

OCTOBER 1978 40p

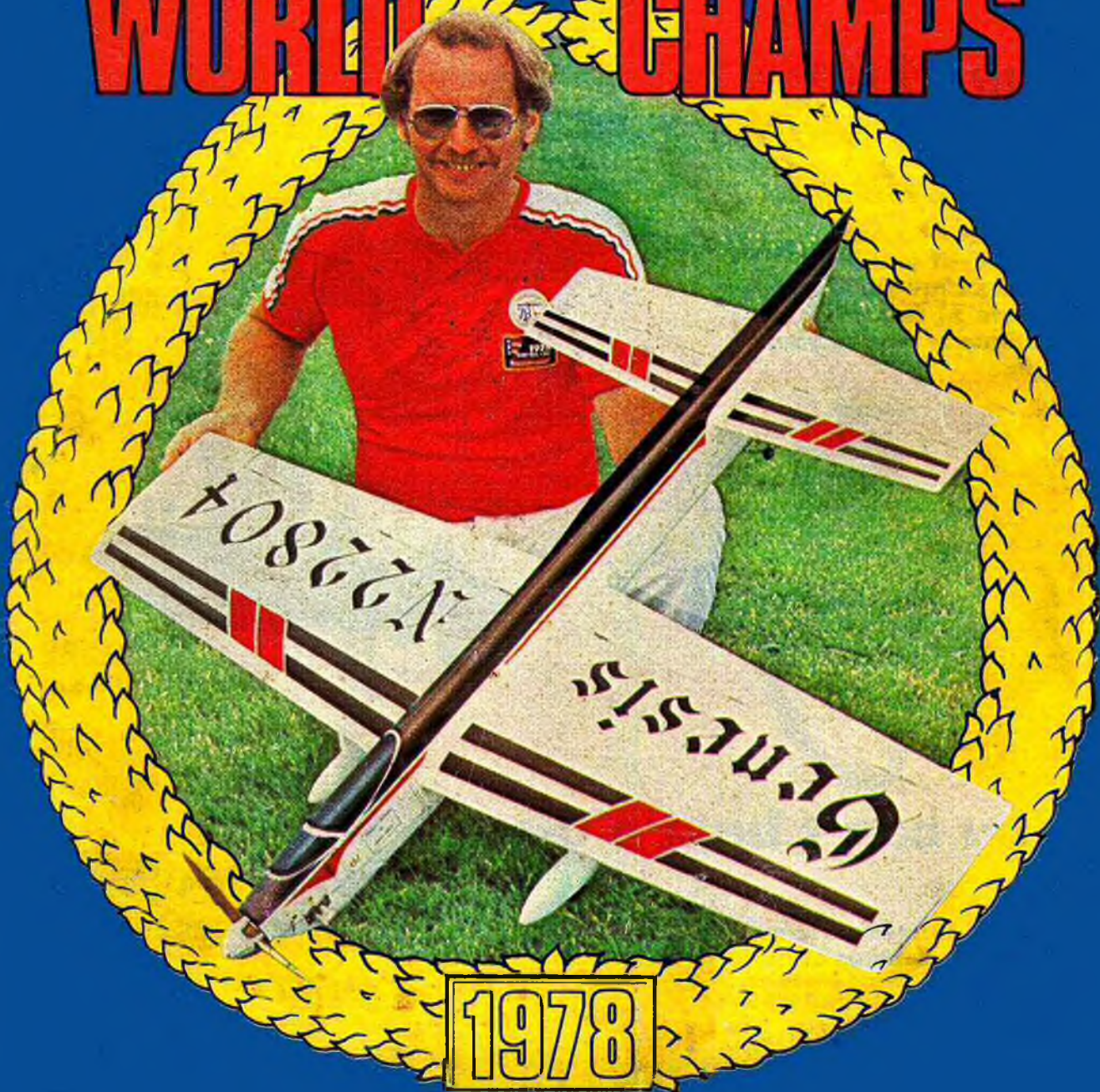
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Aero Modeller

WORLD CHAMPS

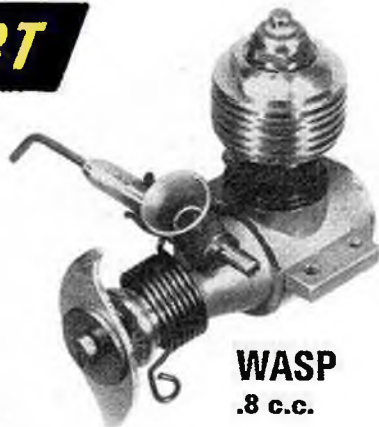


1978

QUICKSTART

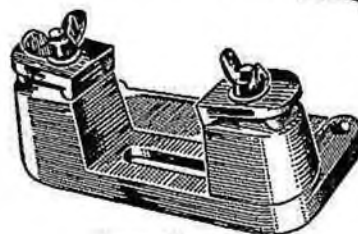


DART
.5 c.c.



WASP
.8 c.c.

Control-line
handle



Test Stand



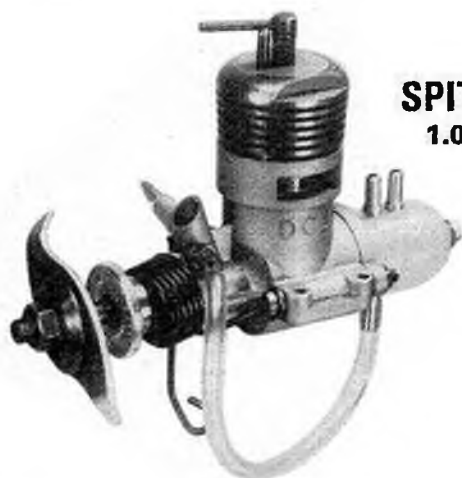
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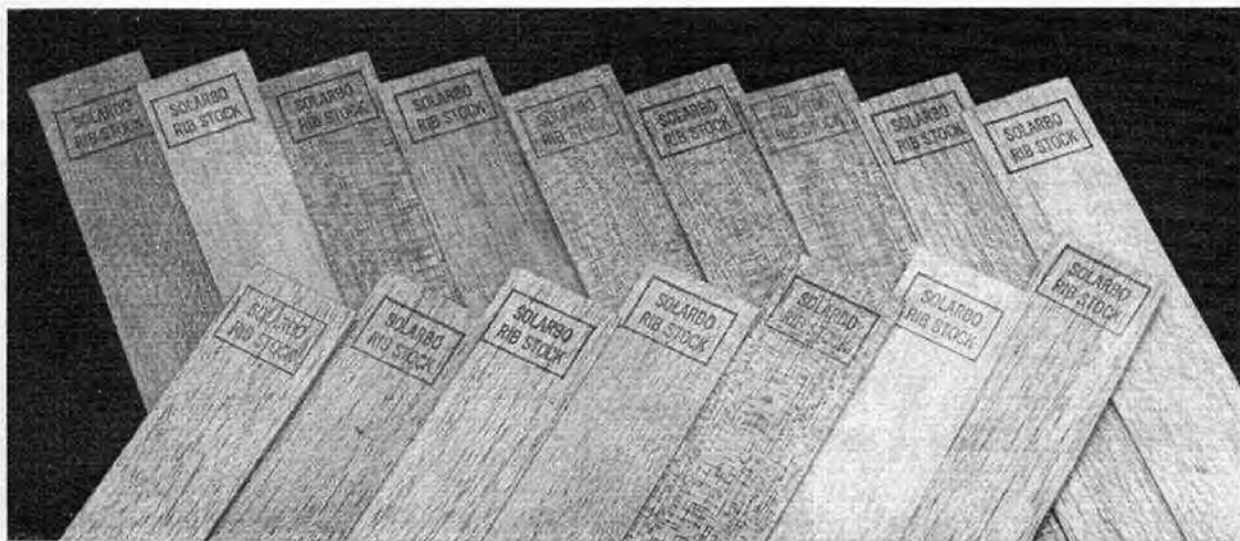
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SOLARBO

**DATA
SHEET**

RIB STOCK



This Data Sheet shows the standard sizes of Solarbo Rib Stock, extra-wide sheet (42in. long), and 48in. long sheet. All new sizes which have only been introduced this year.

Rib Stock is all quarter-grain sheet Balsa. No longer do you have to sort out this 'cut' from the sheet stocks in the balsa rack. Just look for the stamp SOLARBO RIB STOCK. For light airframes you will probably be using soft sheet for ribs. If you prefer to weigh in ounces rather than grams, really light (6lb density) works out at $\frac{1}{4}$ ounce for 2in. x $\frac{1}{16}$ in.

42in. long Balsa sheet has been specially introduced to ensure a regular supply of **extra wide** sheet. That saves joints when covering wing cores.

Extra long Balsa sheet is again very useful for those larger fuselages (and wings). Here to ensure consistency of supply in **all** thicknesses we have standardised on 3in. width.

'Soft', 'Medium' and 'Hard' represents our standard method of grading by density. 'Soft' is 8 lb/cu ft or under. 'Medium' is around 10 lb/cu ft. 'Hard' is 12 lb/cu ft or over. Weights are given in grams in the Table to match the calibration of current letter balances.

RIB STOCK (all quarter grain sheet)	soft	medium	hard
36 x 2 x $\frac{1}{16}$ x $\frac{3}{32}$ x $\frac{1}{8}$	10 or under 15 " " 20 " "	12 18 25	15 or over 22.5 " " 30 " "
<u>42" sheet</u>			
$\frac{1}{16}$ x 4 x 5	22 " " 28 " "	28 35	34 " " 42 " "
$\frac{1}{8}$ x 4 x 5	44 " " 56 " "	56 70	68 " " 84 " "
$\frac{1}{4}$ x 4 x 5	88 " " 112 " "	112 140	136 " " 168 " "
<u>48" sheet</u>			
$\frac{1}{32}$ x 3 $\frac{1}{16}$ x 3 $\frac{3}{32}$ x 3 $\frac{1}{8}$ x 3 $\frac{3}{16}$ x 3 $\frac{1}{4}$ x 3 $\frac{3}{8}$ x 3 $\frac{1}{2}$ x 3	10 " " 20 " " 30 " " 40 " " 60 " " 80 " " 120 " " 160 " "	12 24 36 48 72 96 144 192	15 " " 30 " " 45 " " 60 " " 90 " " 120 " " 180 " " 240 " "

Table shows weights in grams

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8in. dia. x 6in. pitch	...	55p	11in. dia. x 5in. pitch	...	86p
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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

October 1978

Volume XLIII No. 513

CONTENTS

HANGAR DOORS	545
THE TURNING MODEL	546
MODELLERS MAILBAG	549
LATEST ENGINE NEWS	550
TRADE TOPICS	552
TOPICAL TWISTS	554
WOODVALE WORLD CHAMPIONSHIPS	555
MODEL PHOTO COMPETITION	573
FREE FLIGHT SCENE	574
CLUBMAN	579
CONTEST CALENDAR	582



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Comment

By hosting two World Championships within the month of August, the S.M.A.E. set itself an enormous task. The contrast between the two meetings was considerable. Woodvale, stressed to the limits of administrative capability, involved 10 times the personnel at Cardington. One could be critical and say it was like proceeding from the disorderly to the orderly, but though there is a ring of truth to that statement it is an unfair assessment. Each of these great meetings had their own characteristics, their own particular excitements, drama and success stories. Woodvale is covered in this issue. Cardington concluded as we go to press so all we can bring the readers at this time is the news that the individual winner Jim Richmond (USA) set a new "high" with his flight of 42:53. Our British team won the Langley Trophy only after team honours had passed from Japan to Canada and then ourselves, with the USA in close pursuit. Many National records were broken in the big airship shed. Among them, Nonaka (Japan) 40:36, Siebenmann (Switzerland) 37:30 and Kmoch (Yugoslavia) 37:05. There were many other personal best-ever achievements, the full story of which will appear in next month's issue.

