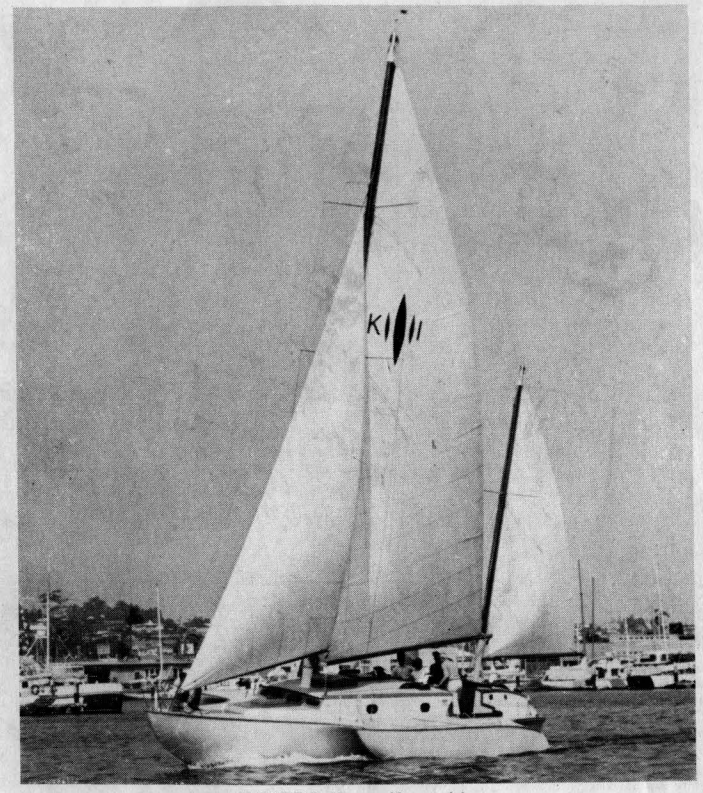
TRIMARANS 1962

A.Y.R.S. PUBLICATION No. 43



TA'AROA (Dean Kennedy)

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PRICE $1.00 ***PRICE 5/-***

THE AMATEUR YACHT RESEARCH SOCIETY

(Founded June, 1955)

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EDITORIAL

April, 1963.

The American A.Y.R.S. Walter and Yvonne Bloemhard have resigned from their official positions in the A.Y.R.S. Walter has taken a job in Italy. Their association with the A.Y.R.S. began in 1957 and they have kept the society going through all these years which has entailed a very great deal of work. We wish them every success in the future and thank them for what they have done for the A.Y.R.S. and Yacht Research.

John Hughes has now taken over the American A.Y.R.S. and meetings are taking place to see what, if any, changes are necessary for the future of the Society. The subscription, incidentally, is now $5.00.

The British A.Y.R.S. As will be explained later, the British A.Y.R.S. is being reorganised in order to make it a more viable Society, while keeping its publishing character intact. Cliff Orris has now been appointed the Hon. Treasurer to look after our finances while the reorganisation is taking place.

The A.Y.R.S. History and Organisation. It may be useful to many members to give the essential history of the A.Y.R.S. so that they can see the reasons for what will be done soon.

The A.Y.R.S. was founded in June, 1955 by the bringing out of publication No. 1. This act, combined with publicity in the Yachting magazines caused interested people to write to me. The response was great enough to cause the series to continue. At this stage, of course, there was no formal organisation at all.

In December, 1955, there was a meeting of a few members at my house and a Committee was formed but owing to the essentially simple nature of the Society at that time, no meetings were held during the year.

In September, 1956, however, the Society had grown to such an extent that a considerable sum of money was involved in the publishing, so at a meeting at my house, attended by a Barrister and an Accountant, a Constitution was adopted. At that time, the A.Y.R.S. was running at a loss which I was paying myself and, in order to avoid the possibility of members becoming liable for it, we wrote into the Constitution that all subscriptions should be payable to me and that I would supply the publications to the members and meet any costs that arose. This Constitution is still in force.

At present, therefore :

1. The A.Y.R.S. has no income as an independent body.

2. The A.Y.R.S. has no liabilities.

3. The A.Y.R.S. has no legal property in the large numbers of back publications accumulating at my house. It does, however, own the Yacht Wind Tunnel because this was built by the Research Fund.

4. For the interest of members, the cost to me in getting the A.Y.R.S. going has proved to be more than £1,000 according to the accounts prepared by Cliff Orris.

5. The accounts which I keep have shown that the net income from the A.Y.R.S. is nil, the profit on the sale of publications being taken up by the cost of the Boat Show, sundry expenses and the ever increasing numbers of back publications.

I think members will agree that this organisation, while allowing the A.Y.R.S. to function well enough is no longer satisfactory and we must reorganise along more usual lines. To this purpose, we have co-opted Rogor Waddington onto the Committee who will produce a new Constitution which will :

1. Allow the Editorial side of the A.Y.R.S. to function exactly as it is doing at present.

2. Allow the publishing side of the A.Y.R.S. to proceed much as it is doing at present, always bearing in mind that, for the present, the work is being done on a voluntary basis by Mrs. Tett. I can then give the back publications, the cash at the bank (and the printers bills) to the Society.

3. The Constitution must also create a Social centre which can house the laminar flow test tank which has been made by members at the instigation of Edmond Bruce. There must also be room for the Yacht Wind Tunnel.

The A.Y.R.S. Background. Very recent history has shown several times over that Yacht Research is very hard to buy. The professional in any field needs a high salary which the yachtsman apparently is not prepared to pay—now will commercial firms pay it. Then, when the work has been done, the results are either kept secret (which is usual) or the material is published in such abstruse terms that it is useless to the common yachtsman.

The A.Y.R.S. was formed so that the *amateur yachtsman* could do research into problems which interest him and so that he had a forum which would publish his researches couched in terms he could understand. All the relevant research can be done with our test tank and wind tunnel and some other very simple apparatus.

There have been some people in the A.Y.R.S. who want our apparatus put in the hands of Universities and Technical Colleges. Such institutions either have or can get similar apparatus. If they hold ours, we may have trouble in using it. I feel that we should keep the use of our apparatus for the use of our members.

The Membership List. We have now carefully gone over the membership list and hope that we have now got all members titles, names and addresses correct. If there are still any mistakes in the addressing, would members please tell us. Or at least write these things carefully when sending future subscriptions.

A.Y.R.S. Ties in pure silk at £1 each are available from the Membership Secretary, Woodacres, Hythe, Kent.

A.Y.R.S. Burgees size 9 in. x 5 in. at 10s. each, are also available from the Membership Secretary, Woodacres, Hythe, Kent.

THE LONDON BOAT SHOW 1963

Our stand at the Boat Show was a great success, with the public showing a great deal of interest in our models, Owen Dumpleton's trimaran and the laminar flow test tank.

Mantua. This trimaran was the first trimaran ever to appear as a commercial article at the Boat Show. Very beautifully made in fibreglass she is a development of the plywood *Mantua* we described in A.Y.R.S. 39. The round bilge main hull is nicely blended to the cabin and wings and the whole set-up was extremely pleasing. The floats are bigger than in the prototype and she should be a very comfortable and pleasant yacht which the ladies will like better than any conventional boat. Speeds of 15 knots should be obtainable. The price is £800 plus £52 for working sails. This price includes three mattresses, sink unit, galley, pump etc. but not stove, anchor or navigation lights. The prices for mouldings are £150 for the hull and £175 for the cabin/fore deck assembly.

The Test Tank. The tank was made by Bruce Duval and Rogor Waddington to the Bruce specifications. The electronics were made by Norman Naish and the tank functioned perfectly despite an attack with a pin by an uncaught lout and a gash from a sharp piece of material, both of which were patched without difficulty.

The Models. In the right foreground is a model of General Parham's "Gullswing" sail with a bent mast. This was almost invariably shown producing the remark "How very ingenious." It demonstrated most clearly the absence of twist from this sail.

In the left foreground is a model of the Micronesian hydrofoil craft surmounted by a semi-elliptical "Squaresail" as described in A.Y.R.S. 36. In this craft, the side force of the sails is converted


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ELITE

into a lifting force and, given the right ratio of lever moments should lift the craft off the water. Steering is by the after hydrofoil. The hulls are made from single sheets of 1 millimeter plywood, the edges joining at the keel, thus giving a rounded deck. The squaresail is controlled by multiple sheets of the Chinese pattern, but the angles to the top yards were very small and control might not be obtained at full size.

On the table between the two previous models is a model of a 30 foot lightly ballasted cruiser made from a single sheet of 1 mm. plywood. Hydrofoils worked by a pendulum or manually would give it an upright position when sailing. The mast is an aerofoil and the sail a semi-elliptical spinnaker which is fully battened. The self steering gear is built over sized. It is the Mill Gear. Because the 6 foot rotor on a windmill will steer the ton or so of cap and wings, we think a 2 foot rotor would steer quite a large yacht.

Several small catamaran hulls were also shown with the sheet of plywood from which they were made. This attracted quite a lot of attention.

Boat Show Results. 90 new members were signed on at the Boat Show with 66 renewals of old membership. The Boat Show was again organised by Tony Millard. The Stand helpers were: Josephine Austin, Mr. and Mrs. Bruce Banham, Mr. and Mrs. Fred Benyon-Tinker, Ruth Evans, David Haslam, Perry Henniker-Heaton, Tom Herbert, Lloyd Lamble, John Long, Pat Morwood, Norman and Peter Naish, Rogor Waddington.

AMATEUR? YACHT RESEARCH

BY LLOYD LAMBLE
89 Alexandra Road, N.W.8

At the A.G.M. on January 5th this year, the question of Professional membership of the A.Y.R.S. was raised and with it the bogey of profit making by or through our Society.

Several suggestions were put forward to counter "the uneasiness of some members" that the Professional designer and/or builder was making a good thing out of the Society. It was suggested that "Amateur" was a misnomer on account of the number of Professionals among the Vice-Presidents, Committee Members, etc.

Many ways of dealing with this apparent anomaly seemed practical at first, but analysis (the very basis of the A.Y.R.S.) showed them all to have as many weaknesses as strengths and the subject was becoming bogged down, until a Committee Member pointed out the meaning of "Amateur," as applied to the A.Y.R.S.

The Society was formed by an Amateur Theorist (Dr. John Morwood) with the object of collating and sharing as much Theoretical and Practical knowledge as possible of Ships, Sails and Seamanship throughout the world. The fact that this knowledge was professional or amateur, crackpot or commonsense was irrelevant. It was the free exchange of ideas to the general benefit of water sport or commerçe that was and is the core of the Society and many of the "hairbrained" ideas of amateur and professional alike put forward in the A.Y.R.S. Magazine only a few short years ago are today being accepted for large scale Commercial and Military seafaring.

Some people *are* making money out of the A.Y.R.S. then? Yes! Some people who do not belong to the A.Y.R.S.—some people who do not even know what the A.Y.R.S. is nor what they owe to the A.Y.R.S. On the other hand there are many people who *do* know these things and admit the source of their success but is this a bad thing? From the A.Y.R.S. viewpoint, it is not! All we have ever been interested in, is stimulation and exchange for the benefit of all, whether Amateur, Professional or the General Public.

What then of the world wide membership and distribution of the A.Y.R.S. Magazine? There must be a nice little something in it for someone? There is not! The birth and continued existence of the A.Y.R.S. is due solely to the Herculean efforts of one man—Dr. John Morwood—who, far from making anything from the Society, has sunk some thousands of pounds into it without very much hope of seeing the money back—let alone with profit.

Dr. Morwood's work and indeed the work of everyone in the Society is entirely free and it is from this premise that the word "Amateur" springs in relation to the A.Y.R.S. It is because of this status that we are able to praise, criticise or damn this or that theory, these or those structures, be they Professional or Amateur. It is research we are interested in, as a stimulus to new and better practice and whether the researcher is motivated by gain or pure science, that person's work, in so far as the Society is concerned, is Amateur, which in its general English connotation means "unpaid."

In conclusion let us consider the word "Amateur" in another light. It is a French word meaning broadly "a lover of—an appreciator." "Yacht" of course is a Dutch word for a type of boat. Perhaps then, at some time in the future, should it ever become necessary to change our name, we may call ourselves "The Lovers of Boats Research Society"—for that really is what we are now!

Ed.—A point not made by Lloyd Lamble concerns an implication by some people that the word "Amateur" implies ineptness while "Professional" implies competence. Now, in England at any rate,

many professional yacht designers have no technical qualifications, such as the Membership of the Institute of Naval Architects, and their competence, outside of the one type of boat in which they specialise, is no better than that of many amateur members of the A.Y.R.S., amongst whom we have many men with Degrees in Engineering, Science and other specialities, who have taken up yachting as a hobby. Perhaps it is also noteworthy that the professional yacht designer and builder has almost never been responsible for any advance in yacht design, this being almost always the prerogative of the amateur.

THE 300 FOOT X CLASS CATAMARAN

BY

THE CHAPMAN SANDS SAILING CLUB.

In order to stimulate design, development and competition in the I.Y.R.U. "C" Class of Catamarans, this Club has decided to attempt to co-ordinate the efforts of owners, designers, builders, sailors and Clubs towards the common aim of the establishment of Class racing. An equally important part of this racing will be the emergence of a defender for the Sea Cliff International Catamaran Trophy at present held by this Club. The defender will be chosen by the Club Committee approximately one month before the next defence of the trophy takes place, after due consideration of the results of the season's racing and any other elimination series which it may be necessary to run.

We are particularly anxious that as many boats as possible should take part in the Season's racing and we would be pleased to hear from any owners or prospective owners who would be willing to compete. There is also the possibility of the formation of syndicates of people unable to afford a complete craft themselves, or anxious to offer help in some other way, and we would also be pleased to hear from them with the object of co-ordinating their activities.

The Chapman Sands Sailing Club will present a Trophy for Annual competition within the Class at various Open Meetings and Regattas and we would ask for the co-operation of fellow Clubs in promoting racing for this Class. We feel that the following fixtures are particularly suitable, and we would ask the Clubs organising these events to include racing for the "C" Class. We would also be most grateful for the suggestions of other Clubs offering suitable fixtures to be included in a programme which will be prepared by the Chapman Sands Sailing Club, and we would be pleased if the Clubs listed

below would confirm whether or not they will be able to include racing for this Class in their fixtures.

Catamaran Yacht Club	May 11-12, July 28th Kerans Trophy. August 17-24 Catamaran Weeks. September 14-15 Regatta.
Southend Regatta Committee	Southend Regatta.
Downs Sailing Club	June 29-30 Open Meeting.
Benfleet Yacht Club	July 14 Nore Race.
Folkestone Yacht Club	July 13-14 Regatta.
Seasalter Sailing Club	? ? ?
Thorpe Bay Yacht Club	Thorpe Bay Regatta.
Yacht Clubs of Cowes	Cowes Week.
Yacht Clubs of Burnham	Burnham Week.

If interested, please write to : 43, Parkway, Canvey Island, Essex.

Chapman Sands Sailing Club. 300 x Class Catamaran

1. A catamaran is defined as a two-hulled sailing boat with essentially duplicate or mirror image hulls, fixed in parallel positions.
2. Racing in this Class shall be between yachts without time allowance.
3. Sail area is to be not more than 300 square feet, measured in accordance with the R.Y.A. instructions for catamaran sail measurement.
4. The overall length of the catamaran shall not be more than 25 feet measured between perpendiculars through the extremities of the hulls with the catamaran in her normal trim. This measurement is to exclude normally accepted rudders and hangings and is to be taken parallel to the centreline of the craft.
5. The extreme beam shall not be more than 14 feet, measured at right angles to the centreline of the craft at the widest point and including all fixed or adjustable apparatus, with the exception of a normally accepted trapeze.
6. The crew shall be two persons comprising the helmsman and one other.
7. The following are specially not allowed: Hydrofoils or other abnormal apparatus, with the exception of rudders and centre boards or keels fulfilling their normally accepted functions and spray strips or steps fitted above the waterline, being non-adjustable and having a length greater than their width.
8. All hull and rig variation, with the exception of sails and replacement parts, shall be carried on board at all times.

9. Each mainsail shall carry in its upper half, the Class insignia and number in figures not less than 12 inches high.
10. (a) No boat shall race in the Class unless it holds a valid Class Certificate of measurement.
    (b) The certificate is invalidated by change of ownership of the boat, or by structural alteration of the design of the boat.
    (c) To obtain a certificate of measurement, application should be made to the Class Secretary.
11. Application for the issue of a Class number should be made by the owner to the Class Secretary.
12. No two similar names are permitted in the Class and therefore owners are requested to submit two or three names in order of preference and the first which is free will be approved and reserved by the Class Committee.

