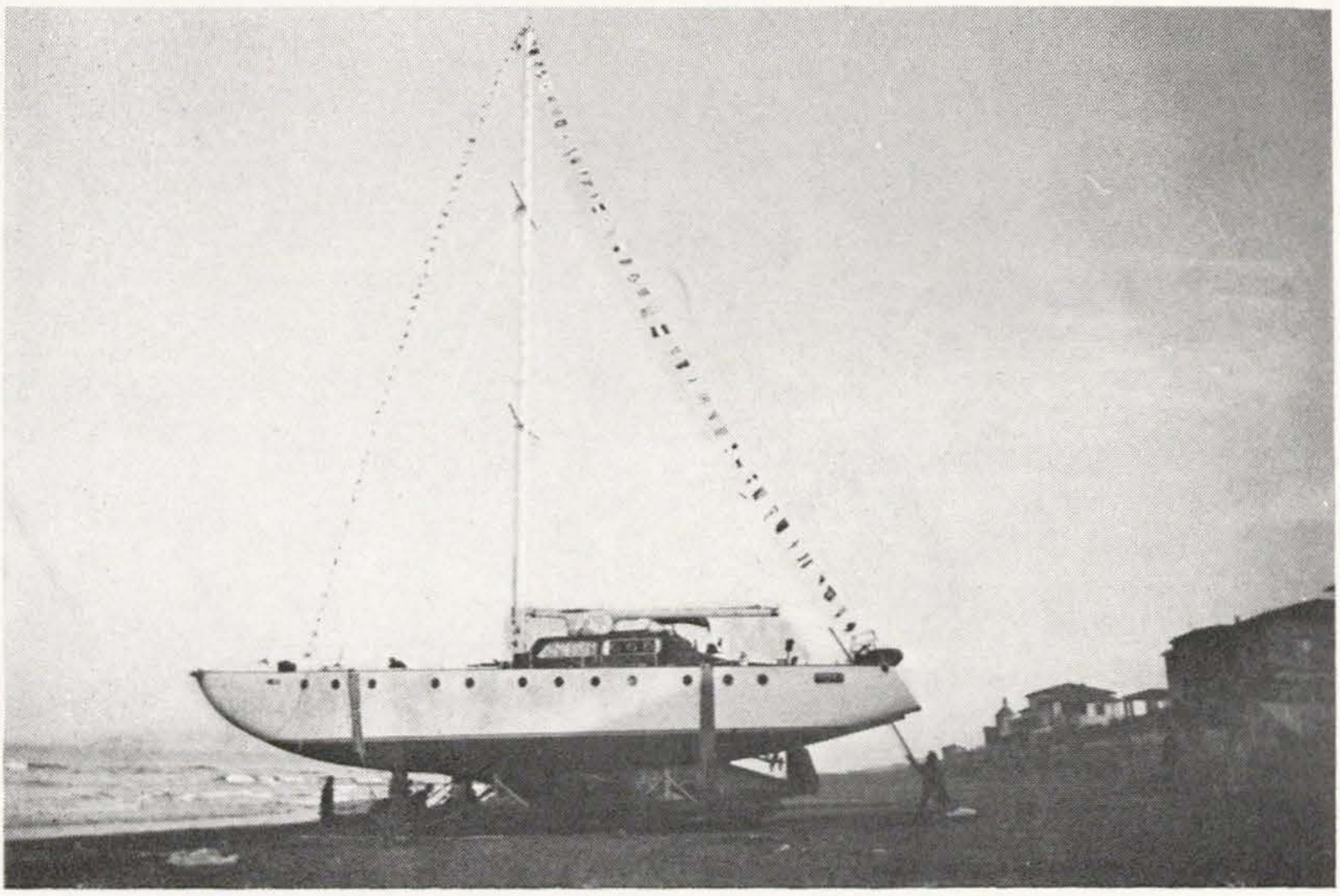
Powered by two 65 hp diesel motors. Speed under power 12 knots.



POLARIS racing—Bow view

Accommodation: Six double cabins, saloon, galley with fridge etc. two toilets and vast storage for sails.
Hulls are symmetrical and are very round.

POLARIS is easily steered and can reach high speeds. She is seaworthy and for the shape of the hulls the pitching is normal and less than that of the first *POLARIS* (see AYRS No. 42, page 18), the sails are, of course, SALATA sails.



POLARIS racing—Note low A.R. keel

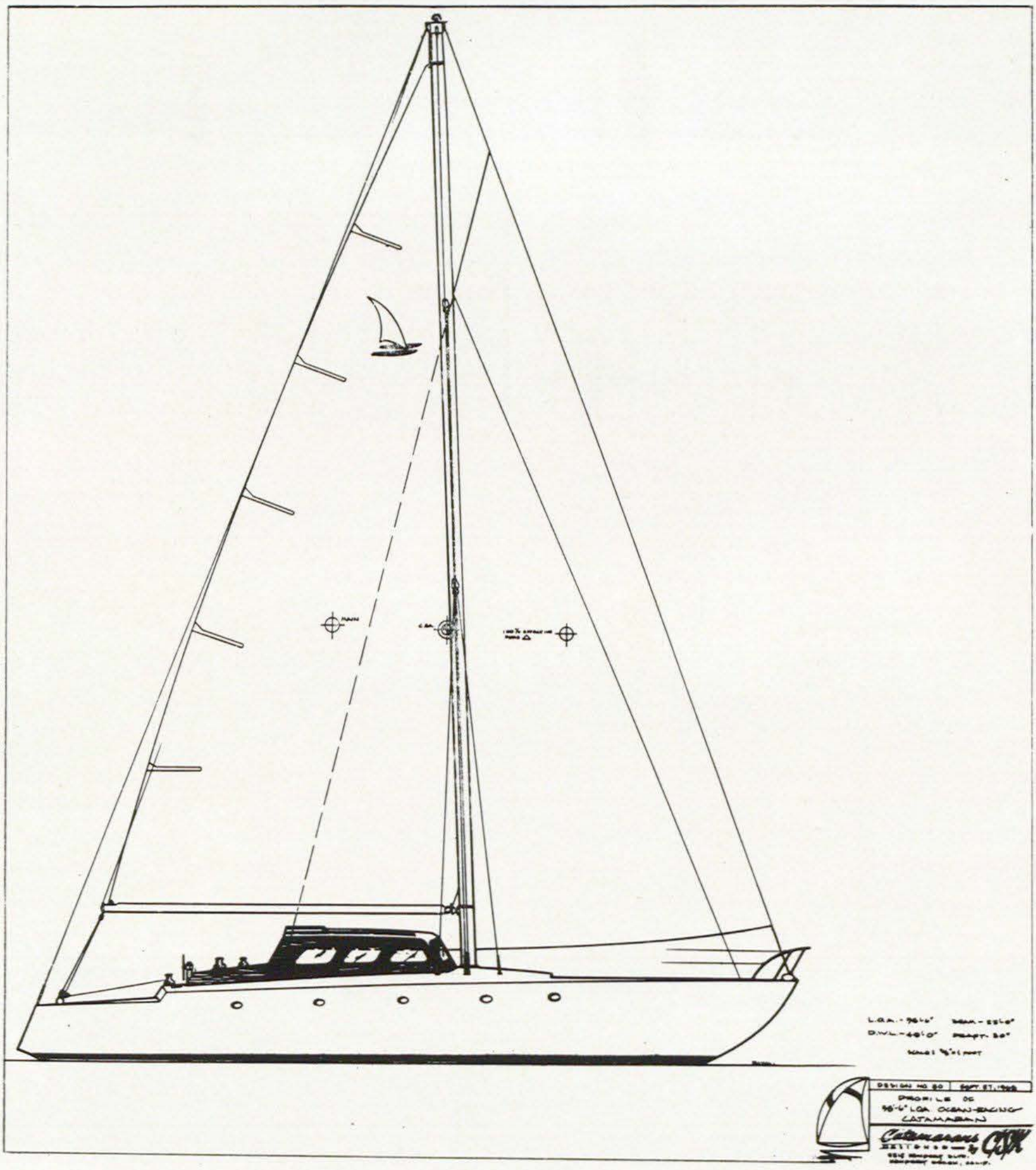
SEASMOKE

by Rudy Choy C/SK Catamarans, Newport Beach, California, USA.

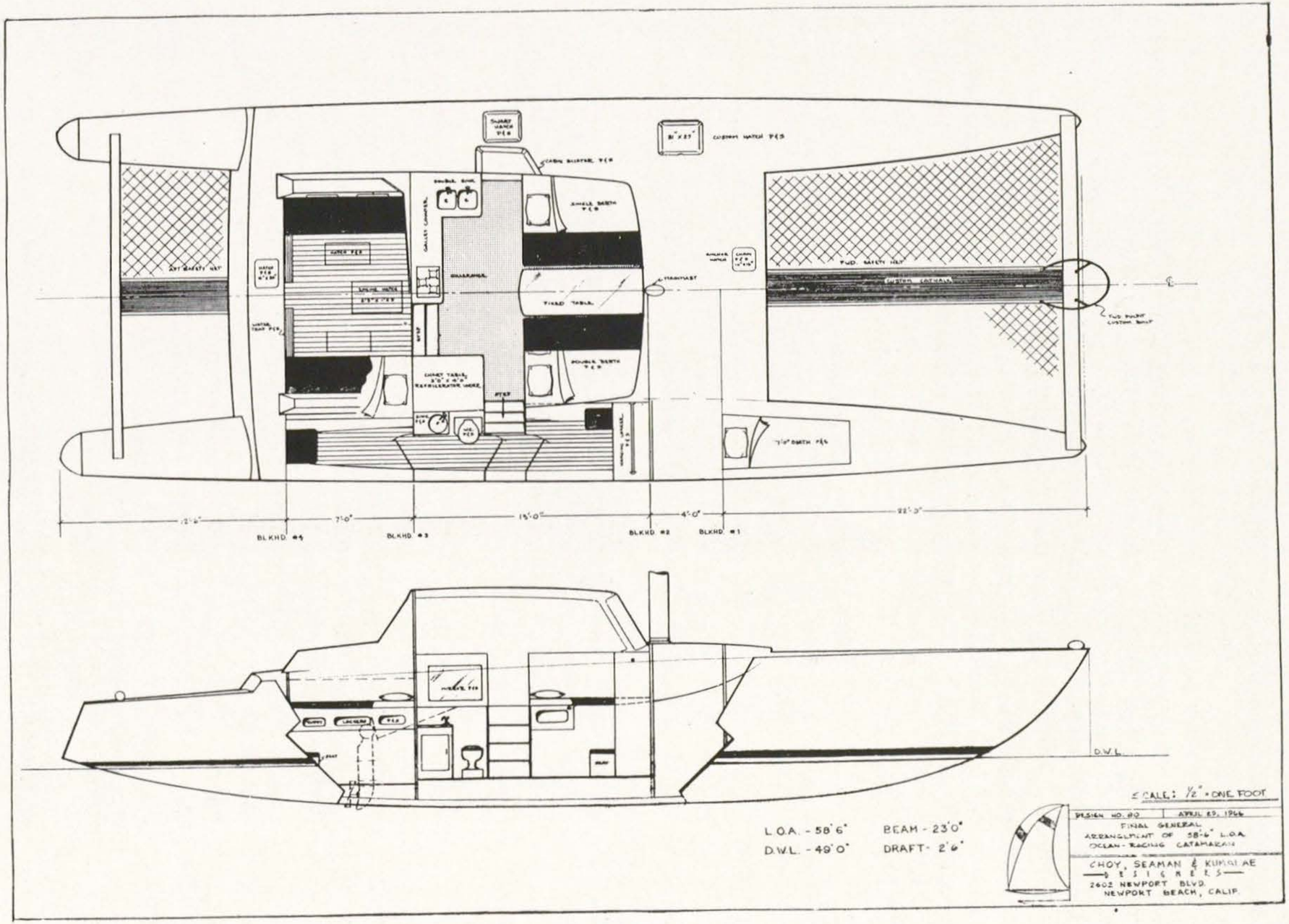
LOA	58 ft 0 in	Beam	23 ft 0 in
DWL	49 ft 0 in	Draft	2 ft 6 in

This 58 ft ocean-racing catamaran was designed and built for Jim Arness, T.V. Star of "Gunsmoke". She is, to ocean-going catamarans, what 73 ft CCA yachts like *STORMVOGEL ONDINE* and *WINDWARD PASSAGE* are meant to be for monohulls.

SEASMOKE was designed with the express purpose of finishing first in any ocean race over any distance against any competition afloat anywhere. This design objective also means the implicit potential to make or break course records when and if wind conditions are favourable.



SEASMOKE


BLKHD #4
BLKHD #3
BLKHD #2
BLKHD #1
D.W.L.
L.O.A. - 58'6"
BEAM - 23'0"
D.W.L. - 49'0"
DRAFT - 2'6"
SCALE: 1/2" = ONE FOOT
DESIGN NO. 80
APRIL 29, 1966
FINAL GENERAL ARRANGEMENT OF 58'-6" L.O.A. OCEAN-RACING CATAMARAN
CHOY, SEAMAN & KUNIGAE
DESIGNERS
2602 NEWPORT BLVD.
NEWPORT BEACH, CALIF.

SEASMOKE

SEASMOKE was launched late in August, 1967. In one year, she has participated in ten ocean races, finishing first in every race. Among the major races she has swept across first are the NOSA Newport-Ensenada International Race, the Tri-Island Race, the San Clemente Race and the Multihull Trans-Pacific Race. She has also saved her time in three of these events to take first, corrected.

Though weather conditions have not been favourable so far, all evidence shows that *SEASMOKE* has the complete ability to fulfill her potential. The evidence is, as follows:

1 *SEASMOKE* sailed the 2,400 nautical mile Trans-Pacific Race in 10 days 9 hours. When she finished this race of light-winds in July 1968, all others were still far out at sea. Among them was *IMI LOA,* a 43 ft Trans-Pac. veteran, which had made a 10 days 10 hours crossing in 1964 under average conditions. This year, *IMI LOA* was over 500 miles at sea or two days behind. Such comparison seems reasonable proof that *SEASMOKE* is able to speed Trans-Pacific in 8 days 10 hours!

2 During one rare Tradewind squall, the needle on the speed indicator was pegged against the stop at 30 knots for one minute. During the final hour, to the finish line, *SEASMOKE* indicated a steady 20-to-25 knots leaving a small, welcoming armada of Hawaiian catamarans and power boats floundering in her streaming wake.

3 *SEASMOKE* has defeated the fastest day-racing catamarans in California in smooth water.

4 *SEASMOKE* has outsailed with ease on all points the largest conventional yachts so far. She has shown outstanding ability to windward against the most weatherly yachts afloat in California waters in addition to her proven off-the-wind performance.

In many respects, however, *SEASMOKE* is comparable in design philosphy to CCA yachts. Great care was taken to provide structural strength, crew shelter and comfortable accommodations for a crew of ten. This design creed means that she may be cruised as well as raced. The temptation to improve performance even more by 'stripping', 'optimizing rig', and 'minimizing facilities' were set aside in favour of reliability and a more traditional approach as better for the good of yachting. One delightful result of this credo is that at a speed of 20 knots, there is no spray on deck!

This pace-setting ocean racer has the finest equipment available for yachts today.

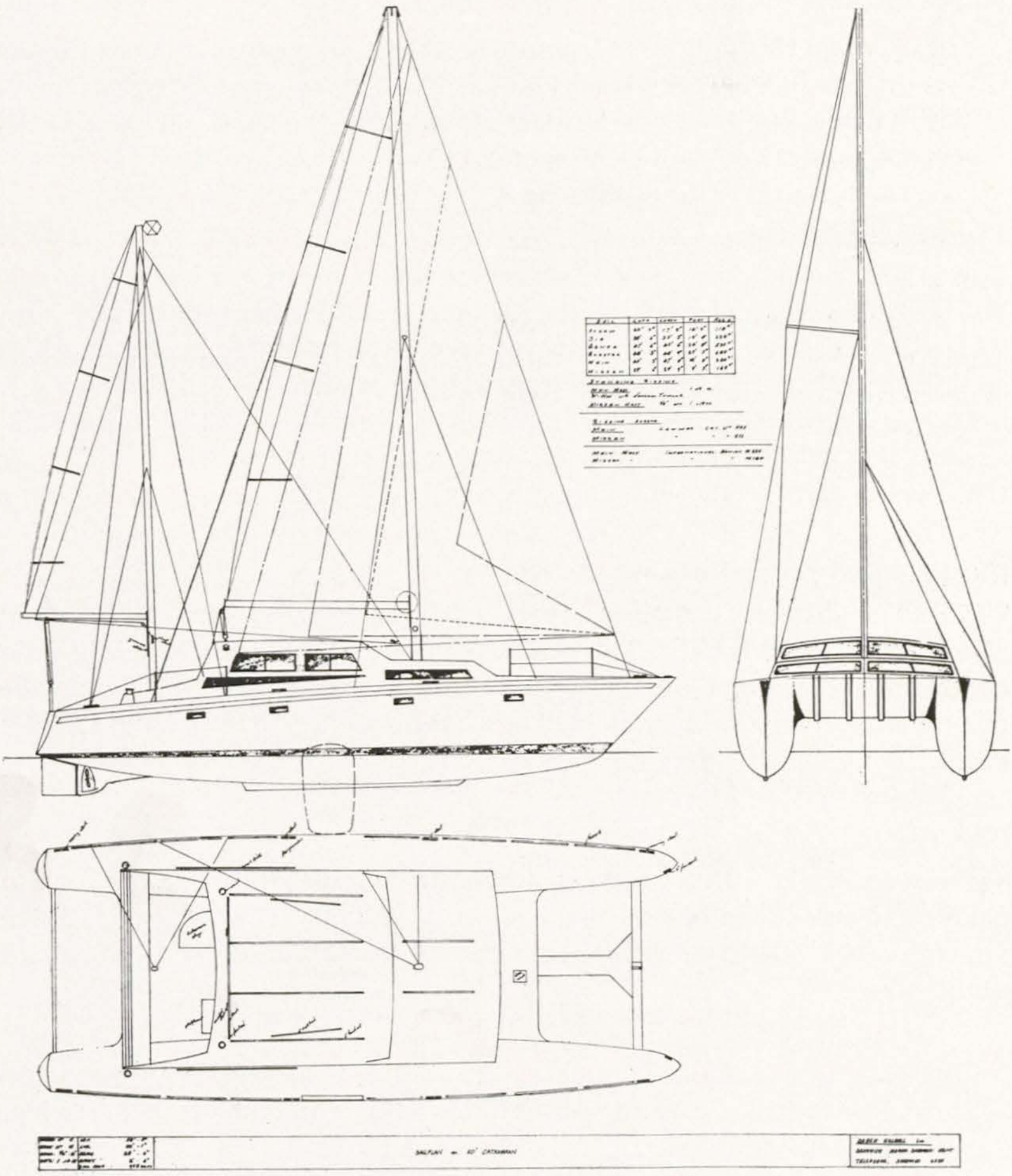
For more information contact designers.

KELSALL 50 ft Catamaran

Builders and Designers: Derek Kelsall Ltd. Sandwich Marina, Sandwich, Kent
Described by John Morwood

LOA	50 ft 0 in	Beam	20 ft 6 in
LWL	43 ft 1 in	Draught	2 ft 6 in
Sail area	925 sq ft		

Derek Kelsall must surely be one the most fortunate yacht designers of all time. Not only is he capable of designing excellent, and often pretty, yachts but he can design and build a single hulled yacht as well as a trimaran, a catamaran or a proa. Moreover, his technique of building in PVC foam and fibreglass sandwich (in the town where the Earl of Sandwich produced the original invention of bread and beef) and his business acumen have allowed him to build yachts of all kinds. His *TORIA* and *TRIFLE* are his best known



trimarans, while he built *SIR THOMAS LIPTON*, though she was designed by Robert Clark.

After the main bulk of this publication had been prepared by Dudley Soulsby, he and I went over to Derek's yard. We first saw the Proa hull which at some 50 feet in length can be lifted by two men. This proa, of the 'Cheers' principle, will have a smaller float than the main hull and is intended for the Round Britain Race in July. She is for Derek's own use and he describes her her as "a trimaran with only one float".

We also saw a very sleek trimaran which again is intended for the Round Britain Race. At 44 feet in length and of definitely a racing character, though not quite so 'Minimal' as *TORIA* when she raced, she should be very fast indeed.

Finally, we found ourselves wandering in a broad tunnel which turned out to be the underside of a large catamaran whose hulls and bridge deck had been completed. We climbed the inevitable ladder to the deck. The main bulkheads were in place and the 'furniture' was being put in.

The drawings show the main features of the design. The main thing of note is that there is full standing headroom in the main saloon. Forward of this is the dining space with good sitting headroom. In the profile drawings, these deck houses do not look unsightly to me.

Hull design

This is pretty orthodox. The LWL crosses the midships section of the hulls just below the centre of radius of the semi-circle and the lines show a fine bow, with plenty of above water buoyancy, sweeping to the semi-circular midships sections and then on to the narrowish transom sterns.

Dagger boards are used to combat leeway, instead of the low aspect ratio keels. This reduces the hull draught but means that the skeg and rudder are the deepest parts of the boat.

Engines and propellors

Twin 40 hp Mercedes engines are likely to be installed and these should give a speed of 10 knots. The propellors are fixed-bladed which will be a considerable drag when sailing but the smallish sail area and ketch rig make one think that she will be more used as a 'Motor-sailer' than as a pure sailing yacht.

The rig

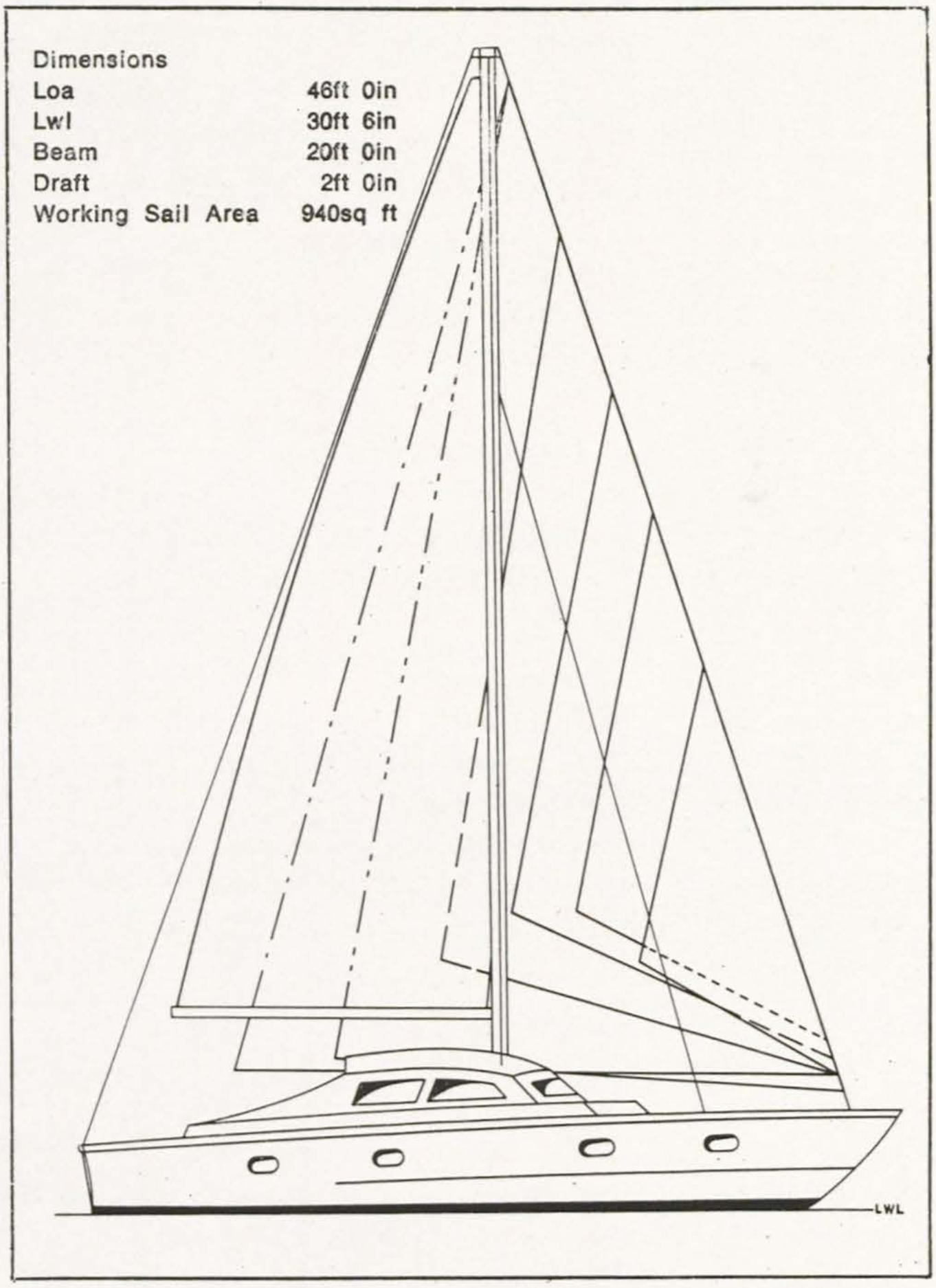
The low ketch rig with a good wardrobe of headsails will make her easy to handle and she should be fast on all points of sailing. The 'Walkway' to the forestay, when fitted with lifelines is essential to all cruising and racing cats of this size.

Summary

This catamaran is designed for comfortable living and comfortable cruising. She should achieve just that.

NAVAHO

LOA	46 ft 0 in	LWL	30 ft 6 in
Draft	2 ft 0 in	Beam	20 ft 0 in
Sail Area	940 sq ft		

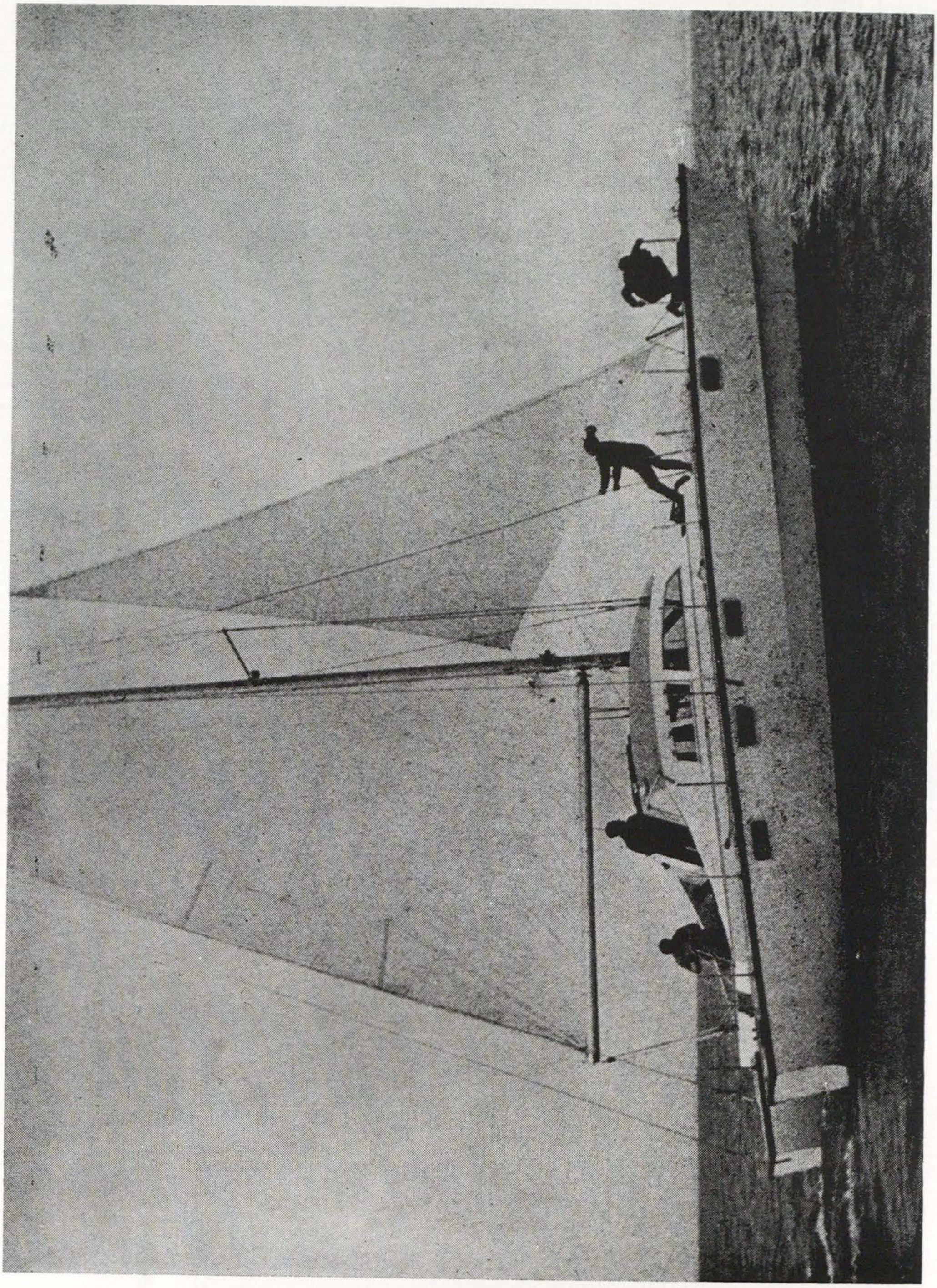


NAVAHO

The 46 ft *NAVAHO*, designed by J. R. Macalpine-Downie and built by Sail Craft Limited, Shipyard Estate, Brightlingsea, Essex, is a really advanced cruising catamaran similar in appearance to her smaller sister—the 30 ft *IROQUOIS*.

