
MOTH
EIGHTY TWO

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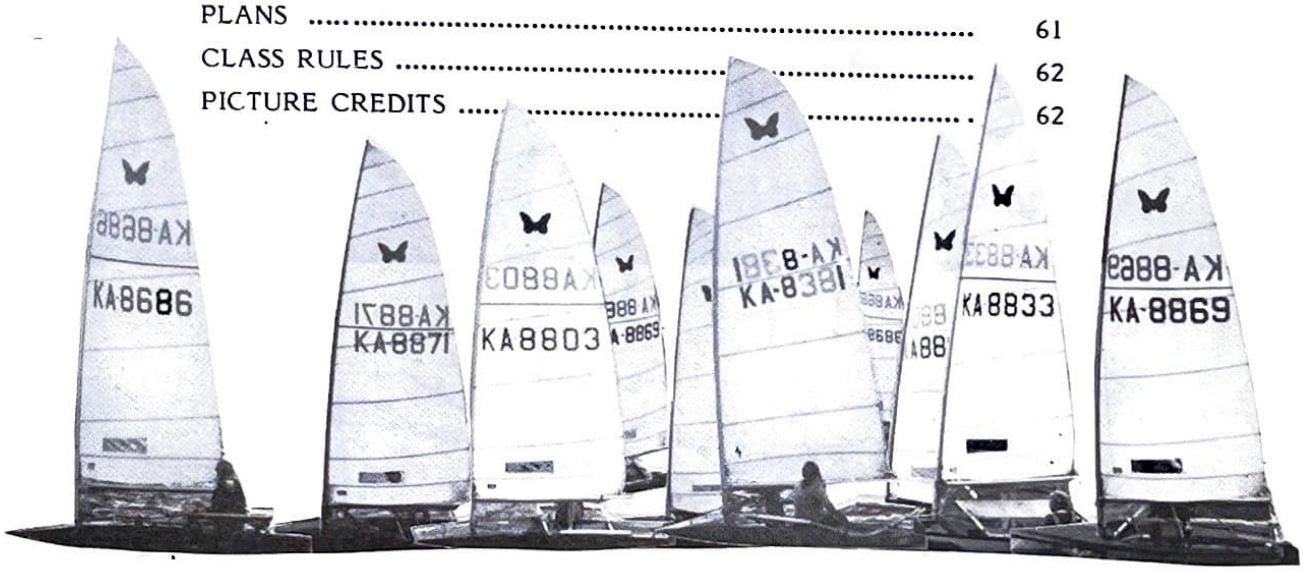

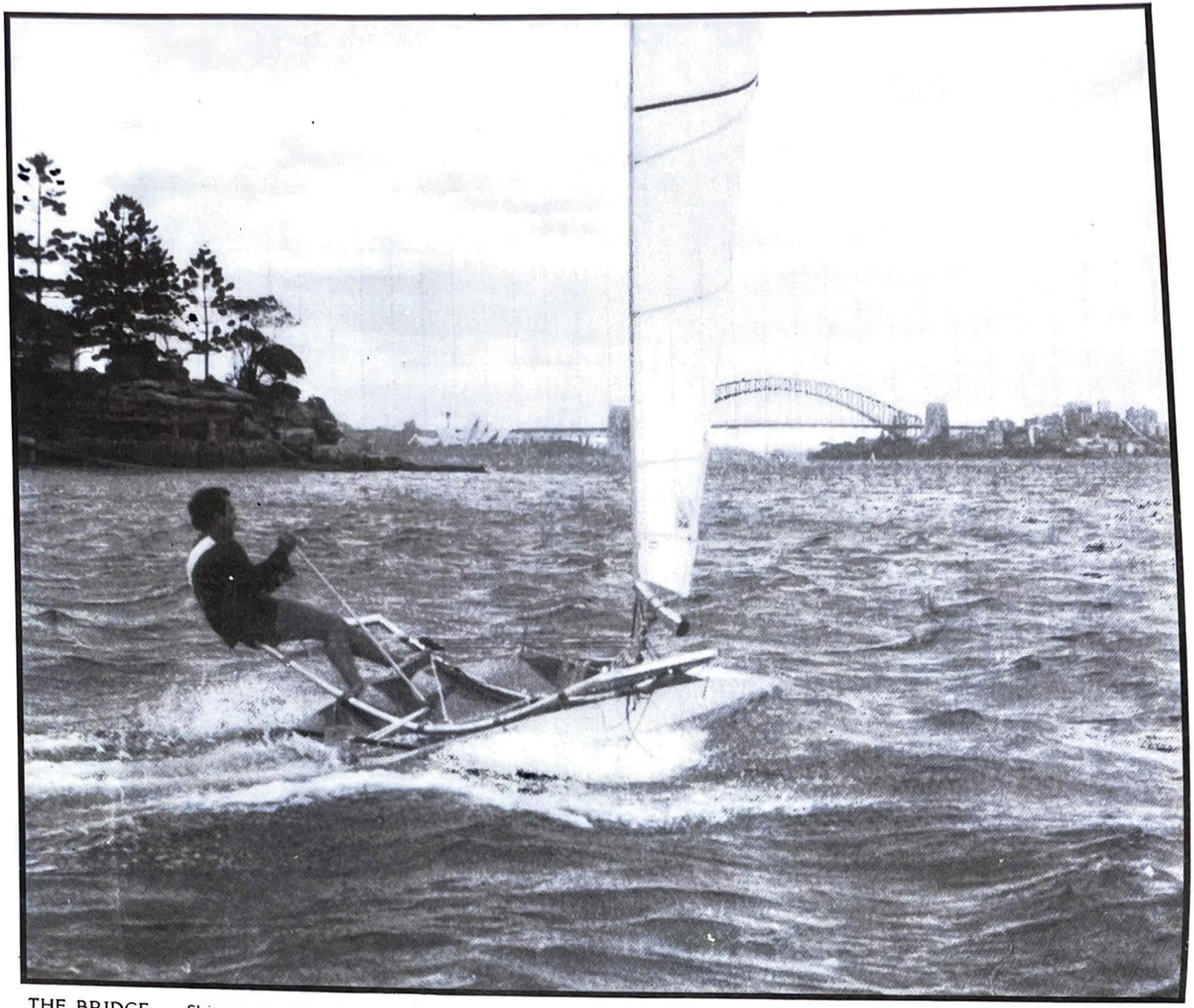

THE BRIDGE - Skipper Ian Ward

Editorial

The following pages are the culmination of a season's literary, intellectual and artistic effort to record a summary of innovations and events unique to the Moth class of Australia.

Thank you to all contributors, including advisors, photographers, writers, organisers, artists, the typist and correspondents from Australian states and overseas.

I would also like to acknowledge advertisers and the National Association for their financial support.

The Western Australian Association will take on Moth '83 editorship so take note of all the excitement (especially the N.S.W. hosted Nationals/Worlds) so you can contribute to that future issue.

LESLEY DAVIS
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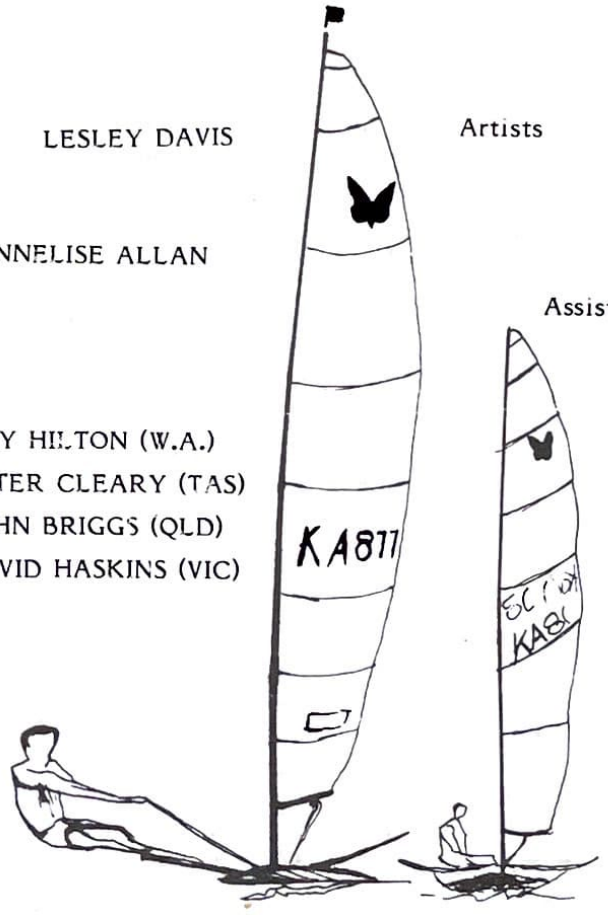

Red Tape

REGISTRATIONS

1. Contact your State Association and obtain the name and address of the State Registrar and A.Y.F. Moth measurer. Send the following amount.

   (a) $10.00 - $15.00 ($8.00 - $13.00) for state registration for one year.

   (b) $9.00 building fee receipt (B.F.R.) - royalty to I.Y.R.U.

2. The owner will receive a B.F.R. and an application for sail number form from the registrar. These must be sent to the A.Y.F. with $20.00 which covers secretarial and administration costs.

3. The A.Y.F. processes the sail number application and allots a number to the boat. The owner is notified by the A.Y.F.

4. The boat must then be measured by a certified A.Y.F. measurer who completes the forms to send to the A.Y.F. who retain the information on file.

5. A measurement certificate is then issued to the owner by the A.Y.F.

6. The A.Y.F. notify the state registrar that a measurement certificate has been issued and he, in turn, issues a registration tag.

CHANGE OF OWNERSHIP

1. Obtain a change of ownership from your Club Secretary or State Association.

2. Send form with the current measurement certificate and $20.00 to A.Y.F. at 33 Peel Street, Kirribilli, N.S.W. 2061.

3. The A.Y.F. then issues a new measurement certificate.

4. The A.Y.F. notify the Registrar that a new measurement certificate has been issued and he issues a registration tag (if current registration has been paid).

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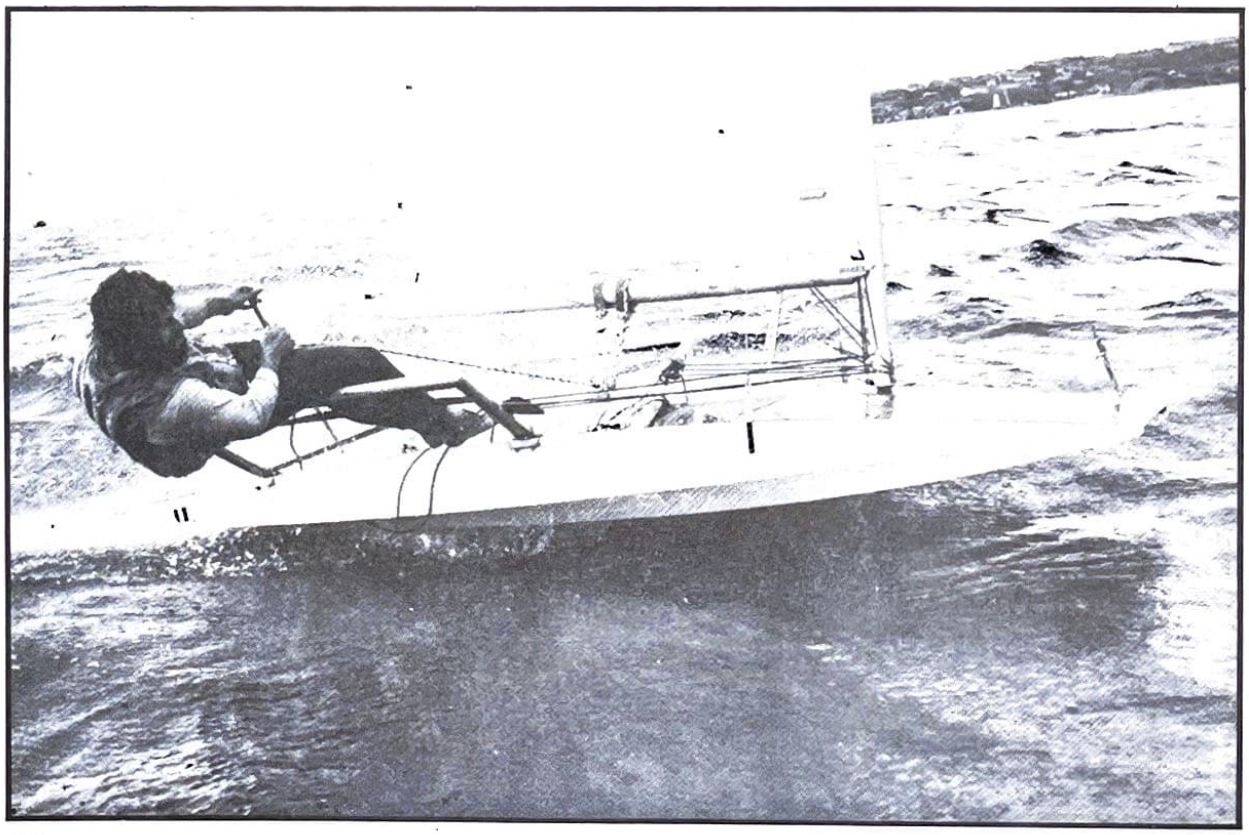


POWER UPHILL - skipper David Payne

Social Notes

THE SOCIAL CORRESPONDENT.

Well, another National series has come and gone and no doubt elsewhere there is a blow by blow description of the racing ; however, there is more to a National series than sailing. Sorrento was no exception. Here are a few highlights :

*The Banana benders were the first to arrive a week before the series. A couple of them were the first to leave, finding the Portsea Pub more attractive than the Hotel Continental (now known as the Hotel California).

*New Year's Eve at the Hotel Continental was a very quiet night's entertainment strictly overseen by the Temperance Society of Victoria. No alcohol was consumed and everyone was sober. To liven up this dull affair, those now well known daredevils from Western Australia, Mr. Bilbo Baggins and Mairy provided us with balcony jumping feats. Due to the high cost of hiring them, they didn't repeat the performance (perhaps those big blokes in the corner had something to do with it). Being frustrated in more ways than one, they managed to worm their way out of it on the dance floor along with many other worms ; actually therewere people squirming on the floor.

*Another highlight was the "Spot the Refugee Competition". Definition of "Refugee" : One who lives in scrub in David Elliot's front yard. Sleeps under or on top of piles of cumpled clothes, rubbish or other bodies. Generally scrounges for other people's toast for breakfast and speaks middle east coast dialect.

*The big event occurred on the second layday when "THE TEST" was played between N.S.W. and "The Rest of the World". After Mr. David Elliot negotiated, in true Kerry Packer style, the hire of bats and wickets from some small kids, the game got underway with "The Rest" batting first and making a sizeable score. The only highlights were Alan Tidy's and Mick's batting. It was during the N.S.W. batting that things began to happen. In an incident packed innings ; Chris Tyquin showed the West Indians, Poms and Pakistanis how they should field and catch, Jim Prower (the Pom) batted like all Poms should, Tim Parker found an excellent way of umpiring, returning to square leg for refreshments every second over and we had a ground invasion by four young girls who distracted the fieldsmen. However, this ploy by N.S.W. didn't work and they were soundly defeated by 20 runs.

*John Smidmore realised that he wasn't going to win a race or anything and tried to do himself in. He disguised this very well by falling off the edge of the lawn while pulling a sail up and hitting his head on a Mirror (of the sailing kind). But alas it didn't work, nor did he look like Dennis Lillee with a bandage around his head.

*Our rivals in those plastic boats called Lasers were conducting their titles next door at Blairgowrie and they had this sign advertising the fact you see. Well, some people - perhaps it was the fairies - decided the sign needed modification and a change of location. This sign was about 12 feet high and quite heavy to move. Anyway, the mission was accomplished quite successfully much to our delight and the Lasers furious admiration. It went back that night all in tact, complete with a correct logo.

*And a final point to muse on. Will John De Vries' next boat be called Pineapple Crusher or Crushed Pineapple ? Could John Hilton have the answer ?

Boat Speed

P. LAMB.

It is important to develop a method or technique to improve boat speed. Keep in mind that, even after the boat has been set up, changes will have to be made.

The most difficult aspect is translating a subjective judgement into objective action. The only way to gain confidence here is to experiment and learn from mistakes or successes. If the judgement is that the boat "goes like a dog", it is back to square one ; however, if the thought is that it "goes like a dog in the gusts", then here is a starting point for development.

Then :

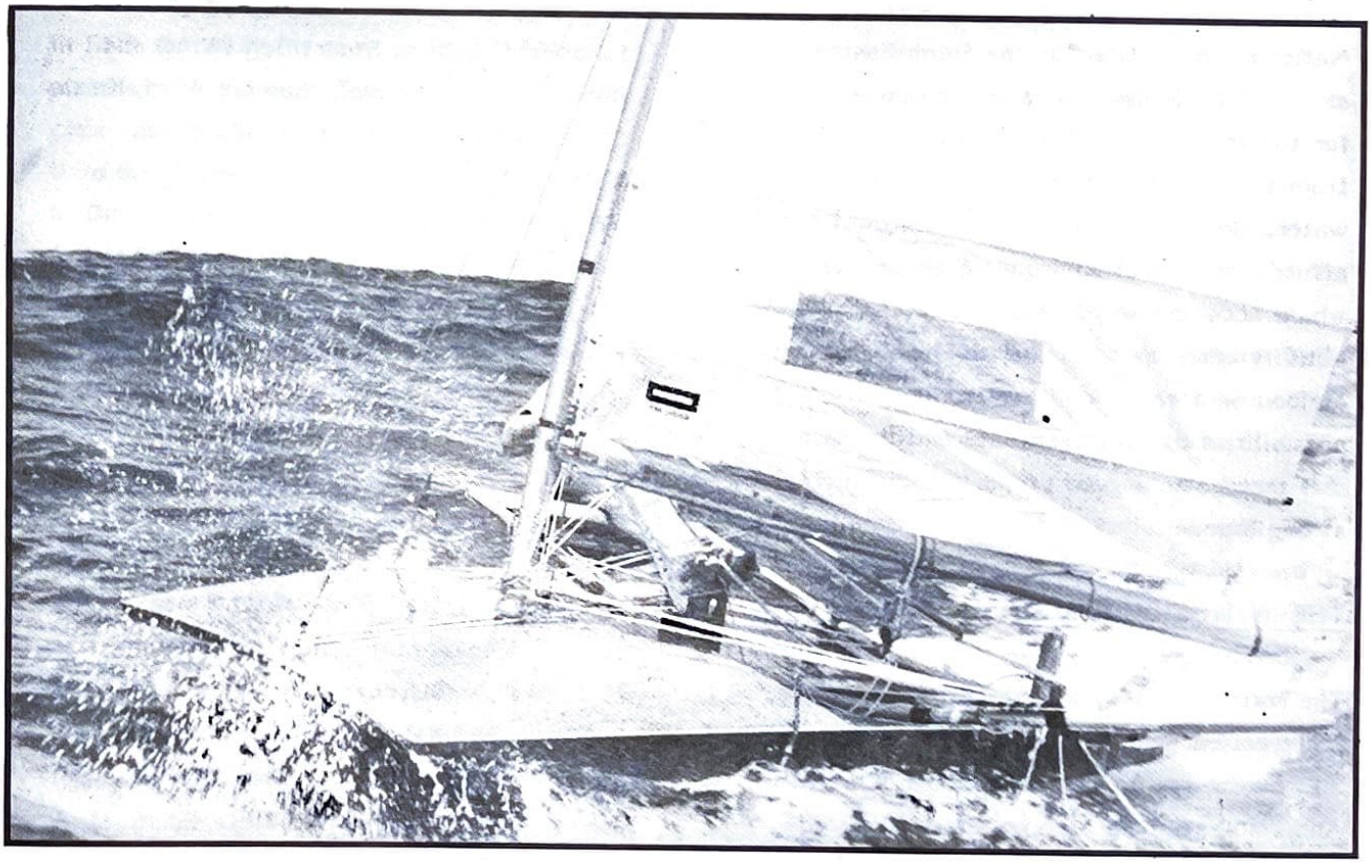
I. Consider the major variables which would improve the performance in the gusts.

II Choose the variable which should compromise speed in other areas least.

III Make changes in a direction (a) if the changes improve boat speed, increase them until the best position is reached. (b) if boat speed is worse, change to a variable in the opposite direction.

IV If no improvement is apparent, repeat step II with the next variable which comprises boat speed of other areas least.

When maximum boat speed is reached, stop messing about - and practise the hard things such as tacking, gybing and starting.



Ian Ward using ocean swell to advantage

Greg Hilton - runner up in Melbourne Nationals.

NATIONALS

Sorrento, the Victorian venue for 81/82 Nationals, is situated on the South East side of Port Philip Bay, and is renowned for the strong tidal flows which channel from the Bass Strait stream. The open water, ideal for championship racing, affords no protection from fierce squalls which accompany the strong frontal activity often associated with the Melbourne area. Fortunately, the grim possibilities did not eventuate and the fleet was treated to a good proportion of fair strong breezes.

THE INVITATION RACE

The series began with a general recall, but the fleet got away in an 8 - 12 knot S.E. breeze and moderately light tide. Andy McDougall, preferring the L.H.S., led narrowly at the first mark with Peter Lamb and Greg Hilton in his wake. They were followed closely by Stuart Bell (W.A.) and Robert Hermans (W.A.), then Ian Ward, Keith Chidzey and Steve Penny of New South Wales. The race quickly developed into a battle between McDougall and Lamb. McDougall was going faster on the run and long beam reach, while Lamb had the edge upwind and on the short shy reach. Greg Hilton and Ward were battling for the minor placings and these four gradually got away from the rest of the fleet. On the last work, the breeze gusted to 18 knots enabling Lamb to cross the line just ahead of McDougall, but he was ranked as a premature starter and the race went to McDougall. Then Greg Hilton (W.A.), Ian Ward (N.S.W.), Phil Edmiston (W.A.), Stuart Bell (W.A.), Vernon Tidy (W.A., 1st Junior), Keith Chidzey and Steve Penny (both N.S.W.).

HEAT 1

This was a similar day to the invitation race, with an incoming tide and the wind in the 10-14 knot range. The course was more equilatoral this time. A clear start, after one general recall, with the fleet of 56 boats spread evenly along the starting line. The port side of the course seemed favoured throughout the race. First to the top were Stuart Bell, Greg Hilton and Gavin Mair (all of W.A.). Then Andrew McDougall (N.S.W.), Ken Trevillien (Vic.) and Ian Ward (N.S.W.) with John Hilton (W.A.) close behind. After the double reach, Greg Hilton had the lead from McDougall and at the top Greg Hilton held a twenty second lead over Trevillien and Ward, followed by Lamb, Bell, McDougall, Hilton and Mair.