The following conditions will only be included in the sailing instructions for the International Catamaran Challenge Trophy.

Crew

Two men comprising of the helmsman and one other both of whom shall be nominated before the series start including one alternate. The alternate can be substituted in extreme circumstances with the permission of the race committee. He shall thereafter become the regular member of the crew for the remainder of the series.

Races shall be held on consecutive days, one race per day except that after the first two races have been sailed either yacht may request a layday. After three or more races either yacht may request another lay day.

The courses to be, if possible, triangular, or Olympic and to be laid again if possible to reduce the effect of local knowledge to a minimum. Courses shall not be less than ten nor more than twenty nautical miles in length. The time limit for the first to finish shall be based on an average speed of two knots.

All matters relating to the racing and all other conditions of the match shall be governed by three impartial Judges whose decision shall be final.

TRIMARANS 1962

BY JOHN MORWOOD

This year we are able to present more downright originality in the trimarans we describe than ever before. Last year, it seemed as if the trimaran design was becoming finalised. This year, we are not too sure.

The Main Hulls. The slim hull is still the preferred shape but the continuation of the right angled V up to deck level is shown by

Trident (Robert Harrelson). Dean Kennedy, however, uses a wider hull and smaller floats, those being of slim aerofoil shape.

The Floats. These are now long and of great buoyancy (G. S. Yorke and Arthur Piver) or short and slim (Dean Kennedy, George Dibb and G. Holloway). Short, fat floats are only to be found in J. Sidgewick's small trimaran (where they were not thought to be a success) and Anderson's *Shark.* The method of retraction of the *Shark* floats is very astute and useful, however. Asymmetry of the short thin floats is used by George Dibb, Dean Kennedy and Owen Dumpleton but centreboards, apparently, cannot be avoided. The keel angle of the floats appears to be less than 90° for best sea kindliness and one wonders if the "Sewer Section" would be the ideal.

Trimaran Speeds. Though several claims to speeds greater than that of the *Shearwater* have been made, one feels that so far, the trimaran has not yet clearly shown itself to be equal to the catamaran in speed.

Trimaran Accidents. The accidents to *Nimble Eve* and the *Nugget* should be noted. Both were due to minor defects and human error.

The Tri-Scaph Configuration. This was used by Hugh Barkla and W. J. E. Moorcroft without success. We now have it used by LeRoy Malrose with a claim to speed. We precede this letter by an article on American Ice Yachting because of the obvious analogy, and because it may lead to new ideas.

DAY SAILING TRIMARAN

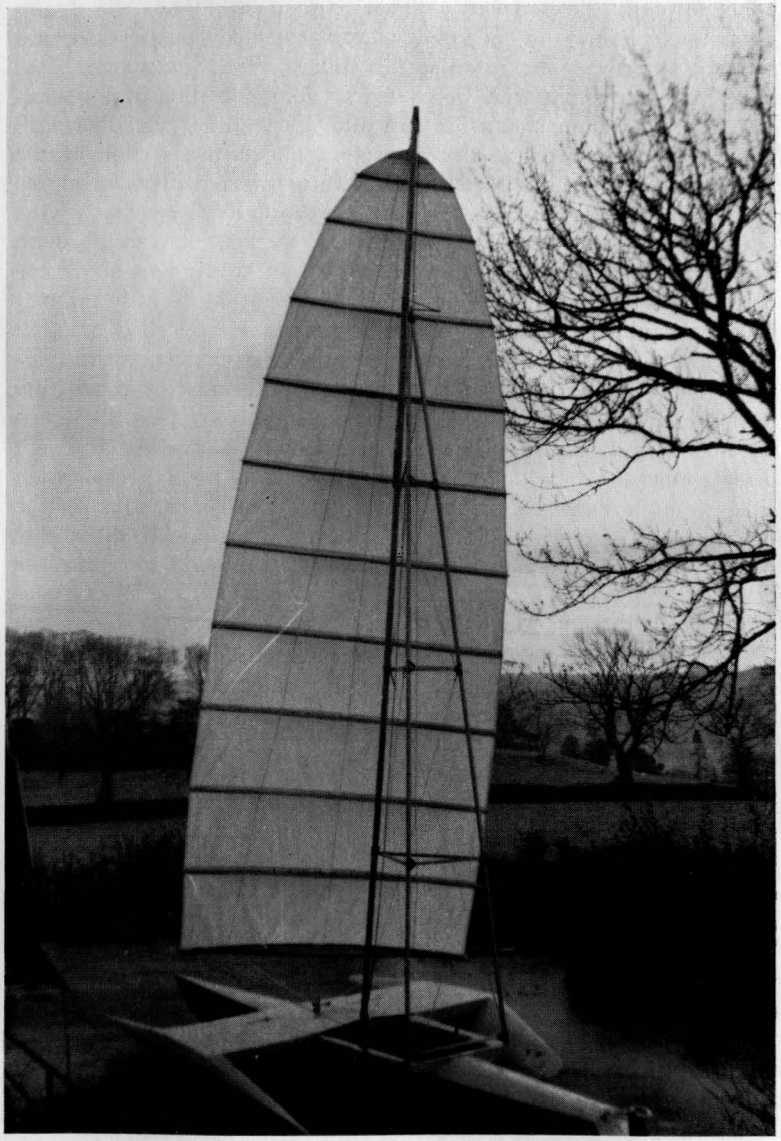
BY GEORGE DIBB

Tremarran, Ivybridge, Devon

Introduction. The intention was to build a "flat-out" two-man outrigger as a base for developing the A.Y.R.S. semi-elliptic square sail, as it was felt that the straddle-stability of such a craft would permit usage of this form of sail with little fear of a knock-down from being taken aback. Efficient underwater form was not to be compromised for economy or ease of construction.

Vital Statistics

Overall Length 21 ft. 6 in.	Draft 8 in.
Water line length 20 ft.	Displacement—hull 650 lb.
Water line beam 1 ft. 6 in.	Displacement—floil 250 lb. with wing clear of water
Overall beam—sailing 12 ft.	Mast height 27 ft. 6 in. from deck
,, ,, —with wings folded for trailing 5 ft.	Sail area 190 sq. ft.
Effective Aspect Ratio 5 : 1	Camber 1 in 9



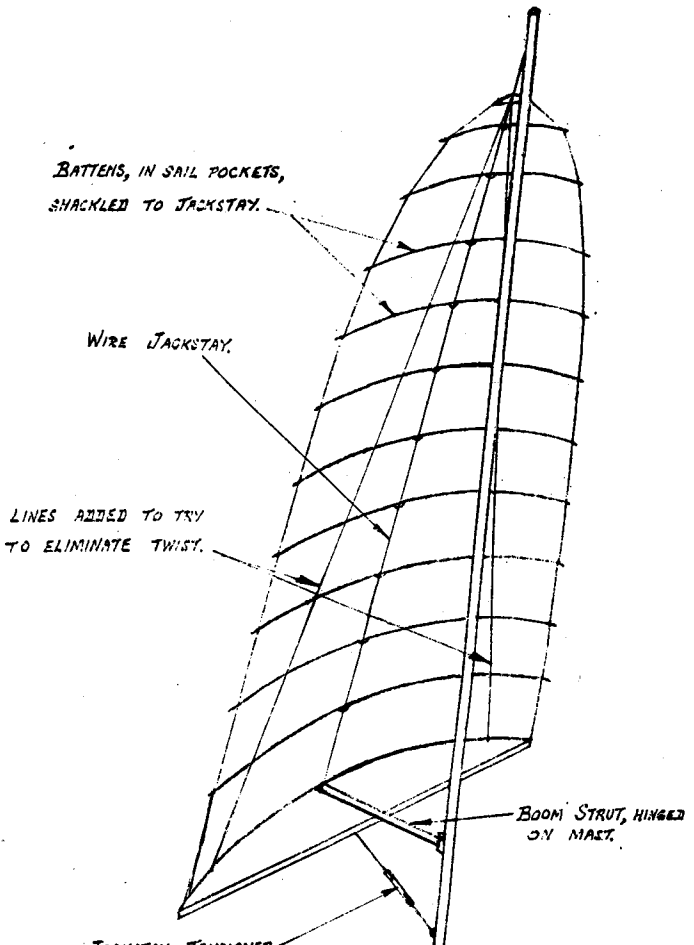
The A.Y.R.S. Sail—George Dibb.

Construction. The hull is built on a Tee-shaped plywood backbone, forming a keeson and a "floor" two inches above the datum water line. Below the floor is filled with expanded polystyrene, and above it is a plywood skin on spruce frames. The underwater form has a very fine entry, with well vee'd sections, blending into a semi-circular mid-section and a flat run aft. The hull is sheathed with glass fibre/epoxy resin to the gunwale. The centre section of the main wing is integral with the hull, with two boxed plywood/spruce beams and a rolled up leading edge. Fore and aft spacing of the beams is 2 ft. 6 in., the main beam carrying the mast step and forming the forward end of the cockpit. A third box beam, 4 ft. above the mast, closes the cockpit, which has rolled down side decks into a foot well. Overall width of this centre section is 4 ft.

The "floils" and outer wings are integral structures, with a plywood outer face, framed to take mating box beams for connection to the main wing and profiled with expanded polystyrene with a glass fibre/epoxy resin sheath. The wings are fully boxed, with an upswept leading edge. Connection to the main wing is by two hinges on each side, through-bolted to the beams, and by two connections on the underside of each wing joint. By removing two quickly detachable pins on each side the floils may be folded, aircraft style, to reduce the overall width to 5 ft. for trailing. With wings folded she looks something like a Praying Mantis!

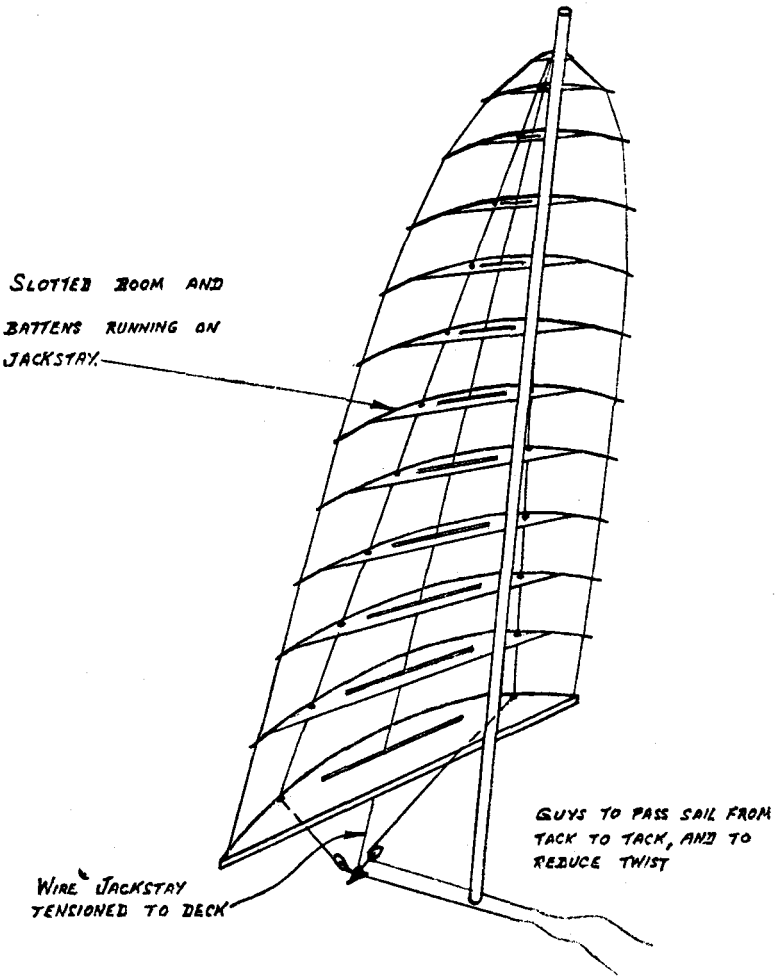
Mast. The hollow spruce mast is stepped on the main beam forward of the cockpit, and is supported by triangulated spruce bi-pods stepped on the ends of the beam abaft the cockpit. This structure was made to fold flat for trailing, by removal of three quick release pins, but in practice it has been found more convenient to transport it in the triangulated state, resting on the main wing and supporting the floils. A welded light alloy mast will be substituted for the wooden structure as soon as it is available. Erection of the mast is very easy and almost a "one-man" job: it is laid on the aft beam and two quick-release pins inserted to hold the feet of the bi-pods. Then it is "walked-up" into place and a third quick-release pin is slipped through the tabernacle on the main beam. It is always under full control and there is no tuning to do, no playing with wires and bottle screws! The bi-pods are not in the way; they give excellent hand holds and are very comfortable to lounge against while steering with the whipstaff type tiller!

Sail. My first attempt to set the square sail, see sketch 1, was with a boxed boom and an integral strut swinging from the fore side of the mast. A wire jackstay from the masthead to the centre of the boom was tensioned by a wire strop and bottle screw from the end



SCHEME ONE.

of the boom strut to the foot of the mast. The sail held curved battens, thirty inches apart, in pockets on the sail, and the centre of each batten was attached to a slide on the wire jackstays. In practice, it proved impossible to set up the jackstay tight enough without giving a nasty whip to the masthead as the sail was passed from tack to tack, and the head of the sail could twist out of line however tightly the halyard

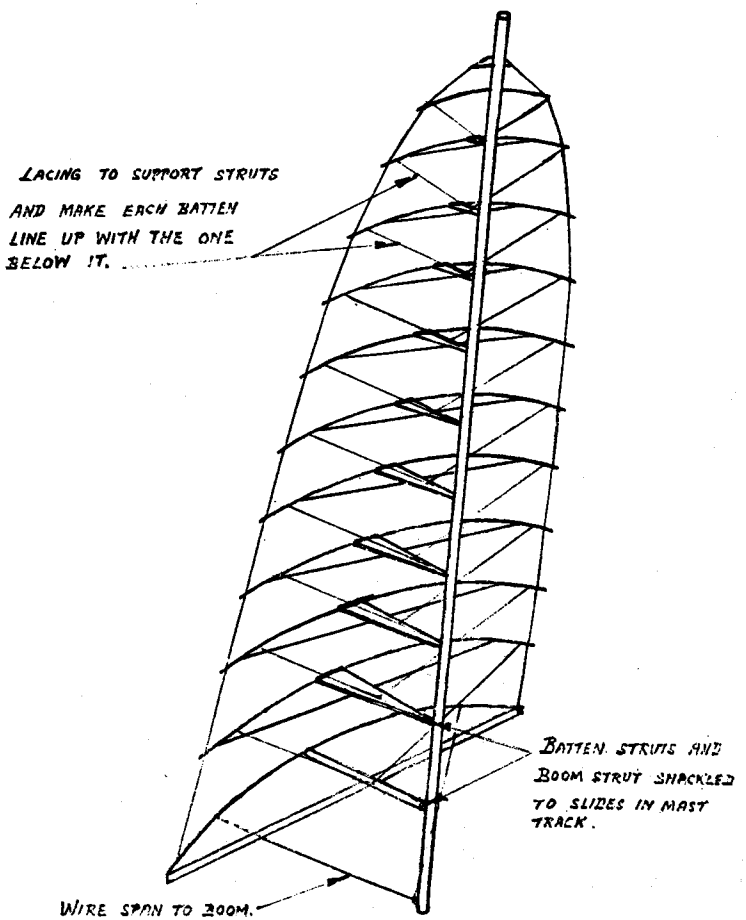


SCHEME TWO.

was set up. Two additional lines from the head of the sail to the ends of the boom did little to remove the twist in the sail, however tightly they were swigged up.

The second arrangement, see sketch 2, was with slotted boom and battens running on a jackstay swigged down hard to a deck fitting. Two lines were taken from the head of the sail, through holes in alignment through the battens and boom, down to swivel blocks on

the jackstay fitting and back to the mast. The graduated slots in the boom and battens allowed the foot of the sail to be brought aft on either tack to bring the C of E back to where it belonged, but, although the two lines could be set up hard enough with the sail amidships to almost eliminate twist, after tacking, it was impossible to set up the aftermost line tight enough due to the bad angle of purchase. The loading on the masthead from the jackstay, plus the sail loads, also



SCHEME THREE.

