

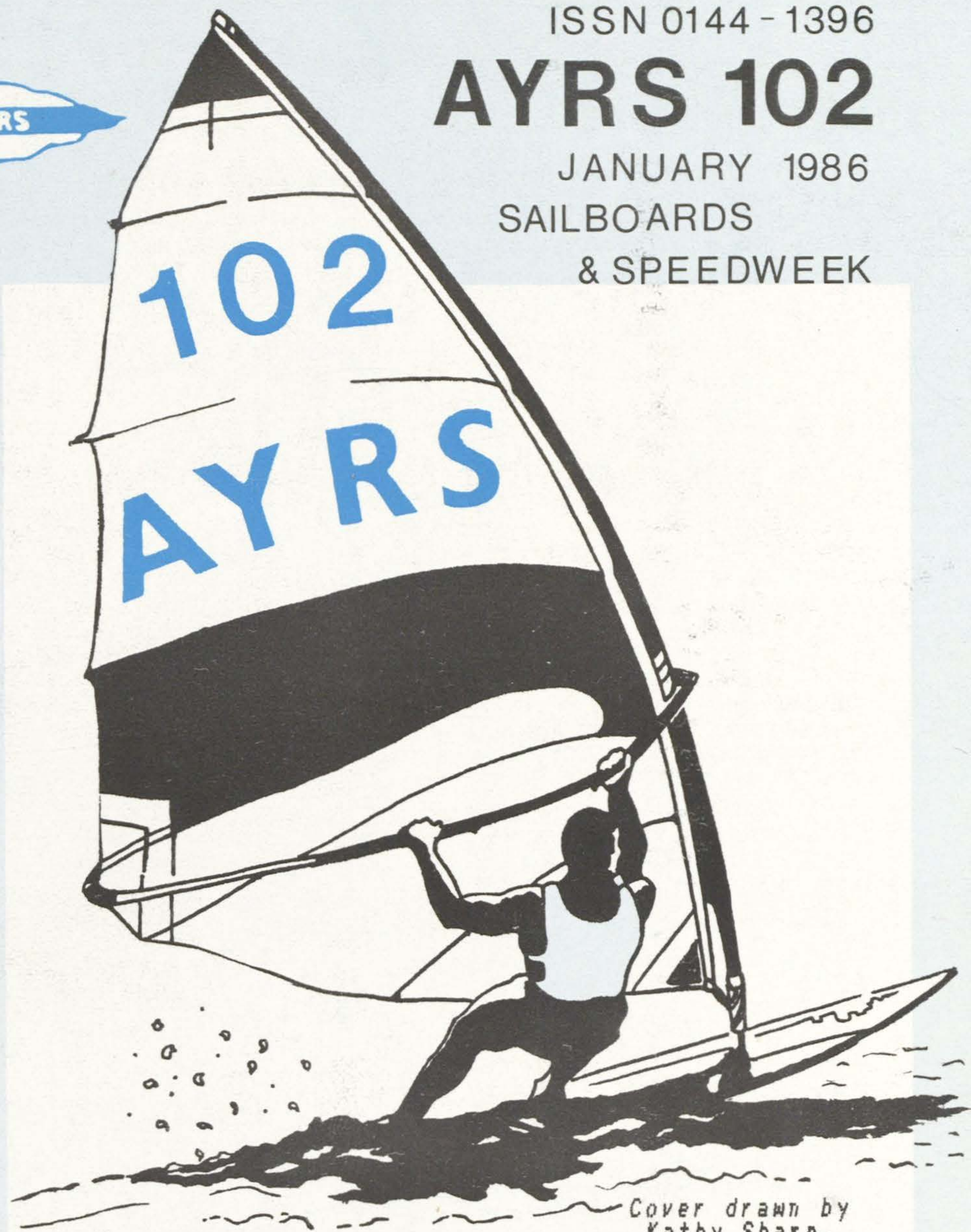


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AYRS 102

JANUARY 1986

SAILBOARDS
& SPEEDWEEK



Cover drawn by
Kathy Sharp.

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ADMINISTRATOR
Michael Ellison,
10 Boringdon Terrace,
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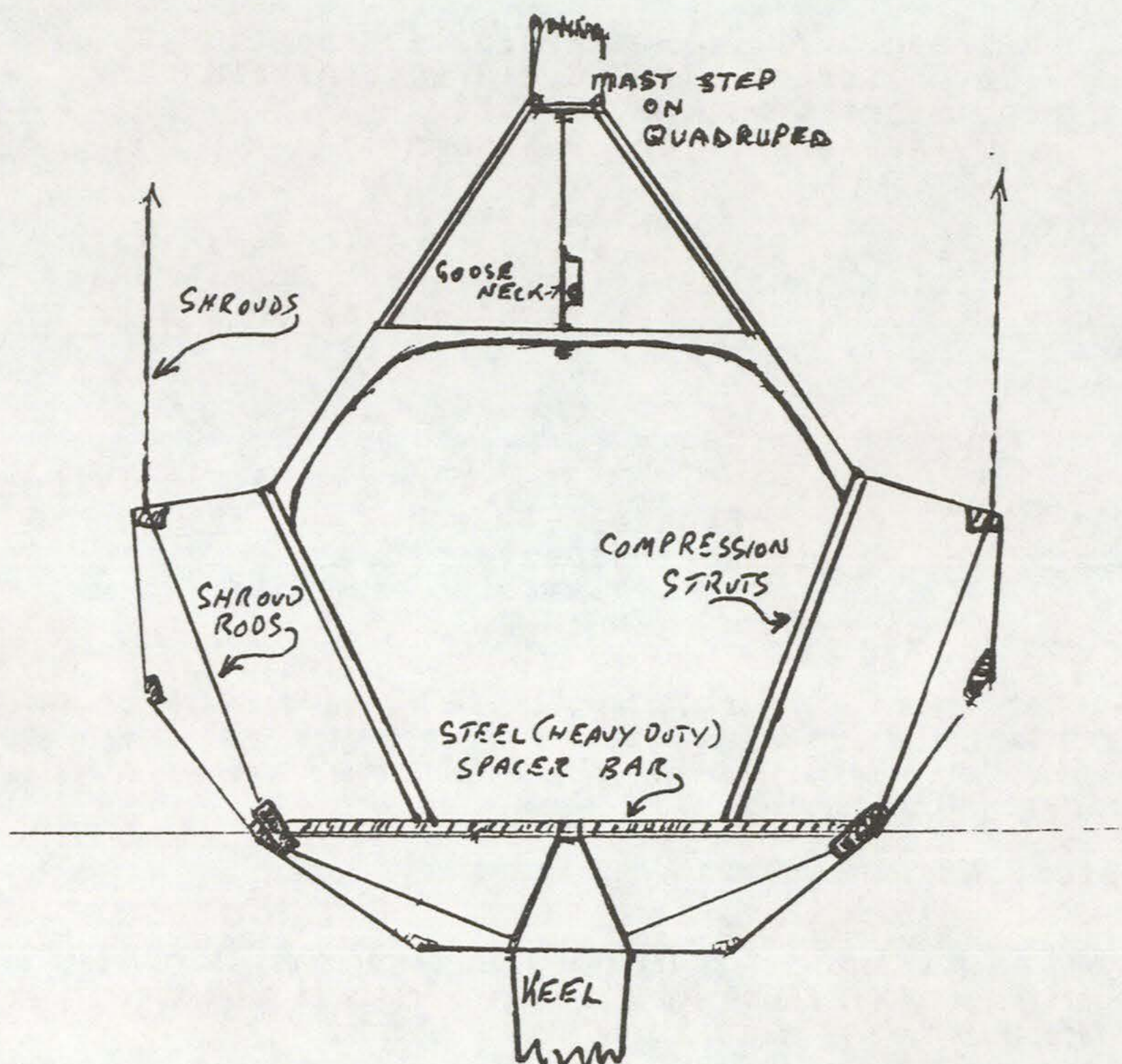
Editor. Norman Champ.

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Mrs HETTY TETT, on whose shoulders rested the bulk of the A.Y.R.S. letter writing and administration during our formative years, died on the 19th of November this year. She carried on working behind the scenes for us until the end. HETTY will be surely missed and remembered with affection by all who knew her.

SLITHY TOVE

Main space frame structure
approx 1/3" to 1'



SLITHY TOVE 17 YEARS ON.

This summer, 1985 after extensive sailing during 84, we have carried out a full refit. After a very full inspection very few problems were discovered. An 8' section of 3/8" ply on the sheer was replaced (plywood is the most useable material). The original nylon sheathing had very little damage and most important the timber beneath was in excellent condition. Slight pitting was found on a section of the 1/8" mild steel keel, blobs of weld were used to reinforce this. Internal structure was sound but to be sure, main compression struts were reinforced and steel shroud rods replaced. Some rigging replaced, the hull got an overcoat of epoxy, followed by two-pack polyurethane.

The new mainsail is something of a coup, fully battened and very flat. I was quoted £600 for a set of six battens, instead, six lengths of 2.5" spruce were bought for £15 and for another £15 a friend shaped them, however the top batten is too stiff in wood so "E"glass might do it.

The whole point is that "Slithy Tove" was built Expertly and economically some 17 years ago. She has survived a good 50,000 miles of sailing and she cruises efficiently and quickly. A great credit to her designer and builder.

I keep in contact with Michael Pipe and we discuss modern trends.

NOTE. See "Slithy Tove" issue 75 1971.

Paul Heychan,
Bristol.

SABU IS FOR SALE

The asking price is £3250. Details of the construction and various modifications can be found in several A.Y.R.S. publications from No.95. onward. Banknotes and coin accepted by our administrator;

Michael Ellison.

THE A.Y.R.S. and Sailboards.

A "sailboard" is unique in that the mast is not supported by any rigging, just a movable joint to the hull and there is no rudder to steer with. The wishbone boom and the inclined sail have been tried and used by many people over a period of years.

In A.Y.R.S. publication No 58, John Morwood reprinted an article with plans for building and instructions for sailing a "sailboard" which was described as a "new and exciting water sport." The article was written by S. Newman Darby and had first been published in Popular Science Monthly 1965. Our publication "Practical Hydrofoils" is dated October 1966. Almost nothing happened after these articles were published, in England this was probably because wetsuits were not available and the water is cold. The rig chosen by Darby is difficult to sail to windward which may have discouraged development.

After the Darby article Hoyle Schweitzer founded Windsurfing International and put a great deal of energy and money behind his effort to introduce the sport he called "windsurfing" to the world. By long distance sailing 'stunts', publicity events and the introduction of schools to teach windsurfing. The sport took off and became international. All credit for the present sailboard performance and popularity should go to "windsurfer".

As the sport became popular people wanted to make new and different shaped boards for wave jumping and speed sailing. Schweitzer had taken out patents in several countries and would not issue licences for making boards other than "windsurfers".

In England, back yard builders could not afford to fight the patent and the few larger manufacturers enjoyed the protection of the patents to discourage competition and paid out licence fees. It fell to the agent of a french builder to fight the case through the british courts. The court case was prepared over a period of years. Michael Ellison is convinced that Beatrix Potter invented sailboards when Squirrel Nutkin and the others sailed to Owl Island using their tails as sails and steering by moving their weight on the boards.

Just days before the case was due to be heard Peter Chilvers came forward to say that he had built and sailed a board as described in the patent in 1958 when he was 12 years old.

The court held that the A.Y.R.S. journal was "prior publication" and although the Darby rig was different the use of a wishbone on a board was obvious so the patent was rescinded. The fact that Peter Chilvers built the first sailboard was accepted by the court and the court of appeal held that this was also grounds to rescind the patent.

With the removal of the patent, sailboard design and construction became public domain consequently sailboard shapes, designs and sizes are now legion.

R.M.E.

WORLD SPEED SAILING RECORDS

CLASS	HELD BY	SPEED	DATE
Ladies	Jenna de Rosnay	27.09Kts	22.10.84
10sq mtr	Michael Pucher	32.35Kts	15.04.85
A Class	Fred Haywood	27.29Kts	12.12.84
B Class	Andrew Grogono/ J.Fowler."Icarus"	28.14Kts	08.10.85
C Class	Ian Day/Martin Rayment."Jacob's Ladder."	25.03Kts	13.10.82
OPEN	Tim Colman "Crossbow 11."	36.00Kts	17.11.80

Over 15 craft have recorded in excess of 30 Knots.

ELECTRIC OUTBOARD PERFORMANCE TEST

Electric outboard motors have several advantages over those powered by internal combustion engines:

- They are nearly silent
- They are nearly non-polluting
- They are more reliable
- They are cheaper to buy and run
- The actual motor is lighter and more easily handled
- Batteries can be charged by wind generators and solar panels

The disadvantage is that present-day batteries are so heavy, that for portable equipment, there is little point in exceeding about 750 W or 1 hp and use is limited to applications where this is sufficient, i.e. efficient low drag boats such as canoes and catamarans, or small boats used slowly for a limited distance.