1. J. Richmond	USA	41:49+42:53
2. B. Romak	USA	40:55+40:27
3. R. Higgs	CANADA	35:16+39:44
4. D. Siebenmann	SWITZERLAND	37:23+37:30
5. L. Barr	UK	37:23+36:34

1. UK	..	..	..	..	218:27
2. USA	..	..	..	..	214:25
3. CANADA	..	..	..	..	212:52
4. JAPAN	..	..	..	..	210:38
5. POLAND	..	..	..	..	205:21

14 NATIONS COMPLETED

on the cover

Bobby Hunt once again proves USA is the top Aerobatic Nation by winning individual first place and top team prize at Woodvale C/L World Champs. Full report of meeting and details of Genesis inside.

next month

Another World Championships in England, this time for indoor models, flown at Cardington, full report. More aeronautical information on how models fly. Special feature on kite flying and more reports on current vintage activity. Plus all the regular features news and views on model flying. On sale October 21st - don't miss it!

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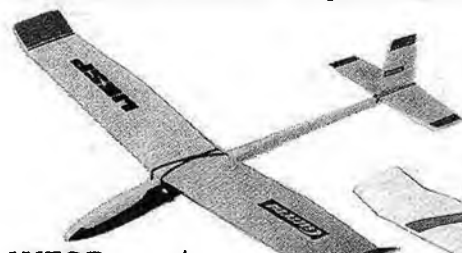
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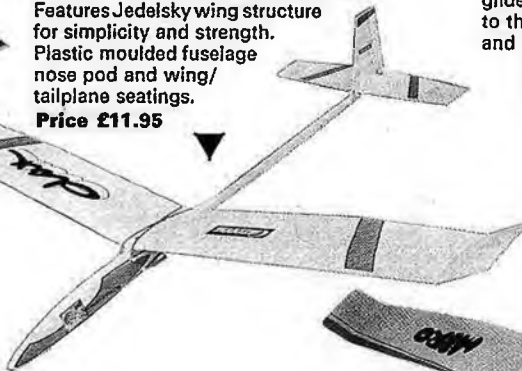
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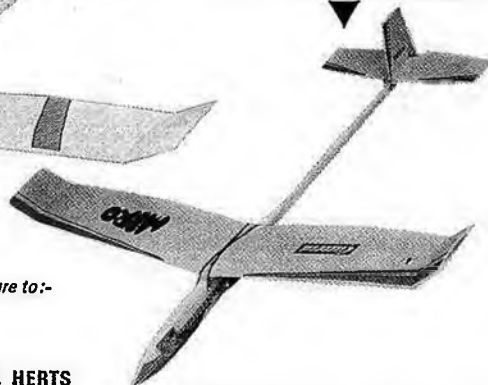
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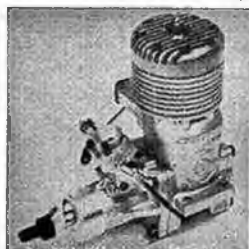
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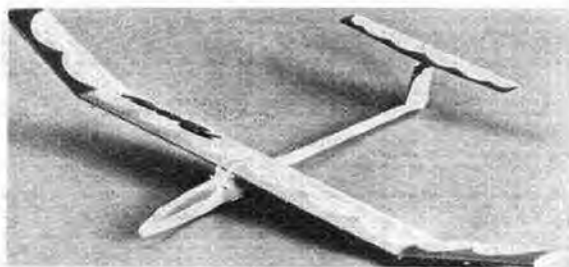


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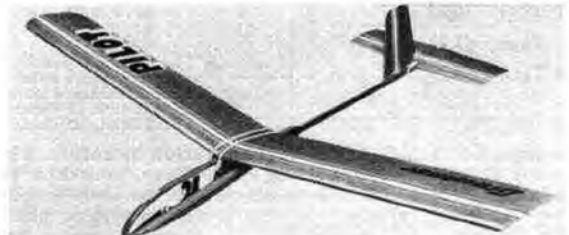
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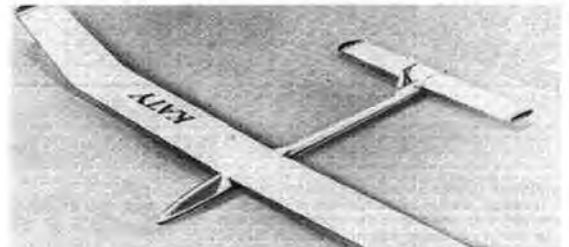
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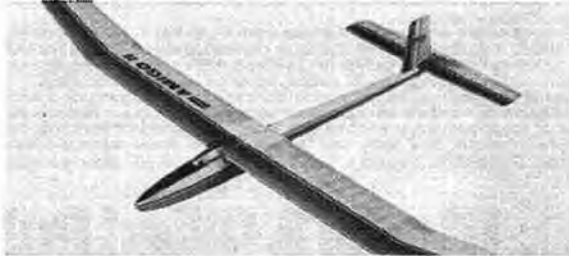


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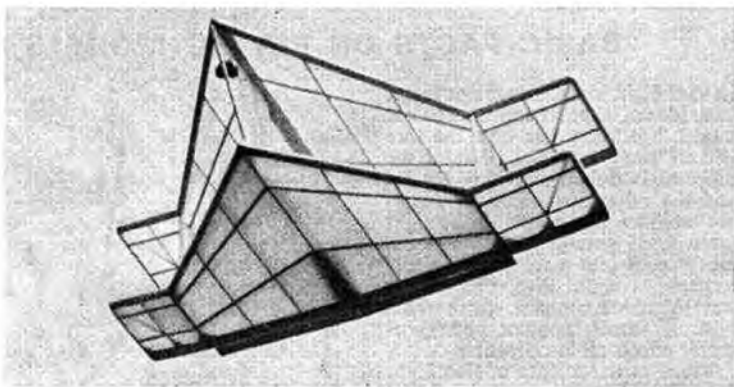


Heard at the HANGAR DOORS

ALFRED LEDERTHEIL, the doyen among German model publishers, passed away on 15th July, aged 66. His was a full life dedicated to aviation and particularly the encouragement of youth. From the mid-30's when he was instructing young modellers and when he became a firm friend of other great personalities, Messerschmitt, Lippisch, Ursinus, Dittmar etc., he was identified with aero-education. With his wife, Beate he established a publishing house for technical books and magazines which grew in stature over the past 30 years to one of the most influential information sources in Europe. The Plans Service, books and regular monthly "Flug + Modell-Technik" were sold to new owners only last year. It seems such a pity that after so many years in the service of others providing an influential leadership that he should have had so little time left to relax and enjoy the results of his labours.

Alfred was very much a Father figure, always humorous and strong on matters of principle. His integrity was impeccable and his guiding hand remains clearly evident in the standards of the German model press today. Our sympathies go to his widow Beate, daughter Monika and son-in-law Jerry Nelson.

NFFS MODELS OF THE YEAR have just been announced and each represents the zenith of achievement in its own class judged over the past twelve months. The technical details and scaled down plans always form an important part of the National Free Flight Society's Annual Digest, filled with the latest ideas for enthusiasts. The 1978 list includes the following: F1A Nordic - Andres Lepp (USSR) A1-29, F1B Rubber - Kim Dong Sik and Team (N. Korea), F1C Power Thomas Koster (Denmark) *Speed Cream*. Large Power - Ed Bellinger *GYSOB* (Class C), Small Power - Tom Hutchinson *Maverick* (1/4A), Rubber - George Perryman - *Great Speckled Bird*, Indoor Rubber - Jim Richmond - *Cat Walker*, Indoor HLG - Stan and Mike Stoy *Coot*.



Oxford Boys Schools entry in the Alcan 78 Award Scheme was a model glider for the year 2000.

1979 WORLD FREE - FLIGHT CHAMPIONSHIPS. Recent news that the Yugoslav team for this year's World Gliding Championships at Chateauroux, France, has withdrawn because of the planned participation of a team from South Africa casts doubts on their offer to host the 1979 World Free-Flight Championships at Zagreb.

As we reported in the February 1978 *AeroModeller*, the Rumanian offer to hold this year's World Indoor Championships in the salt mines at Slanic was accompanied by a request for an assurance that no team from South Africa would be taking part, and as a result had to be rejected by the December plenary session of the CIAM in Paris. The statutes of the FAI are quite explicit that world championships in all branches of sporting aviation must be open to all member nations of the FAI; in 1967 the Czech government refused entry visas to the Israeli team for the F/F Championships at Sazena, and that contest was, as a result, later 'demoted' from the status of a World Championship by the FAI.

With this in mind, one hopes that some of the other nations active in free-flight will come to the CIAM meeting in Paris in December with workable offers to hold the '79 Championships; there will certainly be no time to make arrangements from scratch starting then if the Yugoslavs drop a bombshell by attaching political provisos to their offer only six months before the planned date in May. Perhaps one way round the problem, even if a long term one, would be for the FAI statutes to be altered to come into line with those of the International Olympic Committee.

ALCANS AWARDS SCHEME 78. A unique partnership between industry and local education authori-

ties, attracted entries from 42 secondary schools in the Oxfordshire area. The awards are primarily concerned with craftsmanship and non commercial projects, with groups of senior pupils competing for prizes totalling nearly £2,000. Oxford Boys School was one of several entries who chose model aeronautics as their subject. Five pupils lead by Donald Leask set out to design a futuristic shaped glider with safe stalling characteristics which they developed through a series of smaller experimental cardboard prototypes. Flight tests were performed to discover load carrying potential, stall characteristics and crash resistance. The final design named Moon Hawk consists of a biplane delta with low speed tips, a feasibility study was made with regard to marketing the model.

PEN PALS in their early teens are requested by Andrew Carlile who wishes to trade information, drawings, sketches, photographs and ideas, his interests being mainly scale aircraft. Write to Andrew at 72 Kwarren St., North Balwyn 3104, Melbourne, Victoria, Australia.

MAG-PAM. Ron Firth will be well known to our readers for his Model Aeroplane Gazette, an enthusiast newsletter for Free Flight and R/C Soaring fans. More recently Ron has been developing a similar newsletter for plastic kit modellers that has now resulted in a very well produced A4 size magazine titled *Plastic Aircraft Models*. Recent issues have dealt with details and markings of full size aircraft, plastic kit reviews and news of vac-form models and the magazine includes some colour illustrations. Subscription is £4.50 for 6 bimonthly copies, from PAM NEWS, 22 Slayleigh Ave., Sheffield S10 3RB.

THE TURNING MODEL

BASIC FACTS ON FLYING MODELS by LEN RANSON

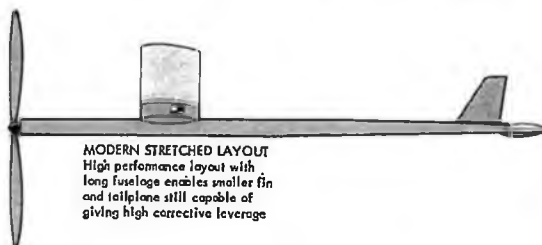
In level flight we have, more or less, a clear idea of what is happening to our model. We know just how the fore and aft trim is arranged, what job the dihedral is doing, and how the fin and the other directional influences are holding the model in straight 'even keel' passage. But when the model goes into a turn, or less fortunately, a spiral dive, then things start to become complex, with a whole host of forces, couples and gyroscopic effects all in operation.

Much of the science of free flight flying is bound up in getting a model to turn in just the right way. This particularly applies to rubber models where a high initial torque can only be controlled by turning the model (normally to the right) in what is hopefully a safe, climbing posture. Without such turn the model would either loop or require a considerable amount of downthrust, or it would either exhaust its power against the wind or bat down without gaining appreciable altitude.

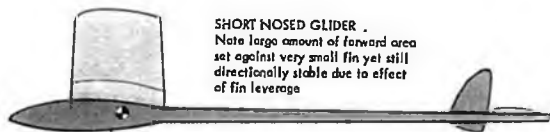
It was quite early discovered that large propeller models impart a high degree of torque to the model. This torque is in the opposite direction to the propeller's rotation, and there-



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SHORT NOSED GLIDER
Note large amount of forward area set against very small fin yet still directionally stable due to effect of fin leverage

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fore, tends to turn the model to the left as you launch. What may seem a disadvantage can, however, be nicely utilised to form a stabilising couple. If we set the rudder or the thrust line to oppose this turn we get two effects in opposition. And there is a bonus here for the torque helps to keep the right hand wing up as the model turns to the right. If we look at a well trimmed rubber powered model we see it turn out of wind still holding its 'even keel' climbing posture; excess banking leads to loss of attainable altitude, and if the turn tightens up in lift as so often happens, a spiral dive can result.