The hulls are glass fibre-balsa sandwich construction which is rigid as well as being lightweight. The balsa also acts as sound and temperature insulation. With full standing headroom throughout and eight to twelve beths she makes a handsome and practical family boat.

Her sail plan incorporates a mast head rig and a wide range of foresails



Rod Macalpine-Downie's 45 ft *NAVAHO*

Letter from: George Tinley

TOMAHAWK, Crystal Trophy Winner 1968

An Iroquois catamaran described in AYRS No. 59, page 49.

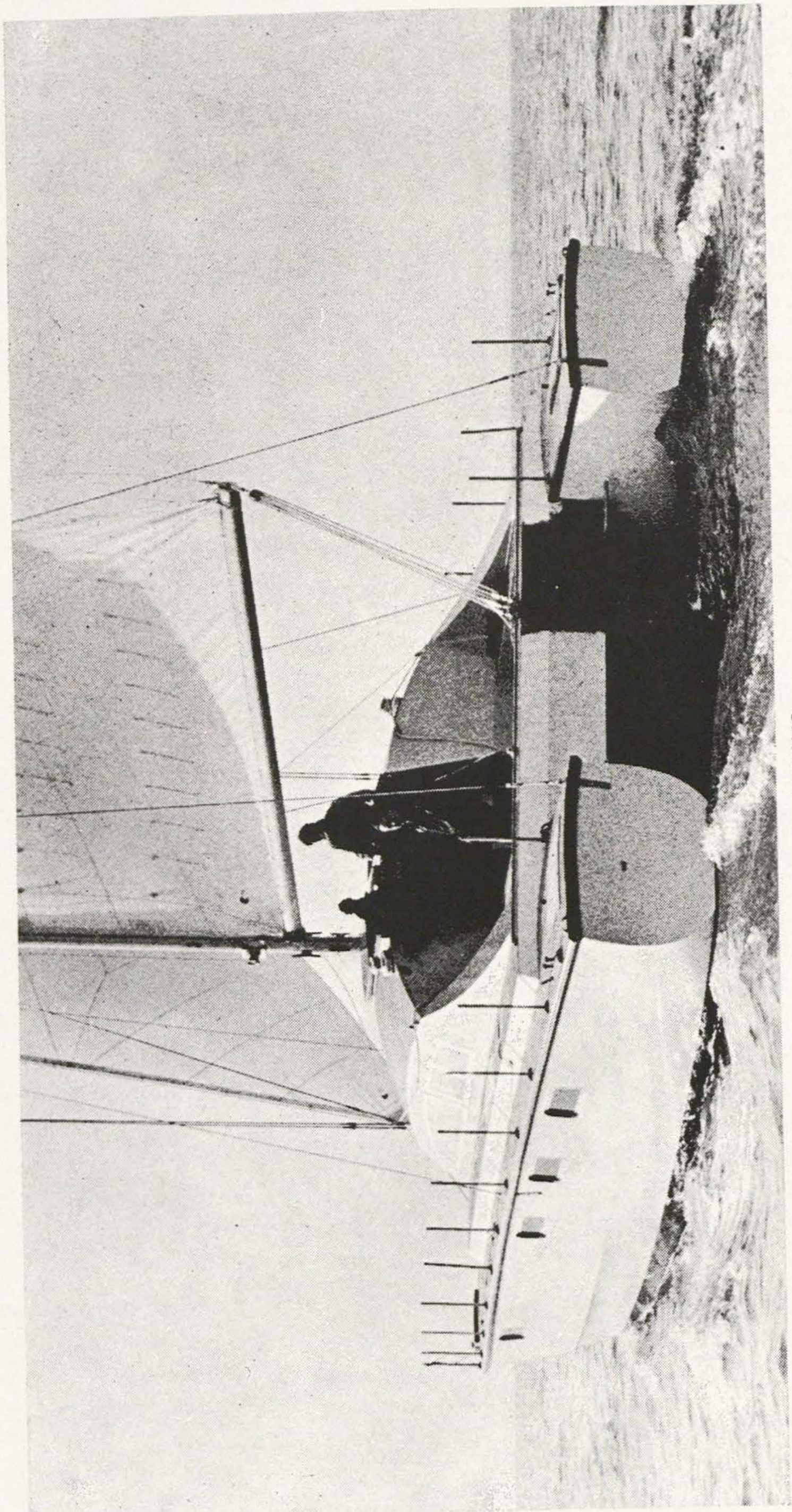
TOMAHAWK is a 30 ft GRP Iroquois built by Sailcraft and is quite standard apart from a souped-up rig designed to fit the rating rule. In her we have enjoyed 5,000 miles of channel cruising and racing and have learnt a lot, all our previous sailing having been in monohulls, classes II and III RORC and the like.

TOMAHAWK is a viceless little boat, and only on one occasion, and that not offshore, has she given us a fright. She is sailed like a dinghy, main-sheet, via a jamber, to helmsman's hand, and one soon gets used to this. With 300 sq ft of main and 200 sq ft of jib we find it sufficient to let fly the main when the windward hull lifts. On the occasion when we nearly flipped, the helmsman (several pints to the good) was short tacking in a gusty force 6 under full sail in restricted Lymington River. Just as the helm was put down to tack, a puff lifted her weather hull. Helmsman, instead of releasing the mainsheet, fell flat on his back and over we went, until, according to the delighted spectators, they could see BOTH plates and right under the bridge-deck. We all fell into a heap and *TOMAHAWK* felt just like a dinghy capsizing; she had reached that balancing point when normally the inrush of water signals the end. In our case she just whacked upright with a hell of a bang, none the worse for wear. As this was in our first week or so afloat it was a helpful lesson, and, as my partner Ken said "Anyway the mast would have landed on a fishing boat and we could have shoved it upright again" ! ! This proves the basic obvious catamaran facts of what action to take—bear away hard and release the main; NEVER never luff.

TOMAHAWK's normal top speed when just off the wind is 15/16 knots, and this is also regularly achieved under spinnaker broad reaching. On a few occasions we have had the delight of clocking 20 knots, and our most exciting sail was home from the Wolf Rock last Crystal Trophy when she was clocking up 18 knots, a moonlit stormy sea, spinnaker, genny, full main and force 6/7 wind up the tail. It was then that I think my feelings of returning to our lead-trailing friends finally vanished. Our average round that course, 305 miles in 46 hours, was not very high, but sooner or later a design break-through will surely be achieved.

TOMAHAWK is sold now, and I am the proud owner of a new offshore Iroquois. Almost as though a fly had sat on the wall and conveyed all our remarks on design to Rod Macalpine-Downie, the new boat puts right so many of our thoughts on *TOMAHAWK*. First and foremost she was too heavy for her hull shape. We floated usually below our boot-top and that some 2 in above our waterline. This meant lack of buoyancy in hard driving and a little pounding on the bridgedeck, and a dreadful dragging of her transoms. We felt her centreboards were too small. We use both to windward and the leeward one off the wind in normal going. When conditions are really hairy we use only the weather one on the happy assumption that when it lifts out of the water we shall slide neatly sideways instead of flipping. This, however, makes steering much more difficult and erratic.

Rod Macalpine-Downie's *IROQUOIS*



NAVAHO

are available, therefore enabling the prospective owner to choose a sail plan to suit his individual requirements.

The 57 ft alloy mast is supplied sound-deadened. This is achieved by a synthetic rubber-like coating on the interior walls of the mast which also helps to reduce corrosion. Stainless steel fittings are used throughout to reduce maintenance costs. The alloy boom is of similar quality to the mast and is fitted with heavy duty roller reefing gear, main and jib halyard winches are also supplied as standard.

The interior of the boat is finished to owners' requirements and a final price can be decided according to the type of fittings and extras required.

APACHE

The *APACHE* designed by J. R. Macalpine-Downie as a 40 ft cruiser racer is a development produced after several years experience with cruising catamarans by Sail Craft Limited which all started with the *IROQUOIS* also designed by Macalpine-Downie, which later developed to a Mk.II and Mk.IIA version. *NAVAHO* a 46 footer, by Macalpine-Downie/Sail Craft Limited, also led to what must be the best 40 ft catamaran produced.

Her hulls and bridge deck are moulded in one piece and joined to the all fibreglass cabin top and deck, also moulded in one piece.

She has that well known Macalpine-Downie attractiveness and must be the longest all glass catamaran produced which is also attractive in itself.

Her rig is masthead sloop which has proved itself time and time again to be the most practible rig for a catamaran of this size. Full head room throughout is maintained with the exception of a small area of the main saloon on the bridge deck.

APACHE's spars are by Sail Spar and constructed in alloy using all stainless steel fittings. The mast is supported by stainless steel 1 × 19 standard rigging. Deck fittings are all manufactured by well known British firms such as Lewmar, Gibb.

Obviously on a boat of this size some special fittings are necessary and these are manufactured by Seatech Limited of Brightlingsea, specialists in stainless steel and alloy welding and fitting manufacture.

Her leeward drift is counteracted by tipping centreboards situated on the outboard side of each hull and controlled from the cockpit area.

Price less Sails £12,500 0s. 0d.

Engines and extra interior alterations and extra fittings etc. are not included in the above price.

The *APACHE* is also available in shell kit form.

LOA	40 ft	Beam	19 ft 6 in

Personally I like to feel she is really a clean narrow 30 footer with her leeward plate to lean on. We are virtually sitting on her outrigger, kissing the water when we must. My new boat has a masthead rig—lower centre of effort but we say goodbye to the beautiful and safe battened sail. I wonder if this full high battened sail depresses that leeward bow a lot off the wind however, and when you sail single-handed with a family, that heap of battens takes a bit of catching. Next year our off-the-wind performance must be down and yet our spinnaker will be larger. It seems to me you pays your money and takes your choice.

TOMAHAWK's sail-carrying ability is very much according to sea conditions. We have used all 510 sq ft of sail in a registered force 7 in our sheltered Solent, and gone to windward at 7 to 8 knots, feathering into puffs and pointing higher than mono's of top class II calibre, but again offshore we have reefed at the top end of force 4, and by force 7 only show 100 sq ft of jib and 135 sq ft of main. Any more and she feels unsafe when canted over by a big sea, but of course these small sails won't enable the boat to point well, and we make a lot of leeway. Off the wind one can drive as far as your nerve allows; we have never had qualms about her but are usually mindful of Rod Macalpine's warnings that the most likely way to come to grief is to pitch-pole over the leeward bow. We take all weight out of that bow and reef when the speed gets up to the 16 knots plus.

In 1968 I had a mainsail made by Anderson with a very 'open' leach as we found our previous one tended to curl to weather and have a greater heeling moment. The Anderson main would spill from the leach cleanly and, although appearing flatter, it drove her faster even in light weather. We reefed less with this sail and rarely lifted the weather hull. Our discussions aboard as we sailed asked for larger more buoyant hulls to carry the weight, and transoms that slid over the water, not through it; a higher bridge-deck to stop slapping; much smaller windows to make them less vulnerable and less like a glasshouse during the summer; a deeper cockpit for security with a better grip on its large floor area; wider side decks uncluttered by shrouds; larger centreboards; better ventilation etc.

Gentlemen, I do believe the new offshore Iroquois was based on that specification—she is going to be an exciting ship.

George Tinley

George Tinley now has his IROQUOIS MK II and we quote the following paragraphs from an article about the 1969 *Crystal Trophy Race by David Pelly which appeared in August's Yachting World.*

Turning the spotlight briefly on to the winning boat, she is an Iroquois Mk II GT by which I mean that George Tinley has gone some way towards turning what is basically a nice, comfortable, tubby cruising boat into a racing machine. Extra sails, better winches, special rudders and a wooden rather than GRP superstructure are the main changes. George's main strength is that he had no pre-conceptions about ocean racing whatever and expects the boat to be sailed like a racing dinghy all the time. On capsizing he says "Its not the end of the world. We would get into the liferaft and have breakfast." The boat stood up fairly well to the attempts of 'Tinley's

Tearaways' to pull it apart but there were one or two curious incidents; none of the mast-head instruments worked at all. The skipper stepped on the compass and broke the dome which thereafter had to be topped up with Scotch from time to time. The radio played music on the beacon band, the fog-horn gave up without a whimper, the French went away with the ground tackle and lastly, the main genoa winch decided to fly across the cockpit and embeded itself in the side of the quarter-berth, bringing the occupant out like a greyhound from the traps. Still, that's multi-hulls for you.

IROQUIOS Mk II

Data of *MK II*

LOA	30 ft 6 in	Rig: Bmu Sloop	Masthead rig:
LWL	26 ft 9 in	Main	202 sq ft
Beam	13 ft 6 in	No. 1 jib	160 sq ft
Draft:		No. 2 jib	95 sq ft
Centreboards down	5 ft 4 in	Storm jib	56 sq ft
Centreboards uo	1 ft 4 in	150 per cent Genoa	273 sq ft
Headroom in hulls	6 ft 5 in	180 per cent Genoa	342 sq ft
Headroom in		By Seahorse,	
centre section	4 ft 6 in	Total working	
Size of cockpit	5 ft 6 in × 4 ft 0 in	sail area	362 sq ft
Displacement	$2\frac{1}{2}$ tons	Recommended wind force to start reefing	Force 5

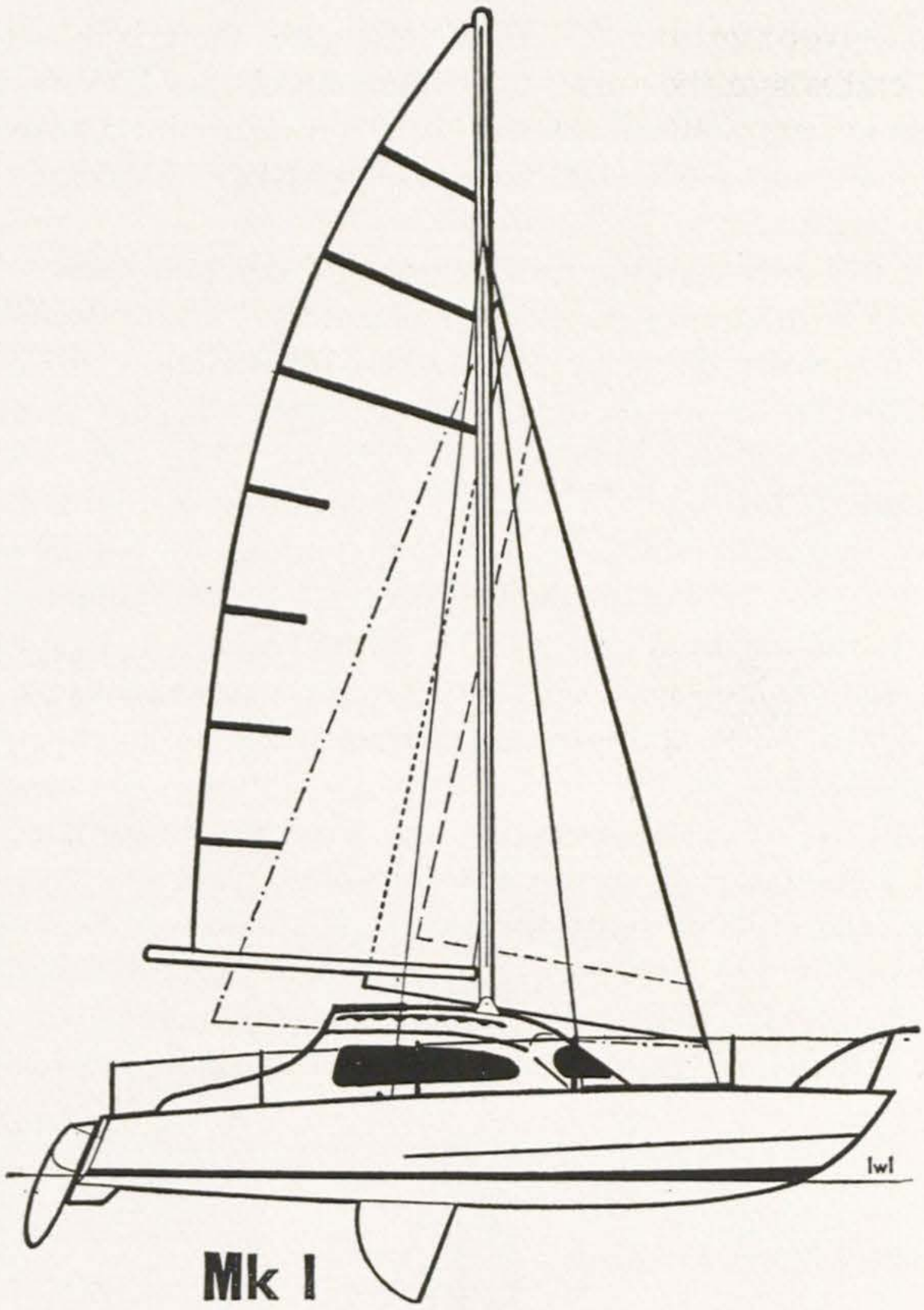
Roller reefing on main.
Mast: Aluminium by Sailspar
Tender: Any inflatable or Prout Puffin
Main materials: Hull—single skin GRP
Coachroof, deck GRP/Balsa/GRP sandwich 1 in thick
Steering: By tiller or wheel onto twin rudders
Two centreboards laminated $1\frac{1}{8}$ in thick
Outboard: 25-35 hp
Cost £4,200 ex sails or D.I.Y. shell £1,900 plus
Builder: Sailcraft Ltd., Waterside, Brightlingsea, Essex
Designer: Roderick Macalpine-Downie

The following extracts are taken from test report by Patrick Boyd (who built his own *IROQUOIS MK I* from a kit) which appeared in Yachting Monthly.

Certain necessary changes have been made between the *MK I* and the *MK II OFFSHORE IROQUOIS.*

The main object behind the changes was to create a potentially safer boat without sacrificing too much speed. The time for any alterations in the design was appropriate last autumn because the original moulds were almost worn out and new ones would have to be made in any case.

IROQUOIS I is a frighteningly fast catamaran and if it can be kept light there is nothing to touch it for its size. This is the problem. Even a racing



Mk I

crew needs a great weight of stores, food, fuel, water, instruments and tools —to say nothing of the incredible mountain of kit needed by the average family for its annual cruise. A greater load-carrying capacity was required and so 3 in of extra beam was given at waterline. A lower rig with 100 per cent foretriangle is expected to give more drive with less inclination to overturn. A practically straight-cut roach is necessary to accommodate the standing backstay required by the masthead staysails. The mainsail is smaller—202 sq ft instead of 256 sq ft and there is a choice of genoas—the 150 per cent one of 273 sq ft and the 180 per cent of 342 sq ft mainly for the man who wants to go racing. The bridge deck is higher out of the water to prevent pounding and the cockpit is slightly smaller and much deeper. There is less solid foredeck but a trampoline covers the area between the hulls almost to the bows and a light alloy pulpit surrounds the whole area. The forepart of each hull is now divided from the rest of the hulls by a watertight compartment accessible only from the deck via large hatches. These compartments, large enough to accommodate all the sails, are self-draining as the lower part is full of foam buoyancy to above the waterline. On the foredeck amidships is a small locker just the right size to take the anchors and anchor warp and no more.

The cockpit gives a greater feeling of safety and there is a large locker at the forward end where the water tank and bottled gas lockers used to be. The two large lockers right aft are still there but rather inaccessible now that the cockpit sides and particularly the after end of the cockpit have been raised.

Ventilation has been tackled with vigour and common sense. Expensive metal windows with sliding panels give a greatly improved current of air, and Reg White swears that they are the best obtainable.

Arrangements inside the hulls remain substantially the same. Double berths aft in each hull and singles right forward. The saloon table is still in the fore and aft line and the whole lot turns into a double bunk. You can therefore sleep eight adults, or with the addition of a couple of inflatable mattresses, ten—but believe me for a weekend of anything but unbroken sunshine six is the maximum, and for a month's cruise I would prefer five.

Tha main companionway is offset to port thus giving a large navigation area to starboard. The chart table, a large business-like job incorporates the Boyd modification, that is to say, the table is hollow to take Admiralty charts laid flat. It folds up out of the way when not in use and the area is then used as a lounge, with a very comfortable double seat one side and a single on the other. The saloon table is of adequate size although the new mast supports do intrude into the area. The main support is a full-size mast section and this makes a family lunchtime conversation somewhat hazardous as you can't actually see your opposite number at table and I also imagine

Mk II

the sauce bottle would be forever lurking behind the mast. Surely there must be a way of producing some support to the deck without that enormous chunk of metal?

Sailcraft have now dished the bridge deck down the centreline to provide better room for the feet of people sitting at the table and because the under-deck clearance is greater there will be even less chance of waves slapping the *MK II IROQUOIS* underneath.

Water storage is better placed. Two 25 gallon plastic tanks are stowed under the heads of the stern berths keeping the weight low down and practically doubling the water capacity. (Only one of the tanks is supplied as standard).

Centreboards, which I suppose could be better called lee-boards, are now $1\frac{1}{8}$ in thick, made of wood, and float up in the boxes when released. The centreboard boxes are wider than this except right at the bottom, where the support is necessary, so that if stones get trapped between board and box they will automatically find their way into the wider part of the box where I suspect they will rattle. A small price to pay though for a non-jamming centreboard.

A choice of engine is offered now that Johnson and Evinrudes can provide a long (sic) shaft as well as the lighter Penta power plant. These are now mounted on a Trojan outboard bracket which pivots the engine up and out of the way and entirely eliminates prop drag.

To sum up, Sailcraft have altered the aim for the *IROQUOIS* from racer/cruiser to cruiser/racer and in so doing have made many improvements which will make a lot or *IROQUOIS* owners envious (Changes which some of us have made to our *MK I*s.). By so doing they have increased the load-carrying capacity to somewhere near the average owner's requirements and made *IROQUOIS* more foolproof. From a personal point of view I think that she has lost a lot in looks. The long low greyhound look has gone, together with the distinctive fully-battened mainsail with the pronounced roach. The sweetly curving line of the windows is replaced by the square outline of the new metal opening windows.

Reg White and I eventually dragged ourselves out to the cold harbour and aboard *MK II*. The sails were up in a trice and Reg took the helm while I blew on my fingers—then we reversed roles. The wind blew nicely up to Force 3 and she started to reach out to sea. It soon became apparent that the lower rig was going to be every bit as efficient as the old one. More so in some respects. Reg at one stage, dropped the main and we continued to beat an even tack under small genoa alone, a most impressive demonstration. She pointed higher too—this was because with the shrouds now attached well inboard, the genoa could be sheeted flatter. The demonstration model, it must be said, had no skegs in front of the rudders which certainly helped in going about quickly and I found the helm almost too sensitive. I also found it difficult to hold a course without constant adjustment to the helm. Frozen though I was, I was almost reluctant to turn for home. *IROQUIOS MK II* is certainly a winner.

ARISTOCRAT 30

Aristocrat Marine Ltd. Avon Works, Bridge Street, Christchurch, Hampshire, U.K.

Dimensions:		
LOA	30 ft 6 in	9.260 metres
LWL	27 ft 7 in	8.375 metres
Beam	14 ft 0 in	4.250 metres

Sail Areas:		
Main	220 sq ft	20.4 sq metres
Jib	150 sq ft	13.9 sq metres
Genoa	250 sq ft	23.2 sq metres
Spinnaker	560 sq ft	50.2 sq metres
Storm jib	50 sq ft	4.64 sq metres

Construction:	
Hull	Glass fibre
Bridge Deck	Glass fibre/Balsa sandwich
Deck and Coachroof	Glass fibre/Balsa sandwich

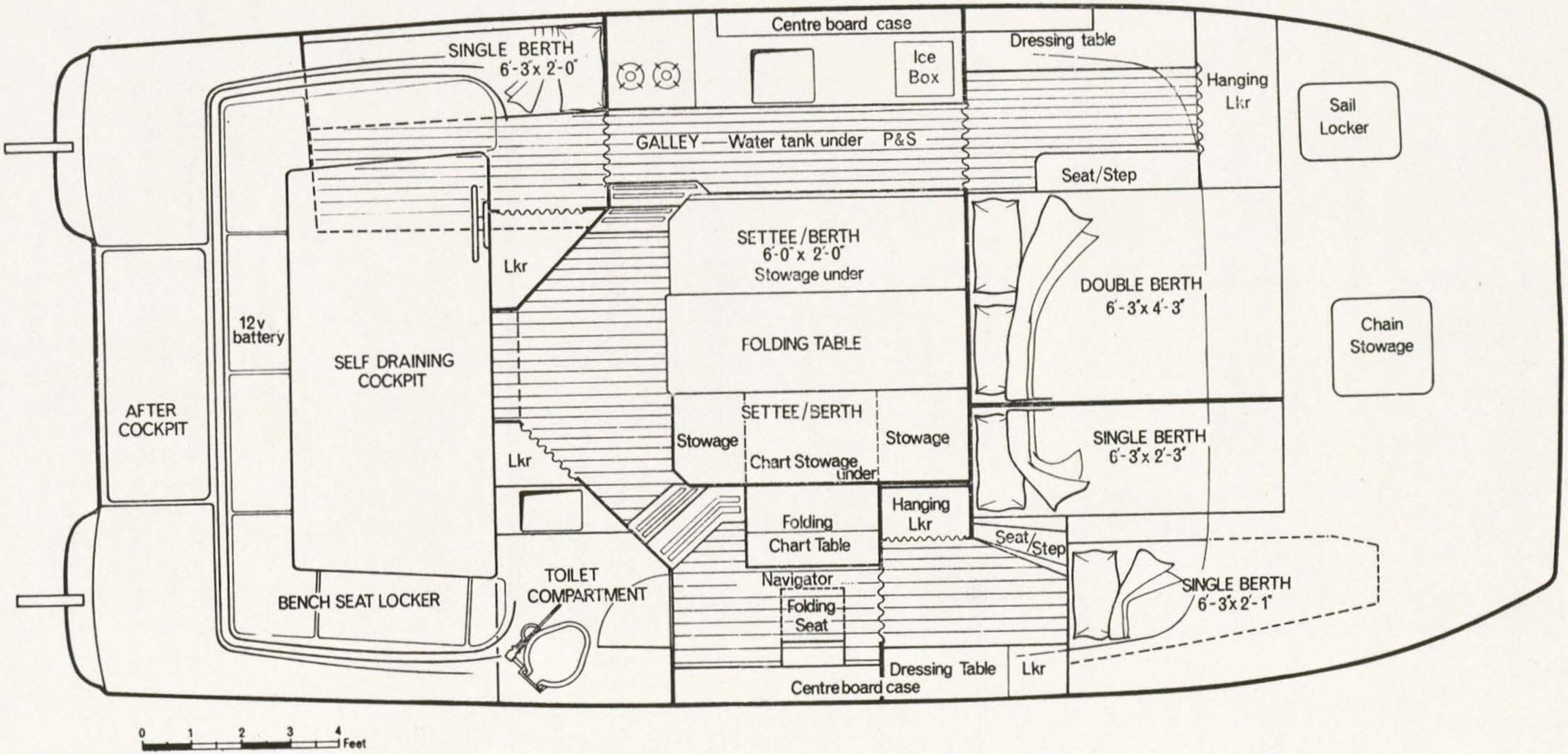
The accommodation comprises a comfortable saloon with seating for eight. Seats convert to two single berths. A folding canopy gives full headroom amidships. A fully equipped galley with standing headroom. Two separate cabins forward each with dressing table and hanging locker. Port-side cabin has a double berth; starboard two singles.

A toilet compartment with W.C., wash basin and space for shower. Abundant storage space. A practical chart table which folds away. All completed in luxurious satin finished hardwood and washable Vinyl.

