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President I h the past 12 mon knowing the Na prparts in othe experience and thes this has be personally. the problem.

Editorial

A comprehensive magazine such as this, is long overdue in Australia, and the sheer volume of contributions reflects the enthusiasm of Moth sailors, past and present. In producing this magazine I have attempted to make an informative handbook, which should remain a useful reference while presenting a resume of the latest championships, social events and design trends.

I would like to extend thanks on behalf of myself and all Australian Moth sailors to; the contributors of articles, photos and sketches who were so prompt with their submissions; the typists who volunteered their time so willingly; and to the advertisers of whom Cemac, in particular, made a most generous donation. Sydney will be host to their first ever World Moth Championships in January 1983 and the venue is most likely to be the Georges River Sailing Club on Botany Bay. Sydney has probably the largest concentration of Moth sailors anywhere in the world and I'm sure every effort will be made to assist International competitors wishing to attend. Let us make this the best ever World Championship series yet!

Finally, I sincerely hope that Australian Moth sailors will ensure that succeeding editions of this annual publication will continue and expand in the best traditions of such a magazine.

IAN WARD

THE MOTHIES NIGHTMARE

Oh where oh where is that starter's gun For here am I with start near won Huddled aboard my trusty moth, Squeezed each side with waves and froth As eager mothies strain and shout Trying to stop from going about And not to cross that invisible line Before the official starting time The seconds tick and I'm in trouble Brakes won't grip in froth and bubble Too early for the start once more Can't go back and can't go fore Now they're pushing me over the line Oh woe it's happened again and I'm Recalled as the gun at last goes bang And the rest of the Mothies tighten their vang

The fleets away with a mighty cheer All 'cept me whose stranded her What went wrong with my brilliant scheme Oh wake me please and say it's a dream.

The Ancient Mariner.

Letters

This paragraph appeared in the W.A. daily Newspapers sporting page shortly after David Iszatt won his third race in succession. - "It seems the English are ahead in Moth designing."

I feel that if the conditions had suited the Australian scows, the statement would have been in our favour.

The English and European Moths have been developed to suit their own conditions which in the main are light and sloppy. The latest skiff designs have reached a stage where they are almost unbeatable in these conditions.

The Australian Scow designs have steadily improved over the years to reach a similiar situation where we hold the upper hand in moderate to strong winds and flatter water.

Both skiff and scow have developed to such an extent that given their favoured conditions both designs are winning by big margins, which places more emphasis on hull shape, and not the overall combination, which is the way it should be in World Championships.

I really cannot see any future for the Moth Class internationally by continuing along these lines. These might seem like harsh words, but when you look at the World Moth scene at the moment it is not very healthy, with several countries falling out and leaving three or four nations to contest World Championships. Considering the effort, time and expense required to attend, skippers then have to gamble on conditions which suit their boats.

Well, what can we do about it? It is not an easy question to answer. Perhaps, for a start we could even the competition up by reducing the overall width to a sensible two meters. This would make the heavier skipper more competitive and make hulls easier for storage and transport. A weight or age division could be considered several other small classes have adopted this idea. This might have the effect of retaining and attracting more of the heavier senior skippers to the class. Ten years ago W.A. had 300 registered Moths with 5 country centres active. To-day we have 60 registered Moths and 2 country clubs. There are several reasons for the decline; attraction to other classes, costs, wide choice of other activities, availability of boats and materials. However, the biggest drop in numbers was through the introduction of alloy wings. Many good skippers were lost as a result.

I feel that the class has a lot to offer. The Moth is still the cheapest centreboarder on the market. It offers tremendous competition and is the fastest and most responsive boat for its size afloat. However, lets make it popular for all age groups regardless of the weight, or lack of it, advantage.

Summing up, I would say something must be done in order to stabilise International competition and communication or we could find the I.Y.R.U. looking closely at our affiliation. We must change the "boat for kids" reputation that now exists. One should look at the overall situation and not the decisions which affect you personally.

BRIAN PEARCE.

Sir,

As Senior Vice-President of I.M.C.A. (Aust) I recently had the privilege of chairing the two main meetings of the Association in Adelaide.

As the South Australian President I have also experienced over the past 12 months, the frustration of not knowing the National Executive nor my counterparts in other States. Thanks to my experience and contacts during the Adelaide Titles this has been largely overcome for <u>me personally</u>. However, it doesn't solve the problem. While it may appear top heavy administration, I believe, National Secretary, Peter Cleary's suggestion of a mid-year meeting on a weekend in Melbourne or Sydney has a lot going for it. The alternative would be to investigate the cost of a National telephone hookup. We are living in a fast-moving age and a once-a-year meeting is not enough as it is soon forgotten and personalities change. With a mid-year meeting, the weak States can be helped by the strong and the Class grow nationally. Sponsors could possibly be found to help finance the meeting.

> Kevin Angove, I.M.C.A. (S.A.).

REGISTRATION PROCEDURES

1) Contact your State Association and obtain the name and address of the State Registrar and nearest A.Y.F. Moth Measurer. Send \$14 to your State Registrar (\$12 for country boats) which is divided as follows:-

- a) \$10 (\$8 country boats) for State registration for one year.
- b) \$4 Building Fee Receipt (B.F.R.) which is actually a royalty to the International Yacht Racing Union to pay administration costs.

2) From the Registrar the owner will receive a B.F.R. and an Application for Sail Number Form which he must then send to the Australian Yachting Federation (A.Y.F.) together with \$10. This \$10 covers secretarial and administration costs for the A.Y.F.

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

4). The owner now has his boat and sail measured by a certified A.Y.F. selected measurer. After the relevant measurement forms have been completed by the measurer, the forms are then forwarded to the A.Y.F. who check that the boat measures and then retain the measurement forms in their files. 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, which completes the registration procedure.

CHANGE OF OWNERSHIP

1) OBTAIN a Change of Ownership Form from your Club Secretary or State Association.

2) Send the competed form with the current measurement certificate and \$10 (administration fee) to the A.Y.F. at 33 Peel Street, Kirribilli. N.S.W. 2061.

3) The A.Y.F. then issues a new measurement certificate to the new owner.

4) The A.Y.F. notify the State Registrar that a new measurement certificate has been issued and he, in turn, issues a registration tag, (if current registration has been paid), which completes the re-registration procedure.

STATE SECRETARIES

- N.S.W. John Smidmore G.P.O. Box 611, Sydney 2000.
- Victoria David Haskins, 68a Shady Grove, Forests Hills 3131.
- Qld. Chris. Tyquin, ll Gerald St., Ascot, 4007.
- W.A. Rob. Hermans, 115 Virgil Avenue, Mt. Yorkine. 6060.
- S.A. Les. Goldfinch, 355 Seaview Rd., Henley Beach. 5022.
- Tasmania Peter Cleary, 79 East Derwent Hwy., Lindisfarne. 7015.



BRIAN PEARCE, W.A.





1980 NATIONAL CHAMPION GREG. HILTON, W.A.

Nationals

Largs Bay is one of the most northern beaches of Adelaide, overlooking St. Vincents Gulf, which is well protected from the southern ocean by York Peninsular and Kangaroo Island.

The water is warm and clear but the strong south westerly sea breezes whip up a nasty sea and bring rifts of weed. The Invitation Race was scheduled for Monday afternoon, 29th December and was officially opened by Mr. Robin Millhouse M.P. in the presence of the Mayor of Port Adelaide.

INVITATION RACE. Most of the fleet took to the water after the formalities in a 20 -25 kt s.w. breeze and fairly heavy seas. The Race Committee decided against a start, and the race was postponed. Subsequently, by agreement of the competitors, it was decided to hold this race concurrently with Heat 3. Ironically, as the afternoon progressed the wind died out.

FIRST HEAT. Possibly 20 knots as the fleet left the beach, but it stabilised at about 15 knots with choppy seas. A starboard course, and most of the boats immediately tacked in and worked the shore line to good effect. Those who sailed further out lost a bit of ground.

First to the top mark was Gregory Hilton, about 40 seconds ahead of Cliff Burton and Bob O*Sullivan, then Peter Lamb, Keith Chidzey and John Hilton. The boats were moving very fast in the conditions and the front runners were handling the conditions very well. Greg had opened up a 90 second lead at the top mark for the last time, but had also put a large hole in the side of his boat near the cockpit. He managed to round the mark, then while reaching to the wing mark he knocked two more large holes in his transom with his shackle key, to let the water out. It seemed to work, but Cliff and Bob were slowly closing the gap. Half-way up the last leg to the finish, he got caught under the boom on a tack, just long enough for the boat to lose speed, and that was that. He was towed in. Cliff had a minor capsize and Bob snatched the lead and went on to win the Heat. Third was Peter Lamb (N.S.W.), sailing extremely well, then Andrew McDougall (again looking like being the fastest Victorian boat), John Hilton, Alan Tidy (W.A.) - the first Junior over

the line, then a dead heat for seventh place -Stuart Bell (W.A., Junior) and Keith Chidzey. Then Ian Ward (N.S.W.) and Mike Finn (W.A.) in ninth and tenth spots.

SECOND HEAT. Six to eight knots, but the startin team was having troubles with what appeared to variations in direction. Anyway, the first start was delayed by 40 minutes and as then followed by three general recalls. When they finally got away the wind was still about six to eight knots. Ian Ward got an excellent porthand start at the port end and crossed the fleet. He was first to the top mark, twenty seconds ahead of John Hilton, then Bob O'Sullivan (30s), Greg Hilton (70s). and Mike Finn. At the wing mark it was John, Bob and Ian and Greg, and the same order at the bottom, this group now opening up a gap from the body of the flett. But the wind was dying quite quickly and was now down to 2 or 3 kts. Back to the tope, and Ian was showing that he is, in fact, a very good all-weather skipper. He had regained the lead, and rounded ahead of the front group. Then Paul Jones (N.S.W.) and Peter Lamb (N.S.W.). On the run to the bottom traces of breeze started to show on the water, and on the last leg up to the finish it gradually set in, up to about 8 knots or so. This saw a close battle develop between Ian and Greg, with tacking duels as first one took the lead, then the other. John, meanwhile, was working the wind shifts, while ob had missed some of the best puffs. In a boat-to-boat finish it was Greg, John and Ian. Fourth was Bob Fussell (N.S.W.) who had been in the front body of the fleet throughout, Bob O'Sullivan and Peter Lamb (N.S.W.) in sixth spot. There are some very good all-round skippers in the N.S.W. team, and the performances so far are bearing this out. D. Krempin (N.S.W.) in seventh spot, was the first junior, then K. Trevillien (Vic.), P. Jones and M. Finn (W.A) The only retirement was Jamie McPhail (N.S.) junior, who holed both sides in a pack at the windward mark.

THIRD HEAT. The sea was fairly flat, the wind strength 8 to 10 knots, high tide (neap) at 4 p.m. and a 2.30 start. The line was well set, slightly favouring the port (shore) end, and the fleet was fairly evely split between the port and starboard ends. The course was set for starboard roundings, a little further out from shore than for the earlier heats. A few boats made early tacks out to

sea, but lost a lot of ground as a result, as it was still paying to work upwind along the shore. This also had its pitfalls, however, as the course had been set near to the minimum length, and the windward leg wasn't as long as expected. With the lift off the shore, about 20 skippers overshot the top mark, including Ken Trevillien and Andrew McDougall.

First to the top mark were five W.A. skippers -Greg Hilton, Mike Finn, Bob O'Sullivan, John Hilton and Chris Piper, but I couldn't pick the numbers in the group just behind them. The order was the same at the bottom, but on the work back to the top Bob had moved into second spot (15 secs.), John into third (27) and Mike had slipped to fourth (30). As the race progressed, Bob and John alternately held second place, and John Smidmore, Keith Chidzey and Ian Ward moved closer to challenge for placings.

As the final upwind leg started, the wind had increased to about 12 - 14 knots, and Greg had a 35 second lead over Bob, followed by John (65sec.), Ian (105sec.) and Mike Finn (120 sec.). During his last tack out from the shore almost exactly, Greg made the finish line in first place still holding the same margin over Bob, with John in third place and Ian Ward closing the gap and taking fourth place. Then came Mike Finn, John Smidmore, Brian Holman (W.A.), Chris Piper (W.A.) Stuart Bell (W.A.) the first junior, and Bob Fussell (N.S.W.).

FOURTH HEAT. The fleet put to sea in winds of about 15 - 18 kts, on Saturday afternoon. With the wind strength still increasing, the race was postponed until the next morning. The Sunday morning saw the opposite in conditions, and light shifty winds resulted in 45 minutes of postponements. Two general recalls later, the heat was postponed until the morning of Tuesday 6th January.

FIFTH HEAT. This heat started on time at 2.30 p.m., Saturday 4th January. In a breeze which looked like a steady 12 to 15 knots and gusting higher, but was in fact full of holes and dead spots, Andrew McDougall and Michael Dudley were first to the top mark, followed at short intervals by Bob O'Sullivan, Greg Hilton and Ken Trevillien. On the double reach to the bottom, there seemed to be a mysterious patch near the bottom mark where the wind played strange tricks. This had become evident at the start line, and strangely enough persisted through most of the race. As the boats progressively became becalmed and then received planing gusts, they

battled their way around the mark and started the second windward leg. Then further strange conditions, with a dead patch separating the port (shore) and starboard sides of the course. Those who managed to get to the port side were well placed to get to the top mark, and this group was led by Ken Trevillien, Keith Chidzey, Alan Tidy, Chris Piper and Stuart Bell. Those on the starboard side of the course came to the top mark about 20 places behind the leaders, and eight minutes back. This had set the pattern for the rest of the rac e. Keith Chidzey suffered a badly cut toe on a broken wing and was later taken to hospital for treatment, David Pacey holed his foredeck, and sundry minor damage occurred in the tricky winds. Ken Trevillien (Vic) sailed very consistently and took the first placing just under two minutes ahead of Peter Lamb (NS.W.). Then three W.A. boats -Cliff Burton, Mike Finn and Alan Tidy.

FOURTH HEAT (RE-RUN). Tuesday, 6th January, and a 9 a.m. start scheduled to get heat four under way. The 4 know breeze was moving around, and it was 9.55 before the gun went. Then two general recalls, a change from port to starboard rounding, another general recall and finally away in 8 to 10 knots at 11.05 a.m.

At the top, Greg Hilton rounded 40 seconds ahead of Mike Fill, then John Hilton (45 sec) Andrew McDougall (47 secs.) Jim French, Ian Ward, and Bob O'Sullivan. On the double reach to the bottom Mike Finn (with reshaped battens) had taken over to lead by 5 seconds from Greg, with John (15secs) Ian (2), Andrew (60), Jim (80) and Bob (90), the air near the bottom mark again showing signs of patchy holes. As the race progressed, these seven gradually moved away in their own battle. In an inspired tactical effort towards the end, Bob moved from seventh spot to take second place behind Greg at the finish. Then Ian Ward, Andrew McDougall, John Hilton, Mike Finn in sixth place, Jim French, Cliff Burton, John Smidmore and Chris Piper in tenth spot.

A long morning , with the skippers on the water for nearly five hours, but anot her heat still ahead of them - heat 6.

SIXTH HEAT. An announcement at 2.45 that Heat 6 would start at 3.15 p.m. caused a mad flurry of activity. This was one heat that started on time, with boats just making the line as the gun went. 10 to 15 knots, and Cliff Burton with a very good

NATIONAL TITLEHOLDERS.

Open.

Junior

1953-54	Mark II, B. Morris, Vic.
1954-55	Wonga II, M. Fletcher, Vic.
1955-56	Fram II, E. Quarford, N.S.W.
1956-57	Minstrel, L. Anderson, N.S.W.
1957-58	Fram II, E, Quarford, N.S.W.
1958-59	Nil Desperandum, J. Henderson, N.S.W.
1959-60	Fram III, E. Quarford, N.S.W.
1960-61	Giselle, A. Holt, N.S.W.
1961-62	Vamoose, R. Coxon, N.S.W.
1962-63	Vamoose, R. Coxon, N.S.W.
1963-64	Chaloupe, G. Marshal, N.S.W.
1964-65	Intrigue, R. LePlastrier, N.S.W.
1965-66	Tango, J. Hebden, N.S.W.
1966-67	Mystique, D. Bowen, N.S.W.
1967-68	Red Wings, B. Pearce, W.A.
1968-69	Imperium, D. McKay, N.S.W.
1969-70	Twora, P. Holmes, N.S.W.
1970-71	Imperium, D. McKay, N.S.W.
1971-72	Ocelot, R. Pitt, Queensland
1972-73	Cavalier, J. Stapley, N.S.W.
1973-74	Gidget, R. O'Sullivan, W.A.
1974-75	Snubby, P. Moor, N.S.W.
1975-76	Snubby, P. Moor, N.S.W.
1976-77	Red Ned, C. Burton, W.A.
1977-78	Gidget, R. O'Sullivan, W.A.
1978-79	Bunyip, G. Hilton, W.A.
1979-80	Red Ned, C. Burton, W.A.