In going for our right turn, though, we come up against an unwanted effect that derives from all airscrews, but seems to be more noticeable with large, rubber model propellers and that is gyroscopic effect. Hold a toy gyroscope with the axis horizontal and pointing away from you in your two hands and move it about. You will find that if you rotate it to the right you get a rather sudden forceful motion, point downwards. A propeller acts similarly, and the critical moment at which the model encounters this danger is in making its initial turn from launch. That first burst of rubber power is quite energetic, and if the model isn't to surge up into a stall the turn must come early and be

fairly sharp. Control of this initial burst of power is one of the most difficult aspects of trimming a high performance rubber powered model.

For many years 'spinning in' was taken to be one of the accepted hazards of contest flying; highly powered models being particularly vulnerable in a level attitude close to the ground. When, however, the rog rule was universally discarded, high angled launching techniques were adopted. This helped to reduce the gyroscopic surge, although it still presents some hazard.

Back in the fifties, and even before, it was commonly believed that the lowering of the side areas of the model would help to keep it stable in a banking turn, and twin sub-fins on the tailplane, or anti-spin fins as they were called, was thought to be an effective answer to the spiral dive. Some designers even put huge under-fins on the fuselage, which also took up cross section area in conforming to the fuselage ruling. One such model, designed by Ted Evans and flown by Roy Chesterton, won the Wakefield Trophy in 1948. Curiously enough, a voguish modern practice is to fit triple fins to the model instead of the conventional single fin. Models thus equipped do seem to demonstrate a smooth, climbing turn, even though it seems to be resurrecting an

old idea. A major effect in a tight turn is due to the outer wing flying faster than the inner wing which rolls the model into the turn progressively increasing bank which can lead to a spiral descent.

Possibly the best correction to excess banking over in a turn, is a method popularly used over the last ten years or more; that of washing in the inner wing. Wash in means warping the wing to give more positive incidence. Thus the wash in tends to correct, allowing the inner wing to generate more lift and thus to keep it up so that the bank is steady rather than progressively increasing.

One noticeable feature of any free flight model is the accentuated dihedral or polyhedral of the wing – far more than you would see on any full size craft. Indeed, it is not unusual for a high wing monoplane such as an Islander, to have a completely flat wing (setting a nice aeronautic poser). Now the non-controlled model requires more inherent stability, and would be critically susceptible to instability in a sideslip but for the countering effect of dihedral. But too much dihedral, as indeed too much of any kind of correction, can be self defeating. Such a model will encounter another instability – the Dutch Roll – and tend to wallow around rather than put in a positive sort of



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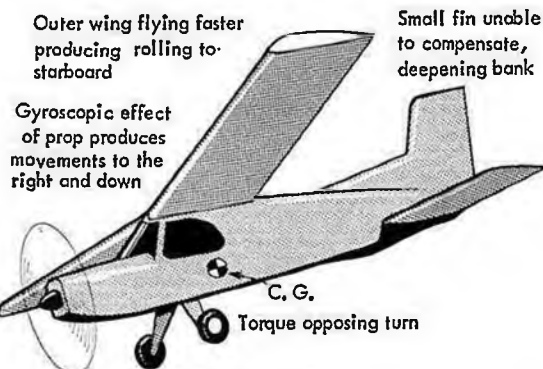
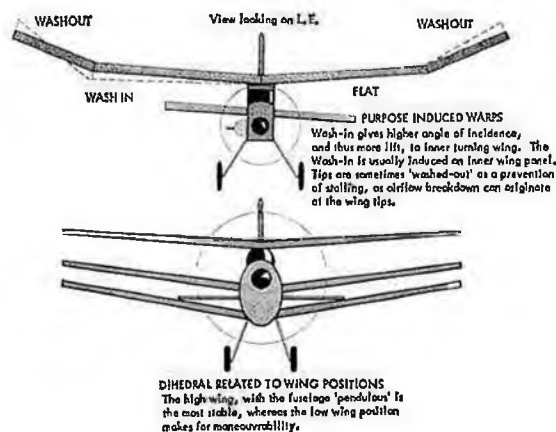
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flight. It is all a question of striking a happy medium.

Another factor much involved with the turning model is one of design rather than trim; the disposition of the side areas. And, here, theoretically, the picture is more than somewhat obscure. It was fashionable in the old days to trot out the old weathercock analogy and something called the centre of lateral area. These indicators may have served as a rough guide, but any exact calculation was difficult because of the somewhat nebulous contribution of the wing dihedral and the changing profile as the model banked. Then, as models grew longer, particularly from the wing back, the leverage exerted by the fin became more marked, and consequently, fins, along with tailplanes, shrunk in size. The leverage effects of such projected areas seem to make nonsense of the old idea of balancing a silhouette of the model on a pin. Based upon the old estimation of lateral area distribution the modern A/2 just should not be flying.

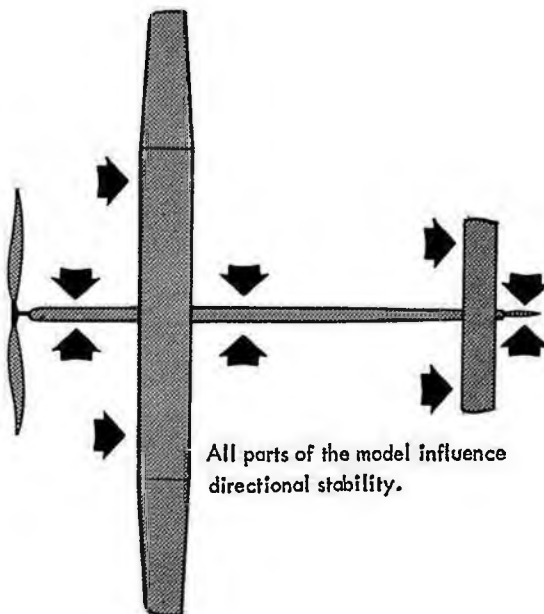
It is fairly safe to say that few model designers work out the side areas by calculation; mostly it is done by the empirical method, that is by adopting what has been successfully and consistently done before. This applies, too, to how the proportioning above and below the datum line is arrived at. The modern model has much less lateral area than its old counterpart but is no less stable as a result. All things being equal it would appear that a nicely judged quantity of dihedral, or polyhedral, and fin area, is the main factor in making for good lateral stability and a safe, climbing turn. Previous mention of the minimal or nil dihedral required on the full size high wing monoplane is a reminder here that the areas below the high wing act as dihedral by inducing a wing rolling moment in a sideslip. Now think of the opposite effect of a fuselage mounted above the wing as in the low wing monoplane, and you can see why such craft require larger amounts of dihedral.

A possible way of achieving a natural turn is by asymmetry. This method is not too acceptable as it offends against the aesthetic sense which likes fair proportion in all things. Even so, the 1968 Wakefield winner, Samaan, was bold enough to venture forth with a slightly slewed wing. The tilted tailplane is now an accepted way of getting a glide turn without appreciable effect on the power flight pattern. Logically, unequal wing areas could be a way of countering the spiral – just one of the many interesting possibilities that still exist in model aeronautics.



THE TURNING MODEL

Inner wing flying slower produces rolling to starboard - countered by 'wash-in' if applied. Dihedral acts to prevent slip into turn.



MODELLERS' MAILBAG

Dear Sir,

When a competitor in a National Final can win with the slower machine and fourteen laps behind with half the race still to go, a situation has been created that requires some rapid correction. If the objective of our sport is other than to find, in direct competition, the fastest machine-team combination, then I cannot understand why we were at Barkston Heath at all, ERNI would have been a far better solution.

A competitor can now cheat his way to victory by judicious use of his two warnings, waiting for the tactical last moment to fly high or whip past the post, all this being aided and abetted by the rule book.

The question now arises, what to do about it? The answer was presented to us by Willoughby in the letter you published relating to his trip to the American Nats, i.e., one warning, one penalty lap, but no disqualification; this way the penalty fits the crime, you steal an advantage and you will have it taken away. The essential part of racing remains that the fastest man must win, and this is the only justification for racing at all.

Beeston, Notts. H. Wilson

Dear Sir,

With reference to your article in June *AeroModeller* entitled 'There's a place for you on your local Sports Council', my Club joined the Huddersfield Sports Council when it was first formed despite objections from various other organisations. However, in order to make sure our voice was not heard we were never informed when or where the meetings were held. Two years ago another local Sports Council held an exhibition at which they asked if your sport was not represented, to fill in a card giving your name and address and any other details. The result was we never hear anything at all. Last year our Secretary wrote to the SMAE asking for help in tackling the local council about a flying field and again, although we got a reply, no help was forthcoming. Early this year we contacted a local MP and as a result we now have the use of a school playing field three days a week. I have no wish to decry SMAE but please do not make it appear that someone is just waiting to solve any problem that comes along.

Honley, Huddersfield L. T. Hirst

Dear Sir,

With the greatest respect to Mr Hirst, he is either being unfair or has misread the article. We only claimed that joining the local Sports Council could help materially – and we could

quote several cases to substantiate this. But you don't get results simply by joining! You have to attend the meetings and keep pushing in a diplomatic way. If you don't get invited to the meetings then there are surely obvious ways to rectify that. Did you really wait two years without checking where the invitations were?

On the matter of the letter to the SMAE, if Mr Hirst will give some more details we will happily check it further. Our current file of cases where we are giving positive help to clubs seeking sites exceeds 15 around the country and we can refer Mr Hirst to any of these to check independently the quality of our help.

We know it's good – and we will be happy to extend it to Mr Hirst's club if he will permit us to identify his club and the details of the earlier letter.

SMAE Chairman Ray Favre

Dear Editor,

Most people build at least one scale model, mostly to fly only, accuracy not important. Hence your sales figures, I'd say.

Where are the other types that are less modest. Certainly some of the less modest types belong to Grimsby and District MAC. The Free Flight Section (we have others) is largely competitive, nationally and inter-club. Quite naturally when we turned to scale we had to compete (old habits die hard).

Over the last four or five years the Grimsby Club have competed at Cardington, mostly in Peanut with a 1st place this year and several other minor placings. We also had a joint 2nd place in Open Scale about three years ago and minor placings with Peanuts in the same event.

Why Peanuts? Probably time element is important. Cost also is low. Plenty of kits and plans about. Small, easy to carry, easy (!) rules. Also easy to judge which is why we have indoor Peanut competitions in the club.

In my case, one kit model, one of your plans, two scratch built, a Chester Jeep and two Lovings Love.

For the future, several designs on the board, playing with commercial gear box. Would like to see an article on small gear boxes for Class 2 Scale Rubber.

Looking forward to more plans (with hint of documentation).

Cleethorpes, R. Robinson

Dear Sir,

Your opening question in August 1978 *AeroModeller* should have asked "what can be done by the various governing bodies such as ourselves and the SMAE to encourage the building and flying of free flight scale models?"

You mention a mere handful of models taking part in this year's Nationals. This should indicate that it is perhaps the existing rules that are the reason for such a low entry. The rules as they stand call for museum-like craftsmanship and this must deter many scale builders who, nonetheless, build many fine models but they can really only fly for fun. Have the SMAE or yourselves ever seen a Rubber Powered Free Flight Scale Comp? I can hear the official reply, there isn't the demand. To which I would counter – have you ever asked?

Even the new Class II rules do very little to encourage new competitors to come forward. They simply ease the judges task.

As for the Model Engineer Exhibition, displaying a free flight scale model can be a risky business. Several years ago I entered two scale models only to collect them at the end of the exhibition, damaged and covered in grime.

You mention the Old Warden All Scale Day. It is very true there is always a good response. I have taken my models such as they are, to every meeting. However, over the years more and more space is given to R/C, and F/F Scale are banished to some corner; this is bad enough but when hordes of spectators with prams, dogs and screaming kids arrive, Free Flight becomes Free Fright.