This article describes the testing of one particular electric outboard motor, the Evinrude, kindly lent by Outboard Marine UK Ltd. There are several other makes, but none of these were available for testing. This little outboard weighs 7.3 kg and has a clamp which allows easy attachment to transoms or the sides of boats. The motor can be rotated 360 deg, swung up 100 deg. and the depth of immersion adjusted by sliding it up and down. all permitting good ease of adjustment and manoeuvrability. The electric motor itself is completely sealed in an underwater pod with no gearing or mechanical linkages, on the top is a five position switch, allowing effective power control by using different windings in the motor. As a permanent magnet motor of this size and usual construction rotates quite fast, a very fine pitched propeller is needed. Although not as efficient as a larger, more slowly rotating coarser pitched propeller, the absence of gears makes up for this. The current consumption and the thrust are nearly constant from standing to the highest speed obtained.

swtch Pos.	Current (+/-20%)	Pwr (@ 12v)	Speed Boat 1	Speed Boats 2+3	Range* Bts 2+3
1	4.5 A	54 W	1 kt	1 kt	10 n m
2	10 A	120 W	2 kts	2 kts	8 n m
3	16 A	142 W	2.5 kts	2.5-3 kts	7 n m
4	30 A	360 W	3 kts	3.5-4 kts	3 n m

Boat 1: rubber inflatable with one person

boat 2: 4.5m plywood canoe " " "

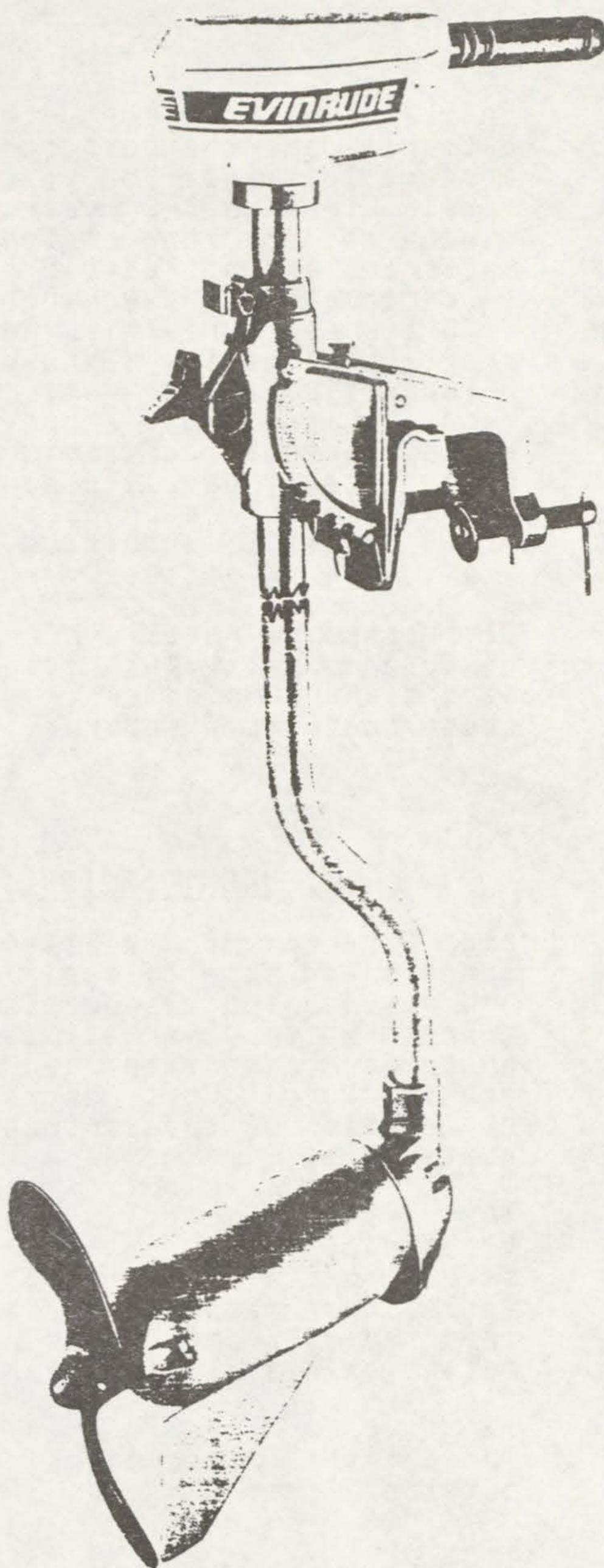
Boat 3: 4.5m inflatable cat " " "

*Using two 24amp hr 12v batteries

Measured static thrust at pos. 4 was 10-11 kgf. The force necessary to propel the rubber dingy at 2.5 kts 1.3m/s was measured at 7 kgf (69 N). Therefore the actual propulsive power produced was $1.3 \times 69 = 90 \text{ Nm/s} = 90 \text{ W}$. Therefore total efficiency at this speed: $90/142 = 63\%$. I would have expected a lower figure, around 50%, as both the motor and the propeller can be expected to be about 70% efficient ($0.7 \times 0.7 = 0.49$), but it is within the large tolerances of the crude measuring equipment used.

As the current consumption for each setting is nearly constant irrespective of usage, the possible length of operation is easily calculated from standard battery data. The capacity of lead-acid batteries is considerably smaller at high discharge rates than at the usually quoted 20h discharge rate.

The battery used for these tests was a small, easily handled completely sealed lead-acid 12V battery, weight 8.5 kg, 20h capacity 24 Ah. It will supply 1.2 A for 20h, but 24 A for only about 40 min. For longer trips 2 or 4 such batteries were used, usually connected in parallel to maximise the range. The longest trip undertaken was in the canoe across the Solent and back, total distance about 5 n.miles. Although 4 batteries were taken, less than half their capacity was used (switch pos. 3).



Choice of battery: At the present time lead-acid batteries are the most cost effective provided they are not left idle for years at a time, as lifetime is usually less than 8 years and much less if left discharged for long periods. Note that car starter batteries are not suitable, as they are not designed to be completely discharged and have a very short life if used like this. On the other hand, proper traction batteries (as used on fork-lift trucks) have a long life but are very heavy and expensive. Many manufacturers have however recently brought out so-called semi-traction or marine batteries which can be repeatedly deeply discharged several hundred times. Many of these are completely sealed and "maintenance free" but still should be recharged several times a year, even if not used.

Batteries are readily recharged with wind generators or solar panels. The batteries used in these tests have been recharged with solar cells exclusively, so these boats have indirectly been solar-powered!

Theo Schmidt.

YACHT DESIGN INSTITUTE SCHOOLS

From Director Bob Wallstrom we have news of YDI Schools and some of their programs. Created in 1969 and now running residential as well as home study courses which cover all aspects of marine design and up to an associate degree in small craft naval architecture. The brochures give comprehensive explanation of the various programs and certificates obtainable.

There is a recently installed test tank, a new version of The Bruce Tank. As a matter of fact several parts are original from Edmund Bruce's first tank. These materials were given to Henry Morss and then sent to John Hughes until it occurred to us to establish a small test tank, now being put to good use

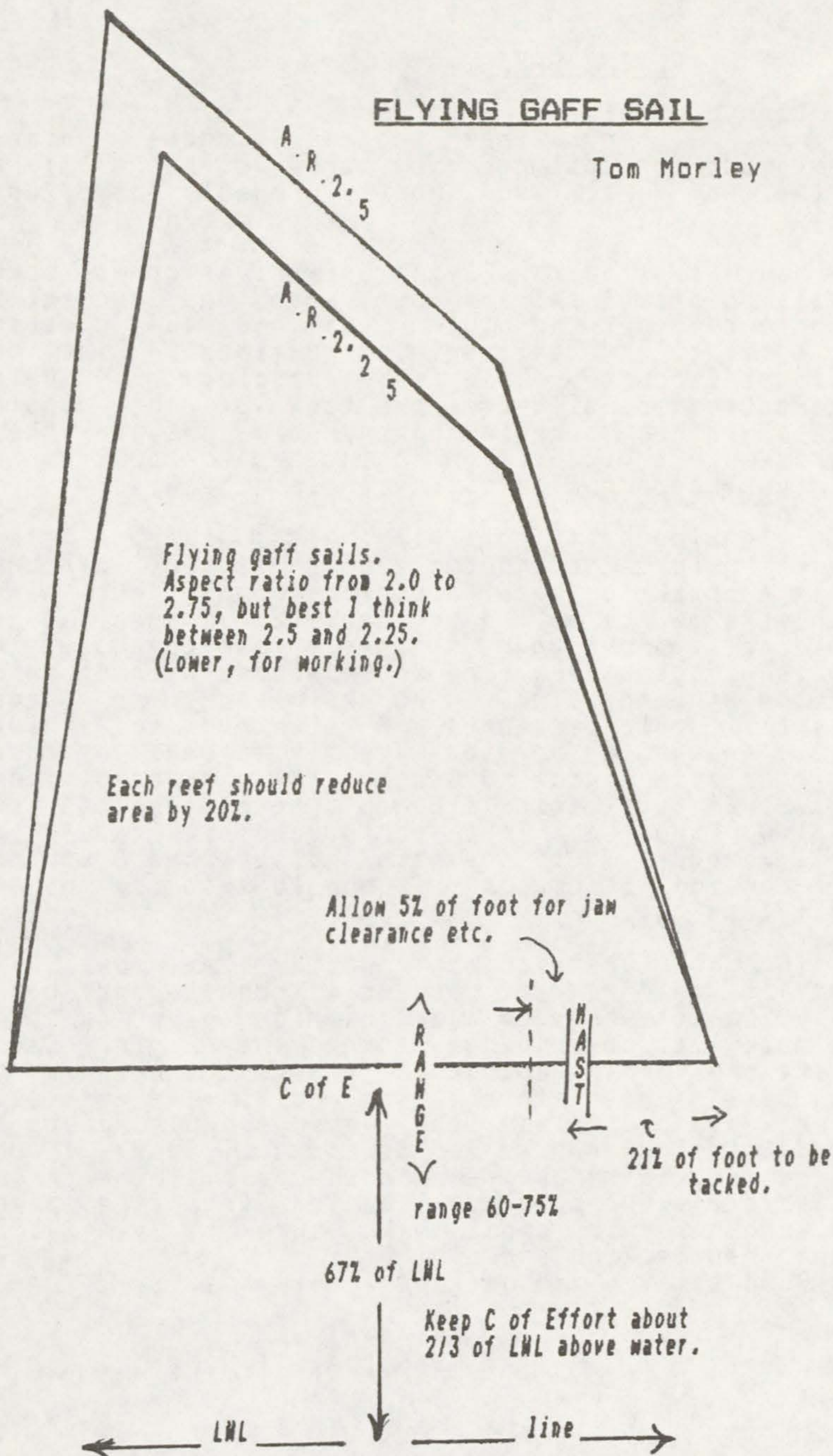
The details of courses and qualification can be obtained from:-

Tel 207/374-5551

YDI SCHOOLS
BLUE HILL
MAINE 04614
U.S.A.

FLYING GAFF SAIL

Tom Morley



FLYING GAFF

Dear Michael.

Your new address seems nicely convenient for sailing. I'm sorry you had a mishap in the I of W race, you would probably have done well.

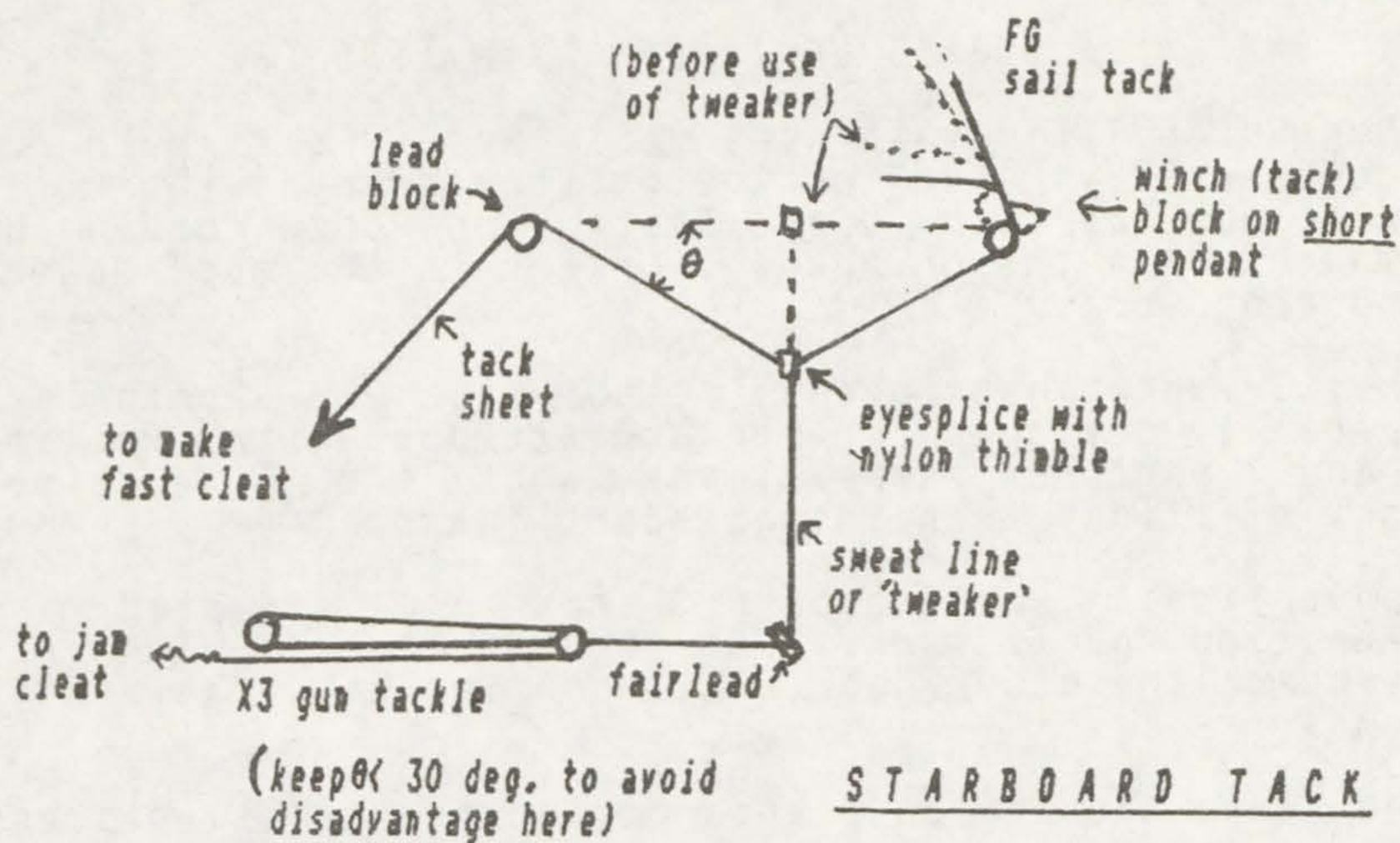
You will find the Flying Gaff gives great power on all points of sailing but when beating it is important to get the luff taut and the sheeting angle right. My sailing instructions - for the Kielder of course - and some doodles, may help. Some cobs actually drew the tack of the dipping lug to weather gunwale, presumably because their sterns weren't wide enough (mules had canoe sterns) to give the correct sheeting angle otherwise.