Ward picked the tide and breeze well on the square run to be almost level with Hilton. Back at the top, Greg opened his lead to thirty seconds, but after the double reach to the bottom, Ward held a lead of nearly one minute, with Ken a further forty-five seconds back. On the last upwind leg, John Hilton, in fifth spot, lost his mast ; Ian held his place easily, although Greg gained a lot. A close tacking duel brought Lamb (N.S.W.) to third spot from Trevillien (Vic.) ; then McDougall (N.S.W.) who started prematurely. Stuart Bell (W.A.) placed fifth, followed by Gavin Mair (W.A.), Keith Chidzey (N.S.W.), Phil Edmiston (W.A.), Steve Penny (N.S.W.) and Graham Ferris (N.S.W.).

HEAT 2

The wind was in the range of 8 - 12 knots with a moderate incoming tide. The course was set a bit further out and seemed to be full sized (ten miles). The front boats worked up the centre of the course, and first to the top was G. Hilton followed by A. McDougall (45s), P. Edmiston (60s), I. Ward (71s), S. Bell, J. Hilton and V. Tidy. Hilton and McDougall moved away on the two reaches with Hilton eight seconds ahead in the light wind and chop. Lamb did well coming through to third spot, then J. Hilton, S. Bell and Edmiston.

Back to the top, Ward had moved up to third spot ahead of Lamb with whom he battled for the rest of the race.
G. Hilton held his lead well on the run (20s) but was threatened by McDougall who cut this back to 10 seconds by the top mark. Hilton held his lead to win the battle. Maybe Greg's "Magic Mast" has saved the future of the scow. Lamb fought for third spot, crossing ten seconds ahead of Ward, but a premature start cost Ward his place. This moved John Hilton up to fourth spot, then Jim Prower (N.S.W.), Stuart Bell, Alan Tidy (W.A. skiff), Steve Penny (N.S.W.) Vernon Tidy (W.A.) and Phil Edmiston in tenth place.

HEAT 3.

A northerly early in the afternoon changed steadily to the west, so by the start, a combination of gusting 10 - 20 knot winds and rising tide caused a short sharp chop to develop.

The top boats broke away from the fleet after a clear start. Peter Lamb picked the shifts well and had good speed upwind so rounded the top mark first with Stuart Bell twenty seconds behind, followed by McDougall, G. Hilton, S. Penny and J. Hilton. Lamb, with clear air, streaked away on the reaching legs, but G. Hilton was also doing well, rounding the leeward mark in second place at forty eight seconds with McDougall a further fifteen seconds back. These three boats vied for first place. However, Lamb applied a loose cover to stay ahead with Hilton and McDougall in a tactical duel for the minor placings. Ward managed to get up to

fourth at the end of the square run but found his rig did not suit the conditions upwind. The day was ideal for scows, but Andrew McDougall's performance in his skiff would put him very high in world class skiff ranking. Achieving such skill in one season must be considered a truly outstanding performance.

The finishing places were : P. Lamb (N.S.W.), G. Hilton (W.A.), A. McDougall (N.S.W.), S. Bell (W.A.), J. Hilton (W.A.), J. Briggs (Q), I. Ward (N.S.W.), P. Edmiston (W.A.), S. Penny (N.S.W.), V. Tidy (1st Junior).

HEAT 4

Heat 4 was heralded in by a forecast for a twenty to twenty-five knot southerly moderating to fifteen knots. The wind actually built up throughout the afternoon, with gusts of over thirty knots. The seas were choppy making conditions difficult and, as a result, there were twenty-two retirements and non starters. The depleted fleet was away on the first start with G. Hilton's mast raking mechanism giving him unbeatable boat speed upwind. At the windward mark, David Elliott was 1m16s behind ; J. Hilton a further 5s, then Stuart Bell, Gavin Mair, Peter Lamb, Steve Penny, Phil Edmiston, Ian Ward and Vernon Tidy. It was getting close to survival sailing and nearly all skippers had at least one capsize. Those that gybed successfully usually made big margins on those that tacked around or nose dived in. As a consequence, the fleet quickly spread itself over the course. Bell was forced to retire while running a good third, Hilton capsized before the last mark and Elliott grabbed the lead. He tried to cover Hilton in the closing stages of the race, but Hilton's boat speed was too good. As they crossed the line, it was G. Hilton, Elliott, Edmiston, Ward, Lamb, J. Hilton, Robert Hermans, Chidzey, Mair and J. Briggs in tenth place.

There were numerous reports of minor damage but S. Penny was the unluckiest. He had sail, mast boom and gear under control of the rescue boat and was in the process of being towed, but had his gear jettisoned when they found it necessary to go to the aid of another wrecked soul. He was not quick enough to save it from sinking and there was no marker buoy left.

HEAT 5

The first of the two morning races brought the expected light breeze, a start in six to eight knots of breeze with generous shifts. Despite the fairly short upwind leg, the fleet was soon strung out over the course. Gavin Mair was first to the top just five seconds ahead of Andrew McDougall with a furtehr five seconds to Bob Bruce in his single chine scow. Then Peter Lamb, J. Robinson (Vic), J. French (Vic) and R. Tutt (N.S.W. skiff).

The leaders seemed to sail in a large arc looking for the wing mark, and with the breeze briefly up to 10/12 knots, the back runners started to close the gap. On the second leg of the reach, the wind died to 6/8 knots staying light and very patchy for the remainder of the race. Lamb, McDougall, Mair and Bruce were engaged in battle, and were joined by Ian Ward. First across the line was Andrew McDougall (N.S.W.), Peter Lamb (10s) (N.S.W.), Gavin Mair, Ian Ward (N.S.W.) (with a seaweed handicap), Greg Hilton (W.A.), Bob Bruce (N.S.W.), John Hilton (W.A.), Peter Hannah (Vic), Jim French (Vic), Jim Prower (N.S.W.) (10th).

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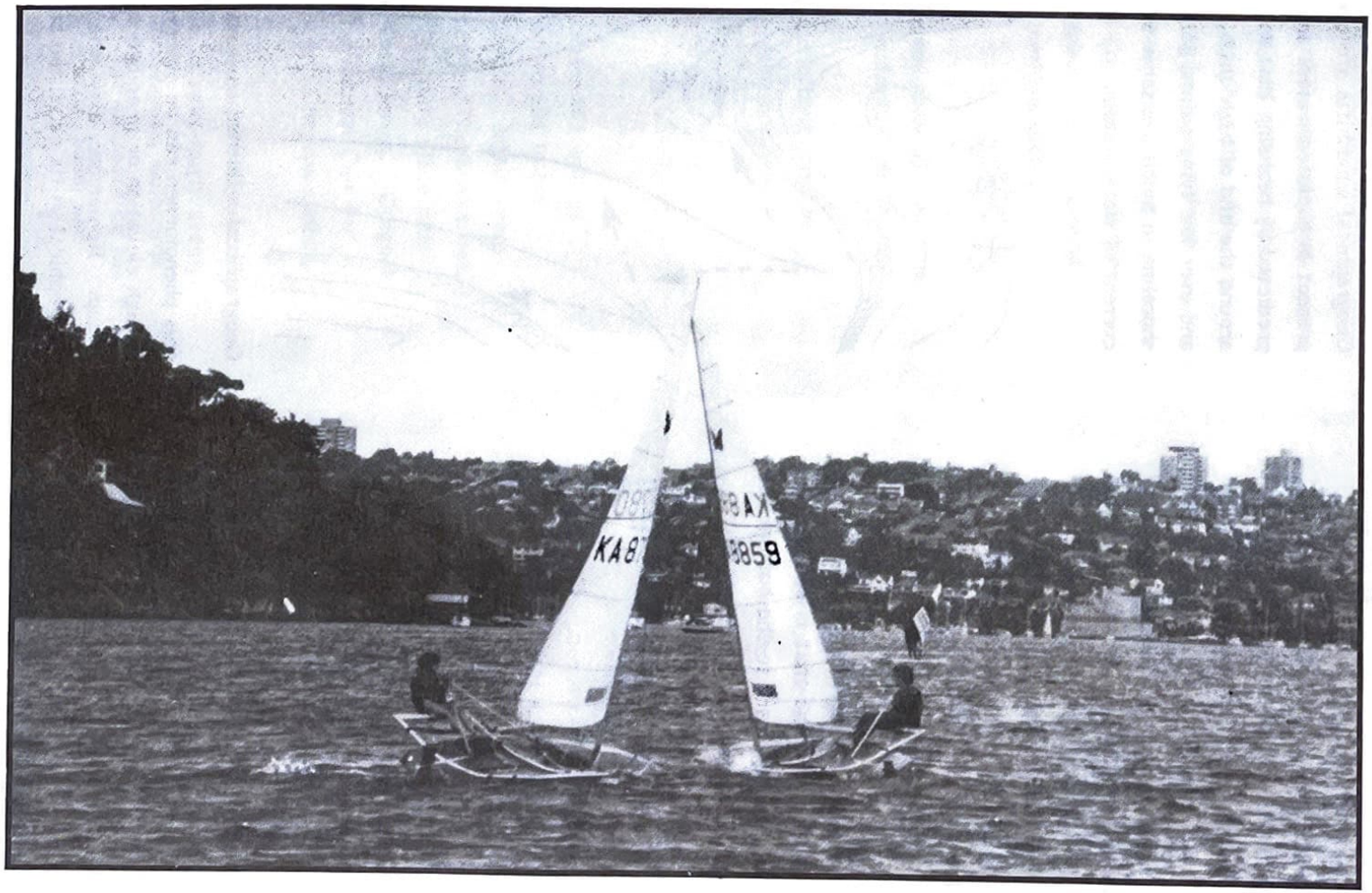


THE ULTIMATE CROSS

Wind Shifts

I WARD

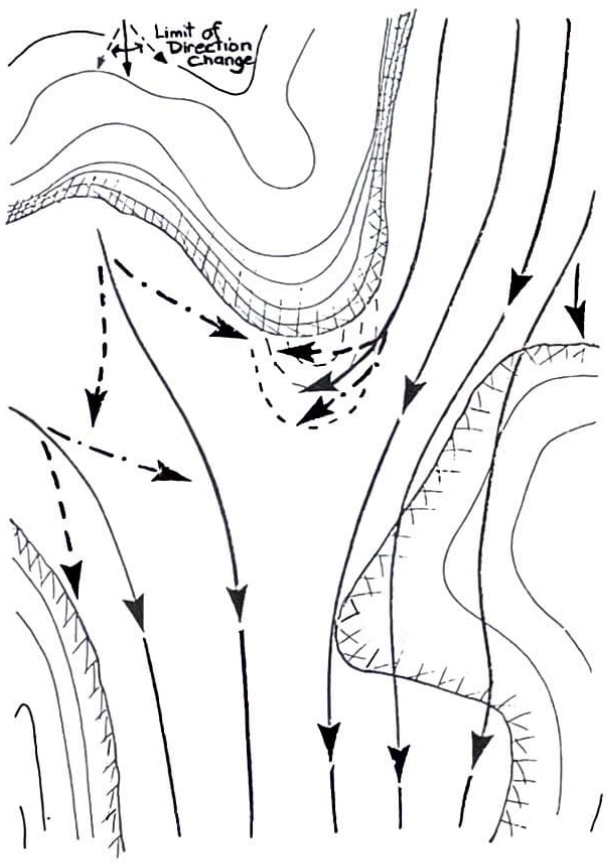
The most important skill for a racing skipper to develop is the ability to read the windshifts, i.e. to utilise the wind as it periodically changes direction.

The wind oscillates around a mean direction - it is never steady. For example, on an open bay, it will swing 5 - 10° from a mean position, back again, then 5 - 10° in the other. In hilly terrain, or on inland waters, it may shift 90° and back in ten seconds.

A moth usually sails at 45° to the wind direction. Take a breeze that is blowing directly from the top mark to the bottom, the course to be sailed will be at 45° to a line joining the two marks. If the wind shifts, so the boat points closer to the top mark than 45°, the distance to travel to the mark is shortened. This is called a lift. A knock is when the angle and the distance to the mark is increased.

Skippers should aim to stay on as many lifts as possible. If the boat points below 45°, it is advantageous to throw onto the other tack, i.e. the lift. On an open bay or ocean, a compass is helpful in discerning the lifts and knocks. On enclosed waters, the shoreline can be well utilised by taking a mental bearing from the surrounds after the tack. This line is used as a reference for lifts and knocks. A tack to take place when the boat is knocked below that bearing. Every attempt should be made to imagine the line at 45° to that which joins the marks even when one or both are obscured.

Geographical windshifts are always present in enclosed waters and are easily predicted by realising that wind flows around the end of high cliffs, around and over low lying points, following the shoreline in much the same way as a current of water would.



Geographical influence on wind patterns.

This phenomenen can be observed from a place of high elevation or imagined with the use of a map. Remember, even when these geographical shifts exist, the breeze continues to oscillate, and it is possible to sail a losing tack within a geographical lift. The main thing is to develop your senses so that these factors described become obvious, thus making it easier to work with the wind and hence win races.

Moth People

PETER LAMB

Peter Lamb is current National Champion in the Moths. He designed and built his own "Stunned Mullet" which is the fifth boat he has built during his nine years in Moths. Peter is currently finishing a degree in Mechanical Engineering at Sydney University and has applied this background to new construction methods used in his boat.

He has topped off a good season by winning the highly contested Seaforth Club Champ.

The N.S.W. IMCA is benefiting from his services as Race Convenor and State Measurer.

GREGORY HILTON

Gregory topped the season off well by another State title win to add to his 2nd place in the Nationals. In six years of Moth sailing, he has two National titles, twice runner up and one third place plus 2nd, 5th and 3rd in World series. Gregory had previously shows a natural flair for sailing in the Pelican and Cherubs classes.

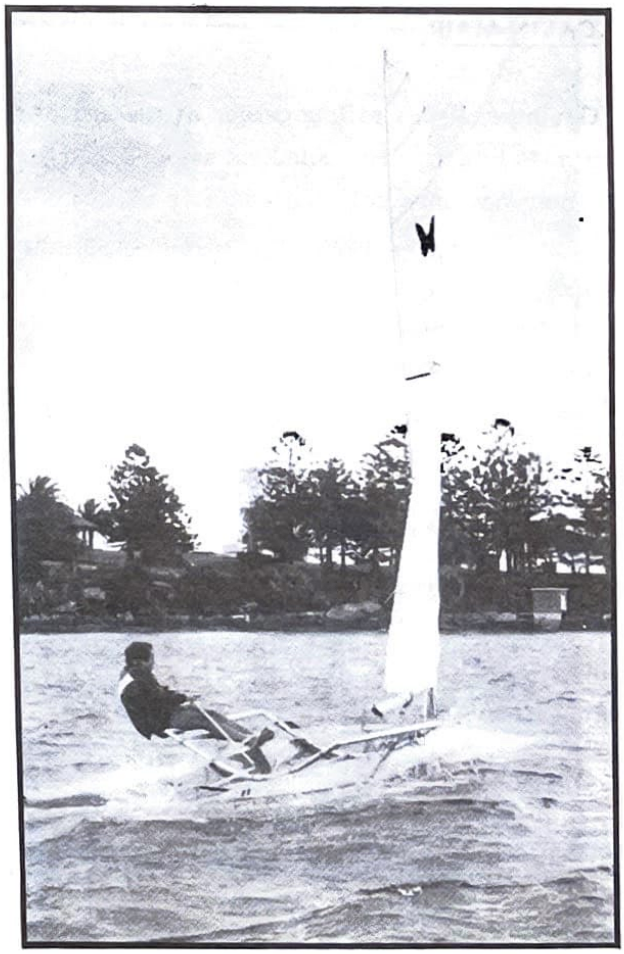
Currently, what spare time he has outside his dentistry practice, is split fairly evenly between Moths, 14 ft. dinghies, sailboards and training juniors. The sailboard he has built himself, including mast, boom and sail. Greg is also president of the W.A. Moth Association, and of the South of Perth Moth Section. Gregory is quite innovative, and his introduction of the swinging mast concept in a practical form has added yet another development to our class.

IAN WARD

Ian Ward has had a long association with Moths, having some nineteen years racing experience, and built seven boats. The most recent design, "Effanineffable", which holds the Pan-Pacific Championship, was runner up in the 1980 Worlds in New Zealand. He was also recently awarded a PhD in Metallurgy and travelled to Sweden to train for the job of Sandvik Australian Technical Manager. On his return, he sailed in the Nationals to procure 3rd place.

At present, he is involved in design and development of the McFraud venture and the class as a whole.

Ian Ward - third place



PHIL EDMISTON

Phil started sailing moths in 1969 after a short but successful career as forward hand in the Pelican class. Moths have featured prominently in Phil's life and each season he has built a new boat incorporating building methods and ideas gained from every possible source.

Phil first represented his State in the 72/73 series in Perth as a junior. He has sailed in most Nationals since the Worlds in Brisbane, gaining a fourth in Victoria and representated Australia in New Zealand in 1981. Sailing from South of Perth, he has always found keen competition to keep his interest alive.

Phil is an Honours graduate in Computer Science, and also a holder of a Diploma of Teaching. He is working at Collie for Griffin Coal as an engineer and travels to Perth at the weekends to catch up on some sailing.

GAVIN MAIR

Gavin began his sailing career at the age of 9 in Pelicans. He sailed six seasons in these speed machines before graduating to Moths. He built his first Moth in 1978, based on the lines of his favourite Pelican ; however, the blunt bow seemed inefficient in choppy water. He chose an O'Sullivan hull for the recent nationals which has since been wrecked by a bus in an accident - just lucky.

Gavin works as a civil/structural draftsman with Perth City Council and is in his final year of study towards a Civil Engineering Diploma.

ANDREW McDOUGALL

Andrew started sailing with his first moth at the age of 14, and built his first hull at 15. He raced in Brisbane Nationals of 1970 when 16, but followed this with three years in Javelins. After a break from sailing, he came back and gathered consistently good placings at the Nationals from Tasmania through to Melbourne with two fifths, one seventh and one sixth.

Andrew moved into an English skiff and defected to N.S.W. from Victoria in 1981 to win the State Titles. This was followed by the building of the current Wombat design which he proved in almost all weather conditions, defending the N.S.W. state titles successfully.

He is a qualified Mechanical Engineer but over the last few years has preferred self employment in related fields.

Andrew McDougall - sixth place

JONATHAN BRIGGS

Jonathan ventured into the sailing world as a Sabot crew member in 1970. The following two seasons he sailed his own Sabot, winning the Club Championships. In 1973, he purchased a second hand redwings and soon acquired the skills associated with nosediving and "Bundy" rum. A few seasons later he won the State Championship in a new redwings named "Eagle". The next year, Jonathan sailed his first National and World Series in Brisbane 77-78, and has been on the circuit ever since. On acquiring a new McConaghy "Klegecell" Moth, Jonathan brushed up on nosediving techniques and finished 11th in Perth ; 19th in New Zealand and won the State Championship. Another boat helped him place 9th in Melbourne and retain enough enthusiasm to come back next year.

A part time course in architecture has kept Jonathan busy and too often away from the coast for the last five seasons. Final year is looking grim enough to ensure the boat arrives at Botany Bay with a protective coat of dust.

VERNON TIDY

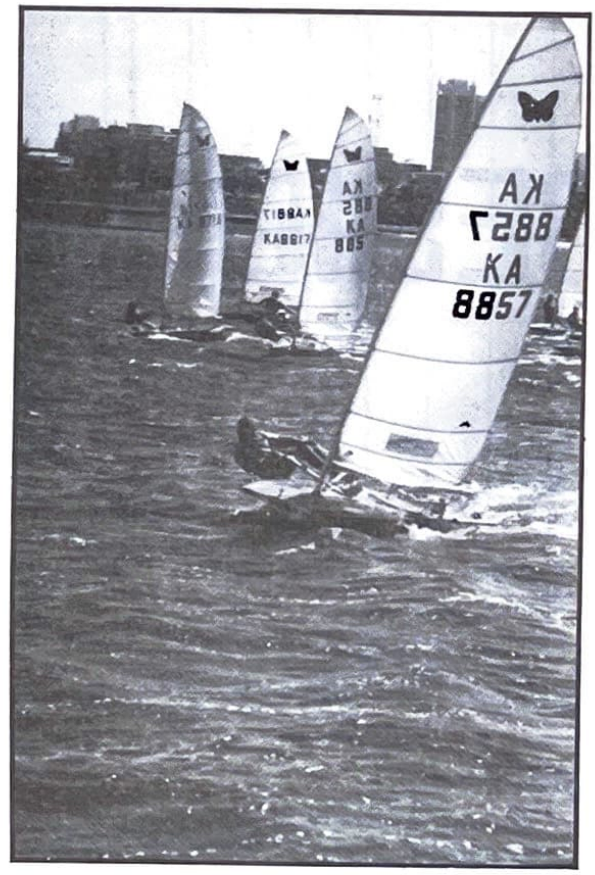
This year's Australian Junior Moth Champion is 17 years old Vernon Tidy, who commenced his sailing career in Flying Ants as a forward hand for his brother, Alan, in 1976. Both boys were virtually self taught. Upon Alan's elevation to the Moth Class, Vernon took over the helm of the Flying Ant for a further season before also joining the Moth fleet. His standard of sailing has improved considerably and he is now a force to contend with in the open ranks. Since returning to the West from the Nationals at Sorrento, Vernon has also added the State Junior title to his record, thus equalling Alan's effort last year by winning the National and State Junior Titles for East Fremantle Yacht Club.

PETER MORRISON

Peter Morrison's history includes half a season on Sabots, one season on VJs and five in Moths.

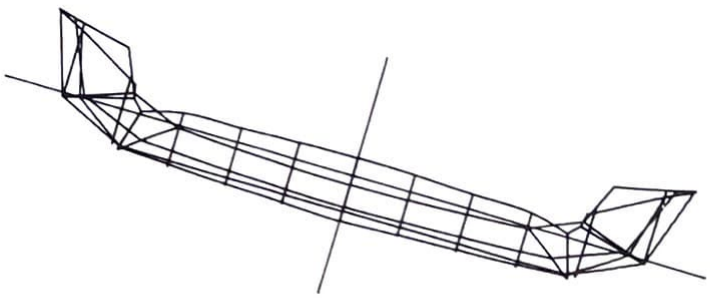
His job as third year apprentice patternmaker has stood him in good stead with the exacting art of boat building. In 1979 Peter and his father built "Spondulicks", followed by four others (not all sailed by himself). He has been a representative for N.S.W. at Tasmania, Perth and Melbourne and sailed his recent Effanineffable design to win the Interclub Shield, Dobroyd Club Champ. and 2nd Junior at the National Titles.