1980-81

Gosling, M. Gale, N.S.W. Agile, H. Arthur, N.S.W. Agile II, H. Arthur, N.S.W. Agile II, H. Arthur, N.S.W. Hornet, G. Jarman, N.S.W. Cameo, G. Marshal, N.S.W. Cameo, G. Marshall, N.S.W. Vamoose, R. Coxon, N.S.W. Vamoose, R. Coxon, N.S.W. Vamoose, R. Coxon, N.S.W. Frolique, M. Bethwaite, N.S.W. Zero, J. Bowen, N.S.W. Whirlpool, P. Wulff, N.S.W. Fable, S. Kiely, N.S.W. Bounty, G. Chisholm, N.S.W. The Fox, P. Wulff, N.S.W. Baccalakis, G. Dearlove, W.A. Black Arrow, K. Stephens, W.A. Ocelot, R. Pitt, Queensland. Gerenuk, M. Pitt, Queensland. Winged Wand, D. Anderson, Victoria. Ichabod, M. Edwards, W.A. Saruman, Miss V. Dudley, N.S.W. Crumpet, D. Martin, N.S.W. Jabberwocky, P. Lamb, N.S.W. Pineapple Doughnut, J. Hilton, W.A. Manassa Mauler, G. Bourke, N.S.W. Pineapple Doughnut, J. Hilton, W.A. Illusion, A. Tidy, W.A.



startsizzled the top with Bob

O'Sullivan hard on his heels. Then Andrew McDougall and Ian Ward. (obviously two very consistent skippers who are always going to be in the front rank if competition), Mike Finn, Stuart Bell and Greg Hilton. Positions were unchanged on the double reach to the bottom, but Greg moved up to third at the top mark and Andrew dropped two places.

The wind was tricky, and at times was starting to drop out, and the big lead Cliff had established early was steadily being whittled away. Greg and Ian were hard on his heels, and as the race neared the end these three became involved in a first class tactical duel. Cliff held on to a narrow lead, Ian just crossed ahead of Greg, and Andrew, who had broken away and worked closer to the shore, came within a fraction of a second of taking third place. Fifth was Peter Lamb, another skipper who has shown that he is very consistent, John Hilton, who sailed a very good race to break through the fleet after being blanketted at the start, Stuart Bell (first Junior and a creditable performance), Mike Finn, Bob O'Sullivan and Reynold LeFevre.

SEVENTH HEAT. Allowing one discard, the points after 6 heats were :- G. Hilton 27.7, R. O'Sullivan 31.0, I. Ward 37.4, P. Lamb 40.4 J. Hilton 40.4, C. Burton 48.7,. A tricky breeze and the series would be wide open. The start was programmed for 10 a.m., but with a 12 to 15 knot Easterly blowing, a shift to a normal Sou'Westerly was expected to come in at any time. Eventually the heat started at 10.40 with 10 to 12 knots of Easterly. The group at the port end led by Ian Ward, had chosen well, and almost made the top mark in one tack. Those at the starboard end were steadily knocked down, and also had to work up against a reasonably strong tide. | Quite a few of these realised early what was happening cut their losses and worked back to the starboard side of the course. At the top, Ian Ward had a 35 second lead over Peter Lamb, then Jim French (80 secs.) Greg Hilton (120), Chris Piper (140), Gary Brennand (first Junior, 180), Mike Finn (190), Andrew McDougall (205) and Bob O'Sullivan (220). Greg's strategy would now be to hold or improve on his present placing. Ian had to finish first, but would need Greg to drop at least one place, Bob was in a bad spot.

On the double reach to the bottom, Ian got right away as the wind died out, and opened up his lead to 4 minutes 45 seconds. At this stage, the wind swung from an Easterly to a normal Sou'Westerly. and set in at about 8 to 12 knots. The issue had already been set however, and Ian went on to win by a margin of 7 minutes from Peter Lamb with Greg Hilton a further 5 seconds back and the title in his keeping. Then Chris Piper (9 minutes), Mike Dudley (10 mins.) J. French, A. McDougall, J. McPhail (first Junior) and Bob Fussell in tenth spot. A minor drama occurred just before the start of the race when Keith Chidzey broke his wings, and with his legs caught under the toe straps, he was thought to have suffered a broken leg. Rushed to hospital, it turned out that nothing was broken apart from his wings, and he was back on his feet in time to attend the Presentation Evening.

Congratulations to Gregory Hilton and Alan Tidy, Open and Junior Australian Champions for 1981. Gregory also won the Invitation Race, for the third year in succession. Ian Ward won the President's Trophy for least points lost, and W.A. won the State Team's trophy.

FINAL PLACINGS (60 competitors)

1.	BUNYIP
	G. Hilton (.W.A.), DNF, 1,1,1,16,3,3 -33.4
2.	GRUMBUSKIN
	Ian Ward (NSW) 9,3,4,3,20,2,1 - 37.4
3.	SCHAMELEON
	Peter Lamb (NSW) 3,6,16,5,2,5,2 - 48.4
4.	GIDGET
	R.O'Sullivan (W.A) 1,5,2,2,22,9,14 - 51.0
5.	PINEAPPLE DOUGHNUT
	J. Hilton W.A.) $5, 2, 3, 5, 21, 6, 6 = 52.1$
6.	RED NED
	Cliff Burton (W.A.)2,35,23,8,3,1,10 - 75.
7.	WILD WOMBAT
	A.McDougall (Vic) 4, Dsq, 15, 9, 4, 4, 6 , 10
8.	AMBER
•	M. Finn (W.A.) 10,10,5,6,4,8,12
9.	GOLDEN OLDIE
10	R. Fussell (NSW) 12,4,10,27,8,10,10
10.	TROLL. $(11) = $
	K. Trevillien $(1c)$ 14,8,30,1,10,14,20
	Tunioro
1	JULIOIS.
1.	h = 1323252 - 17.4
2	SECOND EDITION
	S Bell (WA) 24 1.6.2.1.6 - 25.7
Δ	
	DEVOLUTION

J. McPhail (NSW) 6, DNF.4,5,6,3,1 - 47.1 3. FRENCH CONNECTION Paul Jones (NSW) 3,2,6,1,9,2,3 - 29.1



DAVE PACEY (N.S.W.)





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Youthsail

As Australia becomes more aware of its responsibility to sportsmen, various assistance and training schemes are being instigated. The Australian Yachting Federation's National Youthsail is one of the more successful of this class in which juniors are selected to attend a sailing school with the aim of helping them towards realising their full potential.

This annual congregation of the young sailing talent of Australia took place between 14th and 22nd January at the Royal Geelong Yacht Club. This venue provided suitable conditions for choosing an under 20 Laser sailor and Laser 11 sailors to take part in the World Youth Championships in Portugal later this year. For the bulk of the one hundred and twenty participants the main purpose for their attendance was to improve techniques of boat handling tuning and regatta techniques with the help of the large crew of skilled coaches.

Selection, based on at least one major series, ensured a high initial standard from each class, these being Moths, Lasers, O.K.'s, 420's, 125's, cats and Laser 11's, and 470's. In addition to this, some States added intensive training in the form of camps, evening training and fitness programmes. It was disappointing to see only three females participating; however, with more family and social encouragement this may be rectified.

On arrival at the venue the State teams split up into various class groups for instruction by sailors experienced in overseas regattas, world and olympic titles such as Lex Bertrand, Warren Rockland and Huck Scott. The Moth group numbering only 8 was under the care of West Australian, Cliff Burton, 1979 Australian Moth Champion. Paul Jones, Rich Allen, Glen Hammond, Lesley Davis, Paul Stevens and Jamie McPhail represented New South Wales with West Australian nominations being Alan Tidy and Stuart Bell.

The first two days were reserved for Youthsail. The moths had little contact with other classes save rumours of Lex O.K.'s through hundreds of jibes, tacks and other disciplines. Moth training undertook a somewhat different approach as all were supposed to have acquired such skills. We made use of the pattern of windshifts which had been observed from the vantage point of a nearby hill. Afternoon activities consisted ob boat tuning, splitting into pairs and by team effort gradually changing sail shape, board position and traveller setting, etc., to suit the prevailing conditions. That night saw a resume of the day's efforts with general discussion and hints put forward. The completion of an assignment on first work strategy, taking local knowledge of tide and wind pattern into account, was also expected.

The second day of Youthsail followed a similar pattern the highlight of which was the evening session in those delightful craft, the Lasers, 1's and 11's.

January the 17th was the start of serious racing; the National Youth Championship. This involved two long olympic style courses per day which, to cater for all classes, lacked those exciting tight reaches Mothies revel in.

Even though all competition was within the class only Moths started with Lasers and O.K's causing a new starting technique to emerge. The Laser's ability to point Moths out of a race led to a tendency for leeward-end start. However, in the strong winds experienced most days, the Moths were generally far ahead on yardstick results.

The six races were sailed in a variety of winds from all points of the compass, varying from shifty land breezes to gently oscillating sea breezes. With strengths either 0 - 5 or 18 - 25 knots with only one day touching the medium range.

During the series Geelong experienced a front of great intensity causing a cancellation of the afternoon's race however, it provided a good talking point for Mark Bethwaite's lecture that night. This explanation of the afternoon's wind patterns as related to the shift from northerlies to frontal westerlies caused by the approaching maineloude and the following

especially interesting.

Mark Bethwaite also expounded on the virtues of practising on a very small course for the purpose of bettering boat handling, buoy rounding and accurate preparation for the next leg.

The final races proved very close for the Moths, the top few results being, Stuart Bell, Glen Hammond, Paul Jones and Alan Tidy with no more than 5 points separating all of them.

With the Youth Championships over the trials for the Youth Worlds, began. Those people who had performed well in their own class were selected to try their hand at Laser sailing. The Moths being Stuart Bell, Glen Hammond and Alan Tidy. The less excellent also raced, as 2nd division boats, in the 3 shorter races that afternoon.

With the coming of the final day and another front, most sailors quit the water environment to prepare for leaving to watch the final trials of Lasers and Laser 11's. Graham Ferris showed his managerial talent by securing Paul Jones a Laser. Jones took up the challenge and showed fine form by coming second in the afternoon races.

As was to be expected, out of the available talent the selectors chose proven winners; those being Victorian Laser sailor, Lynch and Bobby Wilmot and his crew for the Laser ll's. This decision must be endorsed by further series of fitness tests and enquiries. Although National Youthsail was a worthwhile experience for all involved the withdrawal of Government support plus escalating costs has thwarted this ambitious project. It is proposed that each State or Class hold their own Youthsail, pending the National Coaching Director, Alistair Mitchell's approval. The Moth class in collaboration with O.K's is hoping to hold a few days training at the same venue before next season's Nationals at Sorrento for all selected juniors.

This year's move to broaden the scope of classes from the previous all Laser Youth fleet enabled people to witness the working and suitability of other boats not normally within such close proximity. This may be beneficial to the Moth class as interest was high with the chance of additions to our numbers; including those disillusioned by their own class and perhaps the graduating Geelong Cadet Youths.

The week was an overall success, offering new oportunities, experience and a high standard of competition. A source of impetus for our further success as a sailing nation.

LESLEY DAVIS, N.S.W.



Preparations

It would probably be true to say that most centreboard skippers do not give enough thought to making adequate preparations in the months leading up to a major regatta. As a result it is quite common to see radical changes being made to boats and year during the first few heats, hear skippers asking what the tide or current effects will be, to find that skippers dont know their Sailing Instructions, and so, if a skipper intends to do well in a series, then as far as possible he must get all the prelimineries done before hand, and keep his mind clear for the task ahead.

First you know the venue, so make some attempt to find out a bit about the local conditions wind, waves, local effects, etc, including tides and currents. Its a good idea to go to a library (or the Harbour Trust) and heights of low and high tides over the full period of the series, including the preceeding week. Plot these values. Later on, you should check them before each race. At least six months ahead, decide on your accompdation arrangements, and make your booking. If you have railway or ferry travel to get to your destination, try to book twelve months in advance. Get as much done as early as possible, not only to ensure that you as early as possible, not only to ensure that you are not left stranded, but to give you more time to do other things when time is short later on. In making your arrangements, its really worth If you have done all these things you are probwhild planning to get there at least a week before the first race. This will give you a margin of safety to cover breakdowns or other travel emergencies. It will also give you time to settle down after the journey, time to get some sightseeing done and out of your mind, and time to assemble your boat, check your gear and get a bit of sailing done before the first race.

The boat you will be sailing should be well tuned and going well before you leave. If you have been sailing it for two or three months before the Its a long trail, preparing for a major champmajor series, you should have been concentrating on tuning it up ready for that series. You should not have to try to get used to a new sail, for instance one or two races before you leave. If you do, you may not have time to get your battens shaped properly, or to find the range of winds where the sail performs best. You shouldn't have to start experimenting with stay heights or a new mast or centreboard. These things should be done well before the regatta.

Next, in the weeks before you leave, check over all your gear, and keep a list of things to be done. If your forestay rope, sail headrope or mainsheet tend to wear out quickly not only replace them before you leave, but take a spare with you. Check you stays carefully for any fractured wires. If you find one, then replace the three stays. If you are going to travel, say 1,000 kilometres or more to the regatta it is pointless gambling on your stays being sound when the indications are that they may not be. Check them if necessary. Take spare with you. Check your sail - stitching, telltales cords etc. Check your sailing gear. Check everything. Then make sure that you can cope with any emergency. Arrange to have with you plywood, nuts and bolts, etc. and a range of tools. If you have damage during a heat, you must be on the water for the next heat.

And now, when you get your sailing instructions read them. Not just before the race, but the same day you receive them. Find a quiet corner, and go right through the Instructions. If you have any doubts or queries, try to get them sorted out with the Race Committee well in advance and dont always leave them to the briefing. You may have a point that requires quite a bit of consideration.

ably pretty well prepared - but there's still one more step. When you are getting into your sailing gear before the first race, make sure that you take with you some basic emergency items which may make the difference between a retirement and a placing - some spare cord around your waist, at least one spare shackle, a shackle key, and any other items you may have found useful in the past to cope with emergency situations.

ionship series, and there are no short cuts.

GREG. HILTON



1980 WORLD CHAMPION

DAVID ISZATT



Worlds

During the days leading up to the World Titles the New Zealand Nationals were being held on a similar course. Many of the Europeans and Australians arrived early and were greeted by the Kiwis, who had been prevented from sailing their first heat of the series because of 30 kt. winds. During the days that followed, the wind ranged from 0 - 15 kts and on one day they were on the water for 11½ hours due to light winds while trying to sail 2 heats. It then rained for some time but fined up on measurement day for the Worlds.

After many anxious moments for those skippers whose sails were oversize or whose bouyancy vest failed the "self-righting" test (one vest was rumoured to have sunk under its own weight!), we prepared our selves for the Invitation Race which was held in conjunction with the Auckland Anniversary Day Regatta.

INVITATION RACE. The course was a local Club course consisting of three triangles bound by a reef marker, a lighthouse and a small club buoy. Owing to the lack of a satisfactoy briefing, half the fleet started 5 minutes early. The correct starters picked up more breeze and soon caught those ahead, many of whom only discovered their error after the race.

The wind was 5-15 kts with unusually choppy water because of the nine hundred other craft racing in the same Regatta. The leading group of English skiffs from the first start went around the wrong reef marker on the second lap and had to retire, while the leading skiff in what is now known as division B, filled up with water and pulled out within fifty metres of the finish.

The race officials must have had a terrible time sorting out this fiasco, but the final placings were:-

I. Ward (N.S.W.) lst, C.Burton (W.A.) 2nd, G. Hammond (NS.W.) 3rd.

This race provided no real clues as to who was fastest or even which side of the course would be favoured, and so we awaited the first heat, keen to test ourselves against the "skiffs".

HEAT 1. Wind S.W. 5 -10 kts, variable with flat water and a starboard course. The starboard end of the line was favoured, and David and John Iszatt pulled away early in the race while Greg Hilton and Ian Ward worked the starboard side of the course to be 4th and 6th at the first mark. The scows seemed surprisingly competitive in the flat water and held their own for much of the race. After the first beat, it paid to go inshore on all other beats. The wind was indeed variable with lots of holes and both Ian and Greg were passed by skiffs on a windshift on the last beat to finish 7th and 10th respectively. David Iszatt won this heat comfortably from Jim Prower (K), John Iszatt(k), Peter Muller (Z), and Glen Hammond (KA).