In a wide beamy boat with wide transom stern there should be no problem, but in larger, narrower boats a track for each tack block could run along each side of the foredeck. I am sure a jib would not improve your weatherly performance; the cornish luggers were more close winded without one. Off the wind the slot can be usefull but on larger vessels I would opt for a F G ketch rig to achieve this - again with no jib. The mizzen would be about half the size of the main and I think a traditional gaff, luff:foot ratio 11:8 would be better than the usual working lug. If a jib is used it should be small - about 1/5 of the main and set on a running, self-tensioning forestay. It should also be boomed (self tacking).

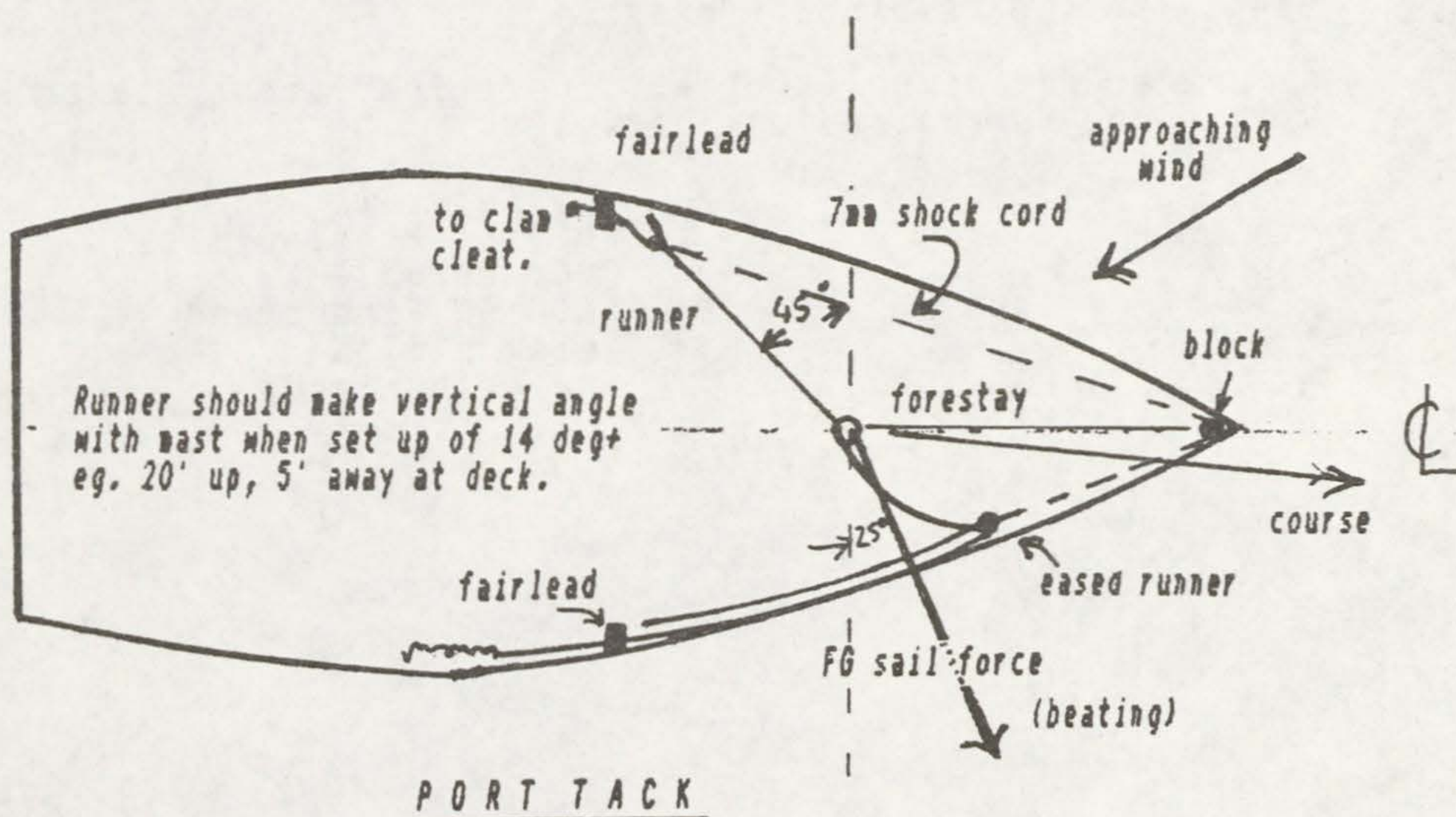
Though an unstayed mast would seem ideal, I fancy it would have to be more robust and hence heavy than the Freedom and Junk rigs have as they are much less powerful sails than the Flying Gaff. I like the runner arrangement I have which seems to take care of most athwartships pull. A Highfield lever would be useless; the eased runner must be fired well forward, as far as the sail tack. I loop the runners (6mm rope) around the mast at the throat halliard eye but they could be led from the jaws. The vang helps too and I make sure it is fairly tight when tacking and gybing.

Good sailing and no further mishaps.

Tom Morley.
Douglas. I.O.M.



"Tweaker" tensions luff and draws tack to weather improving the sheeting angle.



INNOVATOR LIGHTS UP LONGER WITH LESS ENERGY

When Philips Innovator set sail from Portsmouth on September 28th 1985 for the Whitbread Round the World Race, her captain Dick Nauta and crew could be assured that the on board lighting is the most modern and economical.

The 63-footer has been fitted with 18 luminaires specially designed for her and equipped with Philips 7 and 9 watt PL* lamps. These lamps are five times more efficient than incandescent lamps.

Conventional incandescent lamps are affected by vibration and last only 800 to 1000 hours. The PL* lamps on the other hand, will run for at least 5000 hours.

The lamps operate on standard electronic ballasts and should there be a disruption in their operation which is unlikely the luminaires are also fitted with a small failsafe 10 W incandescent lamp.

The luminaires are located throughout the Innovator. They have a prismatic diffuser which has been designed to produce a low level of glare and thus ideal for the reading of charts.

A further advantage is that operating temperatures within the luminaires are very low.

J.C. Russell
Philips Press Office
P.O. Box 523
5600 AM Eindhoven
Telex 515733
The Netherlands



SAILBOARDS? PURE SAILING.

The challenge of a sail board is invigorating and exciting but, when the initial success brings you into conflict with the Force Four barrier you have to THINK because the Dynamics start to beat your reactions.

The beginner learns the art either in light winds or with a small sail and soon learns how to raise the sail, move off and guide the board around a circular course. The dynamics involved in this situation keep the centres of effort and resistance relatively close together.

As the wind and/or sail area increases the centres of effort move further apart; as a result the stability of the resultant is much more fragile hence a large increase in loss of control and involuntary swimming.

Two sketches shew the centre of effort involved in the two situations; the 'man' effort transmits the sail effort to the board as a resultant of the forces generated by gravity on the man and rig opposing those generated by the wind.

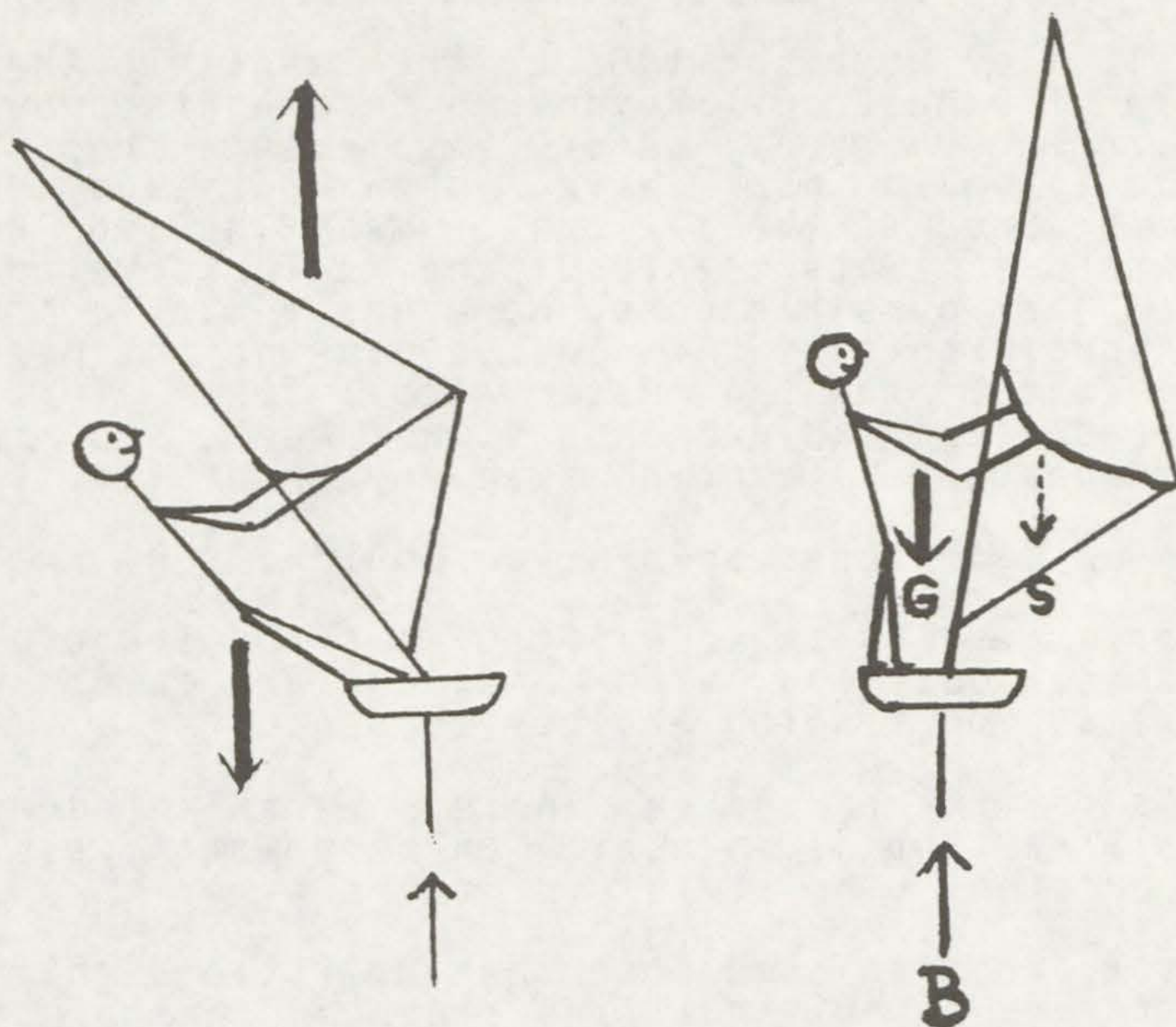
The most dramatic situation where these forces and their offset centres of effort is the starting position where the vertical foils, centreboard and skeg are stationary and unable to produce any dynamic effect of longitudinal stability; upon "sheeting in" the board either moves sideways or more probably luffs up unless the sailor induces a bearing away movement:-

This is seen at its most obvious when watching water and beach starts. Not all the scrambling of feet is inability to mount the board but is aimed at coaxing the board to bear away.