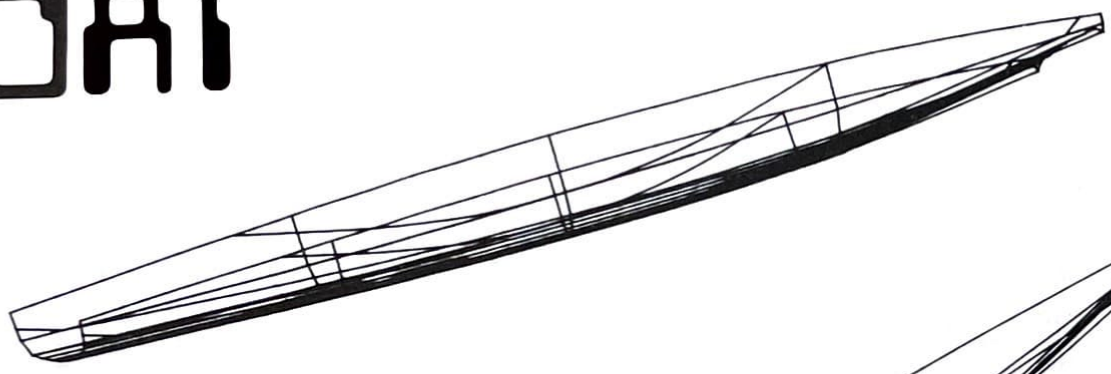
He has high ambitions for the coming Australian and World Junior Titles, but still has time for the State Association in the capacity of selling mast, ply plans and other projects yet to come.



Vernon Tidy - Junior Title Winner

COMPUTERS IN BOAT DESIGN





Most readers will have seen advertisements for computer "designed" sails and yachts. This article is a brief introduction to some of the computer and mathematical techniques used in this field. A computer cannot do anything a person cannot do in principle - in fact, it can only be made to carry out very well understood processes albeit quickly and accurately. Since there is a lot of art in boat design, a computer cannot design a boat; it can do lofting and carry out many calculations to aid a designer.

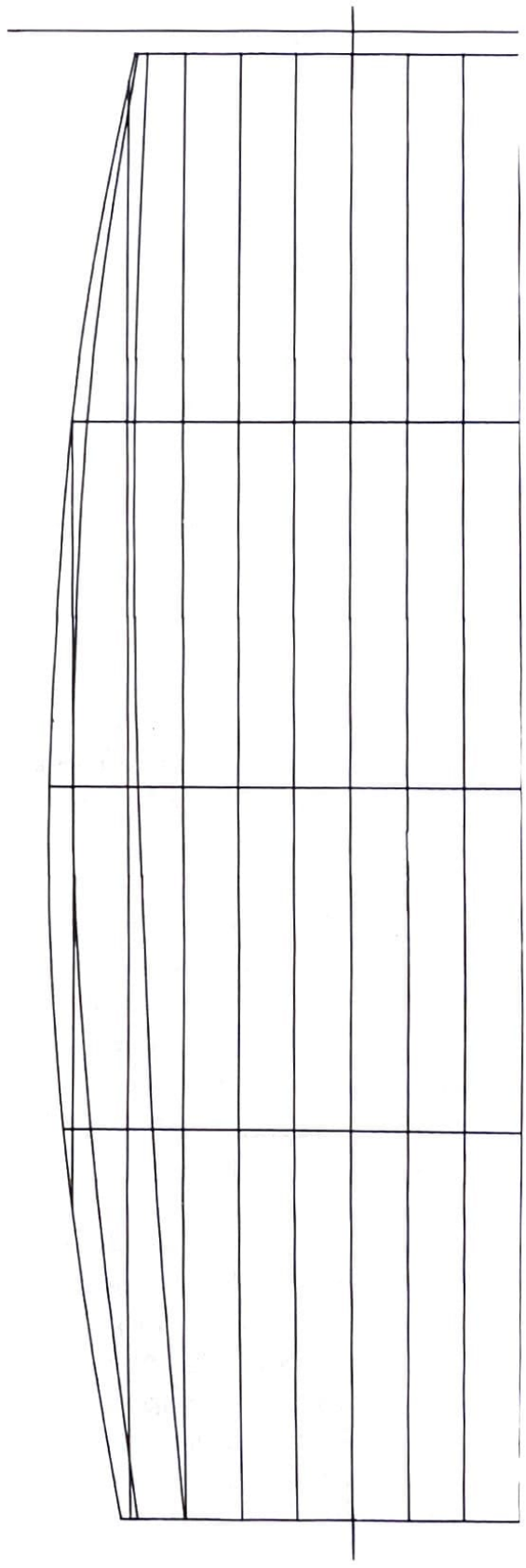
Lofting. A hull or a sail is a complex surface in three dimensions. The designer tries to form a shape with some desirable characteristics, an important one being fairness. Traditionally, hull lines are drawn full size on a loft floor by plotting points from a table of offsets and fitting a springy piece of wood through them. Fine adjustment is done by eye. This process is called curve fitting.

There are many mathematical methods of curve fitting. One applicable to boats, cars and planes is the use of splines. To fit a spline through n points $p_1 p_2 \cdots p_n$, n-1 functions are used : f_i between p_i and p_i+1. Usually the functions are ploynomials, and often cubics, hence cubic-spline. Since a simple straight line can be fitted between two points, each cubic f_i has two "spare" degrees of freedom. These can be used to arrange continuity of first and second derivatives at the transition from f_i to f_{i+1}. This makes for a mathematically "smooth" curve made out of many simple curves. Cubics are easy to work with and efficient to compute. Splines do not suffer (as badly) from undulations (hollows) as other polynomial curve fitting methods. It also happens that a thin piece of wood will adopt a spline shape when fitted through n points if the deflections are "small".

It is convenient to use a parametric representation for curves - in which the x, y and z co-ordinates are functions of a parameter t. This makes closed curves and multivalued functions easier to handle and does not give special weight to any particular axis.

There are in fact many varieties of splines all with different advantages, but the basic idea is similar.

Surfaces. A hull can be visualised by a set of sections : buttock lines running fore and



Contd. Page 57

Better Sailing

IAN BROWN

1. Good concentration of all of the below :

2. Awareness of :

   (a) Course area : e.g. tide, geographical shifts, varying wave conditions, varying wind strengths, etc.

   (b) Sailing instructions : code flags, mark descriptions, starting procedure, etc.

   (c) Competition : where each important competitor is at any time during a race.

   (d) Future : as much as possible have an idea what should happen on the course within the full race time and especially within the next fifteen minutes.

3. Boat sensitivity : knowing when your boat is sailing fast or slow and how to make it sail high and fast, low and fast or slowly. I include slowly as it pays someime to slow down to take a tactical advantage when surrounded by boats.

4. Crew Co-ordination : In a single hander, this means a great affiliation of your body weight with your boat, e.g. in light weather moving smoothly. Also knowing where to put your body weight to trim horizontally and longitudinally, your particular hull design.

5. Boat/Crew Co-operation : here for single handers this means a rudder that never stalls so you can always steer your boat. Enough mast rake to prevent nose diving. Adjustment lines that work easily and make a significant change in performance. A hull design you know is fast.

6. Ease of mind : Enjoy your racing, which means enjoy concentrating on the second factor "awareness". To be able to concentrate well, you must have developed instinctive competence in
   (3) Boat Sensitivity
   (4) Crew Co-ordination
   (5) Boat Co-operation.

Practice on the water and instant remedy to problems found is the first major step to improving your racing performance.

The second step is to not only criticize your equipment, but also yourself and your technique. Always use this criticism to develop yourself ; don't let it demoralise you ; criticise yourself quietly and learn.

Garden Tips

DAVID HASKINS

A lot has happened in Victoria during 1981-82, with the organising and conducting of the National Titles. We hope the series was enjoyable for the visitors. Sorrento S.C. was very pleased with the series and the way the competitors conducted themselves. It would appear that the situation wasn't as harmonious around the corner during the Laser Nationals. On behalf of the Victorians, I would like to extend our congratulations to the major place getters in both the Open and Junior titles. The Victorian challenge was not as strong as we had hoped ; perhaps next year. Somehow I think this has been said before.

The Moths shared a stand at the 1981 boat show with Sabots and Impulses, but still managed to attract an interested public. There has been tremendous activity in the 2nd hand boat market with fifteen to twenty boats sold through the association. Not many of these boats have stayed in the racing circuit due to skipper youthfulness of decentralised country clubs. Fleets of Moths are now sailing at Albury/ Wodonga, Rhyl, Somers, Sorrento, Rye, Mcrae, Albert, Park and Black Rock. From a racing point of view, the clubs are too scattered to ensure good fleet racing, so most of us battle it out with Lasers.

As well as sailing Moths, Bryan Gray and Phil Evans have been crewing on keel boats. Phil sailed on "Isle of Iving" which was the line honours winner of the Melbourne to Hobart race. One day he will sail his recently completed skiff. He also is a part owner of an 18 foot skiff. Others of us have been caught up in the windsurfer craze and spend our time learning to perfect the technique. We still have a way to go to match Andy McDougall's prowess displayed on the West Lakes during the titles in South Australia.
One of our former top skippers, Andrew Hodder, was the first Australian in the recent Laser Nationals, proving yet again that Moths produce good sailors.

The selection series in November was sailed at Sorrento and in a variety of conditions. Bryan Gray won the Macline "Seaphy" Trophy. Second was Ken Trevillien who had to carry a premature start, and third, Mark Davis, in his skiff. Andrew McDougall and David Elliottcame down from Sydney just to show us that sailing in N.S.W. doesn't affect you too adversely by each winning heats.

Since the Nationals there hasn't been much activity as far as sailing goes, with boats being repaired and enthusiasm waning. The Victorian Yachting Council Small Boats Regatta was attended recently by some Moths ; Raja Lingam in Pyromanic Platypus and Greg Hammon in French Cut were well placed.

During December, Murray O'Brien attended the Victorian version of Youthsail that was held on Lake Eppaloch over several days. Conducted by many experts, it was an intensive course and all benefited from the experience.

Here endsthe Victorian News. We look forward to renewing friendships in Sydney next season.

the French way

Jim French

Over the years, the ply/frame method of building moths has been developed to a very high standard. The 1.2-1.5 ply outer skin with 3 stringers a side and 8 - 9 frames has turned the moth into an extremely light and durable boat. The 1.2-1.5 ply is the only viable skin to use and internal framework is now at a minimum so further development seems impossible unless someone comes up with a lighter, stronger skin.

Nothing can fully replace this method of building as it is the best way for the amateur to get into moths cheaply - and the best way for top skippers to develop new designs without much expense.

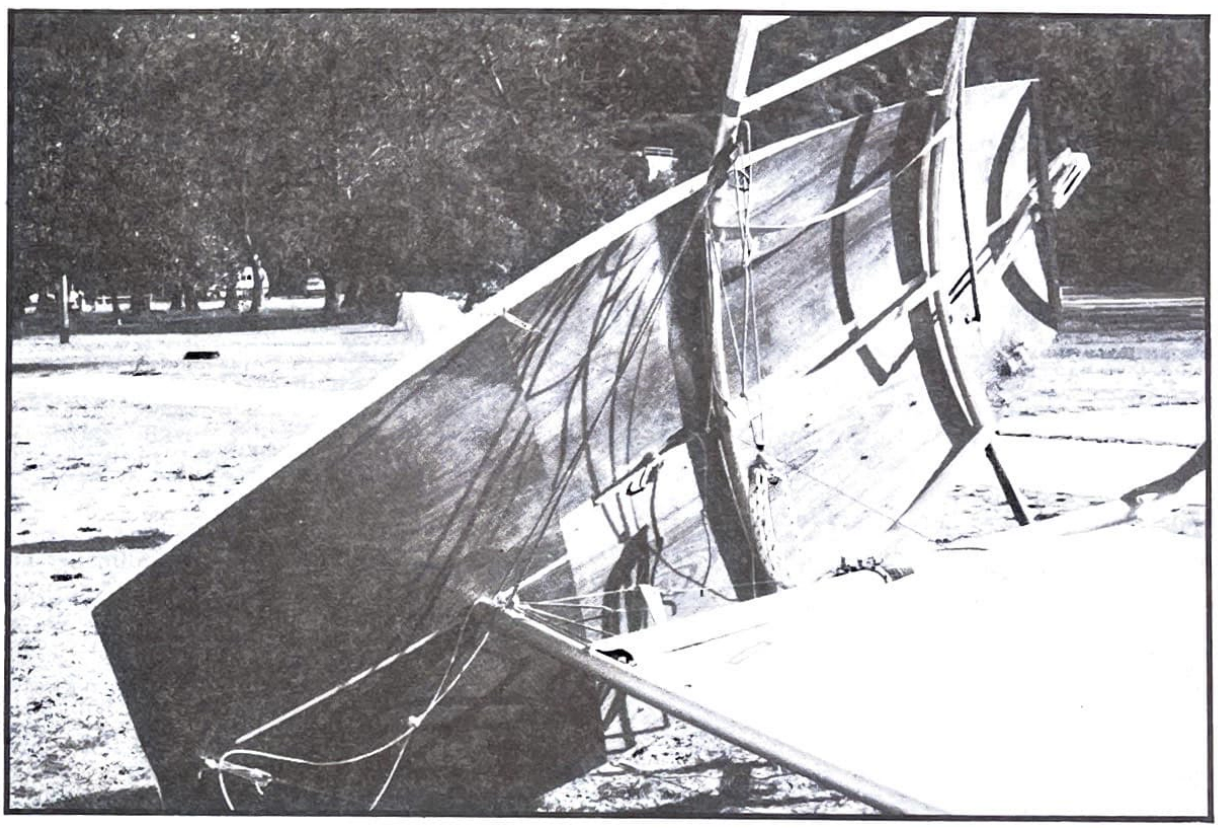
As a boatbuilder, I have found one offs are impractical to build as the extra time involved in setting out inflates the price too much. The standard ply/frame boat also takes too long to build and recent shortages in ply have caused me to search for an alternative method of construction.

The only way for me to go was to use mould techniques and substitute the thin skin and frames with a sandwich strong enough to leave out most of the tedious inside framework. A sandwich of about 6 - 7 oz./sq.foot that had tremendous panel stiffness ..... and which was relatively inexpensive had to be found.

Epoxy soaked Kraft paper honeycomb with 0.6 mm Maple veneer on each side, and the outside glassed with epoxy and 2.0 oz. glass cloth was the answer. The result was a very stiff hull at a really competitive weight with one frame and a half a strong-back - a very simple construction with the hull's skin taking most of the loading. Difficulties in using the 0.6 mm. veneer precluded me from using this material for more than a few boats, but it did prove that a light, strong sandwich could be used very successfully.

Demonstration showing the clean lines of the McFrawd Hull.

Fully rigged



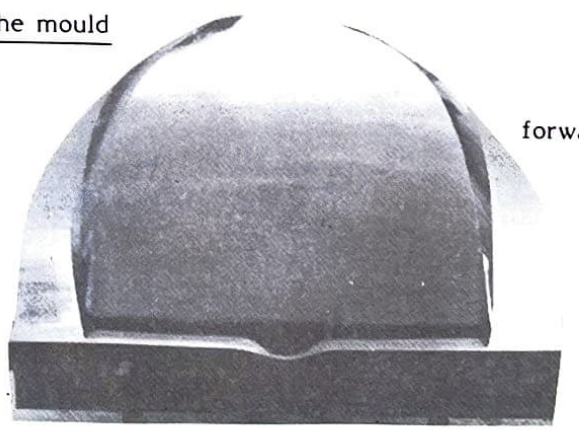
From this experiment, I saw that mass producing a sandwich moth could be a good alternative to traditional methods. With Ian Ward, Peter Lamb and Andrew McDougall, we started the Stunned McFraud venture, with the aim of producing a boat that was maintenance free, very durable as well as being moderately priced.

I chose a polyurethane/epoxy, glass/Klegecell/epoxy, glass sandwich to be constructed in a female mould using vacuum bag techniques. This is a proven method which is simple, quick and produces a top quality product. The ½"

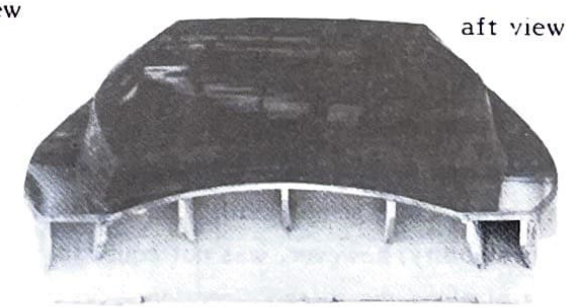
Klegecell with one layer of 6 oz. glass and West System Epoxy is very strong and very light. In using epoxy in the layup, all internal frames and strongback, as well as 1.2 ply decks, can be bonded to shell without fear of joint failure as is the case with polyester resins.

The sandwich construction idea is not new, but until now it was not viable in the moth class. After only five months work it has reached a competitive and cost effective stage. Who knows what we shall achieve after several years development !

The mould



forward view



aft view

EXOTICS

ROB BREWER
(Sailmaker and Consultant)

The last two years have been exciting in the area of sailcloth, with the introduction of exotic and new materials. All these new sailcloths have been the source of much controversy in regard to life expectancy, strength and weight saving.

In the moth class, in particular, reducing the weight of the boat is a very important consideration. Let's face it ; if your moth isn't among the lightest around, it's not going to be one of the fastest either. So any saving in weight should be of great importance, particularly in the rig. You could realistically look at having a sail half the weight of the average 4.5 oz. sail, and remember this weight is in an area where it can cause most heeling moment.

In a broad outline, the practicality of the new light weight cloths should be considered.

Over the last four seasons I have worked with Peter Lamb (current Australian Champion) in developing a fast sail and rig, and therefore considered all of the latest sail cloths. The sail cloth manufacturers were trying to make the materials as stable as possible following this basic development pattern. Sailcloth is made up of Terylene fibres woven at 90° to each other. In this raw state we have a material that is very strong, with minimal stretch, along the direction of these threads. However, it is very weak and stretchy on the bias. Resins were added to bind the weave together, giving the cloth some stability on the bias. This stability, however, was not equal to that of along the thread direction. So the material still stretched and distorted under load. The next step was extreme "resination" of the cloth. This is what's commonly known as 'yarn tempered' cloth. This process was able to produce a 2:1, bias:warp ratio. Finally, to produce the ideal 1:1 ratio they bonded the raw material to a 'mylar' film. The 'mylar' had the 1:1 ratio, while the woven, raw material offered tear resistance.

With this new material, the sailmaker can make a sail that will not stretch or distort under load. Whether this type of material can be used successfully in a moth is a question that needs to be answered. Let's look at the extremes of this new development. This is probably a material made up of 'mylar' film and 'kevlar' threads in the substrate. "Kevlar" is a Dupont aramid fibre that is stronger pound for pound than steel and has super low stretch characteristics. This particular cloth is very stable and has tremendous strength in the direction of the fibres.

We have, in theory, the perfect sail material. However, after consideration of its potential use and performance in relation to the competitive moth, this delicate material showed some major vices. To start with, the 'kevlar' threads are spaced up to $\frac{1}{8}$" apart. This makes joining the panels difficult, as the stitching process makes perforations, and tear resistance is very low in the 'mylar' film. We are relying on glue to do the bulk of the holding power at the seams and batten pockets.

Secondly, this material is very susceptible to fatigue and must be handled with kid gloves.

The practicality of the material in the area of producing the actual sail shape is another major factor.

With the material being so stable, the shape the sailmaker builds into the sail is the shape it will maintain throughout the entire wind range. Unfortunately, with the moth you usually have only one sail and this must be adaptable to all wind and water conditions. So, in fact, you need to be able to change the shape of the sail slightly to suit different conditions and the very flexible rig. With a very stable cloth, the luff curve of the sail must match the mast bend exactly. Unfortunately, the mast will bend differently in different conditions, and therefore we need a sail that can be adapted to the mast whilst on the water.

Adam Thompson

After considering all these characteristics of this material, I came to the conclusion that this type of material is not well suited to a moth but better suited to a boat where a particular sail is only used in a "narrow" condition range.

At the other extreme, I looked at a conventional cloth made up of 'Dacron' fibre, with a low resin factor. This material is very tightly woven, resulting in a heavy material to maintain the strength required. This material is quite spongy on the thread line and is very spongy on the bias. Quite different to the 'Mylar/Kevlar' mix. The stretchy nature of this material meant careful selection of a material weight capable of handling the leech loading without distorting too much. With its massive bias stretch, I found that the shape in the sail could be moved dramatically by use of basic controls on the boat.

This material seemed to offer the flexibility that I was looking for ; it could be changed in shape to adapt to the prevailing conditions. This feature seemed to be the most important and the extra weight was something that had to be lived with for the time being.

The new developments in sailcloth first appeared in the 12 metre class, and it was only in the last challenge that Mylar materials were used on the Australian boat. These exotic materials are only showing marked advantages in a limited number of classes, these being the extremely competitive and high budget classes, i.e. 12 metres, 6 metres and the higher level IOR yachts, and not least 18 footers.

CHAMPIONS OF THE PAST

2411 David Bowen 2370 Phil Susans 2412 John Bowen 2377 Peter Holmes

N.S.W. News

JOHN SMIDMORE

The highlight of the season was the return of the National Championship Trophy to N.S.W. after an absence of six years. Dedicated preparation helped Peter Lamb score a well deserved, although breaktakingly close victory in the National Titles by a mere 1.4 points over defending champion Greg Hilton. Coming in third was Ian Ward who, returning from Europe only one week earlier, was hampered by a United preparation. Andrew McDougall, with two heat wins in his skiff, finished 6th, and would have been close to the leaders if not for a D.S.Q. and a D.N.F., with Steve Penny (8th) and Keith Chidzey (10th). New South Wales had five boats in the top ten, our best for some years. All team members performed well, but we narrowly missed the inter state consistency trophy, largely due to unfortunate boat damage. Peter Morrison's second place in the junior title was also a fine performance.

The Interclub sailing season started well with the traditional October long weekend series at Speers Point. Local sailor, Bob Nicholson, showed early form to take the series from skiff sailors, Phil MacGilvray and Ron Tutt.

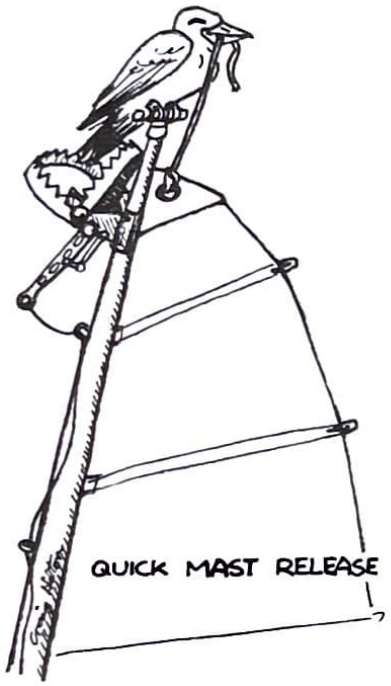
Y.M.C.A. Sailing Club, Canberra, was host to the next Interclub series. Despite petrol problems and the long drive, a large contingent of Sydney sailors made the trip down to test conditions on Lake Burley Griffin. The well run series, sailed in a variety of conditions, was won by Keith Chidzey. The third heat of the Interclub Series was held at Connels Point and was won by Peter Lamb from John Smidmore and Peter Morrison.

For the Selection Trials, a new venue of Koonawarra Bay was chosen. The club officials and members extended genuine hospitality and good organisation. Although the breeze was somewhat lacking on Sunday, the sailing was very closely contested, with competition for the seventeen places being the tightest in years. The team finally selected were worthy representatives as the performances later on in Sorrento showed. The Gypsy Bowl teams race, again completely hosted by Balmoral, finally saw Seaforth put it together for a clear victory. A special mention must go the two-man Connels Point team who battled through to take second place.