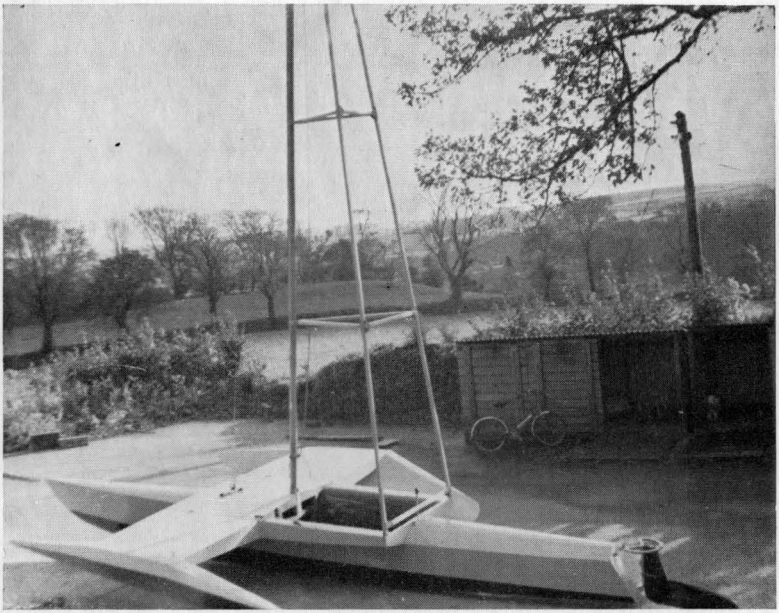
proved too much for the poor pole, and I broke off the top six feet of mast! Back again to the drawing board!

The third and—I hope—final configuration, see sketch 3, seems to have all the answers, but unfortunately our private blizzards have precluded any sailing trials to prove it. On the fore side of the mast is a full length mast track and each batten has a strut from the centre, reaching aft to a slide in the track: the length of the struts are graduated to make the sail take the correct line between the boom and the halyard sheave. The strut of the boom is also mounted on a slide, and the boom is shackled down to the foot of the mast by a wire span. A light terylene line, threaded diagonally, keeps each strut square to the mast track and at the same time makes each batten follow the one below it when the sail is swung from tack to tack, virtually eliminating all twist from the sail. The battens always remain laced to the sail and after removing the halyard and the boom span shackle, the slides can be run off the track and the whole lot taken away for stowage. When lowered, the boom and battens lie stacked up on the wing, and the sail is—of course—always under full control.

Conclusions. The very limited sailing trials carried out so far show considerable promise for this type of sail. I think that it will need a fair amount of practice to use it to the best advantage, particularly regarding the best angle of attack and also the most efficient camber ratio. I believe I have erred on the side of too flat a sail and intend trying battens of various curvatures. So far I have had no trouble in "flicking" the sail from tack to tack, although any delay at the crucial moment and you start a sternboard at a high rate of knots! However, even from "hard astern" she quickly pays off with a reversed rudder and is away again; a quality which gladdened my heart when I once muffed it and saw a horrible concrete wall charging my rudder at about six knots!

The sail is, of course, almost fully balanced and sheet loads are extremely low. Two arrangements have been tried, an endless line from the boom ends—outside everything—like reins, and single lines from the boom ends through swivel blocks on the deck amidships. Both systems work equally well, although the second is neater, and a single-part sheet has proved quite adequate so far for 190 sq. ft. One point that needs watching at first is that you haul in the sheet to spill the wind and pay out to increase the angle of attack, which goes against one's normal reactions, but it is not difficult to remember, and the boat is so stable that a little mental aberration doesn't matter very much!

With the boat itself I am well satisfied: she is light for beach work and compact for trailing. The crew of two can easily do every-



George Dibb's tripod mast.

thing by themselves, and from stopping the car to sailing away can be done in under ten minutes. She is beautifully stable—it is nice to be able to walk aboat "big ship" style—and yet has a nice soft sort of motion. She is very light and responsive to the rudder but holds her course steadily, and the hydro-dynamic floils seem to be quite efficient, holding her up to her course with virtually no leeway without a centre-board. In very light airs she whispers along beautifully, and I believe she will prove to be very fast when the wind really blows. I am now preparing a full set of working drawings, revised in accordance with my experience with the prototype, to include both the square sail and conventional sloop rig as alternatives, and I hope that both versions will be built to get a direct comparison between them.

A MINIATURE TRIMARAN

BY J. SIDGWICK
Leigh Cottage, Freshford, Bath, Somerset

L.O.A. 11 ft. 6 in.
Hull beam 2 ft. 6 in.
Weight of bare hull 40 lbs.
Weight of outrigger beam 21 lbs.

Mast height 14 ft. 6 in.
Freeboard to gunwale 6 in.
Freeboard to coaming 9 in.
Cost of canoe kit £14 10s. 0d.
Weight of float (each) 7 lbs.
Weight of mast, boom rudder, keel 24 lbs.
Weight of total 100 lbs.

The basis of this craft was one of Messrs. Kitboats (now Esa Marine) 11 ft. 6 in. plywood paddling canoe kits. It has a pleasing hull form with hard chines but a rounded bottom and with very little drag.

During construction, strong doubling pieces were added to the gunwale stringer amidships as attachments for the outrigger beam, which consists of a 2 inch thick sandwich of marine ply separated by stringers and webs; the whole making a light, strong, tortionally stiff and buoyant box. It is bolted with four brass bolts to two plywood distance pieces (to hold it clear of the cockpit coaming) and these are similarly bolted to the gunwales.

J. Sidgwick's trimaran.

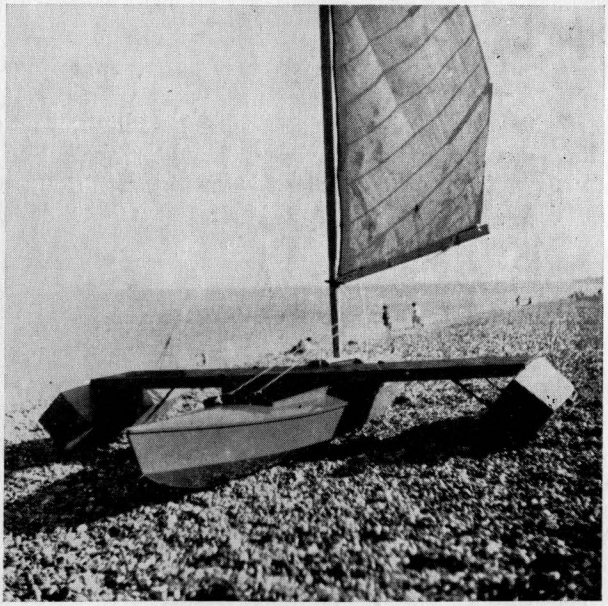
The floats are attached by quickly-detachable fittings to either end of the beam. They are of 10 inch square section mounted on edge to give a 90° V underwater form. They taper to a blunt point forward and have a flat transom. Construction is very simple, of

plywood. Originally, the floats were 4 foot 6 inches long but were subsequently shortened by a foot to make them more easily stowed in a car. This was a mistake; they should have been considerably longer and of smaller section.

Dagger boards were originally fitted, one to each float, inclined inwards at 45° so that they lay flush with the outer lower face of the float. They were of asymmetric section, flat side outward. The intention was that, using the leeward board, a righting moment would be produced.

A single loose-footed mainsail, bought second-hand, was fitted to a simple pole mast. No halliard is used, the sail being set before the mast is stepped. The mast is stepped on the forward point of the canoe's cockpit coaming, beneath which is a plywood bulkhead giving a substantial strongpoint to take the mast thrust. Shrouds go well outboard on the forward edge of the outrigger beam and the forestay goes to the stem. A simple drop rudder is used.

In this configuration she sailed well, being nicely balanced but she was not very fast owing to the very moderate sail area (about 30 square feet). She was not very easy to put about as, being so light, she carries very little way, and the gynastics involved in simultaneously



A miniature trimaran—J. Sidgwick

raising one dagger board and lowering the other were extreme. This year, a single centre-line dagger board has been fitted in a box in the hull and this is much more handy.

A slightly larger sail has now been fitted and in a strong wind she seems quite fast, though this impression is aided by her very small size. In a chop, quite a lot of water comes aboard and in a gust, if one is not careful, the lee float digs in and slews the boat off the wind, though one soon gets used to the onset of this and can avoid it by easing the sheet.

The lessons I have learned in this first essay into design and construction are :—

(1) In a craft of this size, all the righting moment needed can be got by sitting out, and angled asymmetric foils are not worth the bother.

(2) Even a small float gives immense stability due to its distance from the centre-line.

(3) My floats were much too short and fat. They should have been longer and of smaller cross section and with more buoyancy or lift forward.

(4) The open cockpit should preferably be decked in or protected with a canvas cover.

(5) More freeboard is desirable except in sheltered waters.

(6) A very small, light craft, capable of being dismantled and carried on the top of a small car is perfectly feasible.

(7) The planning and construction is just as much fun as the sailing.

If any reader would like further details I would be glad to give them. The craft is now for sale at a very modest price if anyone is interested; the hull by itself is still a paddling canoe for an adult and a child or two children.

TRANS-PACIFIC TRIMARANS

BY ARTHUR PIVER

Three of our local trimarans have cruised a total of some 16,000 deep-sea miles over the past year, and we have added some bits of knowledge as to the behaviour of these craft.

The first trip (to Hawaii) took place last year, when our 35 ft. *Lodestar* 1 (*Lodestar* 56 was launched in San Francisco the other day) and a 24 ft. *Nugget* set sail for the Islands. Both of our boats were home-built—with professional synthetic sails. *Nugget* represented a cost—completely equipped—of $1,000. *Lodestar* cost four times as much.

Start in Company

We began the actual trip (from Southern California) at the same time as forty-two conventional yachts in their biennial race, and because of traffic restrictions at the start, we were a mile or so to leeward when the gun sounded.

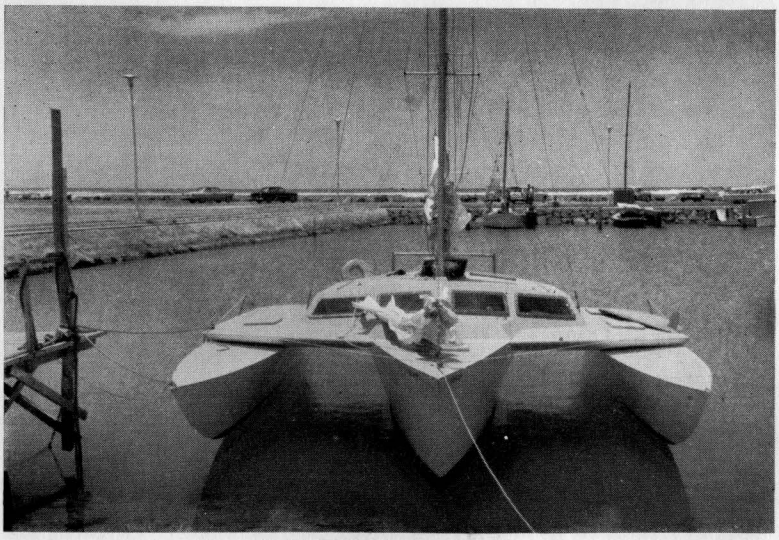
The first twenty-five miles consisted of a beat to windward, and upon arriving at Catalina Island, we discovered we were ahead of a goodly number of the smaller racing machines (28 ft. minimum WL).

For the first three days, the sea was much rougher than the light to moderate amount of wind seemed to justify—so rough that the speed of the cruising boat was reduced to minimize the motion. There were some strong gusts on the first night, however.

With mainsail furled, and under only genoa and mizzen, we averaged 220 miles per day for the three days. This is approximately the average speed for the nine-day, 15-hour record for this passage. This was done with about 200 square feet of sail (as compared with several thousands of feet of down-wind sail on the 98 ft. record-holder.

On the fourth day, when the seas moderated, the mainsail was set. This seemed to be a signal for the wind to stop almost entirely, and for the rest of the trip it remained light and fitful. For one windless four-day period only the genoa (150 ft.) was set.

Lodestar averaged 150 miles per day, taking 15 days for the trip—beating several of the Trans-Pac racing machines.



LODESTAR at Hawaii.

Stability Demonstrated

Nugget was being driven to the utmost by the novice Skipper on the rough first night—resulting in what was at times a wild ride—with the wind free. Toward midnight he noticed that the boat had slowed considerably, was heeling more, and the waves which had formerly washed over the end of the leeward deck were now around the cabin.

He flashed a torch—to discover that the lee deck was entirely under water! Putting about and calling his crew, he found that a deck hatch cover had disappeared, and the lee float was entirely filled with water.

Here was about as perilous a situation as could confront a trimaran—and yet it seemed impossible to capsize it—apparently the wind spilled from the sails as the craft heeled, so that the small amount of buoyancy from the light deck and float structure was itself sufficient. There was also dyanmic lift from the shape of the wing section—which sweeps upwards and forwards. The fact that the under side of the weather float and wing was exposed to the wind was apparently unimportant. Incidentally, even when driven hard, the central hull of this type does *not* rise. In some of these boats, plastic foam is used in parts of the floats—but not in this particular *Nugget.*

The little craft took 20 days for the quiet 2,200-mile passage.

Cruised the Islands

Later the two boats spent some weeks cruising the Hawaiian Group, and the advantage of shallow draft became apparent. We discovered that if the water were not actually brown in colour, we could cruise in any depth. We spent most of the time sailing over the beautiful reefs—rather than being confined to the channels. When we wanted to go ashore we merely ran up on the beach.

Rather than sail *Lodestar* back to the mainland, we decided to leave her at Honolulu, and return in mid-1962 to continue our voyage to the Roaring Forties, where we wanted to find some particularly large following seas in an effort to set a new record for a 24-hour run. As mentioned in the story about our 1960 Trans-Atlantic trip (A.Y.R.S. 34), this should not prove unduly difficult, if favourable conditions were encountered.

Nugget was sold in Hawaii, and her owner returned home to build a larger trimaran.

Return to the Cruise

In May of 1962 we returned to Hawaii—this time three of us on a 30 ft. *Nimble.*

The 17-day, 2,100-mile trip was uneventful, with the first ten days of light and variable winds, and then we encountered the Trades, which blew erratically from ten to 15 knots, although with no regular seas, as the wind kept changing direction.

During the last week we covered 1,100 miles—all down-wind under jib (or genoa) alone. Because of the novice crew, and the fact that the wind was variable, we used no boomed sails, so as to avoid jibing.

The trip was quiet, although on one dark night the wind picked up somewhat, the seas increased, and we found ourselves diving into inky voids at speeds estimated up to 25 knots. This grew hard on the nerves, so we replaced the genoa (which had been set up across the boat before the mast) with the working jib.

We picked up *Lodestar* (three in crew) and continued to Tahiti.

Because of the prohibited Atom Test Zone, we were forced to sail 3,000 miles instead of the usual 2,400. First half of this trip was a close reach—with particularly rough seas.

It was an extremely rugged trip, and the transition from NE Trades to SE Trades was accompanied by five days of unbelievably vicious squalls—sometimes one after another—all day and all night. The wind was always from dead ahead. We did much of our sailing with only jib and mizzen—averaging about 140 miles per day for this leg of the trip.

As an indication of the ease of motion of these boats—even in rigorous seas—we did not even have our stove fastened down on its shelf (*not* recommended). However, it cooked merrily away, and nothing spilled.

The trip from Tahiti to Rarotonga (620 miles) took six days—in an almost endless calm. When light reaching breezes did appear, we were going just as fast as the apparent wind itself.

From there to New Zealand took another 18 days, with variable winds, although perhaps the roughest seas we have ever encountered were found off the New Zealand coast.

On one occasion we hove-to for two days. It was quiet below, but every time we (two in crew) looked out of the hatch, we almost had our ears blown off.

The boat hove-to under just mizzen very nicely—but when we started navigating on the third day—found we had backed up 95 miles! So we lost three days instead of two.

We determined that next time we would anchor to our 24 ft. nylon cargo parachute. This opens under water—looking like a giant jellyfish, and holds the boat (with 100 ft. of $\frac{3}{8}$ in. diam. nylon line) almost like being anchored to the bottom.

In all of our trip so far, we had never had fair winds for a protracted period.

Our last good day's run before reaching New Zealand was 215 miles. This 24-hour period contained: two hours of calm; six hours beating against light head winds; twelve hours under jib alone; four hours under genoa alone. Practically the entire distance was run under jib in a night-long frontal squall—fortunately from astern.

We spent a month in New Zealand—where we were happy to discover over 200 of our designs. Incidentally, this shows the power of the press. The New Zealand yachting magazine, *Sea Spray*, is interested in our developments. Nearby Australia, with five times the population and three yachting magazines (which ignore us), has one-tenth as many of our boats.