Having expressed these thoughts I am sure that they have a profound effect on the design and sailing of conventional boats which could be measured and defined.

The racing sailor not only tunes his rig and boat, he also practices all the manoeuvres so that the transition from one dynamic situation to another is accomplished with least loss of Vmg (VELOCITY MADE GOOD). While lesser mortals miss stays and bounce from one hazard to another.

Fred Ball.



HORTA RACE

After meeting with the committee of Club Naval da Horta, I'm able to tell you that this club and the Tourism Authority are very pleased and ready to welcome what would be the 4th MOCRA race to our port.

Sea week in 1986 is scheduled from the 3rd to 10th of August. The arrival of the race on the 1st or 2nd sounds suitable.

July 20th 1986 sees the 90th anniversary of Joshua Slocum's arrival in Horta. On the 7th I think there will be a race to Velas, and back the following day after the Traditional party, (Open to cruising yachts).

Joao Carlos Fraga.

HORTA, AZORES.

THE MULTIHULL SYMPOSIUM

On the 16th of November 1985 at The Barnfield Theatre in Exeter The Multihull Symposium once again provided something for everyone, dare I say, "even a mono hull enthusiast would not have been dissappointed". Obviously aimed at the sailors of many hulled craft with various interests, cruising, racing, development and even just pure pleasure. Here was a platform that gave anyone with more than just a passing interest in mucking about on the water (not just at sea) somewhere to air and exchange views, meet and renew acquaintances not to mention swap a yarn or few.

The day passed almost before you could blink.

Terry Cooke gave us the benefit of his knowledge and experience about and with antifouling paint with illustration on testing and development.

Theo Schmidt introduced a whole new meaning to multihull sailing (even uphill on hard water, ie. skis) and propulsion 'wind style' in general.

Chris Knox-Johnston shed more than a little light on the mysteries of multihull insurance, pointing out, I think, that the multihull sailor needs to do some P R work to encourage the underwriters that cats and tris are a good bet.

Lunch was programmed to allow everyone the maximum number of encounters within a short period of time whilst refuelling. The event was remarkable for the smoothness of operation carried out in the space available.

John Shuttleworth whose designs barely need introduction gave some insight into progress and the future that could be appreciated by scientist, artist and amateur alike.

Then not content with conjuring lunch, the backroom wizards gave us tea.

Stuart Fisher with not uncharacteristic enthusiasm and fizz demonstrated the driving force behind the M.O.C.R.A. AND MICRO organization of events.

Paul Constantine explained, with some humour, what cruising for the working folk was really all about. The presentation was worthy of a special symposium on cruising. TV series have been based on lesser content.

Rupert Kidd showed slides of The Round Britain and Ireland Race and La Trinite. I suspect Rupert's mileage and race successes are approaching some kind of record.

Mike Ellison wears more hats than most in the sailing world, so when he talks about safety perhaps we should listen. It might improve our insurance premiums eh Chris?

Peter Phillips must have been a little tired after his mammoth marathon build and race program over the last 12 months. He was actually seen and heard to be using a "microphone". The years project of finding premises and finance to build the 80' Shuttleworth cat "Novel Network, get the backers and builders (what a team!) together, launch and race with fair success, especially when compared with some of the highly expensive hardware that failed. Is a feat worthy of considerable note. However I do not actually believe that Peter is standing for Parliament on a platform to reintroduce the 'Press Gang'. Well not really.

David Milner not only organised this jamboree but also runs "CHARTERCATS", an international multihull charter company. So he was able to explain the benefits and pitfalls likely to be encountered when chartering.

Well maybe I might have blinked twice.

The Barnfield Theatre was especially pleasant a venue for the event, more so as the stage was set for a drawing room scene, thus we were drawn into a more informal atmosphere than it might have otherwise been. The management and staff deserve our thanks for looking after our interests so well.

After the theatre, a number had arranged to dine at The Devon Motel. The quality and quantity of the food was 'fare' enough to make the journey from London worth it on its own.

The opportunity to join the gathering at Exeter is something I would go well out of my way not to miss. David, Heather and their team are, once again, to be congratulated for a smooth piece of organization that on the surface must belie the effort and planning that went into yet another very successful Multihull Symposium.

Norman Champ

A VERTICAL AXIS WINDMILL PROPELLED CATAMARAN

Extracted from a 30 page technical paper sent in by Giuseppe Gigliobianco. Of Cremona, Italy.

He has tested two new types of vertical axis windmill in the windtunnel of the Politecnico di Torino and the better one has been installed on board a catamaran. To Professor Carlo Mortarino who has been supervising the project and wind tunnel tests, and Paolo Carotta who helped in building and testing, many thanks.

A program of research is under development at the department of applied aerodynamics of the Polytechnico di Torino. The purpose to test two new types of windmills to be used to drive ships. Two previous craft are known. The first built in 1920 by Constantin, The other has been built in New Zealand; her name is "Waka" and is reported to achieve constant speed on every heading.

The Project

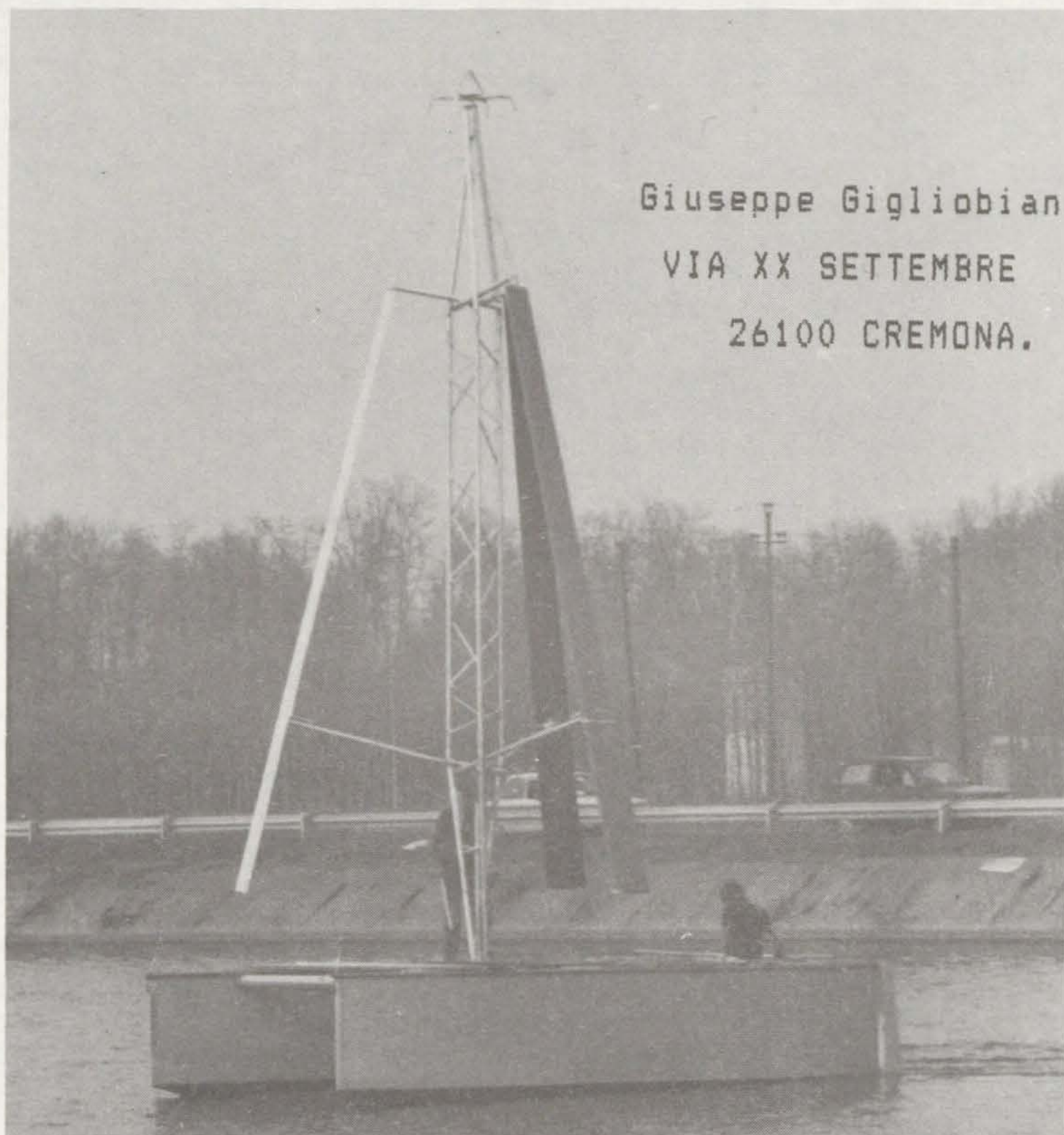
To simplify the mechanical problems the plan was to build a catamaran with a Vertical Axis wind turbine directly fastened to a Voith Schneider Vertical Axis propeller. Such a windmill can obtain power from any wind direction without an orienting vane and the prop can apply thrust in any direction. The V S propeller fits well between the hulls.

"Low Energy Systems" have developed a lightweight rotor which had to be modified to fit within the rig of the cat.

Practical Tests

During the spring of 1985 tests were carried out in Cremona Harbour with moderate breeze and smooth water

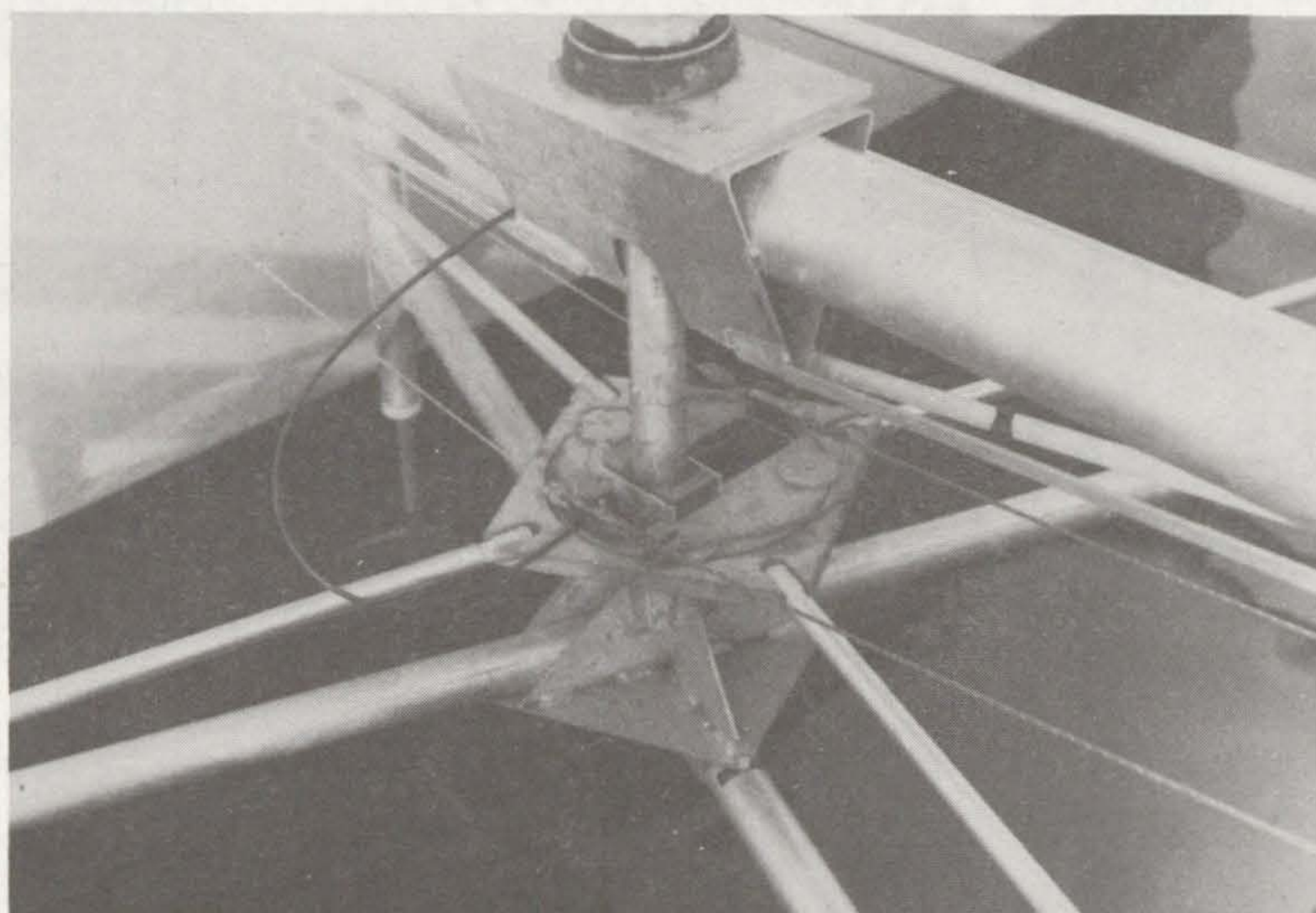
A mast with jib and main has also been used on the boat and she was able to make to windward though with a large dead angle. When the windmill was installed the cat sailed directly to windward but speed was down on all points compared with the conventional rig. This was to be expected as there was no "freewheel" between the turbine and the propeller so drag is a large factor during overrun in varying wind. 2 meters is the max diameter propeller that could be built without using exotic materials.