A growing moth club - Concord Ryde - hosted heat 4 of the Interclub Shield with Ian Ward revelling in the conditions to win from Peter Lamb and Peter Morrison. The final heat of the Interclub Shield was hosted by Narrabeen Lakes with Glen Hammond winning a good race. The Interclub Shield was won this season by Peter Morrison with consistent sailing. Peter Morrison also won the Bernie Hay handicap series.

The state titles were held at Easter with an unusually large contingent of skiffs entering the traditionally scow fleet. Andrew McDougall (in his skiff, Wombat) won the series for the second time from Glen Hammond. High placings were held by those daring enough to make a moveto the unstable skiffs which were suited to the predominently light winds.

Registrations are currently running at a similar level to last season, showing that the class is still on a firm footing in this state. The Association is busy making preparations for the National/World Titles which are held from December 26 to January 15 next season. We are determined to make this the biggest and best titles to date. With these titles as the focal point, the 1982-83 season should be one to look forward to and prepare for.



Dear Ed.,

With the approaching World Titles, this would be a good year for encouraging new blood to enter the class. A good way to do this would be to offer, say, two places in the state team to country boats. This has been discussed before, but no definite decision has yet been made. The idea has proven a success in other classes, and would minimise the expense and travelling time taken to have a 'shot' at gaining a place in the team.

CHRIS OVERY,
Canberra.

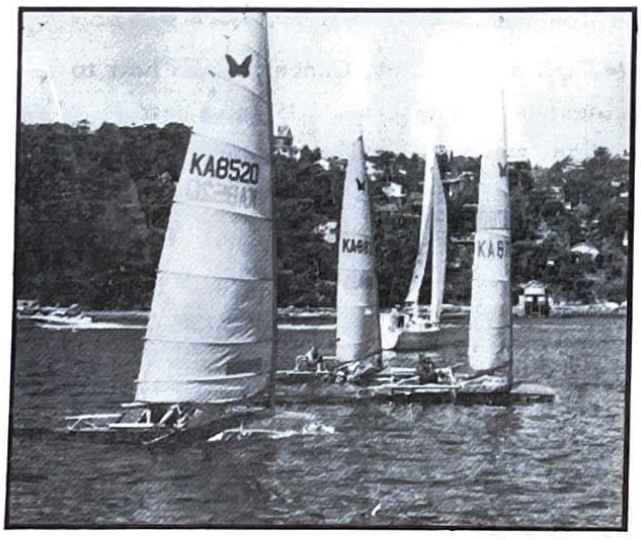
Safety

Many moth sailors use fibreglass and other exotic materials infrequently. However, this makes the materials no less dangerous. The catalyst for fibreglass resin is a substance to beware of. If a drop comes in contact with the eye, the tissue will be progressively destroyed, resulting in blindness. This result will occur even 'though an attempt is made to wash the catalyst from the eye. Once the chemical has started to destroy the eye, there is no way of stopping the destruction or repairing the damage.

The toxic agent is methyl ethylkitone peroxide MEKP. No known chemical neutraliser has been discovered although washing the eye within four secondsmay prevent injuries.

Suggested precautions for catalyst users are eye-protective spectacles and the immediate availability of water for washing ocular tissues.

Before using any of these catalysts or glues or paints, check their chemical composition and take appropriate precautions.



Seaforth Calm

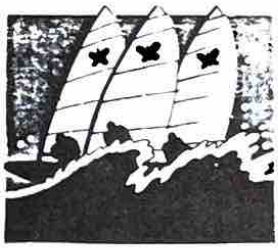
Sails & Tuning

P. LAMB

Achieving boatspeed upwind in a breeze has always been my starting point for tuning a rig. Once this has been achieved, it seems best to find boatspeed upwind over a fuller range of breezes without greatly compensating what has already been achieved. This is followed by concentration on downwind speed.

In a given breeze, twist will reduce heeling moment by taking pressure progressively from the top of the sail. In light to moderate breezes, when maximum pressure is required in the rig, the reverse is the case. Minimum twist without stalling the leeward side of the sail is desirable.

Twist is when the sail lays off progressively from the head ; that is, if the sail lays off 20° at the head, it will lay off 15° 3/4 s of the way up, etc.



Most sails will be cut to reduce camber toward the top of the sail. This builds in a certain amount of twist so the sail has the same angle of attack from top to bottom. A lack of twist in light to moderate breezes would result in the sail stalling at the top. Placing tufts at various points on the sail demonstrates this. Both windward and leeward tufts should flow at all times. If they both flow at the bottom but the leeward tuft is stalled at the top, then there is a lack of twist. Depowering through twist should occur automatically at a certain breeze strength and sail trim is critical in getting a rig to work in this way. Here are a few major variables which affect the leach tension and twist.

1. Twist in a rig tends to a maximum of an 0° angle of attack at the top of the rig, i.e. there is a limit to the amount of twist available.

2. A reduction in L.T. will increase twist and hence reduce heeling moment (depowering). If you are hiking harder in all breezes and going slower - reduce leach tension in all breezes.

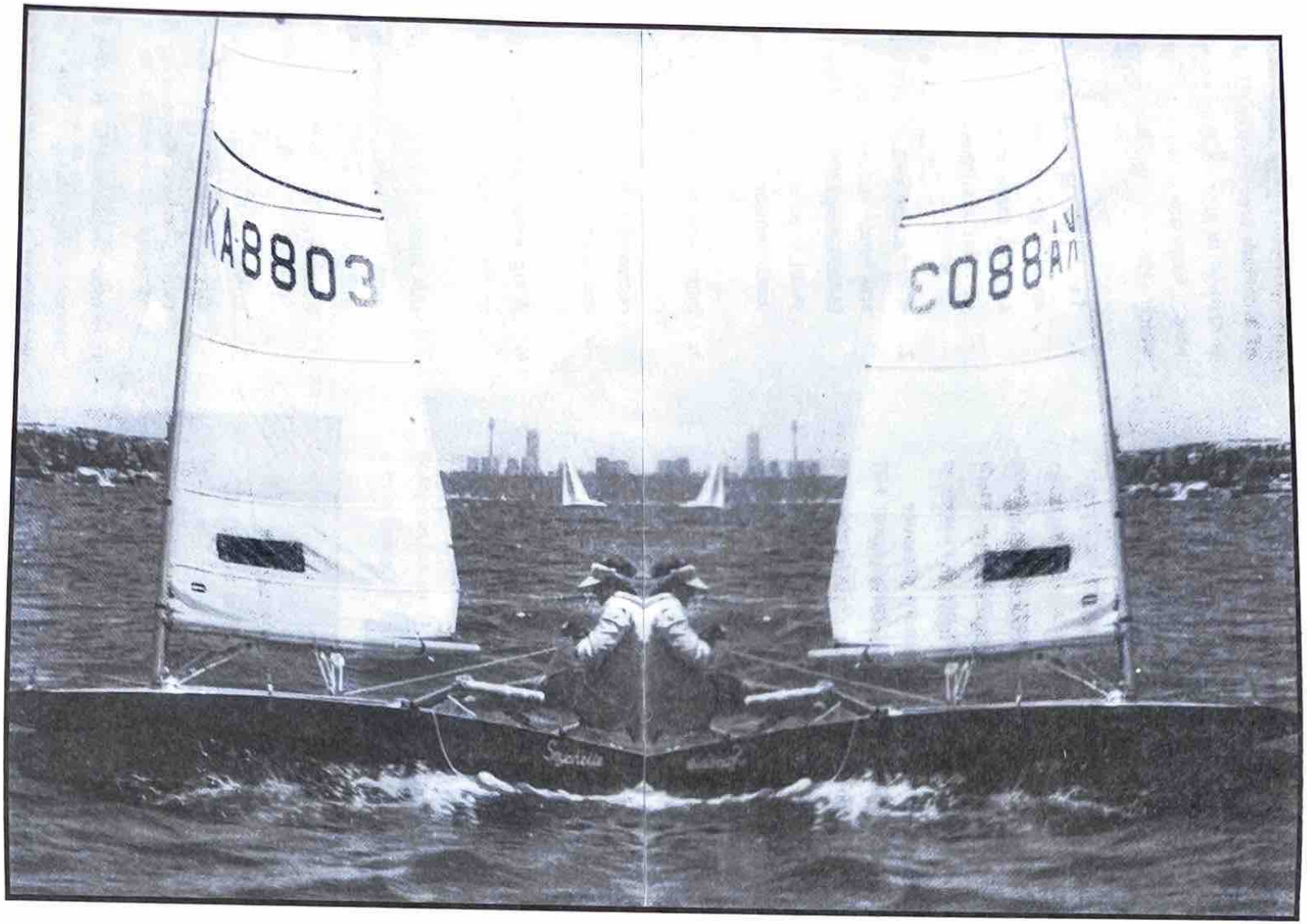
3. Increasing mast bend will decrease sail camber until all luff round has been removed : More vang to reduce camber and drag.

4. A rig which performs progressively worse as the breeze increases could be made faster by lowering forestay height and this should have little effect on light wind boatspeed. Lowering the forestay will increase the fore and aft bend and hence twist.

5. Lowering forestay height will reduce wind strength needed to achieve an amount of twist ; hence depowering comes sooner.

It is most important to develop a logical manner to rig tuning. Only change one variable at a time and assess this change before moving on. Tuning should also be considered as only one side of your overall preparations. Too much effort in one area may not benefit you in the long run.

DREAM EXPANSIONS - Kathy Brown N.S.W.

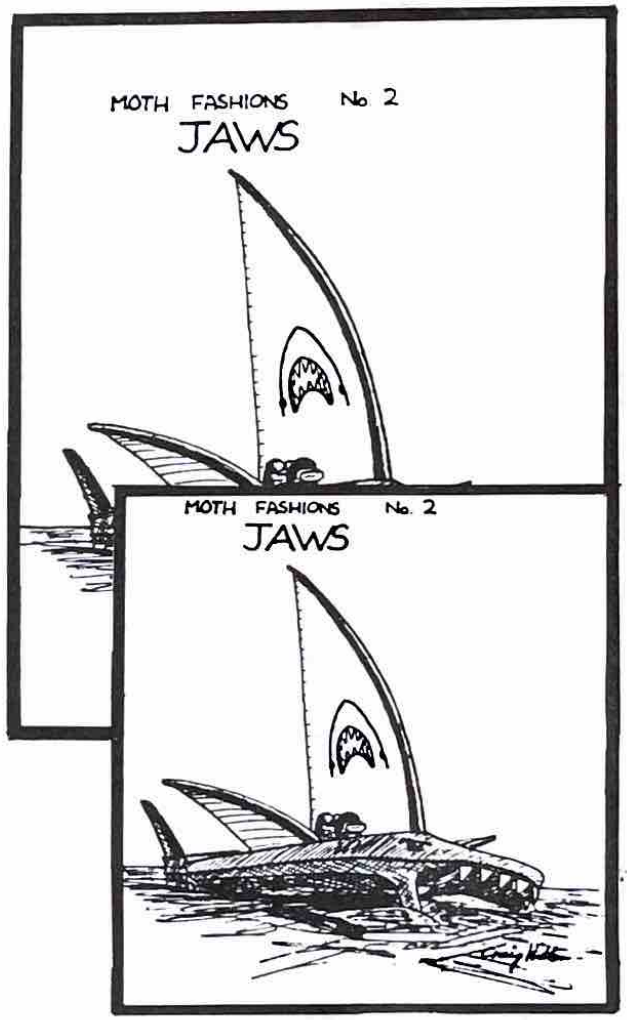


the Q news

PETER BROOKE

Things in Queensland are going very well now but we really did get off to an average start. Opening day loomed bleak and overcast with Noel Stannaway (our local boating weatherman) reporting live from Peel Island that the breeze was 30 knots and freshening. It appears as though he was reporting live from the Char grill at the Breakfast Creek Hotel as the breeze at that time was fading from 12 knots. Chris Tyquin was the only man with a boat to front - the puffs of steam coming from his ears were clearly visible miles away. A few other people, whose boats were still being completed, arrived to watch Chris joyfully rigging in the rain. All of the others appear to have had a fine time watching the Bathurst race on television. Attendances since that day have certainly improved with both the selection trials and the Brisbane River Championship being well attended. The Fleet at Oxley Sailing Club is booming with the standard of sailing increasing favourably.

In an endeavour to get the younger sailors into the Class, the Royal Queensland Yacht Squadron fleet has donated a perpetual Trophy for the Club Champion of the Sabot fleet and provides trophies for one race day of the year at which time all the moths in the fleet are made available for the sabot sailors. The reaction has been very good and it is also assisting to cast off the "wild man" image among moth sailors which tends to prevent parents from being keen about putting their find young Sons and Daughters into moths.



The Queensland Government assisted the team representing Queensland at the Australian Titles this year by making a grant of $1,500.00. It is certainly good to come from a progressive State. Thanks to the Victorian Association for putting the Continental Hotel on the accommodation brochure. It was good to be mixing it with the cockroaches on holiday from Melbourne. The Queensland Association looks forward to recommending a few nice little spots for the Victorians to stay at in 1983/84. All from Queensland, however, thoroughly enjoyed the series and our congratulations go to the Victorian Association for an extremely well run series.

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FEMALE TRIUMVERANT - Kathy Brown Lesley Davis, Merran Ward,

WORLD TITLES

ANDREW McDOUGALL.

The build up to the series was more relaxed than one would find at an Australian title, possibly due to the proximity of most of the participants to the venue. A contrast to the Australian environ which forces most sailors to be loyal to one location and travel long distances for a similar series.

The Europeans presumably had experience of the venue as 90% of the 56 man fleet arrived a day or two before the first race without much time for on site sailing or preparation.

The Australian contingent consisted of Andrew McDougall, Glen Hammond, Mike Pitt, Alan Tidy, Graham Ferris and John Smidmore.

Invitation Race.

After hanging around the start for two hours in no wind the race started in about 5 knots. Robin Wood was very quick the whole race, never looking like being headed. The wind strengthened to 15 knots about half way through the race, but the positions did not change much. At the gibe mark, McDougall fell in and looked around to see his two closest pursuers, Richard H. and David Iszatt both floating around in the water as well. Says something for the Magnum 5's - four in the series and three of those in the water together. At the finish, it was Wood, McDougall, Collier, Hargreaves, Klien and Iszatt. Hammond came through to about 6th after being caught on the port side on the first leg. At this stage, the course consisted of only a triangle, w/return, finish. Wood thought there was another triangle and did not cross the finish line, leaving McDougall to win the race.

After the Invitation Race, a vote was taken and an extra triangle was added.

Race 1.

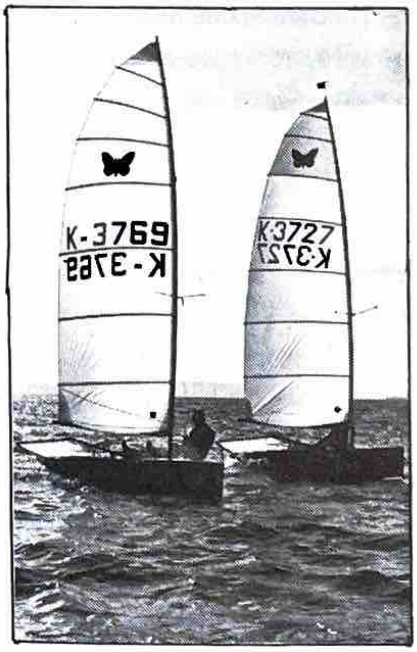
The wind was around 15 knots, maybe more. David Iszatt was never headed. Alan Tidy was 2nd most of the way but was overtaken by Roger Angel to come third. Glen held 4th with the rest of the Australians finishing in a bunch from 12th to 17th.

Race 2.

This race started in light winds with again a big shift on the first beat. After 2 laps, there was Iszatt, McDougall and Cotterill very close, the wind had changed 90° so all the legs were reaches. At the end of the return, the Race Committee stopped the race. The race was restarted in about 10 knots. Robin Wood again showed good speed, picked the first leg and was never headed. Claudius Buchler, McDougall and Hargreaves fought for second, finishing in that order. Hammond came through to fifth after a bad first leg.

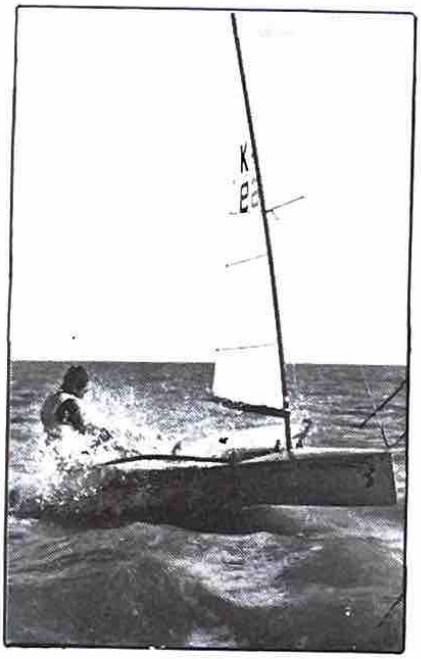
Race 3.

Blowing over 15 knots. Mike Pitt and Alan Tidy cleared out ; Pitt broke his tiller extension, leaving Tidy to win easily. Wood showed he was not just a light weather man coming in second. Hammond was third, Iszatt fourth. After three races, Iszatt led with Tidy on his heels. (This is when Alan should have written home).



Race 4.

Light shifty winds with very little difference in boat speed for the first six boats. For the 1st lap, there would not have been fifteen yards between the first six boats. Iszatt got a break on the second lap and steadily increased the gap. Cotterill got away on the last lap leaving Hargreaves to fight for third. Problems with weed and local wind-shifts caused placings behind third to change every five minutes.



Race 5.

(0.15 knots with very heavy rain squalls.) Hargreaves took a good lead on 1st beat, increasing lead with his tremendous downwind speed. Cotterill, McDougall and Buchler sailed in their own race. Behind the fleet seemed to spread out throughout the race, but on the last lap Hargreaves panicked after a capsize and the first four boats finished within about 15 seconds, but still in the same order and well ahead of the rest of the fleet.

Race 6.

Over 15 knots, maybe 20 at rare times. John Smidmore went for a port hand start and flew away from everyone. After a very bad start, McDougall found some speed to get to the lead half way up the first leg only to fall in. At the first mark, Skids was first, Peter Mueller second;

there was a collision between McDougall and Buchler vying for third spot, leaving the two boats entangled at the mark. This caused a number of near misses. Buchler was holed and forced to retire. Skids went on to win the race in fine style with Glen coming through to second. Tidy rounded it off with an Aussie 1, 2, 3. Mike Pitt had his first good race with a 6th (he had finally found a tiller extension which did not break.)

With one heat to go, there was only 0.7 pts. separating David Iszatt and Richard Hargreaves.

Race 7.

Similar to Race 5 and around 5 - 8 knots. Iszatt took the lead and broke away looking like a comfortable winner with Hargreaves well back. The winds were unusual in that a deep dig to the port side meant coming out well ahead. Hargreaves took this flyer on the 3rd beat and came up to the front group ; Iszatt did not look safe. In two reaches, Hargreaves gained 100 metres to round the leeward mark a boat length from a World Championship. He squeezed ahead for about ten seconds, but did not make it, leaving Iszatt to win the Championship.

The speed of the top skiffs was very even in light winds. The winds were never strong enough to readily give the scows a clear advantage, but a well sailed scow would probably have won the series. The tactical standard was not on par with an Australian Championship but the general sailing was as good.

1. U.K. David Iszatt, 10 st. Magnum V, 17/8" Needlespar, low stay with flex top. Hargreave mylar sail.

2. U.K. Richard Hargreaves, 10 st. Magnum V. Proctor mast, medium stays, Hargreave mylar sail. Fast downwind in over 8 knots.

3. U.K. Robin Wood, 11 st. Old Magnum 3, Proctor mast, Hargreaves sail, Fast upwind over 8 knots to around 15 knots.

4. AUST. Glen Hammond, 11-11½ st. Magnum 3, 13/4" Needlespar. High stays. One Design sail. All rounder.

5. U.K. Chris Cotterill. Magnum 3. 10½ st. Proctor mast. Hargreaves low roach sail. Fast light winds - upwind.

6. SWIS. Claudius Buchler. 9½ st. Magnum 3 Needlespar, Hargreaves sail.

7. AUST. Andrew McDougall, 10½ st. Magnum 5, Needlespar raised 18", High stays, flexible prodder. One Design sail. Fast upwind over 15 knots, Fast downwind under 10 knots.

8. U.K. Roger Angel, Magnum 3.

9. AUST. Alan Tidy, Red Ned, Super Spar, Tasker Sail. Fast over 15 knots.

A.G.M.

The World Annual General Meeting was held on July 15, 1981 during the World Championships in Holland.

There was much discussion at the beginning of the meeting concerning the Minutes of the meeting held in New Zealand in January 1981 and on the validity of that meeting and the decisions made there. Unfortunately, there was no-one present at Holland who had attended that meeting.

The U.K. Association disputed the validity of the motion imposing a 50p. levy to fund the World body. Later on in the meeting, it was resolved that the 50p. levy should be imposed by all countries with respect to registrations in the 1982 season, and that each national representative should report to his national body to suggest that the levy be forwarded on a voluntary basis for the 1981 season.

The present officers, - Andrew McLachlan (President) and Jim Prower (Secretary/ Treasurer) were nominated for re-election. The U.K. agreed, subject to a proper handover from the previous office bearers, and that a Newsletter and Statement of Affairs be produced. The U.K. Association agreed to assist in having the handover effected. The abovenamed officers were then re-elected.

Letter from the I.Y.R.U. was read out confirming our International Status.
It was also noted that the Building Fee to I.Y.R.U. was now Five Pounds.

Future World Championships :

1982 - Australia - January 6 to 15, 1983 - Botany Bay. I.M.C.A. Australia is to ensure these are publicised as the 1982 Worlds.

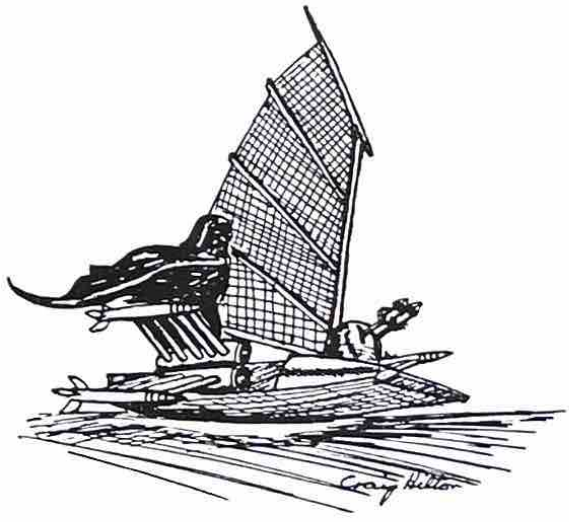
1983 - England - July 30 - August 6 - Sovereign Sailing Club, Eastbourne.

1984 - Japan or New Zealand ?

1985 - Switzerland ?