We left Auckland in vicious head winds (near East Cape) which at times blew so hard (in squalls) that the entire boat—not just the rigging—but the entire boat vibrated like a taut string. She would continue to go to windward at all times—under jib and mizzen.

We put in at Hawke's Bay, on the 39th parallel—after finding another way to combat high winds and seas. We discovered that *Lodestar* would sail herself to windward under jib alone in strong winds. The crew relaxed below in comfort in the 24 hours it took to go about 100 miles.

Running out of time, the writer had to return home, but *Lodestar* with a new crew (John Daigneault of California and two New Zealanders) was scheduled to leave November 24 for the run East in the Forties.

It is interesting to note that despite light construction and all the rugged conditions *Lodestar* encountered, there were no signs of strain.

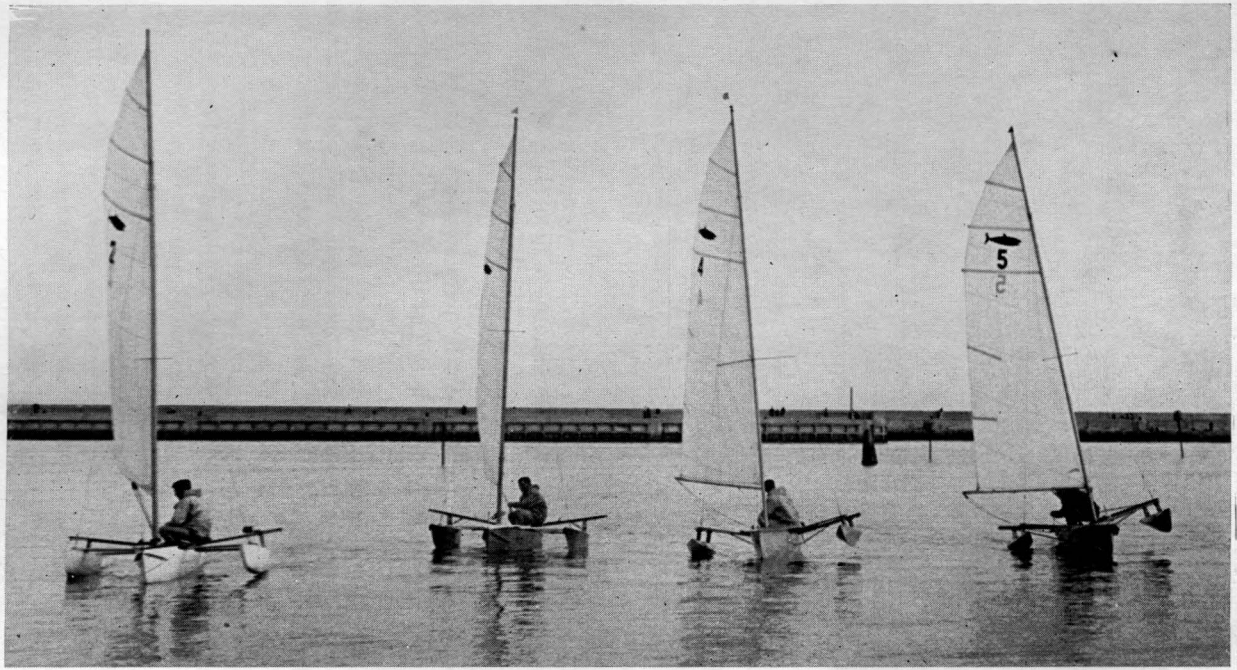
Sole difficulty was with stainless steel rigging—which rusted.

And so, it would seem that we of the A.Y.R.S. have uncovered not only new standards of sailing safety and performance, but indeed —a new—and kindlier—way to look upon the sea itself.

THE SHARK V TRIMARAN

BY R. C. GARRETT
36A Duke Street, Brighton 1

The Shark Trimaran which made its debut in February 1961 at Shoreham in Sussex, was designed by Mr. J. R. Anderson, D.F.C., A.R.AC.S., to be a sailing craft for single handed operation, with all the speed potential and safety features of multi-hulled craft, yet without



Shark V Trimarans.

their disadvantages of wide beams for storage and transportation and lack of manoeuvrability when capsized.

During the past two years, four development craft have been rigorously tested, and these aims have been achieved. At the same time the Shark is a sound proposition for the amateur Builder to construct at home with simple hand tools, and can be an economic design for commercial output.

So far as performance is concerned, Merlin Rockets and Shearwaters have been used as pacemakers and Shark is certainly a match for the former, and is faster than Shearwaters when conditions are such that the floats can be held clear of the water. But true comparisons however, should be made with other single handed craft, and in odd skirmishes with neighbouring *Finns*, Shark has shown them a clean pair of heels, and the surf boarders are nowhere in the running.

Obviously, these are early days and the full potential of this Class will only be realised after further racing and tuning. The Owners Association's Class Rules has sensibly confined the restrictions on dimensions to the length and shape of the hull, the overall beam, maximum weight, and sail plan. Diversions of opinion as to the most efficient design for the floats or stabilizers will best be narrowed down and development proceed more rapidly if the individual constructor is free to experiment.

Having an o/a length of 12 ft. 9 in. and a beam of 8 ft., the Shark carries a single loose-footed reefable mainsail of 115 sq. ft. in area, and with an all up weight not exceeding 180 lbs. in sailing trim, it can be readily appreciated from the drawings that an aspect ratio has been achieved which has not been hitherto attempted.

Add to this the fact that the helmsman can shift his whole weight to the extremities of the aft beam by simply pushing himself out on the seats which slide on tracks on either side of the hull, and it is not hard to imagine that the manner of its progress at speed can produce an exhilaration which far exceeds anything experienced with single hullers.

As the helmsman becomes accustomed to adjusting the trim of his craft by the skilful positioning of his body athwartships, the floats are held ideally just clear of the water, and in effect Shark can be likened to a sailing canoe of hitherto impossible fineness ratio, but with great stability in gusting or high winds. For the lightweights, or in a real blow, the sail can be reefed by rolling up the foot on to the tubular section boom. By a simple adjustment of the loose foot while sailing, the flow of the sail can be adjusted to the optimum according to the prevailing wind strengths.

As far as personal experience is concerned, a capsize has not been incurred, but accidents can happen and demonstrations have shown that Shark is very easily righted single-handed. This is due to the fact that when the mast is horizontal in the water, the submerged float is a powerful righting agent. It is only necessary for the helmsman to promote the initial righting action by standing on the centreboard and leaning outwards while holding on to the uppermost float, and the submerged float will complete the righting operation. As this is taking place the helmsman has only to duck between the hull and the float to regain his position inboard, which can normally be achieved without a wetting. The cockpit is self-draining via the centreboard case slot, as soon as the craft is upright.

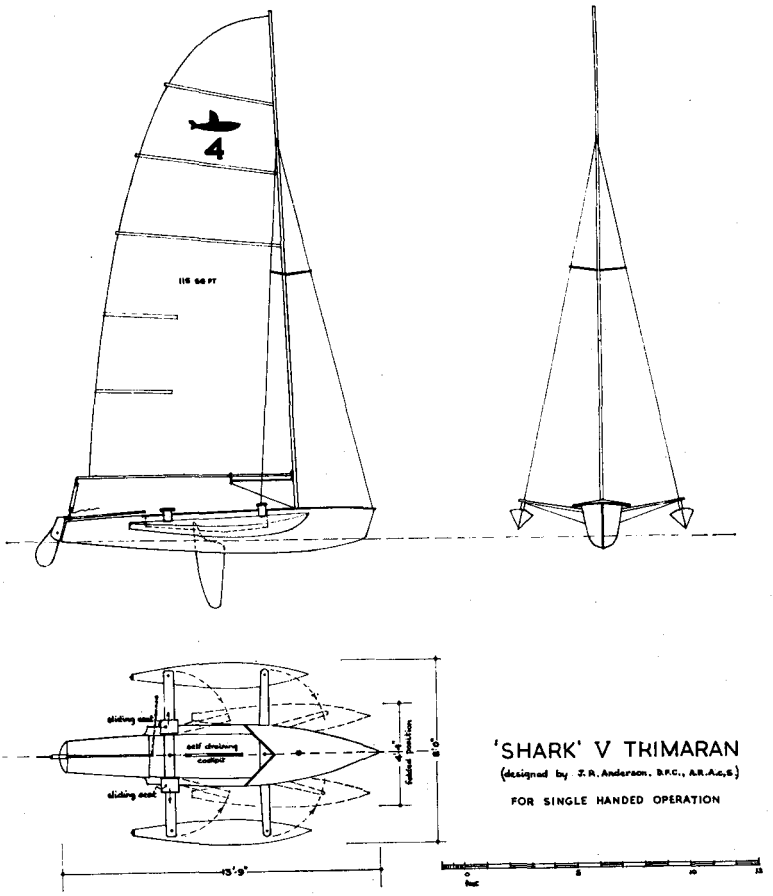
In this connection it will be appreciated that the Catamaran heels with the lee hull in the water and windage on the underside of the large area of cockpit floor and upper hull then takes command. This is not the case with the Shark Trimaran, firstly because of the righting moment from the submerged float, and secondly, there is virtually nothing to provide windage.

The chief disadvantage of any multi-hull boat has no doubt, so far, been due to the difficulty usually experienced in transportation because of the excessive width of beam, and with the ever-increasing popularity of visiting other venues for racing, this aspect was considered to be of such importance that it forms an essential feature of the design.

It can be seen from the drawings that the floats are carried on two outrigger spars each side of the hull, and these are pivoted about one bolt per spar which is located permanently inboard with pivoting attachments at the extremities of the arms to which the posts of the floats are bolted. In the extended position the spars are locked in place by two bolts inboard, and for folding away these two bolts are simply slackened off a turn or two, the operation taking not more than 20 seconds or so.

The resultant package is then compact and light enough to be picked up single-handed and carried on top of an 8 or 10 h.p. car, on a suitably constructed roof rack, and in fact this is the normal method of transportation, and the cost and awkwardness of a trailer is thus eliminated. Furthermore, the designer hooks ropes to his roof rack and simply hoists it complete with the craft and thus slings it to the roof of his garage for storage.

Not least of the attractive feature of the extendable Trimaran configuration is the small amount of space which the home-builder requires for construction. The main hull and floats can be built consecutively and if, for example, the builder is unfortunate in not



having a workshop or garage at his disposal, this need not deter him in any way, since any room having a length of 14 ft. will suffice, and the average window will allow the separate components to be passed through for final assembly to be completed outside in a comparatively short time.

From experience gained over the past two years it has been found that amateur constructors can cope with the U-section bilge of the main hull without any problems since the 3/16 in. plywood skin can be supplied pre-shaped from the designer's press. The resultant hull has all the professionally built appearance of a hot moulded job without the cost involved, and the floats which, so far, have given the best all round performance with a V section, avoid the problems of compound curvature. The shapes and sections of the hull and

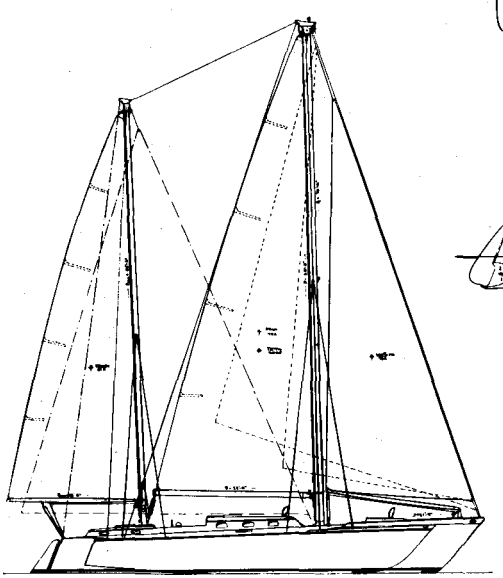
floats are no doubt eminently suitable for commercial production in fibreglass, and such hulls and floats will be available shortly. In the meantime, the overseas home-builder can sheath his plywood with fibreglass for the necessary protection in tropical zones.

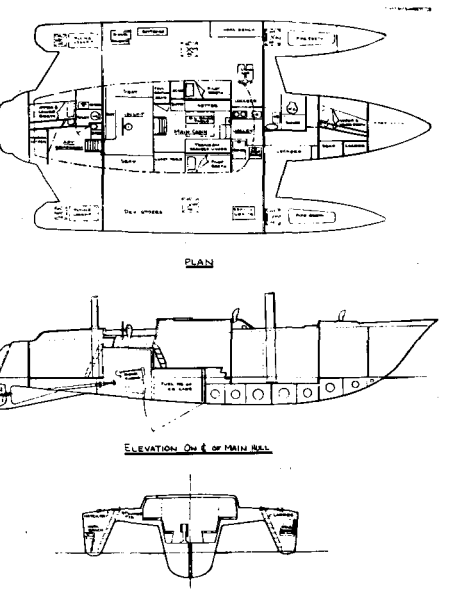
Rigged with a spruce mast it is possible to build the Shark at home for £100 complete with Terylene sail; and a set of drawings and Royalty costs £5 5s. 0d. from the designer. The approximate extra cost for an aluminium mast would be about £10.

In conclusion, it seems significant that there are now three more Sharks being built, and despite the protagonists of the conventional hull forms, there is little doubt that for the novice or older helmsman new to the excitement and sport of solo racing, the Trimaran configuration does supply that added security which is otherwise lacking.

A MACLEAR AND HARRIS TRIMARAN

L.O.A. 60 ft. 10 in.
Length Datum W.L. 53 ft. 9 in.
Beam Extreme 30 ft. 0 in.
Beam Main Hull 10 ft. 0 in.
Beam Pontoons 5 ft. 3 in.
Draft Bd. Up. 4 ft. 6 in.
Draft Bd. Dn 7 ft. 0 in.





McLear & Harris Trimaran.

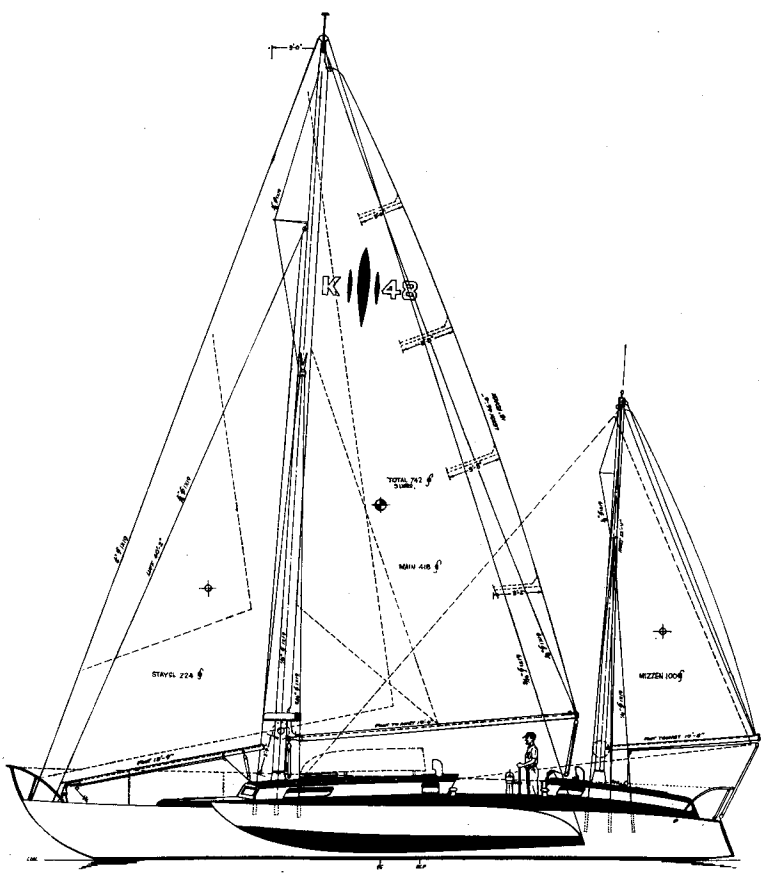
Designers: Maclear and Harris, 366 Madison Avenue, New York, 17, N.Y., U.S.A.

The plan shows the rather nice trimaran design by Frank Maclear and Bob Harris for an Italian yachtsman.

The design looks very pleasant to me with small wetted surface and very ample accommodation. The shallow draft of the floats would give rather violent motion in a small boat, but at this size this is likely to be easy enough.

TA'AROA

L.O.A. 47 ft. 10 in.
Beam extreme 18 ft. 0 in.
Displacement 8/10,000 lbs.
Sail Area 742 sq. ft.