I have been an aeromodeller for nearly forty years. However, I have only been interested in Free Flight Scale since the early sixties. The scale aspect was more of a challenge especially models of the pioneer aeroplanes. My latest is a 1/18th scale Rubber powered 1911 Bleriot Canard. It flies very slowly and only flies on warm calm evenings!! I hope to try ROG's at the Cardington sheds later this year. On the building board I have a 1909 Voisin; this is CO₂ powered but will not be ready until next season. Whilst on the drawing board I have just finished scaling up the 1919 Breda Pensute.

Hatfield, Herts. John Blagg

The August comment was provocatively written in order to stimulate debate and discover ways we can help and encourage the majority of scale flyers. Perhaps the challenge fell on deaf ears as very few scale fans wrote offering any ideas.

Do the Scale rules need amending or are fly for fun meetings a better option than contests?

For next year's ME Exhibition where practical, all exhibits will be inside Perspex cases to prevent dust and damage, and collection points are being arranged for modellers living too far from London.

The Editor

Latest Engine News

by Peter Chinn



HGK engines will shortly be available in the U.K. Ranging from .15 cu.in. to .45 cu.in., all have Schnuerle scavenged, chromium plated, cast aluminium cylinders. Shown above is the lowest priced model, the HGK-15 plain bearing front induction motor.

HGK Engines

We have been advised by Roy Greaves of Eurapex Ltd, best known as the UK distributors of the West German range of Robbe model products, that they have arranged to import and distribute the HGK engine range in the UK.

HGK first came on the scene in Japan some time ago with a 2.5cc Schnuerle scavenged rear exhaust, rear rotary-valve twin ball bearing C/L speed engine. With this, HGK introduced a form of construction, new to commercial model engines (but well known in full size circles), that employs a cast aluminium cylinder with a chromed bore instead of a separate liner. From this, a number of other 2.5cc and .20cu.in. (3.26cc) units were developed, all using chromed aluminium cylinders, for C/L speed, free-flight and R/C use. More recently the HGK range has been further expanded and a number of new and larger models of up to .45cu.in. are now being put into production.

The range is, in fact, reaching somewhat confusing proportions so, for the record, this is how it stands at the moment: (All engines feature Schnuerle scavenging and all have twin ball bearings with the exception of the 15 MkIII. All have side exhausts except the 15-R. Weights quoted here are manufacturer's claimed figures.)

HGK-15R. 15 x 14mm, 2.474cc, 0.1510cu.in., rear rotary disc valve, rear exhaust with tuned pipe for C/L speed. Weight 210g (7.4oz) including pipe.

HGK-15SF. 15 x 14mm, 2.474cc, 0.1510cu.in., front rotary valve.

Weight 182g (6.4oz). Also available with R/C carb. Weight 185g (6.5oz).

HGK-15SR. 15 x 14mm, 2.474cc, 0.1510cu.in., rear rotary disc valve. Weight 210g (7.4oz). Also available with R/C carb. Weight 213g (7.5oz).

HGK-15 MkIII. 15 x 14mm, 2.474cc, 0.1510cu.in., bronze bushed main bearing, front rotary valve. Weight 185g (6.5oz). Also available with R/C carb. Weight 188g (6.6oz).

HGK-20SF. 16.1 x 16mm, 3.257cc, 0.1988cu.in., front rotary valve. R/C version only. Weight 198g (7.0oz).

HGK-20SR. 16.1 x 16mm, 3.257cc, 0.1988cu.in., rear rotary disc valve. R/C version only. Weight 222g (7.8 oz).

HGK-21SF. 16.3 x 16.7mm, 3.485 cc, 0.2127cu.in., front rotary valve. R/C version only. Weight 215g (7.6oz).

HGK-21SFC. R/C car version of 21SF with heat-sink head and extended carb intake with filter. Weight 265g (9.3oz).

HGK-21SR. 16.3 x 16.7mm, 3.485 cc, 0.2127cu.in., rear rotary disc valve. R/C version only. Weight 210g (7.4oz).

HGK-21SRM. Marine version of 21SR with flywheel and water-cooled head. Weight 345g (12.2oz).

HGK-40SF. 21.1 x 18.6mm, 6.504 cc, 0.3969cu.in., front rotary valve. R/C version only. Weight 360g (12.7oz).

HGK-45SF. 22.4 x 18.6mm, 7.330 cc, 0.4473cu.in., front rotary valve. R/C version only. Weight 360g. (12.7oz).

HGK-45SR. 22.4 x 18.6mm, 7.330 cc, 0.4473 cu.in., rear rotary disc valve. R/C version only. Weight 390g (13.8oz).

HGK-45SRM. Marine version of 45SR with flywheel and water-cooled head. Weight 555g (19.6oz).

How to Photograph an Engine

When collectors send photos of engines for identification, it is helpful if those photos are reasonably clear. An out-of-focus shot against the garden wall or sitting-room carpet is not too helpful if the engine concerned is of very obscure origin that we do not recognise, whereas a good picture can be published and can give other readers a shot at identifying it.

A few hints on photographing engines may, therefore, be helpful. First, background. The simplest solution here is to use (on a table or bench top) a sheet of white card, say 20in x 30in, curving it upwards at the back and supporting it so that, when viewed from slightly above the horizontal, the entire engine is outlined against the plain white background. Have the camera mounted on a tripod and get as close as you can to the engine while remaining within the minimum focusing distance of the camera being used. With a 35mm single-lens reflex camera (possibly the best 35mm type for this purpose) it is usually possible to get down to about 18in, or even closer by using extension rings. With other types it may not be possible to focus much closer than about 3 feet; which means that the image is going to be rather small unless you use a close-up supplementary lens. (These are not too expensive, incidentally.)

Stop the lens down to the smallest available aperture (usually f16 but sometimes f22) in order to obtain

maximum possible depth of field and expose accordingly. An exposure meter is not a great deal of help here because the white background will generally tend to give an artificially high reading, causing the engine itself to be under-exposed. You can use a meter as a guide but, generally speaking, it will be worthwhile taking two or three extra shots at slower shutter speeds, especially if the engine is not brightly finished. (Many old engines were, in fact, rather dull, often with black fins.)

If you are using natural light outdoors, it may be helpful, depending on the direction and strength of the sunlight, to use a piece of hand-held white card to reflect the light and eliminate dark shadows. Indoors, a pair of No. 1 Photoflood lamps can be arranged about a couple of feet away from the subject to give the necessary illumination and, with these, and using Plus-X (125 ASA) black and white film, exposure time will generally be between 1/30 and 1/60th of a second at f16.

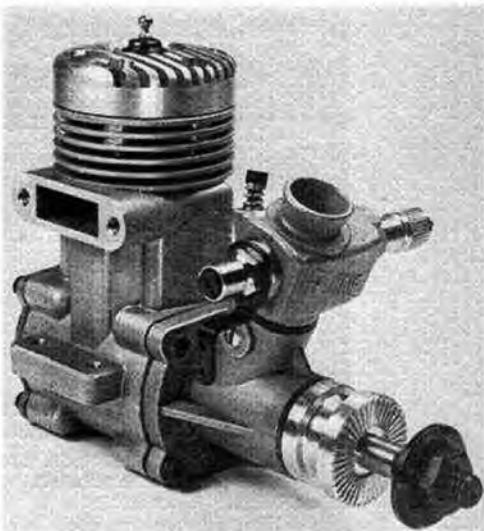
The above information is not intended to ensure 100 per cent professional quality photos, but it should enable you to turn out something of acceptable quality.

Irvine 40

We recently ran some tests on a

couple of Irvine shaft-valve 40s. Although this engine is at present sold only in a throttle version, the instruction leaflet quotes prop sizes for control-line use (including speed) and it may well be that Irvine Engines intend to offer it with a standard intake assembly. In any case, it should not be beyond the wit of a capable C/L enthusiast to convert the engine with a suitable venturi and needle-valve, if a larger (speed) or smaller (stunt) choke area is required. (For the latter application, it may also be helpful to reduce compression ratio with the addition of a head gasket.) The standard carburettor has a choke area of approximately 25 sq.mm. and can very well be left *in situ* for scale C/L.

We found the Irvine 40 to be a very good performer, with a gross rating (less silencer) of around the 1.0 bhp mark at 17,000 rpm on standard 5% nitro fuel. With the silencer (supplied with the engine), it reached an output of 0.87 bhp at between 15,500 and 16,000 which is also very good. These figures put the Irvine 40 among the upper performance group of 40 cu.in. R/C aerobatics engines and, since it is appreciably less expensive than its imported rivals, make it quite an attractive proposition for those looking for a high performance engine at a reasonable price.



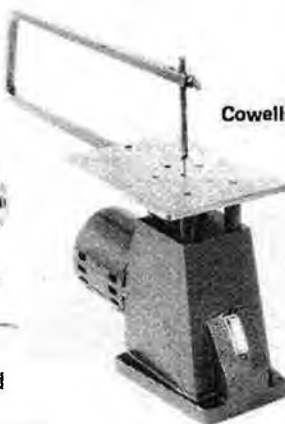
On test, British-made Irvine 40 proved comparable in performance with more expensive imported rivals. Shown here with throttle, but should make good C/L motor.

A fully illustrated description of the Irvine 40 was included in the July issue of our R/C contemporary *Radio Control Models & Electronics* and a report on its performance is featured in the September issue.

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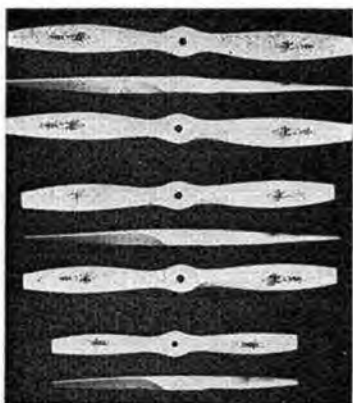
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TRADE TOPICS



Examples of Wooden props from Zinger

ZINGER PROPS from USA are being imported and distributed by David Martin Products. New to us here in England these propellers have been popular for some time with competitors across the Atlantic. Made exclusively from high quality maple wood like most other brands they boast true helical pitch with a flat bottom airfoil section, and accurate balancing, ready to fly. Available in a complete range of diameters and pitch, they tend to be lighter and stiffer than their plastic counterparts; the smaller pitch ones being favourite for racing while the bigger finer ones are favourite with the pattern pilots.

DREMEL TABLE SAW, a new product from USA, is being imported and distributed by Microflame. This 4 inch diameter circular saw for bench top mounting has a tilting table enabling various angles to be set between workpiece and saw for cutting bevels, chamfers or trailing edge stock. A grooved table top also allows workpieces to be offered to the saw blade at different angles using the adjustable carrier. The saw blade is housed in a Perspex safety shroud to minimise the obvious dangers of a powerful saw.

The saw produces very clean,

accurate cuts in all woods, balsa spruce and plywood and is naturally suited to reproducing numerous identical parts once the table is set. A compact and versatile tool for the serious modeller or a good acquisition for a club, for example, wishing to produce kits of parts for club projects.

NOVA KNIFE from Stanley, a new general purpose modelling knife. Made from black and yellow glass filled plastic, it incorporates a little trap door compartment in which to store spare blades. The rectangular shape makes it a little uncomfortable for really delicate cutting out held pen fashion, but its slim profile and long Sheffield steel blade makes it ideal for carving. With the blade stored safely in the handle, it is a handy knife to take to the flying field in pocket or model box.



New knife from Stanley contains spare blades in handle compartment.