A spacious foredeck for dinghy stowage and sunbathing. Roomy self-draining cockpit for family safety. Glass fibre construction with oiled hardwood trim for minimum maintenance.

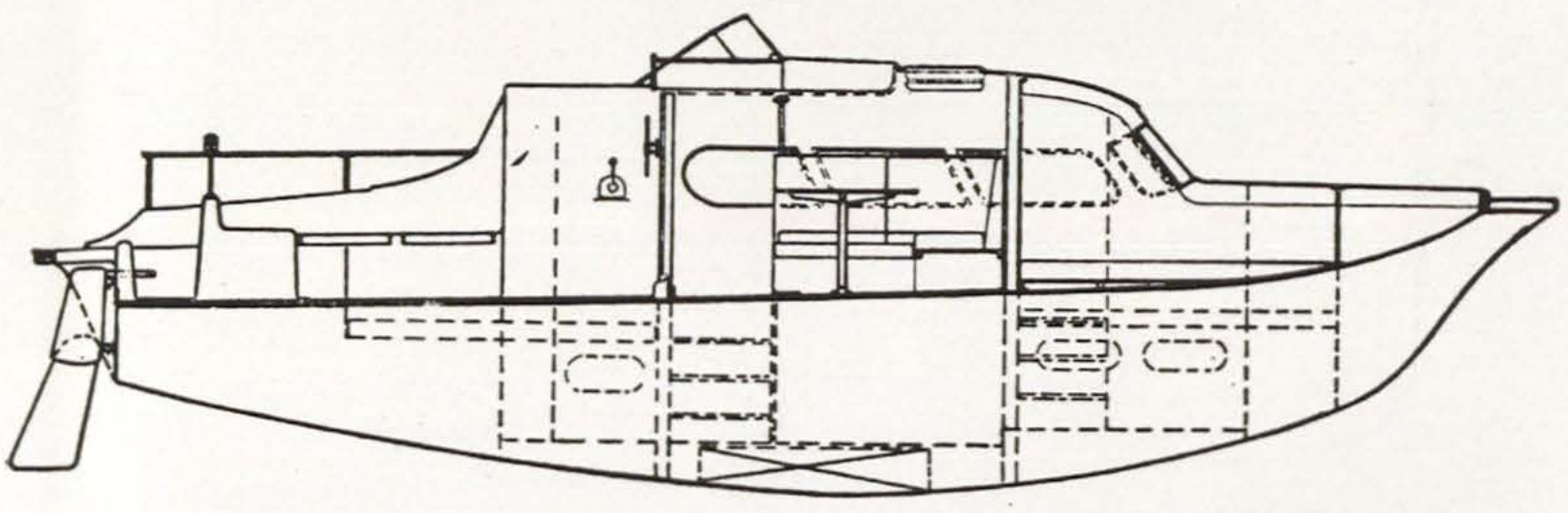
The *ARISTOCRAT* 30 can be powered by inboard or outborad engines, single or twin installation, to customers' requirements.

Metal mast in tabernacle. Roller reefing and Terylene sails.



ARISTOCRAT 30

CATALAC 28



CATALAC 28

THE 'CATALAC 28'

Sales are handled by: Tom Lack Catamarans Ltd.,
Flagstaff House, Mudeford, Christchurch, Hampshire, U.K.

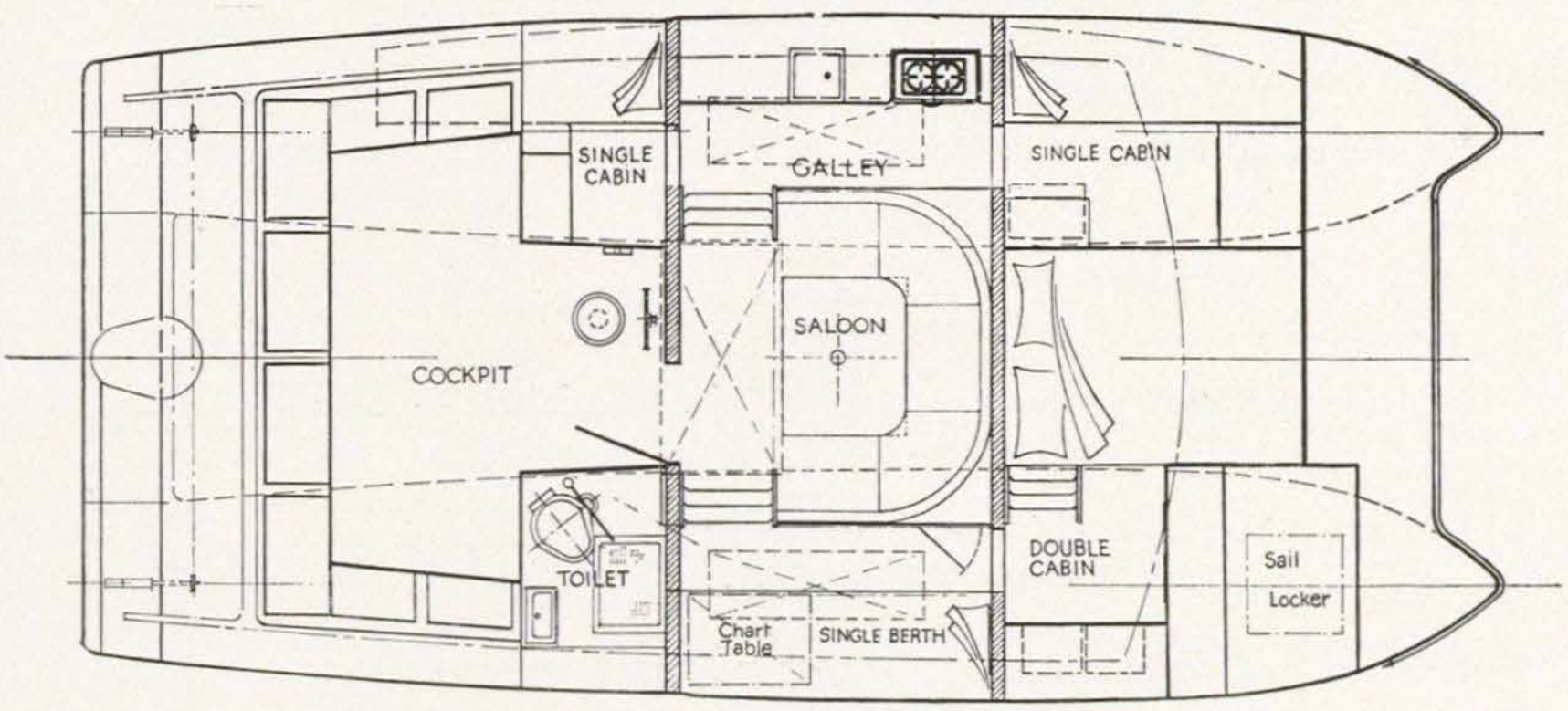
This design by M. G. Duff & Partners has resulted in a very original craft, which makes the 28 ft *CATALAC* one of the most attractice Cruising Catamarans on the market today.

With hard chine hulls and plenty of natural ballast below, safety and comfort are assured. The well balanced sail plan, giving 425 sq ft makes for an excellent turn of speed. Spinnakers, genoas and storm jibs are readily available. The unique layout of the self-draining cockpit gives plenty of elbow room for everyone on board and the generous foredeck makes crewing a real pleasure.

Hulls will be available in kit form.

The ingenious interior layout plan is worth particular attention by all of those looking for a really comfortable cruising boat which seldom heels, but offers abundant accommodation for family and guests. The owner's Cabin forward is entirely private and boasts a 6 ft 2 in × 4 ft 9 in double berth, dressing table and hanging locker. There is also ample stowage space. In the port hull forward is a single private Cabin with a 6 ft 2 in × 2 ft 3 in bunk with the same generous locker space for clothes and gear. Amidships in the port hull, the Galley is equipped with a cooker with twin burners, grill and oven, a sink and draining board and plenty of working space into which a cold box can be fitted.

The Saloon is one of the special features of the craft and has a distinctive seating plan, normally associated with very large yachts. The table is removable and lowers to form a large double berth when more than five are to be accommodated. Another single berth aft of the galley is tucked very neatly in its own separate Cabin. The seventh berth is situated amidships in the starboard hull and is also 6 ft 2 in × 2 ft 3 in. Ample hanging and locker space is close at hand. A standard chart table is fitted over the end of this bunk, with chart stowage below.



CATALAC 28

A separate compartment houses the flush W.C. and wash hand basin. There are also facilities for fitting a shower.

The novel Cockpit layout provides the helmsman with full protection in all weathers, as the 'Wheelhouse' can be completely covered by a pram hood type dodger. The position of the wheel enables the crew to handle the sheets without getting in the helmsman's way. The Cockpit is surrounded by excellent bench seat lockers and special attention has been paid to the siting of the fuel lockers.

HIRONDELLE

LOA	22 ft 8 in	LWL	20 ft 0 in
Draft	1 ft 3 in	With C.B.	4 ft 0 in
Beam	10 ft 0 in	Sail Area	250 sq ft
Genoa 150%	120 sq ft	Displacement	2,300 lbs

An extremely pretty catamaran moulded by Robert Ives of Christchurch and marketed by B.C.A. Marine Development and Pennington Yachts at 10 Stem Lane, New Milton, Hants. The complete boat costs in the region of £2,645 according to requirements but kits are available in limited numbers as follows:

Supplying one *HIRONDELLE* with hulls and bridgedeck bonded together. Fitted with teak rubber strake and toe rails. Floor bearers bonded in. Hull centreboard cases bonded in and sealed. Perspex windows fitted. Ply bulkheads bonded into position. Ply floors bonded in forward self draining lockers and after lockers. Sliding hatches fitted to coachroof. Mainsheet traveller complete with slide fitted. Sink Unit fitted together with water carrier moulds. Washboard keeps supplied. All stainless steel stem head fittings and chain plates fitted. Pulpit fitted. All chain plates fitted. Interior stanchions fitted. Exterior stanchion bases fitted.

£1,395 0s. 0d. ex yard New Milton

Mast and boom £165 0s. 0d.

Rudder boxes complete with blades and centre boards, not varnished
£93 0s. 0d.

Standard and running rigging
£50 0s. 0d.

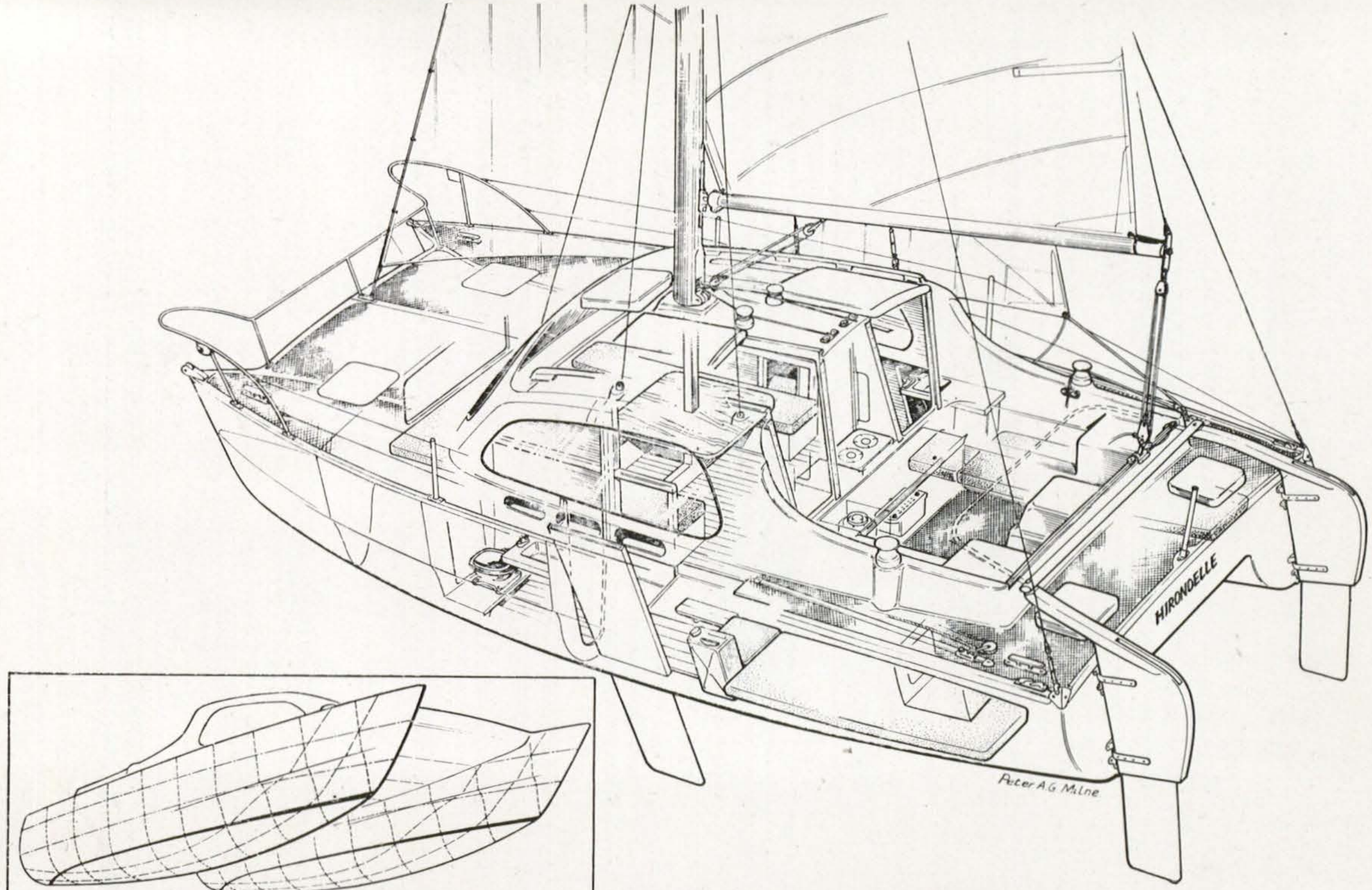
Set of internal furniture cut to size but not varnished or fitted
£85 0s. 0d.

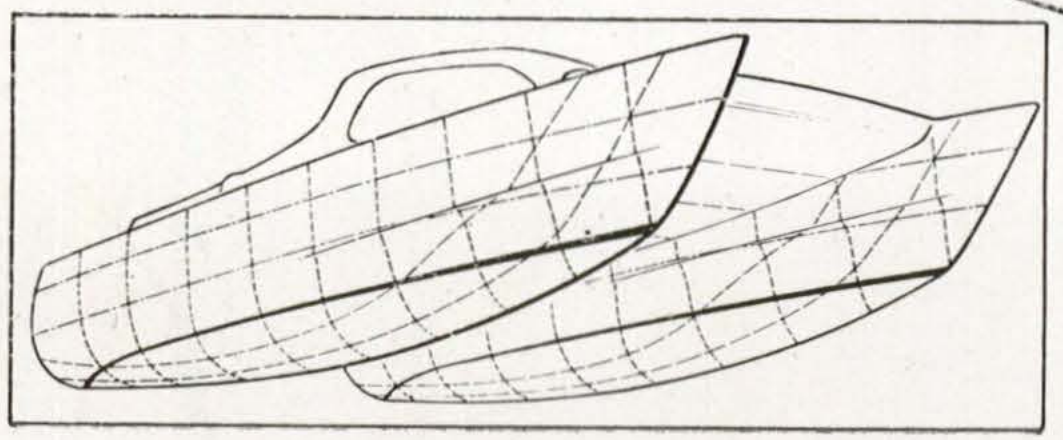
Set of internal cushions Standard—dark blue
£70 0s. 0d.

Full set of drawings supplied for the internal furniture.
All prices are ex yard New Milton.

HIRONDELLE

HIRONDELLE 5 BERTH CRUISING CATAMARAN





SEA BIRD Flight to Hawaii

by Hugo A. Myers
(by courtesy Editor Multihull International)

A new *MANU KAI* (Sea Bird) is in the Pacific, and she is perhaps closer to the old Polynesian concept of hulls joined by flexible members than many of the current ocean racing catamarans. However, aluminium, titanium, stainless steel, fibreglass, marine plywood, mathematical hull shapes, tank tests, and rotating mast make her one of fastest of ocean racers.

Actually, *SEA BIRD*, although incorporating many advanced concepts, is only competitive with international developments. She is very much like the English *MIRROR CAT* designed by Macalpine-Downie, with the aluminium cross members and the accommodations in each hull. She also has a rotating mast—nothing new to smaller catamarans—flush decks and retractable rudders, nothing new to the famous 73 ft *ONDINE, BLACKFIN,* or Dick Newick's elegant design *CHEERS* that was the first multihull to finish in the Single Handed Trans Atlantic Race. Compared to the 2,500 lb *CHEERS*, the 5,900 lb *SEA BIRD* is an ocean liner.

As far as the Multihull Honolulu Race was concerned, we did not object to the committee's decision that the boat was not ready for the race. Their deadline was about three weeks before the race, and we were still building and modifying everything. Like *MIRROR CAT* in the Round Britain Race, we were building the morning of the race.

Therefore, we did not really 'race' to Honolulu, in the sense that we did not push the boat, knowing full well her newness and our own inexperience with her. We stayed a mile away from the starting line and more or less followed the fleet over to Catalina. Then James Arness' 58 ft *SEASMOKE* and *SEA BIRD* left the rest of the fleet 'sail-down' on the horizon by nightfall. We were nowhere near the rest of the yachts during the whole race.

We had given the boat a few severe but short tests in strong winds and rough water prior to the race, of course. One time, outside Santa Rosa Island off the California coast, where the winds and waves sweep in from Japan, we experienced 40 to 50 knot winds. We dropped the jib, and under reefed main only we pinned the 20 knot electric speedometer for over an hour. We subsequently added a 30 knot version but did not see anything over 20 knots the whole race, since it was a light wind year.

To keep *SEA BIRD* well within her known limits, we dropped the jib and reefed the main the first two nights, but held well to windward, whereas the other Catamarans kept up full main and genoa and fell off away from the high pressure area which hangs over the central Pacific in the summertime. My reason for doing this was that we didn't want to take any chances with structural failures, which happened in the 1964 race, when two of the three catamarans had to return after the first night, one under tow. Also, if it turned out to be a heavy wind race, I wanted to be in the lighter winds and practically dead upwind from Hawaii, so that we could make it relatively easily in case of trouble. Thus, right off the bat, we took two measures that cost us many hours: reefing down the first two nights, and staying in the lighter wind high pressure area. In fact, although one catamaran broke a mast,

Hugo Myers' *SEA BIRD* on her way to Hawaii

and the trimaran a backstay, and others were blowing out sails, we had no rigging problems.

For practically the whole race we were a couple of hundred miles ahead of the rest of the fleet, and one to two hundred miles north of *SEASMOKE.* The boat was wet going to windward the first few days, mainly because the hatches leaked under the fire hose type action they were getting, and our foul weather gear was inadequate. Otherwise, the trip was physically delightful. The fine entries and exits gave a very smooth ride; the working of the hulls with respect to each other through the torsion bar action of the cross members seemed to absorb the rough water shocks; and of course there was no wing pounding, since there is no fixed wing.

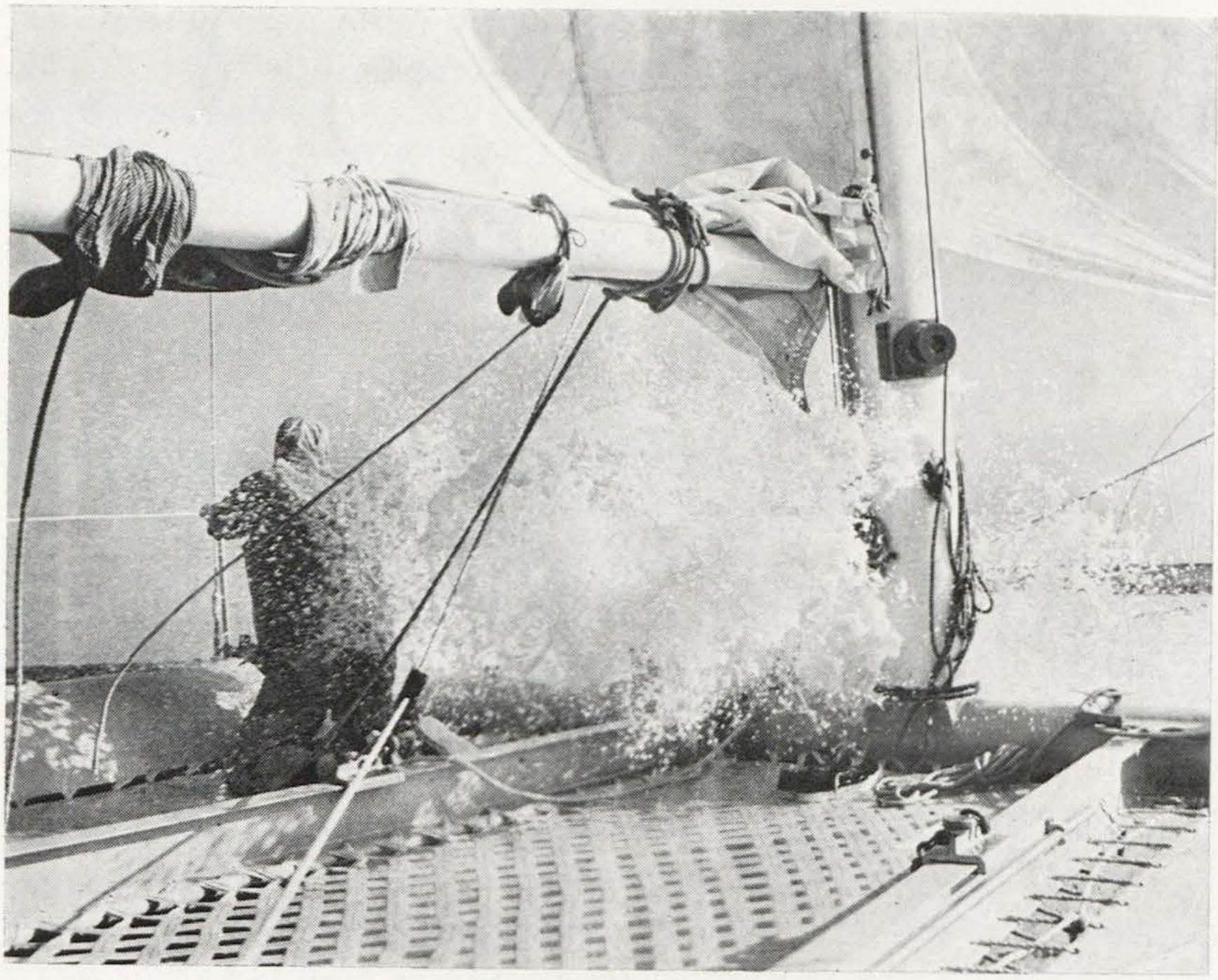
We were naturally excited and concerned about the great adventure of taking a new development across the ocean. It was the first overnight race for the boat and two of the crew. Nevertheless this crew had plenty of experience to back its judgement.

Bob Baker is in his forties, has been sailing and racing all his life, and is a National Pacific Catamaran Champion. Of course, he was by far our best

helmsman. Bob Fincher who is the foreman at Jud Grant's Trimaran Design Centre, where the hulls were built, had sailed first to Honolulu on a schooner (eighteen days) and then on Ed Horstman's 40 ft *TRI-STAR* in the 1966 Multihull Trans-Pac. He produced great meals with limited facilities and is a strong and dedicated all-round sailor. Just into his thirties, he was the youngest member aboard, Bjorn Hallin, just into his fifties, raced meter boats in Denmark before WW 11 is a master experimental machinist, and has been around the world twice as a machinist on ships. He helped design and then built almost all the metal-work, especially the titanium tangs, bridle, and masthead. He can do anything on a yacht, and was our damage control officer. Dr. John Novak is an experimental physicist, has raced in major local races, was President of the Los Angeles section of the Amateur Yacht Research Society, and has taught Navigation courses. He is a co-owner, and he served as assistant navigator and helmsman. Bob Hanel is an old friend and co-owner. The least experienced of the crew, he made up for it by his heart and drive. He served as helmsman, deck hand, and photographer.

Thus the average age of the crew was around forty, and we represented a very broad range of sailing experience. Just after the committee's decision was relayed to us we held a meeting of our own and voted on whether or not to sail to Hawaii to check out the boat and ourselves. The vote was five to one; I voted against on the grounds that neither the crew nor the boat were sufficiently prepared and that incidentally we were bound to irritate some ORCA members. However, I chose not to try to exercise a veto, because everybody had put in a terrific amount of time and money. The overwhelming majority opinion was that we had built the boat for the Honolulu trip, it would have to be tested sooner or later, and the race was now. Everyone agreed to pitch in and work full bore to get the boat ready. Therefore, one might say that the crew unduly jeopardised my life, rather than the other way around. Or, in a larger sense, since I had promoted the whole venture, I was really responsible. The truth is that we were all big boys—plenty of multihull experience, mature, married, with families well along and provided for, and we all enthusiastically embraced the challenge of testing ourselves and our concepts in the open ocean. Therefore, it was really a joint venture in which the risks were quite well evaluated and prepared for.

Soon we were sailing along in the very light winds of the high pressure area, but with confused and lumpy seas. On rare occasion there would be a squall, but according to Bob Fincher, there were none of the steady trade winds that are normal for the crossing. Then Bob Baker noticed that the steering was significantly different, and upon checking found that the port rudder had sheared off completely! Nevertheless, the boat continued to sail well, only requiring more excursion of the helm. This incident separated the racing, driving enthusiasts from the rest of the crew. Bob Baker, Bob Hanel and Bob Fincher feared that I would become 'too conservative' and slow the boat down too much, and so they did not tell me, John, or Bjorn about the missing rudder for a day or so. We had all heard a bang on the hull, but thought we had merely hit a log.



SEA BIRD: life on deck

The rudders and boards were somewhat new for an ocean going yacht. Instead of being formed out of laminated wood and fibreglass, a NACA 0012 (12 per cent chord) airfoil section mould was made by John and the core was of polyurethane foam. Then, the rudder tubes were only 1/16th in wall 2 in o.d. stainless steel, reinforced at the keel line with a solid rod. What actually happened was that the foam gave way, allowing the tube to work, and the tens of thousands of cycles caused the tube to first bend, then crack and shear off at the keel. When the rest of us did discover the nature of the accident, you can imagine there was considerable ill will. John took a benzedrine tablet, and Bjorn, our damage control officer, skipped supper and went to his bunk, I was very quiet for some time.

The previous night we had been sailing under spinnaker only by mutual agreement—from my conservatism, and from the Bobs' concern for the remaining rudder. We continued this way for the rest of the trip—a total of seven or eight hundred miles on one weak rudder post. Once Bjorn knew of the damage, he planned for an emergency sweep rudder, since a spare tiller cross bar had been brought along. Also, we were dead upwing from the Islands, so we were in no serious trouble in any case. However, our speed dropped by 20 per cent of so, just keeping the pace of the rest of the fleet, but losing *SEASMOKE* day by day. In summary, we believe that these events show that we were properly conservative in the first crossing, refusing to race the boat hard, and taking a position that would be in light winds and upwind from the destination in the event of trouble.

At this point it is appropriate to thank all my ORCA and non-ORCA

friends for all their warm support and help, Ken Murphy, owner of the famous *AIKANE* that holds the Ensenada and Honolulu multihull records, and Doc John Pursell, owner of *PATTY CAT II,* first-to-finish in the 1966 Honolulu Race, both lent a spinnaker and safety gear. That the sails were unsuited for *SEA BIRD* was of course not their fault; they were infinitely better than nothing! Jay Johnson, owner of *GLASS SLIPPER* and President of ORCA passed along our position each day to his home office, so that our families could be kept informed. During the race, James Arness and Warren Seaman aboard *SEASMOKE* were great sports, communicating morning and night, Buddy Ebsen, famous T.V. actor and owner of first-on-corrected time *POLYNESIAN CONCEPT* gave us a thank-you wave as we passed to his lee near the start, to give him the clear air.