Giuseppe Gigliobianco.

VIA XX SETTEMBRE 10

26100 CREMONA.



Perhaps a Big Windmill Cat is the answer

Rob Denney has, after several excursions into other possibilities, converted his Iroquois catamaran to windmill/turbine power.

How did it all begin? The inspiration came while sitting in a liferaft after capsizing on the second leg of the 1982 Round Britain Race. As we were second in our class at the time I had proved that I was capable of designing and building ('though perhaps not sailing) a race winner. It was the first chance to think of anything except "Jan 11" since starting her in January that year. I decided that to get a sponsor I needed to become well known. The way to do this was to build a entirely different type of craft. Perhaps a windmill would be the answer.

Having had a discouraging reply to a letter to a NZ windmill boat builder, I was fortunate to meet Roger Wooton, an enthusiastic wind engineer. Our attempt to raise sponsorship from some 120 companies for our project of a 12M MacAlpine Downie Tri with a 9M turbine costing around £90,000 did not succeed. Disbelief, disinterest and the amount seemed to be the reason.

Even delving through the archives of The A.Y.R.S. and showing a model on "Tomorrows World TV" produced little public interest.

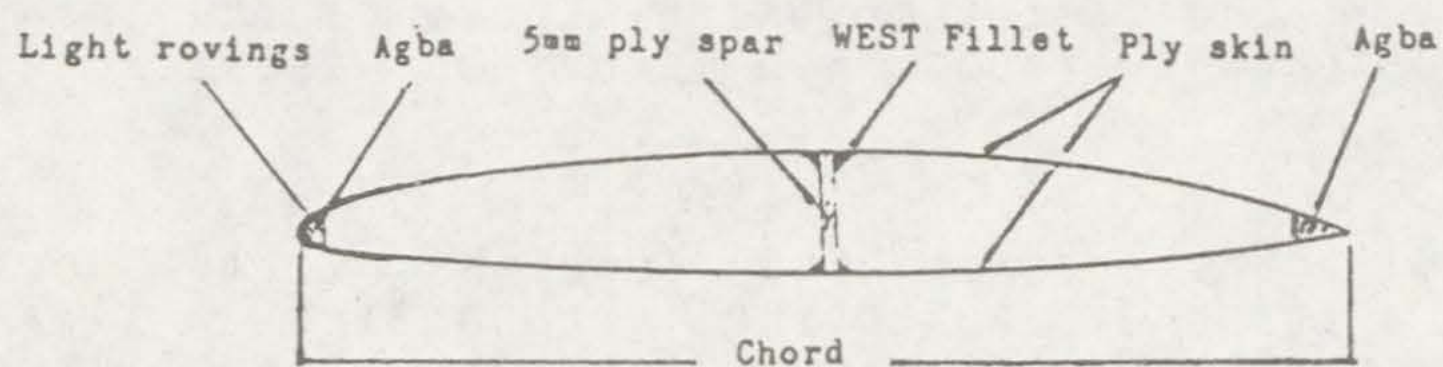
At this time I decided to convert my Iroquois catamaran and was lucky enough to meet Neil Bose, a naval architect at Glasgow University. He was fitting a 5M diameter wind turbine to his 6M Blackwater sloop. Neil offered to design my blades, he also put up with a lot of inane questions and suggestions. My wife and I then left for Greece to retrieve "Jan" where she had been left while "Jan 11" was being built.

Time during the trip back was spent designing, redesigning and writing to potential material suppliers. This was much more successful than seeking cash sponsorship, resulting in:-

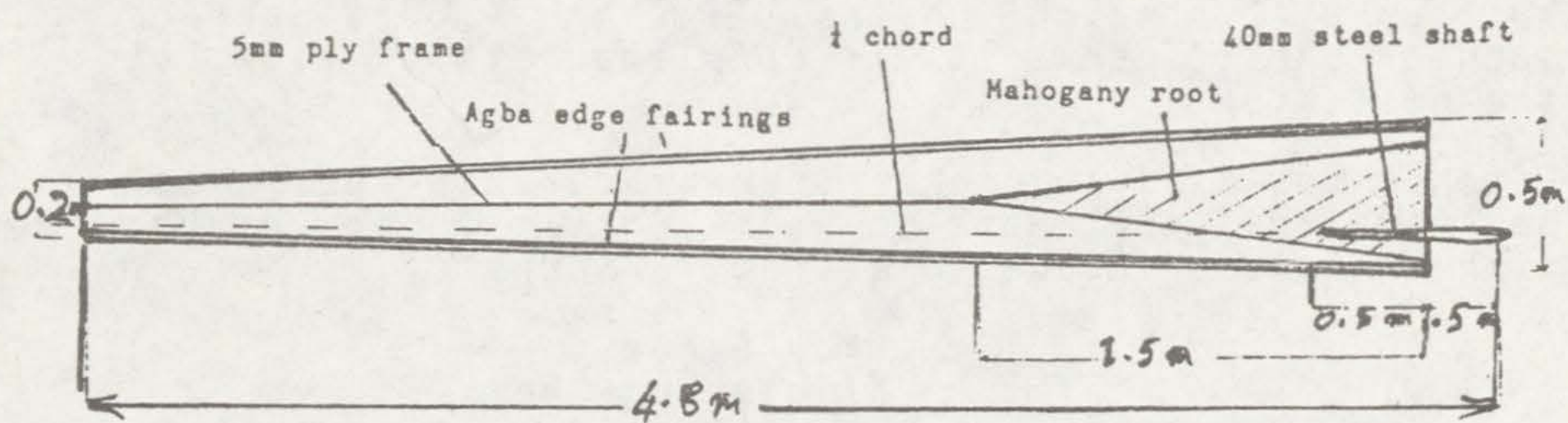
SKF, bearings
WESSEX RESINS, WEST(R) epoxy
PENNINE INDUSTRIES, Claw coupling & torque limiter
POLYPENCO, Nylatron
being supplied free in return for publicity. I decided to rename the boat "THANKS TO", and list the sponsors on the hull sides.



Blade Cross Section



Cutaway of Blade



At Trevor Taylors yard in Essex, Trevor and Malcolm Van, the yard's glassfibre expert, were very interested and offered facilities and materials. This was a very lucky break and enabled me to start work on the blades immediately.

With Mahendra Patel and Mike Courtney at London's City University with Allen and Ron, the technicians to put me right, I soon found my plans were not up to standard. Mike taught me to draw properly. So between weekdays at University and 75km by moped to the boat at weekends, with my father in law keeping up morale, making sure that I ate and supplying tools, generator and advice we started to modify and repair the boat.

EDITORS NOTE This paper contains a considerable amount of technical detail which has for the sake of accuracy been left out. I expect for a small fee and an offer of sponsorship a photocopy of the full report can be obtained from the author.

The rig is designed to produce 44 hp at 180 rpm in 13m/sec wind. So far we have sailed 4knots directly into 6m/sec wind. The rig is easy to operate and working up and improvements are on the agenda. When you get used to blades passing 0.5m over your head at 100kph you find there is very little to do.

"Thanks to" was launched in May this year, 2 years and £1200. after I'd estimated 3 months and £4000. The former was due to my complete ignorance of what was involved, the latter to the kindness of the many people and organisations who provided assistance, gratis.

NEXT?

Very early in the project the turbine became more than just a means of achieving recognition. I am fairly sure that the rig has at least two applications for small boats.

First, an attempt on the world sailing speed record with a 3M diameter turbine mounted on a lightweight hull to sail straight upwind. If I can find a job or sponsor when "Thanks to" is completed, this will be the next step.

Second, would be an ocean racing cat. This will not be cheap so I will have to wait until I am either rich or famous enough to attract a sponsor.

Rob Denney,
37 Highbury Park,
London N5 1TH.

JOHNNIE WALKER PORTLAND SPEED WEEK 1985

This year the "week" (eight days) was preceded by three days of speed sailing by British board sailors who otherwise have no chance to make timed runs to qualify for the event. Entries are limited to fifty boards because it is impossible to control more. Wind conditions ideal for boards are not suitable for boats or foil craft so that another "batch" of entries can be accepted.

The event ran very well indeed, more strange craft than usual; at least for several years. "Johnnie Walker" seemed very pleased and are willing to sponsor again next year and almost certainly for a further two years.

It has been agreed that the A.Y.R.S. prize for the fastest craft in the 10sq metre class, (£150 this year) shall be withdrawn and awarded instead in future to the boat with best speed relative to wind speed. This year both "Icarus" and a sailboard achieved 1.4 times wind speed. The wind speed is recorded throughout the event.

Philip Hansford brought but did not enter an "Ayrsofoil" hull, fitted with inverted "T" foils and surface sensors. She was launched as "Philfly" and sailed by Simon Sanderson. From the start she lifted out and maintained stable and level "flight" using an old 10sq m. sail from "Sisi" (an early Catapult).

"Dalibor" came through the French canals to Dunkirk and arrived at Southampton in time for the boat show. She was craned out, cleaned and polished for speed week but missed the best winds at portland so her true performance has yet to be seen.

The wind this year started fresh to strong at times reaching 35 knots from the "right" direction but as the week passed it slowly decreased, but by Sunday 13th there was a light Easterly breeze and no sailing. Fastest speed of the week was Pascal Maka with 30.27 knots in the 10sq.M. class and "Icarus" made two runs at 28.14 knots in "B" class which, subject to ratification, is a new world record. Andrew Grogono sailed "Icarus" as sadly James was in hospital. The A.Y.R.S. prize went to Geoff Shine and Miles Handley sailing "Intermedia" at 16.71 knots. Most craft improved their performance except, "Icarus 11" from England, "Hydra" from Germany, and "Dalibor" from Australia, all in the open class who failed even to reach ten knots.

The event has come a long way since we sheltered under a blackberry bush trying to keep the watches dry and writing on wet paper but tests indicate that watches are more accurate than most people expected. The improvement is in the number of runs possible by having several craft on the course at the same time. With 1050 record attempts measured during one day it is not surprising that there was a delay in checking and posting results. Next year it is hoped to obtain mains electricity to run more powerful computers.

Rules for the 1986 event which will be held at the end of September are available from the Royal Yachting Association, Victoria Way, Woking, Surrey. Also from the same address rules for making private or organised record attempts anywhere in the world are available from the W.S.S.R. which is authorised by the I.Y.R.U.

A very good video of the 1984 event (VHS) has been issued by Johnnie Walker, it is available at a cost of £14.95 from "Johnnie Walker Weymouth 1984" 63, St James's Street, London SW1A 1NB.

R.M.Ellison.

BIG BANG BOAT BUILDING

John Mayfield has extracted some references to explosive forming in answer to a request from Peter Ottenhof for information on that subject. Peter is interested in the possibilities of building in aluminium and thought that making a mold and with one big bang persuading the aluminium take up the correct shape. References so far:- Explosive Forming, Compaction and welding - 1983. B.Z.Blażyński - University of Leeds. Published by Applied Scientific Publishers, London & New York. and a paper by J.W. Schroeder of the Foster Wheeler Development Corporation, Livingston, New Jersey, from a conference on High energy rate forming, hosted by Leeds University. British Aluminium (ALCAN) may be able to advise on the suitable grades of alloy. R.M.E. Find this quite an exciting prospect, having previously regarded explosives as destructive rather than a means of trying to obtain a less expensive hull shape. Any further information to Peter Ottenhof 32 Plum Street, Kingston, Ontario K7K 1T4, CANADA. Please let us know of your progress or problems Pete.

N{.