1986 - Australia, New Zealand or Japan ?

MOTH FASHIONS No. 3
STAR WARS



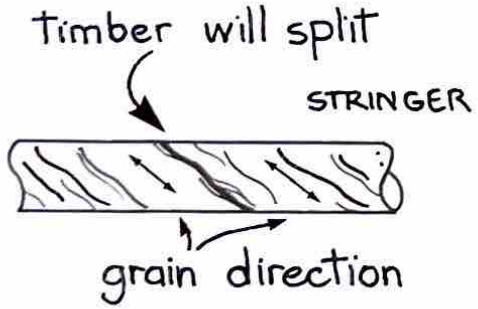
Fairing Up

PETER MORRISON

The most difficult part of building a boat is the fairing up of the stringers, chines and gunwales. Some boats are covered in lumps and bumps due to improper fairing which can slow the boat down as well as detract from the overall appearance of the boat. However, there is a method to mechanically set up the timbers to make the fairing up process much easier.

Pick the timber for the stringers, chines and gunwales. Whatever kind of timber, the pieces must be well seasoned, straight grained and, most importantly, must contain no knots. Well seasoned timber will bend into a fair curve better than "green" timber. If the grain is curved or not running lengthways, it will weaken the timber. Timber needs to split along the grain and the bigger the angle between the grain of the timber and the centreline of the timber,the less it will flex before it breaks. Knots also weaken the timber considerably. (Warped material takes more time to fair up). These factors must be taken into consideration especially if you are using six small stringers. (See figure 1).

FIGURE 1



Set the gunwale timbers up with one side of the timber flush with the side of the boat and so the top outside corner is on the intersecting point of the side and the deck line. (Figure 2).

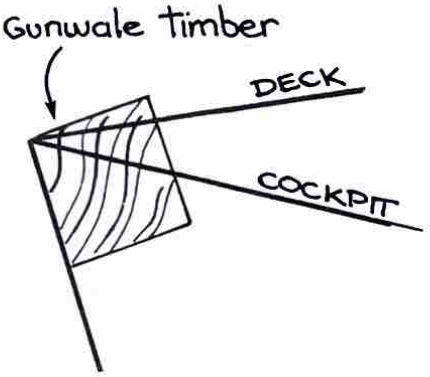
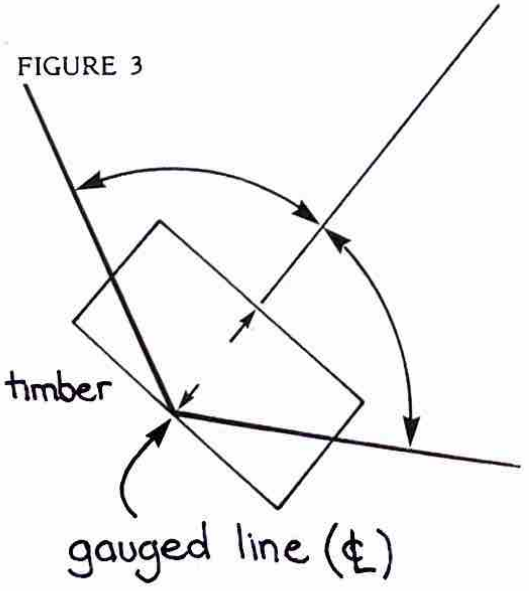


FIGURE 2

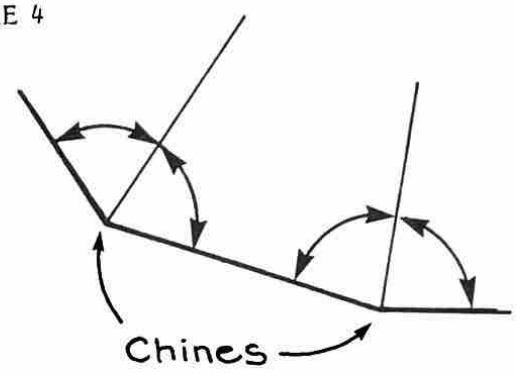
To set up the four chine timbers, you need a sliding bevel and a small offcut of your chine timber. Guage a centreline on the top and bottom sides of your offcut. Using the bevel, bisect the angle of the sides of the boat. (Figure 3). Stand the offcut on the frame so that one centreline lines up with the point of the chine and the other centreline lines up with the bisection of the angle. Trace around the timber and then cut out this section. This must be done on all four chines of every frame of the boat.

FIGURE 3



Before the chine timbers are glued in, guage a centreline down the outside of the timber, thus marking the chine line right along the length of the boat. (Figure 4.)

FIGURE 4



The stringers should be set flush with the bottom of the boat and at right angles to the frames.

When the timbers are glued in place, the boat is ready to be faired up.

To fair up the chine timbers, plane from the next timber until the guaged line is reached and it is flat between the two lines or the line at the next timber. Use the edge of your plane or a steel rule as a straight edge and be careful not to bend the timbers when planing, or the wrong angle will result.

When fairing up the stringers, use a "Bendy Stick" which is a piece of timber approximately 12 mm. x 6 mm. with crayon rubbed along one 12 mm. side of it. This stick needs to be at least 150 mm. wider than the bottom of the boat. Rub the stick along the bottom of the boat at right angles to the centreline of the boat, and the crayon will mark all the "high spots". These areas can then be planed down. If the stick is too stiff and will not bend from chine to chine without flexing the stringers, cut the stick down in the height to make it softer. Also check the curve fore and aft, again using the stick. The bottom of the boat will be fair when the crayon marks all the timbers both fore and aft and across the boat.

N.B. Before the bottom is glued on, all the timbers must be skimmed as the glue does not adhere to crayon.

Finish the timbers off with a plane as sanding tends to round off the corners. This is easy as long as the plane is sharp. The gunwale timbers should not need fairing until the boat is turned over ; then the deck is faired off. Use the outside edge of the timber to plane down to.

Take care when fairing up to get the maximum glueing surface from your timbers.

Hollow out the frames between all the timbers on the bottom and sides before the frames are assembled. This makes the boat easier to fair up as the plane does not hit the frame and split them off the timbers. If the plywood flexes in between the timbers (when the boat is in the water) there will not be a ridge at every frame so a fairer hull will result.

A little extra time and care taken when fairing up your next hull will result in a better looking and potentially faster hull.

SPECIAL NOTICE

DON'T DELAY

ERADICATE the

FOOT IN MOTH DISEASE

vaccinate your cockpit with KEVLAR NOW

World competitor's boats wil be subect to current quarintine regulations

Want to Win!

BOB NICHOLSON

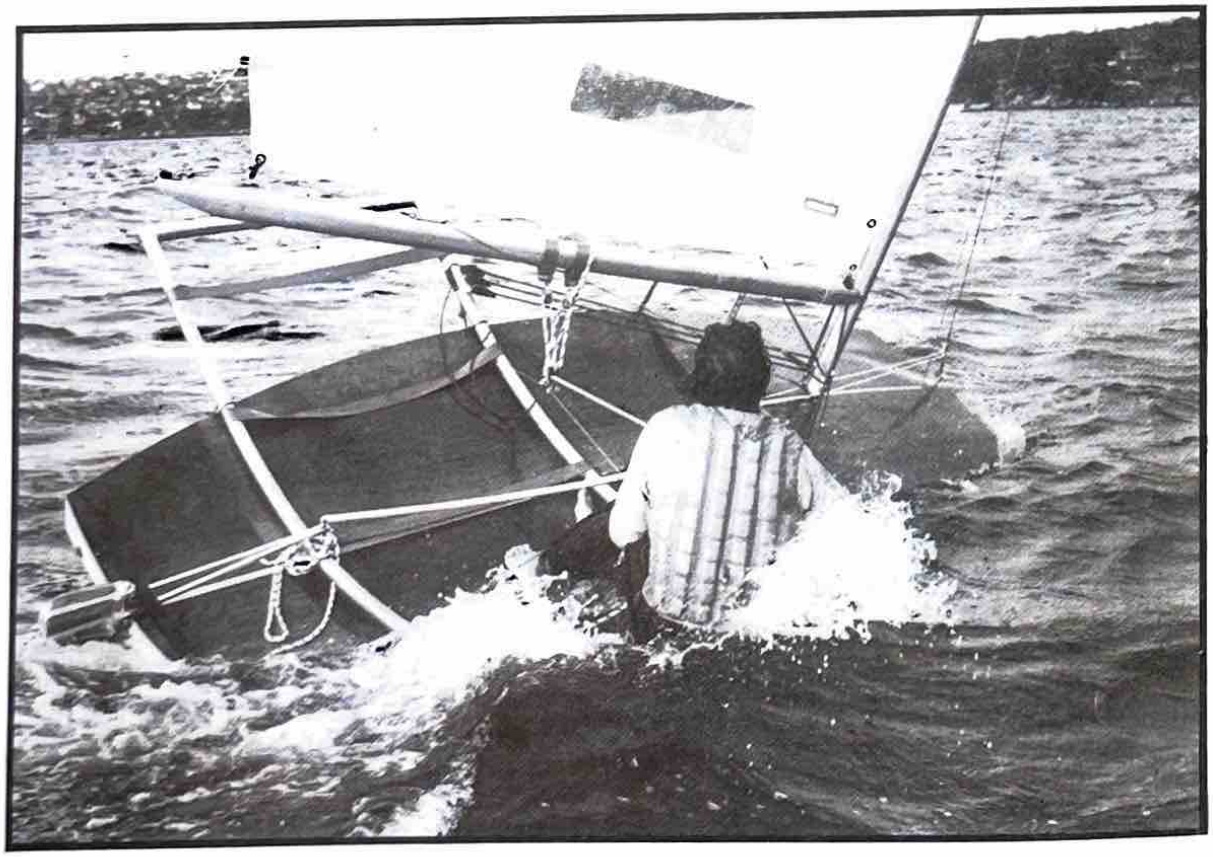
One often reads articles written by champions which discuss aspects of boat handling and tuning. Unfortunately, their general approach to sailing is often overlooked, even 'though this is the real difference between the champion and the common sailor.

The first proviso is to have the will to win, whether it be for personal glory, self satisfaction or a public cause. This must be directed along constructive paths in the pursuit of stardom. To do this, draw up realistic aims such as those suggested below :

(1) Be relatively fit.
(2) Improve boat handling.
(3) Know your boat and how to control speed.
(4) Know where to go round the course.
(5) Know the rules.
(6) Know how to use both (4) and (5) effectively.

Most sailors have some idea of these aims, but do not act upon them in a synchronised and consistent fashion. In order to achieve the objective, a lot of time and effort is needed. For example, champions attend to any problems or potential problems concerning their boats or sailing techniques immediately, even if it means a concentrated effort after a hard day's racing. Match this dilligence and results will be forthcoming.

A positive frame of mind is necessary to win a race and discipline in the listed aims makes this easier to procure. It is necessary to eliminate the 'if onlys' and the 'if Ida's' from the sailing vocabulary. With the will, aims, time and effort, an average sailor can join the Champion's ranks.



IF ONLY IDA - The Anonymous Sailor.

Controls

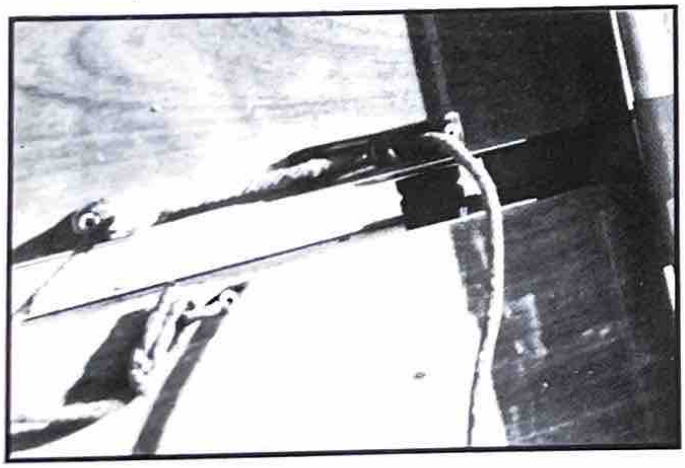
IAN WARD

CENTREPLATE CONTROL

For many years sailors have been aware that the positioning of the centreplate is critical both upwind and down, and that both rake and height must be adjustable. Early Moths had retractable centre boards ; however, these were found to be inefficient on reaches compared with a raised dagger board.

The major problem with a dagger board in a Moth is the repositioning. Peter Moor introduced the double control line system on his Snubby designs. Although this board could be moved while the skipper sits on the wings, the repositioning is inaccurate. Greg Hilton (W.A.) introduced the Hilton centreplate guide box on his Bunyip design which maintains accurate positioning of the board with rake adjustment, only, from the wings. The guide box is excellent for precise positioning of the board, but is cumbersome.

A new system based on Hilton's idea is the extremely simple McFRAWD board system which consists of a large roller inserted at the bottom back edge of the centre board case and a restricting control line at the top leading edge of the board.



QUICK RIG MAST STEP

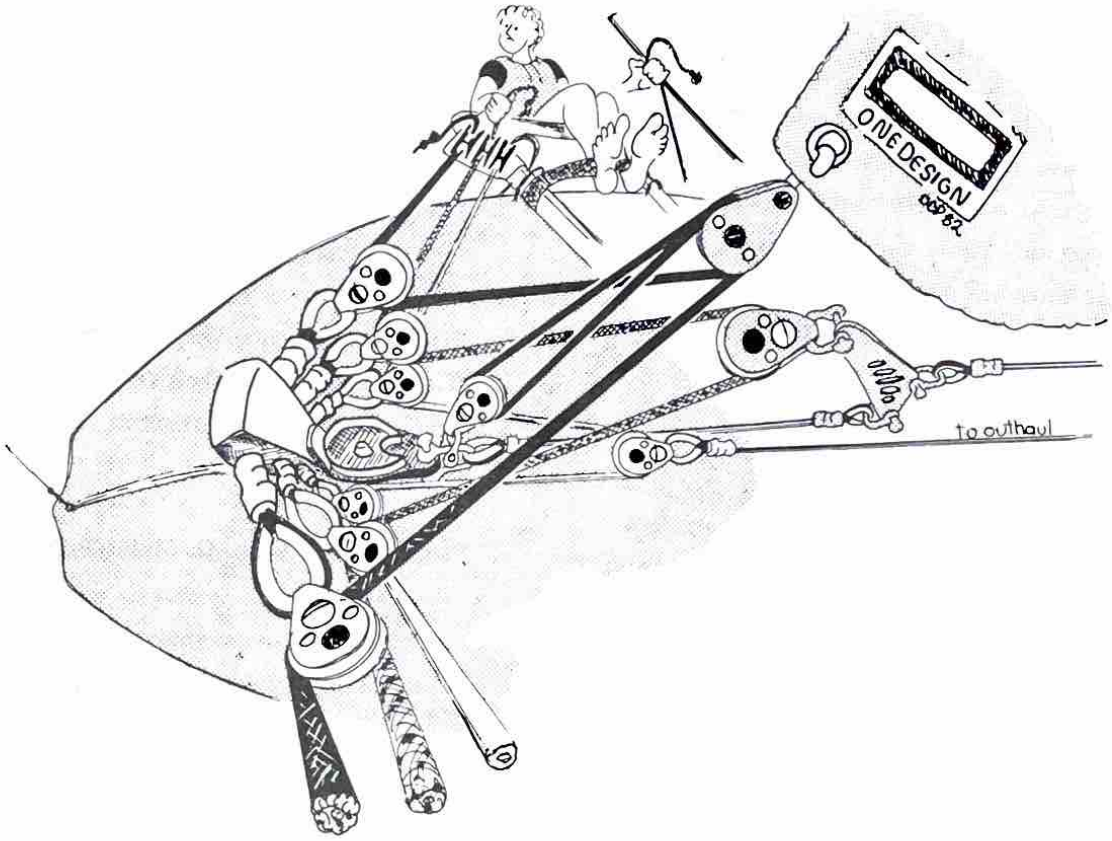
In order to simplify the rigging procedure, Ian Ward has perfected a simple mast step base and gooseneck fittings which decreases rigging times for a Moth to four minutes.

All control line pulleys are attached to an upright bolted to the front of the mast step casting. The mast simply slips over the step when rigging. When unrigging all pulleys, the mast step, control lines and boom are left on the boat. The boom attachment is also simple, strong and light. The stainless steel tangs have slots cut at 45° to the centreline of the boom which retain the boom in position over the mast bolt whenever the sail is attached to the boom.

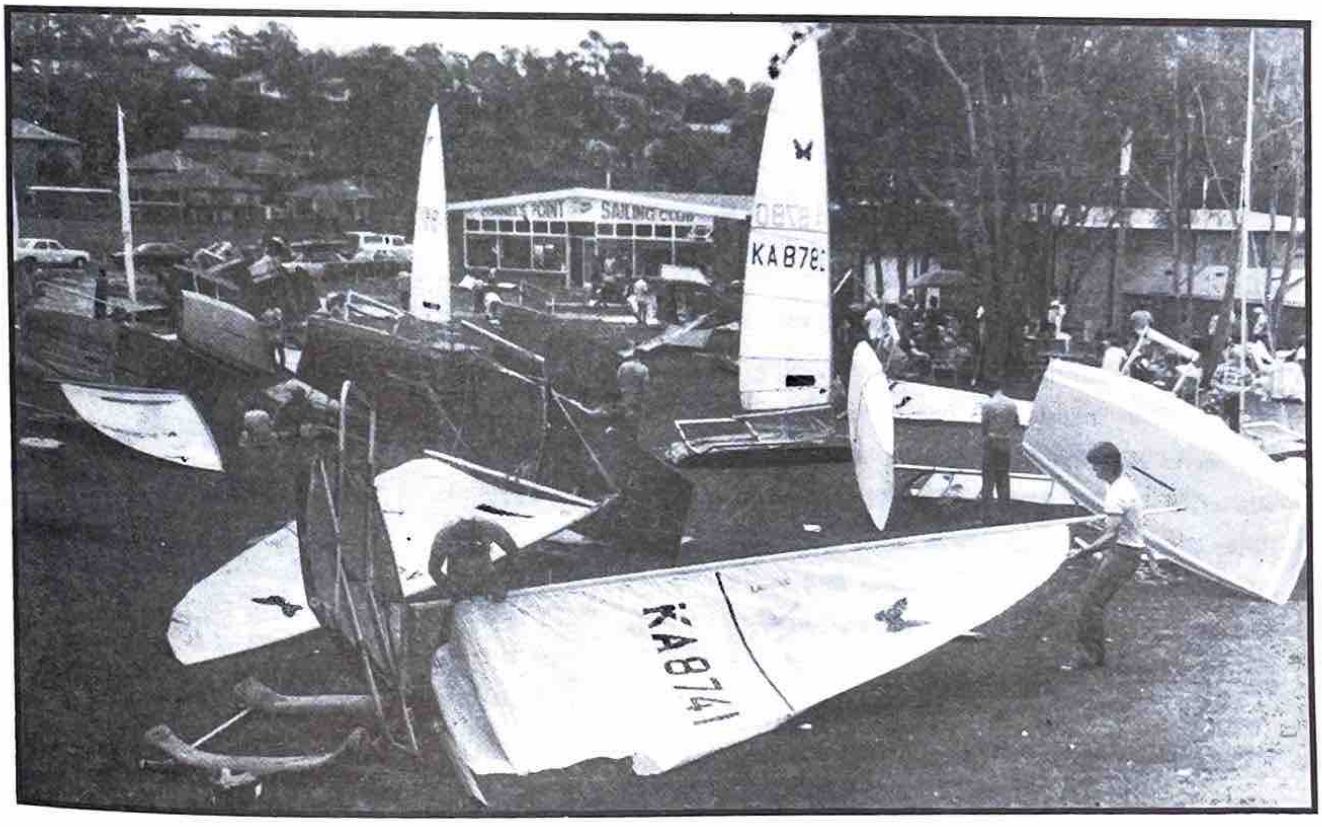
The luff downhaul is quickly rigged by passing the control wire and its loop through the pulley sewn to the sail. The wire loop is simply hooked over a mast attachment and you are in business.

NEW ALLOYS

Since the Moth has no weight restriction, it is imperative to reduce the weight of all fittings. Some people have tried titanium instead of 304 stainless steel but unfortunately this is very expensive. An alternative is a special Austero-Ferritic stainless steel grade called Sandvick 3RE60, which has better corrosion resistance than both the standard 304 and 316 grades while possessing twice the strength and fatigue resistance. Fittings can thus be made to half their normal weight and their cost on a price/weight basis is cheaper than 316. Something to think on for the future.



QUICK RIG MAST STEP



Quick rigging adds to peace of mind before a race.

Tas. News

PETER CLEARY

This season has been a very quiet one sailing wise. Unfortunately, most of our regular ranks have been involved with sailing on keel boats and, as a result, most of their time has gone into preparing for the major offshore races such as the Sydney to Hobart.

Club racing has been at an all time low with only 3 - 4 moths racing at Montrose Bay in the south and likewise at Port Dalrymple in the north. Several helmsmen have interests in windsurfers as a sideline while others have been sailing model yachts. One of our northern helmsmen, Stephen McElwee, is, in fact, the National Champion in his particular diversion.

Even though moth sailing has been at a minimum throughout the season, all helmsmen rallied to support the recent State Championships held at Port Dalrymple and Montrose Bay Yacht Clubs.

The series held over seven heats was expected to be a fairly even event in view of the fact that only a few helmsmen had been racing regularly.

Local "Hood" sailmaker, Peter Jones, in "Hughie" was installed as one of the pre-series favourites along with last year's winner, John McKillop in "True Grit" and Peter Cleary in "Magic Mushroom" who took out the Selection Trials. A total of fifteen entries were received of which only 2 were juniors.

The weather for the six heats was predominantly light with only one heat over 10 kts. Overall, Peter Jones had superior boat speed in most conditions, especially off wind and made up for his unfortunate last series to record a fine win.

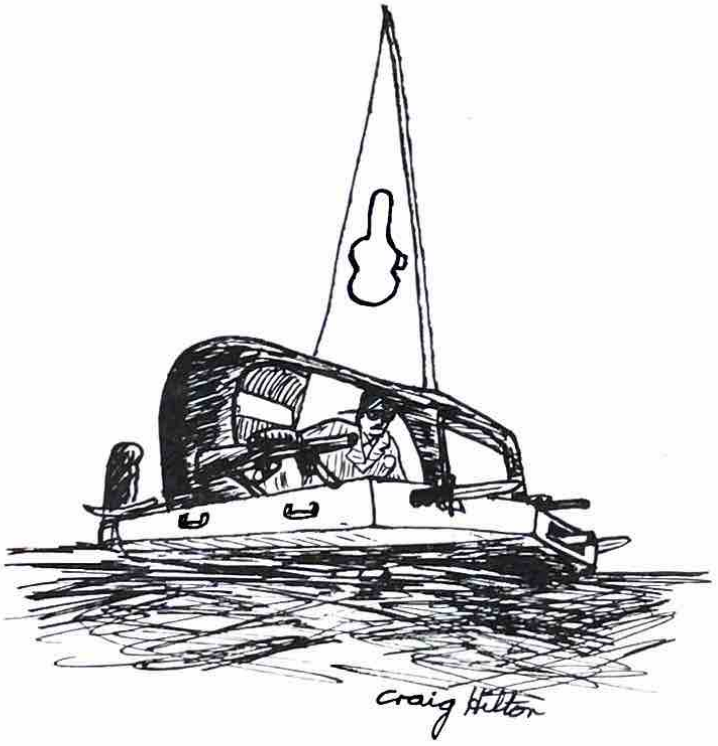
Placings are as follows :

"Hughie"	P. Jones M.B.Y.C.
"True Grit"	J. McKillop M.B.Y.C.
"Cicada III"	S. McEl P.D.Y.C.