SEA BIRD—Inside a hull

In Honolulu, both the Waikiki and Honolulu Yacht Clubs and the Outrigger Canoe Club extended their welcome to us. The yacht and beach clubs in the island have a special 'Aloha' for the seafarers that come across, in honour of all the adventurers and explorers that populated the islands over the centuries. Lance Raventlow, famous auto racer and sportsman, and owner of the lovely 50 ft *MANU IWA* in the race, presented us with a beautiful native wooden bowl 'Pioneers Trophy', in honour of Woody Brown and all the others who have introduced and taken new multihull developments across the ocean. So, taking the modest criticism in context of the warm support and great satisfaction of this adventure, we feel more than adequately compensated. After all, we were the unofficial second across the finish line, behind the 58 ft *SEASMOKE.*

SEABIRD now has a fail-safe mechanical mast base rather than a welded one. New hatches have been fitted so that the crew does not have to take inadvertant showers. The solid titanium rudder shafts are, if anything, too strong. So we have all benefitted from our first trials and are in that state of pleasant exhaustion which occurs when a long held dream has actually culminated in an exciting and satisfying adventure.

CAN CATS PLANE?

by James Fox
(Reprinted from 'Boating')

When I was trying to sell *BLUE,* the first catamaran I had ever built, I mentioned to a prospective buyer that *BLUE* would plane down big waves when running with a 15-knot wind.

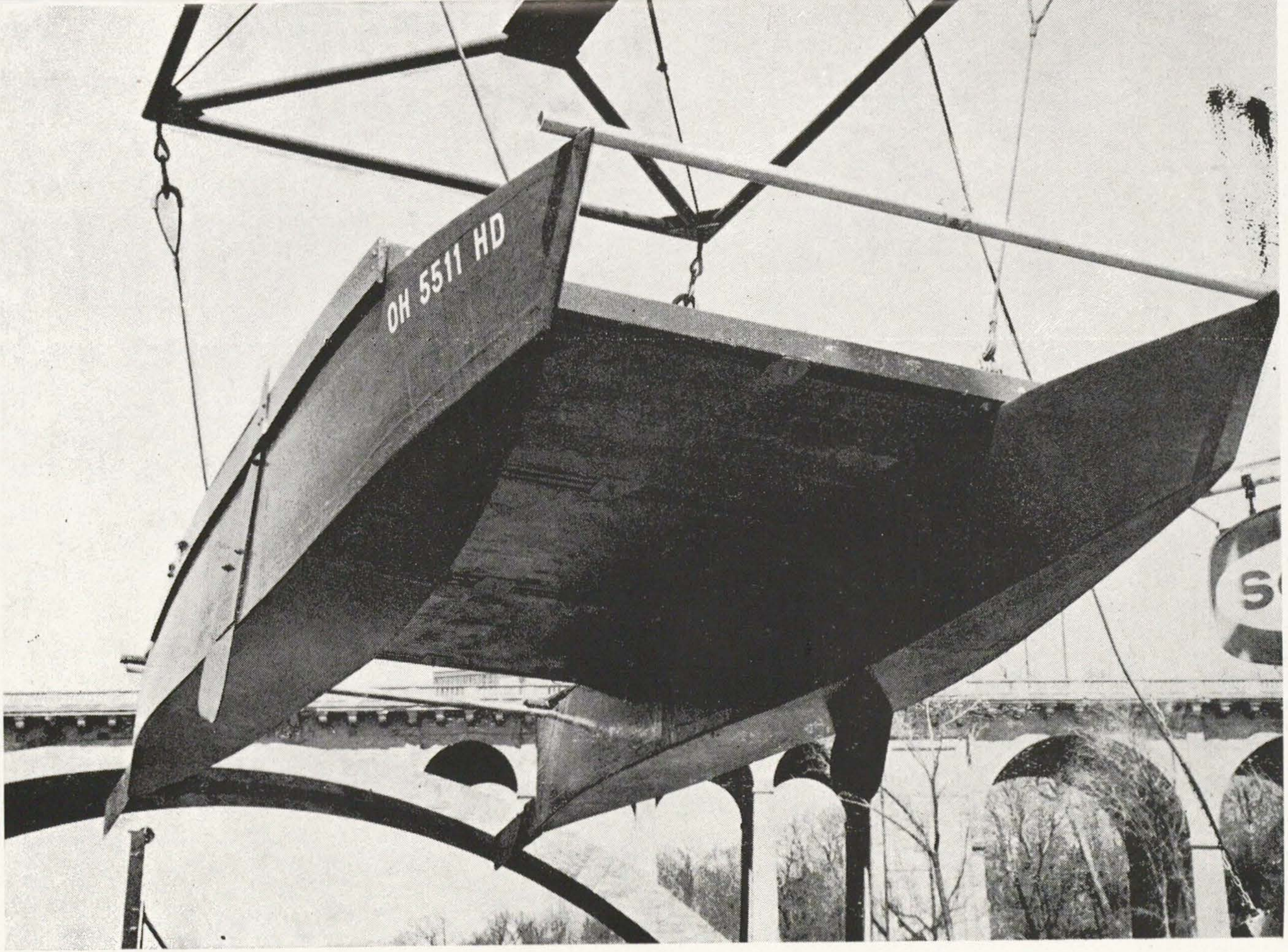
"Sounds like the euphoria of sailing", the man replied; "And a beer or two helps that euphoria", his companion added.

Their scepticism knocked down my next selling argument, namely, that I valued the qualities of the blue, flat-concave hulls so much, I had incorporated the principle in the hulls of my new catamaran, *AERIUS.* Later, as I sailed *AERIUS,* I daydreamed about confronting these two sailors with a quip that would blanket their wind: "If you were to take *AERIUS* on a reach before 15 knots, you'd think your beer was brandy!"

I'm not claiming that my new catamaran planes all the time. It will not plane to windward—yet. It hasn't planed running before the wind because its lateen sail seems least effective in that attitude. But when the wind rises above 15 knots and the sail is eased for a reach, she lifts on her thin hulls, and her speed surpasses that of the wind.

AERIUS is different from other catamarans only in the flat bottoms of her asymmetrical hulls. Flat at the bows, the bottom sections begin to change about one-third of her 17 foot length to a concave surface. The flat-concave bottoms will pound going to windward, especially when waves are up and wind is lowering, but they also prevent the boat from diving when under pressure to windward or on a reach.

Driving the hulls is 150 sq ft of Dacron on a 24 ft Sitka spruce yard. This



James Fox's planing Catamaran

spar is suspended just belwo mid-point from an A-frame made from 2 in square spruce, 12 ft in length. The sail, 14 ft along the foot, balances quite well, giving the boat a slight weather helm. When taking planing factors into consideration, however, one might find *AERIUS* weak in sail area compared to weight. Her hulls, at 130 lb each, could possible be lightened if this type of catamaran were to be developed further. Also, she could be further lightened by eliminating some of the weight from her bridging and deck. Like her forerunner, *BLUE, AERIUS* is rugged but slightly on the heavy side for a planing cat.

It was with *BLUE* that serendipity led to the discovery that flat-concave hulls could make a catamaran plane. She was built with V-bottoms and, as anyone knows who has sailed catamarans with round or V-bottoms, they tend to dive or even submarine when under pressure from strong winds. When running with the wind, this type has been known to dig the bows in and go stern over bow.

While *BLUE* had her V-hulls, she never turned end over end, but on a reach would sometimes run her bows under and suddenly stop. She capsized during a northwest blow in the Fishing Islands of Lake Huron and after turning over in five-foot waves, she grounded her mast in 18 ft of water. Washed onto a rocky shore, the starboard hull was smashed, as receding waters left her on a rocky beach. It was as a result of the repair of the damaged hull that she was made to plane.

The damage made it necessary to chop about a foot from the starboard hull in order to make the repair economically feasible. Waterproof $\frac{1}{4}$ in plywood was used to cover the bottom, and a concave surface was chosen to make the plywood stronger on the long dimension. The bottom was flat at the bow and gradually made concave to the extent of 2 in at the centre of a 15 in arc. The other hull was rebuilt to the same dimensions.

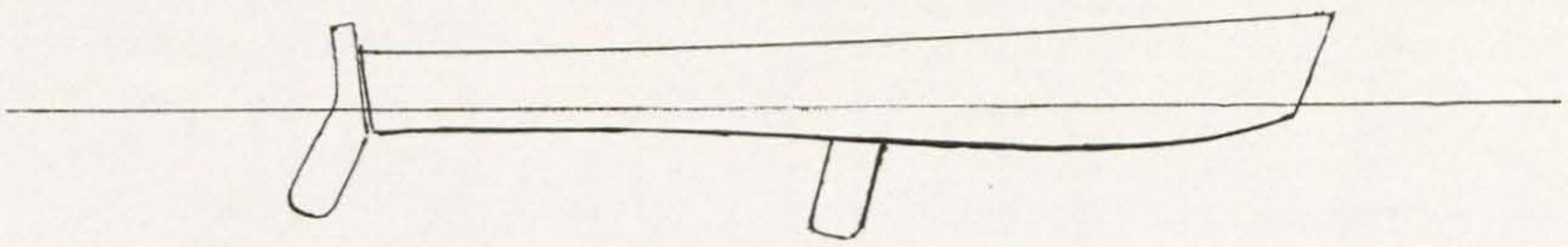
Improvement in performance was noticeable immediately. The boat now refused to dive no matter how heavy the pressure of the wind. There was less tendency to heel, no tendency to capsize, even in winds of 20 knots. And when the waves built up and the wind held, she would plane down the waves like a surfboard.

Round or V-bottom catamaran sailors might be held in contempt if they made such a claim, because, in my opinion, these cats don't truly plane. In certain winds there might be a lifting effect, reducing wetted surface of the hulls, but for the most part they are skimming through the water, not on top of it. I believe a planing catamaran must have flat bottoms to get a true planing effect.

I built *AERIUS* to plane, but she was a disappointment when I first started sailing her. She sailed quite well but wouldn't get up on a plane. "There must be other factors in planing," I thought, "or else this cat is too fat, and her bridging too heavy".

Then one day in a stiff breeze I lost my hat trying to tack out of our bay into the waters around the Fishing Islands. As I watched the green straw sink into the water, my attention was diverted, and I unconsciously loosened my grip on the mainsheet. *AERIUS* swung with waves abeam, and suddenly a puff took hold. Wind was over the port side, but the lee hull was lifting

AERIUS TYPE HULL



NOTE FLAT CONCAVE BOTTOM, POINTED STERN AND LEEBOARDS.

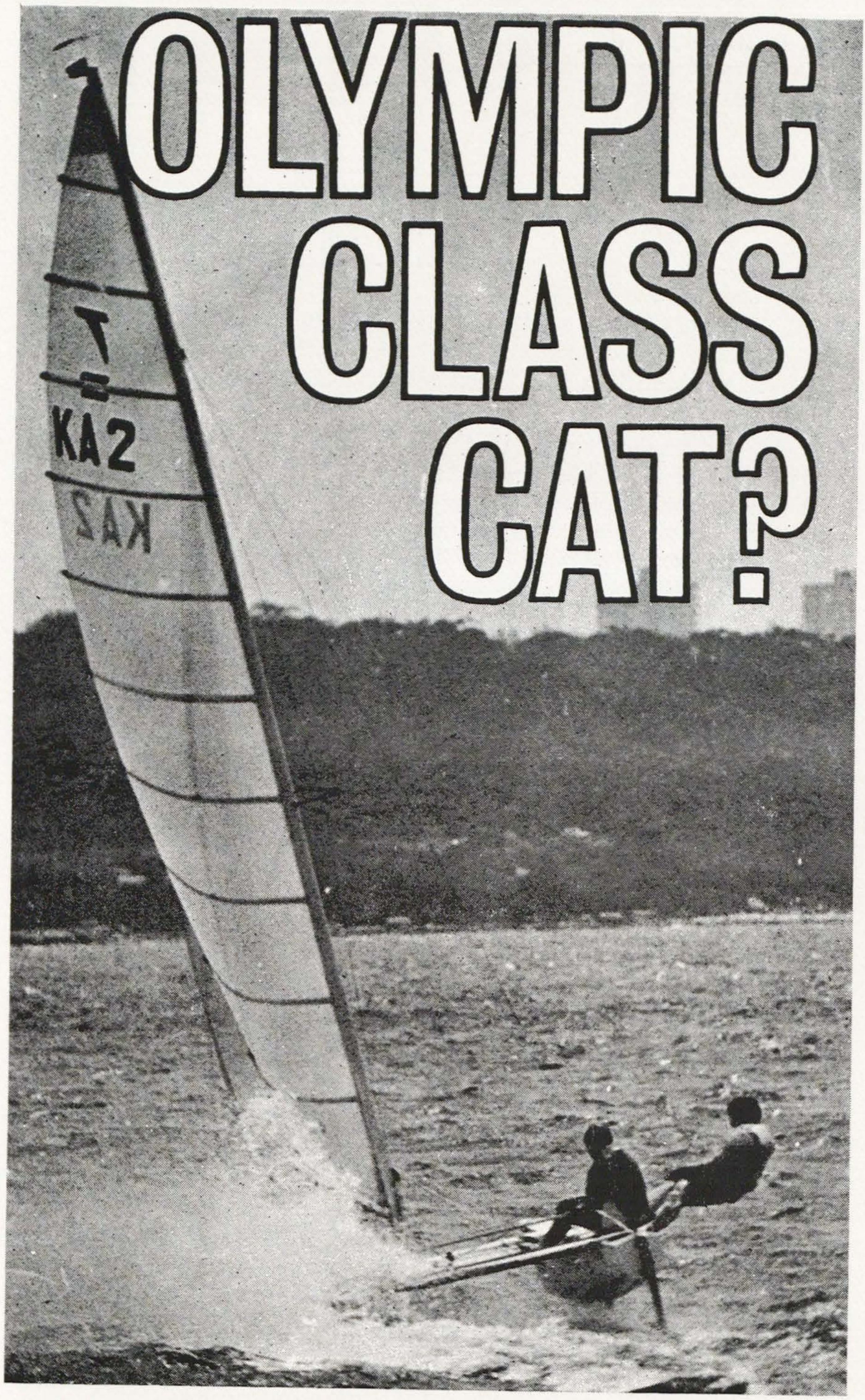
visibly. The red and white sail was bent around the A-frame in a very sloppy fashion, but some kind of barrier had been broken. The loose sail had formed an airfoil with tremendous forward lift. *AERIUS* skipped over and down waves with absolutely none of the usual motions or attitudes of sailing. She was flat—her bows were high. There was spray but no bow waves. In some new alliance with wind and waves she rushed across the water. Trying not to let the 'euphoria of sailing' take hold, I estimated the speed of the boat at about 16 to 20 knots. It may have been more. And it was not a fluke, because I did it over and over again, with the sail purposely loosened, and experienced the same effect.

In subsequent sails on other days, I learned more about *AERIUS* and her ability to plane. I identified a fourth planing factor adding to those of hull design, weight, and sail area. This factor, has to do with the airfoil of the sail and its angle of attack. If too large an angle is presented, the lee hull is pushed down. All cats plane their weather hulls a great deal of the time, but the other hull runs deeply. For this reason, I don't believe a cat, even one with flat bottoms, will truly plane to windward. *AERIUS* has given some indication that she was trying to get on top, when beating upwind, but this was in special conditions with an off-shore breeze briskly raising a light chop. On a reach, however, with eased sail, there is little downward pressure on the lee hull, and the flat bottom lifts it to the top of the water. As both hulls plane, the boat picks up speed much like an iceboat. Where an iceboat can sail three to four times the speed of the wind, I estimate that *AERIUS* will plane at speeds of 1.3 to 1.5 times the speed of the wind.

Of the four planing factors I 'discovered' for myself, the effect of the sail as an airfoil is the most baffing. It is obviously related to the pressure which causes heeling and pushes the lee hull of a catamaran down into the water.

As catamarans are gradually improved in hull and sail plan to produce true planing characteristics, I believe that not only will they plane, but they will be the first sailboats to reach speeds in excess of 50 mph. Like the iceboat which was the first vehicle to reach 100 mph and 12-footers with diminutive sail plans are regularly clocked at over 60 mph—I think planing cats will be able to demonstrate speeds well in excess of the velocity of the winds in which they sail.

OLYMPIC CLASS CAT?



OLYMPIC CLASS CAT?

Report by Nick Creech
(By courtesy Editor Modern Boating, Australia)

When Rodney March named his pet creation *TORNADO,* he wasn't kidding —she's one hell of a rampaging cat and there are precious few sailing boats around that could get close enough to tie a can to this particular tail.

To be perfectly frank, this was the first time I'd ever sailed a cat—prejudice —and it was an introduction, that considerably opened my eyes. Following the IYRU trials held in 1967 to select a new Internation B Class cat, where the *TORNADO* ruled supreme, winning five out of the eight selection races, the class has been growing at a steady rate. As of last May there were 30 *Tornados* registered in Australia, with 180 throughout the world, and it is now predicted that in 1970 there will be 600.

So when Mark Hookham, official IYRU builder of the class, offered us a sail on the first of his fibreglass jobs, we jumped at the chance. A quick once-over the boat, and my first question was ". . . and how much does this little lot cost?" Comparing the *Tornado* to the average small sailing boat is like comparing an Aston Martin to a 'Volksie'. She has that indefinable look of class, accentuated by her lean hulls, very tall aspect ratio rig and high-quality, expensive fittings.

Price of $1,725 (Australia) shook me a bit, but, when you sit down and work it out, it's not nearly so bad as it sounds. This includes everything from sails to sales tax, and if you consider that a top-flight Dutchman is probably worth around $2,000 then the boat is really quite reasonable.

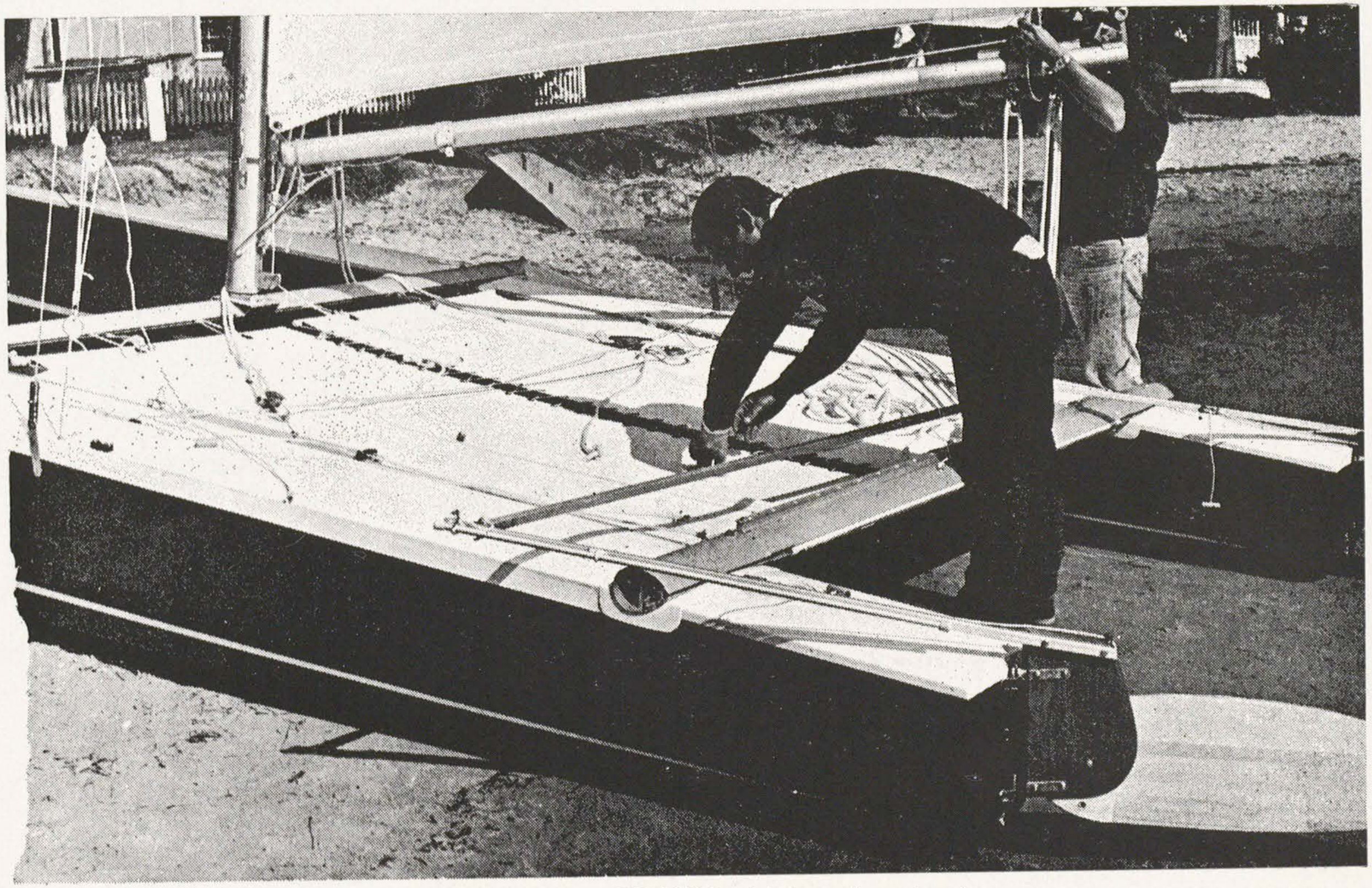
On the water, the *Tornado* bears out this Aston Martin of the Dinghy World tag. The power of the boat is incredible. Although, because of the plaguey weather in Sydney this winter, I wasn't able to sail in her anything over ten knots, performance was particularly impressive.

The average cat is just not worth sailing in light weather—but not so the *Tornado*. I'll swear we had her moving at close to seven knots on occasion, and even when the easterly faded right away until there was barely a breath, she still kept moving. In the puffs, her acceleration was outstanding and she'd carry her way for a much greater distance than any other small boat I've ever sailed. However, in anything below five knots, her pointing suffered rather badly. To keep her going I had to come a long way off the wind, but in a puff I was surprised at the way I could push her up and still keep way on.

Tacking is a cat's traditional weakness, and the *Tornado* is no exception. No matter what I did, I could not keep her moving through a tack, and stopped her dead each time. She came round easily enough and I never got caught in stays no matter how light the breeze, but I found that under five knots, and once through the eye of the wind, I had to pull away to virtually a broad reach before she'd start to move again. If I tried to hold her on anything like a close-winded course she would—because of her very small fin area—just make leeway.

For heavy-weather comments on the boat we turned to staffer Max Press,

Hookham-built *TORNADO*



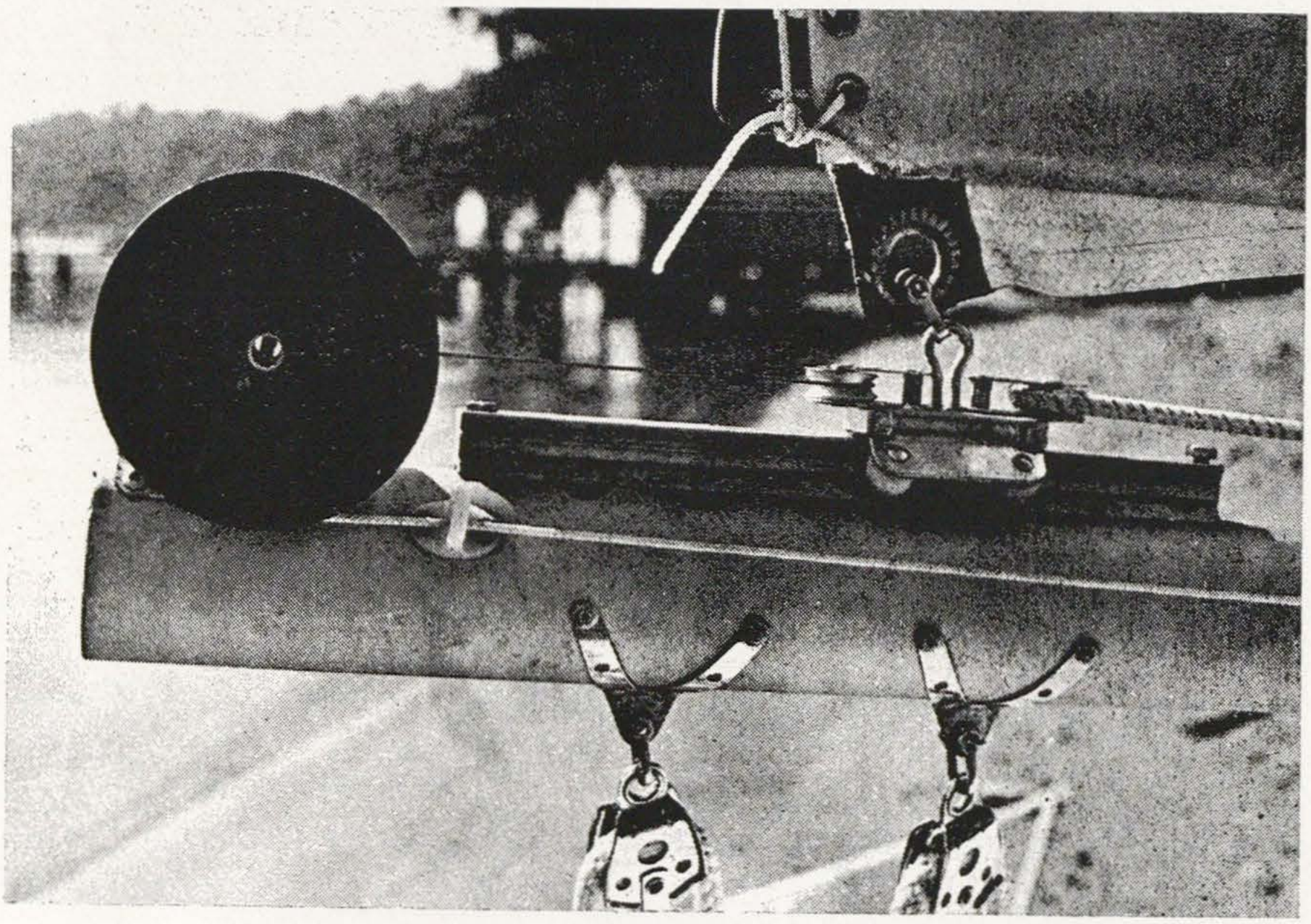
Hookam-built glass *TORNADO* with loose-footed main

who has beem among other things during his chequered career, National Quickcat champion.

Max Press comments— According to him "the *Tornado* is one of the most vice-free catamarans, with driving qualities that make it quite awe-inspiring to windward. Despite the high-aspect ratio of the rig, she should never get out of control, if the main is strapped down tight and the sail played on the traveller. The boat, like any cat, is capable of driving its bows below the surface, but with no forebeam to cause tripping, it can take green water as far aft as the main beam without serious loss of speed or danger of a capsize".

Tacking is relatively easy, with the sloop rig, but it is necessary to pick the right time, otherwise a wave can slap the weather bow back and cause a stall-out. "She is generally very responsive to the helm and accelerates very quickly, holding her way well between gusts. Reaching with the *Tornado* means pure unadulterated speed". From the point of view of design she is sophisticated and highly developed. The lines are based on Rodney March's C-Class *THUNDER II,* and the feature which caused most of the eyebrow-raising when she appeared on the scene was the lack of a forebeam. Critics said she'd never hold together, but she did, and dispensing with the beam was one of the major factors in eliminating the cat tendency to nose-dive.