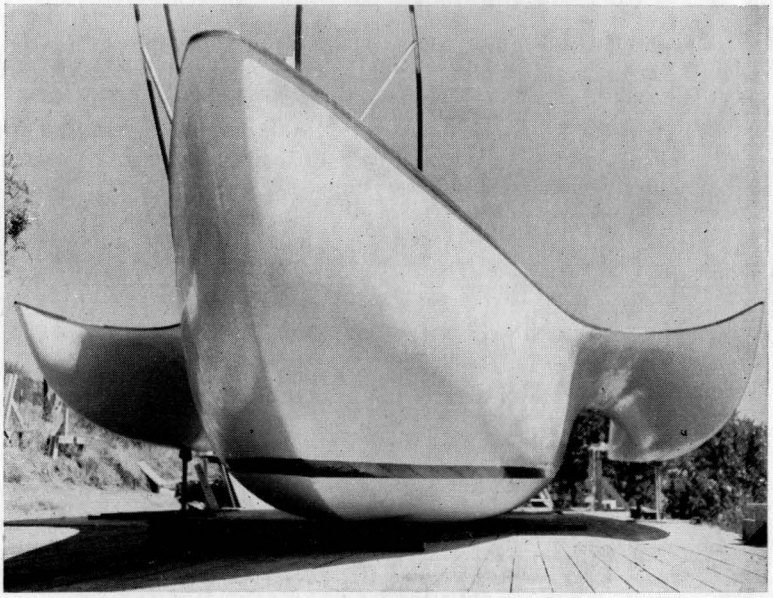
Beam (main hull) 11 ft. 6 in. Float length 25 ft.
Draught 20 in.
Draught with C.B. 6 ft. 4 in.

Designer: Dean Kennedy, 990 Yacht Harbour Dr., San Diego 6, Calif.

Readers will remember Dean Kennedy's *Kolumaran* for its elegant construction and beauty of line. His approach to the trimaran principle is that the main hull shall be wide and fairly beamy, as compared to other designers, and the floats are small and arranged to give the stability curve of a keel boat. They are very short in length, comparatively but they have a large enough length to beam ratio not to hold the boat back.

What strikes one about *Ta'Aroa* is again the Kennedy "touch" of elegant appearance of graceful lines with the dark masts and dark lines picking out sheerlines and coamings.

Ta'Aroa as a Sailing Machine. There is no reason why the system used should be slow. Weight and wetted surface is saved in the floats and added to the main hull, thus giving accommodation. Dave Clewitt's *Trident*, described in a very early A.Y.R.S. publication, won many races with a similar principle many years ago. Perhaps

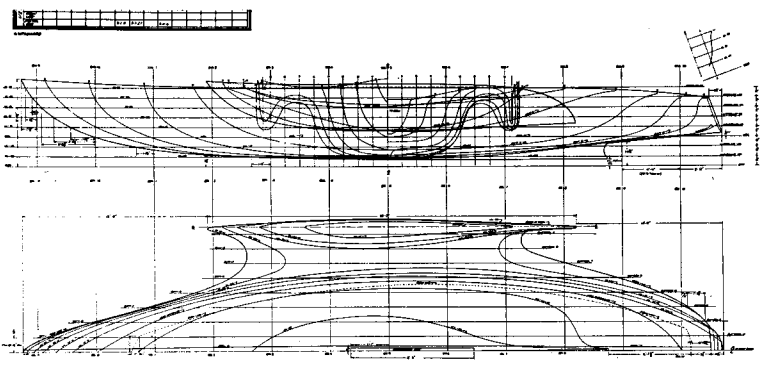


TA'AROA.

the ultimate design will lie in a shape between that of *Ta'Aroa* and that of Arthur Piver.

The designer writes :

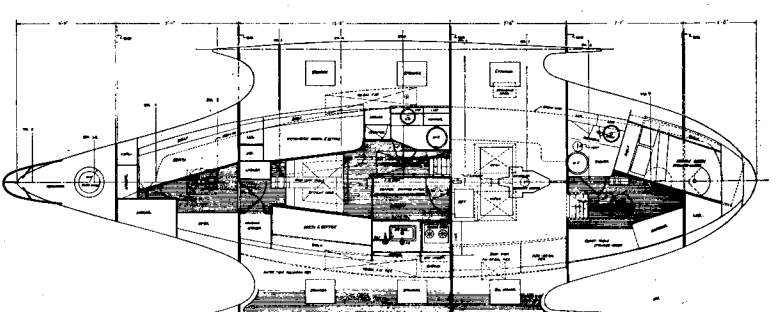
"*Ta'Aroa* is passing her sea trials with flying colours and I expect a great future for this type of design. I have driven the vessel hard on a 40 mile beat in a short steep sea, covering the distance in 3 hours 40 minutes, sometimes reaching 14 m.p.h.



TA'AROA — lines and sections.

"The important thing about this vessel is her stability at sea. There is very little pitch, no roll and no tendency to yaw. The venturi effect between the stabilising hull and the main hull shows the velocity of flow to be 15% greater than on the outboard or lee side. This venturi effect has the added advantage of acting as a calming factor and practically eliminates any lee surge.

"The maximum angle of heel with a 25 knot beam wind is 18°. The highest wind velocity I have sailed in to date is 30 m.p.h. so I



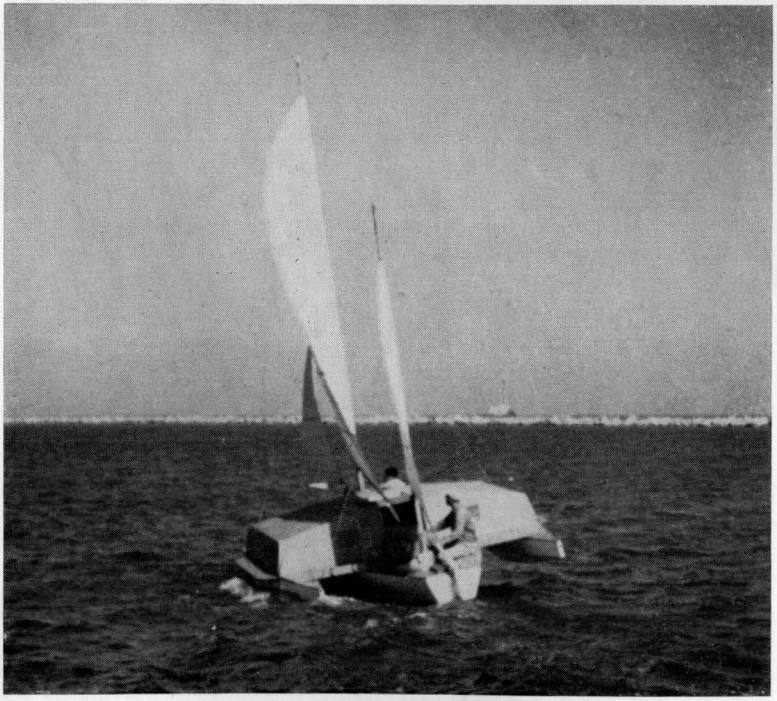
TA'AROA.

cannot attest to any performance figures above this. However, the wing section and stabilising hulls are the limiting factors of the ultimate hull speed. Perhaps I must reiterate that *Ta'Aroa* is designed as a fast cruising yacht and not an out and out racing machine. The design features of this vessel are in the following order: Safety, Comfort and Speed.

"*Ta'Aroa* performs best when the wind pipes up and I believe her to be the fastest hull for her waterline length and wetted area in the world today. I just haven't had the chance to prove it (yet)."

TRIDENT—A CRUISING TRIMARAN

L.O.A. 23 ft.
L.W.L. 21 ft. 6 in.
O.A. beam 13 ft.
Max. Beam Main Hull 7 ft.
W.L. Beam Main Hull 3 ft.+
L.O.A. Floats 18 ft.
Beam Floats 2 ft. 6 in.
Sail Area 246 sq. ft.
Designer: Robert Harrelson, P.O. Box 2293, Corpus Christi, Texas.

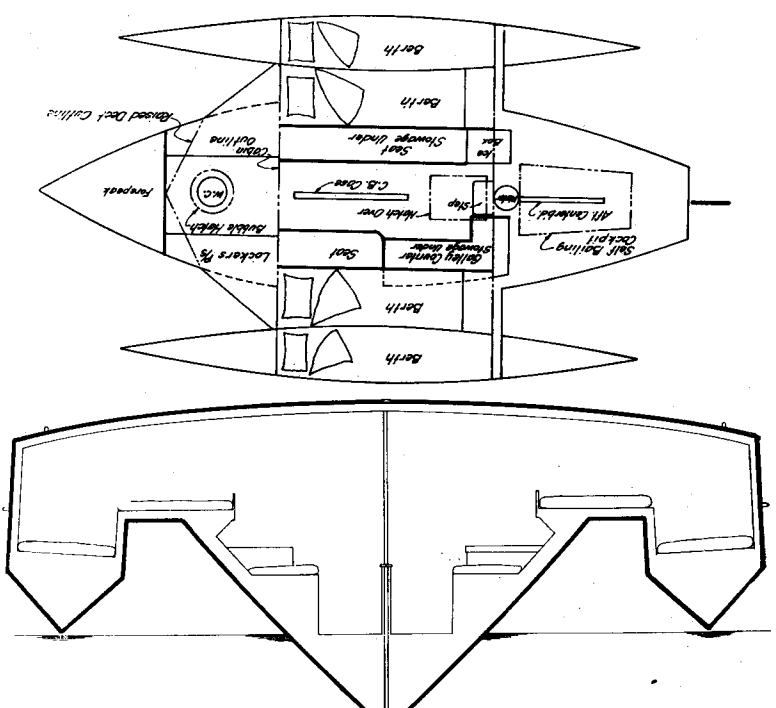


TRIDENT—Robert Harrelson.

The purpose of this design was to provide an able cruiser for a family of four. One that could be handled easily and safely by one man on long passages, that would be inexpensive and easy to build, one that would be fast, comfortable and safe.

The hull form was worked out based on the proven shape of the right angled vee. This is carried all the way out to the deck line giving a midship section shape of a triangle. In order to flatten the lines aft the bottom was evolved into a normal vee bottom with chine for the after six feet. These lines were developed to take plywood planking.

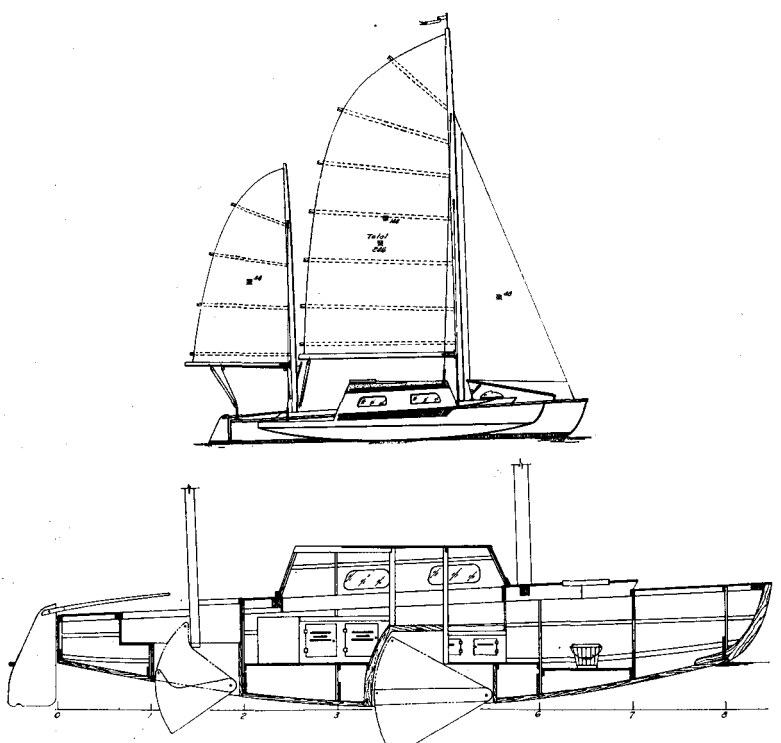
The floats also, were laid out with the right angled vee, but with a chine for the entire length. They were double ended with a flat chine (parallel to the water). In profile the bottom sweeps down from the chine on each end to the maximum depth allowed by the width amidships. The sides were carried straight up from the chine to the underside of the crossarms. These floats were designed to just touch the water line when the boat was at rest. This did not work



TRIDENT—Hull section and plan.

out in pr ctice of course, because the boat heeled one way or the other until the float picked up enough displacement to stop her. Any shift of weight would send her over on the other float. This was found to be a desirable feature under sail, but proved to be rather uncomfortable at a mooring, so the float shape was altered in section to a regular triangle. The profile was not changed except to deepen them somewhat, putting them down in the water a few inches amidships. This gave the added advantage of easing the construction for the amateur builder.

Both the floats and the main hull are planked with $\frac{1}{4}$ in. plywood and covered with fibreglass. A cabin was built over all three hulls and a berth placed in each float, and one over the wing section on each side. This left the entire main hull clear for the other accommodation. She carries a head forward, a seat to port and starboard at the forward end of the cabin, with a table lowered from the overhead



TRIDENT.

to form a dinette. The galley is aft to port with a chart table to starboard. The forward centreboard was tucked beneath the cabin sole in a watertight trunk with a pipe stanchion carrying the pennant up to the cabin top. This stanchion is the only portion of the trunk which is above the floorboards and doubles as a good hand hold.

There is a short bridge deck just aft of the companionway, then a self draining cockpit with the after centreboard under this. These tandem boards, together with the ketch rig, affords easy balance under sail in almost any conditions.

There is ample sitting headroom in the main cabin and sleeping room over the berths. These berths are very easy to get into and out again and are very comfortable.

Storage space is ample with a large forepeak, locker to port and starboard of the head, personal lockers at the foot of each berth, space under the two float berths, under the seats, galley counter, and chart table, and of course, the entire after end of the hull beneath the bridge deck and cockpit.

She was built over a period of four months of spare time labour by two men, at a cost of about 625 dollars. This did not include sails or joiner work.

A collection of rather inefficient home-made sails was used giving an area of some 50 or 60 feet short of the designed rig.

Her performance has exceeded expectations. Even though she was not launched until November, we have sailed her in a variety of wind conditions, both in rough water and smooth, and even managed a short weekend cruise.

In light airs (10 m.p.h.) she was clocked at about 6.5 m.p.h. In a somewhat fresher breeze (18 m.p.h.) she did 12 m.p.h. On the cruise we experienced quite high winds (up to 30 in a couple of squalls) but had no means aboard for checking speed. There was no tendency to bog down nor was the crew uncomfortable. It was unnecessary to hike windward. We just sat tight and went fast.

As to handling, she is rather remarkable. She comes about with a smooth, steady motion and not the slightest hesitation. There is no tendency to get caught in stays. She does this in hard winds or in practically no wind at all. We have pinched her up until she was barely moving and still she comes about handily. She does require a lot of water to manoeuvre in high winds. In a confined area, when the wind pipes up, we drop the main, using the jib, mizzen, and outboard motor.

When being sailed single handed she handles easily. The balance under sail is excellent. There is just a finger touch of weather helm in the lighter airs (with the after board up). In fresher winds this

weather helm becomes stronger but is easily remedied by dropping the after board a bit. She has been sailed close hauled with the tiller tied down and the crew found to their delight, that they were free to move about the boat as they pleased. They made coffee, adjusted telltales, etc. moving from one end of the boat to the other and from side to side. She stayed right on course and sailed beautifully.

The boat points very well considering the sails used, and she has remarkable headreach, not tending to lose her weigh in coming about like so many multi-hulls.

She is comfortable in a three foot slop with little tendency to roll. There is, of course, some up and down motion which is to be expected in so light a hull.

Fore and aft trim seems to have little effect on performance. We sailed with all the crew aft in the cockpit and with them all forward except the helmsman, with about the same results. There is no tendency for the float to bury and almost no turbulence. Very little turbulence was noted from the main hull even with all the crew aft.

In summary, she is a rather fast cruising boat in any weather with good accommodation, very manoeuvrable, comfortable, and seaworthy. Easy to sail and easy to handle. She will make a handy cruiser indeed.