1st Junior.

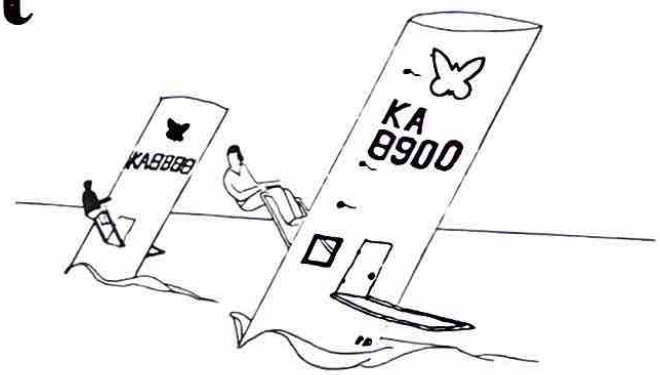
"Teal"	G. Myler P.D.Y.C.

MOTH FASHIONS No. 4.
THE GODFATHER



Wearing Out

P. DOUGHNUT



When thinking about equ.pment for Moth sailing, it is easy to forget about your clothing. It is essential to have sailing gear which protects you from the elements and the boat, but is completely comfortable, so concentration can be on the more important aspects of the race. Here are some thoughts about some of the options.

A large proportion of Mothies begin their costume with a wet-suit. This offers warmth and some protection. I don't find one necessary, and think they are a bit restricting and therefore tiring in strong winds. Over this, many skippers don various assortments of jumpers for protection, warmth and weight. I like to have two or three sleeved jumpers on to protect my arms and back from injury, as the wing bar stops my slide across the boat during tacks. A thick coat of wool on very hot days keeps you from the sun's heat in much the same way as a sheep. Combinations of sleeveless jumpers (for mobility of the arms), expensive weight jackets and special home made jumpers, when wet, help a skipper to approximate what he believes to be the ideal body weight. You are required to wear a buoyancy vest, so find an approved one which isn't too thick - especially on the shoulders. Over this goes a flashy jumper or jacket. Experienced campaigners will have a favourite moth-eaten State jumper. Your own personal printed jumper is always effective. If you don't wear a wet-suit, a light spray-jacket is very good on cold wet days, even if worn under the top garment.

If you do a lot of Moth sailing, you might like to think about padded sailing jeans. These help you hang out further for longer and with less pain. I use a pair of jeans with the legs cuffed outwards so they finish just about the knees. Into the back pocket this makes, insert a flat piece of dense rubber about $\frac{1}{4}$" thick, say, (or rubber-backed carpet) and sew them up. The denim on the legs is also quite good non-slip on the wings. Over these, or over your wet-suit, wear a pair of shorts which take the wear of sitting on a Moth and are easier to replace.

Sailing gloves are essential, if you are doing an extended period of sailing. The chamois-type sailing glove is usually adequate, but at around $20.00 a pair, which lasts less than a season, this is hard to bear. The cheaper ($10.00) imitations aren't any better value, however, as these thin gloves wear out a lot faster. To get the most out of a pair, make sure they are (very) tight in the shop, since the fingers soon get loose and roll down, and rinse them out in fresh water before going sailing if they stiffen up. I am using cut down washing-up rubber gloves at the moment, thanks to an idea from Gavin Mair (and the present owner of my new pair of expensive gloves), and at under a dollar, they aren't bad value. You may find it necessary to have some sort of footwear if your non-skid is particularly vicious, or you have been thoughtless with your fitting placements. I have a pair of wet-suit type boots for pre-season sailing and some of the dismal southern capital cities. Sneakers are also used for protection, and take the bite out of

toe-straps. The disadvantage of footwear is that you can't use your toes for steering, etc.

To cap off your suit, a hat or visor-type screen is advisable if you are spending a bit of time on the water - make sure to tie it to your collar if you plan to do some swimming. A shackle-key, a spare shackle and a short length of multi-purpose rope are all very useful items to have with you. (The shackle-key is essential if you end up being towed in.)

Make sure you are comfortable and can move freely.

LOST

VINTAGE SHED
complete with between 10 to 20 moths, some chairs, trestles, sliding doors and assorted boat paraphenalia. last seen, Middle Harbuor. club members anxious.

Planing Surfaces

I WARD

During the past two seasons a dramatic change has occurred in the current thinking about the form of planing surfaces. These ideas have been applied to both the latest skiff and scow designs with great success. It is the principle behind these developments that will be discussed in this article.

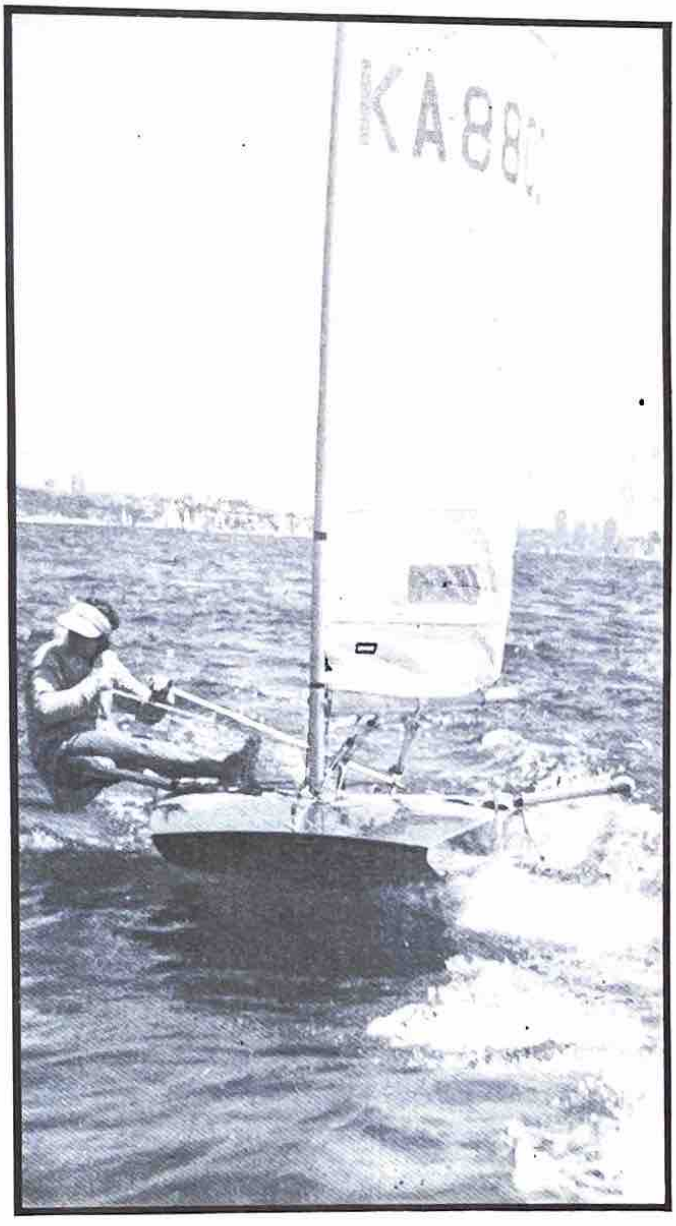
The "scow" Moth has traditionally been recognised as a planing boat and most changes to its design have centred around producing a wide, flat planing surface, this being limited by its tendency to nose-dive and its large, wetted surface area.

In the past, attempts to produce faster planing boats by flattening the hull "spring" resulted in chronic nose-diving problems and so a limit of around seven inches spring was reached as the optimum degree of flatness.

In 1978, Ian Ward began producing a series of boats, each refinement having a narrower stern than the next. Initially, this was an attempt to improve the scow's heeled displacement distribution for light weather sailing. It was soon realised that the tendency to nose-diving was also reduced by sinking the narrow stern, thus allowing the spring to be reduced.

In 1981, Peter Lamb developed the concept further by reducing the spring to $5\frac{1}{2}$" with fine, U-shaped stern sections. This hull shape not only produced blinding speed off wind but it also planed earlier than previous boats and, even more importantly, the tendency to nose-diving was reduced. Jim French in Victoria has since confirmed this finding this year by reducing only the centre line spring of Ward's EFFANINEFFABLE design by 1". The result was a boat which also planes earlier, faster and nose-dives considerably less. The boat no longer 'sticks' to the water but 'skips' lightly above the surface.

It is important to realise that the scow planing surface is most effective under the mast step region and that the aft sections really only go along for the ride. With this train of thought, the planing surface takes on the form shown in diag. 1. It is significant that the section shape need not be flat across the boat ; in fact, very deep U sections are being used successfully.



Further design changes along these lines have since taken place, and a combined effort by Lamb and Ward with a further reduction in spring and a 4" narrower tuck has been designed specifically for the World titles to be held on Botany Bay in January 1983. The boat will be known as the McFRAWD design and is being manufactured by Jim French in his Melbourne factory from a new Klegecell Epoxy-Glass-Polyurethene sandwich construction.

The specific features of this new concept are therefore an extremely flat (spring) planing surface forward with just sufficient buoyancy aft to ensure a low angle of incidence when planing. The stern can be sunk further by the helmsman moving aft if large waves threaten a head first burial at sea.

It is also interesting to note that the latest sailboard experimenters are using these same principles evidenced by Jack van der Rest's world speed record board which has a wide flat entry and a narrow stern. The critical amount of spring in his board (6") is identical with that of the new breed of fast planing scows ; this is not just a co-incidence !

A parallel design approach has been taken with the current skiff Moth development. Andy McDougall and Ian Ward have produced a narrow skiff (WOMBAT) along the lines of the English "Magnum" designs except that the planing surface has been substantially improved. A major difficulty with skiffs is that the "working" section of the planing surface is generally well aft which induces wide flat sterns of the type introduced by Ian Brown in his 1973 "Good Grief" design. The problems here are that the boat becomes directionally unstable downwind due to its centre of buoyancy being so far aft, the hull "gripes" badly when heeled (i.e. is unbalanced) and has a poor displacement distribution (curve of areas) for light weather performance.

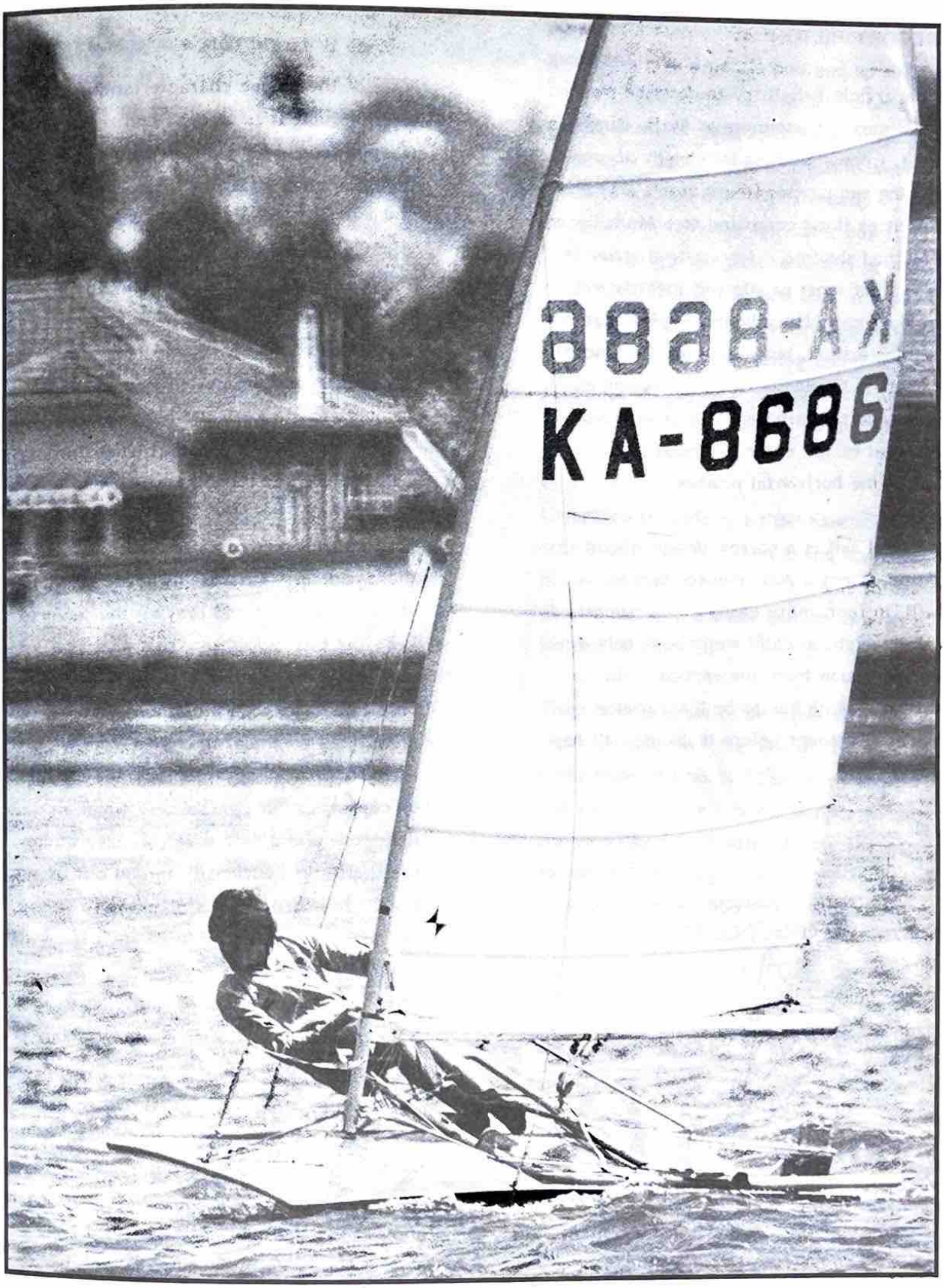
In the WOMBAT design, the very narrow hull overcomes the "gripe" problem and, in fact, the stern is reduced in width compared with the mid sections, which produces a rather well balanced hull shape. The centre of buoyancy is moved forward to 56% of the waterline length from the bow as opposed to the English Magnum design at 72%. The directional stability is thus improved even 'though the bow sections are slightly finer. The most difficult step was to maintain a good "curve of areas" or displacement distribution while keeping a flat planing surface. This was achieved by keeping a very flat planing surface in the centre section of the boat with slightly increased spring aft and a narrower than normal stern.

Again the principle of a narrow flat planing surface with a low angle of attack has been vindicated by its clear superiority over the European skiff designs in heavy winds. It is also pleasing that the effort spent in achieving a good displacement distribution has resulted in a boat with improved light weather ability as well. WOMBAT recently won the N.S.W. State Titles in light conditions and is a proven heavy weather performer.

Since these new ideas can be improved upon, there is substantial room for further rapid development - something to look forward to in the near future.

FOUND

a large heap of good quality, (used) planks, beams, assorted timbers, colored and varnished marine ply, alloy tubes (various), synthetic cloth(s), other plastic(s) materials, and a sliding door. all slightly water damaged. Tender to MSB for removal with in ten days.



SLICE TO WINDWARD - Skipper Peter Morrison 2nd Junior in National Titles.

A Different Life

GREGORY HILTON

In this article I shall try to describe my experiences and attempts at 14 ft. Dinghy sailing, from a Moth sailor's point of view, including similarities (there aren't any) and differences (lots) compared to a Moth. By Moth, I shall be referring to a scow, as this is what most people will identify with (including myself). My few experiences of sailing a skiff, however, have convinced me that its similarity to a "14" sailing is striking, particularly in the fact that a great deal of the early "training" period is spent in the horizontal position.

The "14" I sail is a narrow design which, I'm told, is not a good one to start in. It will, in fact, quite easily capsize under its own weight in calm water with only a slight deviation from the vertical. In contrast, a Moth has to be leant over a substantial amount before it decides it's had enough.

One of the unique characteristics of the Moth is that it is so light and responsive that it becomes a part of the person sailing it, responding instantly to movement of body weight and changes in sheeting. A "14", however, gives exactly the opposite impression. It is the boss and you are the one trying desperately to control it, adjusting crew balance, steering and sheeting in an attempt to find the right combination to keep the boat upright. This is especially important when turning corners, such as rounding a leeward mark.

The easiest point of sailing seems to be close-hauled. This simply involves hanging from the trapeze and playing the main to keep the boat upright. This part is a lot less tiring than sailing a Moth ; it's only when unexpected difficulties arise (very common) that your energy is really drained - see especially the section on capsizing. It can be very tiring in a light "one and a half wire" breeze, where the skipper is continually in and out of the boat. In addition, it is difficult to keep the boat moving smoothly through the water under these circumstances.

A simple manoeuvre such as going about is much easier said than done. In a Moth, about the worst eventuality is getting into irons. In a "14", however, the problems start once the tack is completed. If the boat is brought round too broad or the job sheeted too early, a capsize is the likely result. In a strong wind, even the crew flat out on trapeze will not stop a capsize if the job is sheeted before the skipper is ready to go out. This is aggravated by the fact that the boat won't point into the wind with the jib alone sheeted. On getting into irons, it is extremely frustrating to grab

the mainsheet and pull the boom to windward only to find that the boat merely moves sideways instead of the bow coming around.

Broad reaching in a stiff breeze is very interesting. It's amazing how much impact waves have at speed, but fortunately the crew takes the energy out of most of them. Occasionally though, you open your eyes after a particularly vicious one and find yourself at some distance from the boat, skimming along on your back and desperately trying to keep the boat on a straight course. The humour of the situation is inversely proportional to your position in the race.

Foot straps are fairly essential when reaching, as the forward pull of the skipper's wire is considerable when trapezing from near the transom.

Another interesting problem arises when reaching. In a Moth, when a strong gust hits, there are two possibilities in order to keep the boat upright - either bear off with it or point up and let the sail out. In a "14", if the boat is not kept absolutely flat, bearing off will cause the boom to hit the water so the main won't go out, with the inevitable capsize. Rounding up, however, throws the mast to leeward, with the same end result.

With the spinnaker up, the main seems to have little effect as it is small in comparison. This means that the Moth sailor's skill in quick sail adjustments goes by the board, and the spinnaker takes control.

When sailing downwind, the boat is sailed sufficiently shy to enable the crew to be kept on trapeze. This greatly increases boat speed over that of sailing on a dead run (which is fairly deadly in a strong wind). The centreboard is left down for greater lateral resistance.

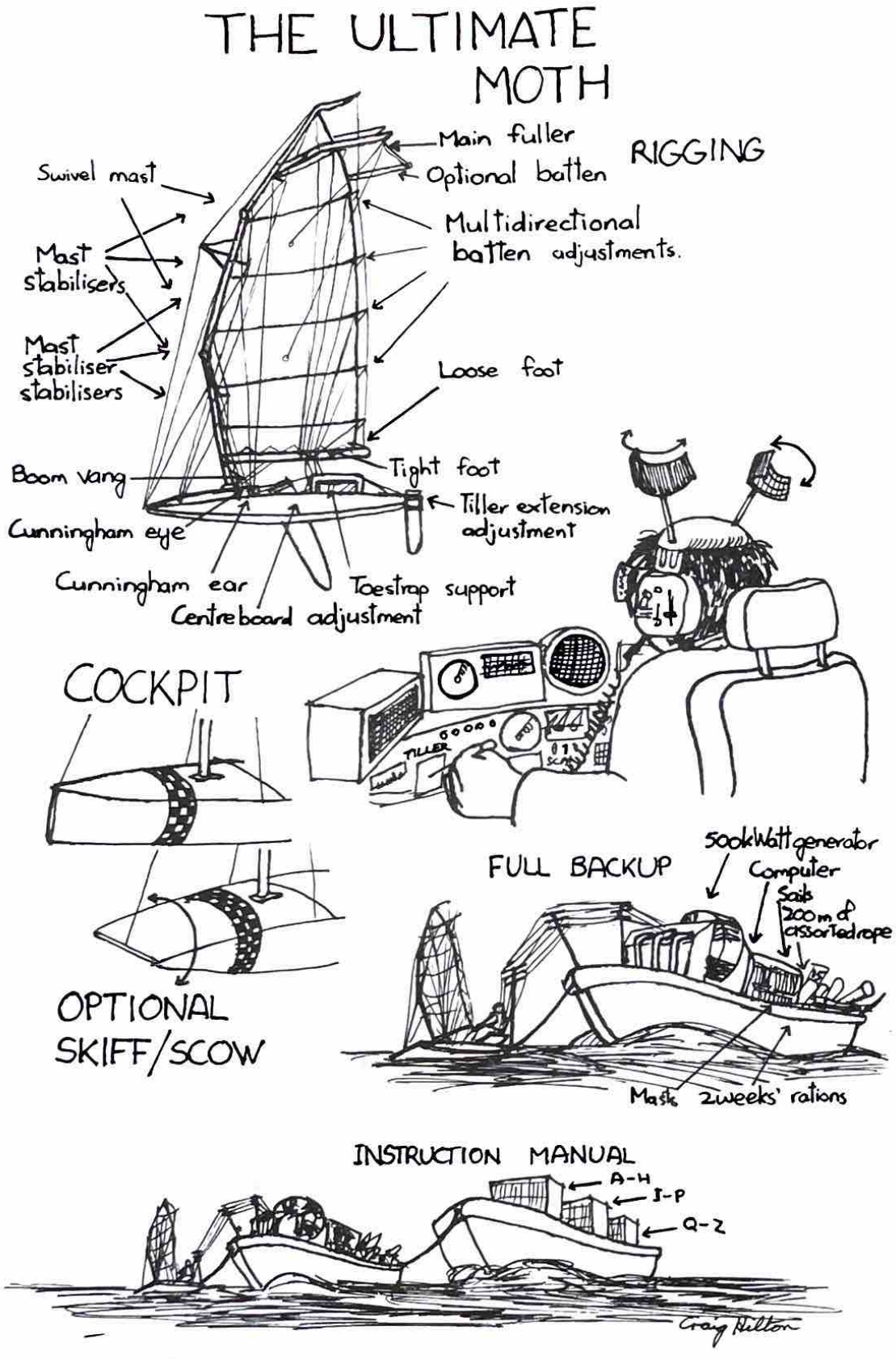
Now we come to the worst part of sailing a "14" - capsizing. Moth sailing spoils you in this respect - no longer is it possible to merely reach up to the gunwhale, give a gentle pull and up she comes ; two people are needed on the centreboard before it even looks like budging. Capsizing with the spinnaker up can be disastrous. It is usually necessary to take the spinnaker down before righting the boat, and this is no mean feat with 300 square feet of sopping wet sailcloth. After several capsizes, it can be extremely exhausting climbing up on to the centreboard with wet clothing on, and then having to haul yourself back up into the boat again.