The other factors in this near-perfect racing machine are the very fine hull entries, which though knifelike, have a lot of reserve buoyancy with a depth of about 26 in, and the keel-rocker, which is very marked. From the bow, the keel line drops about 2 in to the hull's maximum depth at the centre beam, and then rises 7 in to the stern. Wetted surface areas of the fins are: Centreboards 24 in × 22 in each and rudders 24 in × 10 in each



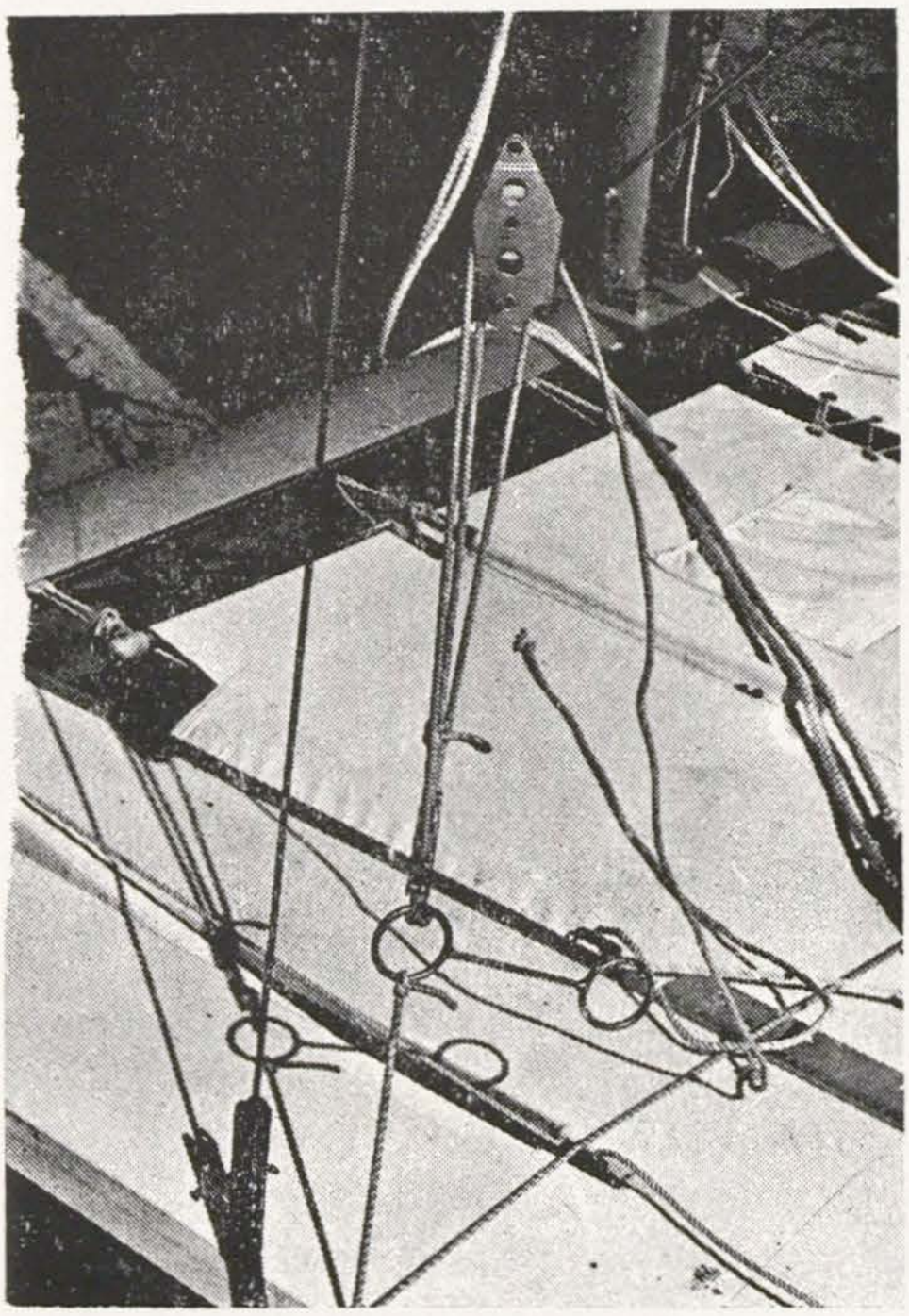
Drum winch, acting against shock cord, varies foot tension

With crew weight for'ard, the whole of the waterline length can be utilised when beating, and then on the reaches, by moving the weight right aft (the crew generally trapezes behind the skipper) the bows can be cocked up thus further cutting down the likelihood of a nose-dive, while avoiding the speed-cutting drag of spray deflectors. From the fine entries, the hulls fill out in section until the underwater shape is almost semi-circular at the stern. The decks have a slight reverse sheer and the hulls are symmetrical.

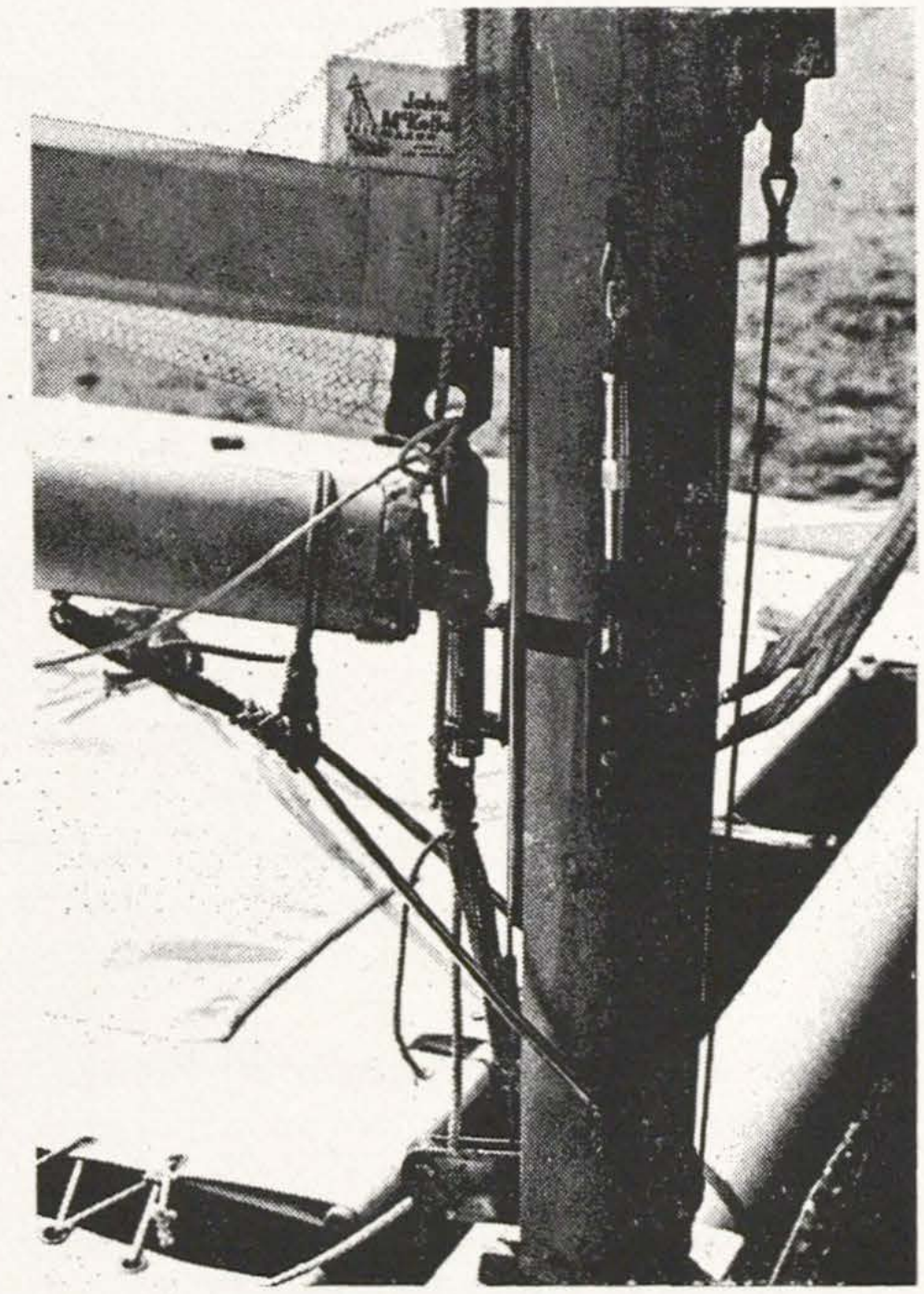
The fine balance between the tall rig and the small wetted-surface area of the fins is one of the boat's major assets. With the much smaller-than-usual counter leverage effect of the fins, the heeling amount is correspondingly less, so that the full power of the rig can be used in much heavier conditions which in turn means the boat goes faster and so doesn't need large fins anyway—except in really light airs. The plates, incidently, are of the folding type which are much more convenient to use than dagger boards. A nice touch, we thought, on the test boat was the way the centre-case slot rubbers had been inset into the hulls, thus cutting drag to a minimum.

The rig itself is basically simple, but at the same time there would be a lot to developing peak tune. The boat we tested had a loose-foot main set on a rotating mast, which is controlled by a simple lever arrangement. The main traveller runs the width of the boat and, because of this, there is no vang. Jib-block positions are controlled by a 'barber hauler'.

This alone gives you a fair bit to play around with—add Cunningham eyes to jib and main sail and you've got the lot. These, in fact, are the only two twitches that Mark doesn't put on his boat as standard.



Trapeze has length adjustment



Mast control lever (below boom) not yet fitted with control tackle

The staying plan is a simple three-point system, with the addition of one set of fixed diamonds, the spreaders for which are deliberately short (14½ in) so that they will not interfere with the jib as the mast rotates.

Construction. Construction of the hulls in ply is relatively simple and quite within the capabilities of an amateur, but not so the glass version. Basically, each 'glass hull has a skin of 2½ oz chop-strand mat. Then there is a 12 in-wide band of 16 oz woven roving passing around the hull at each beam, and the points of contact are further reinforced with a 10 oz lamination which extends for 2 ft either side of the beams.

The keel is braced with 16 oz woven roving and the whole hull is further stiffened with a complex of foam bulkheads and stringers which are epoxied into place. The final product has a good finish, and though there is a fair bit of flex in decks and topsides, the underwater sections are quite rigid.

Deck beams are made from mast sections and this allows quick breakdown of the boat, as the fore and aft ends of the trampoline are held in place by sail slides, while the beam edges are permanently attached—thus eliminating time-consuming lacing. The mast is an Austral section and has a cunningly hinged step which makes raising and lowering fairly simple. All alloy on the boat is anodised. The main beam is braced by a stainless-steel dolphin striker.

Mark makes both ply and 'glass hulls—the 'glass selling for $570 a pair plus tax, and the ply for $450 unpainted. For the complete boat the price is the same for either 'glass or wood.

However, there is some weight difference between the 'glass and wood hulls, the latter tipping the scales at 80-85 lb each unpainted, and the former 10 lb more. The boat was built with care and attention to detail, and when Mark says "sail away for $1,725", he means it. The boat is ready to race—and holy hellfire, what a racer!

CLASS C
HULL FORM AND CONSTRUCTION

by John Mazzotti
(By courtesy of the Editor, Yachts & Yachting)

C Class catamaran hulls present special problems to the designer and builder. Those familiar with the smaller catamarans will know that under certain sea conditions they can perform some alarming tricks. Scale these up and the antics of the larger, faster C Class boats can be visualised. There are three basic problems: sea worthiness, strength and weight. A fourth problem of course, is hull form, a point on which every designer has his own theories.

Sea worthiness and hull form

The basic requirement of a hull is that it should support the rig. During its development, the C Class cat has seen several basic hull shapes but one in particular has formed the basis of C cat thinking. I refer to the *Hellcat* design by Rod Macalpine-Downie. All the modifications of this design were based on a U section hull and have, in various forms, won all the International

Catamaran Challenge races over the years. *LADY HELMSMAN*, although not designed by Macalpine-Downie, is also of this type.

The U section design produces a buoyant hull with good manoeuvrability but in the light of recent developments does not appear to be too easily driven. The *Hellcat* profile is very handsome with a noticeable bow overhang and raked transom with slight reverse sheer. The buoyancy is well distributed, the bow sections being quite full above the waterline. In the case of *LADY H* a knuckle has been built in to increase the bow buoyancy further and to diminish the possibility of burying the bow.

Probably the most successful overseas challengers in this class have been Charlie Cunningham's Australian *Quest* designs. These are based on a slab sided U section. The hull buoyancy is considerably less than the *Hellcat* type and the hull sinks deeper in the water when the boat lifts one hull. The bow sections are slimmer and the boats have all been canoe sterned and plum stemmed with considerable rocker amidships and straight sheers.

The American *SEALION*, which raced here in 1964, had a slab sided hull form with a flat bottom and rounded bilges. She had chicken breasted bow sections, again with considerable rocker.

Recently, another hull form appeared on the scene, this was *THUNDER II* designed by Rodney March and Peter Shaw. This hull is the slimmest C Class design to date and has a rounded V hull form with very fine bows and straight sheer. Most of her hull rocker is about two thirds aft. This hull has proved, to my mind, to be the most easily driven and seaworthy design to date.

A catamaran, driven hard in rough water, will eventually force its lee bow into a wave. The various hull forms described above react to the situation in different ways.

a. *Hellcat* type. Buoyant bow, rapid increase in buoyancy slows boat as bow is depressed and causes boat to trip over lee bow in severe conditions.
b. *Quest* type. Deep bow again has considerable buoyancy as hull is depressed, similar ultimate situation to (a).
c. Very fine bow section but with comparatively wide decks. This type depresses the bow easily then takes water on deck with similar results to (a) and (b).
d. Fine, deep bow and very narrow deck depresses easily but because of narrow sections does not offer much forward resistance. Bow continues under water and emerges on the other side of the wave with a minimum reduction in speed and little chance of a trip-up.

The other factors affecting seaworthiness are position and height of the centre of effort and centre of lateral resistance and also positioning of main weight centres.

In order to reduce pitching it is important to keep weight out of the ends of the boat and also to keep the weight of the rig as low as possible. To this end, masts have been moved steadily aft to the extent that many are now stepped nearly amidships. In the case of una rig boats this means that the CE is well aft of amidships and the CLR and in consequence the centreboards are well aft. In extreme cases, (fig. e), this means that the lever arm L between the rudder and CLR is so reduced as to make the boat difficult to

Fig 'a' Hellcat Type

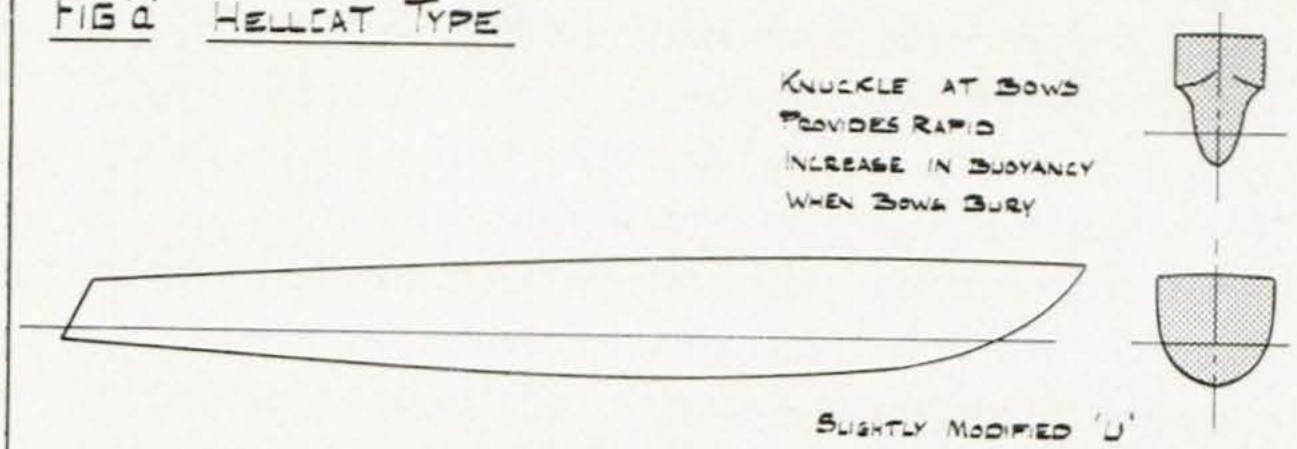


Fig 'b' Quest Type

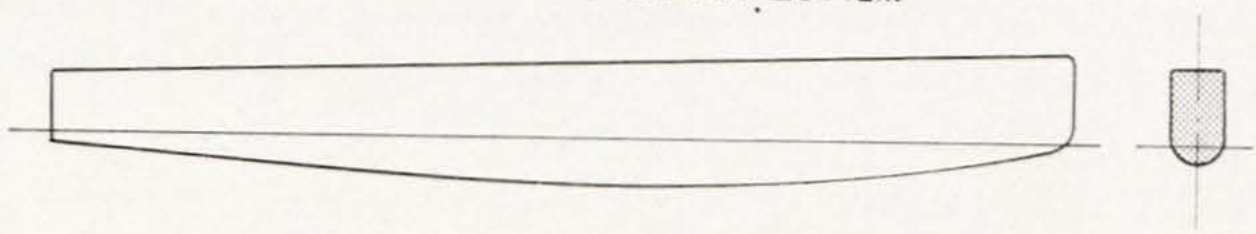


Fig 'c' Sealion Type

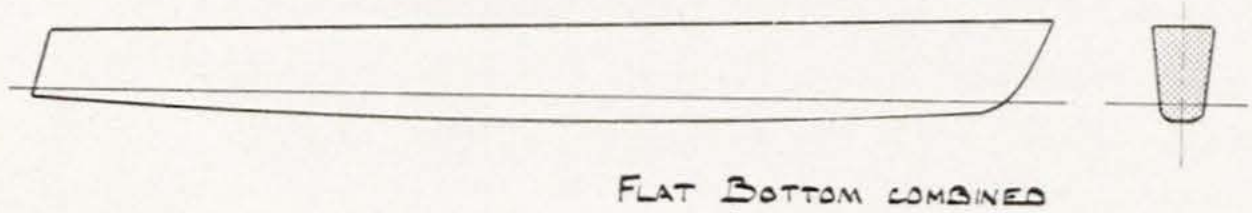


Fig 'd' Thunder Type

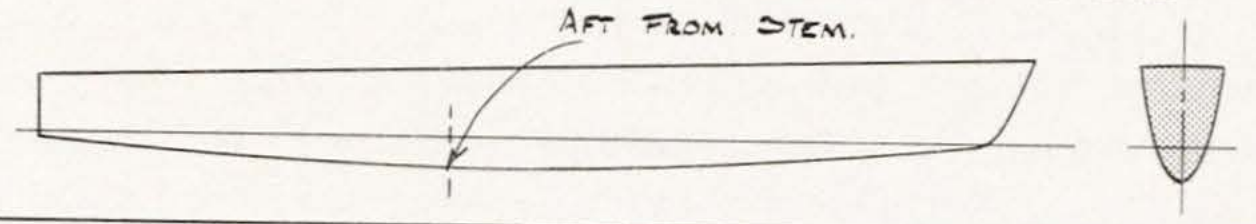
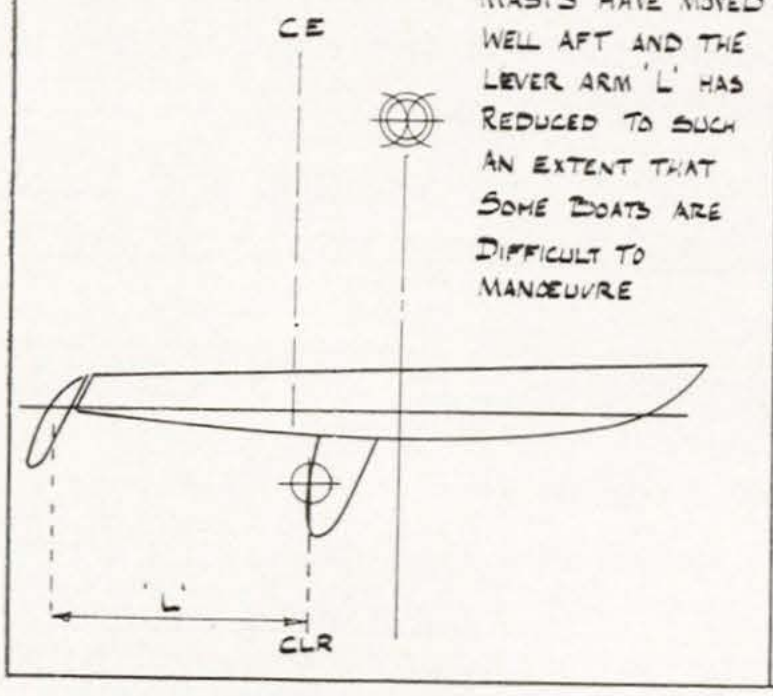


Fig 'e'



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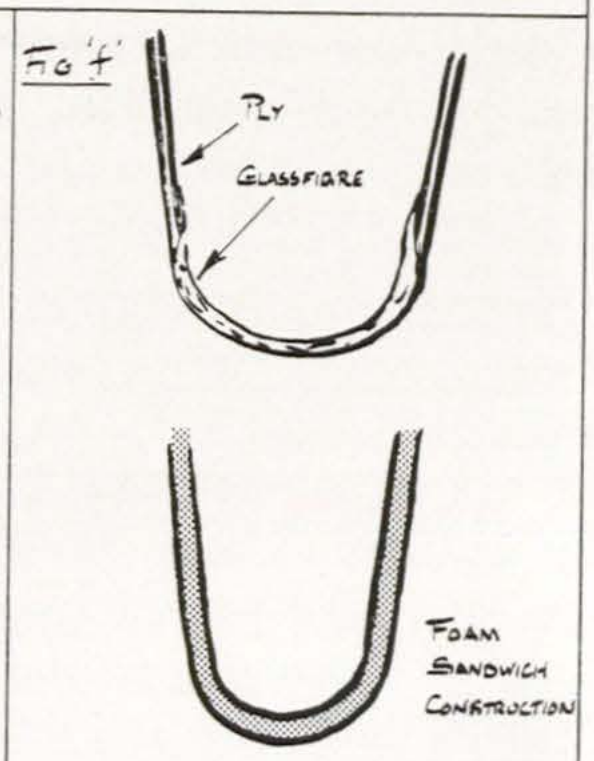


manoeuvre. This situation occurred in *THUNDER II* in her first season and during the winter of 1965/66 her mast rake was reduced and her centre-board boxes moved forward approximately 2 in. Her performance was greatly improved.

Hull construction is just as varied as hull form. There are three basic methods: cold moulded plywood, glass-fibre construction and developed plywood. Some of the more unusual methods are described below.

Sheet ply/glassfibre composite

The *Quest* series of boats are built by this method. The sides of the hulls are formed from flat sheets of 3/16 in (4 mm) ply and the round bilges are moulded in glassfibre. The ply is placed in the mould first and the bottom section is then moulded in place. This produces a strong, light hull but requires a mould. The method is suitable for amateur construction.

Glassfibre/foam plastic sandwich

This method was used on *GAMECOCK*, the American boat which came to Britain in 1966. This is a rather costly form as either an internal or external mould has to be constructed. The internal mould is cheaper, the external gives a better finish.

The internal mould method was used to build *TORIA*, winner of the first round Britain race and also *SIR THOMAS LIPTON*, winner of last year's single-handed trans-Atlantic race. PVC foam sheets which are thermoplastic are formed over the male mould and then covered externally with glassfibre. The hull is then removed from the mould and an internal skin laid up. This system too is suitable for amateurs.

The external mould method requires a well finished female mould. The outer skin is laid up, the foam sheets laid inside and a final inner skin applied. This is not really suitable for amateurs owing to the difficulty and expense of making the female mould.

The most important point to be remembered is maximum strength with minimum weight. This requires careful planning right from the start of designing and building. Modern materials such as epoxy resins reinforced with glassfibre, end grain balsa sandwich between glassfibre skins and foam plastics (PVC polyurethane and polystyrene) must be used in conjunction with the better known methods of plywood and solid timber if success is to be found.

DANES DAY

DANES DAY

by Jack Knights
(By courtesy of Editor, Yachts & Yachting)

They say that cats have nine lives. Eight times previously British C Class cats have won the Little America's Cup, right from the very start of it when John Fisk first flung down the gauntlet to the Americans saying "Name your cat and we will come over with *HELLCAT* and beat you" (which he and *HELLCAT*'s designer Roderick Macalpine-Downie did in 1961).

Then, this September, at Thorpe Bay on the muddy banked mud coloured Thames Estuary, came the ninth time, when Britain had to answer a challenge from Denmark and the Skovshoved Sailing Club in the form of Gert Frederiksen and Leif Wagner-Smitt sailing their *OPUS III.* At first it looked as if perhaps British bred cats are special, with ten lives or more, for the nominated defender, *OCELOT* sailed by her designer builder Reg White and crewed by his brother-in-law John Osborn, won the first race.

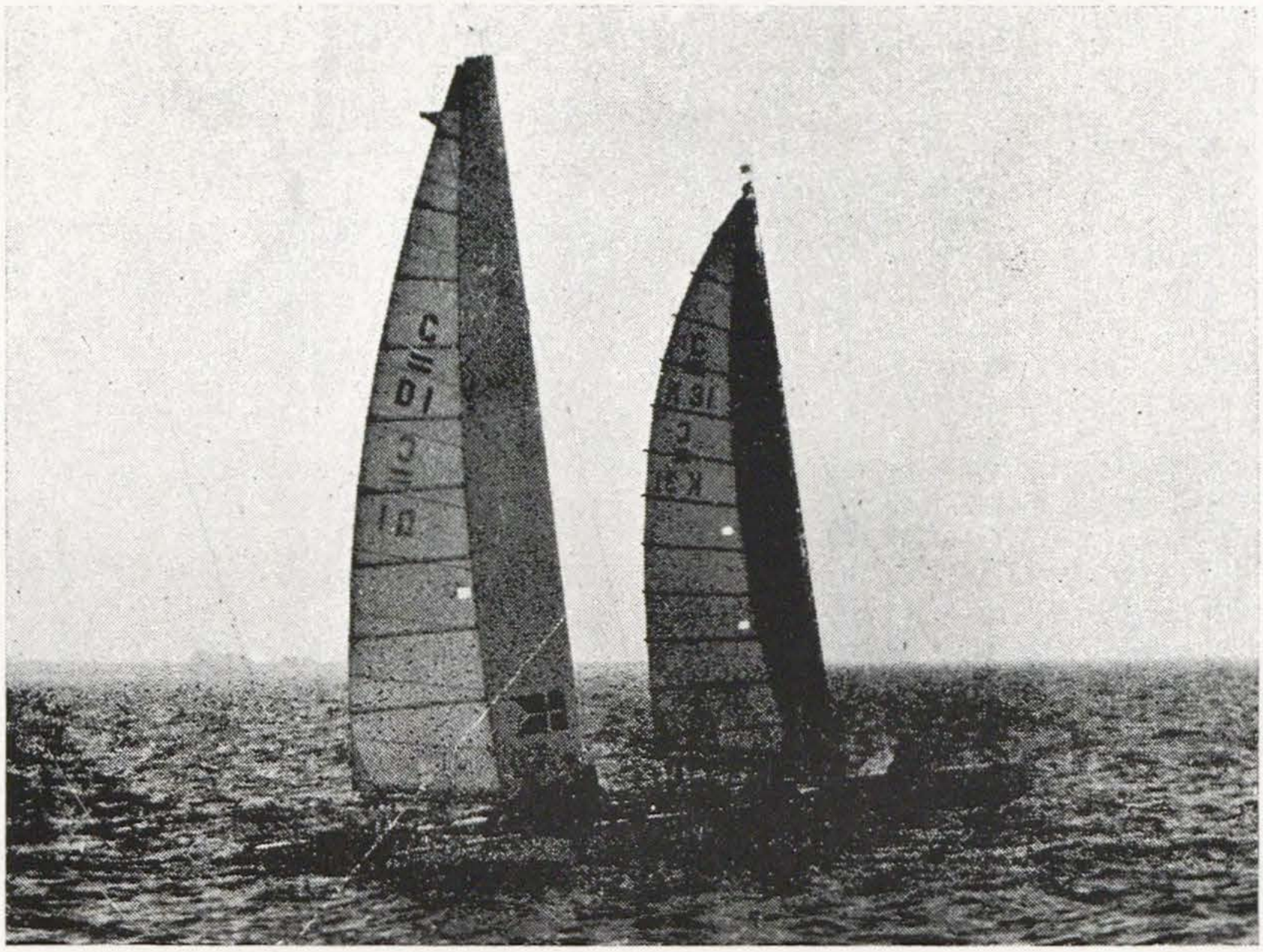
But it was not to be, the series became longer and longer. Denmark won the second to get even, then followed a lay day—at the British request. Then followed a frustrated day with the race having to be abandoned for lack of wind when Britain was again leading. This was followed by two consecutive British wins and once again the Little America's cup began to look as peculiarly British as the America's Cup is American. Britain now needed only one more win to win the best of seven series.

That one more win never came. Not unnaturally following two defeats, it was Denmark's turn to ask for a lay day. This was followed by a Danish victory to make the series 2-3 and the inevitable British request for a lay day. The crews actually got four lay days for the requested one was followed by three enforced ones—enforced by the late hour of high tide at Thorpe Bay, preventing racing during daylight hours. When racing recommenced after the long break Denmark won to tie the series. Britain requested its lay day and then finally, fifteen days after the series had started on September 10th, came the seventh and final race which Denmark won easily—easily so far as the other boat was concerned but only with the greatest difficulty vis-a-vis the four hour time limit. The Danish catamaran finally crept across the finish eight minutes short of that limit.

Everybody was finally able to breathe a convulsive, concerted sigh of relief for justice to the challengers had finally been done. Very early on it became apparent that in *OPUS III* they had a boat which in any wind above 8 miles per hour, was superior to the British defender *OCELOT.* But in those far off early days at the start of the series Britain's wily skipper Reg White showed more than once that he could outfox his opposite number Gert Frederiksen.

Frederiksen proved a good learner. He was also blessed with plenty of time in which to learn. By the time the final race came around he was able to outsail *OCELOT* in a wind which was never more than 10 miles per hour and usually less than half that velocity.