LOSS OF DOUBLE ARROW

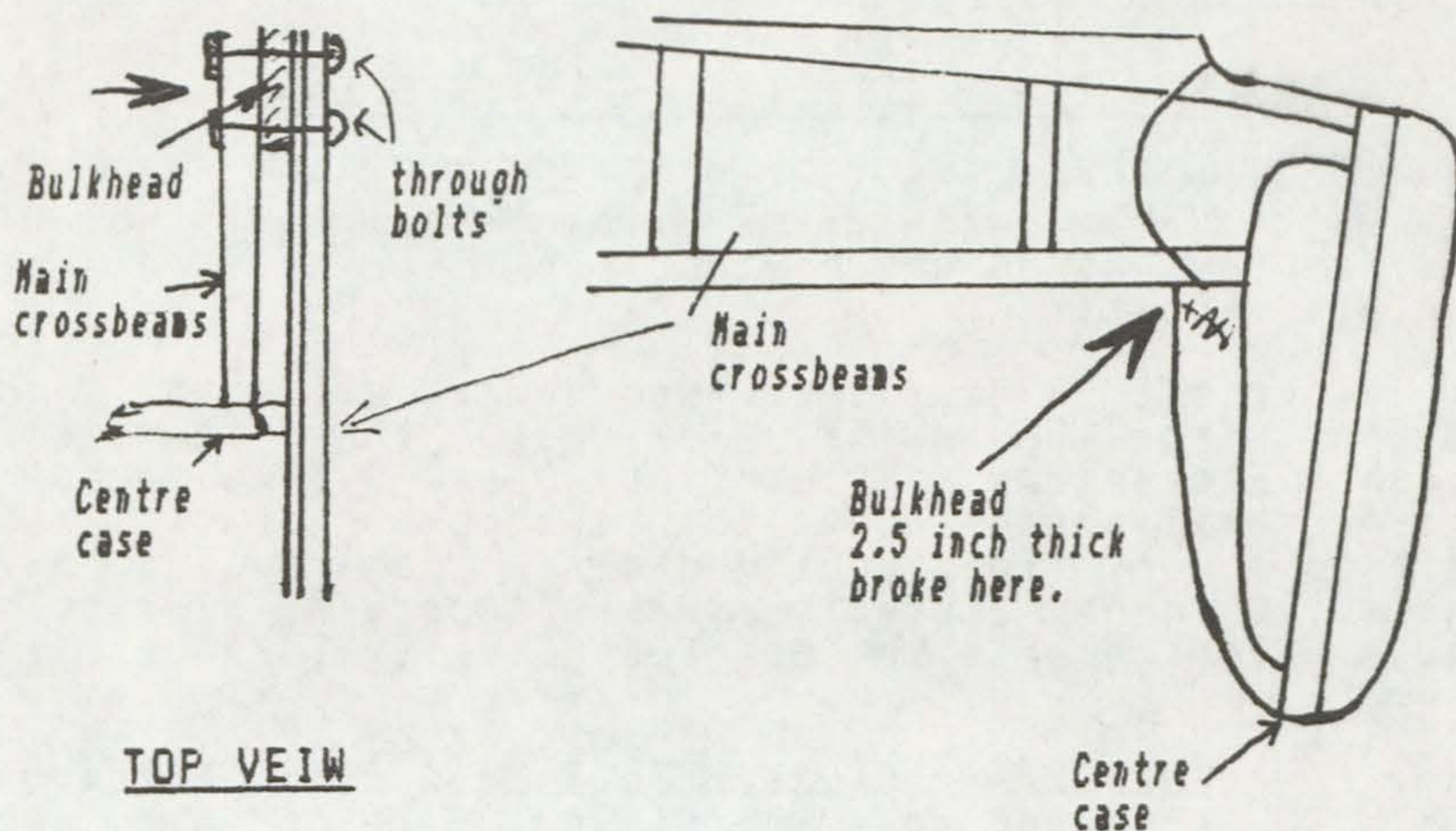
Double Arrow was lost NE of Cape Kari Kari on May 24th 1985. A 45' Lock Crowther, built to plan. She had been raced and cruised for five years on the Northland Coast.

Forecast 23 May 1985, from Whangarei, wind 10 to 15 knots from Southwest, following three days of strong Easterlies. Departing Opua 3.30pm under engine until abeam Tapeka point where we hoisted all sail to a very light Southwesterly. Log reading 5-7 knots, a large Easterly swell smooth with little white water. Course set to clear Cavalli Islands 310 mag.

8pm abeam Cavalli Islands, wind Westerly 15 to 20 knots and seas increasing. Sail reduced, two reefs and staysail only 300 sq feet each. Course to Norfolk Island 300 mag. D A is hard on the wind with beam seas. About 10pm wind is gusting 35 to 40 knots. It was decided, as we were not racing, to keep speed down and continued under staysail alone at about 4-6 knots.

11 pm. Abeam Cape Karekari, wind still gusting and seas increasing so we furled staysail to lay ahull, the helm was lashed to leeward and D A lay comfortably beam on to the sea still heading 300 mag. 2am Friday still off Cape Karekari, the seas now large with breaking crests though those off watch were managing to get some rest and sleep.

At 3.40 the boat was hit by two large seas in quick succession with no apparent damage but about 4am there was a loud explosive crack as a large wave broke under the wingdeck and the leeward hull. David Millar called me to the starboard hull where the main bulkhead between the head and forward cabin was fractured just below the main beam joint on the inner side of the hull. This timber is 2.5 inches thick and broken across the grain allowing the hull to flex outward and opening up the wingdeck to inner gunwale joint. This rapidly spread along the length of this joint fracturing further beams.



No water was entering at this time but it was obvious the hull would not remain connected for very much longer. With everyone on deck a last effort was made to turn the boat downwind to ease the strain, she would not come about without either sail or motor and there was no time to engage either, the hull collapsed outward to allow the wingdeck to list into the water.

The three male crew members went forward to launch the life raft while I escorted the two female crew to the bow with instructions for them to go over the front crossbeam and hang onto the net if the boat capsized as I feared the mast would capsize the boat to leeward with no hull bouyancy on that side. Fortunately the mast came down before this could happen.

the crew launched the liferaft over the forward netting and collected a 20 litre drum of water which was put in the raft. I had already collected the E.P.I.R.B. beacon (7 day), the crew then boarded the raft and secured it to the yacht as it would float for some time.

We were also concerned about fire as we had smelt gas leaking and the boat lights were all on with the consequent risk of fire. We remained tied to the yacht for approximately an hour sheltered in the lee of the port hull.

After about an hour D A seemed to be settling by the stern so I cut the attachment line and the raft drifted clear. We activated the emergency beacon and every one tried to get some rest. It was very cold.

At 8.15 am we heard an aircraft but could not see it above the cloud, later we learned four aircraft recorded our beacon, the first at around 8.15 am. At 12.30 pm we heard the Orion which described a large circle to go over our estimated position of the wreck and turn towards us.

We waited until the aircraft was flying towards us before lighting a flare. They saw it instantly and flashed their lights so we would know. The plane described another large circle and as it faced us we fired another flare.

The Orion kept us company on and off until the arrival of the helicopters, we were winched up and they took us to Kaitia hospital for a medical check and subsequently flew us back to Auckland.

I must praise the efforts and calmness of my crew of whom I cannot speak too highly. There was never any panic or concern over personal possessions, most of which were lost with Double Arrow, passports and ships papers were also lost. Fortunately no one suffered a scratch.

Analysis.

After much thought, I now wish that I had waited a little longer before commencing the voyage, to let the weather and sea settle. The attitude of the customs against us anchoring overnight influenced us to keep sailing once we had left the wharf when I would rather have anchored the night.

Also, although we hove to initially by lying ahull, the boat seemed very happy this way, it would have been better when the wind and seas began to increase, to have set a reefed staysail and sailed off downwind. This would have relieved the stresses on the boat.

Another time I would also be inclined to use a parachute - seaanchor, instead of lying ahull.

Ivan Cranch.

From. "MULTINEWS" the Auckland Multihull Sailing Association Inc. Box 3337, Auckland, New Zealand.

SKI-CAT A New Way to Sail

She is built with the idea of being acrobatic. Several versions have been made so far but development is still in hand. Typically dimensions are:- loa 8ft, boa 3ft, hull beam 7 to 10 inches, weight 18kgs, rig 5kgs with sail area up to 6 sq m. Performance is comparable with a sailboard but with differences in handling. Cost compares favourably with that of sailboards.

For further details contact:-

Umberto Colacicco,
Oaklands, Marl Lane,
Fordingbridge,
Hampshire, England.
Tel (0425) 54126.



Sidewell House,
Witcombe,
Martock,
Somerset. England

THE SELF SETTING AEROFOIL SAIL

The principles involved can be applied to all types of sailing craft, and so easily be adapted to windsurfing. Having to continually make small adjustments to sails and rigs it seemed to me that it should be possible to get better performance using an aerofoil. The idea of a self inflating and setting aerofoil sail was discussed with the technical manager of a large sailmakers and thought to be a good scheme. Since then. Silence!

To be a successful improvement at generating lift at low airspeeds an aerofoil needs:-

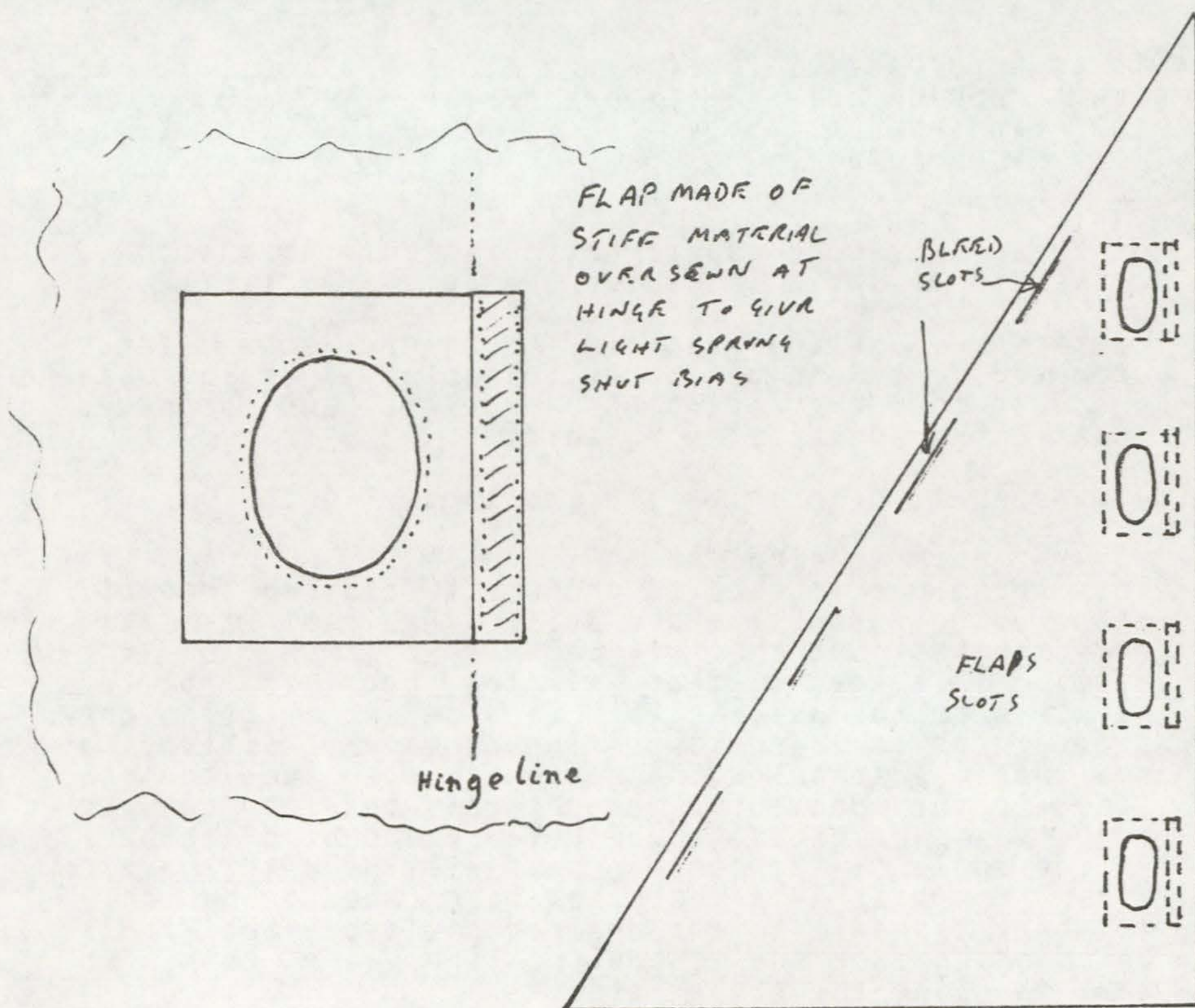
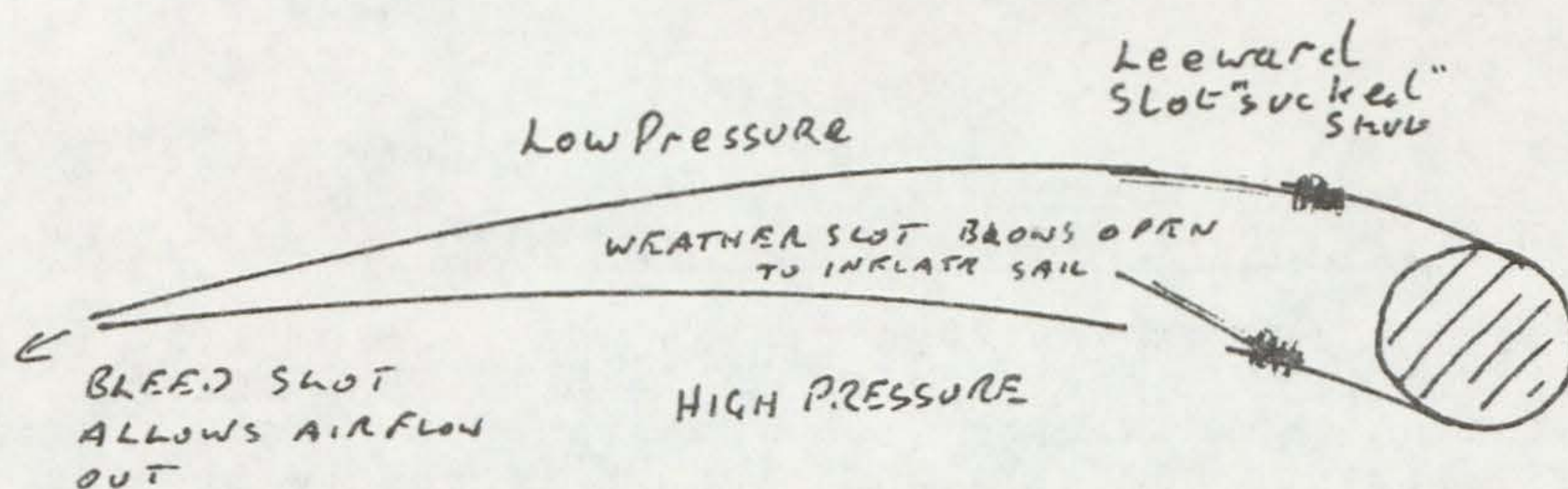
- (a). High aspect ratio.
- (b). Large camber.
- (c). Rigid structure.