Compared to a Moth, a "14" hardly nosedives at all, but then again, nothing nosedives like a Moth. It's great to be able to sail into a wave and go through it instead of under it.

There always seem to be ropes tangled, ropes hanging over the side of the boat or ropes under the boat. Spinnaker tangles are very frustrating as the skipper usually has to sit back and watch as the crew tries to sort out the mess. A good crew is essential as is the ability to work as a team.

As gloomy as this picture may sound, once the basic skills of boat handling are mastered, "14" sailing is extremely fast and exciting.

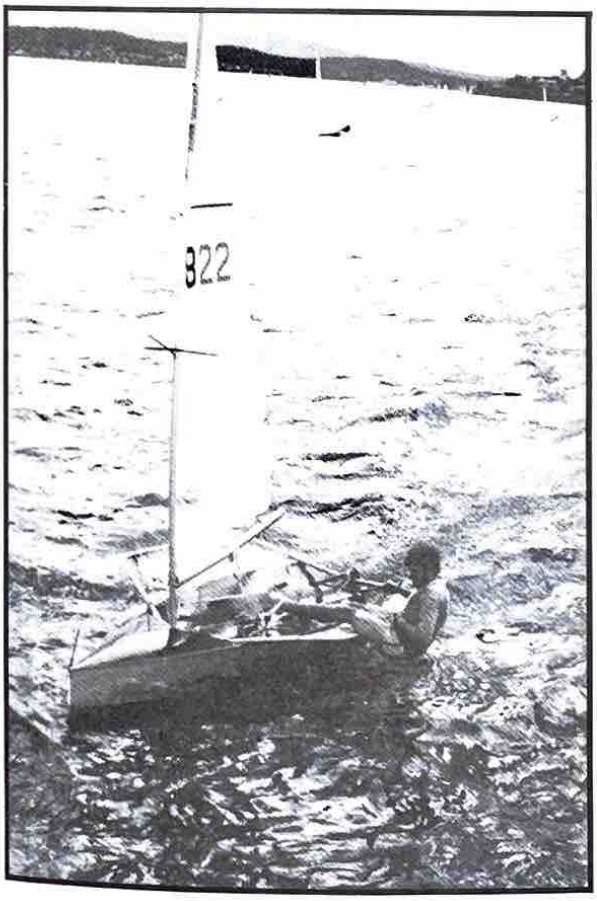
fly on a MOTH


THE ULTIMATE MOTH
RIGGING
Main fuller
Optional batten
Swivel mast
Multidirectional batten adjustments.
Mast stabilisers
Mast stabiliser stabilisers
Loose foot
Tight foot
Boom vang
Tiller extension adjustment
Cunningham eye
Cunningham ear
Toestrap support
Centreboard adjustment
COCKPIT
OPTIONAL SKIFF/SCOW
FULL BACKUP
500kWatt generator
Computer
Sails
200m of assorted rope
Mast
2weeks' rations
INSTRUCTION MANUAL
A-H
I-P
Q-Z
Craig Hilton

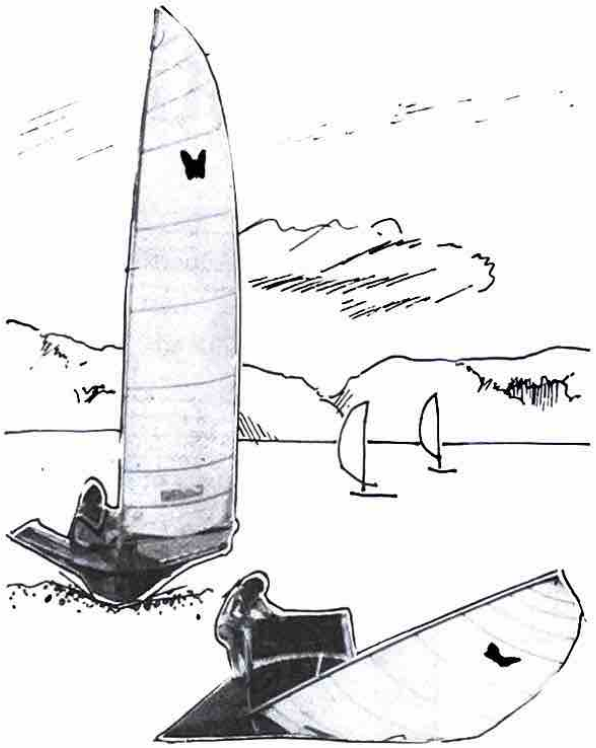
A Word

JOHN BUTLER

There is one idea that can be gleaned from the Windsurfer concept : the benefits of creating lift with the sail. There is no doubt that a boardsail rigged Moth would outpace our present boats on a close reach. This is due to the lift created by a sail which is inclined to windward and slightly aft. This physically lifts the boat out of the water until it is almost flying over the waves, with just the aft part of the board remaining in contact with the water for control. The effective weight of the boat is reduced to almost zero, and the resistance caused by spray and friction is drastically reduced also.



Phobia Skiff well under control
skipper - Ross Keogh



A word about sail size. Richard Hargreaves, Bill Short and Dave Iszatt all use $8m^2$ sails with little or no head to them in the conditions above force 5. Their boat handling, however, is far better than the majority of us, and I believe it is important to realise your own limitations of skill.

Survival conditions call for survival measures, and it is important to finish the race and build up valuable heavy weather expertise. That is where the Moth is different from other dinghies. In heavy weather it is vital to master the boat, not your rivals, in order to be most successful.

Storm sails are an indication of good seamanship. They require a great deal of low down area, a tight leach and a low to moderate camber. This is because the lower the aspect ratio the less sideways force is generated and also the danger of nosediving is also greatly reduced ; however, be wary of lulls, as you just don't have the power to pull yourself out of a potential windward capsize ! I recommend about $6.5m^2$ for the average Moth storm sail, with a luff length of 4.00 metres and little roach.

Jap. Moths

Japanese Moth Association Membership has decreased more and more. Last year there were 85 members but only 40 entered the Nationals.

1984 Moth World Championships will be held in Japan on Lake Hamanako, August 1984. I hope many Moth sailors come to Japan.

Two or three Japanese Moth sailors will enter the 1982/1983 Worlds in Sydney.

Naomi Tachibana,
Secretary,
Nagaura-Machi 5 - 77,
Yokosuka,
Japan.

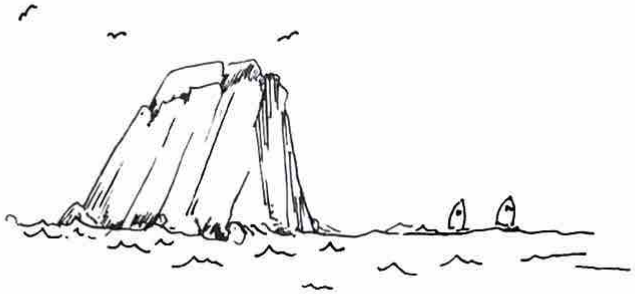
Naomi Tachibana

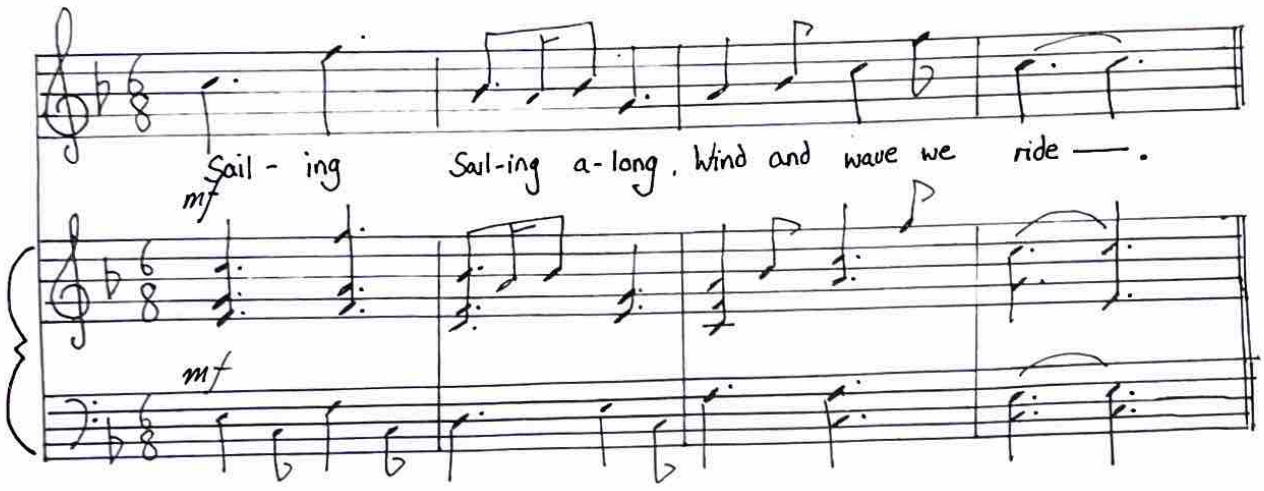
A Moth Shanty

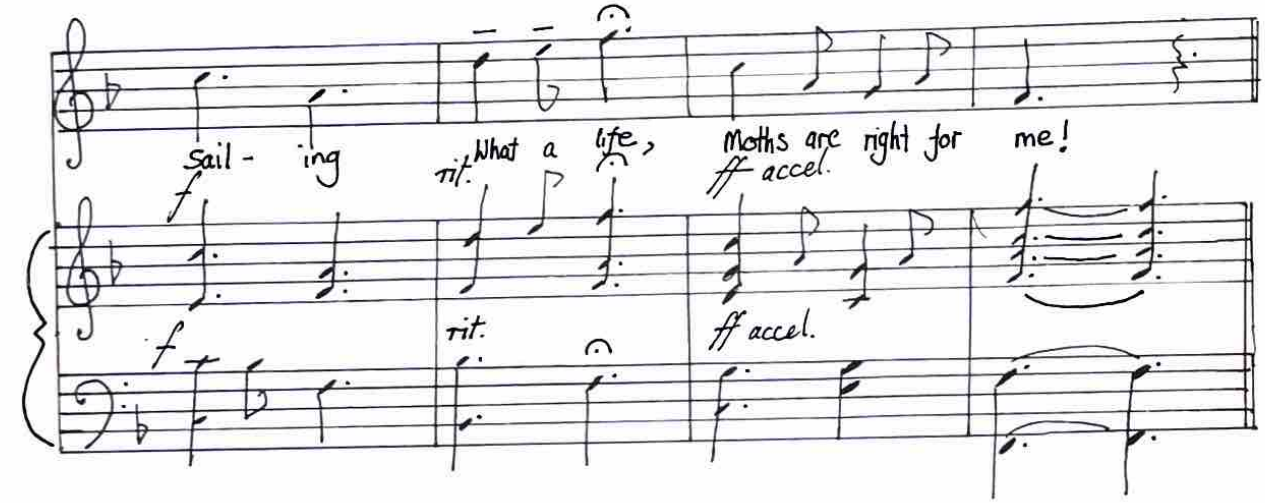
Lightly with Lilt.

Sail-ing Sail-ing a-long, glid-ing on the sea —. Sail-ing Sail-ing a-long Moths are right for me. Their speed and grace do urge us on to vic-tor — y. Oh

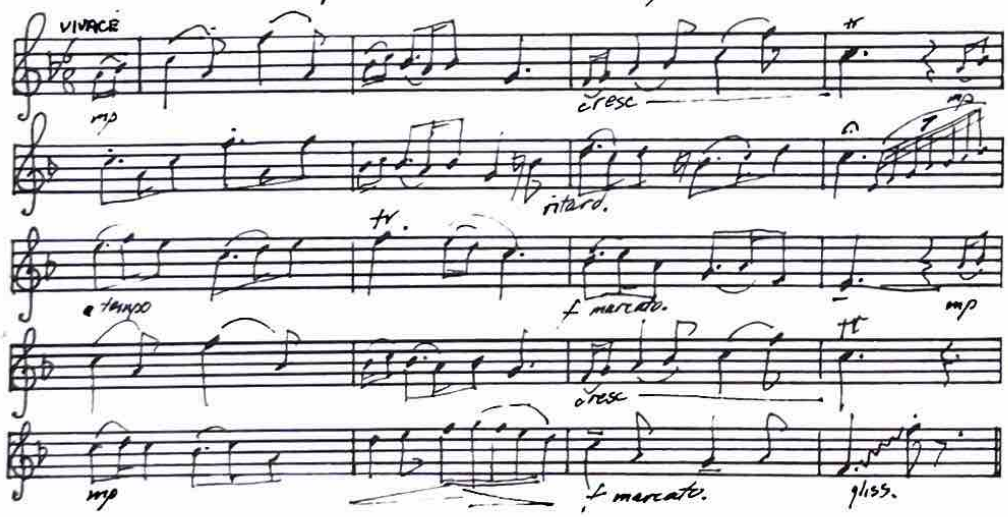
mf *mf* *mp* *mp* *dolce* *dolce* rit. *f* a tempo rit. *f* a tempo



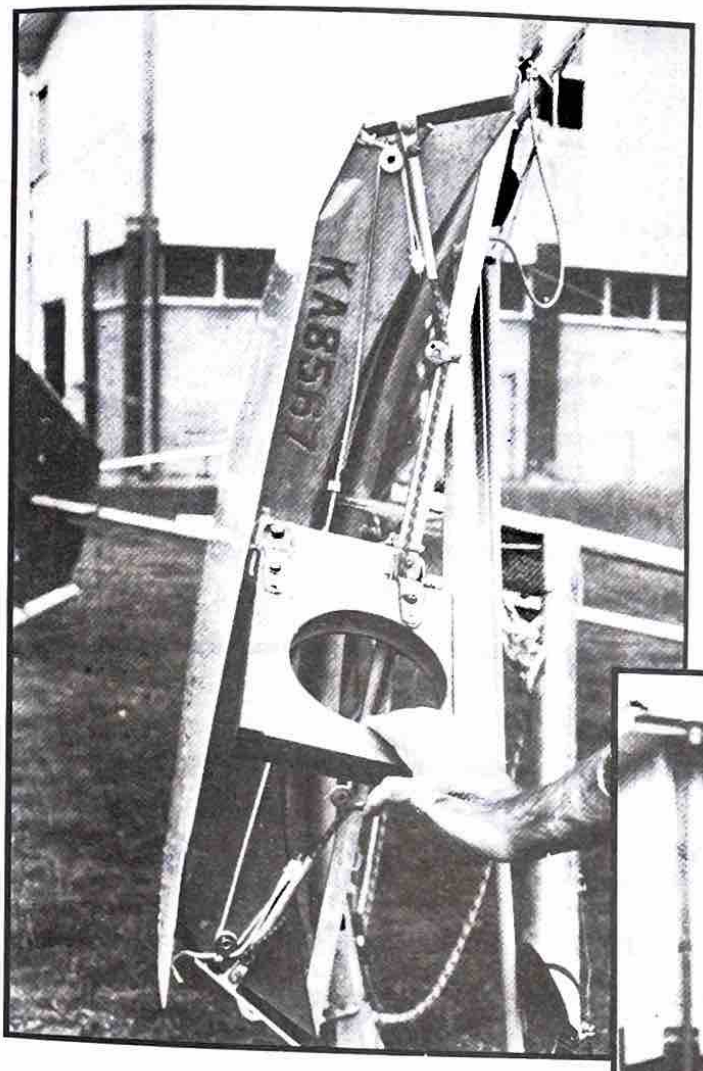




Variation for Tin Whistle or Flute (Piccolo)

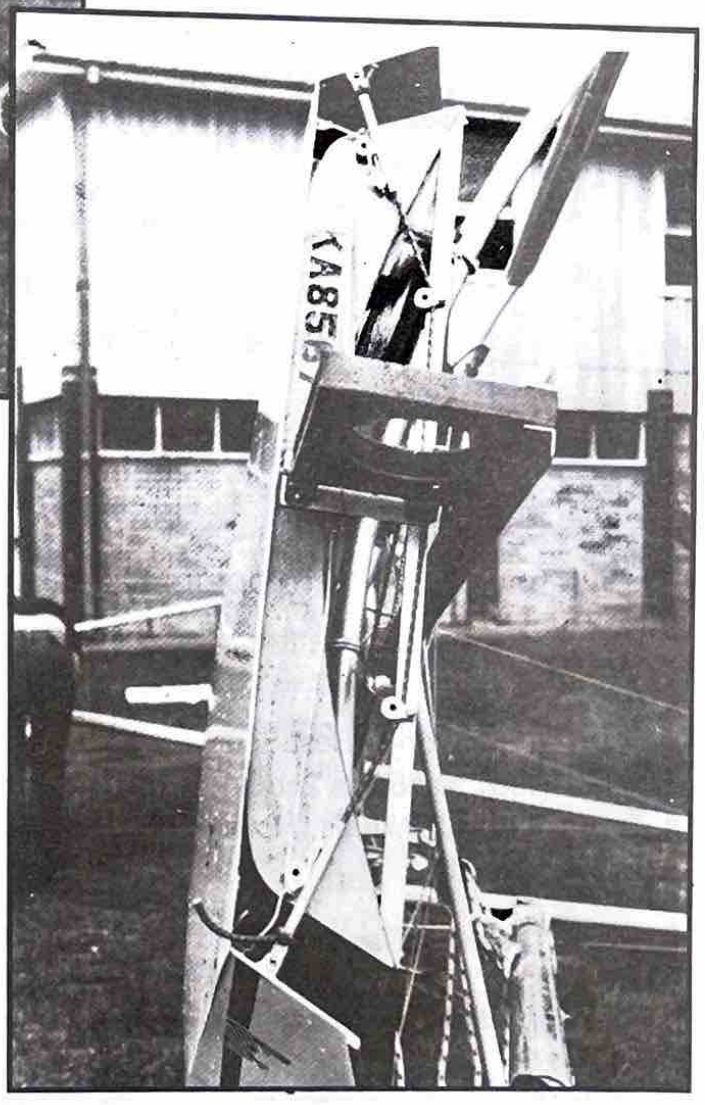


Adjustables



The nature of the IMCA rules allows a diversity of design and development to flourish in a manner controlled only by the constraints of racing feasibility. Some experiments have been bizarre and accordingly disappeared from public scrutiny. Others have become part of class history, having proved their worth in the winning stakes.

The adjustable transom, a recent innovation by John Savage, enables the aft chines to be moved in and out a considerable distance, thus changing the width of the tack to suit the weather conditions. The system involves a simple set of pulleys and ropes which enable the skipper to transform his boat with a minimum of effort. In fact, if properly controlled, one could develop a subtle pumping motion which should increase boat speed in non-planing conditions. But I digress.



This innovation could be the start of a move towards the convertible hull we all dream of. Then again .....

aft, cross-sections (often at frame stations), and waterlines (horizontal sections). The table of offsets usually specifies the shape of particular cross-sections. From the cross-sections, points at regular distances out from the keel can be calculated and buttock-splines fitted through them. Waterlines can be calculated similarly. Computationally, it would be as easy to start with sections in any axis as with cross-sections.

Given enough sections through a hull, the exact position of any point on the hull can be calculated by reference to the sections close to it.

Another computational method of representing a surface is the bi-cubic spline in which x, y and z co-ordinates are given as functions of two parameters in cubic patches.

Yet another method is to divide a surface into small polygons - triangles and rectangles. If the polygons are small enough the patchwork surface appears smooth. This method is also used in the finite-element-method of calculating stresses in structures.

Developable surfaces. Builders of sheet ply boats will recognise there are limits on the shapes attainable. In fact, ply (and aluminium or other flexible but non stretchable sheet material) forms only developable surfaces. Such a surface has zero Gaussian curvature - which roughly means the surface may be very curved in one direction, but in the perpendibular direction a ruler can be laid along the surface. This collection of (imaginary) rulers can be calculated given just the boundary, e.g. keel, chine, transom of the surface, and totally specifies the surface. It should be straightforward to roll the surface out flat (in the computer) and produce templates for a stitch and glue type construction. (The author sails a "125" !).

Calculations. Once a shape is represented inside a computer, it is possible to do calculations on it that might be impractical by hand.

Traditionally, the fairness of lines is judged by eye. On a computer, this is also possible by large scale plotting ; alternatively quantities such as the radius of curvature may be calculated. A negative radius of curvature shows a hollow and a (near) infinite value a flat spot.

Static quantities such as displacement, centre of buoyancy, righting moment, heeled waterline are straightforward to calculate.

The computer could put more science into boat design. At the moment, accurate dynamic simulation of sailing is not possible particularly in dinghies, where turbulence, planning and wave action are important (dominant ?) factors. However, if many designs with known characteristics can be collected, aspects of their shape which affect these characteristics might be identified.

Modifications. Only rarely is a boat designed from scratch. Usually a known design is altered. This is particularly easy with a computer. A design can be stretched, narrowed, given more rocker or otherwise transformed by adjusting a small amount of data. Frames can be "moved" by taking new sections off the hull lines without altering the hull shape.

LLOYD ALLISON
Department of Computer Science
University of Western Australia.

Contd. Page 58

Further reading.