<u>HEAT 2</u>. Wind 0 - 6 kts. with flat water and a port hand course.

The fleet got away to an even start and the skiffs soon made mincemeat of the fleet. Although the New Zealand skiffs performed at their best in these conditions, they were no match for the much finer Magnums from Europe and were even beaten by the top scows. At the first mark the English and Swiss skiffs dominated, with Greg Hilton leading the scows in 8th spot. On the reaches to the bottom mark the scow sailors were surprised to be almost keeping up with the skiffs. By leaning the boat over, the scow's wetted surface is similar to a skiff's.

The wind was extremely variable with lots of holes. Greg took a short starboard tack after rounding the bottom mark only to sit in a big hole for 2 - 3 minutes whilst the boats behind detoured around it. On the subsequent beats, windshifts played a major part in determining placings and on the whole the scows kept pace with the skiffs, especially when it was very light. Once the wind strengthened, however, the skiff sailors got out on their wings and moved away. Dave Iszatt (K) flew away to another convincing win, followed by John Iszatt (K) and Simon Allen (K). Ian Ward (KA) was able to edge out Jorg Heinzer(Z) and Jim Prower (K) for fourth spot while Greg Hilton (KA) only just beat a fast finishing Glen Hammond who had picked up a good shift to the port side of the course.

An interesting point is that when the wind was very light (about 2 - 3 kts) and the water very flat the scows were able to keep pointing higher and going slightly faster than the skiffs. Probably because the skiffs then use the sail to aid their balance.

HEAT 3. Wind 5 - 10 kts with choppy water and a port course with a strong tide.

After the first general recall of the series we got off to an even start. The skiffs took off to the port side of the course while a concentrated bunch of scows worked the middle and starboard side. Although the skiffs appeared to have better speed in these conditions, the scows led by Ian Ward Greg Hilton, Cliff Burton and John de Vries were only 30 seconds behind the leading skiffs at the top mark. On the second beat Ian and Greg sailed out of the tide on the starboard side again, only losing another 30 seconds. Glen Hammond, Peter Muller (Z) also sailed this side and gained considerably on the leaders. After the square run, the leaders sailed straight into a hole and watched as the wind swung up to 90° to port, giving a huge advantage to the boats behind. Although the leaders seemed to be in a hopeless position at this stage, the wind eventually returned to its original heading, allowing the front runners to round the mark 1 minute ahead. The finish line was laid 500 metres to port because of the wind change. David Iszatt won his third beat with Andreas Wickart (Z) second. Glen Hammond (KA) third and John Iszatt close behind. Greg Hilton held off Ian Ward by two boat lengths and nudged Jim Prower and Peter Muller into 7th and 8th spots.

With three light weather races, we needed some wind in the next heats to break the skiff dominance.

HEAT 4. Wind 6 - 12 kts gusting to 15, very choppy water, port hand course.

After the first start, the wind dies and came in from starboard around Rangitoto Is., turning the first leg into a reach. This race was abandoned and the course re-laid. After the second start the skiffs were up front once again. Ian Ward was second at the top mark and passed Jim Prower on the two reaches. Greg was about 9th at the top, and planed past a couple of boats on the reaches.

On the next tack up, the water was so choppy that we were only sailing at displacement speed. The wind did freshen to about 15 kts for a short while and Greg just managed to get planing and pass Peter Muller. The third beat was very choppy again and very hard to get through. Jim Prower had a comfortable lead over David Iszatt now, and was going well in the chop. Fortunately, the wind stayed in on the final beat and Greg held on to 4th place, about 5 boat lengths behind Ian Ward. Peter Muller just edged Glen Hammond out of 5th place on the line.

In conclusion, when the wind was strong enough to plane, we could pass the skiffs fairly easily; when we were displacement sailing, but under full power and leaning hard, we were almost as fast; when we were sitting inboard, we were hopelessly slow because of the chop. Downwind, we were as fast because of surfing conditions.

HEAT 5. Wind 15kts, gusting to 20; very choppy water; starboard course.

Ian Ward led at the top mark, with Rob O'Sullivan and Cliff Burton close behind. The wind lightened off to about l2kts in the middle of the race making sailing very difficult in the chop. Greg managed to move up to third at the top mark the second time, just behind Ian and Cliff. On the run, Ian pulled away slightly, and, further increased his lead on the next tack while Greg stayed about the same distance behind Cliff. The positions remained the same on the reaches. On the final tack up, Cliff went left and Greg went right. Ian covered Cliff and Greg managed to move into the lead. After a close tacking duel near the finish, Ian emerged the winner by a boat length, with Greg second and Cliff third. Rob was not far back in fourth place, then came Phil Edmiston and Mike Pitt. The English boats were 7th, 8th and 9th. They were going reasonably well because of the chop.

HEAT 6. Wind 10 -12 kts, dropping to 5 kts; fairly flat water; port course.

After an even start, the fleet spread out with some going out to sea and some going inshore. The windshifts were very large. Greg rounded about 10th, with English and Swiss skiffs in front as ususal. Ian Ward came down very fast on the first reach and moved up to the leaders. On the next beat the leaders were sailing in completely different wind shifts from the boats behind them. The wind was very hard to to pick, and it often paid to keep sailing on one





JIM PROWER (U.K.) GLEN HAMMOND (AUST.)





1980 WORLD TITLES

Blue Peter



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one tack rather than tack on the windshifts. It was hard to keep the boat moving in these conditions. We were getting on and off the wings continually. The positions remained the same until the final beat. Coming up to the line the wind swung onto a reach and Greg caught up to the two Swiss who had passed him in the light conditions, but could not get passed them. Ian Ward sailed well to finish a creditable 4th.

David Iszatt, lst. John Iszatt, 2nd. Peter Muller, 3rd. Ian Ward, 4th Simon Allen, 4th. Glen Hammond, 5th.

HEAT 7. Wind 20 kts, gusting to 25 kts; fairly flat water; port course.

This was the best breeze of the series, but it was too late for us. Cliff led at the first mark, with Kevin Whitehead (NZ) second and Greg third. While Cliff and Greg grannied at the gybe mark, Kevin and Ian gybed and made it - just! Next time up, Cliff went inshore and gained considerably. Ian and Greg tacked on the windshifts up the middle of the course, but this did not pay off. Kevin Whitehead put a hole in his boat and had to retire. This was very unfortunate as he was going extremely well. Cliff was about 2 minutes ahead at the top mark, Greg was 2nd followed by Phil Edmiston and Ian Ward. On the final leg, Greg gained on Cliff as they both tacked on the shifts up the middle of the course, to be about 30 seconds behind at the finish, with Ian further back in 3rd place, Mike Pitt4th and Phil and Rob in almost a dead heat for 5th and 6th respectively. David Iszatt finished a creditable 8th, with a good display of boat handling.

David Iszatt proved he is still the best skiff sailor in the world, sailing well in all conditions. Ian Ward sailed very well and had good boatspeed in all conditions, particularly the light winds, while Greg had better speed in slightly fresher conditions. If we had had a bit more wind earlier on, the scows could have beenright up there on points, but that is the way it goes in the Moth class racing.



WORLD CHAMPIONSHIP RESULTS.

Place	Skipper	Country	Points	Design.
1	David Iszatt	U.K.	17	Magnum III - skiff.
1.	Ian Ward	Australia.	39.1	Effanineffable - scow
2.	Crog Hilton	Australia	53	Bunyip - scow
3.		U.K.	53.7	Magnum III - skiff
4.	Jim Prower		67 7	Magnum III - skiff
5.	John Iszatt	U.K.	07.7	
6.	Simon Allen	U.K.	69.4	Phobia - skiff
7.	Glen Hammond	Australia	71.1	Magnum IV - skiff
8.	Peter Muller	Switzerland	71.7	Magnum III - skiff
9.	Cliff Burton	Australia	90.7	Red Ned - scow
10.	Andreas Wickart	Switzerland	91	Magnum III - skiff
11.	Phil Edmiston	Australia	93	Red Ned - scow
12	Rob O'Sullivan	Australia	107.7	Gidget - scow.



Design Trends

A summary of the latest design trends throughout the International Moth Class.

The World Titles in a development class are much more than simply close tactical racing between some of the best skippers in the World. They are a forum for ideas and developments which ultimately lead to faster boats. Not being restricted by rating rules, any improvement made within the Moth Class is a fundamental advancement and, as such, should be of great interest to anyone wishing to improve the performance of any sailing craft.

Although sailing techniques and tactics are developing continuously, it is the purpose of this article to concentrate upon the latest trends in rig and hull design as compared at the latest World Championships held in Auckland. I will attempt to point out the differences and similarities of design while providing reasons for their relative performance.

HULLS

Scows - The Australian Scow designs look remarkably similar, and yet incredibly small changes in overall spring from bow to stern alters the performance of these craft dramatically. The first three scows were quite different; Ian Ward had the most overall spring on the centreline and proportionally more along the chine line. His results in the light, sloppy conditions were outstanding. Greg Hilton's boat was slightly flatter but with the same emphasis on increased chine spring which gave him excellent all round performance. Cliff Burton's 'Red Ned" design is flatter and wider than Hiltons proving to be slower in the light winds, although, as would be expected, had superior speed in strong winds and flat water.

The weight of the hull is a contentious issue, but it was quite apparent that in winds below 10 - 12 kts, Ian Ward had a definite speed advantage, especially in marginal planing conditions. Above 12 kts hull weight does not seem critical. His effective hull weight advantage was only 10 lbs over that of Hilton, but probably more over Burton. <u>Skiffs</u> - Although there were many interesting skiff developments from New Zealand the fastest skiffs by far were from Europe, being Magnum 3 and Phobia designs. These boats are in general narrow and unstable. Their poor distribution of displacement makes them relatively poor light weather performers (compared to other skiffs) unless the skipper can bury the bow both upwind and downwind in light conditions.

In stronger winds they are extremely fast but suffer from instability, nose diving and lack the necessary stability to carry nearly as much power as scows.

The Phobia is a more easily built version of the Magnum 3 and is slightly more stable. The performance of Simon Allen in a Phobia suggested that there is very little difference in speed between these designs although lack of "flares" forward on the Phobia leads to nose diving problems in a breeze.

The success of a hybrid wide skiff depends uponits beating the scows in light breezes and the narrow skiffs in heavier winds. In this series they were not able to achieve either objective and so remain to be proven. The only skiffs of this type to perform successfully were those of Ian Brown sailed in Napier (1973) and Sweden (1974).

RIGS

Scow rigs have generally standarized to a simple single stayed system, with no restricting devices such as spreaders, lowers, prodders mast gates or even over-rotating masts. Two completely different concepts are being used by the top scow sailors. Ward uses a fuller sail with low hounds relying upon vang tension to keep the leech tight. In light winds and choppy conditions the fuller sail carries more power, while in the heavier winds the flat sail and high hounds allows higher pointing ability.

Probably the most important aspect of consistent speed in all conditions is the ability to reproduce the fastest settings for any wind conditions. The best development to aid this in recent years has been the Hilton type centreboard system which allows for accurate adjustment to any angle

and height without fiddling with strings.

Skiff Moths require much less power to push them through the water and because they are unstable and easily overpowered have very flexible rigs. They use light weight Needlespar masts with high hounds and a prodder system to hold them straight. Although some of the latest U.K. skiffs are using heavier Proctor sections with spreaders, no significant advantage has been proved yet.

It could be most interesting to sail a skiff with a scow type rig.

BOARDS.

A variety of centreboards were used with no particular shape being preferred. A smooth surface and clean trailing edge were the most sought after goals, although some of the fastest boats had poor blades.

CONTROLS.

All boats had at least the basic three controls on the sail. Luff tension, Vang, outhaul. Leechlines do not seem to be in fashion at present. These controls were set up similarly on all boats, only differing in minor details.

Vangs of 18 and 15:1 were common, 4 :1 and up to 8:1 on the luff tension and 4:1 on the outhaul were universal.

CONSTRUCTION.

Many forms of construction were used including, plywood, klegecell foam and fibreglass, foam and Kevlar, ply and carbon fibre. Skiffs have an obvious advantage in using less material and are generally lighter than scows, but it appears that at present thin plywood is by far the strongest and lightest form of construction.

Further information on construction trends is given elsewhere in this magazine.

CONCLUSIONS.

The narrow skiffs have a wetted surface advantage in light weather and less wavemaking resistance in choppy conditions.

Scows have greater stability and therefore better sail carrying capacity in stronger winds.

interestingly the scow has a definite advantage in 2 to 3 knots where they could be kept moving faster and pointing higher than the skiffs. This was due to the skiffs instability which required them to use the sail for balance instead of speed. Only David Iszatt, the most successful skipper in these light airs was able to maintain perfect balance while sitting well forward, to use the sail to best effect. The scows were able to heel their boats, reducing surface area while maintaining balance easily under these conditions.

In comparing the skiffs and scows over a variety of conditions, we find that their performance is remarkably similar. This is simply because they have the same displacement / length ratio which is the fundamental restriction on the speed of all sailing craft.

SAILBOARDS _.

Windsurfer type months were a strong topic of discussion. It was voted at the World Annual General Meeting that they should be banned from the International Moth Class, although such a move must still be ratified by the I.Y.R.U. The windsurfer concept would open up a totally new area of development. However, clarification of the definition of a "trapeze" and similar terms must be made before any progress can be made.

IAN WARD



World Scene

The Moth Class began around 1936 and originally had restrictions of 11' length, 85 sq.ft. sail area and unrestricted beam. They were raced throughout Europe and in the United States. A totally separate development occured in Australia during this same period when Len Morris designed the first Australian Moth, with restrictions of 11' length, unlimited beam and 75 sq. ft. sail area. Although competing under similar rules the two classes developed independently, as skiffs in Europe and predominantly as scows in Australia, due to the different weather conditions.

In 1968 these classes merged to form a new class which was granted International status by the I.Y.R.U. Under the new rules the sail area was increased to 8 sq. metres (86 sq. ft.) and the Australian Moth had to drop the "tight tape" rule which then allowed "wings" to develop on the scows. The nature of the class changed markedly during this transition period as did the world wide distribution of Moths, which increased in some areas and faded in others.

Having survived a buffeting from the mass production boats, our class can only expand in size and distribution from now on.

A breakdown is given here of the world International Moth distribution and a precis given of their top skippers.

United Kingdom. (K) - 170 boats.

At present boats 1, 4, 5 and 6 in the World titles.

The Iszatts - David holds 2 World, 3 National and 1 European Championships. His three brothers - Michael, John and Peter all have very impressive records in the Moth class. David is current World and U.K. Champion.

John Claridge - Twice National and European Champion. Professional Moth builder and responsible for the development of the light wedge skiff.

<u>Richard Hargreaves</u> - Has never won a major title but has produced dazzling performances on several occasions. Responsible almost single handed for the Switzerland (Z) - 102 boats.

Peter Muller - Currently 6th in the World and currently top Swiss, however, Claudius Buhler (G) is the present Swiss champion.

Andreas Wickart - Ex Swiss champion in his own design, has also held German and Czechoslovakian National Titles.

The Swiss hold a Ski-Yachting event in April of each year which counts 1/3 points for skiing and 2/3 for sailing.

Holland (H) - 20 boats.

Casper van De Graff - Wandering minstral of the Moth class in Europe, paid for 1980 Europeans by busking in Geneva.

Hilderbrand von Hamburg - National President and dedicated scow sailor.

Jim Prower (U.K.) is current National champion.

Germany (G) - 200 boats.

Claudius Buhler - Junior World Champion in 1977 and third overall.

Probably the fastest growing and most active Association in Europe.

Sweden (S) - 5-10 boats.

All loonies, with great light air ability.

France (F) - Unfortunately the Moth has died in France since the Government pledged support only for nominated Olympic training classes.

Czechoslovakie (CZ) - Unknown.

The Czechs were last seen in 1977 in England. Their fleet was affected by Russian influences in 1968.

Russia (SR) - Renowned to have some 1,000 older style Moths.

Canada (C) - Another rumour of 5 boats

U.S.A. (US) - Although active until 1976 they have since declined and were last seen in the form of three mad men at Hayling Island in 1977.

New Zealand (KZ) - 200 boats.

Kevin Whitehead - Current National Champion, sailing a scow he showed good spped in a breeze at the Auckland Worlds. Although scows are predominant, various skiff designs are sailed.