Had the series been held in typical British weather, the Danish victory



OPUS III and *OCELOT*. Note different mast profiles

would have come much sooner for if one boat is superior to another in any wind above 8 mph, that boat should win in British winds, five days out of six, but it so happened that this late season series coincided, as has happened in the past, with the arrival of autumn in the mouth of the Thames. This is a very special occasion, bringing fog and mist to match the colour of the mud banks and the tile roofs of the houses lining the shore. The fog suffocates the wind, throttles it to death.

In all those fifteen days, only two races, the second and the fifth were sailed in anything like a fresh breeze and not once were conditions in any sense frantic or even exhilarating. But at least several of the early races were far closer than has usually been the case in these matches.

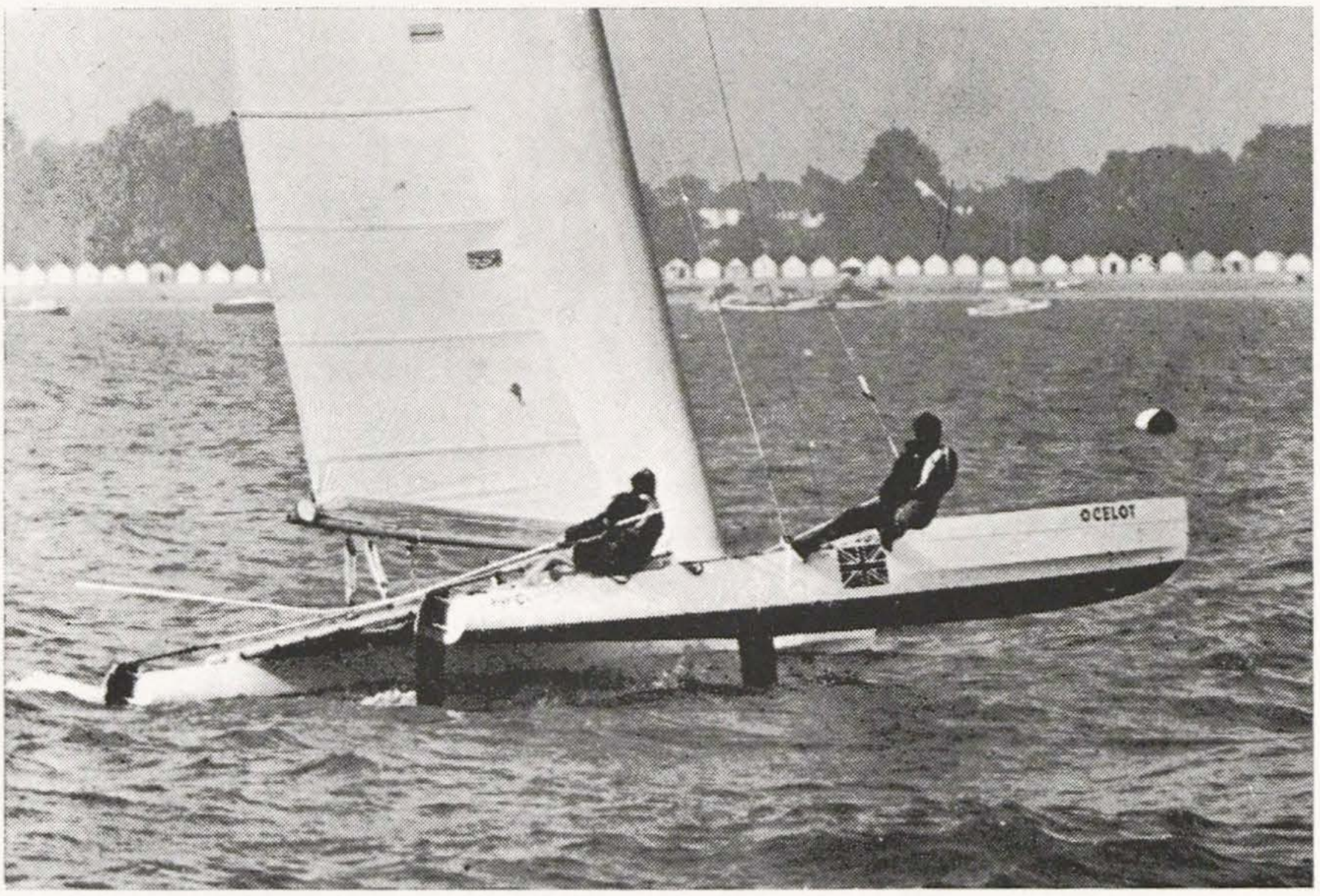
The two cats, *OCELOT* and *OPUS III* made an interesting contrast. The most casual and landlubberly observer seeing the pair lying side by side on Thorpe Bay's ribbon of shingle could not fail to discern that *OPUS* was far better detailed and engineered than *OCELOT* which, truth to tell, looked rather a lash up.

Gert Frederiksen, who used to be the manager of Paul Elvstrom's dinghy building yard and is now a boat builder on his own account, had for several years been an extremely keen student—at a distance—of all that had been happening in the International C Class. About four years back he built his first C cat, using glassfibre and giving her a neat and dainty sloop rig. With Paul Elvstrom as skipper and himself as crew, this boat, *OPUS II* was soon given a powerful wing rig, with a streamlined mast totalling 45 per cent of the total sail area (the C Class rules measure the area of mast and boom along with the permitted 300 sq ft of sail). It was brought to England three years back for some class racing—since it was the only one of its kind on the

Baltic. Unforunately the British boats were elsewhere at the time, disputing their own Little America's Cup selection trials and the only racing she got on this trip was a brush against the Australian challenger of the time. So boat and crew went home unfulfilled and disappointed. The boat was later sold to West Germany.

Early this year, Gert with the designing help of his crew Leif, who is a qualified naval architect, set about constructing his second C Class boat. *OPUS III* uses the same wing rig given to *OPUS II* and is in most ways a conservative craft. In her entirety, with her workmanlike sheerline, beautiful hull form, neat gear details and excellent finish she looks to this writer to be the most professional and practical C Class cat built to date.

By contrast, Reg White's *OCELOT* was brought out as a last resort. She was built five years back by Reg White himself at his catamaran firm Sail



OCELOT. Note deep forefoot and position of centreboard. These made tacking slow

Craft. She was unique in being the first cat Reg had designed himself with no help from the talented Roderick Macalpine-Downie. From the very beginning, things did not go right with her. The radical cruciform, tubular bridge deck structure with which she first appeared, at the recommendation it is said, of an aeronautics engineer, collapsed even before she went out sailing. In her early days she could never quite beat the best of her rivals and when Helmsman Paints put up the money for *LADY HELMSMAN* four years back, the newer boat beat her too, so *OCELOT* was hauled up to the roof beams and left to gather dust.

At the end of last year, after Reg White and John Osborn had won the Cup for Britain for the eighth time, on this occasion against an American challenge in the shape of *YANKEE FLYER*, Helmsman Paints bowed out

of Cup sponsorship. Efforts were then made to get other syndicates going but only one of these, the Southend centred Five Cs Syndicate, came to anything and this one got about £500 together.

With *LADY HELMSMAN* on the sidelines and not enough money for an all new boat, Reg White decided to renovate and modify *OCELOT* and set upon it the *LADY HELMSMAN* wing rig, designed by Austin Farrar of Seahorse Sails, which Robert Sanderson of Helmswood Paints eventually agreed to lend him. *OCELOT* wasn't the only British C Class cat on the water this season since Derek Nunn had again brought out his 1968 creation *EARLY BIRD,* whilst an all new, amateur built boat called *SNARK* entered the lists, but *EARLY BIRD,* possibly because of a new, extremely blunt wing mast, didn't have the speed to beat *OCELOT* whilst *SNARK,* just as she developed signs of having the speed, collapsed a hull in moderate airs and staggered ashore for major repairs.

There was no doubt that Britain's hopes would have to rest in the rejuvenated *OCELOT* buoyed up by the experience, local knowledge and cool craftiness of the experienced pair Reg White and brother-in-law John Osborn.

OPUS arrived three days before the series was due to begin, having been towed from Denmark behind a diminutive Fiat 124. The first thing one noticed was the apparent absence of spares and alternatives. She had only the one wing mast and sail. No sooner had she arrived than Gert went off shopping for British fittings. On her first outing it was said that she was beaten to windward by a local *Tornado* cat. This is as maybe . . . well sailed *Tornado* cats have many times beaten offtune British C Class cats.

The First Race

The first race was scheduled for Wednesday September 10th, starting at 10.30 a.m. Wind was sou'west, about ten knots. *OCELOT* grabbed the

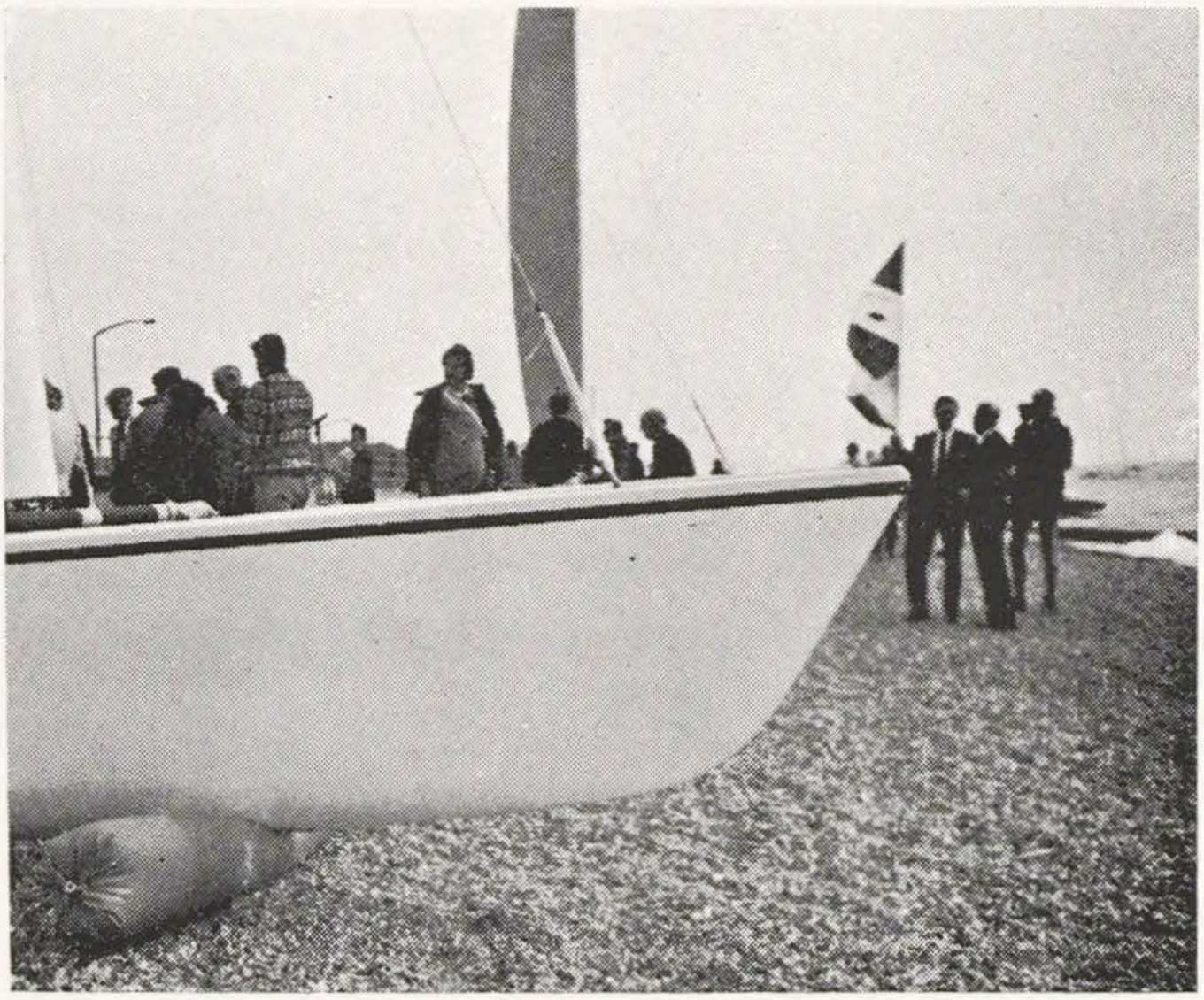
OCELOT's bow showing deep forefoot and knuckle parallel to the waterline
Photo: Knights

weather berth at the start and moved straight into the lead, rounding the weather mark of the 20 mile, twice around Olympic style course (but with much longer reaching legs than the windward-leeward leg) 36 seconds up. By the end of the first triangle this margin stood at 72 seconds, *OPUS* having gained a few seconds back on the second reach. A wind shift prevented any need for tacking on the second beat but already *OPUS* had shown she could tack quicker than *OCELOT*, which was not surprising considering her extra keel rocker and particularly considering the way in which her tramsons are tucked well up. Two thirds of the way through the race there was a little more wind, *OCELOT* began to lift her weather hull but not *OPUS*. At the end of the second triangle *OCELOT* was 2.29 ahead but then, with the extra wind *OPUS* began to chop away at the deficit finally finishing 1.48 minutes behind. Afterwards, Gert Frederiksen admitted that this was the first Class race his boat had ever sailed. "I'm sure I have a fast boat" he said, prophetically.

Reg White for his part, privately confided that he hoped the Danes would never think of luring him into a tacking duel since their boat could obviously tack faster than his. During the race his rudders had occasionally sent up rooster tails of foam, which usually betokens a breakage. This time Reg said they were not broken, he had had to apply a lot of rudder to keep his boat straight "She's a bit of a cow, if you want to know".

The Second Race

The second race on the day following was postponed for half an hour while the course was laid. Wind was due south, about four knots fresher than the day before. *OPUS* got too near the line too soon so that she was unable to accelerate before the gnn, with the result that *OCELOT,* even though she too was by no means flat out on gunfire, was able to sail through the Danes'



OPUS III's fine and clean bow with sections quickly becoming semi-circles
Photo: Knights

lee after the gun and draw clear ahead. Once Leif Wagner-Smitt had laboriously climbed out onto his trapeze wire and Gert had pulled in a bit of sheet and they had finally settled down, *OPUS III* began to claw out to weather of *OCELOT* which was compulsively lifting and dumping her weather hull. *OPUS* was making light weather of it. *OCELOT* was ploughing her lee hull deep, throwing spray over herself. *OPUS* led around the first mark by 18 seconds. *OCELOT* closed at one stage on the first reach, by cutting between two moored freighters whilst Frederiksen decided to weather them both (all part of the Thorpe Bay hazards!). *OPUS* gybed the second mark just three seconds up. This was good racing. She pulled out to 41 seconds at the lee mark, got in irons on the second beat and dropped to 16 seconds at the weather mark and after getting in irons more than once later, finally won by two minutes and five seconds. Later it was found that *OPUS* port rudder downhaul had been broken by driftwood and she had sailed for most of the race with only one blade operational.

Under the match rules, either helmsman can claim a lay day following a race day, once two races have been completed. Consequently, Reg White, hearing Force 4 was forecast for the next day, requested and got a lay day.

The Third Race

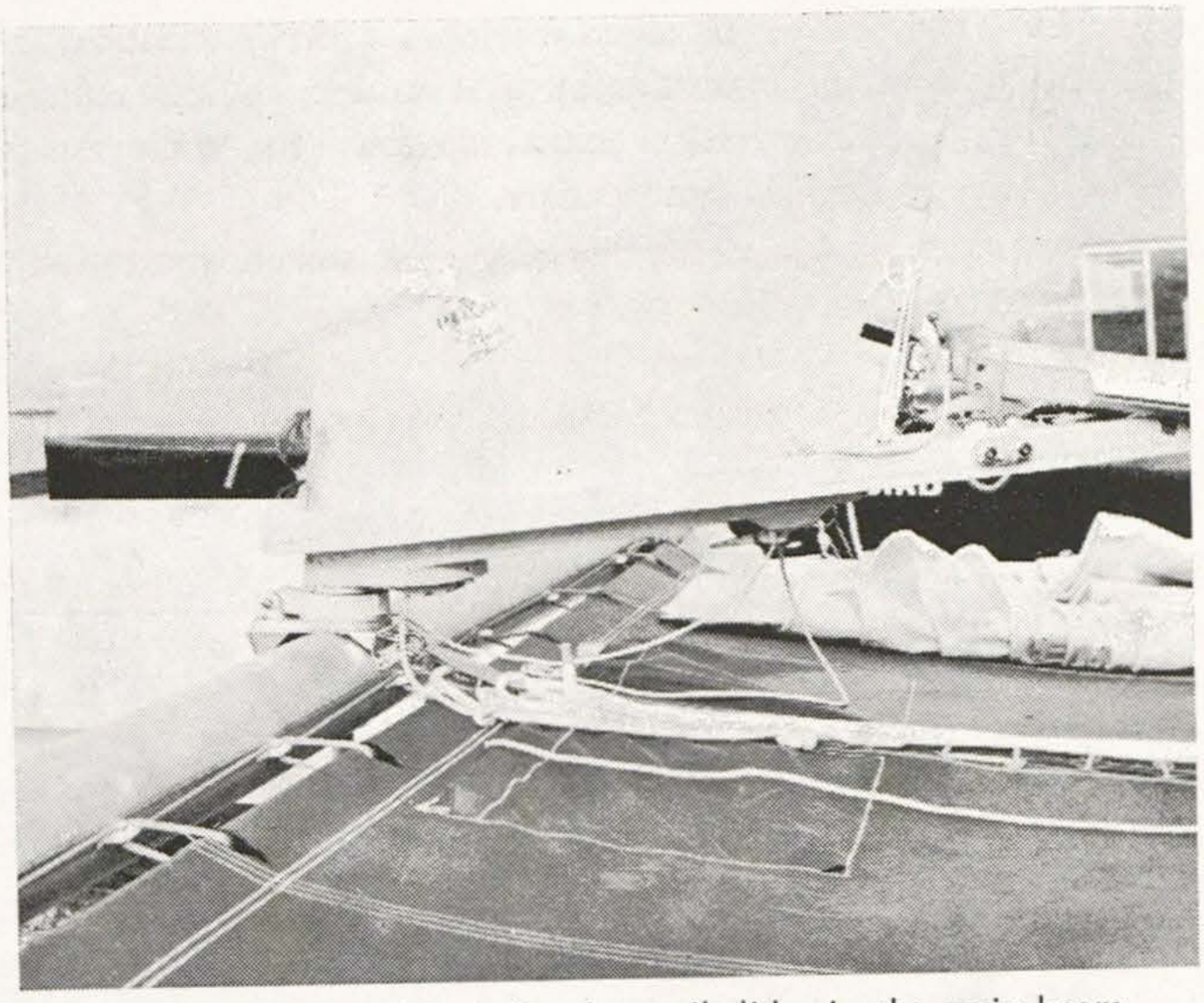
The third race was started on Saturday, September 13th and abandoned some ninety minutes later when it became quite clear there was no hope of finishing within the 4 hour time limit. At that time, *OCELOT* was at least twenty minutes ahead but had hardly finished the first triangle.

The recalled race was duly completed on the day following with *OCELOT* winning for Britain and drawing ahead 2-1. But it was another most exciting battle. Early on, *OCELOT* had pulled out a big lead of $3\frac{1}{2}$ minutes but at the finish this was only 7 brief seconds and if Reg White had not shown himself to be the more resourceful and experienced tactician the Danes would undoubtedly have profited from the increased wind towards the end of the race to get by.

The Fourth Race

For the only time in the series neither party asked for a lay day so the fourth race took place on the Monday, ending with another win for Britain who were now just one victory short of retaining the Cup for the ninth time, the score being 3 to 1.

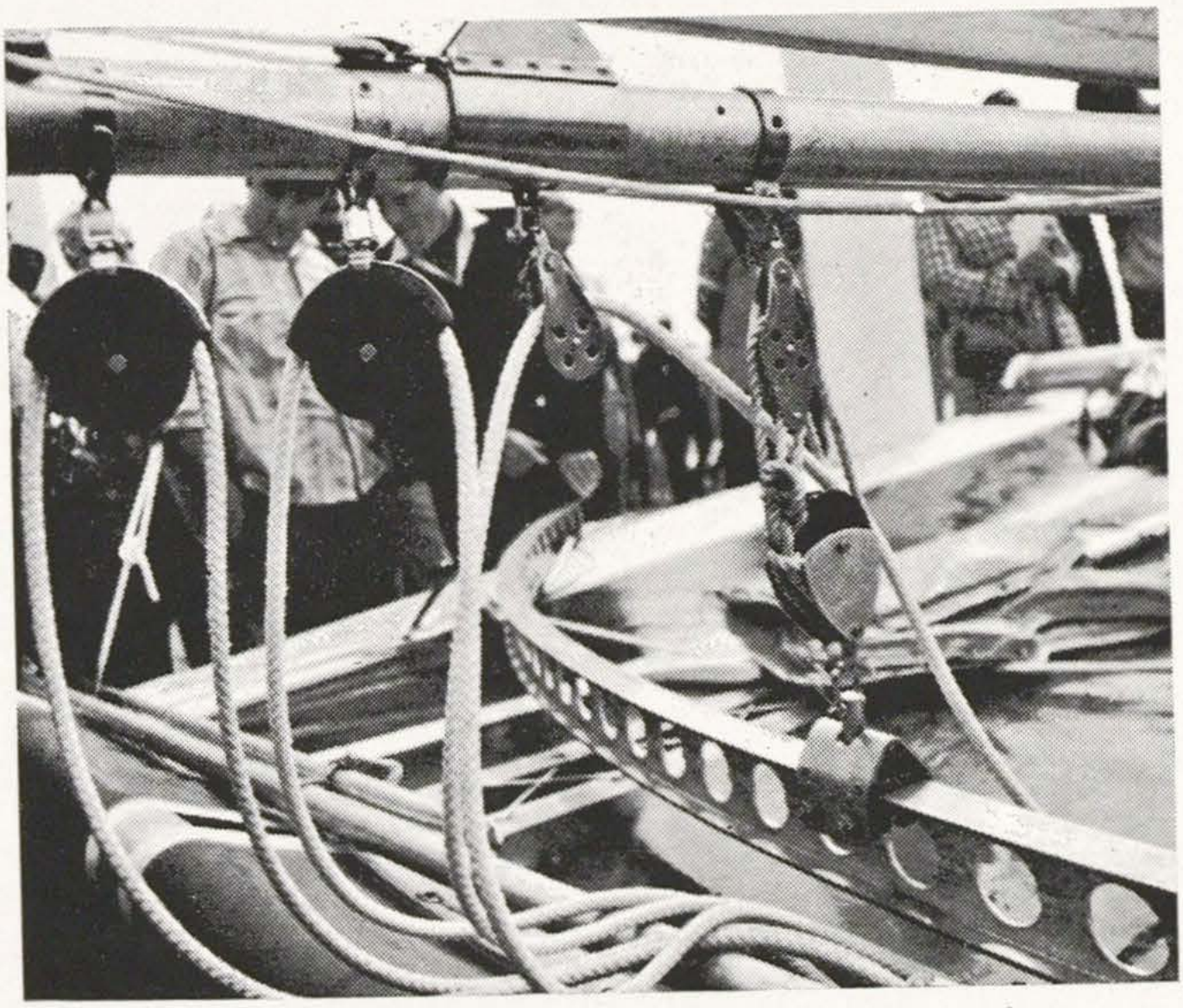
This was yet another slow motion creep through the Thames Estuary fog. It really was most unfortunate for the challengers that a decent breeze was so hard to find in usually windy Britain. Gert Frederiksen, though his boat looked as if it should be at least as fast as the other in light going was never able to get his wing rig set at precisely the right angle. (Techniques with these big masts are quite different from normal sailing.) *OCELOT* drew further and further ahead so that at the last weather mark, with only a dead run and a final beat left, the Danes decided to give up and await and applaud the arrival and finish of their opponents which actually happened sixteen-and-a-half minutes within the time limit. Now the Danes had their backs to the wall. In the hope that time was on their side, it was their turn to request the lay day.



OCELOT's trampoline is fixed to sail slides in the main beam
Photo: Crettenden

The Fifth Race

Their prayers were rewarded, Wednesday, September 17th saw the appearance of the best breeze yet. Although the British got away to the better start once again, *OPUS* soon showed she was superior on all points of sailing, leading around every mark to tour home the winner by 5½ minutes which, considering the strength of the breeze, was a very big gap. Once again, *OCELOT* lifted her weather hull far too easily.



OPUS III's mainsheet and curved, lightweight track
Photo: Knights

On the reaches she ploughed her lee hull deep, its forward knuckle throwing up as much spray as is made by a hippopotamus doing its ablutions in a water hole. Again and again Reg White had to apply helm savagely, to keep his boat straight.

Reg White demanded yet another lay day and this meant that there was now a four-day truce in hostilities, for racing was decreed to be impossible on the three days following the lay day because of the increasing lateness of high tide. At Thorpe Bay racing is only possible for about three hours either side of high tide. At low water, much of the course dries out completely.

During the period of enforced inactivity, the British camp was busy whistling up a new sail and this was probably their downfall. In an attempt to increase their speed in a breeze they decided to get Seahorse to run them up a new sail with less curve to the leech at the top and more area low down—thus looking more like the Danish rig. They got permission to have such a sail from the judges which was strange considering the Cup rules clearly specify that replacement gear is only allowed if it is similar to that which it replaces. The object of this rule is to prevent multiple rigs for different wind conditions, which is precisely what Reg White was after.

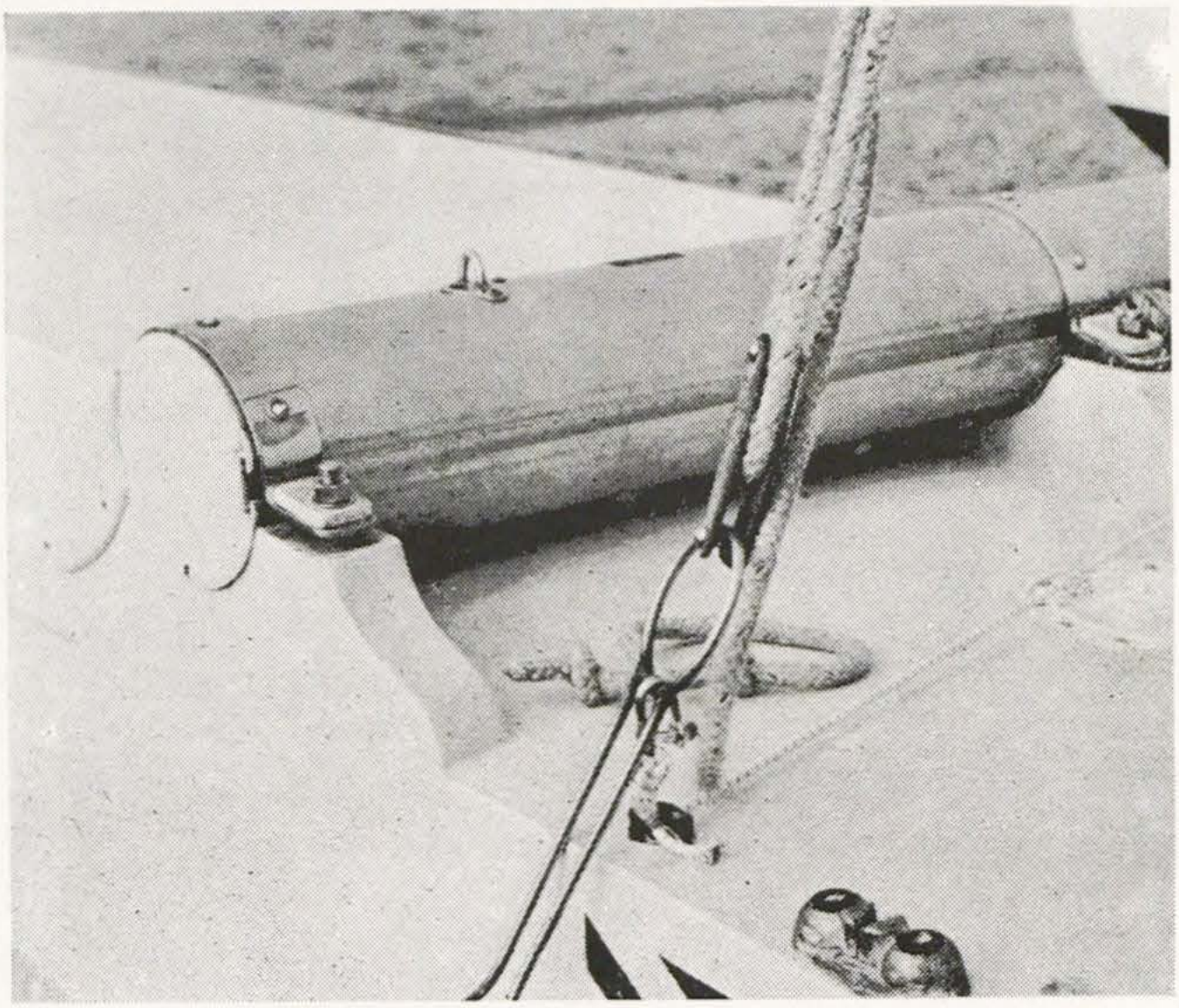
Anyway he got his new sail and on the final rest day, Sunday, September 21st took it out in the strong breeze to race against the British C cat *EARLY BIRD* which was steered by her owner Derek Nunn and used *OCELOT*'s spare mast. *OCELOT* easily beat *EARLY BIRD* and White and Osborn returned to the beach happy in the belief that they had improved their boat's performance.