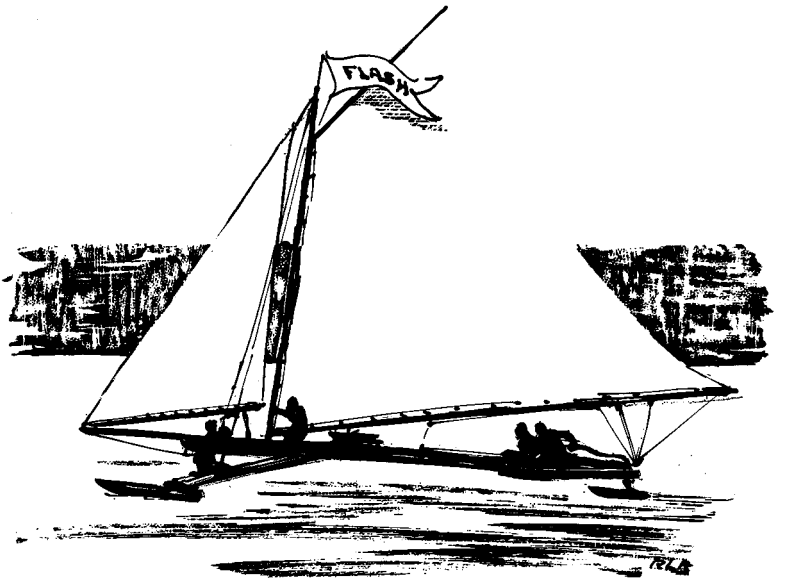
AMERICAN ICE BOATING

BY RICHARD L. ANDREWS
25 Audubon Drive, Ossining, N.Y., U.S.A.

Ice boating is a rather fugitive sport, for the cold winters that bring thick ice, also bring deep snows to cover it. Thus the greatest opportunities for ice boating in the U.S.A. exist along that belt from the Great Lakes to the Atlantic Coast around New York where winter weather is variable, the thaws removing snow and resurfacing the ice.

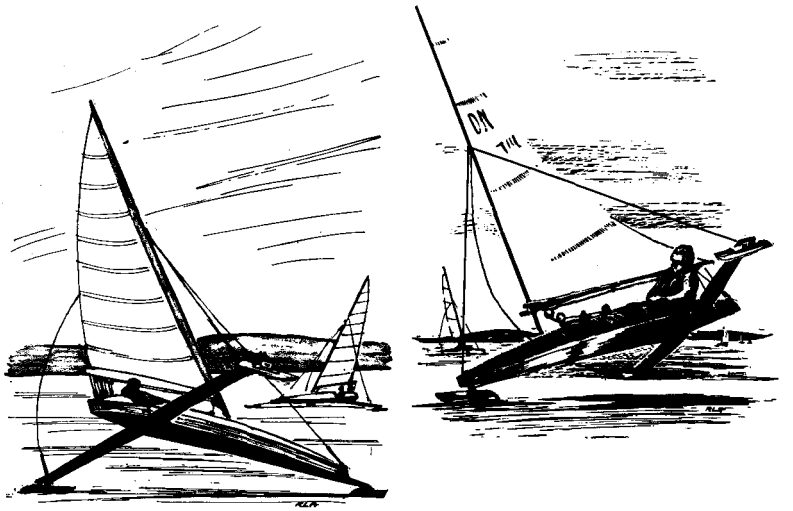
The sport dates back at least to the 1870's when rather large craft outpaced trains along the Hudson River. The *Icicle* was over sixty feet long, and spread more than 1,000 sq. ft. of sail. These boats consisted of a heavy longtitudinal beam over a stout cross plank and a steering runner placed aft. Many were sloop rigged, the jib reducing side pressure on the steering runner, although the lateen with bipod mast was not unknown. Some fine sport was had with these old "stern steerers" and a few remain in use, but they are prone to the "flicker" which is a flat spin resulting when the steering runner lifts from the ice, as tends to happen.

During the '20's and '30's the general advances in sailing aerodynamics led to improvements in ice boat design. The basic "T"



Old type of ice boat.

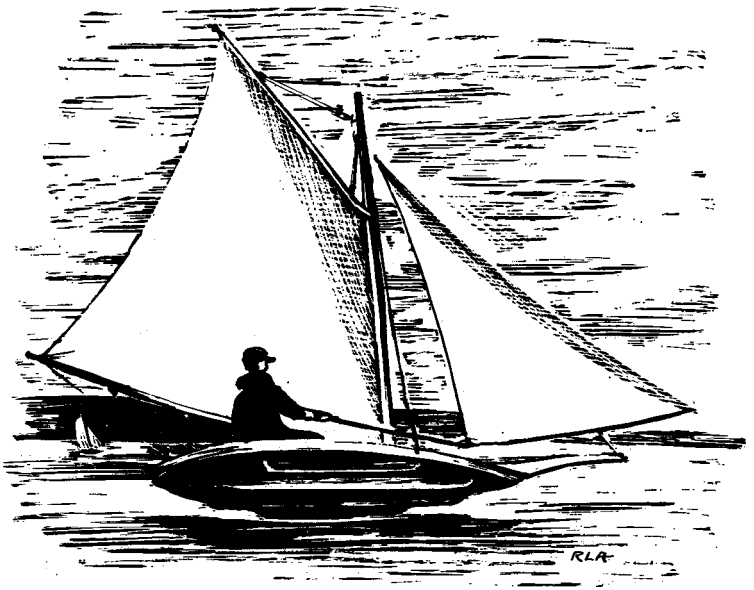
frame of the ice boat was turned around so that the steering runner was forward for better control while the crew weight was placed aft by the cross plank. Many craft were given open cockpit fuselages and somewhat resemble light low-wing planes travelling backwards, and minus the tail surfaces. The single sail is fully battened and masts are rotating and raked sharply so as to keep side pressure off the steering runner. Steering is by cables to an aft-facing tiller or wheel mounted horizontally under the cowling, often supplemented by foot pedals to free the skipper's hands for the sheet. The arrangement of the sheet in the most highly developed single seaters has received very careful attention as this line is the working accelerator of the craft. It is run boot-lace fashion through four blocks on the counter and four just above them on the boom, then along under the boom to a block on the sliding gooseneck, then down to a block on the mast step and then straight back to the hands of the skipper. As the craft gains speed to three or more times the true wind speed, the skipper steadily hauls in on the sheet to bring the boom in *and* down, sometimes almost to his shoulder. Another feature of the rigging is the slackness in the stays, the lee side stay is often very slack and the mast sometimes heels to lee even when all three runners are still on the ice.



E Tpye *Modern ice boats.* *DN*

There are "one design" and development classes as in "soft water" boat sailing. The most popular "one design" type is the *DN*—a very sporty and simple little ship about twelve feet long and with about 65 sq. ft. of sail. The open classes are designated chiefly by sail area, from the grand old river flyers like the *Icicle* in the "A" class down to the elegant little single-seaters of the "E" class limited to not over 75 sq. ft. of sail area. That is no more than the spread of a small dinghy, but the "E" boats today may run over 25 ft. in length with a cross plank as much as 18 ft. long, and a good "E" can break one hundred miles per hour in favourable conditions of wind and ice. The steady development of these craft has included higher aspect ratio plans more sharply raked and a greater span of cross plank as well as a flexible fore plank extending the fore-and-aft span still more. The down thrust of these higher plans is such that many of the older "E's" when fitted with them, have had to be stiffened through the fuselage to take the strain. It has been remarked that the boats with the lower aspect ratio plans are often still quite as fast to windward but cannot keep pace on a reach with the higher rigs.

Various configurations for ice boats have been tried, but the only example remaining popular is the *Scooter*, which has an actual water-tight hull resembling that of a duck punt and is used where salt bays may have weak ice or even open leads. There are two long runners next the keelson and a shorter one near each chine. The sail plan is very generous—reminiscent of an Australian dinghy—



Scooter type—note water tight hull.

with a long main boom and a substantial bow sprit and big jib; moreover the jib is the rudder as the *Scooter* has no steering skate or blade under the hull! One plays the jib sheet to alter course.

Although A.Y.R.S. members will readily grasp the technical principles of ice sailing, it is difficult to convey the experience of sailing these craft. "Riding a hike" (ice boats do not heel) is somewhat like flying a hull in fast catamarans, but the apparent wind force is so much the major driving force that at times the sensation is akin to soaring. One can exceed true wind speed several times over in running broad off, and thus it is futile to run directly down wind; the best course is to go at forty-five degrees to true wind direction. But in a veering and puffy wind it is easy to lose orientation to the true wind direction; one can get the impression that the wind has dropped away, only to see another craft whizz past at fifty per—indicating that one is inadvertently running directly downwind. Putting the craft on a broad reach then brings immediate acceleration. It is uncanny to stand by the ice and watch the boats skim about so much faster than the wind one feels to be blowing on one's face! Or to watch the experienced skippers pick up a good puff and ride it down the ice, controlling a hike like wheeling gulls, bearing off in a press to hold the craft down and gain an extra burst of speed!

SERENDIP TRIMARAN

L.O.A. 18 ft.
B.O.A. 10 ft.
Depth 6 in.
Beam W.L. 14 in. (main hull)
Sail Area 110 sq. ft.
Weight 200 lbs. (approx.)

Floats 12 ft.
11 in. depth

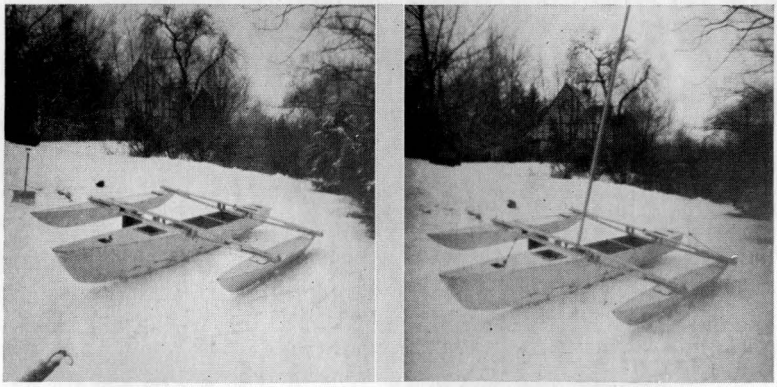
Designer: Richard Andrews, 25 Audubon Drive, Ossining, N.Y.

Design. Main hull is similar to a Cougar hull except for a finer bow and flatter run. The floats have a 60 degree V midsection and sharp ends.

Construction. This is a plywood sharpie with a flat bottom, riding on a glass-skinned foam underwater body—an excellent method for dub shipwrights.

Performance. She has not been raced, but is certainly fast and handy. The floats hardly disturb the water and the bow knifes without spray, but the flat-bottomed transom seems to drag a little water at low speed.

In a 25 m.p.h. wind on the Hudson River here, we deliberately tried to capsize her by laying her broad to the wind, stopped, and then sheeted the sails flat. The lee float submerged a few inches and she stabilized.



SERENDIP—Richard Andrews.

General remarks. This is a "single hull catamaran," stabilized by low buoyancy floats on cross arms. We do not know if her speed can equal that of catamarans of the same length, but intend to find

out after giving the run a little more fullness at the transom (easy to do with this type of construction). It seems to us that the trimaran configuration is open to various interpretations, of which the "three hull catamaran" type may be mandatory in the larger sizes, but we have found no need for it in a small size where crew weight makes so much difference. This craft is frankly designed for solo sailing at speed; we do not believe that a two-man "tri" of this length can be fine enough for catamaran speeds. We hope to learn more about this next season. It will be noted that the decks are missing. They add a good deal of weight, and we are going to try a hiking board. Usually the helmsman has sat very comfortably on the after cross arm, and his guest comfortably relaxed in canoe style, on the cockpit floor.

LETTERS

Dear Sir,

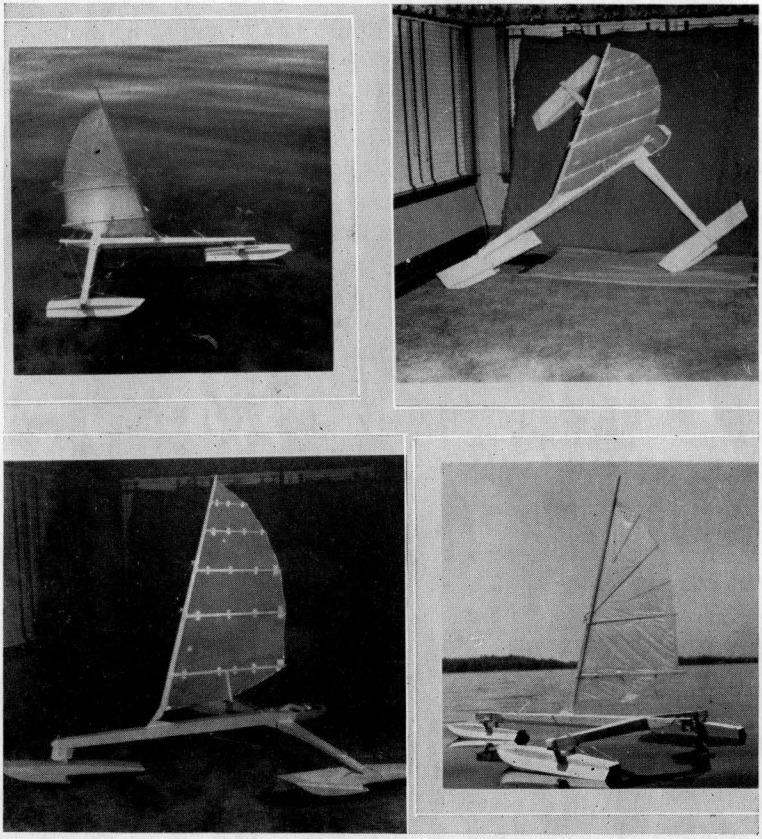
After being interested for many years in the power boat field, especially hydro speedboats, I have changed over to the sailboat field in earnest. I have read and studied everything possible I could find in this field, and am trying to convert the hydro-plane principle to this class, without using the hydro-foil effect.

Models

We have made many models one-third size and tested all manner of shapes of floats and planing surfaces. These models we built were eight feet long and were tested in all weathers, and wind conditions. After many tests, we discovered that until we licked the heeling effect, we couldn't properly test the models as they would never stay on line long enough to judge the proper action; they would head to the weather or fall off when on their own with a tied rudder. We finally used the extended float in relation to the centre line and the three-point contact with the water. This not only corrected the heeling but helped them to stay on line longer. By reducing the area of the front fin it would no longer head to the weather but would go straight. With this delicate adjusting, they would stay on line for a mile or even more. Now we are getting results and speed, together with a reading on the different floats and planing surfaces. These models were doing 15 m.p.h. or more with a good stiff breeze and we had plenty of trouble retrieving them in one piece.

The Full Sized Craft

After these tests had proven the design practical, we decided to build a full-sized boat, three times the size of the model.



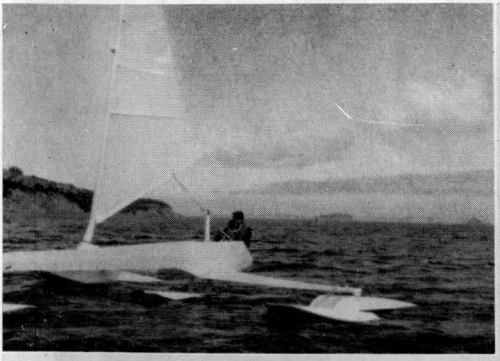
LeRoy Malrose's Triscaph models.

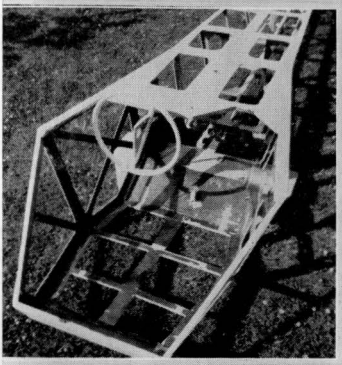
(*New Approach*)

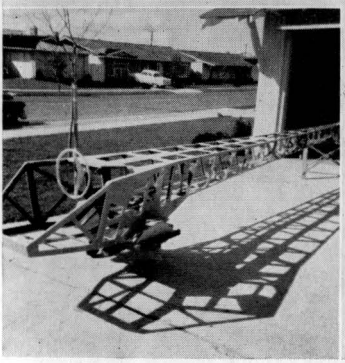
We decided to try the flat bottom float design, as this type of float proved the fastest from our model tests. These had to be changed, because they had too much drag at slow speeds on the larger, heavier boat with the added weight of the pilot. After making these changes we started getting performance, and now we know it does work. I have had many an enjoyable ride in this unusual boat myself; it planes very nicely and seems very easy to drive.