Of these only high aspect ratio is achievable with a conventional sail. A solid cambered aerofoil can only work on one tack and will be heavy and cumbersome. With this in mind and some ideas prompted by modern parachute technology a design was produced that overcame these problems and produced some further unexpected advantages.

Two separate principles are involved.

1. Variable Tension.

This technique is used to produce a cambered aerofoil shape using a double sided sail. The sail is slid over the mast but the luff tack is up FRONT of the mast. This means that if the boom is rotated relative to the mast it will tension and flatten one side of the sail and loosen the other. By fitting a small spar just below the gooseneck with two control lines to the boom the amount of tension can be adjusted hence giving an adjustable amount of camber. As the angle of the boom to mast will have to remain fixed, the mast as a whole has to rotate to be able to sheet the sail to the desired position. See Fig 1. On changing tack the opposite lines are tensioned thus changing the camber side.



Not a Scale Drawing, to illustrate text-only.

2. Self Inflation

The sail above would be useless as an aerofoil as it is not rigid. To achieve this the pressure distribution round an aerofoil is exploited. Just aft of the sail's leading edge are a number of slots, these are closed off by flaps which tend to hold shut and block the slot. See fig 2. When the sail is set with the inner (windward) sail tensioned flat the inner flaps are forced open due to the slightly higher pressure over the inner surface. The outer holes stay shut as the flaps are tensioned that way and also as the reduced pressure on that side tends to hold them shut. The net result is that air is forced in the slots and the sail "inflates". To stop the inner side overinflating and blowing outwards small slits are made in the leach to spill some air out of the sail keeping inner pressure of the sail controlable. When the sail is tacked the windward slots will again be forced open as the leeward ones close off.

The net result is a simple sail whose camber can be adjusted. In light winds when an aerofoil may be ineffective the boom control lines can be reversed so the inner collapses into the outer reverting to a single flat sail.

The sail is somewhat under sized for the boat. A Minisprint Dinghy, so windward performance is nonexistent but on a reach the sail inflates and takes up a good shape. Performance comparisons have not been made as there have been no similar boats to sail against during tests. However the boat speed on a reach is as good as with the original sail. Camber adjustment brings a notable change in performance. Photos show the sail and rig Ground mounted. The sail was made at home out of old spinnaker material on a domestic sewing machine.

DEVELOPMENT

To produce the same power as a conventional sail the airfoil sail area may be smaller. The centre of effort would be lower so less capsizing moment. It will be simple to adapt to a sailboard, the current record of 32.5 knots may need some new approach to beat. For cruising sailors it should increase ease of handling and improve performance.

If any members or other readers are interested in further details I would be only too delighted to discuss future application.

L. Jeram-Croft.
Lt Cdr RN.

A Proa

Dear Michael,

I thought you might like to see what I am doing now.

LOA 26' WOA 19' W centre line / centre line 13.5' W
main hull 22" Disp 1200lbs sailing, 900lbs empty
Mainsail 179sq ft Jib 50sq ft Total 408sq ft Bruce
number 1.90 Centreboard cant angle 60 degrees Float
max static displacement 1000lbs.

Why this?

1, Canted foil models indicate that having the centreboard slanted in will hold down the back of the boat. Increasing the righting moment, increasing the effective displacement. By the time that is happening the boat is moving so the float, or ama, is developing dynamic lift due to leeway and its cant angle.

2. Round hulls no deck, so should pop back up if it poops.

3 Masts lean to windward. also hook to windward. Why? First if you capsize aback the mast hits the water early. At that point the float is not directly over the main hull but still off to the side, where you can climb up onto it and help right the boat. Second the mast/sails develop lift, raising the boat. Since this lift leads the centreboard/rudder, the bow lifts. The models do, this well at least. The hook to windward is for sail control, by rotating some, the sail shape can be adjusted. The mast is basically square in cross section with the track on the lee side. If you are going to build a proa you might as well take advantage of some possibilities it offers. The curved mast prevents me from using the wishbone boom that I like so well, so this boat will use a normal boom. It is rigged like an ice boat so the boom will slide up and down on the mast adjusting luff tension. I expect it will take some time to find the ideal location for the boom blocks.

4 Float long and thin, B' canted in again, about 60 degrees. Develops dynamic lift. But also it will side slip if the main hull ever comes unstuck. In the models the main hull will sometimes come up, the whole boat then just slides sideways and plops down again. I would rather have leeway resistance to windward of the sails.

5 What are those funny braces at the end of the main hull? I need someplace to tie the booms. because of the canted mast and no decks there is nowhere to attach anything at the ends. Since they are streamlined and angle up at the front I hope they will not prevent the bows from rising.

6 Construction. Double diag. cedar with glasscloth on both sides. Formed on variable camber moulds. Float has five bulkheads, main hull four. This comes out nice and light. The beams are strip-planked with 8 bulkheads and glass outside. There is a support wire 4' from the ends near the ama. I built the ama full length, it went easily. But then so did the main hull in four sections, it was a pain to line up right. Front, back, left and right. It was easy to build the panels though, since the mould became very rigid with the previous panel still attached.

Jeff Livingstone.

Delta, Ohio.



Dear Jeffery.

Your paper is most interesting, exactly the line that John Morwood suggested but did not have time to follow up.

"Ama" is rarely used over here, we usually refer to a "float" as did Arthur Piver. I think Dick Newick and one or two others have introduced the "Ama" as being a suitable word. It would be less confusing if we all used the same terms.

Your craft seems very well thought out and the shape looks "right" from my observation of fast sailing boats. I look forward to reports of trials.

R.H.E.

From "Northwest Multihull Association News
Summer 1985.

The NBF is urging some agency of the federal government to assume responsibility for labelling gasoline pumps, as more alcohol blends are introduced into the market as a substitute for lead additives, which will be off the market (USA) by Jan 1.1986 in compliance with the EPA timetable.

The EPA declines responsibility on the grounds that this is a safety and not a health problem. Alcohol is a virtual solvent for flexible fuel lines, pump diaphragms and gasket materials and 8 to 9 million older boat motors will soon be dripping fuel into their bilges. Retrofit of substitute materials is estimated to be a 5 Billion dollar job, if manufacturers would be interested in supplying parts. Twenty one states, & DC have no labelling system in place and the rest have inadequate labelling. A large proportion of gasoline used in boats is roadside purchased.

NW.M.A. PO BOX 70413
Ballard Station,
Seattle, WA, USA.

FOR SALE

"T R I - U M P H "

BUCCANEER 28. SSR 01279
LOA. 28'3" LWL. 26'9"
BEAM 21'6" Main hull beam 4'0"
Sail area 610sq ft displacement 4000lbs.
Draft 2'6" Payload 2000lbs Weight empty 2000lbs

Construction - Ply sheathed in glass and epoxied below the waterline.

Main and three headsails. 5 berth
Yamaha 6hp long shaft - 1982 with battery charging.
Well equipped for cruising and or club racing.

David Milner, Several racing credits.
Stoneridge, Asking Price £6.750

Kennford,
Exeter, EX6 7TH Tel (0392) 833402
Devon, England. Telex 42575 CLARET.

In Case of Computerisation.

THE DATA PROTECTION ACT. If there is no objection to your name and addresses being put on computer for mailing and the association agrees not to disclose that information to unauthorised persons without your consent then it seems that we would not have to register. The member will be free to inspect any record referring to them at reasonable notice. Otherwise of course there is a registration fee, more grabbing of our limited funds by bureaucracy.

Please, when sending articles for publication STATE whether you wish FULL or abbreviated address to be used in the text.

N(.

YELLOW BIRD

Guess you could call this a progress report. Enclosed pictures of the flying Proa that I have been working on for the last few years. Now am far enough along to move the operation outside and assemble all the pieces. This past weekend I was able to step the mast and get a rough idea of what it will take to finish off the rigging. Also hooked the sail to the yard and ran it up and down the mast a few times, will have to replace the screw eyes I used with swivel blocks but it looks as though it is going to work out OK. Should be able to go about by slacking off a few lines and taking up on others. The mainsail will be loose footed with a with a 3/4 bolt rope sewn along the foot. (approx 190sq ft).

There was a slight identity crisis with port and starboard so marked various pieces windward and leeward.

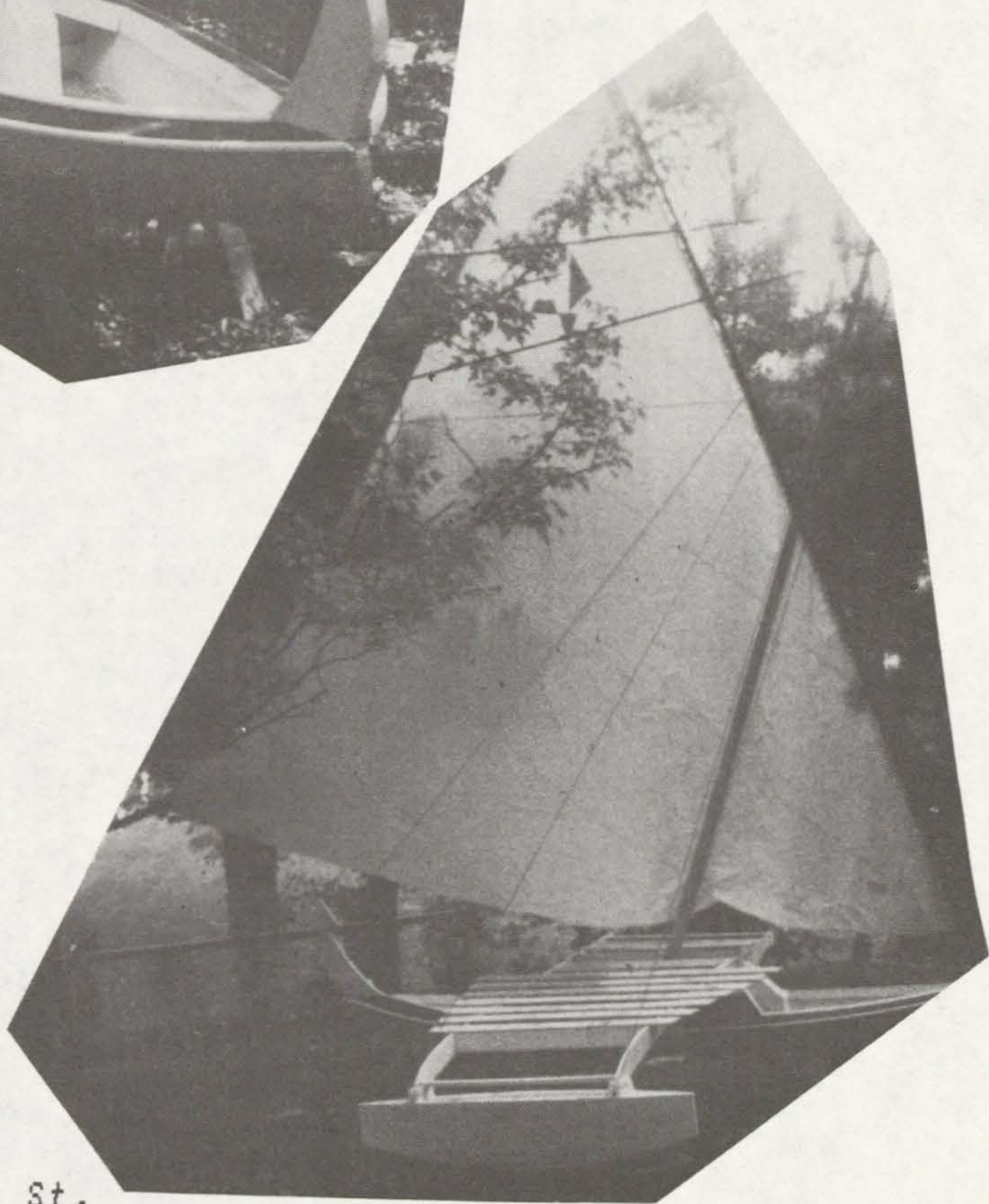
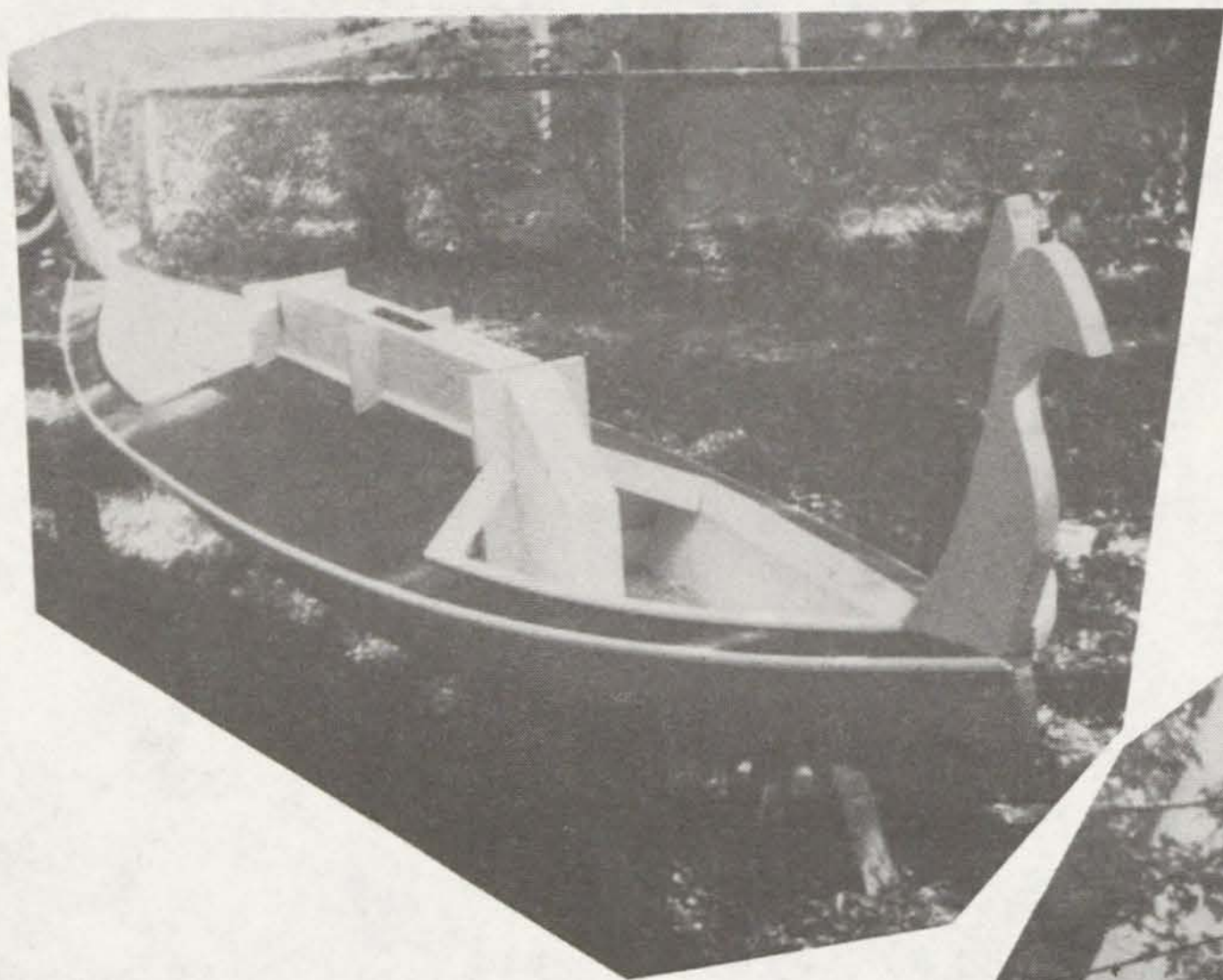
"Anticipation" is her name, and she may get waterborne this fall, if not, first thing next spring.