Japan (J) - 200 boats.

The Japanese have just rejoined the Association and mostly sail their own scow designs.

Thailand (TH) - Raced actively until at least 1965. Status unknown at present.

Australia (KA) - 500 boats.

Probably the strongest Moth sailing country in the world. Although scows been developed for the conditions, skiffs have had some success. A precis of the top Australian skippers is given below.

GREGORY HILTON

Gregory Hilton started sailing in Pelicans in 1969/70, and in his first three years won two club and one State title. Then three years in Cherubs (two club, three state Cadet and one Australian Cadet titles) and then into Moths, where in five seasons he has won a state junior and two state open titles, two Australian titles , and several club and other titles. Always highly competitive he maintains his concentration and single mindedness right to the finish, which is essential in top-class sailing. He is meticulous in the care of his boat and gear, and maintains all equipment in first class condition - another ingredient essential in top competition.

Over recent years particularly he has developed a very good knowledged of sail shapes and sail design, which is quite important when striving for that last bit of performance. Greg is very innovative, and is always looking for ways to improve his gear. The Bunyip hull, which he developed with his brother John, has proved to be a good all-weather design, and has remained unchanged for four years.

As with most of the top Moth skippers he is always ready to help others to improve their performance, and as an AYF Instructor spends Sunday mornings assisting in training in various classes at South Perth Yacht Club. Recently graduated in Dentistry and with the heavy commitment of 6 years of study behind him, Greg is now looking forward to taking up sailing in 14 foot dinghies as well as continuing in Moths.



GREG HILTON (W.A.) 1ST NATIONALS

IAN WARD - Ian acquired his first moth, a "mouldie" when 12 years old, but sailed it only occasionally and did not race at all until his second boat, a glass hull with timber deck, replaced the "mouldie". After many alterations to the rig of No. 2 and some consistent racing, Ian built the first of a series of 6 boats, all to his own designs, and won a place in the 1973 State team to represent at the Perth Nationals in the first of these boats.

Succeeding boats have performed progressively better and he won Club Championships at home clubs of Balmoral and Seaforth and has held the N.S.W. State Championship twice. His National placings have been consistently high and his world ranking was 5th in Brisbane and 2nd in New Zealand. Apart from sailing, Ian lectures at sail training courses, is Editor of Wings and the National Moth Magazine and is concluding post graduate studies in Metallurgy.



IAN WARD (N.S.W.) 2ND NATIONALS



PETER LAMB - Peter began sailing as crew in the Enterprise Class and has been a past State Enterprise Champion. At 13 and only 6½ stone he started sailing Moths at Narrabeen Lakes. Since then he has built and designed four Moths, the first of which gained him the title of Australian Junior Champion in 1976. The following year he participated and came fourth in the first National Youthsail.

Peter is completing the final year of Mechanical Engineering at Sydney University and is also an active member of the Moth Association.

ROB O'SULLIVAN

Bob began his sailing career, in Moths, in his early teens. He has seen many changes in the class since that time, the most significant being the introduction of wings, the change from moulded to hard-chine construction and the trend towards minimum rocker or spring.

Bob's achievements make impressive reading -6 club championships, 6 champion of champions events 4 state championships, 2 Australian and 2 world titles. He has also played a prominent role in Teams Races, three of a kind races outport regattas and so on. A true all-weath er sailor, he regularly wins races in all conceivable conditions of wind and waves.

Apart from the first two boats which were built by his father, Bob has designed, built and rigged all his own craft, plus a number of hulls for other skippers - something over 25 hulls in all. His Gidget designs are acknowledged as providing a good all-round boat.

Throughout his sailing career Bob has been a strong worker for his class, and with his Maylands clubmate Cliff Burton, has been a source of encouragement and example to both Junior and Senior skippers alike. Bob is happily married, and his wife Jean and daughter Tammy are his keenest supporters.





ROB O"SULLIVAN (W.A.), 4TH NATIONALS

CLIFF BURTON- Cliff, an electrical fitter, took up sailing in the 1967/68 season when he acquired a second hand mouldie weighting about 110 lbs, and joined the Maylands Yacht Club. A season later he built his first boat "Adios" a triple-chined hollow-bottomed scow, and sailed in the "B" fleet. Since then he has built a new boat each season, and the high standard of his "Red Ned" hulls is legendary. He soon got his handicap down to scratch in the "A" fleet and has won several Club Championships.

An active supporter of his Club, Cliff has helped Maylands to many wins in the annual Teams Race since 1971, and has played a big part in the encouraging of juniors and making Maylands a very strong Moth club.

On the National scene he has represented his State nine times, and has won the Australian Open Championship twice. In the four World Series he has contested, he has always been up amongst the top skippers. Cliff has always been a hard worker for his Association particularly as President of the Western Australian branch.

Now looking for challenges in new fields, Cliff has recently completed building a 14 ft. dinghy. If he applies the same dedication to this class as he has to the Moths, there is no doubt that he will be a JOHN HILTON - John joined the Pelican Class training sessions at South of Perth Yacht Club in the 1971/72 season as a forward hand to his brother Gregory. He was an instant success, and shared a State Title with Greg in his first year on the water. Two years later he skippered the Pelican "Bunyip" to his first Club title, and over the same period also crewed as forward hand on Flying Ants. In 1974/75 he sailed his first Moth and at under 44kg (7 stone), he had to learn to survive in all sorts of conditions. He rarely capsized, however, even in gusts that bent his mast or bowled over other skippers.

Since joining the Moth ranks, John has won four State Junior titles and two Australian Junior titles, and has always been very competitive in open competition - he recently finished fifth overall in the Australian Championships in South Australia, in his first year as a senior. His boat "Pineapple Doughnut" is a "Bunyip" design, which he jointly developed with Greg. He is a sailing addict, with a broad knowledge of many classes of boat.

John is an A.Y.F. Instructor at South of Perth Yacht Club, and spends Sunday mornings instructing and assisting in training skippers and crews in various Classes. He is a third

year Medical student.



JOHN HILTON (W.A.) 5TH NATIONALS

STUART BELL - Stuart represented Western Australia at the National Moth Titles at Largs Bay in 1980/81 and was runner-up in the Junior Title. Stuart was the winner of the Moth class at the National Youth Sail at Geelong in January 1981.

Stuart is a member of Princess Royal (Albany) and Mayland Yacht Clubs. This photo was taken since Stuart's return to W.A. from Largs Bay and Deelong where he was sporting a luxuriant beard.

STUART BELL (W.A.) 2ND JNR. NATIONALS



ALAN TIDY (W.A.) 1ST JUNIOR NATIONALS ALAN TIDY - Alan represented W.A. at the National Moth T itles in Perth in 1979/80, and Largs Bay, 1980/1981. He was winner of the Australian Junior title in 1980/1981.

Alan is a member of East Fremantle and Maylands Yacht Clubs. He is current Moth champion at East Fremantle. He commenced sailing in Flying Ants and graduated to Moths.

At the presentation night in Adelaide Alan was obliged to take a late night swim , having been'assisted' to the water by 'friends'. This was followed by a streak to recover his clothes which friends had thought fully.

World A.G.M.

OFFICE BEARERS :-

- President Andrew McLachlan Blues Point Rd., Milsons Point, Australia.
- Secretary Jim Prower, 21/3-5 St. Neot St., Potts Point, Sydney. Australia.
- Vote of thanks to Alf Claridge for his work as President for 1979-80 season.
- I.Y.R.U. Centreboard Committee felt that I.M.C.A. was not running in the manner expected of an International Class
- The Japanese Association now have a proper constitution and are now eligible as a member of the World Association - Accepted.

- 4) Voted to ban Windsurfer type Moth development. Discussion suggested that this may be impossible to police, however, the motion was won on a directed National vote basis It appears that a more concise definition of a"trapeze" could solve this problem.
- 5) The 1981 World Championships to be held in Holland at W.S.F. Flevo, Hardewijk, from 11th to 18th July, 1981.

Possible future locations are:-

1982	Sydney		
1983	U.K.		
1984	Japan		
1985	Switzerland		
1986	New Zealand.		

6) A vote of thanks was passed on to Leyland Unipart (N.Z.) via Mr. Peter Masters for their part as major sponsor for the 1980 World Championships.



Reaching

Much has been written on the techniques of upwind sailing and a considerable amount of variation exists in opinion as to the fastest way to the windward mark. However, there are large amounts of ground to be gained or lost on the 4 reaches of our typical championship course, especially in some particular conditions. Perhaps the following notes will stimulate some thought on the subject and maybe answer that nagging question: Why am I being passed?

SETTING UP THE RIG FOR REACHING: Ideally, the sail would be curved uniformly from head to foot with the point of maximum curve just forward of the middle of the sail, there would be no twist in the sail from head to foot, and the mast would be straight or even curved to windward at the top in the plane of the boom. None of these 3 conditions can be achieved perfectly with a Moth rig, our job is to adjust our "compromise" rig to be as close to this as possible. The curvature in the sail is controlled partly by outhaul position and partly by vang and downhaul pressure. Your telltale tufts will tell you how full to make your sail. When your forward tufts are streaming both sides, the leech tufts should be just on the point on the point of not streaming - if they stream easily the sail is too flat so "let the foot in" and ease the downhaul off (ignoring wrinkles).

Ease the traveller out so that the mainsheet is pulling mainly downwards to keep the sail untwisted and use the vang to assist so that if the boat is luffed slightly the telltales, all the way up the sai, agitate together.

We do not have much control over mast bend sideways except to reposition the sidestays higher up the mast - a bit difficult on the water!

As the windstrength varies you will have to change the curve in the sail - in light conditions the wind won't flow around a deep curve, so your tufts will tell you to flatten the sail (if they are working at all!), and as you reach the windstrength where the boat is overpowered you will again flatten the sail for less drag. In between quite deep curves are possible.

Getting the correct amount of centreboard in

you go the less you need. You have too much up if the boat feels mushy and develops lee helm. The board should be raked - especially as the wind increases until the boat has no weather helm. If you leave too much down you will have to ease sheet to stay upright because of the extra leverage the board has on your body.

Your body position in planing conditions should be well aft on the wing to set the hull on its (hopefully) flat after sections. The fastest reaching hulls are straight along the keel from the centreboard to the transom.

TECHNIQUE:

a) Flat water and steady wind - This is an ideal condition and rarely occurs, but when it does the experts find it difficult to pass some quite inexperienced sailors. The technique is simple - sheet in the sail until the leeward tufts almost agitate and sail the boat on the correct angle of heel for the windstrength (heeled in light weather, flat in planing conditions) and sail a straight line to the next mark with minimum tiller movement. If the windstrength is increasing it will pay to sail higher at first for more speed, and, conversely if dropping you should sail lower at first to allow you to shy up in the lighter air later on. The same principle applies if there is a known change of wind direction along the reach. Plan your course so that you are always on the best angle to the breeze.

<u>b</u>) Gust wind - This is the more usual state of affairs, and offers great potential gains if you exploit the gustsand lulls. Most people are aware of the "up in the lulls, down in the gusts" rule, but there are subtle variations to this which are important. Remembering that the faster you go, the more the apparent wind swings forward is the key to the whole exercise.

As an approaching gust hits, rapidly move your weight outboard slightly more than needed to balance the boat and sheet in a little. This will give you an initial acceleration just by itself and the gust you continue to sheet in and start bearing off. As you bear off carefully watch your tufts and keep the sail on the point of stalling. As the gust starts to die start pointing back up and be careful not to let the sail stall here. Through the lull, point up even more so that you get to the next gust quicker. Who said downwind sailing was easy?

c) Waves - These add an extra complication as well as the ever present nosedive problem. Basically the idea is to keep sailing downhill all the time. You must now try to coordinate your weaving due to gusts with the best path through the waves. If you can "wind up" your apparent wind by accelerating down the face of a wave in a gust you will be amazed how far you will have to pull in the sail and you can now continue on your own "generated" apparent wind well into the following lull. There are many ways of exploiting waves to the full, depending on their size, shape and angle to your course, but that's another story!

KEN TREVILLIEN



Vorwind spegialisierter Mothsegler.

Tuning

Boat Tuning basically boils down to mast/sail inter-relationships. This involves a discussion of mast rake, stay height, mast bend, boom height and batten shape. Boom vang and centre board will also be discussed.

MAST RAKE - Set the boat up horizontally and then look at the mast side - close and from a distance away. It should appear to have just a slight amount of aft rake. If there is too little rake - i.e., vertical or forward - the boat does not accelerate properly in gusts, but instead tends to bury the bow. Too much rake and there will be excessive weather helm which must -be compensated for by raking the centreboard more, whicg in turn reduces pointing ability.

STAY HEIGHT - A good starting point is 12'

The height of the stays is governed by the sail shape. A sail with a loose roach and loose leech will need higher shrouds to maintain power in the sail. A sail with a smaller roach and a tighter leech will need lower shrouds to enable the mast to bend sideways and release power. If the shrouds are too high, the boat will not accelerate in the gusts but will lean over and have a "boggeddown" feeling. If they are too low, there will be a noticeable lack of power, particularly in light to moderate weather, and possibly a decrease in pointing ability. In general the forestay should be about a foot below the shrouds. Too low, and the mast will have too much fore and aft bend, pushing the drive too far aft. Too high, and the mast seems to lack responsiveness in gusts.

MAST BEND - The amount of mast bend should closely match the amount of luff curve of the sail. The best way is to select a mast and have a sail cut to match it. A good guide is to look at the sail when sailing in a strong wind. When hard on the wind, with the downhaul and vang pulled on, the sail should first start to exhibit diagonal lines from the luff towards the clew. This indicates that the mast bend is just exceeding the luff curve of the sail, and is the ideal situation. If these lines do no appear, the sail is probably too full and the drive too far forward. If the lines in the sail are excessive, the mast bend is exceeding the luff curve by too great an amount, and the drive is too far aft.

The mast bend can be altered to match the sail, to a large ext ent, by altering the position of the shrouds and/or forestay.

BOOM HEIGHT - The boom should be as low as possible on the mast, allowing sufficient room to get under it when taking or gybing. The boom should be parallel to the boat when sheeted on hard.

BATTEN SHAPE - The shape of the battens relates largely to the shape of your sail. The battens can be used to change the position of maximum chord depth of the sail to a limited extent, but in general, the position of maximum bend of the battens should match the position of maximum fullness of the sail. The battens in the top part of the sail should be shaped so that the maximum fullness is about 40-50% back from the mast. The battens in the bottom part of the sail, however, should be shaped so that the maximum fullness is slightly further forward. This allows for the drive to move aft when the mast bends down the bottom while sailing.

When trying a new sail for the first time it is a good idea, when shaping the battens to leave them slightly on the stiff side. The sail can then be evaluated on the water, and if it seems too flat the battens can always be shaped some more until they are right. Quite often, the sail will perform much better than expected on the first time out, which never would have been known had the battens been shaped to give the sail an "ideal shape" the first time.

The battens should never be too stiff at the back, or the sail will be too flat

This will enhance pointing ability and give more power.

The battens should be tied in almost as tightly as possible, i.e., enough to remove the wrinkles, then a bit more. It is probably better to have them a bit too

loose. The exception to this would be in a strong wind, where slightly less tension allows the sail to become slightly flatter.

<u>CENTREBOARD</u> - In a light wind (sitting in side boat) the centreboard should be vertical. This should give just a touch of weather helm. If this is excessive, however, the board may have to be located further aft (i.e., the pivot point). As the wind increases (just leaning out), the board should be raked to maintain a slight degree of weather helm. As the wind increases to planing conditions the board should be raked until there is almost neutral helm, and raised until the boat can be kept flat comfortably.

BOOM VANG - As a general rule, there should be slightly more vang tension than mainsheet tension when sailing to windward, in all conditions. In a light wind it should only just more, or the sail will be too flat. In planing conditions, however, a lot of vang will flatten the sail and take the tension off the mainsheet, allowing the boat to be sailed easily. The boat should be just as easy to keep up in 25kts as it is in lOkts, if all the controls are set correctly. This means that maximum use is being made of the available power.

There is much more that could be said, but a lot of this would fall outside "tuning".

GREG. HILTON



New Ideas

Keith Chidzey has been experimenting with hull construction on his last two boats. Due to having relatively limited expenses he has found that doing a complete foam sandwich hull from carbon fibre was so unrealistically priced that it was of the first options to go. In this article he gives us some details of construction and his results.

Before describing the techniques of constructing with Carbon fibre and Kevlar cloths, which is very simple, here is some relevant technical data.