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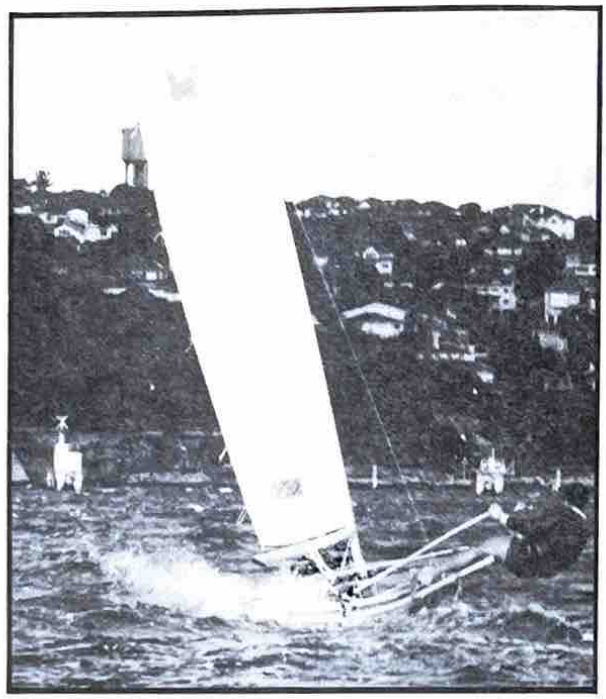
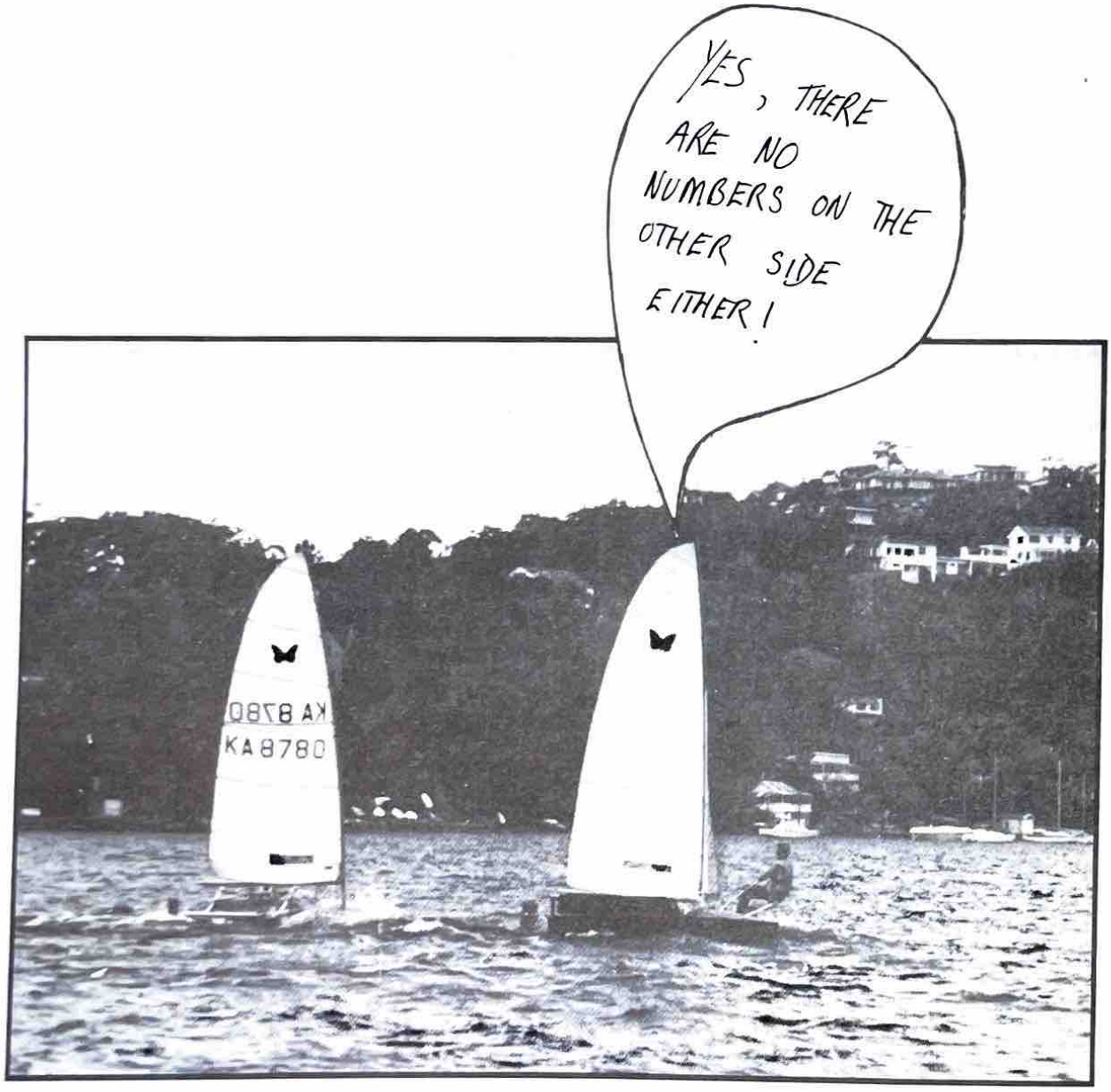




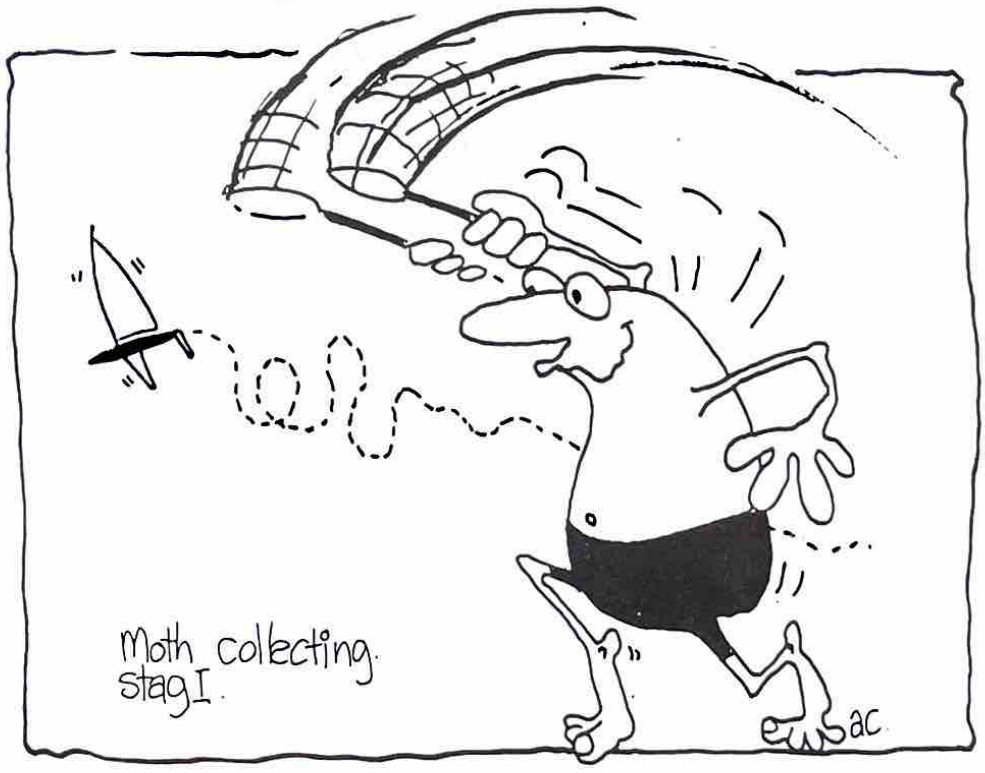
HEAT 6

Lasers were also sailing this day, so the course was pushed westwards with the start in the main channel where a fast current from the ebb tide was running. The start was at 2.30 p.m. in a 12 - 15 knot south to south west sea breeze.

The port end starters had a great advantage as they were first out of the tide. Lamb, sticking to the lay line, led a tight group to the first mark including G. Hilton, Mair, then Edmiston (22s), Ward (27s), Bruce (35s). Lamb moved away in clear air with a collision between Mair and Hilton, allowing Edmiston and Bruce through. Hilton dropped behind steadily, taking water through a hole in the aft deck ; two holes in the transom helped counteract this. The first four boats had a tussle, with Lamb holding his lead throughout ; Ward and Mair changing positions each leg, and Edmiston holding fourth. Bruce lost ground and finally pulled out due to steerage problems, while McDougall and Chidzey did well to work through the fleet. Lamb was first across the line and Mair (W.A.)(34s) passed Ward (N.S.W.)(45s) on the last tack to the finish. They were followed by Edmiston (W.A.) (55s), G. Hilton (W.A.) (1m.50s.), McDougall (N.S.W.) (2m.25s.), Chidzey (N.S.W.), Trevillien (Vic), V. Tidy (W.A.), J. Briggs (Q).

HEAT 7

Going into the final heat, G. Hilton had to beat Lamb by a place and finish no worse than fourth to take the series. The second morning heat with forty-seven starters was in a breeze of 5 - 8 knots from the north, with a slight chop. It proved to be ideal skiff weather with McDougall leading at the first mark and increasing this on each leg to win by 9 min. from Jim Prower (N.S.W. skiff sailor). Third and fourth placings were also skiffs - Alan Tidy (W.A.) (12m), and Phil McGilvrey (N.S.W.) (12m50s). Then Greg Hilton (W.A.) (14m30s), Steve Penny (N.S.W.) (15m25s), Chris Overy (N.S.W. (16m), Ian Ward (N.S.W.) (16m30s), Peter Lamb (N.S.W.) and Steven Greeve (W.A.) in tenth place.
Peter Lamb won the Open Title with Vernon Tidy succeeding his brother for the Junior Title. The overall team trophy went to W.A., 1 point from N.S.W.
G. Hilton won the President's Trophy for the best placings over 7 races.



PLACINGS	SKIPPER	POINTS	DESIGN	SAIL	MAST
1. Stunned Mullet	P. Lamb (N.S.W.)	24.4	Stunned Mullet	Olympic	Superspar 8' taper
2. Export Bunyip	G. Hilton (W.A.)	26.6	Bunyip	Tasker	Old Superspar
3. Effanineffable	I. Ward (N.S.W.)	48.7	Effanineffable	One Design	Superspar 9' taper
4. Struth	P.Edmiston (W.A.)	74.7	Bunyip	Tasker	Superspar 9' taper
5. Actrapid	G. Mair (W.A.)	75.4	O'Sullivan	Tasker	Superspar 9' taper
6. Wombat	A.McDougall(NSW)	77.7	Wombat skiff	One Design	Endtune Marine
7. Pineapple Doughnut	J. Hilton (W.A.)	80.7	Bunyip	Tasker	Superspar
8. Sail of the Century	S. Penny (N.S.W.)	97.7	Le'Fevre	One Design	Superspar
9. Run Away Boy	J. Briggs (Q)	99.7	Effanineffable	Truflo	Superspar
10. Moo Scow	K. Chidzey (NSW)	103	Snubby	Truflo	Superspar
JUNIORS					
1. Norrie Numbat	V. Tidy (W.A.)	6	Red Ned	Tasker	Superspar
2. Comatosis	P.Morrison (NSW)	44	Effanineffable	One Design	Superspar

Plans

STUNNED MULLET

Designer ; Peter Lamb.

Current Australian Champion. Marked planing improvement ; exceptional in heavy weather.

Available - lines plan, table of offsets, materials list, strong back and frame assembly.
Cost : $25.00.

From : Peter Lamb,
43 Abingdon Road,
ROSEVILLE NSW 2069.
Ph. 46.2107.

BUNYIP

Designer ; Greg Hilton

Used over last years to gain two National Titles. Excellent all round performer.

From : Gregory Hilton,
4 Hawkins Street,
MT. PLEASANT WA 6153.

EFFANINEFFABLE

Designer ; Ian Ward.

Good all round design ; excellent light weather performance - 2nd in both World and National Titles of 1981-1982.

Available - Complete plans and building instructions.

Ian Ward,
22 Hopetoun Avenue,
MOSMAN NSW 2088
Ph. 969.6757.

Jim French,
6b Braeside Drive,
BRAESIDE VIC 3195
Ph. B.(03)587.1204

STUNNED McFRAWD

Designers ; Ian Ward and Peter Lamb.

Latest innovation in fast planing surfaces incorporated with less nosediving characteristics.

Available - Plans, offsets, building instructions.

Jim French,
6b Braeside Drive,
BRAESIDE VIC 3195.
Ph. (03)587.1204.

WOMBAT SKIFF

Designers ; Ian Ward and Andrew McDougall

Extremely fast skiff utilising better planing surfaces and improved stability. Current N.S.W. State Champion.

Available - A. McDougall,
2 Burnt Street,
SEAFORTH NSW 2092.
Ph. 94.4014.

RED NED

Designer ; Cliff Burton

Popular Western Australian design suiting flat water and strong breezes.

Available - Cliff Burton,
46 Tranmere Way,
CITY BEACH WA 6015.

Other - European Skiffs - Magnum III, IV and V, Phobia and Womble, plus helpful advice on construction methods may be obtained in Australia from :

Jim Prower,
23/3-5 St. Neot Avenue,
POTTS POINT NSW 2011.
Ph. 358.3437

INTERNATIONAL MOTH CLASS RULES

Authority International Yacht Racing Union, 5 Buckingham Gate, London SW1E 6JT
Date of International Status 1st September 1972

1. GENERAL

(1) The International Moth is a single-handed development class boat. The intention of these rules is to give the designer and builder the fullest liberty in design and construction, within these rules, to develop and produce faster boats.
(2) The official language of the class is English and in the event of a dispute over translation, the English text shall prevail.
(3) These rules are complementary to the measurement form. Any interpretation shall be made by the I.Y.R.U. which may consult the International Moth Class Association (I.M.C.A.).
(4) In the event of discrepancy between the rules and the measurement form, the matter shall be referred to the I.Y.R.U.
(5) In countries where there is no National Authority (N.A.) or where the N.A. does not wish to administer the class, its function as stated in the rules, shall be carried out by the I.M.C.A. or its delegated representatives (National Associations).
(6) Neither the I.Y.R.U. nor the I.M.C.A. accept legal responsibility in respect of these rules, or any claim arising therefrom.

2. BUILDING FEE

(1) The building fee is £2.00 sterling, or its equivalent in other countries, of which £0.50 is due to the I.Y.R.U., £0.75 to the I.M.C.A. and £0.75 to the National Association.
(2) The amount of the building fee may be reviewed by the I.Y.R.U.
(3) The I.M.C.A. is responsible for the collection and distribution of building fees on the above basis.
(4) The I.M.C.A. may delegate its responsibility to collect building fees and issue receipts to National Associations.
(5) The building fee is payable by the builder on each boat built, whether or not it is subsequently measured and registered. Payment shall be made direct to the I.M.C.A. which shall issue a building fee receipt. The building fee receipt shall be delivered by the builder to the owner on sale of the boat.
(6) Building fee receipts shall be valid only if made out on official forms issued by the I.Y.R.U. The I.Y.R.U. will sell these forms at £0.50 each to the I.M.C.A. which shall sell the mat £1.25 each to the National Associations. The purchase price in each case represents the proportion of the building fee due to the I.Y.R.U. and the I.M.C.A. and the National Association.

3. REGISTRATION AND MEASUREMENT CERTIFICATE

(1) No boat is permitted to race in the class unless it has a valid measurement certificate.
(2) The certificate is only valid for racing if the owner is a paid-up member of the I.M.C.A.
(3) Each N.A. shall issue sail numbers which shall be consecutive and the number shall be preceded by the official national letter(s). A N.A. shall only issue a sail number on receipt of evidence that the building fee has been paid.
(4) No two boats in the class registered in the same country shall have the same name.
(5) The certificate is obtained as follows:
  (i) The owner or builder shall apply to the appropriate N.A. for a sail number, enclosing the building fee receipt and may at the same time submit the proposed name(s) of the boat. The N.A. shall enter the sail number on the building fee receipt.
  (ii) The owner or builder shall have the boat measured by a measurer officially recognised by a N.A. The completed measurement form shall be supplied to the owner of the boat.
  (iii) The owner shall send the completed measurement form to his N.A., together with any registration fee that may be required. On receipt of this the N.A. may issue a certificate to the owner.
(6) Change of ownership invalidates the certificate but shall not necessitate remeasurement. The new owner may apply to his N.A. for a new certificate, returning the old certificate together with any re-registration fee required and stating the necessary particulars. A certificate shall then be issued to the owner.
(7) It is the owner's responsibility to ensure that his boat, spars, sails and equipment comply with the class rules at all times and that alterations or replacements to the boat, spars, sails or equipment do not invalidate the certificate.
(8) Notwithstanding anything contained in these rules, the I.Y.R.U. or the N.A. shall have the power to refuse to grant a certificate to, or withdraw a certificate from, any boat.
(9) The I.M.C.A. shall obtain at regular intervals from each N.A. details of sail numbers and certificates issued, together with the names and addresses of owners.

4. MEASUREMENT

(1) Only a measurer officially recognised by a N.A. shall measure a boat, its spars, sails and equipment, and sign the declaration on the measurement form that they comply with the class rules.
(2) The measurer shall report on the measurement form anything which he may consider to be unusual or to depart from the intended nature of the boat, or to be against the general interest of the class and a certificate may be refused, even if the specific requirements of the rules are satisfied.
(3) A measurer shall not measure a boat, spars, sails or equipment owned designed or built by himself, or in which he is an interested party, or has a vested interest.
(4) New or substantially altered sails shall be measured by a measurer who shall stamp or sign and date the sails near the tack. The details shall be recorded on the certificate and the entry signed by the measurer or secretary of the N.A.
(5) All boats, spars, sails and equipment shall comply with the current rules.
(6) All boats, spars, sails and equipment shall be liable to re-measurement at the discretion of a N.A. or race committee.

5. IDENTIFICATION MARKS

(1) The class emblem shall be a representation of a Moth and shall conform in shape and size to the pattern held by the I.Y.R.U. Copies may be obtained from a National Association, the I.M.C.A. or a N.A.
(2) The sail number and national letter(s) of the boat shall be cut into, or marked indelibly on the hull, aft on the port side in figures not less than 30 mm high. These shall not be removed during the lifetime of the boat.

(3) The sail number, national letter(s) and class emblem on the sail shall conform with the current I Y R U Yacht Racing Rules. Letters and numbers shall be of the following minimum sizes

Height	250 mm
Thickness	35 mm
Width	170 mm (excluding number 1 and letter I)

Space between adjoining letter and number minimum 50 mm

(For sails measured before 1st March, 1973, the minimum height shall be 230 mm and the minimum width 150 mm.)

(4) All emblems, numbers and letters should be of a durable material securely attached.

6. HULL

(1) The overall length of the hull, excluding removable rudder fittings and stem fittings, shall not exceed 3355 mm measured between perpendiculars with hull level transversely and water line horizontal.

(2) The overall beam shall not exceed 2250 mm.

(3) (i) Catamaran or multihull configurations are prohibited. There shall be no visible air gap dividing the boat longitudinally throughout its length when afloat upright, fully equipped, but without crew. In the case of a boat with flexible or hinged transom, this test shall be made with the transom in the fully raised position.

(ii) There shall be no hollow in the underside of the hull more than 75 mm in any section closer than 2700 mm from the aft perpendicular as described in rule 6(1). The reference line for this hollow shall be a stringline stretched tightly around the underside of the hull from points immediately below the outer gunwale (or where the outer gunwale should be) and the stringline shall be at right angles to the centreline of the boat.

(4) There is no restriction on chafing battens, rubbing strips, or outer gunwales, so long as they are an integral part of the hull, and provided that the maximum beam is not exceeded. These items shall be considered to be an integral part of the hull if their removal requires the joint to be broken or cut.

7. BUOYANCY

(1) Boats shall have buoyancy tanks or bags firmly attached to the hull sufficient to float the boat's own weight plus 75 kg approximately level when capsized or full of water.

(2) Where boats are constructed with a significant amount of non-buoyant material, sufficient rigid foam buoyancy (minimum 0.05 m^3) shall be securely fixed to the hull to ensure that it is inherently buoyant in the event of failure of all buoyancy tanks and/or bags.

(3) Inspection holes shall be provided to enable measurers to check positive foam buoyancy when fitted. Each hole shall have a detachable cover capable of resisting dislodgement, and such covers shall be kept in place at all times when racing. The opening(s) shall be not less than 85 mm in diameter.

(4) The measurer shall satisfy himself that the buoyancy compartments are watertight.

8. SPARS

(1) The overall length of the mast shall not exceed 6250 mm.

(2) Measurement bands, not less than 15 mm wide, shall be marked on the spars so that they are clearly discernible when racing. The inside edges of these bands define the limits to which the sail may be set.

(3) The distance between the bands on the mast shall not exceed 5185 mm.

9. SAILS

(1) The boat shall carry only one sail. No extra sail shall be on board when racing.

(2) The sail area measured and calculated in accordance with the Sail Area Measurement Instructions shall not exceed 8.00 m^2 except that:

(a) Only the area of that part of the spars that will not pass through a ring 90 mm in diameter shall be included.

(b) For a sail which encloses the mast, an area equivalent to the length of the luff multiplied by 50 mm shall be excluded.

(c) For a sail which encloses the boom an area equivalent to the length of the foot multiplied by 90 mm shall be excluded.

(3) Battens shall extend not more than 150 mm from the sail. No attempt at increasing sail area shall be made by the number or size of the battens used.

(4) Where the sail is set on spars no part of the sail shall extend aft of the inner edge of the boom band and no part of the luff shall extend beyond the lower edge of the upper mast band and the upper edge of the lower mast band. ~~The forward extension of the line of the upper edge of the boom shall not be lower than the upper edge of the lower mast band.~~

(5) A loose-footed sail, with boom parallel to the foot and with the boom projecting beyond the clew, shall be counted as a sail set on a spar. But if the boom is shorter than the foot, or if the boom is not parallel to the foot, the owner shall declare the maximum foot measurement and shall mark this declared foot length clearly and indelibly on the foot of the sail at the tack in figures 10 mm high.

10. CREW

There shall be one person on board when racing.

11. PROHIBITIONS

Moving or detachable seats and trapezes.

12. ANCHOR

An anchor need be carried only when specifically prescribed in the sailing instructions.

Effective: 1st March, 1973
Previous issue: 1st September, 1972

* PICTURE CREDITS

Photographs by Robert Mill on Pages 11, 31, 58
Photographs by Bob Ross (Aust. Sailing) on Pages 2, 5, 13, 14, 20, 21, 38, 55, 58.

I would like to acknowledge all those people who assisted in capturing the action on film as well as those who, through intent or mishap, presented themselves in front of the lens at the right time.

MOTH OF THE FUTURE

THE NEW, ULTRA-LIGHTWEIGHT CRAFT

ADVANTAGES:

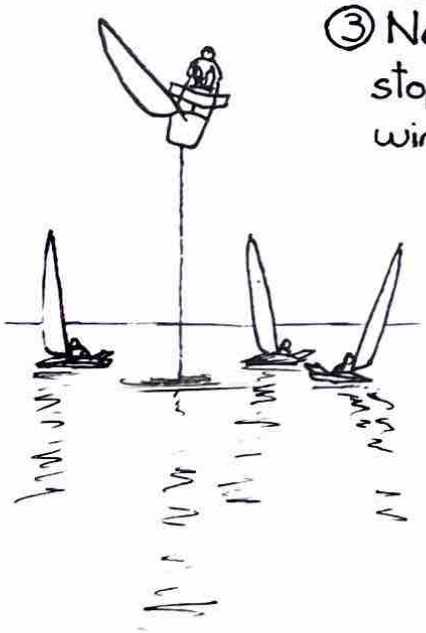
① It is very fast.

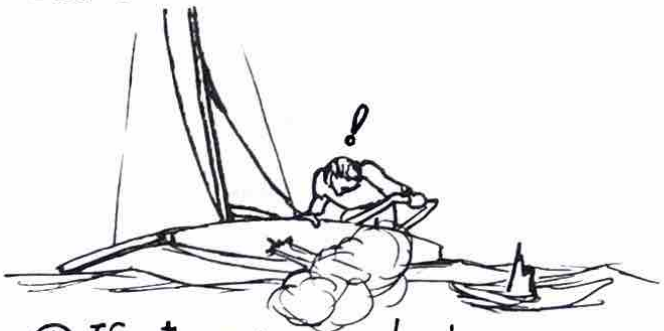
DISADVANTAGES:

① Needs four people to carry it into water.

② In order to stay afloat, must have hydrofoils (turned upsidedown)

③ Needs anchor to stop it drifting when wind dies out.





④ If it springs a leak — don't light a match!

another cover job by David Payne

the IMCA MOTH WORLDS 82 down under in 83