HI-FLIER KITS being distributed by RIKO are manufactured in USA and include a range of 16 built up tissue covered rubber powered models some of which will be remembered from the Tern range. The models are grouped in three colour code ranges: Green Starter Series, Howard DG8, Monocoupe 16, Bellanca Sky Rocket, Rearwin Sportster, Stinson 105 and



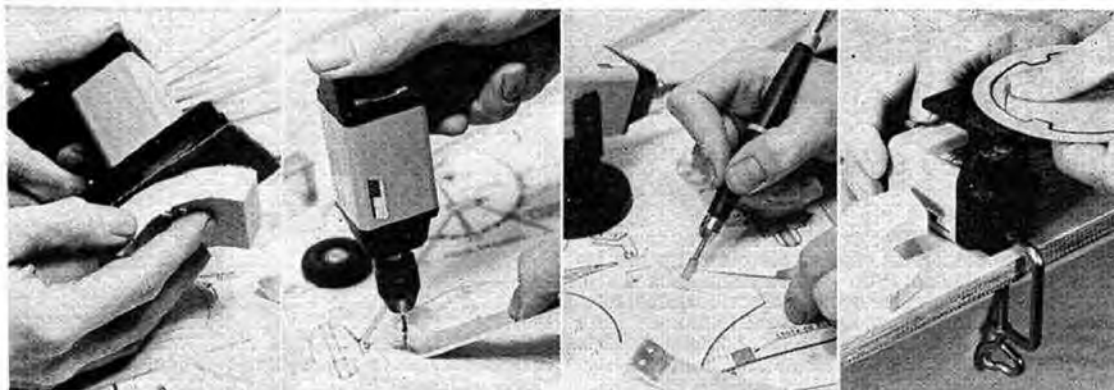
Two part rapid adhesive from Bostik requires no mixing. Adhesive and activator are applied one to each surface before aligning and holding for about three minutes to produce an immensely strong bond between a wide range of materials, even if slightly oily!

Taylorcraft; Blue Original Series, Gone Goose, Traveller Sailplane, Starduster Sportplane, Nighthawk Sportster, Porterfield Collegiate and Aerobug; Red Scale Model Series, De Havilland Tiger Moth, Ryan ST, Curtiss Robin & Aeronca C-3. Each kit comprises printed balsa parts which will need careful cutting out – Dad's help might be required here by younger modellers – plus ample strip-wood to complete basic model frame work. Instructions are very clear with sketches or photos of assembly and neat vac-formed plastic parts deal with the otherwise tricky shapes of spats, wheels and cowls. Multi coloured tissue and transfers are included along with simple hardware and plastic propellers. Having seen several kits made up, the end results are most appealing if somewhat tricky for the raw beginner. Modellers with some experience should find them a real pleasure and it would not take much ingenuity to convert any of them to CO₂ power.

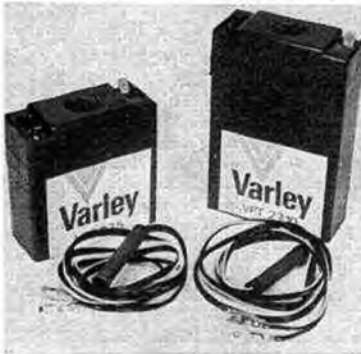
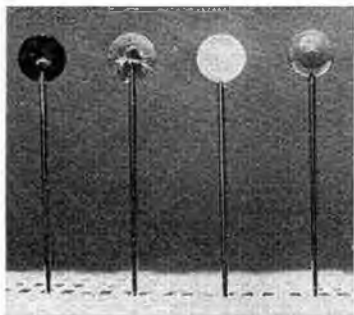


Left Dremels compact table top 4 inch diameter circular saw bench. Below Transfer's, illustrated instructions, plastic propeller, wheels and cowings, go to make these Hi flyer kits very complete and attractive





Mini tools in action from left to right, sander, drill, grinder and bench clamped jig saw all operate from 12 volt D.C. source ideal for workshop at field, produced in bright green plastic from Precision Petite.

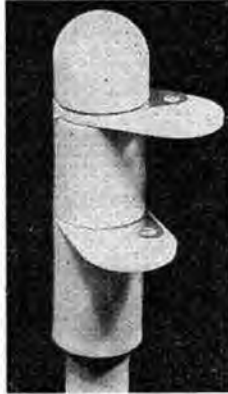
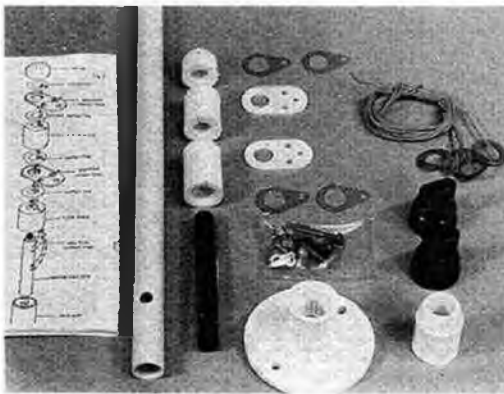
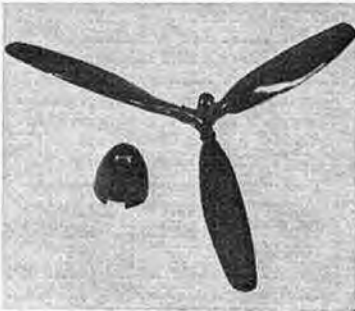
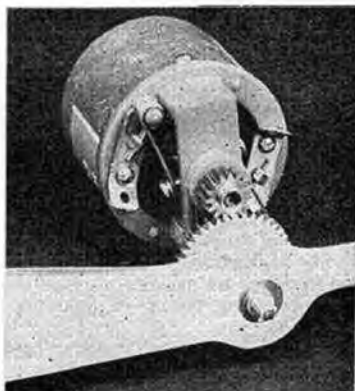


RTP ACCESSORIES — new products from Harry Butler. M4 Electric Motor, a high performance motor fitted with reduction gears which has been specifically designed for model flying. The front of the motor has an open end for improved cooling essential for airborne use, with RTP models. The motor weighs 60grams and runs on a 6in. x 4in. propeller (150 x 100mm) while a direct drive version (M2) is available weighing 50grams for a 4½in. x 2in. propeller (112 x 50mm).

B30 Three Blade Propeller 5 x 2in. diameter (125 x 50mm) designed with a 2mm shaft hole to allow a push fit directly into the shaft of the larger 36D type electric motors. This scale type propeller can be used either with or without the snap on plastic spinner depending upon the type of model to which it is fitted.

Top Left, Large headed modelling pins from Avicraft, section reveals metal head inside, safer than many brands. Below, Varley rechargeable dry 2 volt accumulator complete with leads and glow clip marketed as Glowpack from Ripmax. Below, kit of parts for Henry Butlers RTP pole with assembled unit to right. New Geared electric motor and three blade propeller with optional snap-on spinner on right.

Gemini Pole and Contact Head Kit CK50 assembles from a selection of snap together plastic parts to produce a pole suitable for two models to be flown simultaneously. Each connection consists of a plastic slip ring mounted at the top of the pole which has the advantage over more expensive ballrace heads that there is virtually no electrical losses at the contacts, especially important where limited power is available. A very neatly designed and well engineered unit that is quick and easy to assemble, it can be used with line lengths from 1-8 metres.



topical twists

by 'Pylonius'

Illustrated by Sherry

PHOTO PHOBIA

ALL THIS BUSINESS of model photographic competitions got me looking up some of my old snaps just to remind myself what not to do when photographing model aircraft. After intensive study the best advice I could give myself was to leave the camera at home in future.

I am not sure what makes the worst photographic subjects, domestic animals or model aircraft. Both have the supreme quality of blending almost invisibly into whatever background you may wish to choose, although it can be said on behalf of the model that it doesn't try to chew the lens hood. On the airfield you have three choices of background: sky, grass and tarmac. Models, like midgets, suffer from their diminutive size and dwell in a world of giant objects. Those few stones on the tarmac which you overlooked show up on the photo like boulders on the moon, and the picture takes on the dramatic quality of a forced landing in the Grand Canyon – not quite the effect you may have been after. Take the model against the sky and the wings never come out, but the hairy hand holding the model aloft would do justice to a XX Horror film. And, as for grass, this is the photographer's worst enemy. It comes in about ten different confusing shades, and by some odd law of light refraction the stalks always appear in sharp focus, huge as giant oaks, behind which the blurry model uncertainly cowers.

If you are a glutton for punishment you can try snapping a model in actual flight. The difficulty is locating it on the print without the use of a microscope. The general effect is rather like one of those 'Spot the Ball' competitions. For even worse results have a go at a shot of the model taking off, that is if you want to know what twenty pairs of legs look like. Then there is the close up in which the model comes out like one of those 'What Is It?' pictures. The answer being a model plane taken at a very unusual angle.

Very popular is the model in the held position. If its a bloke hanging onto the model you might be sure he comes out with a fag in the corner of his mouth, and if it's a girl by the time she gets the idea which way up to hold the model the sun has gone in. Generally, the trend in these permissive times is to pose the model with a sexy girlie giving background support. This diminishes interest in the model to almost zero; if it is noticed it is by reason of the interesting pieces of anatomy it is unnecessarily covering.

All in all, when examining your negatives your comment will be unprintable.

OFF PUTTING

"Hey, mate. You've lost a bit of your wing."

"No, I haven't. It's meant to be like that – asymmetric."

"Just shows you can't beat the old feet and inches for accuracy. Made a bit of a mess of the tail, too."

"But you don't understand. The plane goes round in circles..."

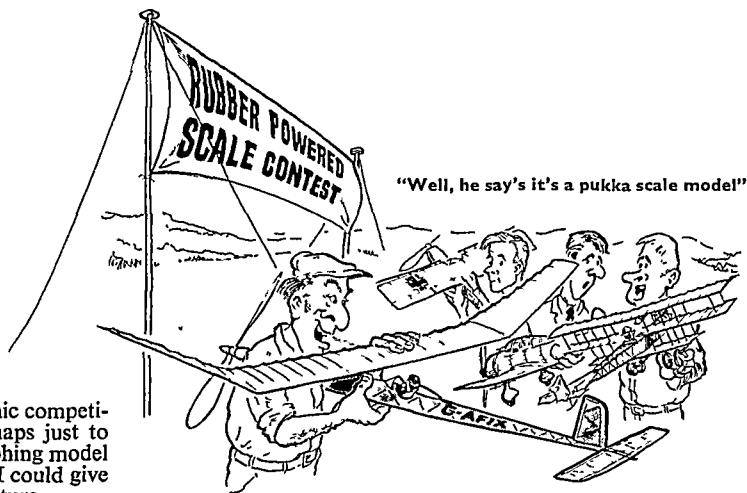
"Can't wonder at it, built like that."

"You don't seem to appreciate that this asymmetric configuration makes it go faster."

"Oh. Tell you one thing, though: it's safe."

"Why's that?"

"No one is likely to get a clip round the ear from the outer wing tip."



SCALING DOWN

A type of model, long thought to have gone the way of the Dodo and other extinct forms of flight, is the rubber powered Scale model. It might well have been called the 'Don't-don't', for it was the classic way how not to make a start in model flying, but one to which, in the early days of the popular kit, the beginner was all too often attracted. Part of the attraction was the glossy picture on the lid of the carton of a glossy, zooming craft. This contrasted all too sadly with the poor, limp and rather faded thing the few bits of balsa and tissue made up to. And you were not likely to make a flying start with this most unflyable of objects, its one ounce of weight having the gravital impetus of a sizeable brick.

All this makes the revival this type of model is now enjoying something of a puzzle. If you want a reasonable scale appearance and a fairly realistic form of flight then there's nothing like a small engine up front, with its scale prop, steady power output, mechanical noise and almost limitless duration. It could only be that the rubber powered scale model represents something of a challenge – the achieving of the impossible. But, then, why do the exponents of this newly revived art scour the aviation world for planes that look suspiciously like functional models? It's a funny thing, but most aircraft which nip about the sky with such sureness and confidence make rotten model aircraft and quite useless rubber powered models. On the other hand the few aircraft which perform at all as rubber powered models were such appalling flyers that hardly any were built, and the plans, where not hurriedly burnt, are difficult to obtain. Where obtainable, though, they just romp through the Peanut contest, leaving the Piper Cubs and Stinson Reliants on the starting blocks. Few judges have heard of Whatsit Mark I or Thingamajig Special, though looking suspiciously like something that had won the Wakefield back in 1920 something.