Carbon fibre is manufactured from a polyacrylonitrite precursor using a process evolved from that invented at the Royal Aircraft Establishment, Farnborough.

The fibre is supplied as a tow containing 10,000 individual parallel filaments with different combinations of mechanical properties:-

Α	-	high	strain	
HT	-	high	tensile	strength
HM	-	high	modulus.	•

The properties of unidirectional carbon fibre composites and those of other materials are compared in Table 1.

TABLE 1.

A surface treatment process has been developed which improves the resin/fibre bond by modifying the fibre surface. Fibre is normally supplied surface treated, denoted by the suffix S, i.e. A-S. HT-S, HM-S. This must not be confused with resin size (or binder) which is applied during fibre manufacture to aid customers handling the material.

The ranges of interlaminar shear strengths obtainable from composites containing 60% by volume treated fibre are given in Table 2. Comparative values from untreated fibre composites are quoted to illustrate the surface treatment effect.

TABLE 2.

Resin System	Units	A-U	A -S
Epikote 282	MPa	60-80	70-90
Araldite MY720) MPa	45-65	80-105

Material	Specific Gravity	Ultimate Tensile Strength (GPa)	Young's Modulus (GPa)	Specific U.T.S. (GPa)/kg.	Specific Y.M. (GPa)/kg.
Fibre A - S	1.5	1.5	110	1.00	74
Fibre HT-S	1.5	1.9	130	1.27	87
Fibre HM-S	1.6	1.5	190	0.94	119
GRP	2.0	1.0	42	0.50	21
Titanium DTD5173	4.5	0.96	110	0.21	25
Steel	7.8	1.0	210	0.13	27
Aluminium L65	2.8	0.47	75	0.17	26
I have used Bidirectional cloth style 6570 Table 3 is a comparison of the mechanical properties of hand lay-up Kevlar* 49, "S" Glass and "E" Glass and Graphite 6570.

TABLE 3.

1

1

1

Material & Fabric Style.	Weight (oz/sq yd.)	Specific Gravity	No of Layers of fabric	Laminate thickness (ms)	Tensile Modulus (10 ⁶ psi)	Flexural Modulus (10 [°] psi)	Tensile Stren- gth (psi)	Flexural Strength (psi)
Kevlar*49 style 250	4.7oz	1.29	13	0.143	3.74	3.16	60.000	36.600
"E" Glass style SK800	8.9oz	1.67	13	0.186	2.17	2.34	40.800	31.800
"S" Glass style S800	8.7oz	1.65	13	0.186	3.03	2.97	54,870	47,214
Kevlar*49 Woven Roving 1350	13.5oz	1.28	4	0.151	3.16	2.60	48,518	30,925
Graphite 6570	5.7oz	1.58	13	0.130	5.82	4.72	43,400	51 ,7 00

The advantages of these specific strengths struck me after studying this data, and was actually proven enough in practice in the National Titles in Adelaide. Out practising on Registration Day in 35 kts (official in the Club House) the boat jumped two waves in succession. After the second wave the boat landed on the face of the next wave, the impact point between the back wing bar and the stern. As I have my chines glasses on the inside and the back area is not specifically strengthened for that sort of treatment, the glass fractured; but the carbon fibre held. For the rest of the series I sailed with that chine turning inside out whenever excessive pressure was placed in that area, which was quite often in the waves we encourntered down there. Any normal construction would have cracked up immediately with that treatment.

Now to the construction side. Epoxy 90 resin was used on both hulls. This has given satisfactory results.

For the first boat I bought a shell off a professional boat builder and finished it scissors and it tended to buckle and form air bubbles during sheathing.

The surface to be covered must be free of oils, waxes, grease and paints, then prepared by sanding to leave a clean dust free surface. Any cavities or cracks, etc, should be filled using epoxy thickened to a paste. The thickening agent commonly used is talc, but for special applications Q Cells or Microballoons are used. At this point the surface should be clean, dry and porous enough to allow a good mechanical bond with resin/fabric system.

<u>Stage 1.</u> - Mix enough resin to coat the compete surface. Coverage is at the rate of approximately 0.5 fl. oz. per sq. ft. To apply the tack layer use a woollen roller or paint brush.

<u>Stage 2</u> - As these cloths have the capacity to produce properties of higher tensile strength when pre-stressed (stretched) it is advantageous that it be stretched across the surface to be sheathed.

It is usual to commence the sheathing from

fabric by means of clamps or staples. Should the surface area to be covered be wider than the fabric supplied overlapping of $1\frac{1}{2}-2\frac{1}{3}$ " is recommended.

<u>Stage 3</u> - The fabric is wet out by applying the resin at the rate of approximately 1:1, the same weight of resin per square yard as the fabric per square yard. Use a lambs wool roller or paint brush to wet out the complete surface of fabric. Then remove excess of resin using a squee gee. At this stage wait 24 hours minimum, or until surface is hard and tack free.

Any imperfections in the sheathing process will remain, so ensure that this is done carefully. Sheathing is now at a stage where the finishing coat can be applied.

For this finish coat Epicraft 2 pot Reaction Lacquer Marine Paint was used.

With the second boat, I used my own design with 1.2mm coachwood seaply throughout. The graphite was placed over the hull while it was still on the jig using the lay-up technique outlined above. Under the cockpits on both boats Kevlar* 49 Style 285 was placed. On "Blodsinn" I was using 2.2mm Klinki ply, and after 3 seasons of hard sailing my elbow or knee never saw the inside of the boat. So far it is the same story with "Moo Scow", except the ply being used this time is 1.2mm coachwood.

I would not recommend this form of construction to everyone. For those who have the time, patience and/or an adventurous enough nature to indulge in this sort of silliness they will come out with a hull of competitive weight ("Moo Scow" was 58 lbs with wings for the first half of the season) and a hull which is vastly superior in strength to the average.

Acknowledgement- Steve Tremaine, Director of High Modulus Fabrics (Aust.) for technical data and advice.

* Du Pont registered Trade Mark.

KEITH CHIDZEY



Construction

Over the past decade there has been some stabliisation in the design of the Moth. While the Australian builder can still choose various scow designs, they do not vary greatly. Much of the recent development has centred around construction techniques and advamces have made a proposed minimum weaight four years ago of 70 lbs. seem relatively heavy. The hull weight of top boats is now close to 50 lbs fully fitted including wings. As the weight is reduced the margin of safety becomes less and less, and attention must be given to details of construction to ensure that sufficient hull strength is achieved.

What then are the desirable properties of a Moth hull? Obviously strength is paramount; if the boat breaks it does not matter how well it performs. The overall hull stiffness and torsional rigidity are big factors. That is, the boat should not flex too much when mainsheet pressure is applied or twist when hiking on the wings. As well, the skin stiffness of hull below the waterline is important; the bottom flexing between frames does not make for a fair finish, and feels sort of soggy anyway.

The advent of modern foam sandwich materials have not had a great impact in Moths. While they are suited to many classes where the extra skin stiffness is beneficial, to achieve the required strength means extra pounds. To date, the lightest foam boats are at least ten pounds heavier than the lightest ply boats - perhaps this difference could be made up by using effectively lighter fibre composites such as Kevlar or Carbon, but these are not readily available to the amateur boatbuilder. One of the beauties of the Moth is that a complete hull can be homebuilt for around \$200!

The basis of the light plywood construction is the internal framing which includes the strongback running lengthways down the cenre of the boat, the framing across the boat and any stringers between the framing. Since about three-quarters of a hull's weight is in the outside ply, it is best to save as much weight there and provide the strength The largest loadings on a boat are from supporting the mast, the skippers weight hiking on the wings. and on the centreboard in the event of a capsize. The strongback provides the strength to support the mast and gives the overall hull stiffness between the forestay chainplate and the mainsheet blocks. To enable heaps of mainsheet tension to be used, the strongback should be a single rigid structure from the forestay chainplate to the mainsheet traveller.

Framing across the boat is needed to support the mast step region, the chainplates, the centreboard case and the wings. At the same time, they must be fairly evenly spaced along the length of the boat to support the bottom and sides of the boat. No less than four frames can be used so it is best to place them at the mastep, the front of the centreboard case, the back of the centreboard case which becomes the front wing support, and the back of the wings. The bulkhead can be the frame at the front or the back of the centreboard case giving a long or short foredeck. A long foredeck makes the centreboard case stiffer while a short foredeck makes centreboard handling easier. For instance, the centreboard can be raised further when gybing. As with much of the deck layout, deciding between a long and short foredeck becomes a matter of personal personal preference.

The sidestay chainplates must be supported by some sort of additional framing. This can be done by taking the mast step frame diagonally from the mast step to the chainplates or putting in struts of timber across the boat between the chainplates. When constructing the frames keep in mind that they work in compression and have to have high strength in places such as the wing supports.

The other important area of internal framing are the members between the frames of the boat. That is, any stringers, the chines and the gunnels. The stringers on the bottom of the boat are designed to add stiffness to the hull below the waterline. While they cannot stiffen the ply, they can hold a fair curve which results in only small deflections of the ply betweem the stringers. So choosing the size, shape and Despite all that is said about the 'right' and 'wrong' way to build boats it does not mean the 'right' way is the best. Try to look at what ends you want to achieve in very broad terms when planning your next boat. Perhaps you can come up with something <u>innovative</u> that will give you an edge. Look at it this way; if you build a boat the same as last year's World Champion, it will only be as good, not better.

PETER LAMB.





Automerikanischer Mothsegler.



Are you always a year behind in the ideas department?

Kevin Wadham and Andrew Buckland of Hood Sails are the INNOVATORS in the 12' and 18' Skiffs.

Michael Dudley has joined the team at Hoods.

If you want the new ideas in MOTHS this year call Kevin Wadham or Michael Dudley on 929-0700.

HOODS SAILS BRADLEY AVENUE

Centreboards

There is a huge gap between what we know about centreboards and our ability to reproduce this knowledge in physical form, such as a centreboard. For instance, the difference of 1/100th of an inch between two identical shapes can have a huge effect upon the drag factor, therefore the speed of the foil. At best most people can only produce a shape that is similar to what it ought to be, therefore bad qualities may be shaped into the foil unwittingly.

This fact applies to professional and homebuilder alike, hence the question of-What shape is best? Should be followed by; how do I achieve this shape?

I found that by applying the principles of theory, as guide lines to be achieved if possible, rather than trying to achieve theoretical perfection, is an effective way of attaining a satisfactory solution. In simpler terms, a shape that is near to the desired theoretical will do the job satisfactorily, any undesirable side effects just have to be overlooked unless they effect the ability of the foil to do its job properly.



diagram la.

The stall angle of a foil influences its effectiveness as a foil. The greater the angle at which stall occurs, the less likely that cavitation will occur. Hence, the better the foil will handle high pointing and increased leeway.

The front third of any foil is the main influence upon stall, with leading edge (L/E) being the most influential. Sharp and very rounded L/E's followed by full sections give great results. See diag. la

Higher stall angles may also be achieved by moving the maximum thickness forward from anywhere between 33% to 25%, without having any serious increase in drag. By reducing the amount of 'round' in the after sections of the foil any increase in drag (due to the forward movement of the maximum thickness) is reduced. See Diag. lb.

The drag factor in a foil is influenced by the L/E and by the fairness of all sections behind this edge. The quality of the surface

finish also has a large bearing on the drag factor.



diagram lb.

I have found that foils have been faired with pains taking devotion and then highly polished will overcome any faults caused by inexperienced shaping, poor sectional shape and even -poor L/E shape. The moral here is keep on trying BUT take extra care and effort in the fairing and the finishing of the foil. Therefore all you home-builders and frustrated boffins, there is hope for you yet!!!



Diagram la Common faulte to avoid

Poor fairing.

When shaping your foil it helps to be as methodical as possible. Mark as many reference lines as possible and then work to these religiously. Select any profile shape (profile has little bearing on the foil's efficiency) though the squarer the better as it is much easier to shape and glass, than a profile shape which is curved or tapered.



Diagram 1d.

Pencil the maximum thickness in position and plane to NEARthis line, leaving a small flat. Guage the L/E and T/E lines and then sight down the lines to check if they are straight. If not, rule them straight OR get a new piece of wood. See diagram le.





To fair and round the L/E, firstly reduce the existing flat by 50%, fair this in over as short a distance as possible on each side. Then round the remaining flat to as circular shape as possible. See diagram below.



Diagram f.

In finishing the foil, any modern finish is good. Those that head the list for me are those that can be Wet and Dried (W/D) and then buffed to a high polish. Some finishes remain dull and cannot be polished.

It is a well accepted fact that a high polish influences the efficiency of any hydrofoil.

It is an unpopular fact that care and elbow grease result in a good finish, in direct proportion to the amount of effort expended. The simple fact being the more painstaking care taken in the W/D process the better the polish attained, when buffed. This also explains why the professional blades are generally expensive, especially if the workmanship and finish are good.

If a good final paint or resin coat is achieved, then the W/D process can begin with 240 grit then 400, 600, 800, and finally 1200. Do them in order and don't get lazy! It helps if a change of rubbing direction occurs with each change in grit. Always finish the 1200 in the up and down direction for the best polish. Now polish the blade and see how good your cffort has been, a dull polish means not enough care and effort in the W/D process, so, back to it boys!!

The rougher the paint or resin job the courser the grit required to remove the faults. This in turn means a harder job to remove the deeper scratches. I would suggest that any finish requiring below 180 grit is poor enough to re-attempt the finish coat. Time and effort only, separate the home and professional builder. Whilst a professional can frequently achieve a good and fair shape, due to the continual practise he gets, a home builder is unlikely to achieve the same results without a lot of painstaking and loving devotion. This situation also applies to the finishing process as well.

It is good to see someone do all the hard work himself and to end up with a good result. Such effort is to be applauded and certainly encouraged. However, there are people I would highly recommend obtaining the foil in a shaped and faired state from a professional. The glassing and finishing can then be done by you. Failing this I would then recommend that you get your foil finished to a pre W/D stage. You would then do the W/D and polishing yourself. In this manner you will achieve better results than doing the whole lot yourself whilst saving some of those valuable \$\$\$\$'s. Finally, I wish to point out that the theoretical section for foils that are best suited to boats fall in the range of 9% to 12% N.A.C.A. cord section. Ideally, 9% is best, however, I use 10% because it is easy to calculate. For example, a centreboard of 10" in width, should have a thickness of 10% of this figure, which is 1".

I wish also to congratulate the I.M.C.A. (Aust) on the great job it has been and is doing. To all Moth sailors, past and present, I would like to add my greetings for in no other class have I seen as many top ranking Sailors produced with as likable personalities as many of the Moth-ers I have seen or known. Such is the essence of this Class and I sincerely hope that this spirit continues onward.

PETER HOLMES



Emmentalor Mothsegler.

N.S.W. Notes

New South Wales is currently enjoying a good season for Moth sailing. Registrations are at their highest for a number of years currently 125, and sure to increase by the end of the season. Sailing throughout the season has been of a high standard - a fact reflected in our good showing in the National Championships in Adelaide.

The increase in registrations is most encouraging. For a number of years there has been some fear that the mass produced Laser and Laser-look-alikes would rob us of numbers, but it is now certain that the Moth will continue in strength in New South Wales. There are people who are prepared to put time and effort into developing their boats and rigs. In return, they are rewarded with the pleasure and satisfaction of sailing the fastest, most exciting and yet highly tactical single-hander afloat. We have a large contingent of enthusiastic and competitive juniors who will ensure that the class prospers and grows.

There have been strong fleets sailing at both Club and Association events. Our strongest clubs - Seaforth, Balmoral and Sp-ers Point regularly boast fleets of 20 boats, making for good competition. Other clubs have smaller, but nonetheless enthuriastic fleets. The growth of numbers at Connels Point after a brief lull, is encouraging.

The Interclub racing has been very competitive. Our traditional season opener at Speers Point over the October long weekend was well attended as sailors tuned up new boats or relaunched old ones. The series was well won by Ian Ward, but many sailors showed that they would be forces to contend with for the coming season.

The next Interclub Shield heat was held at aratoga Sailing Club. It was pleasing to see the large numbers who came both north from Sydney and south from Lake Macquarie to visit this venue which we had not sailed at for many years. The Club greeted us warmly and provided us with a good race in a fresh breeze. Peter Lamb won an exciting race.

The Selection Trials at Lake Macquarie saw nearly 60 boats, most of whom were trying for the 17 spots in the State team. After four heats in a variety of conditions, Peter Lamb won narrowly from Ian Ward with Glen Hammond and BobFussel not for behind. Some experienced sailors were finding the competiquite stiff and were struggling to make the numbers. Some past state representatives were unable to match the speed and ability of some of the newcomers. Overall, the team selected had a good blend of experience and youth and were looking forward to sailing at Adelaide.