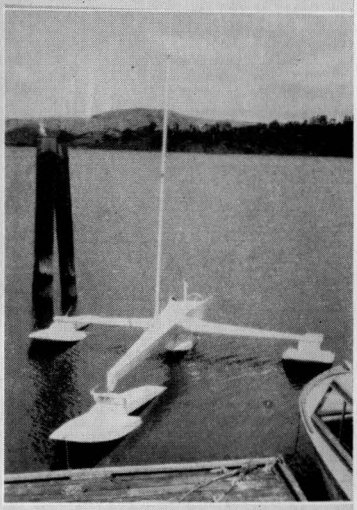
The sail arrangement is semi-automatic. The pilot does not handle any ropes when he is sailing, just sits and steers. You go about by just turning the steering wheel.

The angle of the boom in relation to the wind direction and centre line of the craft is controlled by a special winch. This winch has a









Full sized Triscaph—LeRoy Malrose.

free spool and brake. By releasing the brake you adjust the sail over and under to find that sweet spot, then set the brake.

Every skipper who sailed this craft liked it very much. They all said the same thing. You need a larger sail. We used this small sail because we didn't know exactly what to expect; but one pilot says he did 18 m.p.h. or more in a fair breeze. We have never clocked it, only from a power boat and guessing, as the sail was known to be small. We never had a stiff breeze while testing.

Next spring we will have a new sail and do more testing and we will also have new boats, as we are making some changes from what we learned from the tests we had.

Materials and Dimensions

Length 22 ft., weight with pilot 500 lbs. Sail under 100 sq. ft., span 20 ft. Light frame plywood covered with fibreglass two coats, resin, two coats of epoxy, box spar mast inside halyard and sail track, mast 22 ft. Mast footing spring loaded, free turning, floats hinged free floating with action restricted if float leaves the water entirely. Floats variable V planing surfaces, fins in well; they contain a sheer pin.

Box spar spreader arm, held solid to fusilage with four bolts for removal, has flexing tendency. Front float banks on turns, has little turbulence. I have it patented in 1960.

New Boats on the Board

I have designed five versions of this craft, various sizes drawn to scale ½ inch to foot. Have lofted two full size. We expect to come up with something real good this summer, as we are still studying the movies we had taken of the first model. Could be we are on our way to be producing the fastest boat on the water today. Its potential is showing up in a big way. Who ever heard of a model sailboat doing over 15 m.p.h., unaided for miles, not to mention no hull drag, no rudder drag, or heeling spilling the precious thrust of the wind.

Let me hear from you, make some suggestions. By the way I am tackling the cat next. I haven't heard or read any reports of a real planing cat.

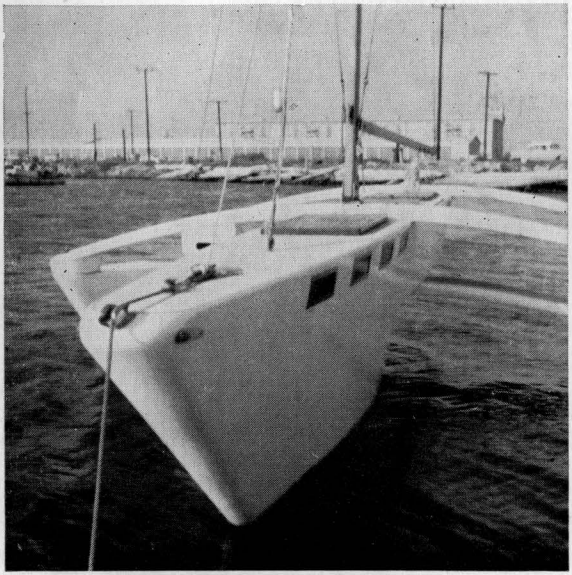
LEROY MALROSE.

10312 E. Estates Drive, Cupertino, California.

Dear Sir,

The pictures of the two trimarans that I sent you are the only and the best. Unfortunately, when one is insane enough to venture forth in an experimental craft of this nature there are very few people besides myself to take pictures. I can, however, give you some pertinent information in regards to both boats.

Mr. Ray's boat, the one with the cabin, was designed with the idea in mind that if hull speed was reached at sufficiently low speed, an equal drag in pounds could be overcome, providing enough sail area was available to cause the craft to run over its bow wave and, in essence, right down the centre of the intersection of the various bow waves. And indeed, this boat might have done so had it not exceeded its design weight by sufficient quantity as to never really get going. I have sailed this boat myself and found that the hulls

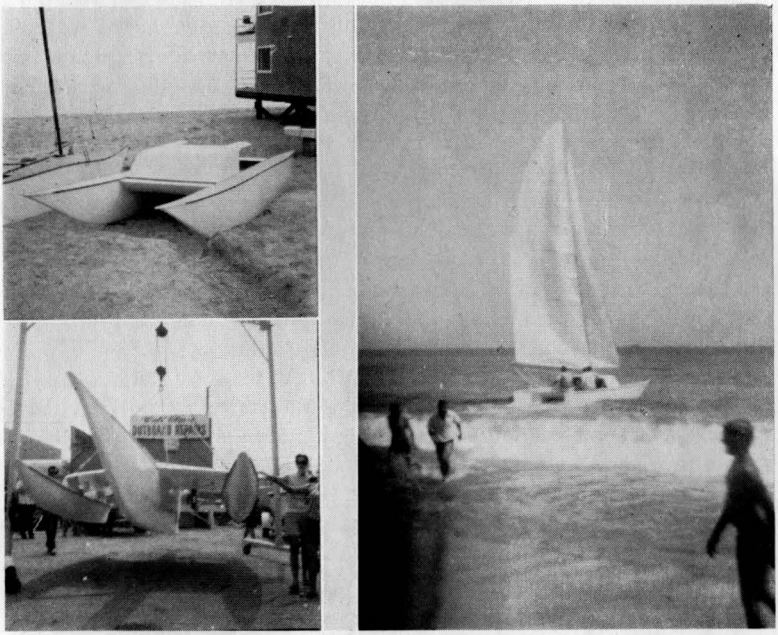


Mr. Ray's trimaran.

did not have enough reserve buoyancy to dampen the wave action. This resulted in a violent rocking motion which spilled air from the sails and prevented headway. This boat was a result of considerable effort, and calculations were made to substantiate the premise. I am sure a lighter variety of this craft would have had much more satisfactory results.

The second boat was built by myself and numerous partners in crime with what was left of a catamaran (see enclosed picture) that was dismasted in the Catalina Channel and virtually pounded to pieces in Santa Monica Harbor. The catamaran was not equipped with any centreboards or plates, but in this variety this hull form came about quite smartly and seemed to sail quite well. Unfortunately,

the maiden voyage, as in many instances, was the last voyage, and not too much data is available. However, having salvaged one hull, the trimaran as previously referred to you went through a number of modifications and evaluations and served quite well the experimental purpose for which it was constructed.



Catamaran into Trimaran—David Tenneson Rich.

As one can see, the hulls are elliptical and quite fine throughout their length. As originally constructed, this boat had an overall beam of nine feet, and would not under any circumstances, even when being pulled by a power boat, exceed eight knots. New arms were added and the distance between hulls changed to almost fifteen feet. At this juncture, the performance was that of a new boat. And it should be noted that considerable resistance will occur with hulls placed too close together—substantiating Hereshoff's opinion that the bow waves must meet in the aft one-third. With a good amount of sail in light airs this craft had no equal, having easily beaten by considerable margin Shearwaters, Pacific Catamarans and many speedy single hulled boats. But upon encountering its first good blow, our aluminium mast was bent double in a matter of minutes. And common sense indicated we should substantially reduce the amount of sail area.

Unfortunately, our light air performance disappeared and the craft also lost its ability to come about smartly. And it was necessary to backwind the jib in order to do so. These difficulties not withstanding, in a stiff wind we experienced many exciting moments. It was noted that at a certain point in acceleration the extreme weather helm due to lack of centreboard disappeared entirely and the boat seemed to lean forward, lose all vibration, all weather helm, and accelerate for extended periods in excess of twenty knots. It is my opinion that this most spectacular performance was due to having run over the bow waves and having exceeded the displacement hull speed, reaching what we locally have come to call "the break away speed."

One further thing should be noted: it appears that the low angle of attack of the bow surfaces creates a wave of small enough amplitude so as to allow the craft to easily run up and over it. My conclusions are that a centre board or leeboards on the pontoons are a must and that the deep, elliptical hull offered too much resistance in coming about, and that a more semi-circular configuration would have offered less resistance not only to coming about but to forward motion as well.

In regards to the pontoons which were semi-circular, I feel that sponsons, or some planing shape in conjunction with a displacement shape, is a good bet for a more efficient pontoon form.

The trimaran constructed by Mr. Ray was given to me in the name of progress, and I intend to modify this craft based on the observations that I have related to you.

Data on Trimaran 2

L.O.A. 22 ft.	L.W.L. 17 ft. 6 in.
Beam 15 ft.	Weight 800 lbs.
Draft 18 in.	Sail Area 350 sq. ft. (reduced to 280 sq. ft).

DAVID TENNESON RICH.
139 Ocean Ave. Extension, Santa Monica, California.

Dear Sir,

Two of us here in Fiji, both ex-New Zealanders, have designed and are building trimarans. One, a 24 footer is finished and sails very well but seems to be too light for the very heavy conditions as experienced in open water.

The other is a heavier cruising trimaran of 28 feet 6 ins. and we have higher hopes for it for comfort if not for speed. We have not followed the Piver idea of the sinking float but have instead always

worked with the idea of greater buoyancy in each float than the full displacement of the boat. This has meant getting floats of the same length as the main hull, 8 feet from the centre line and, in the second boat, of V section.

Being complete amateurs in the field of boat design, we have had our problems, but 20 m.p.h. out of the 24 footer with one reef down is, I feel, quite fast sailing and some credit to us somewhere along the line.

Mr. Taylor of Ratu Kadava Levu School and myself would like to make these points.

1. The size of the floats, by mathematic calculation, must, to gain full advantage of the three hulls, have a greater floatation in each float than the displacement of the whole boat. Then, depending on sail area and wind force on that sail area, extra floatation must be had to allow for the effect of *downward* force on the float from resolved moments acting *sideways* on the sail. See Diagram 1.

2. If the floats are each less than total displacement (W) the fulcrum of this lever system will be at the centre of gravity of the main hull. See Diagram 2. On the other hand, if floatation (F) is greater than W, then the fulcrum of this system will be at centre of gravity of the "down" float. See Diagram 3.

Now, calling W, the weight of whole boat, 3 tons in both cases A and B; d = distance from c of G of float to c of G of main hull (8 ft.). d_1 = length from c of G to c of G of each float (16 ft.) and the negligible weight of float n, we have these two formulae

For case A.

Righting moment = F x d + n x d
= 2 x 8 + 1/20 x 8
= 16.4 F + tons

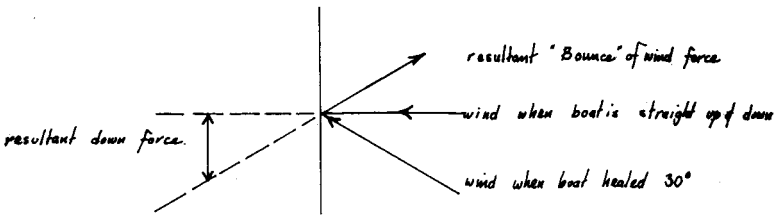
For case B.

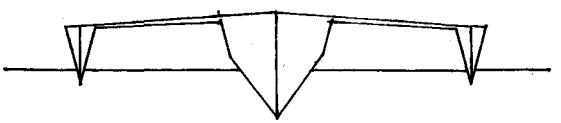
Righting moment = W x d + n x d
= 3 x 8 + 1/20 x 16
= 24.8 F + tons

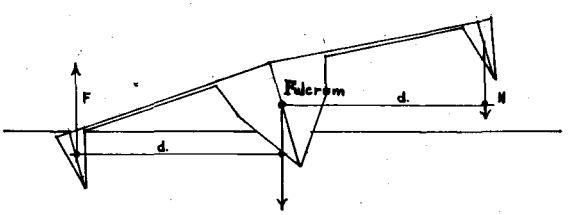
i.e. Case B has an advantage of 8.4 ft. tons over Case A.

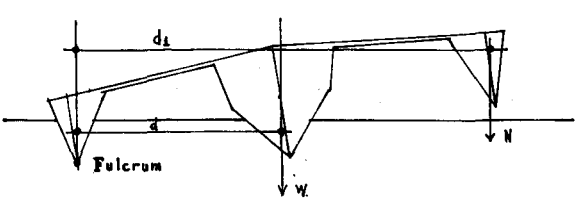
3. The calculation for the finding of force on a sail from a set wind velocity is carried out by the formula in $P = \frac{V^2}{400}$ where P = pressure and V = velocity of wind.

But this does not readily convert to a downward thrust on the float as this will vary with the buoyancy of the float. Less buoyancy, greater downward force. We have allowed a buoyancy in our floats









of another $\frac{1}{3}$ the total displacement and then presume we will shorten sail should the wind exceed 30 m.p.h.

Finally, might I add that we are using the rounded profile on floats and a sectional angle of 50° on the second boat, though 90° was the angle on the first boat.

We are amazed at how closely our design points seem to follow the "ideal" you mention.

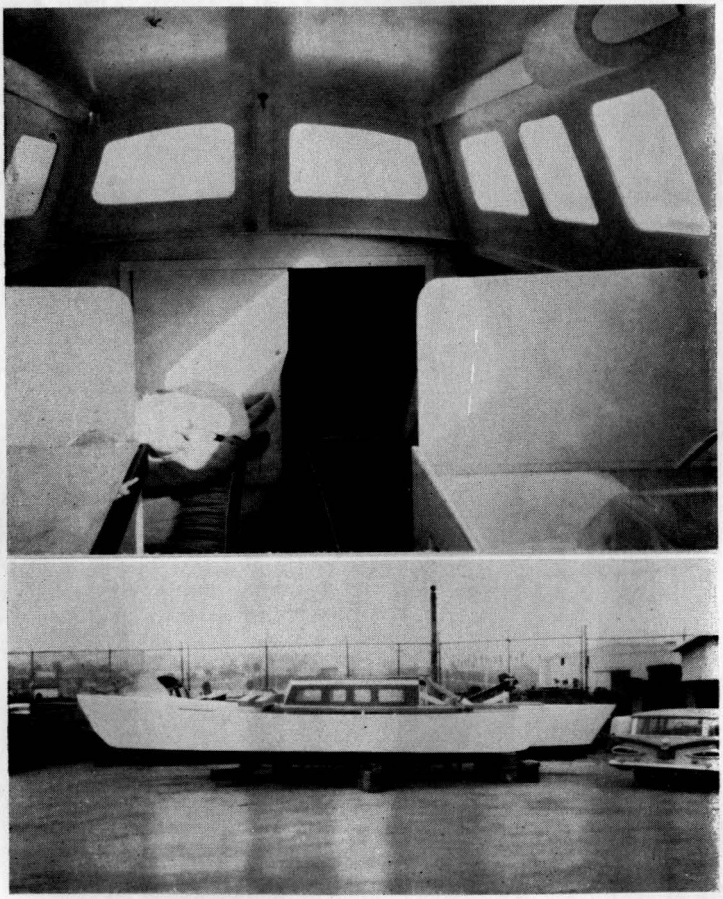
Many thanks and best of luck to all.

GERALD S. YORKE.

c/o Adi Cakoban School, Private Bag, Suva, Fiji.