On the boisterous air outside the Indoor hall the Scale flyers are usually reluctant to put any sort of dangerous space between the ground and their fragile models – and who can blame them. Put on a static display or non flying get-together and they turn up in droves, eager to get the best profiles of their glamorous models within camera range. Some become so enthused by the occasion that they actually attempt to fly their decorative but so vulnerable creations in which more work may have gone into the dashboard alone than in four standard radio models. Only when the 500 man hours is precariously poised above the damaging terra firma does the scale builder start to regret his impetuosity, and every second of flight become a lifetime of anguish. But what a sense of relief he feels when the model at last descends, almost intact, save for a wiped off undercart, broken prop, and the usual miscellaneous debris that surrounds the scale model after a flight attempt.

The moral being, I suppose, is that models in glass cases should never be thrown.



WORLD CONTROL LINE CHAMPIONSHIPS RAF WOODVALE 1978

WOODVALE has a long standing reputation for the annual aeromodelling jamboree staged by the North Western Area of the S.M.A.E. where spectacular models, mainly radio controlled, are put through their paces in aid of charity. They also have an enviable record of hot and very clam weather for the show, plus a high rating for field organisation and fund raising. So it was no real surprise that when this enterprising S.M.A.E. Area made known its intent to stage a World Champs to the Council, they were given *carte blanche* to carry through the tremendous task of handling the biggest ever international meeting. But the fates were very unkind.

It poured. Organisation creaked. Crisis piled upon crisis. Politics reared an ugly head.

Thanks to field organisation for the events themselves, and the perpetual optimism of World Class aeromodellers, who waded through floods, flew in weather they'd never venture forth in back home, and put up with delays, discomfort, and a degree of being made to feel they were part of a side-show to the R/C glamour boys – the champs were terrific. Records broken, fantastic stunt flying, thrilling com-

bat, private entrants beating the Pro's at speed, great spirit everywhere with super accommodation and social services at Liverpool University, everyone playing their part in getting things done which were not previously done, and generally making the meeting into one to remember.

There were great personal efforts, like the Dutch lads who volunteered to bring the digital team race lap score display in the face of a £4000 demand for a VAT deposit at the Customs. Or the heroes who put up the control line cages, or those who stood drenched in long downpours to guide spectators and cars through the mud to car parks. Never before, even in a long record of self-help by clubsters at the other World Champs held in this country, have we seen so many willing hands at work.

And though the funfairs, the custom car show, the market trading stalls and the myriad other diversions cooked up by the organising committee were intrusions into the normal form of prestigious championships, they too played their part in drawing huge crowds through the gates to support a very heavy financial commitment.

Modelling had its own market place too. The Marquee had just the right balance of traders, booksellers, manufacturers and of course . . . publishers of magazines. Talking with any of the many visitors from

overseas it was inevitable that the conversation turned to the subject of the British model trade and its flourishing state of affluence. Not even in the USA have there been so many really useful souvenirs to purchase. The sight of a Brazilian modeller struggling with a huge fibreglass boat hull prompted thoughts of how he was ever going to get it back to South America. The French, picking up countless bargain priced items and the Cubans studying that great pile of special offer balsa. The Americans discovering scale references sources, all this is the stuff that makes a meeting tick, even when some of the protocol is either ignored or overlooked. We could have done with an overall Contest Director. A permanent base office. Better viewing facilities for the modellers who travelled hundreds of miles not to see the R/C scale models, and a stronger whack on the hands of the freeloaders.

But until one has tried, and run a World Champs, seen at first hand the enormous amount of planning, scrounging, innovation, investment and sheer mental strains it involves, then there is no justification for carping criticism. We know. We've done the job, and more than once. The first is the worst and with Woodvales' Champs under his belt, Arthur Searle and his team could tackle anything, and keep it out of debt too – and that's the REAL achievement.

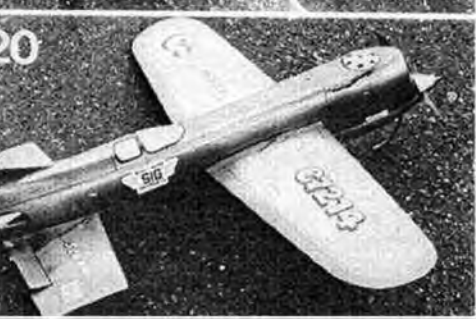
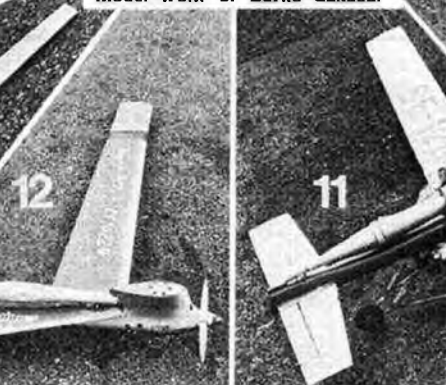
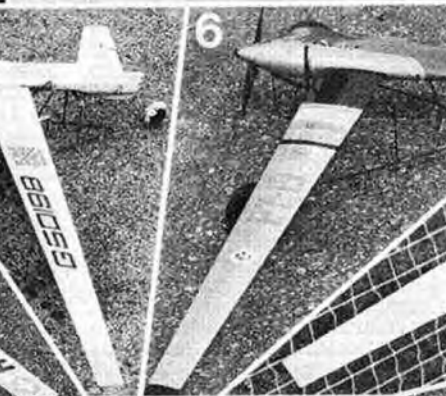
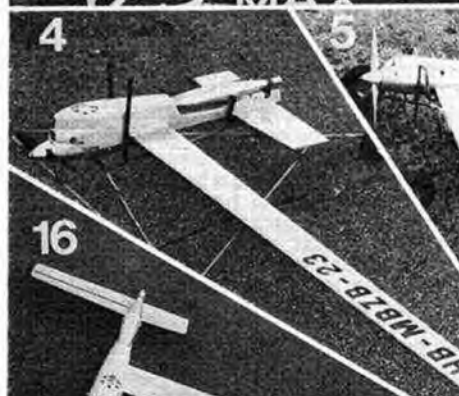
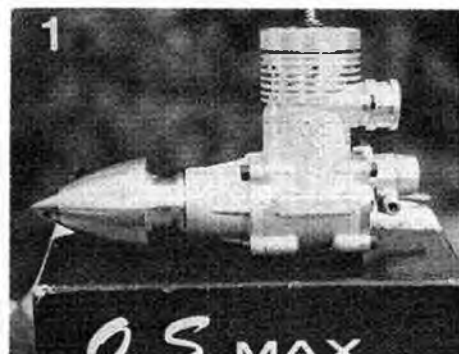


SPEED always has a 'slow' start, with cautious test flights. Official practice was from 9.00 a.m. to 2.00 p.m., while processing was done throughout the day. Despite the unsettled weather most teams made their trials but due to the official practice sequence this meant that only seven countries flew in good weather. The British team, (in keeping with all others) returned slow times. Among the surprises, Italian team did not return one full run and the Germans, practising during the heavy rain, were obviously experiencing some difficulty.

The USA team had only a few minutes of bad weather and this helped Lieber, their youngest member to return an extremely fast time of 14.3 seconds (156.4 mph), flying in his distinctive style with the pylon yoke at eye level – much higher than most other fliers.

During the afternoon sessions when the weather had settled, the British team improved to record times of between 14.9 and 15.2 seconds – which seemed reasonable prior to the first round.

Louis Bilat on form in the pylon.



1. New OS Max 15 released too late for use by Japanese team. 2. Bartels single blade carbon fibre used by all West German teams including 3 Jurgen Lenzen the new individual World Champion. The models they flew; 4. Lehmann Switzerland 242.5kph 10th; 5. Halman U.K. 246.3kph 9th; 6. Pinho Brazil 203 kph 35th; 7. Lenzen W. Germany 255.5kph 1st; 8. Rumpel W. Germany 239.4kph 15th; 9. Turner New Zealand 239.8kph 12th; 10. Arakelian Brazil 205kph 33rd; 11. Kjellburg Sweden 219.6kph 29th; 12. Fell Canada 203.6kph 34th; 13. Ricci Italy 247.5kph 7th; 14. Masters (Senior) South Africa 235.4kph 21st; 15. Gafner Switzerland 239.6kph 13th; 16. Smith Australia 228kph 26th; Fourth over all in the team race results were Great Britain's 17. Dave Smith, 18. Gordon Isles and 19. Peto Halman. Finally the most unusual model from S. Burke Canada.



Facilities were second to none, indeed the organisation surpassed itself in this respect. There were two circles: the actual flight circle complete with cage, pylon, timekeepers' tower and an electronic speed readout and a practice circle with a pylon. Between the two circles was a stretch of runway for the pits. The top half of the runway was clear for competitors to dismantle models and either commiserate or congratulate, while the lower half of the runway was specifically roped off for pre-flight checks.

The running of the practice slots went very smoothly with the fliers being shepherded through arrival, fuel dispensing and pull test and into the circle. (On the official flying days the routine was: arrival; line length and diameter checking; pull test; fuel dispensing; tank flushing and line separating on the way through the gate into the circle.) To indicate the conscientiousness of the ground crew, the timekeepers sat through all of the practice day to 'limber up'.

The weather throughout these Championships left a lot to be desired with heavy rain being predominant, although on Monday, the second round day, the rain held off until 3.00 p.m.

In the end, the top five fliers, Lenzen, Bilal, Spahr, Entroy and Lieber all returned their best times during the good flying weather of the second round. The next five fliers, with the exception of Halman who returned his best flight during a third round reflight, returned their best times during the good weather of the third round. But back to the beginning . . .

First Round

Extremely heavy rain held up the first round for over two hours with it eventually starting at 11.30 a.m. — still in the rain, albeit not quite so heavy. Bilal, Spahr, Schuette Ricci, Cantoni and Horvath called attempts without flying and had their reflights at the end of the round. Only Bilal, Ricci and Cantoni returned any times and for Cantoni (proxy flown by Fontana) the slow 136.1 mph was his only official flight of these Championships.

The 1976 World Champion, Emil Rumpel, came out to fly when there was a noticeable breeze and, with this in mind, seemed to choose an odd side of the circle from which to take off. The model came out of the dolly, climbed steeply, stalled and dropped. Fortunately the engine stopped before the model hit the ground. A different take off may have avoided this disappointing prang. On his reflight, Rumpel did not record an official time.

Ingo Schmidt took off from the same place as Rumpel and seemed to have the same difficulty with the same result. His reflight was no better and he ended the first round without an official flight either.

Jürgen Lenzen, the third West German, and the only one to record three official flights flew his new model named in honour of Ricci and Dusi, two of the greatest Italian speed fliers. Although *not* a side-winder such as the Italians use, the wing and tail were based on designs by Ricci and Dusi and Lenzen recorded a good flight of 150.5 mph.

Of the American contingent, Lieber was the only one to record three official flights and the only one who flew in the first round without a reflight. His model was one of the most beautifully made and most exciting designs to be seen.

Both Bob Spahr and Chuck Schuette had problems with their engines or, perhaps, not so much with the engine as such but with the systems used. With no obvious indication of the fuel system, the answer to the question was "a kind of pressure system". Whatever this means, neither recorded flights on their reflights and subsequently the engine did one of three things: (a) didn't come on the pipe (b) came on and died immediately (c) came on and died after eight laps. However Bob Spahr did seem to get it together for one flight in the second round.

The Italians seemed to be having problems too. Ricci's flight at the end of the first round was a respectable 149.6 mph but was slower than expected.

Constant, who in practice seemed to be the best of the Frenchmen, put in a good flight of 155.3 only to be disqualified for using a handle grouper. Because the organisers were partly to blame for allowing him to fly with a grouper in the first place, he was allowed a reflight but only produced 145.3 mph and after that he just couldn't seem to recover.

Our British team did well in the first round, all recording official flights which gave them first team place at the end of the first round. Sadly this was not to be repeated. Highest placed in the first round was Gordon Isles beating Peter Halman by .9 mph. Both Gordon and Peter flew in the clear weather around 2.30 p.m. and experienced no great difficulty recording 149.5 mph and 148.6 mph respectively. Dave Smith who flew just before the rain ended managed a fair flight of 142.7 mph.

The dreary weather seemed to have people worried: Rumpel, Schuette, Spahr, Cantoni and Horvath were, amongst others, observed practising.