The Sixth Race

There were gales around the British coast that night and first thing the next morning the weather still looked wild. Racing was due to begin at the unearthly hour of 8.30 a.m. and there wasn't much time for collected thinking. The weather forecast did predict the wind would moderate but promised at least Force 4 all day so the British confidently hoisted their new sail. Within minutes of the starting time the wind dropped right away. Since the start had been delayed there was still just time to change to another sail but the British didn't and because of this they were trounced by a larger margin than any defender has ever been defeated in the Little America's Cup.

Reg White squeezed the Danes the wrong side of the limit mark at the start and got away a whole minute up. Yet at the first mark, the Danes already led by half a minute. By the end of the first triangle this had become 2.15 by the end of the second beat 9.15 then 11.05, 13.10 and so on. Then the wind increased a shade and the time gap was reduced though the actual distance was not. *OPUS* was now over a leg of the course ahead. She actually slipped through *OCELOT*'s lee to lap the British right on the finish line (*OCELOT* had been trying to harrass her though not on the same leg of the course).

The Danes were displeased by the harassment but pleased that they had stolen one out of the fire. The British weren't so much kicking themselves for hoisting the wrong sail as they were kicking the weather forecasters for



OCELOT's main beam is cramped into mounting chocks
Photo: Crettenden

misleading them. On previous form, the British should have had little trouble in winning in that windspeed and wrapping up the series, but some had the suspicion that not only were the British slower than usual, the Danes were faster.

Reg White got his lay day and the final race took place on Wednesday, September 24th fifteen days after the first.

The Seventh Race

Luck seemed to stay with the British, the day once again dawned with the lightest of airs. This time *OCELOT* wore a favourite old sail but in spite of this she could not find the light air speed to match the Danes. The only trouble was that with the first $6\frac{2}{3}$ miles taking two hours and 20 minutes it seemed highly unlikely that the remaining $13\frac{1}{3}$ could be sailed in the remaining 100 minutes. A nice new easterly rescued the Danes. It meant that the beats became reaches. On top of this, the tide turned so that one of the long reaches was sailed in hardly any tide whilst the second had the tide with it. *OPUS* managed to finish with eight minutes to spare. For the second day running the British, though on a different leg of the course, attempted to harass her, but Frederiksen, instead of trying to pass through their weather, went for their lee and Reg refrained from bearing away on them.

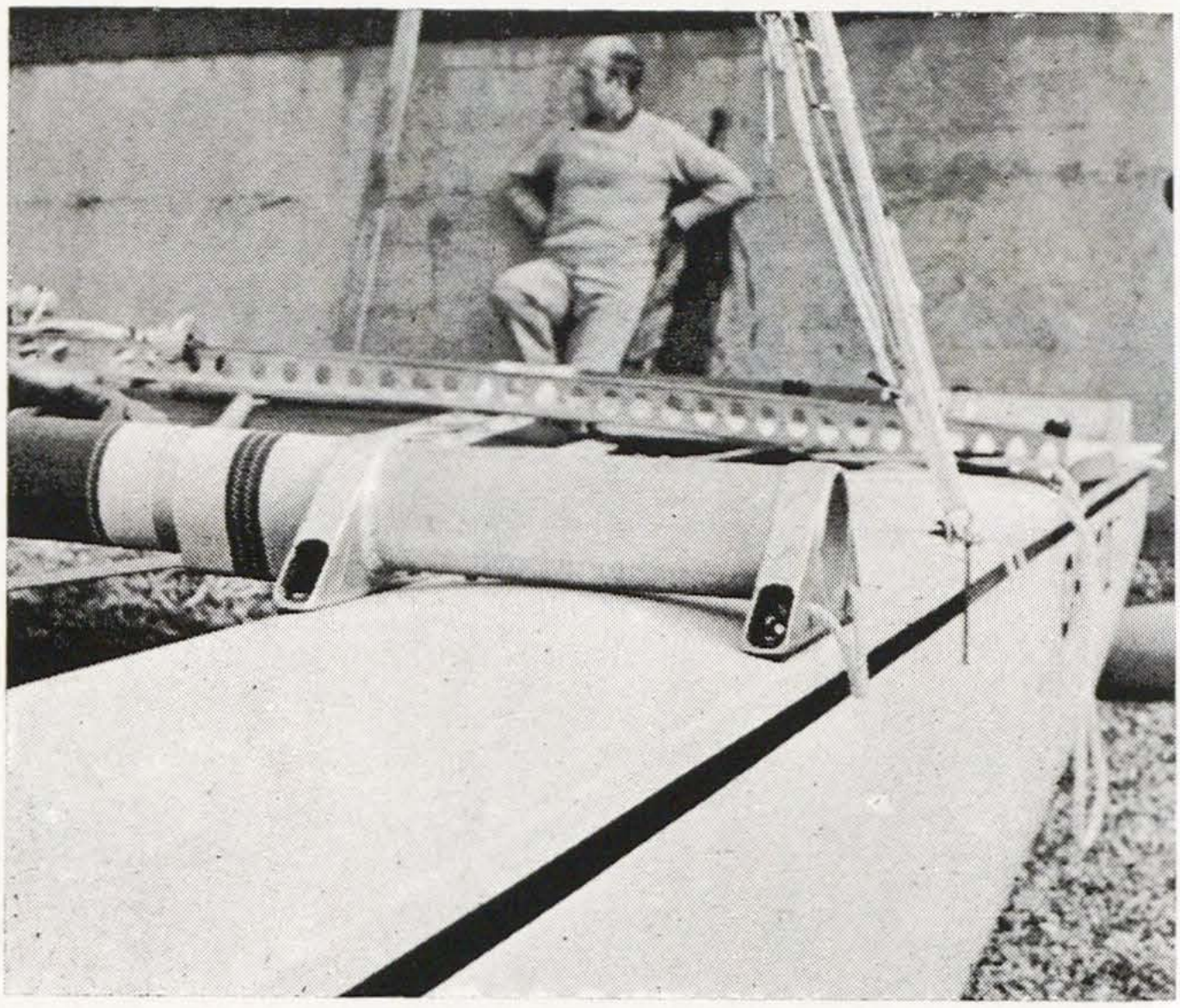
So the Danes won 4 races to 3. Then along came Kit Hobday in a launch to hand a new challenge to the Danes. It was on behalf of the Thorpe Bay Yacht Club. It is claimed to have the £5,000 sponsorship backing of Helmsman Paints.

No sooner had the weary Danes come ashore than they were assailed a second time—by Phillip May, chairman of the British C Class Owners' Association, serving them with another challenge. To all of which they

replied diplomatically, that the matter would receive their consideration. You see, the boot is on the other foot now.

Chances are that the next match will take place from the Skovshoved Sail Club in Copenhagen's Northern Suburbs, around next August. But if Britain are to win the Cup back they have a lot of work to do, starting now. Backers must be found for more than one new boat. There will have to be more tune-up trials and more home racing than has been the case in recent years. It would be of enormous advantage if Roderick Macalpine-Downie, architect of our earlier victories, with his famous *Hellcat* family of designs, could be persuaded back into the game. *OPUS* is a well built, workmanlike boat of good engineering. Her rig with 45 per cent of the 300 sq ft area in the mast, is more logical and more manageable in a blow than *OCELOT*'s more curved spar. But it cannot be the last word. There has to be progress.

One thing is sure . . . knuckled bows are obsolete. This should have been clear when *LADY HELMSMAN* was beaten in Bermudan waters by Van Alan Clarke's *ALLIANCE* three years ago. *OCELOT*'s new defeat by a boat without knuckles whose bow is very similar to that of the *Tornado* is only a necessary reminder of that earlier revelation.



OPUS III's circular cross-section beams fit into box-section webs
Photo: Crettenden

OPUS main contribution may prove to be constructional. Till now the lightest C Class cats invariably have been built of cold moulded veneers or bent plywood. *OPUS* is of glass and foam sandwich, yet at Thorpe Bay she weighed in ten pounds less than *OCELOT* which is the lightest British C cat.

One element of the Little America's Cup conditions needs changing—the bit about lay days. To contain the series within a manageable time span, one lay day should be allowed after three or four races have been completed and

OPUS III

possibly a second after six. No time should be granted for repairs (except in exceptional cases beyond the control of the crew concerned) since the absence of a minimum weight acts as an incentive to fragile boats.

If the Danish success stimulates more activity in this fascinating but impractical class it will be very much to the good of sailing in general.

CATAMARAN DEVELOPMENT IN NEW ZEALAND

by John Simpson
(By courtesy of Editor, Modern Boating, Australia)

Graham Stanton has in five years catapulted New Zealand catamaran yachting into world recognition with some brilliant and scintillating designs.

Runner-up in that first A Class contest in Melbourne in 1966 and then official New Zealand representative in 1967 at the IYRU catamaran trials, he has been both the blessing and the bane of Canterbury yachting.

In racing, he is as erratic as a temperamental prima donna, first one day and withdrawing the next when losing. In churning out new and more brilliant designs he is as prolific as a pair of mating rabbits, which is a mixed blessing in today's ever growing number of new classes.

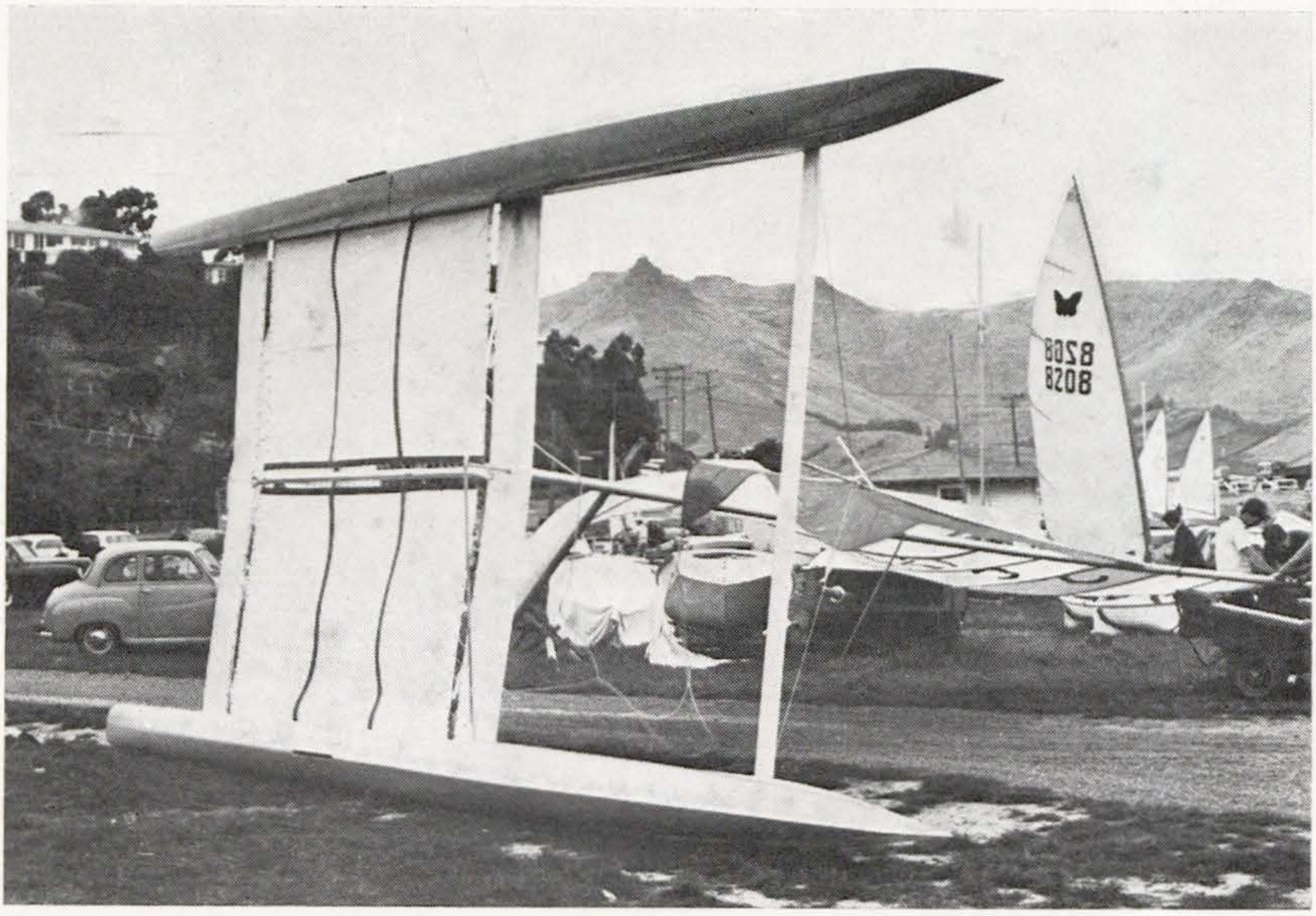
But arguments and criticisms are like water off a duck's back to this long, gangling man of restless energy with the long face and the droopy smile.

For though he may be a relative newcomer to the boating world he is a brilliant technician and engineer.

Graham Barrie Stanton was born on June 22, 1939, in Christchurch, educated at St. Andrew's College and Canterbury University College, where he graduated with a B.E.Mech. He has spent three years with C. W. F. Hamilton & Co. Ltd., the jet motor people, as design and chief development engineer (boating). His first sailing steps were made in December, 1956, at the Mount Pleasant Yacht Club, where he spent his first season in the old *Takapuna* (*Z*) class.

He built a *Frostply* and sailed it for three years. Then he built the first *Kitty* catamaran in Canterbury and sailed it at Charteris Bay (where most of us first met him) for the next three years.

After sailing *Cherubs* in the North Island, with little success in 1963, he designed himself *KITTEN,* a hard-chine 14 ft 6 in sheet-ply boat which was very successful.



Graham Stanton's *C CLASS CAT*—a very fast boat which never achieved her potential

Then in 1965, came *SCAT,* the first A-class cat in New Zealand which was placed second in the 'world' championships in Melbourne in 1966.

SCAT was originally designed as a 16-footer with short overhangs but was changed to 18 ft after discussions with Peter Mander. She had a moulded bottom with sheet-ply sides and was too light—half of the designed weight. However, she was highly successful and is still sailing.

His next design was *SAFARI,* the first A-class sloop and the first of the 'tortured' ply boats, built in three weeks for Ian McIntyre. She was very fast.

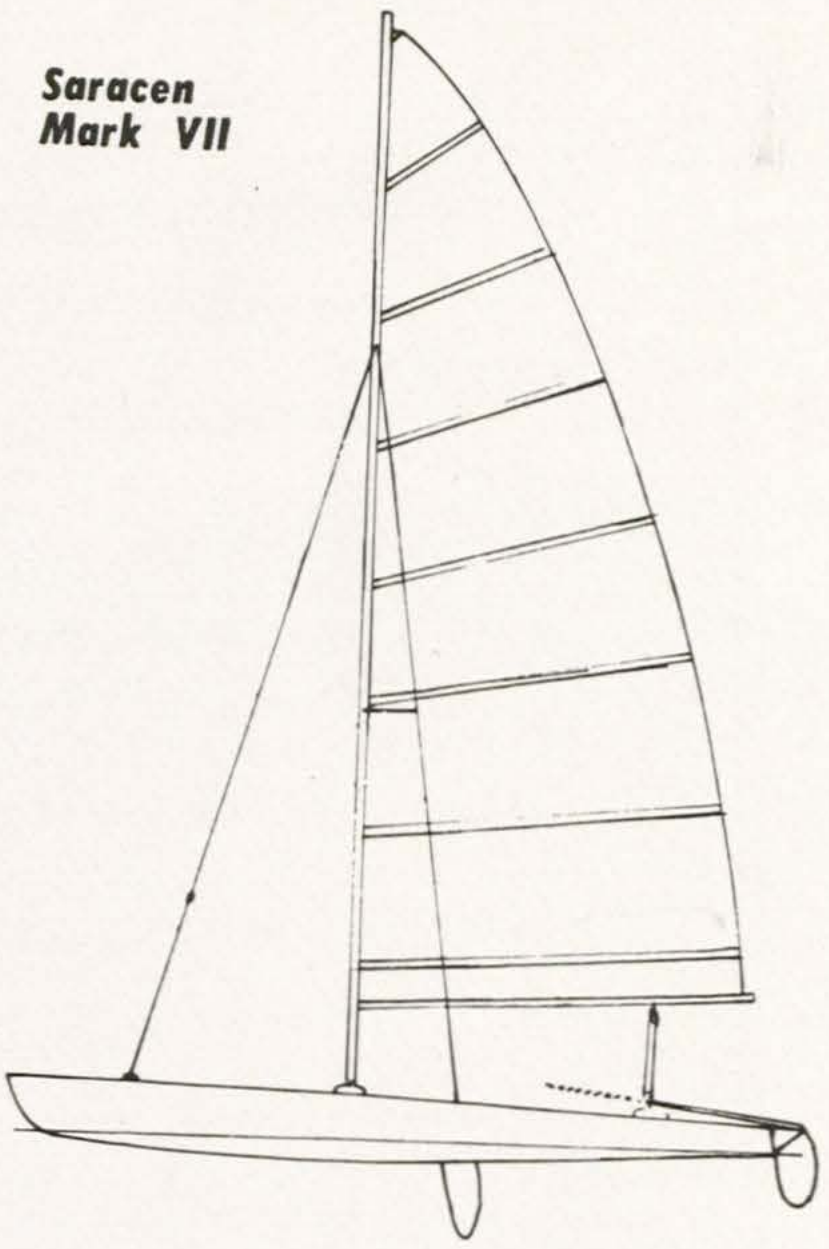
Then in 1966 followed *SARACEN,* Stanton's own tortured-ply A-class with very well balanced hulls. *SCAT*'s and *SARACEN*'s rig were interchangeable.

In 1967, Stanton produced an improved version, *DUETTA* (or *MISS ROTHMAN I*), for the IYRU trials, However, she was not properly tried or tuned before leaving New Zealand.

His *OPUS* (or *MISS ROTHMAN II*) the first and only C-class cat built so far in New Zealand, went to Europe at the same time and was sold to Sweden. She was a scaled-up A-class, very light (220 lb) with a sloop rig. She had a ton of potential but not enough racing.

Later in 1967 followed *SCAT II,* a 12 ft Sunbeam class and the first of his third-generation cats with moulded bottom and sheet-ply sides, small mast, loose-foot sail and ultra light at 63 lbs.

This boat, although new last season, was very successful, even with Graham's large bulk aboard, and most time he has sailed it very much like a champion. Besides finishing second in *SCAT* in the so called world A-class championship in Melbourne in 1966, Graham won both the Open and A-class N.Z. titles in *SARACEN* on Wellington Harbour in 1967.



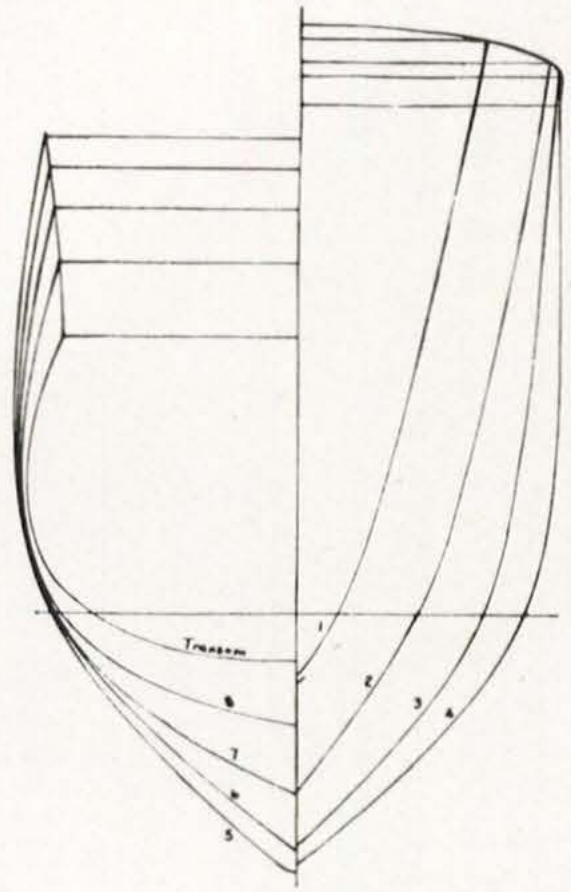
His other designs are: *SABRE* (formerly *SIOUX*) 15 ft 8 in long × 7 ft with 135 sq ft sail in cat rig—a scaled down A, more manageable, and will fit in the family garage. *SIGNET,* two-up sloop version of the *SABRE* with 150 sq ft; *SCORPION,* a Sunbeam stretched to 14 ft. His latest is a brand-new trailer-sailer cat cruiser-racer, 20 ft × 8 ft × 200 sq ft with two bunks and a solid bridge deck.

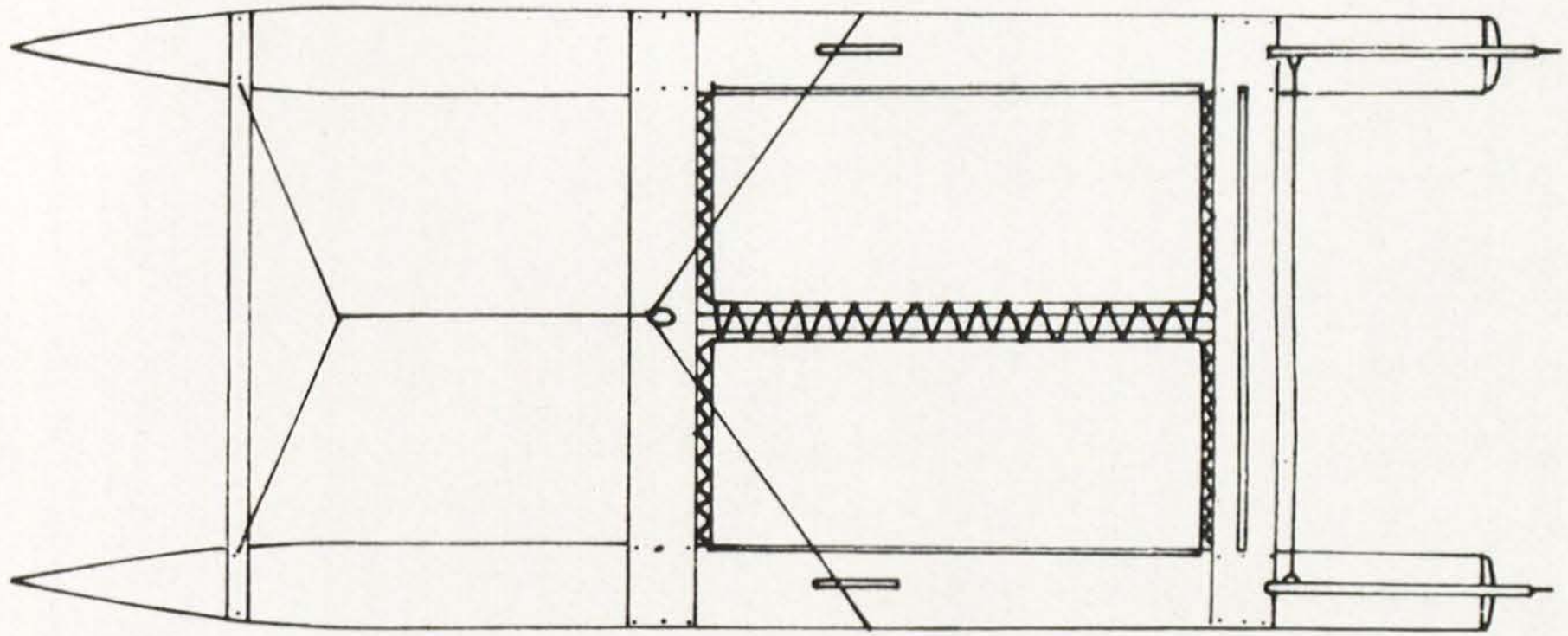
His theories

Graham always aimed for an easily handled boat rather than for speed, with lines basically parallel on the waterline. He would rather take changes in section on the hull which make for quick tacking as the A's righting moment

SARACEN Mk. 7

L.O.A.	17ft. 10in.
Beam	7ft. 6in.
Sail luff	22ft. 6in.
foot	9ft. 0in.
leech	23ft. 9in.





increases. The lighter the boat, the better the boat, particularly catamarans, as being inherently stable they can afford lightness with ease of handling.

He believes in the transom stern, firstly because it keeps the stern high for tacking. A double-ender is more efficient if restricted to length overall, but the efficiency is lower due to overall drag, which is higher.

Stanton likes narrow, deep hulls. With present methods of construction these are not possible, but some of the later-designed hulls are narrower and deeper than before. On future designs he feels there should now be some consolidation generally on the basic shapes, like the N.Z. unrestricted R class, and more emphasis should be placed on rigs, sails and crew work.

There is a tie-up between Lady Helmsman's and Graham Stanton's rig. The leeward bending technique—bending the mast to leeward below the hounds and up to windward above—is the correct one, irrespective of wing mast or not. Lady H's wing mast achieves the same sail shape on the soft part of the sail as does Stanton by bending a small aluminium section.

With further development all round, the performance of the wing mast will be better than the soft rig. Cat or sloop rig depends on wind strength where one is sailing. The sloop is much more manageable in harder conditions.

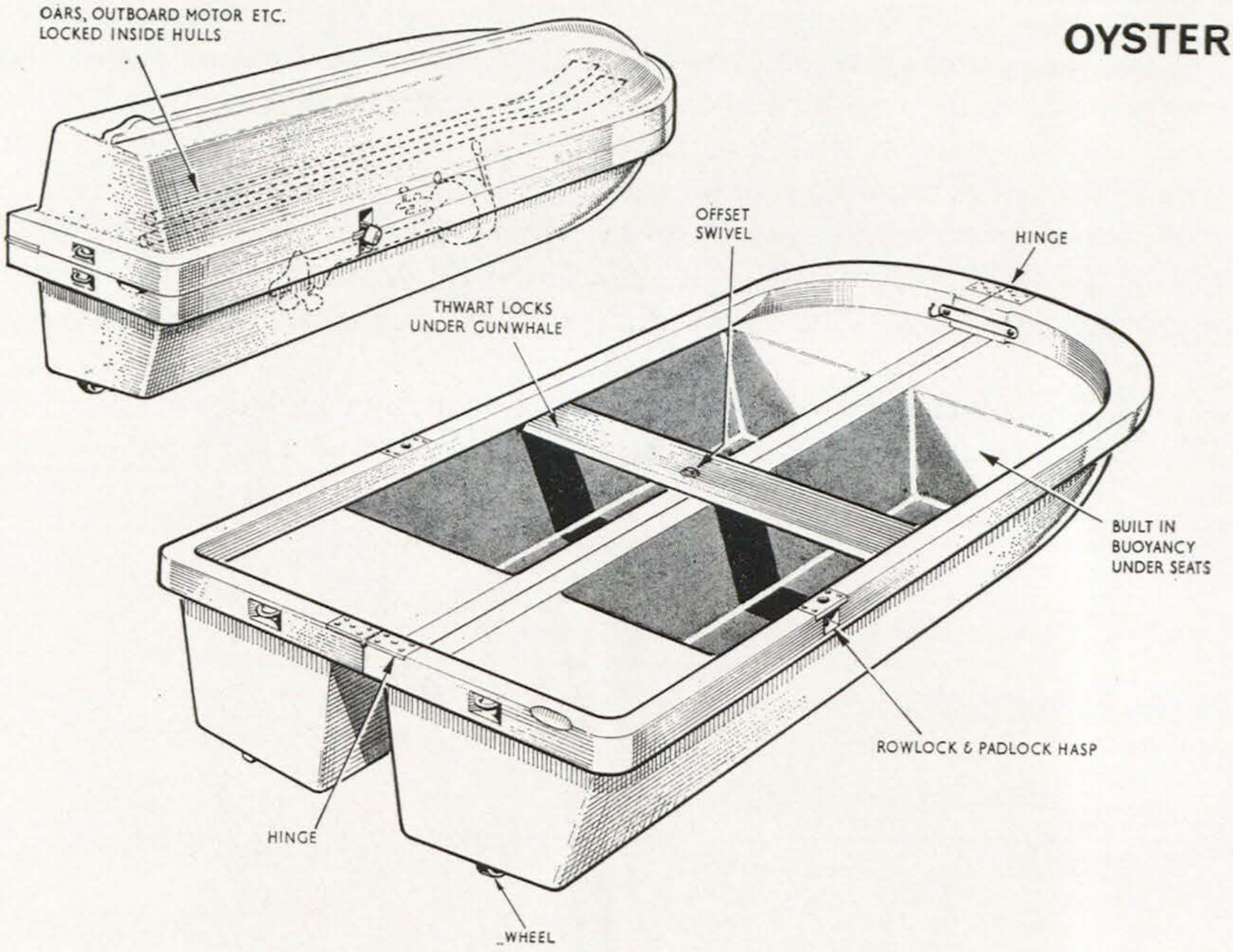
Well, that's the story of modern catamaran design and development in New Zealand—virtually a one-man effort and very few who see these modern flying machines scudding about on the Chrischurch Estuary below us ever bother to acknowledge or thank the man responsible.