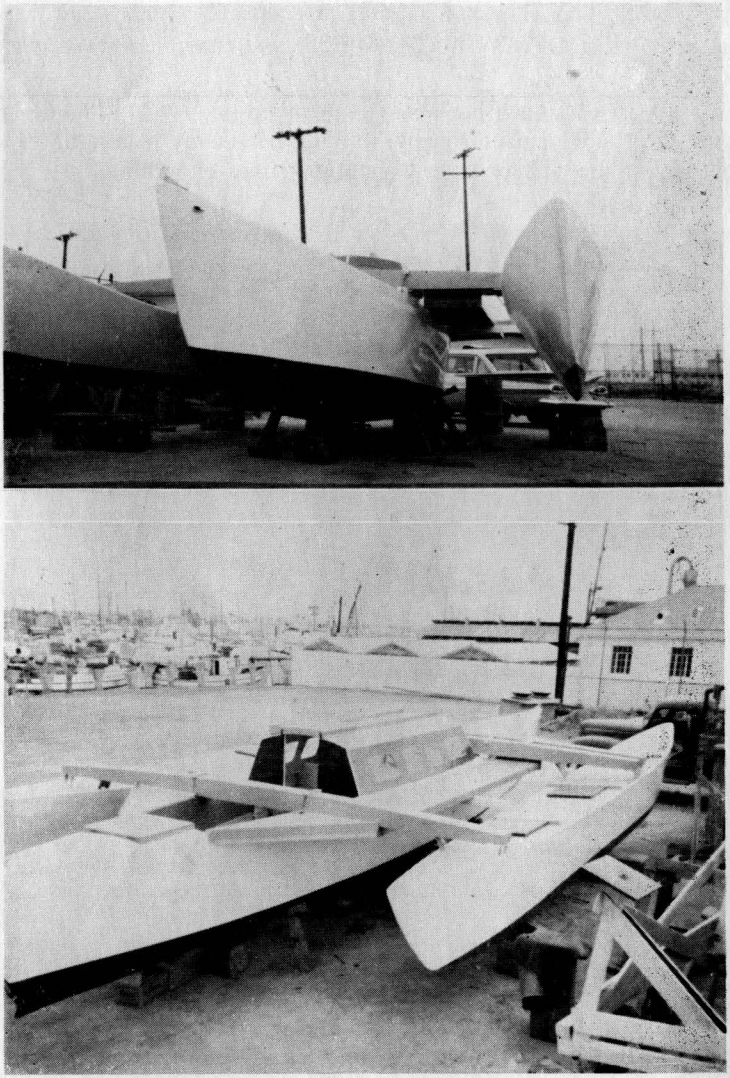
Members may remember Leon Cook's trimaran whose early stages were described in A.Y.R.S. No. 34 (*page* 55). *His latest letter is as follows*
Dear Sir,

I expect to launch her about September 1st, 1962. The design is my own and I am personally building her in my backyard. The photograph shows her state at about the time of writing.



Leon Cook's Trimaran.

The fastest trimarans in this area at the moment are the 28 foot *Leaky Teaky*—a jazzed up Victor Tchetchet design and the 24 foot *Ekalu Pahi* designed by Joe Doebler of Santa Monica and owned



Leon Cook's Trimaran.

by Bruce Embody of Portugese Bend. The latter, while racing against eleven *Pacific Cats* and some *Wildcats* defeated all of them boat for boat.

LEON COOK.

1248, Windover Way, Monterey Park, Calif.

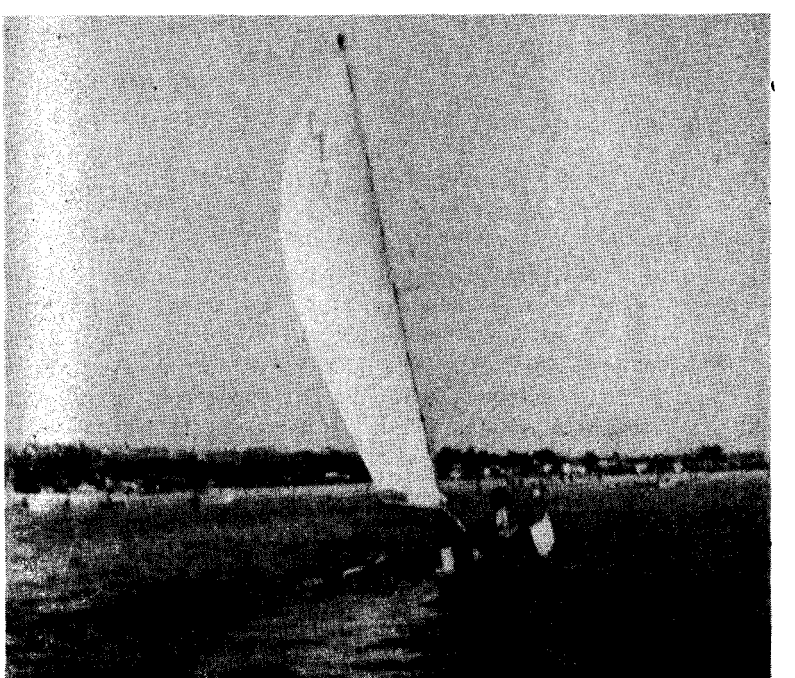
Dear Sir,

Enclosed is a clipping of one of our earlier *Challenger* trimarans going to windward.

The *Challenger* is in many ways a somewhat novel boat. Her 17 ft. round bilge, fibreglass main hull is coupled to two 12 ft. asymmetric, hard chined, plywood outriggers.

The maximum beam on *Challenger* is less than 8 ft., making her trailerable, and ideally situating the leeward outrigger on the main hull's bow wave. This is very important in the trimaran configuration.

However, the greatest achievement of the *Challenger* design is in the use she makes of her asymmetric outriggers. By varying the angle of heel, a *Challenger* will make definite way to *windward* of her steered course. In doing so, she suffers no discernable loss of speed! On the other hand, her windward ability is tremendous. With relative ease we have brought up weather coves which have utterly



G. Holloway's CHALLENGER.

defeated latest model dinghies and one of our own hard chine catamarans.

Sailing in winds of 10 to 12 knots, *Challenger* has approached 16 knots true speed. Wind is all important to this trimaran, for in the light, variable airs of Southern California, we find it difficult to keep the windward outrigger clear—and that is absolutely necessary to the concept of a racing trimaran. When better winds arrive, we have every anticipation that modified *Challengers* will breeze past 20 knots.

Additional note on *Challenger:* the paying off tendency of asymmetric hulls is easily overestimated. When we balanced our sail plans to this paying off, we developed instead a powerful weather helm.

P.S. Michael Maurer, my partner, and myself are now developing an experimental concept which we believe to be so radically new that I cannot disclose details. If tests are at all successful, we will be planning a project to produce a 16 ft. sailing vessel capable of assaulting 40-50 knots. We will probably be in need of financial assistance. Anyone who is at all interested in owning the fastest sailing vessel in the world, *cheap*, is invited to inquire. Greg Holloway, P.O. Box 57, Del Mar, California.

G. HOLLOWAY.

Open letter to Cox Marine Ltd., written within 2 days of the loss of the Nimble Eve *off Dungeness on August 6th* 1962

Dear S/Ldr. Clarke,

I am very sorry to be writing this letter which is not intended to be an apology nor is it making excuses, but I thought that you would like a factual account of what happened.

On Sunday we had an uneventful sail to Ramsgate where we lay at moorings for the night. On Monday we set out early, the weather forecast was good and we intended either going to Newhaven or make a passage through for the Solent. When the wind failed off Folkestone we kept on under motor in order to make Dungeness before the tide turned so that the reverse tides on the far side of the point would take us on. The midday forecast mentioned force 6 winds so we felt confident of making Newhaven in good time before the tide turned again and we would either go on or spend the night there depending on the wind and what speed we could make over the ground. We were past St. Leonards, 10 miles from Beachy Head, when the 6 o'clock forecast said the winds would strengthen later to force 6 or 7 with the possibility of gusts to 8, the wind veering

West and North. The wind at this time was South at about force 4-5 and we were making 5-6 knots and were intending to shelter at Newhaven. In less than an hour the wind strengthened from the South South West and I took about 2 reefs in the mainsail which did not reduce her speed but made her much easier to handle; we were now close to Beachy Head when the wind increased and swung South West. I took down the jib and she continued at about 6 knots. Rather than head out past Beachy Head and get onto a lee shore at Newhaven, I decided to shelter behind the headland and ride out the gale off Eastbourne. I shortened sail again until there was only about 8 feet up the mast and 5 feet along the boom. All the time *Nimble Eve* behaved superbly.

The wind was now increasing from the South West and the seas were possibly 10 ft. high. We sailed her round onto the other tack as we were only ½ mile from the beach, and we decided to sail off and back while waiting for the wind to go round to the West when we would have good shelter; the wind and sea continued to increase and we were sailing into the gale meeting the seas on the starboard bow where *Nimble Eve* seemed happiest. We had sandwiches and tea and prepared for a long night.

We stood out for about an hour and then headed back for Eastbourne which was well lit up by now. The wind continued to rise in strength but refused to shift West; there was apparently no shelter at Eastbourne, and if the wind remained in the South West we would be on a lee shore so I decided to head for the open sea. We put about off the pier and headed South East.

We caught one bad sea at this time. It broke as we were riding over it, throwing the windward float upward; there was a second wave just behind that bumped in under the starboard wing with a nasty bang—this was probably the start of the trouble. We sailed off the shore keeping wind and sea 1 to 1½ points forward of the beam. *Nimble Eve* behaved beautifully surfing down the backs of the waves and riding over the crests and answering the helm well. She gave us all great confidence. The cabinlights lit up the sea for 30-40 yards so that one could meet the seas as they came. The wind slowly veered Westward and we sailed a course which slowly turned South. In spite of the seas and wind the crew were terrific and cocoa or tea came up every hour. We hoped to get some shelter behind the Royal Sovereign Sands but unfortunately although the seas were not so high they were more confused and the occasional meeting of a number of waves gave the wing fairing on the starboard side several more bumps. About midnight I saw it float away astern (most of our clothing with it!). However, I was not particularly concerned at the

time because a good look around indicated that there had been no other damage to hull or float. The occasional sea that came up under the wing when a number of waves met now banged under the bunk and at about 0100 they broke through in the area aft of the starboard bunk removing most of the kits stowed there. The crew fixed the chartboard over the hole which stopped the seas coming in, the bilges were virtually dry and the cockpit probably required 4 pump strokes an hour. Incidentally I see the reason for the wider stern, the odd wave that came at right angles to the rest would come to within 9 inches of the cockpit top: those that did break over could be pumped out in no time at all—we had good pumps, crew and boat. At about 0230 the wind was stronger still—I didn't think it was possible but the local coastguards said it was gusting to near Force 10! *Nimble Eve* remained in fine form riding the waves so well that tea was still being made—one hand on the kettle, one hand to hold on.

We were now heading South with the wind due West and we had got into the main shipping lanes, so I decided to head North again. I gybed her round without much trouble as the waves were not breaking at that particular moment (I had to wait ½ an hour). She went on the other tack O.K. and than I saw the starboard float was awash so I put her about again and had a look. She was full of water. I bailed her out in 2 minutes with a bucket and had a good look but could see no hole anywhere. Thinking about it afterwards I can only imagine that the hole for the water and calor gas pipes was large enough to let the float fill in 5 minutes. There was no sign of damage where the fairing had come off so this is the only way I can guess the water got in. (Mr. Leaf had not remembered the large hole cut in the forward part of the float by the water tank for reaching the chain plates). The seas were very large and I never saw the tops of most of them until we were over the crest. To give you some idea of size I could see the lights of a ship while I counted 5 and then only waves while I counted 15, which indicates 25 ft. to me. The waves which broke at the crests were hammering under the bunk so I turned to run down for shelter behind Dungeness. We went along at a fantastic speed—*Nimble Eve* responding beautifully to the helm, surfing down the waves. Unfortunately they were so steep at the top that they tended to come up under the wing and in under the bunk. I turned South again not wanting to lose the port wing fairing as well. I bailed out the starboard float again but unfortunately the forward part appeared to have taken some water too though I am not certain of this.

We were now in quite a fix: if we went South towards France and the wind veered North as predicted we would be on a lee shore again

with no way of going about. We tried heading straight into the wind but the bumps got worse and it seemed she was only happy sailing so there was not much use thinking about sea anchors. A steady stream of bits of wood were coming away from under the starboard wing, so reluctantly we decided to get help while we were still able to sail. We sailed towards one ship and lit a flare, but she did not see us. Then we sailed on a collision course with another vessel until we were only a mile away when we lit flares and used our torch. They saw us and stopped. We hauled down the sail as the whole starboard float was now awash. We all sat on the port side to stop her turning over as the wind and waves caught her. The time was about 0430 and the waves were getting worse with more breaking crests. We had the dinghy lashed down on the port float upside down: it dissolved in about 5 waves which broke over us.

Morale was high but we realised there was the danger of getting too tired and letting go so we were most anxious to get picked up. The East German ship Erfurt stood by about a mile away for two hours and then came much closer to have a look at us. The main hull and starboard float were full and awash so they obviously thought the boat might sink soon and set about coming alongside. This was the first time I was really worried as the seas were higher than the mast and the crests were being blown off in our faces (most unpleasant!). We were all wearing life jackets and oilskins, but we were exceedingly cold. The helmsman of the Erfurt did a wonderful job coming alongside the port float. The bow passed about 6 ft. off and they threw us lines. We made one fast but it promptly broke and they passed us at about 1 knot—the wind carrying her stern down onto us. This snapped off the bow of the port float where the main spar is connected, leaving us with all the decks awash as the rest of the float filled immediately.

So now we were much worse off than before with exposure a real problem to face. They tried again, but passed too far off, although what they could have done I don't know as launching a boat might have been possible but getting it back would have been almost as difficult as picking us up. They were getting ready for another pass when the Dungeness lifeboat came up. Boy, were we thankful! The lifeboat crew were wonderful, and we all seem to have survived very well indeed. The press, needless to say, were onto us and succeeded in twisting the odd statement we made into some wonderful hair raising tales.

So much for what happened. I know that the reports in the papers may damage your business so if this letter is any use to you please use it how you like. We would never consider getting any

other boat than *Nimble* again, and when we have recovered from this experience we would like to start discussing our next *Nimble.*

Three things I think can be improved; two of them have already been done.

1. Strengthen and raise the fairing under the wing.
2. Increase the beam of the stern.
3. Make the floats independent watertight units and fill the forward compartment with foam.

We all think *Nimble Eve* put up a wonderful performance.

Thank you very much,

All the best,

ROBIN LEAF.

NOTE. *Nimble Eve* was the first Piver-designed trimaran to be built in the U.K. Launched at Great Yarmouth on December 1st, 1961 she was sailed continuously on demonstration trips throughout the very bad winter of 1961-62. She was an early version and all modifications mentioned by Mr. Leaf were already incorporated in later models. In spite of her damage she survived the above storm and drifted ashore at Andresselles, France two days later.

During demonstration trips *Nimble Eve* sailed through 7 major gales—coastguards recorded the highest windspeed as 50 to 60 m.p.h. On one occasion she reached a speed of 25 knots when running before a severe squall unreefed. Highest recorded windspeed when close-hauled and unreefed: 43 knots—the speedometer reading 14 m.p.h. at the time. *Nimble Eve* made nearly 60 demonstration trips altogether. She was responsible for selling about 40 trimarans.

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Photograph by courtesy of "Lilliput" magazine

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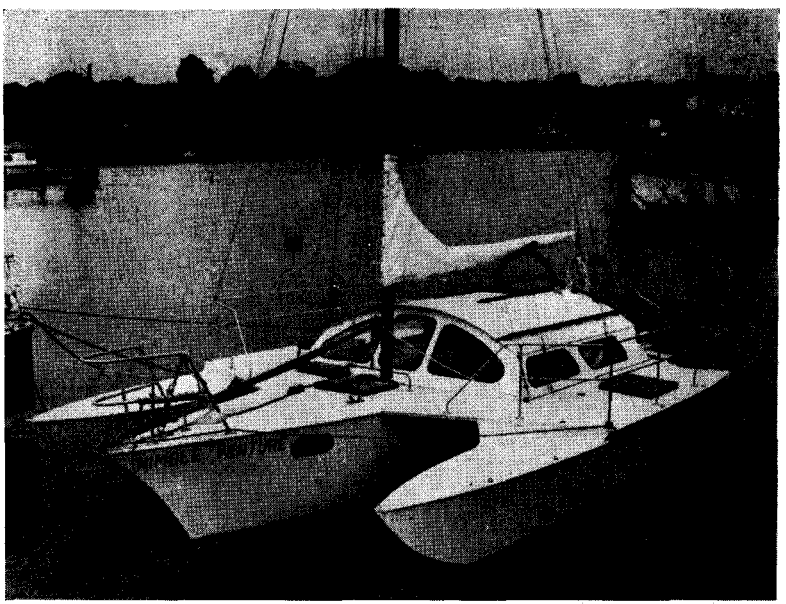

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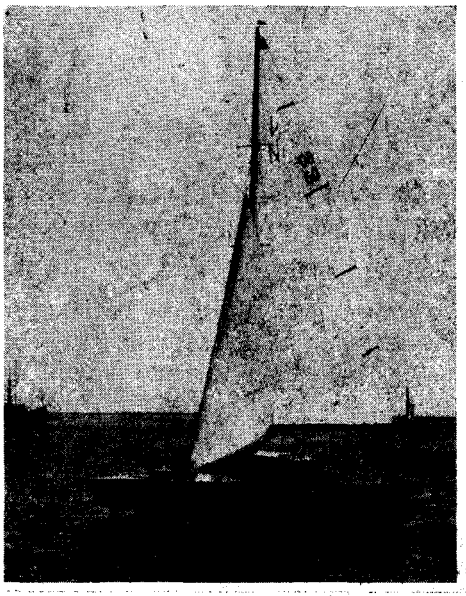

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