Second Round

The weather for the second round was dry and many competitors took advantage of this although the wind that sprang up about 11.15 a.m. was a little disconcerting. None of the major competitors called attempts without flying and only Spahr, Schuette, Cantoni and Lehmann had reflights. It must have been sad for Schuette to have his reflight disqualified for flying too high. Having not returned a flight in round one and his engine going off after eight laps in round three, Schuette may well have finished nearer to his usual position if this reflight had qualified.

Gordon Isles went slightly faster in the second round but Peter Halman and Dave Smith returned no-flights.

Tuesday was a practice day and the weather cleared about 11.00 a.m. On arrival at the practice site the Americans were already out practising. Peter Halman put in a good day's flying while Dave Smith spent part of the day rebuilding his seized engine. He and Gordon Isles eventually arrived for practice and at the end of the day the three British fliers were well satisfied. As we left the site we saw that the Americans, Australians, Japanese and New Zealanders were still practising.

Incidentally, Hiern (Australia) had changed from the pipe pressure of the 1976 World Championships (and bottom of the placings with no official flights) to suction feed and did very well to be placed 19th. His fastest flight of 146.7, equalling our own Dave Smith's, was added to two more official flights to give him a final placing of one above David.

Third Round

The third round day dawned calm, warmish and overcast and the British fliers were drawn to fly mid-morning. Dave Smith flew first with his rebuilt engine after a seizure and put in a credible 146.7 mph. Gordon Isles jumped almost 6Ks to record 153.1 mph — a new British Record. A flooded engine meant that Peter Halman had to go for a reflight later in the day. Initial disappointment in that the weather was perfect when his official flight was scheduled, turned out to be good fortune as he jumped 7.1Ks to give him his fastest flight of 153.0 mph.

The third round was one of the most exciting of recent years with Bilal challenging Lenzen all the way. Bilal beat Lenzen by 3.4 mph in the first round; Lenzen beat Bilal by 1.0 mph in the second round and so the first place looked to be a battle between these two. Bilal was due to fly before Lenzen but called an attempt without going into the circle. Ever the diplomat, Lenzen also called an unflown attempt, so Bilal *had* to take his reflight. Sadly for Bilal, his engine had trouble and he lost his reflight.

Having recorded 158.7 mph in the second round Lenzen could have rested on his laurels but Spahr, also due for a reflight after Lenzen could have presented a challenge and so Lenzen flew and recorded 158.5 mph. In the event, Spahr's engine/pressure system had problems and he did not record a flight so Lenzen was home and dry (well, figuratively anyway!).

Lois Bilal took a well deserved second place with Bob Spahr who only recorded one official flight in third place.

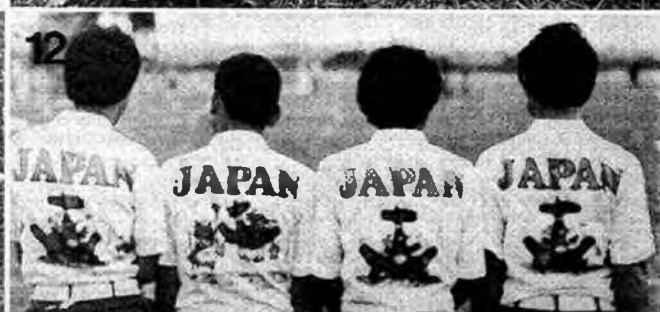
British fliers did better than ever before with Gordon Isles and Peter Halman in the top ten. Only .1 mph separated them. Dave Smith was placed 20th.

Especially deserving of mention were the New Zealanders who, flying in their first World Championship, had A. B. Turner placed 12th and the Canadian, Burke, who flew a very semi-scale GeeBee Racer and was placed 17th.

Now that the 1978 World Championships are over what is there to look forward to? . . . Well, the 1980 World Championships of course and future *Aero-Modeller's* which will contain detailed information on speed models, engines and props.

Louis Bilal (Switzerland) helps a fellow team mate prepare his model.





1. Favis by Spagia of Italy
2. The only flyer to split the American domination Italy's Luigi Compostella. 3. Smiles from the British Aerobatic team Jim Mammal, John Newnham and Pete Tindal. 4. Bob Gieseke with a much faded Nobler variant. 5. Ex-patriot Geoff Higgs Canada own design model placed 23rd. 6. When it was all over they still flew for fun Japan's Hara thanks Al Rabe after flying Mustang VI. 7. Details of Bob Hunt's Genesis, handmade prop and stubby silencer. 8. Another Genesis from Australia's J. Tidey. 9. Doug Harlow with repaired Atlantis. 10. Ex-World Champion Les McDonald's Stiletto. 11. Masuda's Typhoon. 12. Line up of team shirts.

STUNT — reported by Glen Allison

THIS was the largest ever World Championship for stunt flying with 53 competitors from 18 countries participating. It would have been larger still but for politics. Because South Africa were competing in speed, the USSR, Argentina, Czechoslovakia, Spain and Portugal withdrew entries even though some of them had actually arrived and were present at Woodvale. This not only accounted for a further 14 competitors who *would* have flown, but the Czechoslovakian judge Zdenek Liska also failed to appear. Keith Trostel (USA) a stunt flier and President of PAMPA, the Precision Aerobatics Model Pilots Association was drafted to fill the gap and judge at short notice. The other judges were Mick Harvey (UK), Van Ommeren (NL), M. Souliac (F) and L. Kannevorff (I).

The event seemed to lack the atmosphere that one normally associates with a World Championship because it was sited on a large airfield rather than a specialised control line site and there were other distractions going on all around. However this had certain advantages for the fliers in that although the wind strength was greater than many would have liked there was not the turbulence to upset the models that you get on a site surrounded by trees or hills. Another advantage of an airfield is that there was plenty of practice space available for those who wished to practice in private.

Practice saw the demise of Sasaki of Japan who wrote off his model when a transport joint failed. Doug Harlow of Australia also crashed due to a line snag and this started quite a drama as he tried to locate the model that he had sold two years ago after the last World Championships! After much telephoning and running around he succeeded, but in the event managed to repair and fly his new model.

The first round started at 9.00 a.m. on Sunday with a warm-up flight for the Judges by British reserve Bill Draper flying his new *Super Hawk* with Enya 45. It must be remembered that in countries like USA, Great Britain, Japan, etc., where stunt flying is strong there are team trials held to decide who will represent them at the highest level.

In certain other areas of the world the interest or standard of flying is not so great and hence it is very much an individual effort for those fliers who can come with no sponsorship or help. This is one reason why one sees very wide variations in the flying and models from country to country, which may be surprising for a visitor to the World Championships expecting to see a universally high level. The first two rounds are eliminating rounds in order to select the top 16 for the 3rd and 4th flyoff rounds. The final result is the sum of the best of a pilots first two flights added to the best of his second two if he is in the flyoff, and below that from 16th place it is just his best flight that counts.

Because of the high entry it was impossible to run a whole round in one day and thus it was convenient to make round 1 take 1½ days and let round 2 start at 2 p.m. on Monday and finish Tuesday evening. Although this arrangement had the advantage of avoiding those 7 a.m. starts and late finishes that have occurred in recent years it did mean that weather variations from day to day had a great effect on the fliers.

Indeed the whole Championships was noted for the mainly bad weather. It was



Mustang VI flies inverted past the silhouette of Al Rabe who placed 2nd.

cold, windy and wet for much of the time. However there were spells that were good such as Monday morning which meant that those fliers in the last third of round one had a distinct advantage.

So to the flying. On the first day of round 1 it was very windy and this caused a lot of inaccurate flying. Bobby Hunt (USA) handled the weather particularly well, perhaps it was something to do with the absence of a fin on his model, more likely it was really well trimmed. Bob is using a unique motor for stunt, an OS 40 FRS Scheurle port, which ran very well with an unusual note from the miniscule homemade silencer. He says it is more powerful than the ST46 or HP40 that he has used previously. Other outstanding flights came from reigning World Champ Les McDonald with a new version of his *Stiletto* design, Billon of France, and also Hara of Japan flying his *Hurricane* design. At the end of the first day Les McDonald led with 2887 Billon had 2816 and Hunt 2782, which were high scores considering the weather.

The next morning saw a great improvement in the weather, overcast but relatively calm, which was to the advantage of all who remained in round 1 and the previous days highest scores were easily bettered by Luciano Compostella for Italy, the reigning European Champion with a new version of his *Tango* design, rather old fashioned in appearance with a one piece elevator and small fin. He uses a ST46 using a 10 x 6 3 blade Tornado prop and runs it very fast. Also putting in a high scoring flight was the American Al Rabe who for his first appearance in the American team flew his famous semiscale *Mustang*. The model is relatively small by modern standards yet has a modified ST 60 at the sharp end to give an exceptional power weight ratio. In contrast to the sleek modern stunter the Mustang gives an unusual effect with the long undercarriage hanging down at the front and a tail fin at the tail. The motor runs at a deep loud 4 stroke all through the flight and the silencer is fitted internally. Notwithstanding the scale appearance it is an excellent stunt model and Al scored 2924 with that flight.

Young Gerard Tayeb from France flew a very fast schedule with his Enya 45 foam winged model. He is obviously going to be a star of the future, judging by his confidence and accuracy.

So at the end of round 1, the lead was held by Al Rabe followed by Compostella

and McDonald, and the pattern of the contest was set. It would be a battle between the USA and Italy with strong competition from France.

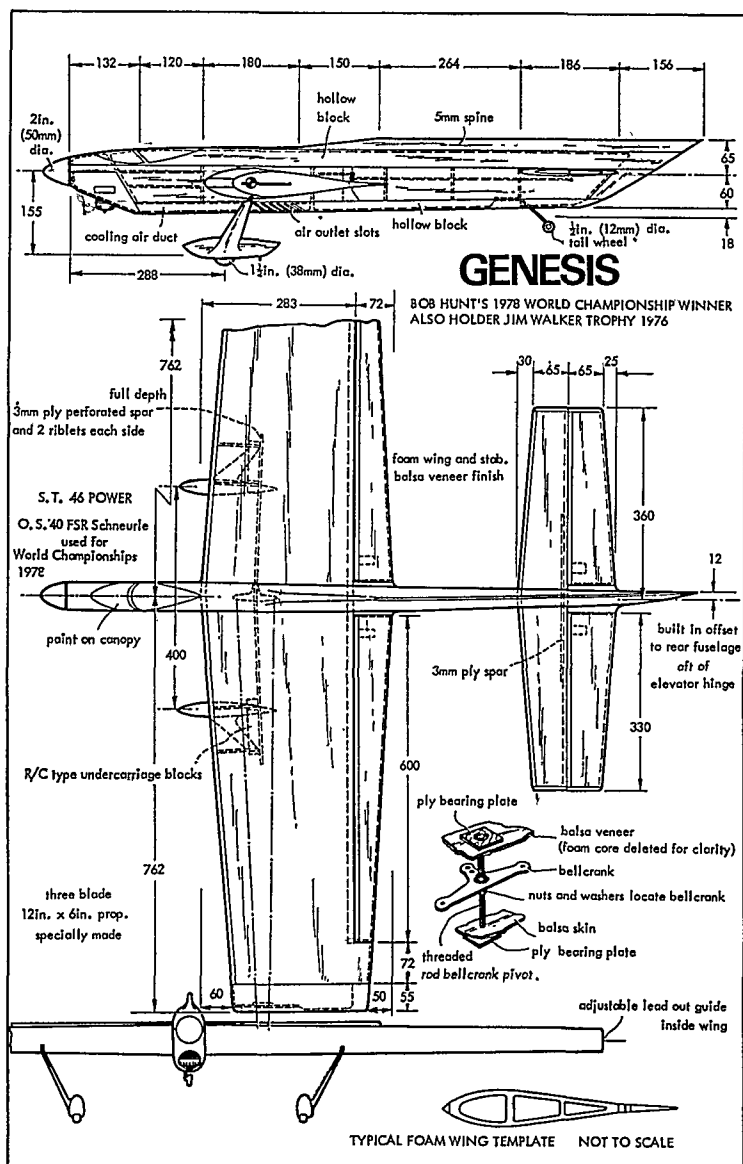
Of the British lads Jim Manall was in 13th position with 2477, John Newnham 15th with 2446 and Pete Tindal way down at 28th with 2241 due to losing his landing points by having an over-run.