The main hull is about 15ft long and 3ft wide with about 1ft freeboard. The outrigger deck is 11ft 9in long and sets approx 1ft over the lee side with the rest to windward, there is a slot on the lee side for a 15in X 42in daggerboard. For storage there is a box built into the outrigger deck. The sponson is around 5ft long and 15in high filled with polyurethane as are all the voids in the main hull. I do not want to have to bail out any more than I need to when she rolls over. The intention is to keep the sponson clear of the water whenever possible. The mast is 17ft 9in, the yard is 22ft. The Mare Co at Marina Del Rey made the sail, Calif have just stained the spars and rubbed in linseed oil to see if it will stand up to weather without varnish.

Although the hull is not right configuration for a Proa it will help me understand sail handling when going about.

On paper I have plans for a 37ft Proa and am going to loft it out later this fall on particle board, cheaper than regular plywood.

I have a preference for a cabin topside rather than accommodation in the hull as long as the drag factor is not too high.



Proafully
Roland Naylor,
525 N. Arlington St,
Greencastle, Ind 46135-1112
U.S.A.

FROM THE JOURNALS

October was a good month, Yachting Monthly and Practical Boat Owner are highly recommended. The particular items that interested me were:-

YM. Reef Right ref page 196B.

PBO. Bilge Pumps ref page 38.

Reef Right. Simple sail making alterations to improve through mast roller reefing. A very practical set of improvements which I think could be to all types of roller reefing. The end result is to prevent boom droop and to establish luff tension control so that the reefed sail sets in good shape without the hassle of slab reefing.

A set of excellent colour photographs accompanies an article about hollow wooden spars made by Richard Mason using designs and the patented technique of Barry Noble. Noble Spars indeed!

Many other informative articles are in this issue including educational tales of woe [at sea and on the slipway], and cruising Northern France.

PBOs well illustrated "Sketch book" introduction shewed installation hints and tips, with a picture of a full scale [2"] hole that beats all the hand operated bilge pumps for flow. The main article describes the tests performed and pictures the pumps tested with their specifications and test results. The best buy was far from the most expensive.

The same issue includes "Cruising Magazine" Celestial navigation by Commander Geoff Lewis MBE, MR Inst.Nav. A remarkably well illustrated treatise, with examples of the geometry and calculations.

As usual there are many practical projects and ideas in this issue and details of cruising The North East coast of Britain, Blythe to Seahouses.

Fred Ball.

THE AMATEUR YACHT RESEARCH SOCIETY

The Amateur Yacht Research Society, A.Y.R.S. was formed in 1955 to promote, publish and encourage innovation and invention among yachting folk around the world.

In thirty years well over a hundred publications have been produced, a catalogue is contained in this issue.

You are invited to join in the interchange and discussion on performance, safety and comfort through these journals.

For the information of non members, the publications are sent free as they are published to society members.

----- ✂
OPEN MEMBERSHIP. SUBSCRIPTION £12.50 or \$20.00 US.

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CHEQUE/MONEY ORDER ENCLOSED.

To. MICHAEL ELLISON,
 10 BORINGDON TERRACE,
 TURNCHAPEL,
 PLYMOUTH, PL9 9TQ,
 ENGLAND.

QUOTE OF THE YEAR

TRY TO IMPROVE THOSE THINGS THAT NEED
IMPROVEMENT, NOT THOSE THINGS THAT WORK
QUITE WELL ALREADY.

From The Newsletter of
The British Human Power Club.

For information on The British Human
Power Club, contact Hon Sec:-

John Kingsbury,
Old Chapel,
Well End,
Bourne End,
Buckinghamshire.

D E T A I L S

TYPE OF CRAFT

SAILING AREA

PARTICULAR INTERESTS

CROSS CHANNEL

INTERMEDIATE TECHNOLOGY develops tools and techniques which help the rural poor of third world to work themselves out of poverty. Examples are fishing nets in Sri Lanka, irrigation channels in Pakistan, food-drying in Peru, bicycle ambulances in Malawi and many more. These are long term developments to give the under privileged a pride in themselves and their community and a hope for the future. In all cases local craftsmen are encouraged to do the work using local resources.

Theo schmidt of kite and inflatable^{float} fame, is planning a ride from London to Paris using a cycle catamaran amphibian construction similar to that shown at the last London boat show.

This ride is open to sponsorship and is in aid of Intermediate Technology.

Or donations can be sent direct to Intermediate Technology, (Freepost in U.K). 9 King Street, London, WC2E 8BR.

N(.

I. A. W. P. R. C.

The International Association on Water Pollution Research and Control. Well that is quite a mouthful but what is being done is to try and keep that mouthful clean.

Formed 20 years ago in 1965 and now covers over 30 countries. There are several publications, one is styled as a newsletter with a breakdown of up to date papers and events, next there is the journal with more specific detailed reports and finally a year book. I have not yet seen the year book but the publications that I have seen indicate that the whole aim of the association is to bring specialists and interested bodies together to enable cross referencing and to avoid duplication of effort. NOT unlike the A.Y.R.S. in fact. Where do we come in? Pollution is something we all are likely to come across so I thought you would like to know of some body who was actively attempting to control it on a global scale.

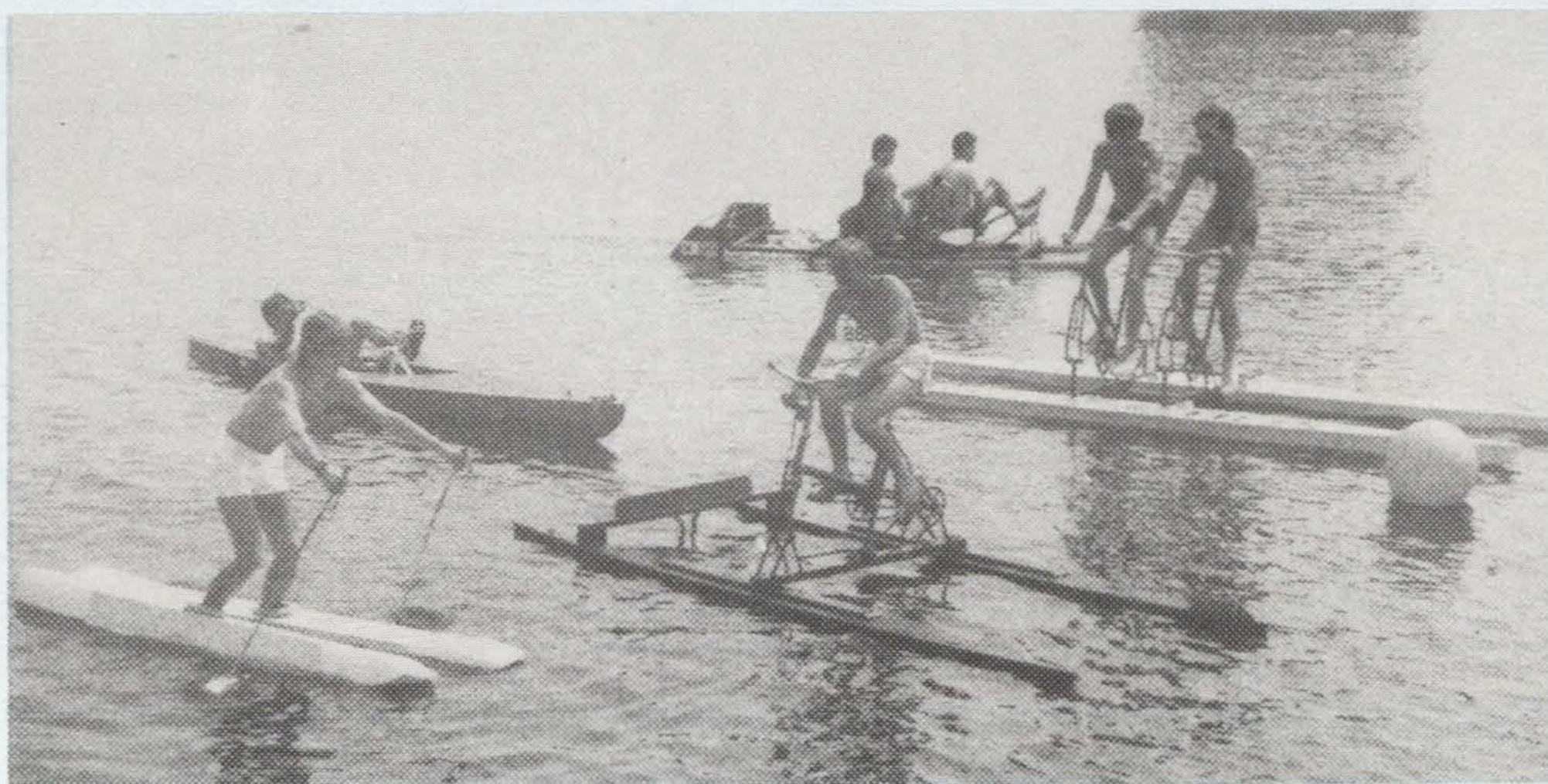
Information and membership Enquiries to
Executive Editor, I.A.W.P.R.C.
1 QUEEN ANN'S GATE,
LONDON, SW1H 9BT,
ENGLAND.

TEL 01 222 3848. TELX 918518 WASSOC Attn IAWPRC.



" FOILED AGAIN "

Human powered Hydrofoil. Designed by David Owers,
6 Leysfield Road, London W12. Sponsored by B.O.C.



Several of the Human Power Water Craft at Thamesmead
"Festival of Human Power" Sponsored by the G.L.C.