The Gypsy Bowl teams race saw last year's winners, Balmoral, triumph again, but not before close competition, especially from an enthusiastic Connels Point team and a somewhat disorganized Seaforth team. The close racing was a good sharpener for the Nationals.

The National Championships in Adelaide, though once again going to Western Australia(congratulations to Greg Hilton) showed that New South Wales was coming closer to breaking the West's stranglehold on the Title. Ian Ward and Peter Lamb sailed excellently for their 2nd and 3rd placings. The others were not consistent enough to fill other top placings, but there was a rash of pale blue between 9th and 30th. Keith Chidzey and Mike Dudley were two who would have done better but for boat problems. The juniors though beaten for the top places, did well to fill placings three to seven.

New South Wales had six juniors selected to participate in YouthSail and Youth Championships. All performed well, and together with the two West Australians showed the other sailors there, what an outstanding class Moths were.

In the World Championships in New Zealand, the four New South Wales sailors performed creditably, especially Ian Ward's fine second and Glen Hammond's seventh.

Back at home, the Seaforth Championship was well won by Peter Lamb from a fleet of some forty boats. Peter made it a fine double in winning the Pittwater Championship at BYRA just recently to wrap up the Interclub Shield series before the final heat.

There is still to be sailed the Interclub Shield heat at Dobroyd, with the minor scratch, and all handicap placings still open. We are also looking forward to an excellent State Championship series at Sunshine on Lake Macquarie and are hoping for record entries as well as competitive racing. There is no doubt that it will be an enjoyable series. In the longer term we are looking forward to a combined National and World Championships which look likely to be held on Botany Bay in January, 1983.

JOHN SMIDMORE



Ian Collin N.S.W.



LESLEY DAVIS

START TO WIN Eric Twiname

This book is written for the benefit of helmsmen who may never race in the Olympics but do want to win their club races and perhaps one day their National Championships.'

Twiname draws the reader's attention to reasons for losing and then uses his experiences to help rectify this situation with descriptions of tactics and handling the various problem areas of a race. The book also has a relevant diagrammatic section on rules.

approx. \$20.00.

THIS IS RACING

R. C. Osborne - publishers, Nautical.

Deals with the major points of racing with detailed descriptions of v arious boat handling manoeuvres. Diagrams and descriptions show factors involved in racing procedures such as gate starts and buoy rounding. This includes a very good section on weather for interpretation of prevailing and predictable conditions.

approx. \$16.50.

TACTICS OF SMALL BOAT RACING Stuart Walker, M.D. - pub. Norton.

Stuart Walker deals with the tactics concept in a general sense drawing on his wide experience to illustrate tactical problems and their solutions. Pleasant reading in the authorial ideas rather than points of fact and method.

\$17.50.

ADVANCED RACING TACTICS Stuart Walker.

A skilled analysis of the racing method as an expansion of his earlier book; "Tactics of Small Boat Racing". Walker delves into the psychology in greater depths.

TACTICS.

RACING TACTICS

Manfred Curry - publisher Scribners.

Curry deals with racing rules and tactical situations for the entire race. Diagrammatic representation with question and then explanation type layout makes it suitable for contued and easy reference.

\$25.00.

THIS IS COMPETITIVE SAILING Fred Imkoff and Lex Pranger publishers, Nautical.

Easy to understand with clear points and colour prints on boat handling, i.e., step by step analyses of roll tacks, manoeuvres and preparation.Not totally relevant as deals with items such as crew work.

approx, \$16.50.

TECHNIQUES OF 1 DESIGN RACING Jack Evans - publisher, Haessner.

Well laid out with clear diagrams and a text of high standard dealing with basic facets of racing plus description of more complex points.

approx. \$ 9.00.

TEAM RACING

TEAMS RACING

Eric Twiname - publisher, Adlard Coles.

This book deals with development of the basic concepts of racing with reference to teams racing. Due to the specialisation it contains a good deal of techniques worth trying in normal racing. It also has section on relevant rules.

RULES

THE RULES 1977 -1980. Eric Twiname - publisher,Adlard Coles.

A practical analysis making rules readily understandable by explanations and diagrammatic representation of racing situations and the rules applicable. Also includes a complete text of I.Y.R.U. Racing rules for 1977/81 Australian seasons.

SAILING RACING RULES THE EASY WAY. Stephen Falk - Publisher, MacMillan

Contains interpretation of rules discussing ssituations, obligations to both parties, and methods of drawing right conclusions on the water plus definition from pertinent sections of the official N.A.Y.R.U. sailing rules.

Most books are unavailable from normal Book Stores. The New South Wales outlet, "Boat Books" supply most of the titles. Their address is,

35 Hume Street, Crows Nest, N,S,W, 2065. Ph. (02) 439-1133.



DEAN BUTLER S.A.

Vic. Notes

This season has eeen the Selection Series and National Titles competed for with encouraging results. Whilst we didn't finish in the major placings at Largs Bay, the individual results combined to make the Victorian team more competitive than it has been for some years. Andrew McDougall followed up his previous fifth's in Perth and Montrose Bay with a seventh. Whilst Ken Trevillien, who we gained at N.S.W.'s expense, won a heat and finished 10th overall. With Ken's expertise plus that of Bryan Grey, who has to Moths after a season in keelboats (it is very hard to give up sailing Moths due to their unique nature) plus Andrew McDougall we should be able to seriously challenge for next year's Nationals at Sorrento.

During the year we have gained some new members one of who is Chris King. Chris has migrated from England and brought out a skiff with him(don't hold that against him) which he has found not very suitable for some of our conditions. The skiff is one that the current world champion David Iszatt sailed a season or so ago.

This season also saw the continuation of the David Elliott Adventures in Moth Building and reconstruction. The next event of interest will be our State Titles in March to be held at McCrae Y.C., scene of the last Nationals to be sailed in Victoria. McCrae has a reasonably large fleet with most being juniors. At this stage it appears that Andrew McDougall, if he returns from Sydney, Jim French, Ken Trevillien David Elliott, Peter Hannah and Bryan Grey will be the main contenders for the title. We hope to have better conditions than year when all but one heat were sailed in winds of 25 kts plus with waves to match. We hope to have 40 boats for the series.

The Moth in Victoria has been strengthened by the presence of a Moth builder (Jim French).

This is important as people were reluctant to go interstate to get hulls and plans.

That is about all I can think of to highlight the inaugaralissue of a National Magazine and I wish you all good sailing and plenty of wins if you are good unless you are racing against me.

DAVID HASKINS.



Power Sailing

In newspaper write-ups one often reads "... won the race with a fine exhibition of power sailing". What is power sailing? Probably the best way to describe it is the method of sailing a boat so that it is under control and mvoing fast at all times. It means making maximium use of any available wind. This may sound obvious, but many people don't do it properly.

In a wind light enough to be inboard or just out on the wing, everyone has similar boatspeed. Once the wind increases, however, variations in technique may cause large differences in boat speed.

When the wind increases to the stage where you are flat out in the gusts with the centreboard down and the sail on hard, it is time to think about releasing power. The centreboard should be raised slightly, and the foot pulled out flatter, so that balance is restored. You should be leaning as hard in a ten knot wind as in a 30 knot wind, Now is the time to start sailing a little more freely. The traveller is eased slightly to stop the sail twisting too much as the sheet is eased. This maintains the power in the sail. By now the boat should be planing to windward. If it is not doing this easily, the sail is probably too full or the centreboard too far down. When sailing in a wind strong enough to require spilling off wind from the sail, many people put the traveller out further to "flatten the sail". What they are actually doing is making the sail more powerful and reducing pointing ability at the same time. The best way to release power is to keep the traveller more towards the centre and let the sail twist. This keeps the drive in the bottom of the sail where you need it and allows for

higher pointing ability since the boom is closer to the centre of the boat. Also, the sail may be adjusted a lot more as the mainsheet is at a more efficient angle to the boom.

To sum up, when sailing to windward, you must be prepared to pull the centreboard up, bear away and make the boat go. If it doesnt work, you havent lost much, but if you don't try you could be missing the chance for a dramatic increase in performance.

GREG. HILTON

The decision on when to bear away and sail more freely is critical and depends mainly on the wind strength. It should only be done if the boat can be made to plane by doing it. If not, windward height will be lost for little increase in boat speed. Once the boat is planing it needs less power to keep it moving, so it will not be necessary to lean hard at all times. This is particularly valuable in a strong wind, where short rests are needed to restore circulation to the legs. Furthermore, it is possible to ease the boat up into the wind to the point where the boat almost comes off the plane. Hence, the boat will follow a zig-zag course to stay on the plane while still pointing as high as possible.



S.A. Notes

The 1980/81 National Titles may not have been held in the best of Adelaide weather but we cannot help what our visitors bring with them! Although Moths in general are not strong in South Australia the series attracted the stalwarts of the class who managed to organise the series very well.

The Committee consisted of Les Goldfinch, Kevin Angove, Bert Wellman, Brian Royal, Lindsay Sawyer, Bill Randal, Len Hearing, Alan Potts, Harry Howitt and Dave Corcoran, all held together by Chairman, Dr. Syd. O'Halloran.

The series ended up almost square financially, making about \$100 profit, which was mainly due to the presence of the Rainbow sailors, who attended the New Years Eve bash.

Mark Goldfinch has married since the series and is now sailing on Lake Burley Griffin, A.C.T.

For next season there is a lot of behind the scenes recruiting happening. Les Goldfinch is allowing interested persons to race his spare Moth in club races at Grange. Recruiting is mainly youth oriented at present and it appears that the father of two boys who are interested is a representative for a timber firm, possibly giving us a lead in for plywood stocks. On another tack, Graham Philips and Len Heaving are interested in making a mould for some foam glass Moths similar to Mike Dudleys. Thoughts at present are to have a glass shell with ply strongback, frames and decking. The aim is to get as many people as possible to build identical boats and do on the water tuning during club heats.

It seems that as always, we are getting the enquiries about Moths, but in the past have had nothing to offer. This project is just the thing to overcome these problems by providing a building programme and on the water aid which must attract new skippers.

Five heats of the State Championships have been sailed to date, two at Largs Bay and one each at Grange, Henley and Port Pirie. The first two heats were won by Len Heaving (Port River Club) with Dom Paparella (Port Pirie) and B. Ramsay (Arno Bay) pushing him in the first heat. Mark Goldfinch (Grange Club) was followed by Dom Paparella in the second. David Bowden was first junior on each occasion improving from 9th to 4th overall in the second heat.

Heat 3, at Grange, was sailed in very light winds and only 6 Moths turned up. David Bowden led convincingly throughout the race, only to be run down on the final leg by Dean Butler.

Heat 4 at Henley Sailing Club was very hot and uncomfortable without any wind at all. The race was finally abandoned, perhaps the most disappointed skippers being Brian and Andrew Ramsey who had come from Arno Bay, 300 miles away.

Heat 5, 15 knots, gusty, at Port Pirie. Fifteen boats turned up and after the start Len Heaving held a good lead throughout the first lap. Two unexpected swims in succession on the second beat saw Dom Paparella take the lead and hold it to the finish. The Ramsey brothers from Arno Bay had another bad day with Brian breaking his rudder and Andrew holing his boat. At the finish Dom Paparella led Graham Phillips (Largs Bay) and first junior, Tod Bleischke (Port Pirie).

The top three on points so far are:-

1	L.	Hearing	1,	1,	4,	D	sq.
2	D.	Paparella	2,	3,	DN	IS,	1
3	G.	Phillips	4,	DN	s,	5,	2
Ju	nio	rs:-					
	D.	Bowden	9,	4,	2	6	

T. Blieschke DNF, 9, 3, 3. Moths in South Australia are presently sailed at Largs Bay, Grange, Wallaroo, Port Pirie and Arno Bay. It looks as though we will have a team of six or eight at the

Nationals in Victoria in 1982.

Let's Twist

The extent to which the mainsail twists, i.e., lays off to leeward towards the top is probably one ot the more critical factors in sail shape. The difference between well set up boats and the slower less well set up boats ten years ago could most clearly be seen in photographs. The fast boats have very little twist due to powerful boom vangs and the slower boats were typified by skying booms and huge amounts of twist.

Once again there seems now to be a move back toweards increasing twist for greater speed. This does not necessarily mean that the fast boats ten years ago were wrong - it is attributable to the greater flatness of moder day sails.

Reducing twist to a minimum ensures a powerful sail - all if which is driving the boat forward and if the boom is set at the correct angle to the wind then so it is assumed, will be the rest of the sail.

Increasing twist tends to reduce the power of the sail as the top of the sail tends toward a 0° angle of attack to the wind that is, it "feathers".

Control of twist depends on a number of factors:-

- Boom vang pressure keeps tension on the leach and prevents the end of the boom from lifting.
- Mainsheet trav eller by sheeting out wide and pulling in the mainsheet, twist is reduced as again the end of the boom is forced downwards.
- Outhaul adjustment increasing camber of the loose foot encourages the leach to stand up.
- Luff tension increasing luff tension eases leach tension and therefore increases twist.
- Sail seam shape greater amounts of swelling sail seams produces a fuller sail with less twist.
- 6. Luff curve or round increasing the

amount of curve cut into the luff of the sail will also reduce twist as it again makes the sail fuller.

In general terms - if a sail twists too much, and this is one of the most frequent faults in big roached Moth sails the top sections of the sail "feather", i.e., have a O^O angle of attack and produce no drive. However, a distinction must be made between a twisting flàt sail and a twisting full sail. Flat sails "feather" easily, ie., when due to twist, the top sections have an angle of attack, the wind flows down both sides equally, creating no lift but also no drag. This ia a highly desirable state when working to windward in fresher winds. A full sail on the other hand, will flog in the upper sections ehn it twists and, because it is curved, the wind flowing down the leeward side will turn the sail inside out periodically - creating no lift but considerable drag - thus slowing the boat.

How much twist is the correct amount? This is a very difficult question to answer as it depends so much on weight of skipper and sail cut. Perhaps one answer is that if the wind strength does not overpower the skipper then twist would be minimal. What does minimal mean? Leach ribbons can be useful hear and two or three could be attached to the leach in the top half of the sail - they should always flow aft. If the break and curl around onto the leeward side of the sail, then the sail is either not twisting enough and/or is too full. Typically, on a Moth these ribbons continually flow aft and this may mean that the sail is too flat and/or twists too much. So, as a basic rule, the fuller the sail the better as long as the riboons flow and as long as you are not overpowered.A ten stone skipper tends to get overpowered to windward in 10 knots plus.

Easing the vang in a fresh breeze certainly increases twist and reduces pressure - the boat is easier to keep flat - but is it going faster? Probably not, as, easing the vang allows the mast to straighten which will make the sail fuller as the luff curve cut in by the sailmaker is pushed back into the sail. The sail being fuller tends to "flog" or "back" and the increased drag tends to slow the boat. How do you twist

<u>G. L. Jogg</u>

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the sail in a strong wind and keep it flat? This depends on a delicate balance between the six factors mentioned above.

Reaching and working to windward in medium breezes, say 6 to 12 knots, probably calls for minimal twist and a reasonably full sail. Ease in the loose foot, tension the leech line, ease out the traveller, while maintaining sheet pressure.

For lighter winds a new problem usually arises. In very light conditions it is easy to stall the sail, and without a jib particularly, it is difficult to re-establish flow again - so great care must be taken not to sheet in too close. Due to less wind pressure on the sail there is little tendency for the sail to twist, in fact, in some sails in very light airs "negative twist" develops in the leech in the upper sections hooks to windward and the leech ribbons stall and flow around behind the sail. Easing the vang will straighten the mast and thus create a fuller sail, which will cause the leech to hook to windward further. Pulling the traveller to windward and easing the sheet can help. Leech lines should never be used in light airs as the problem is always one of trying to reduce leech tension.

A sail which is made specially for light airs would be useful - such a sail would have very little luff curve - say 2" to 3" and thus the vang could be eased to encourage twist without fear that the sail will become too full.

Probably one of the easiest ways of checking the tension of the leech is by -

- Laying the rigged boat on its side with all sheets and controls set at the usual places,
- Supporting the mast at the hounds and putting a light pressure on the top of the mast to simulate a little sideways bend, and
- 3. take the ends of two battens, one in each hand, preferably two that are separated by a third and bend downwards. If the half of the sail nearest your hand readily falls away, i.e., turns inside out (the batten develops an S bend) - then the leech is probably too free - unless you are light.