OYSTERCAT

Compton Page Ltd.
Whiteshipyard, Hazel Road, Woolston, Southampton, Hampshire, U.K.

Seen at the London Boat Show. A remarkable little catamaran which solves the dinghy problem in an extremely original and neat way.

It can be seen from the photographs that one half folds over the other. Oars, engine and equipment can be stored inside the boat which can then be locked for security.



Construction is of double skinned G.R.P. and a built-in nylon wheel enables the boat to be wheeled ashore.

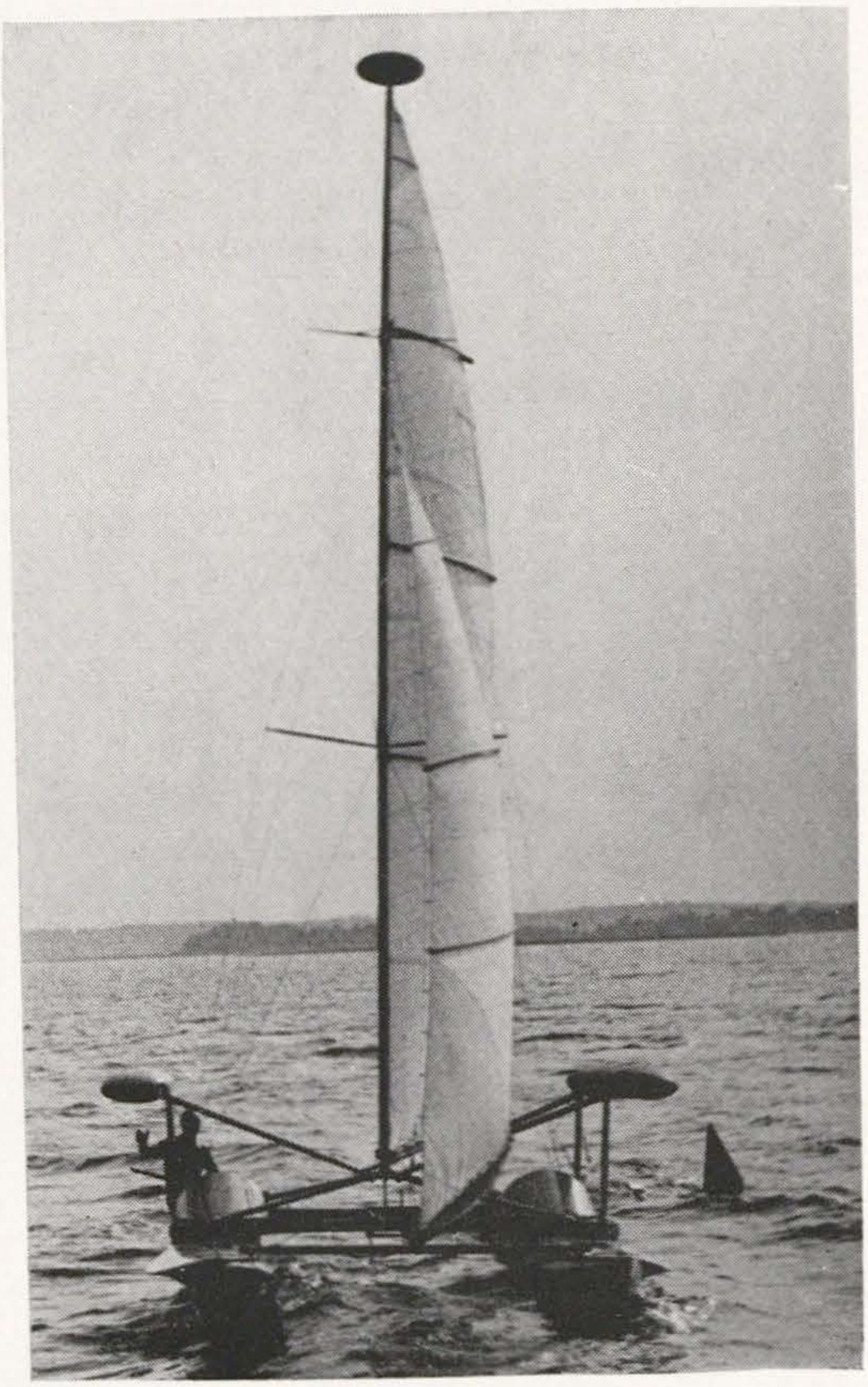
Two models are available: 8 ft 0 in × 4 ft 0 in at an ex-works price of £69 10s. 0d. and 5 ft 9 in × 3 ft 3 in at £59 0s. 0d.

FLYING FISH (POLAND)

Designer: mgt. ing Ludomic Jawniszko

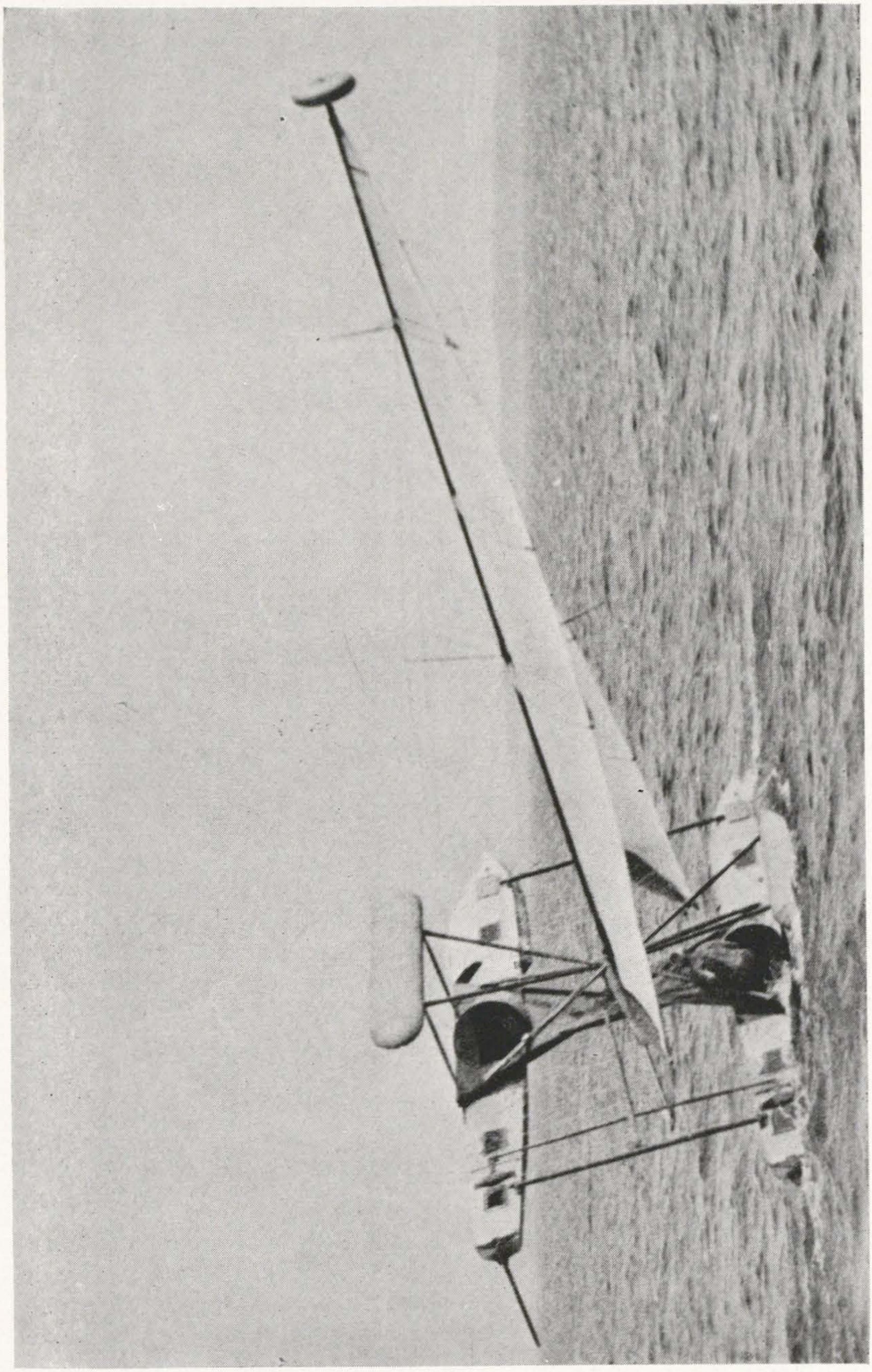
The following photographs show the ideas of one Polish designer for a self-righting unballasted catamaran.

Photo 1. Bow view of Flying Fish showing large built-on buoyancy tanks.
Photo 2. Bow view showing wave deflectors.
Photo 3. Flying Fish capsized and starting to right herself.
Photo 4. Flying Fish's sailing away after her capsize.



Bow view of buoyancy tanks

Bow view showing spray deflectors



FLYING FISH capsized

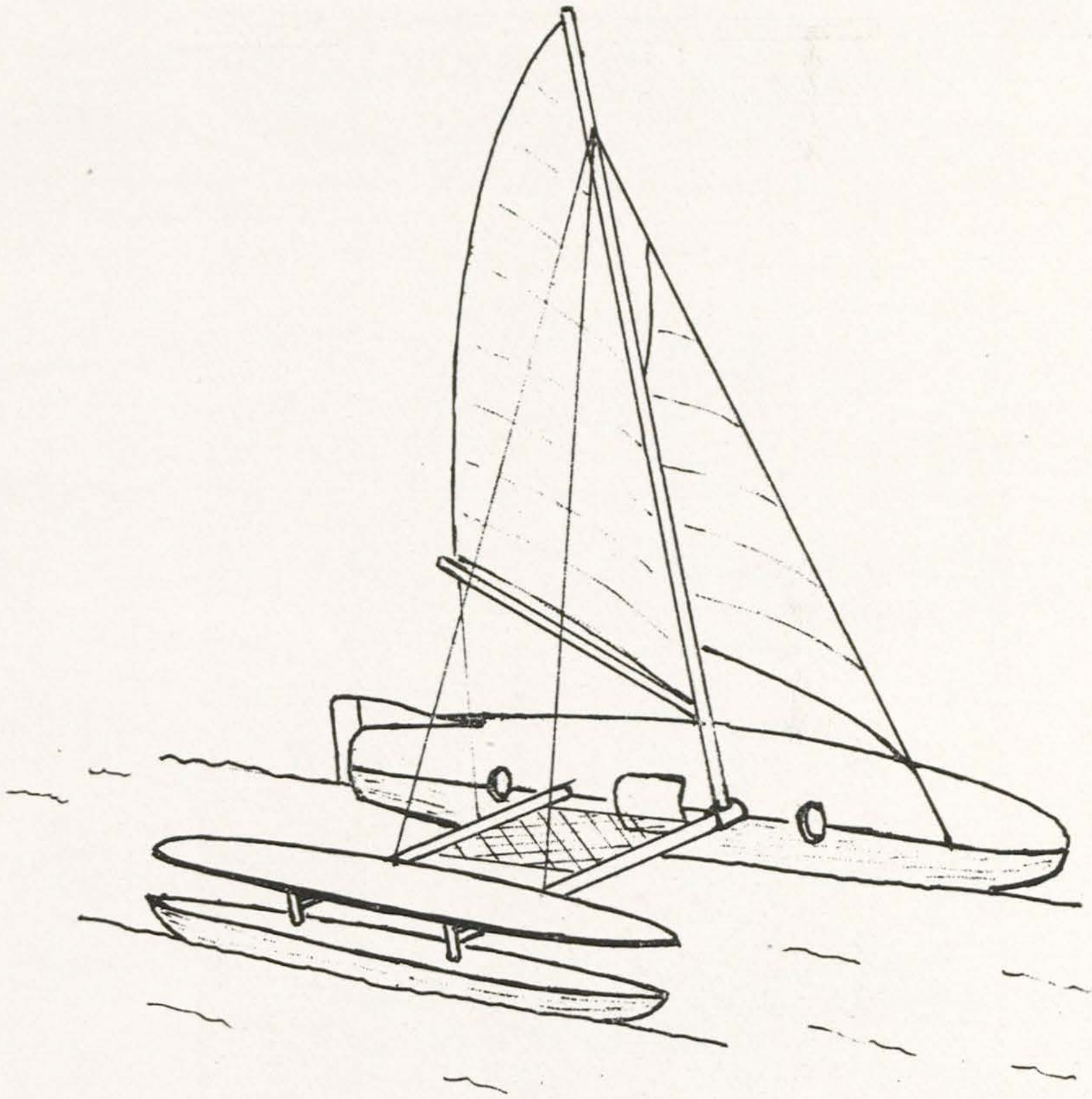
Sailing away

We have no further information on the catamaran such as length, beam, displacement, buoyancy etc., but we print the photographs as an example of the thinking in Poland.

Letter from: Martin Sanderson to John Morwood

Dear John,

Towards the end of 1968 when I was thinking of building a multihull I had several ideas about sailing a capsized catamaran or designing it so that it could be sailed equally well either way up. Being knocked down by the wind didn't bother me as much as being turned over by a large wave. Some of these ideas used pivoted floats which could be flopped over so that they were again in the water if the boat capsized. However, I didn't really like the idea of pivoted things which might decide to jam when they shouldn't and also may have allowed the boat to flex too much unless the pivots were massive.



Another idea was to have a proa which could sail either way up, with either a double float or a pivoted float which could be flopped over. The float could also have a 'Bruce' foil for added stability. The main hull would be symmetrical about a horizontal centreline plane and the hatches, etc. would all be on this centreline so if the boat turns over, everything is still above the waterline (fig. 1).

In all these ideas, the mast would be pivoted at the base, and, if capsized, it would be unstayed so the top of the mast would float to the surface where it could be winched upright again on the 'bottom' of the boat. I realize that that is much easier said than done, but these are only suggestions.

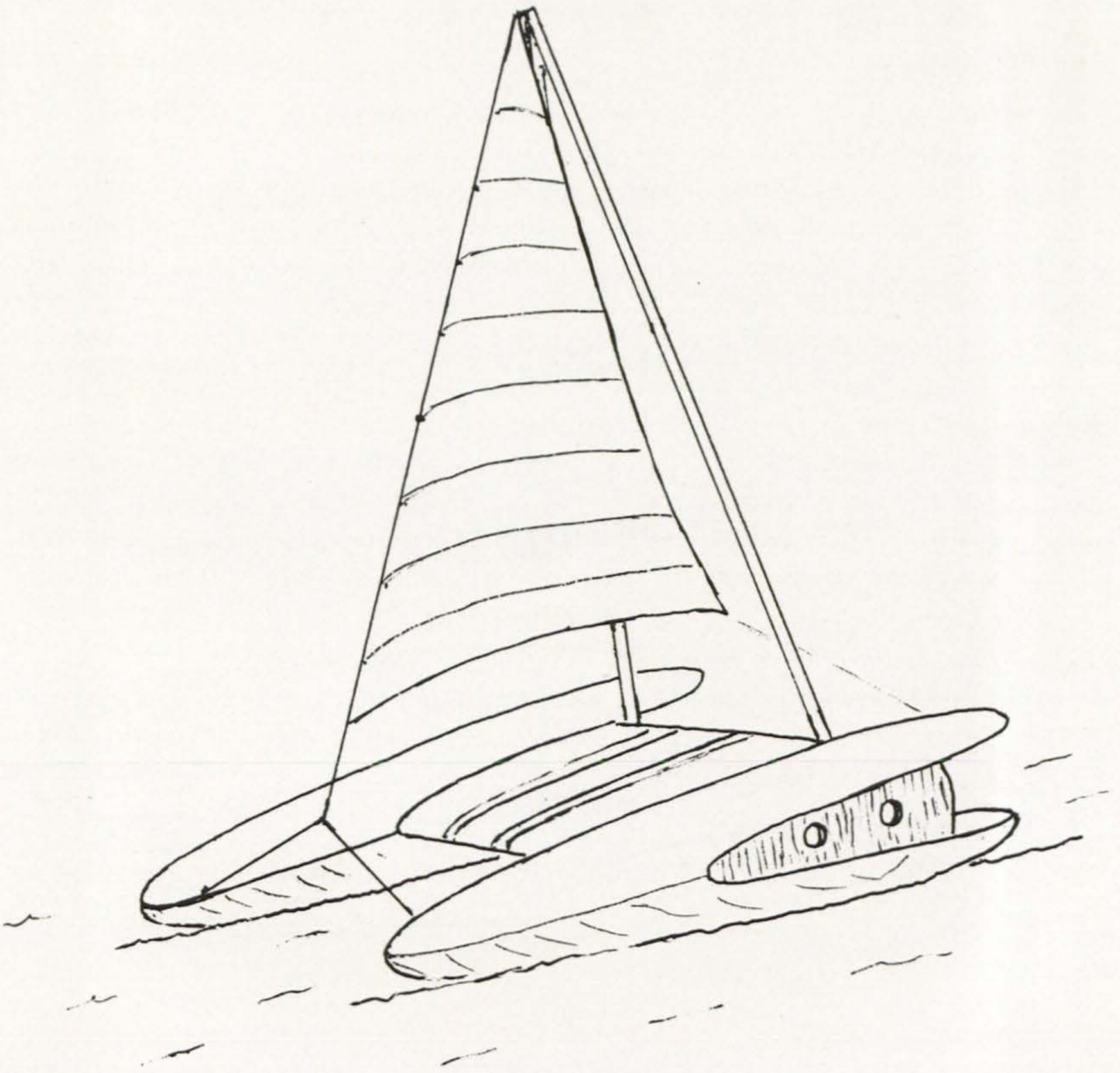
After thinking a while about the double float on the proa, I thought it may as well be enlarged to make a hull equal in size to the other. This boat would also have the pivoted mast (fig. 2).

It was at this stage that I became interested in ferro-cement which is too heavy for multihulls and so these ideas were shelved for a while.

The reason why I decided to build a ferro-cement boat (which is to be a hydrofoil stabilised monohull) was because I could build it much more quickly and quite a bit cheaper than the moulded plywood method which

EQUAL HULLED PROA.

FIG 2.



my catamaran ideas would need. The fact that I completed a 35 ft hull in 4 months spare time and at a material cost of less than £250 seems to prove it. But more of that in another letter.

Martin Sanderson

Letter from: Editor to Michael Henderson

Dear Sir,

I am editing the next AYRS publication on Catamarans for John Morwood and he has suggested that I write to you and ask if you might let the members of the AYRS know your reasons for apparently bowing out of the Catamaran scene after you have produced such good designs. Was it from lack of suitable opposition in racing or do you find it more satisfying to desing and sail Monohulls?

We should appreciate any comments you may like to make on Catamarans in general.

Letter from: Michael Henderson to Editor

Dear Mr. Soulsby,

The reasons for my, probably temporary, leaving of the Catamaran scene are somewhat mixed, but basically for the reasons you suggest.

My interest in multihulls stems from my interest in offshore racing and a desire to see whether a type suitable for this sort of game could be developed, and I thoroughly enjoyed the 4 fairly intensive seasons I spent doing this. However racing is the name of the game and there was not at the time, and still really is not, enough good racing to be had, and this coupled with the advent of the Half Ton Cup, and my-desire to get back to 'proper' racing, caused me to change. I still keep an interest in the multihull scene however.

As far as Catamarans (by which I take it you mean multihulls) in general are concerned, I can only speak of the cruising variety, and I must confess myself a little disappointed with the rate of development. I think most people would agree that there are not really many very interesting boats about, and this I think is almost entirely due to the lack of interest by really keen racing people in the type, and until we do get the Amey's, Clark's, Carter's and Slaters of this world taking an interest, I cannot see very much happening, which is a pity because a *really good* ocean racing multihull would surely be a most delightful beast.

I hope this has been useful to the Society.

Michael Henderson

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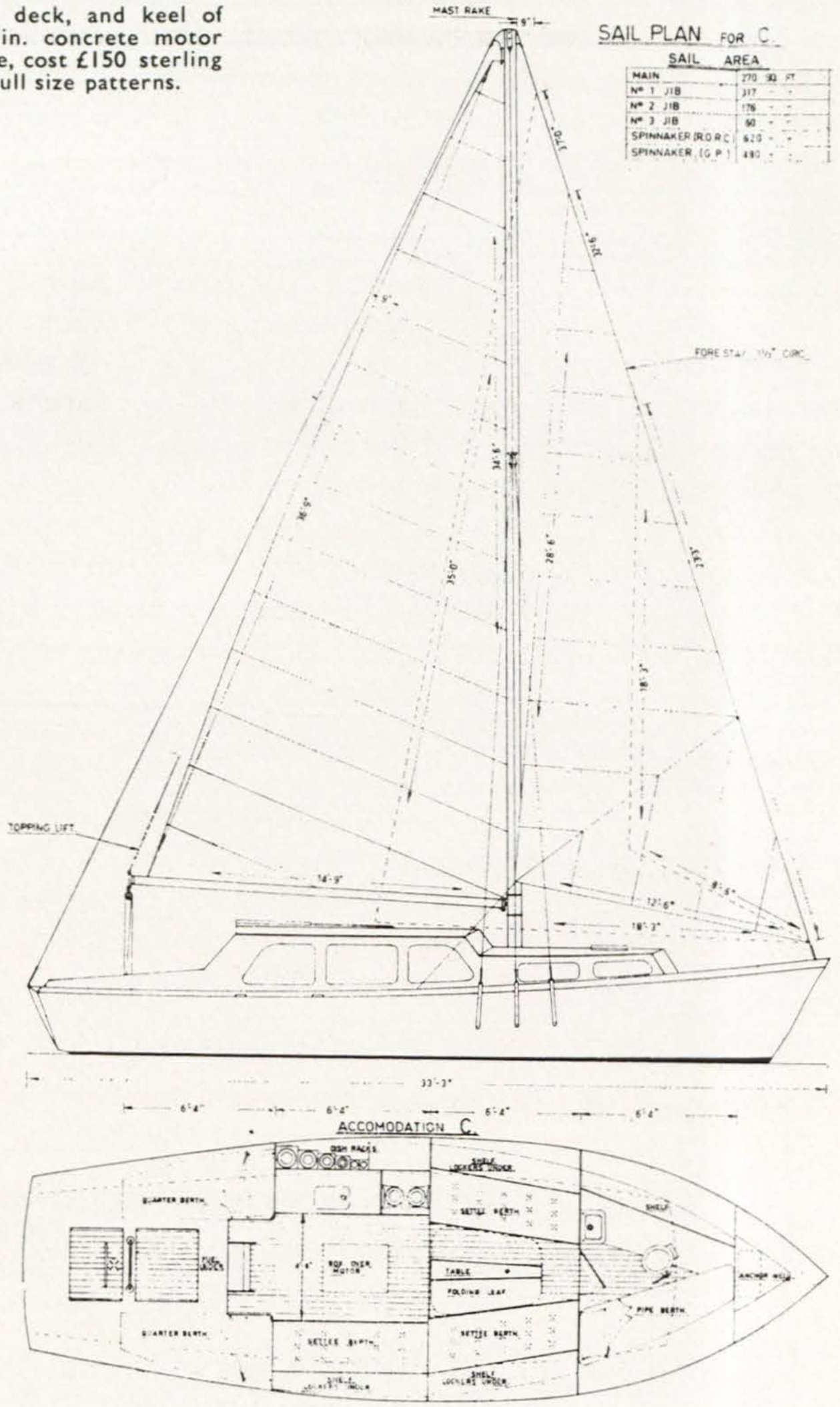

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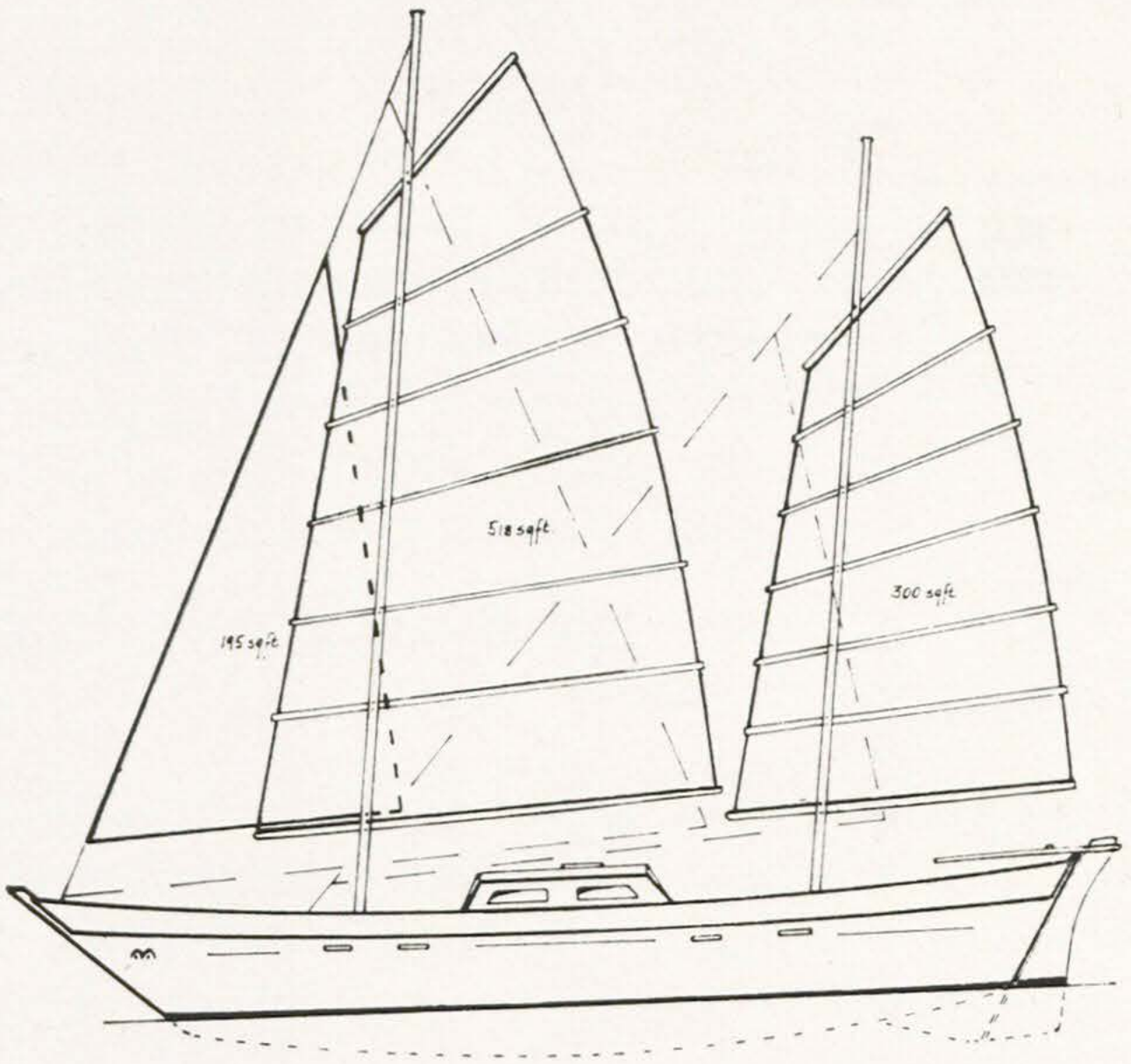

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