To correct -

ease luff tension, ease vang pressure ease in foot outhaul,

return the sail to the sailmaker for tightening of the leech - a simple matter of overlapping the cloth in the seams a little more towards the leech. If the sail will not turn itself inside out at all, then the leech is probably too tight - unless the sail is set up for reaching or owrking to windward in 8 to 10 knots and/or the skipper is fairly heavy. Such a problem can be corrected by a reverse of the above.

A better method is to have photos taken while sailing at various angles to the wind in various wind strengths. Position the boat so that the camera is directly aft of the end of the boom.

Outhaul adjustment

Sail fullness is increased by the amount the sail curves away from the straight line between luff and leech. Theoretically there is an optimum amount of fullness - perhaps somewhere between 6% and 12%, and thus the depth of the sail should increase as the width of the sail increased towards the bottom, particularly if the wind is fresh and the sail is flat and feathering in the top section. Many sailors pull their loose foot flat along the boom when sailing to windward. By having maximum drive in the bottom of the sail, full power is derived from this section without making the boat much harder to keep upright. How much the outhaul can be eased in depends greatly on sail cut. A fullish sail with a tight leech would be intolerable unless the foot was pulled very flat. A flattish sail with a free leech can tolerate quite a deep foot without causing the leech to stand up too tight.

Flatish sails tend to be more useful as they are more adjustable. It is always possible to make a flat sail fuller - with leech line or outhaul but it is very difficult to flatten a full sail.

PETER MOOR



Sail viewed from directly aft of boom

- a. Minimal twist ideal reaching.
- b. Some twist ideal working.
- c. Large twist ideal working, fresh breeze.
- Negative twist never ideal, tends to occur in drift conditions.



Leech too tight. Too much luff curve. Sail too full.



Backing or feathering section of sail in fresh breeze to windward.

Top section flat or feathering - centre of effort low down.



Finishes

This is a very important part of boat building as it adds to the performance, makes it look good for reselling, and must give the skipper pride and satisfaction to see a beautiful high finish. A point here that as far as I know has never really been proven. That is, wether the high gloss finish or the very smooth flat finish gives greater speed through the water.

When the 16 foot skiffs from the East were in WA for their championships I spoke to one skipper from Belmont (NSW) and enquired generally about the price of a hull and was told that after the bare hull was bought the varnish finish cost another \$350. This was quite a surprise as generally "moth-ers" would only count the price of the varnish. (Completely wrong as it is the amount of work that goes into it that provides the finish).

How to get down to how to get a top finish - (my opinion only).

 All work should be by hand. Machines are not satisfactory. They cut through to base.

2. When hull construction is finished rub down with fine paper. Although initially the ply had a high finish, during building, being exposed to the atmosphere, it tends to get "furry".

Apply a coat of varnish broken down with turps
say 3 parts varnish to 1 part turps. Use a 4"
brush which can be soaked in turps between coats.

4. Fill all staple pin holes and lightly paper off before next coat. Do not think that varnish will fill the staple holes. This is not correct.

5. Apply another coat, taking care not to have any runs as these are hard to remove.

6. A light rub down, then another full coat.

7. If looking a fairly good body, a heavier rub down, this time using a block about 10" long. This will remove any slight hollows.

8. Apply another coat of varnish.

9. Now to the hard work of rubbing down with wet and dry paper (about 240 grade, getting finner say to 400 and maybe finally 600). Wet and dry paper to be held in the hand or on a rubber block.

10. Another coat of varnish and more wet and dry. These rub-downs would take about $1\frac{1}{2}$ - 2 hours to do properly.

 The finish will tell you wether another rub down and another coat is requir ed.

12. It is hard to varnish on a very hot day - you have to be too quick. Sprinkle water on the floor to lay the dust cleanliness in No. 1.

With regard to rudder blades and centre plates, the trend today is to have these fibreglassed, (pretty expensive, But you can do them yourselves) thus getting more strength as well as a harder finish.

Coat the inside of the boat with silicon water repellant - this is lighter than varnish and in any case you should not be getting any water inside.



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Secretary's Report

It is with great pleasure that I present my second annual report.

The past year has been a very active one on the administration side, the World Association's activities or lack of them should I say have come under notice by most of the other member nations particularly the United Kingdom whose president, John Butler is rather disturbed at the seeming lack of interest.

The Australian Yachting Federation has embarked on an intense training campaign and has sought contributions and requirements of the major international classes being sailed in Australia including the MOTH which has finally been recognised officially as one of the top singlehanders. As a result our top junior helmsmen will have a chance to show not only their potential at major regattas against other singlehanders but also the fine attributes Moth sailing can give. This scheme can only benefit the Class in promotion throughout the country.

Yet another increase in administering the Class seems evident as we have been advised by I.Y.R.U. that the cost of B.F.R.'S will escalate from \$4 to \$14 which is quite astronomical. It would appear that the paperwork involved in administering International Classes is the same, be it a Star Class or a Moth Class and I.Y.R.U. have based their fee structures on this point.

It is also rumoured by the United Kingdom Association that to help finance the World body, a fee be proposed for every financial member of I.M.C.A. rather than to rely on the income from BFR"S which are only purchased approximately once a year. This idea we feel carries a lot of merit and could possibly solve the situation.

Nineteen Eighty-one will see two World Championships being conducted. Firstly in New Zealand and then followed only a few months after in Holland.

It is worthy to note the efforts of Ian Ward one of our senior members in endeavouring to organise a regular National newsletter. After perusing the United Kingdom newsletters we have a lot to be envious of. We feel I.M.C.A. (Aust.) should back the move wholeheartedly and provide the necessary finances.

Financially, I.M.C.A. (Aust.) is very stable, the main expenditure this past year being the new registration stickers of which six years supplies were purchased. Interest earned from Investments throughout the year contributed towards a major part of administration costs. A Government grant also helped to boost funds. However, conflicting reports are to hand on when there will be another available.

In closing Neil Jackson expresses his sincere disappointment in not being able to attend the conference. However, due to business difficulties and his recent marriage, for which we all pass on our congratulations, he was unable to affort the time.

I would like to than Neil personally for his continued advice throughout the year and direction when sought.

We have been lucky to have a president who has had such continued and genuine interest in the Classes affairs and has advised that he will be available for re-election along with myself. We look forward to Australia being the major Moth Nation of the eighties.

To all competitors good sailing and members, a prosperous New Year.

PETER CLEARY.

Repairs

Most Mothies have to face up to this problem at some time or other, and usually its not a very rewarding job. The objectives are to try and produce a repair that is as strong, water tight and as light as before, without blemishes in appearance, and often in a minium of time. its usually quite impossible to do all these things, and the end result is invariably a compromise. However, the repair is done, the problem usually arises of trying to apply pressure between an outside piece of ply and an inaccessible inside piece of ply, and thats where this short article may be of help.

The first typical case is where a cut out section of ply is being replaced. This matching hole is usually prepared by having a strip or strips of ply glued in place around its edges by these strips. After edge-gluing, the new piece is usually held down with weights. The second typical case is where a backing piece is glued slipped in through the fracture, and pulled up into place by a thread or threads.

Taking the second case first, I lay the backing piece in position over the place it is going to finish up, and drill fine holes - usually on a grid of about 75mm - through the piece and the underlying ply. I then thoroughly tie the end of a piece of waxed thread (300mm) to the middle of half a matchstick, to provide an anchor to pull up one hole of the backing piece. The other end I thread (with a needle) up through one of the drilled holes in the backing piece, and up through its matching drilled hole in the original (fractured) ply. After repeating this to each pair of drilled holes, the backing piece can be coated on its top face with glue, pushed through the fracture, and pulled up into place with the threads. The trick now is to hold the threads in tension while the glue sets, and I have found a neat way of doing this. I have a number of spring loaded metal finger clamps, each about 100 mm long and working on the same principle as a clothes peg - squeeze the legs at one end, and the jaws at the other end open. Each of the two operating legs has a hole (about 8mm dia.) near the end.

I pass the free end of the thread through one of the leg holes and tie off on the other leg hole, then open the jaws of the clamp wide and hold them open with a small block. By winding the slack in the thread around the leg where the thread is tied off, the clamp will finish up over the drilled

hole with one leg against the ply and the other leg in the air. Remove the block from the jaws, and the clamp will be prevented from closing by the tension it sets up in the thread. Repeat for each of the threads. Actually, I tie each clamp to its thread before dropping the backing pieces inside the boat, so as not to loose the ends of the threads.

Coming back to the first case, where a piece is laid into a prepared opening, I use the same method to provide the glueing pressure, by drilling holes along the edge of the patch piece and through the support strips.

RAY HILTON



Plywood

One major improvement in the performance of Moths has been through reduction in weight. Since the skin of the hull accounts for nearly 2/3 of its total weight it is not surprising that most improvements have been through lighter skin materials.

The difficulties associated with light materials is in preserving their stiffness, strength and impact resistances with any significant weight saving. Plywood has long been the preferred construction material for Moths because it is relatively cheap, easy to handle and work, is light and produces a good looking finished product.

Until relatively recently the lightest suitable plys available were 3mm Klinkii Pine and at great expense 1.5mm Maple. With some care one could construct a conventional scow hull to weigh 50 - 55 pounds, varnished with no fittings. Peter Moor was rumoured to have built a 45 pound hull from 1.5mm Maple for the Melbourne Nationals six years ago.

It was just at that time that Cemac began manufacturing its "Super thin" marine plywoods from an Australian hardwood called Coachwood. Previously plys of 1mm thickness had been manufactured from this timber for aircraft construction, but it was scarce and expensive. The Super thin plys are made in 6" x 3" (900mm x 1500mm) sheets of 2.5mm, 1.5mm and 1.2mm thicknesses which were originally used for foredecks. "Tissue paper" they were called in the beginning, but now have gained general acceptance. Over this last season several boats in N.S.W. were constructed with 1.5mm ply bottoms, and 1.2mm decks. The internal structure was altered to provide 3 stringers per side in the hull and the overall weight of a varnished hull was reduced to less than 401bs. This plywood has stood the test now of one season's hard racing and is still as sound as new.

Many attempts have been and are being made to reduce weight using foam sandwich or even ply-carbonfibre composites, but none have equalled the excellent combination of stiffness, strength and exceptionally light weight of the plywood alone. Cemac has produced their range of Superthin plys for 6 years and are now the main supplier of plywood for Moth construction in Australia.

Plywood is manufactured from selected hardwood logs which are mounted on a lathe which acts like a huge pencil sharpener, peeling a continuous strip of veneer. This rotary cut veneer is cut into sheets slightly larger than the finished size and laid in a press. Sheets of thin solid glue are placed between the veneers and the huge flat plattens of the plywood press are brought together under high pressure and temperature near 160° which melts and sets the glue. Talc is used to keep the separate sheets of ply from sticking this is the chalky material on the surface of the 1.2 and 1.5mm ply. Once trimmed to the finished size thick sheets are sometimes sanded to give a smooth finish, however, the thinnest sheets cannot be sanded and are supplied just as they leave the press.

In N.S.W. the State Association carries stocks of ply at a substantial discount over retail prices as a service to its members, maybe other States could follow this example since it has served to encourage many new amateur builders and gives an opportunity to advise new Moth sailors on the correct use of materials throughout their boats.



The Hilton Centreboard System

55

Hull Design

When designing a Moth, considerable importance should be given to the prevailing conditionns in which you are going to sail, whether it be for a local, national or international event. The recently held Worlds' in New Zealand saw Ian Ward take the initiative when he built a scow ideally suited to the rough water condtions. It was a boat with more than the average spring in the keel and wide midships, making the ends of the boat narrow in width forming more spring again. In fact, in all the Titles I have participated in, all the performing boats, have suited the local conditions. This is the concept of our class and because of our development characteristics it will never change and as a "Mothie" it is up to you to take advantage of this fact.

Obviously, one could write pages on which boat designs went where and how, etc., however, all I intend to do is to give a basic understanding of what I have learned in designing boats and the basics which you should know as a "Mothie".

The most important point is how much spring rocker, or as the Queenslanders say, "banana" you should carry in your boat. Well, when you find out, let me know. I have yet to see an "all rounder" scow moth design, although I admit that we are a lot closer to it now than we were ten years ago. Spring is the amount of curvature in the lines of your hull. There isn't really much difference now in the spring of all the proven designs, in fact we are fast reaching a stale-mate in scow designs.

The spring of your boat controls your light and heavy performance. The aim in light winds is to have less wetted surfact and our scow designs this means lifting the ends of your boat out of the water. This is achieved by more spring. The reverse of this, less spring, will help you to perform in heavy breezes. The amount of spring in the keep seems to have the biggest influence in this area.

Imagine a speed-boat with a curve in its keel-line, it wouldn't plane anywhere near as fast as it would if it were dead flat, bear this in mind when making alterations to your keel. Looking at your boat side on, ther is also spring in your chines which can be varied.) rom experience, I have found that it is best to keep this as straight as possible, (as the proven designs are now) with maybe little variations to the amount of kick in the bow section, which would be varied to suit the flat or rough water conditions.

There is yet another spring in looking at a plan view of your hull. Reducing the width of your ends so as to make your boat wide mid-ships considerably helps the boat to perform in light choppy conditions. In flat water, the opposite is the case, straighten your lines, i.e., by widening your bow and stern frames. A wider stern makes a faster close-reaching boat, but it has its pitfalls slow in light winds - and because of its extra bouyancy at the back of the boat it will have a tendancy to nose-dive.

Moving onto another familiarity, the bottom of our Moths must be flat under the mast and the angle of the chine sides from the bow to this section should be relatively verticle. This explains the reason why our mid-chine has now turned into a twisted chine - not a boat designers dream of a fair curve. In principle, the straight chine side angle seems to help the pointing ability of your boat and as it twists off flat to the stern gives a bigger planing section.

Basically, if you are a light weight increase the width of your hull, which will make it more stable and thus make it easier to "hold down". For a heavyweight - slightly more spring and perhaps also dropping your whole keel-line up to 4" (that is dead-rise), could be a good move. Of course all these variations should be carried out in moderation so do not go "overboard".



EC

Moth History

In 1928 Len Morris built the first Australian Moth, named "Olive" which he modelled on the Inland scows as exemplified in the exciting races for the Seawanaka Cup. described in some old copies of "Rudder". The "Olive" was a cat rigged flat bottomed scow, hard chined, 11 feet L.O.A. and carried 80 square feet of sail. She was sailed on Andersons Inlet at Inverlock in victoria and as several other craft were built, the Inverlock Yacht Club was formed to sail the class. In 1932 the class name was changed to Moth, to conform with an American design of similar restrictions to the "Inverlock" class. The numbers grew and in 1936 the Victorian Moth Class Association was formed.

In 1930 Captain Van Sant of Atlantic City designed his "llft. Class" which was shortly afterward changed to "Moth Class". The early American Moths were scow-like but had a decided V bottom whereas Australian "Moths" were real scows with a flat flow, designed to sail on their sides. There is no record of when the American Moth became the sharp bowed, V bottom craft they are now.

In 1946 Len Morris designed and built the "Mark II" scow which was thought the ultimate. For many years it was unbeatable until the round bilged moulded scow was developed. The "Mouldie" took over from the Mark II but the scow continued to dominate the field. In 1963 no fewer than 621 Moths were registered in Austsalia with probably two or three times that number unregistered.



"IN DESPERATION", John Henderson, a skiff Moth 1960 style



"FRAM", Eric Quarford, "FLORIDA" design from U.S.A. 1950





"MARK II.. Moth designed in 1946 by Len Morris

In New Zealand Mark II Moths were raced and in 1962 the New Zealand Moth Class Association was formed but strictly on a one design basis. A group of enthusiasts in Wellington then adopted the development rules of the Australian Moth and the Class has remained strong in the this country with around 200 registered at present. The restrictions which governed the American Moth hull were surprisingly close to those of the Australian Moth with the exception of the sail plan. It had a restricted 15 foot luff, foot of 9 feet and a limitation of 4 small battens. The American rig was quickly outmoded by its restriction free Australian counterpart.

The most popular design in France and Belgium in 1964 was the Europa Moth which is a stem boat and looks like a very beamy Finn.

The British Moth was originally based on an early American scow, but the sail plan had a ligher aspect ratio. It was plagued with a minimum weight restriction of 145 lbs and was outclassed in International competition, but an International Moth Class Association was formed to sail newer types which grew rapidly.

In Europe there was also a so-called Australian Torpedo Scow Moth which appears to have been a standard "Mouldie" with an International rig. Paul Elvstrom commented that the Torpedo could keep up with Finns under some conditions.

In 1964 the permanent headquarters of I.M.C.A. was in the U.S.A. and affiliated National Associations in order of fleet size were: U.S.A., France, Belgium, Portugal, Germany, Sweden and Great Britain with small but growing fleets in Switzerland, Austria and Hungary.





Walking-stick mast on David Bowen's 1966-67 Australian Champion Mystique

Although the class bears the name "International", it was not until 1970, and through the substantial efforts of the then World Secretary, Tony Hibbert (U.K.), that the Moth Class was granted official International status by the I.Y.R.U. The sail area was increased to 85 square feet in 1969 and after much argument the luff was restricted to 17'. Since the American and European Moths had "Wings" it was inevitable that they should appear on the Australian scow and this occurred in 1970.

Both hull and rig development has taken place throughout the lifetime of the Moth Class. In Australia the bendy mast took over early in the piece, the pocket luff sail with square top and "walking stick" masts were refined but eventually gave way to the more simply rigged sails of to-day. Meanwhile the British developed the light wedge shaped stem skiff and have stuck with light masts supported with "prodders" from the stays.

Almost every conceivable combination of controls, sail shapes, hull designs and construction methods have been tried at some time or other, which of course is the essence of, and reason for growth and success of a development class such as ours.

Insurance

" Why should I insure my boat? House? Car? Life? Anything? I won't get back what I put into it!

As an Inusrance Consultant I hear this every day of the week. "Why indeed should they? I used to ask myself in my early days in the Insurance industry. However, like most things, time sorts these matters out. The answer in my experience, is that "the fortunate ones won't get back what they pay into it" Why? Simply because they won't have to make a claim and experience all the hassles that go with it such as temporary loss of boat but they will have peace of mind. The sensible ones who insured and had a claim, quite often receive back far more than they put into it to, at least, ease the loss and hassles. The foolish, who reckon the odds are all on their side, don't insure and haven't the ability to replace what is lost are, of course, the real losers. There are n aturally, the lucky ones who didn't insure and didn't have a claim - or did they but couldn't claim anyway? Where is the balance? The answer I believe is up to you and lies in the questions :-

> "If I damaged or lost my possessions, could I afford to live without them or replace them from other resources?"

> "Could I afford to pay any Third Party claim against me at Law?"

If the answer genuinely comes up "yes I could", then you can please yourself on whether to take the chance or not.

However, if the answer is "I don't know", "I doubt it" or simply "No", then, if you can't afford the premium, you had better seriously ask yourself whether you can afford to be involved.

Insurance really is a mathematical calculation and risk sharing exercise, the basis for which go back centuries. I won't go into a history lesson but will suggest a quick calculation to think about. Assume you have 100 Moths in your Association at the beginning of a season and all want to find end of the season, no one with more or less than the other. You estimate that damage could occur to the value of 5 complete boats, so, to Association fees, or as a Call on members, you add 5% of the value of a Moth on each member. If, at the end of the season, your estimate is correct, the "pool" will have nothing in it and all boats will be in equal condition. If you under calculated, you will have to make a further call on members, (By getting an Insurance Company to "underwrite" it, this wouldn't happen)or let some members miss out. If you have over calculated them, you can make a refund to members or carry forward the surplus to the next season.

Without wishing to over simplify, that is basically what insurance is all about. The real financial risk as I see it, is the claim out of your control - Public Liability. If a Moth is damaged while racing it could be repaired by a financial "whip around of the hat" or by members volunteering their labour and time to repair it. However, what if a Moth sails too close to shore and accidentally hits a swimmer, injuring him for life or, while travelling, the Moth comes off the trailer and hits a pedestrian and legal action is taken for tens if not hundreds of thousands of dollars. Who is going to pay then? Public Liability Insurance is very cheap for what it covers and I would like to suggest if you do nothing else, you cover yourself for at least this. It goes under a variety of names - "Public Liability", "Public Risk", :Third Party" etc. If in doubt get your own insurance advisor to theck it for you.

There are many excellent Insurance Companies operating in Australia, indeed throughout the world, offering very good boat insurance policies. In the main, the premiums are comparable, cover similar with no excess and a 2/3 cover on sails and spars while racing. However, occasionally one finds a variation and could I suggest that neither the cheapest or dearest premium should be the deciding factor. It is what you get when you make a claim that counts. This is where the real money is involved. Again, your insurance advisor is the person to contact as, overall, each of us have different insurance requirements even though they In conclusion, may I suggest that because of the "pooling: effect of insurance, there is considerable merit in the I.M.C.A. (Aust.) considering appointing an "Official Insurer". This could (should) result in:-

- 1) Lower premiums to individuals.
- 2) The correct cover.
- 3) An income for the Association.
- 4) A sponsor for Titles.

As stated before, it may not be to the advantage of all to be involved in the scheme, but I'd be amazed if it didn't benefit the majority.

> Kevin Angove Vice-President I.M.C.A. (Aust).





a wolling thtone gatherth no moth

Hound Heights

This is probably an area which a lot of people don't fully understand yet which makes more difference to a boat's performance than just about anything else, assuming hull and sail design are good.

I will assume that the forestay heights affect fore and aft bend and the sidestays affect sideways bend. Actually, sidestay height has a noticeable effect on fore and aft bend. The heights will be discussed in feet, since these are readily identifiable.

Consider first a sidestay height of 11'. This is about the lowest practical height for these. The mast will tend to ben to windward at the bottom and lay off a lot at the top. This will suit a full sail with a large luff curve and a low roach. The problem with this is that the sail will tend to go best when the mast is bending adequately, but in light winds there is little mast bend, the sail will be too full and the drive too far forward. If a sail is used with inadequate luff curve to match the mast bend, when the mast does bend the sail will become too flat and is characterised by lines running diagonally from the mast towards the clew.

If a sail with a high roach is used with a mast that lays off at the top a lot, the top of the sail will not be held up properly and a lot of power will be lost. This is particularly noticeable off the wind where you need all you can get.

Consider next a sidestay height of 13'. This is probably about the highest practical sidestay height. Depending on the mast flexibility and taper, it will probably stand fairly straight, with perhaps a slight bend to windward at the middle. This type of mast bend will suit a slightly flatter sail, with less luff curve and a higher roach. In this case, instead of the mast bending to release excess power, the big top of the sail lays off. The sail will have a more constant shape in all conditions because of reduced mast bend. It will perform very well in light to moderate winds, with both speed and pointing ability. In stronger winds, however, pointing ability is sacrificed for greater speed. If a sail is used which

has been cut for a mast which bends a lot while sailing, the drive will be too far forward and the sail too powerful. Also, a low aspect-ratio sail will be too powerful since it will not lay off enough at the top.

As for the forestay, a good rule is to have it about a foot below the sidestays. If a high sidestay height is used, such as 13', a two foot gap may be necessary to induce a bit of fore and aft bend. Maximum fore and aft bend seems to be obtained when the forestay is around the middle of the mast.

For interest's sake, I tried a mast with sidestays 6 inches from the top. Pointing ability was terrible and speed was only reasonable. The excess power was mainly in the form of heeling moment rather than effective drive. This was accentuated by the need to flatten the foot of the sail to reduce power. As could be expected, the rig is excellent off the wind. Since this rig goes no better than a more conventional rig in light winds, it would not be worth using any time.

I hope this brief discussion will give a few clues to people who are uncertain about how to rig their masts. It must be appreciated that stay heights must be matched with mast flexibility and sail design.

GREG HILTON.



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Building

Too many people end up building Moths that fall to pieces! - this is not only a waste of time and money for the builder, but it is bad for the Class in general as many people think of Moths as toy boats, always being broken!

Many Mothies go all out to build a light hull and forget to put in basic structural members just for the sake of a few ounces (I could name a few). Light and strong boats can be built with a bit of careful thinking <u>before</u> you start building.

Most people just make it up as they go along and then patch it up as it falls to piences. This is sheer stupidity and can be avoided.

Before you start building it is worth finding someone that knows how to build a good boat and pick their brains.

A couple of good photos of a boat under construction is also a good move.

The next step, now that you are determined to build a good boat wit h heaps of thought is to pick a good design. Most of the top sailors in the country are sailing their own designs, some of these have plans available so pick the fastest design with the best set of building instructions.

Getting all the plywood and timber together is a big problem for most builders. One of my boats with 1.5mm decks, 2.0mm sides and 3.0mm bottom has a timber list as follows:-

Western Red Cedar (or similar timber)

Noseblock - lm 20 x 70mm Strongback Framing - 10m x 25 x 10mm Framing - 24m 10 x 10mm No. 1 frame (bow) - lm 10 x 70mm C/plate case framing - 3m 20 x 20mm Chines - 4 off - 3.5m 25 x 12mm Gunwhale - 2 off - 3.5m 20 x 12mm Mast strut - 1.5m 40 x 10mm.

Stringers use clear Oregon (or similar timber)

Bottom - 4 off 3.5m 20 x 10mm Deck - 2 off 1.5m 20 x 10mm Plywood must be top quality marine ply.

Decks 3 sheets 1800 x 900 x 1.5mm Sides 2 sheets 1800 x 900 x 2.5mm Bottom, frames. strongback. and usually S.W.P. Klinki) 4 sheets 2400 x 1200 x 3mm.

This timber list would not cover all types of hulls but it would do most of them.

A boat built using these materials should weigh about 50 lbs. (bare hull) or 60 -65 lbs with wings, which is light enough for all but the top skippers who are looking for that extra edge. If you are not a top skipper, bon't kid yourself, a superlight boat won't make you one, but a good, moderately light and strong one will give you the experience over a couple of seasons you need to become one. Too many sailors blame their boats for bad performances. when it is their own inability and inexperience that is failing them!

The basic tools required for construction are - Tennon saw, jig saw, smoothing plane, block plane (small plane about 4" long) spoke shave, 3/8 + 1" chisel, scraper, sander and a good stapler with plenty of 3/8 and $\frac{1}{2}$ " staples.

A flat dry and spacious working area is also needed (an air-conditioned living room is ideal with a good stereo and plenty of food and drink on hand - failing this a garage will do!).

I use epoxy products throughout building, coating the ply with it both sides before glueing on and using epoxy glue as well. This way, every part of the boat can be sure of being sealed.

Epoxy, being the only coating that can effectively stop the transmission of water vapour, seals and strengthens the timber and stablizes the ply, stopping rippling. Epoxy glues also don't stain the wood, are truely waterproof and can take high stresses for long periods. They are also gapfilling (which is good for many not so good moth builders). is not necessary if reasonable joints are made using epoxy glue!

On no account use polyester resin and fibreglass for anything that is under high stress or subject to vibrations or movement. Polyester resin is <u>not</u> recommended for sticking to timber (If in doubt ask the resin manufacturers).

A lot of thought must be given to avoiding putting joins in high stress areas if it can be helped. (i.e. under the mast area on the bottom ply).

I usually put the bottom on in one piece and just slit it down the centre aft of the centre case slot if the curve of the bottom is too much for the ply to take.

I always use scarfs in construction. Most people haven't got the confidence or patience, but it is really worth doing if you want a boat that will last. I use a 10:1 ratio which is more than is recommended for a scarf, but it has a bigger glueing area and it is easily worked out for varying ply thicknesses (i.e., 1.5mm ply, 15mm scarf). Even if the edges are a bit raggety it is a lot better than a butt join.

I use a small block plane for scarfing thin ply and doing fiddly jobs like fairing up the chines and fairing up the ply after it is glued on. - You can't accididently take too much off!

When building take your time and organise it so that you have plenty of time before the start of the season. Only use the best materials (within your budget) and products when building; because when you have finished the boat you want to forget about construction and concentrate on sailing. A skimpy building job will lead to skimpy sailing results!

JIM FRENCH.



Plans

The Australian Scow design is extremely popular because of its stability, ease of handling, superb performance and ease of construction. The method of construction as been refined over the years to make the boats strong, light and yet simple for the amateur builder.

Although most scows look very much alike, extremely small differences in shape have a devastating effect on performance and it is wise to build your first boat from a standard set of plans. The following list of plans are available from the addresses listed and the comments are made to assist you in deciding which is the most suitable to construct. Most scow designs suit skippers from 8 to 13 stone.

 <u>Snubby</u> - designed by Peter Moor.
Probably the most popular design over the last six years. Known for its distinctive chisel bow and good all round performance, it is easy to build and has complete construction notes. Recommended and sold by N.S.W. Moth Association.

Full size framing drawings, construction details and construction notes ...\$15.

Contact Peter Morrison 'phone 02-812662 or write to I.M.C.A. Plan Sales, G.P.O. Box 611, Sydney. 2000.

2) <u>Red Ned</u> - designed by Cliff Burton. Currently the most popular West Australian design it is best suited to flat water and strong breezes. Reasonably complete plans are available from Cliff Burton ...\$20.

write to Cliff Burton,

46 Tranmere Way, City Beach. 6015.

3) <u>Bunyip</u> - Current Australian Champion designed by Gregory Hilton, it is an excellent all round performer.

Offsets and materials list only available ...\$5.

write to Gregory Hilton, 4 Hawkins St., Mt. Pleasant W A 6153 4) <u>Magic Fish</u> - designed by Ian Outhred Curremtly 3rd National Championships is another good all round design with excellent light weather performance.

Full plans, construction notes available\$20.

Contact Peter Lamb, 43 Abingdon Road, Roseville, N.S.W.2069. 'phone 462107.

5) French Cut - designed by Jim French it is similar to the Red Ned design but performs best in light airs.

Excellent Plans and construction notes are available from Jim French for ...\$20

Contact Jim French, 6b Braeside Drive, Braeside Vic., 3195 'phone 03 - 5871204 (bus)

 <u>Effanineffable</u> - designed by Ian Ward. Good all round design, excellent light weather performance, 2nd in current World Titles. Offsets and materials list only,

Available from Ian Ward, ...\$5. 22 Hopetoun Ave., Mosman. 2088. 'phone 02 - 9696757.

7) <u>Skiffs</u> - Many skiff designs are available from both European and Australian designers. Although extremely fast in light airs, they have not proven to be suitable all round performers in Australian conditions. Contact your State Moth Association for further details.

8) European skiff plans such as 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 Ave., Potts Point. 2011. 'phone 02 - 3583437.

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 lee 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 m³) 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 m² 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.

Future?

In 1946 the ultimate in Moth design was the Mark II scow. It was unbeatable and no-one at the time could imagine anything to be faster. Since then bendy masts with rotation and even over-rotation have been developed and moulded and even multi-chined hulls built. The question now is, where do we go from here? Well it is pretty well up to what your imagination, combined with a little judgement can come up with. There are still solid wing masts and super-narrow skiffs to play around with, but maybe we can stir the imagination a little further with a glimpse of the latest innovations of the Bowen brothers from Seaforth. Both John and David raced successfully in Moths through the years 1962 - 1967; John winning two N.S.W. State Titles. They have both returned to Moths recently and this is what we saw!

John's Windsurfer Moth is currently registered and has shown good potential in stronger winds. The board originally weighed just 181bs, including the pivoting fin and has a 70 square foot square top sail.





David's Moth, just launched, weighs 55 lbs and is made from sheets! Yes, cotton sheets stretched over a wooden frame, soaked with resin and glassed on the outside. The rig is something altogether different, having a full walking stick mast, pocket luff sail, no battens and stays meeting the wishbone only three feet above the deck.

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All those people who contributed articles and helped in production this magazine.



"A plywood, 1.2mm in thickness? Yes, sir. Cemac's Superthin Seaply is available in 1800 x 900 sheet size from any of the Home Carpenter Centres."

This is typical of questions and answers which are becoming more and prevalent every day as the word spreads throughout the boating fraternity re Cemac's Superthin Seaply.

Superthin is not really a new product in the Seaply range and has been manufactured for some six years. However, in the last two years skiff builders have awakened to its unique properties such as its high strength and pliable nature. A sheet 1800 x 900 will almost take a full compound curve.

As previously stated Superthin is manufactured in the sheet size 1800×900 . This is basically due to the high specification requirement for the face veneer, thereby restricting the length to 1800 mm.

Speaking of veneers, Superthin is manufactured from first class Coachwood veneer peeled at our own Mill at Yarras, just outside Wauchope. Complete quality control is maintained from the basic log through to the finished article, ensuring that the Superthin conforms with Australian Standard 2272-1979, covering Marine Plywood.

Superthin is available ex stock in three thicknesses: 1.2mm, 1.5mm and 2.5mm from all Cemac Home Carpenter Centres.

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AUSTRALIAN INTERNATIONAL MOTH



Blasting into the eighties



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