The circle administration went very smoothly under the supervision of Contest Director Tom Jolly. Fliers reported to an assembly bay half an hour before their flight where they prepared their models and attached lines etc. They then moved forwards to the Pull Test bay under the control of Gordon Bryant and his wife Maria. On receiving a pull test certificate the fliers moved forwards once again to the waiting bay where they waited their turn to go into the circle to fly. They could not enter the circle without submitting the pull test certificate. On completing the flight, fliers took their model to an exit compound for removal of lines, wiping down etc.

The system worked very well. An innovation this year was the computerised results service whereby scores were processed by Merseyside County Council Joint Computer Unit, and initially results were forthcoming every 5 flights or so. This was too long a delay between a flight and the score being hand written up on the master scoreboard and made it difficult to follow the progress of the competition. However later on in the event the frequency was shortened to every two flights which made a great improvement. Of great help on the scoreboard was the continuous updating of the relative position as the fresh scores became available.

Round 2

Masuda of Japan flew an excellent schedule with his Enya 45 *Typhoon* design. It is interesting to see the Japanese approach to stunt flying, they take it very seriously and treat the whole schedule more as a ceremony rather than a performance. Their starting procedure is particularly novel, the assistant holds the model inverted in the normal manner whilst the pilot, wearing white gloves, prepares the engine to start, connecting leads etc. When ready, the pilot stands back, faces the judge, raises an arm and shouts "start". He then starts the motor, one flick and after helping to turn the model over walks to the handle. The assistant holds the model off the ground until the moment of launch, presumably to prevent



FLYING MODELS U.S.A.

ingestion of tarmac dust and grit whilst waiting. Jim Manall had a little bother starting the old Merco 35 in the *Nimrod 7* and only just managed to take off within the 1 minute allowance. It was a good flight for Jim however and he raised his score to 2532. John Newnham did slightly better with 2537, but Pete Tindal made a big improvement jumping up to 2644. Harold Pokorny of Austria showed a big advance over his previous form in international competitions. In his own design model he is using the new HP 40 Gold Top stunt engine and it ran very well for him.

On day 3, Tuesday, saw the continuation of round two and a deterioration in the weather, it was windy and showery getting worse. Bobby Hunt had to call an attempt as the Os 40 FRS failed to start but succeeded at the second go and put in a super flight handling the conditions well. The weather was getting really bad now and it

caused Lavalette, France, to miss his cloverleaf when the Merco 49 stopped with suspected water in the carburettor putting out the plug. It landed with fuel in the tank. He protested but to no avail. Next to fly was Les McDonald and it was pouring down by this time. Les had trouble with his lines binding together due to the rain and it nearly caused him to crash as he lost line tension in the first loop of the cloverleaf. The organiser then called a break for an hour and the weather did abate somewhat.

Dr Egervary, now living in, and flying for W. Germany, put in a flight of 2554 points which was bad news for England because it pushed John Newnham out of the fly off.

Bob Gieseke flying a rather old, sun faded, version of his famous red Nobler is very consistent and was seen practising a lot throughout the contest, however he flies a very soft schedule rather slowly which is not impressive enough to win World

Championships these days. Power is the name of the game at the top and that old Fox 35 does not have the power to maintain air speed after a sharp corner, but he makes up for it by sheer accuracy in all the rest.

Al Rabe put in another superb flight spoiled only by a slightly bumpy landing and although better than round 1 he could not match the big improvement of Bobby Hunt who had taken over the lead with 2963.

It was at this point after the 2nd round had finished that John Newnham on checking his score sheets noticed that one of the judges had omitted to award him landing points. When he brought this to the attention of the contest director it was decided to give him an average of the other four judges, 9, 8, 8, 7, i.e. 8 points, but in doing so the extra points put him up to 15th place, i.e. in the fly off but at the expense of Jim Manall who had thought he was in the fly off for the first time in several Championships. It was a terrible disappointment for Jim.

4th day fly off

(for top 15, 3rd and 4th rounds)
The weather at last was respectable, cloudy with a light wind and there was a fresh draw for the flying order. All of the top 15 are very good fliers and it is difficult to spot one who is so obviously better than the others. At this level it is more a matter of spotting minor mistakes or inaccuracies which spoil an otherwise perfect schedule.

Les McDonald put in the finest flight of the contest with a 2966 but this of course had to be added to one of the windy weather flights earlier which gave him a grand total of 5853 which was unlikely to place him in the top 3.

Billon pulled up considerably to 2951 as did John Tidey of Australia to get 2612 for his best flight.

In the fourth round 13 of the finalists made higher scores than in the third which showed that they were really putting in an all out effort as the contest reached its climax.

When Hara of Japan was flying, a radio controlled Boeing 747 flew overhead and disturbed his concentration. He was offered the option of a re-fly at the end of the round without seeing the original score. This he accepted and in fact scored an additional 75 points which put him up another three places to 7th position in the final list, this shows how close it all was. Although it looked as though either Bobby Hunt or Al Rabe was sure to win it was not certain until the end of the round when Billon flew and he did indeed score more than anyone in the final round with a magnificent 2963. It was not enough though and the Americans breathed a sigh of relief.

Bobby Hunt with his foam wing *Genesis* had won with an unheard-of motor in the stunt scene. The Os 40 FRS driving a home made three blade 11 x 6 wooden prop. Congratulations to him, but oh, so-close, (only 15 points behind) was the *Mustang* of Al Rabe.

Of the British lads, John Newnham made a further improvement by scoring 2669 to jump up to 13th place just in front of Pete Tindall at 14th. Jim being top of the non fly offs at 16th.

So there it is for another two years. The entries were up and the standards are up and the whole event was a success, it all bodes well for the sport.

F2C Team Race

Recent performances, world wide, led to record breaking expectations in the Team Racing event. Considerable improvements in engine design, noticeably the wide availability of the Nelson 15D, promised to throw the event wide open. With such high 'out of the box' performances being claimed by Danes, English and Dutch, the American Team also would surely have some good times in store. Indeed, the very opening race of the championships truly set the pace of things to come with Clarkson/Woodside recording a scorching time of 3:53.4 well and truly smashing the once magic four minute barrier.

In the Second Heat Nelson/Dodge followed with a comparatively slow time of 4:03.1. Heat 3 Geschwendtner/Mau disqualified for whipping with three warnings. Heat 5 and the Metkemeyers scored a superb 3:49.5 using their FMV home made motor.

By the end of the Opening round five teams had each broken four minutes, three of them were British, a fantastic achievement, to lead the team scores. Clarkson/Woodside were placed second, being now equipped with a second recently finished *Nelson Sprint* (Plan last month). Heaton/Ross were third with their 3:54.4; a broken pushrod just before the champs had crashed their best model but repairs seemed not to have affected their flying. Fifth place went to Smith/Brown with 3:58.6 using their Blohm & Voss inspired "half a tail-plane" model, which had needed an extra inboard piece to be added during processing to ensure "scalelike outline".

Heroes of the meeting were undoubtedly the Australian teams, Georgiadis/Prior, only having received their Nelson three days before their departure from Australia, they now surely had one of the fastest machines of the meeting. Yet disappointingly, failure to get the motor going robbed them of a decent first round score. Subsequent discussion with Johnny Mau of Denmark and our own Jim Woodside led them to modify their exhaust prime set up which then enabled them to overcome their problems. Such was the camaraderie at this extraordinary championships.

The 2nd Round Opening race produced

Champions Rob and Bert Metkemeyer with Enrico Flores who helped develop their FMV 15 motor.



F2C-TEAM RACE

Metkemeyer Heaton and Geschwendtner. The illuminated electronic score board borrowed from Holland helped make the meeting for the spectators.

a good line up of contenders Nitché/Fischer/Böhlin/Bengtsson (both big pilots) and Geschwendtner/Mau who needed a good score and they got it in a classic race with an amazing one range of 55 laps producing 3:49.7 a new World Record. During the second heat Stevie Smith soon started notching up warnings for not walking around the handle packed tight unable to alter his flying style, he collected the set of three to be disqualified. Henry Nelson dropped a catch for Carl Dodge to whip round another lap all adding to a 4:20.1. Then came Georgiadis/Prior in the 4th Heat, could they solve their starting problems? One flick, two, three . . . then they were away to set another World record breaking time of 3:48.7. What might they have scored if they'd got everything 100 per cent? As they left the circle the ran splattered across the tarmac, tough conditions for the following teams whose second round

flights were all made in pouring rain before proceedings were suspended. The wet conditions were making the white lines, used to mark out circle and pit segments, go sticky which was causing problems for flyers and headaches for organisers.

Of those who flew after the rain in Heat 8, produced the star studded line-up of Clarkson/Woodside. Oddy/Reichart and Fontana/Amodio. This long established Italian team was one of the few teams using retractable undercarriage, their Bugli III powered model also included airbrakes. Lower undercarriage door and upper fuselage hatch sprung open to increase drag to enable pitstops from a cut-out only half a lap ahead of their segment. However, inevitable dramas during the race lead to missed catches necessitating extra whipped laps, definitely a no no with the airbrakes still out, slowing things up even further!

A lucky escape for the other two in this race as they flew in to a pit stop in formation inches apart. As Julius Reichardt caught his model, Dave flew underneath! Quick reflexes from Hutton Oddy who swapped hands to clear the line tangle, triggered the shut off and the model took off on just the prime to glide round for another pitstop. Both were allowed reflys which produced a close race, with neither improving their first round score, yet becoming the only two teams to break 4 minutes in both rounds.

Wilson/Wilson, Australia's final hope for the team prize, missed a catch in their race to score 4:16.3, enough for second prize however.

Heat 14 gave Geschwendtner/Petersen their last chance of a place in the semis. Luis Petersen chose an up wind segment rather than risk being blocked from further back, but a run in at launch after a pitstop meant disaster for them.

So to the semi-finals, the top nine teams and all of them having broken the magic four minute barrier! Two Dutch, two Australians, one Dane, one Italian and all three British teams reached the semis clinching the team prize for the U.K.

During practice just prior to the semis,

RESULTS

1978 WORLD CONTROL LINE CHAMPIONSHIPS WOODVALE

NATIONAL RESULTS

SPEED F2A			1st	2nd	3rd
1	J. Lenzon	West Germany	242.2	255.5*	255.1
2	L. Bilat	Switzerland	247.8	253.8*	000.0
4	D. Enfroy	France	221.9	251.9*	000.0
5	C. Lieber	U.S.A.	240.9	250.8*	243.0
6	J. F. Bellelle	France	000.0	249.3	250.4*
7	G. Ricci	Italy	240.9	000.0	247.5*
8	G. Isles	United Kingdom	240.6	240.8	246.5*
9	P. Halman	United Kingdom	239.2	000.0	246.3*
10	W. Lehmann	Switzerland	000.0	239.9	242.6*
11	I. Schmidt	West Germany	000.0	242.4*	242.0
12	A. B. Turner	New Zealand	000.0	233.4	239.8*
13	M. Gafner	Switzerland	000.0	219.5	239.6*
14	P. Constant	France	233.9	239.4*	000.0
15	E. Rumpel	West Germany	000.0	239.4*	000.0
16	L. Eskilden	Denmark	231.2	233.2	238.5*
17	S. Burke	Canada	000.0	222.4	238.5*
18	J. Horvath	Italy	000.0	236.5	238.3*
19	R. Hiern	Australia	230.1	234.0	236.2*
20	D. Smlth	United Kingdom	229.8	000.0	236.2*
21	D. G. Masters	South Africa	235.4*	000.0	000.0
22	R. Brands	Holland	000.0	000.0	234.6*
23	D. T. Smith	South Africa	000.0	233.4*	000.0
24	A. Kerr	Australia	221.2	209.3	230.7*
25	T. Matsushita	Japan	229.5*	227.5	000.0
26	D. Smith	Australia	226.2	220.0	228.2*
27	R. D. Masters	South Africa	000.0	225.7*	189.5*
28	K. Sato	Japan	000.0	222.3	223.6*
29	O. Kjellburg	Sweden	205.2	000.0	219.6*
30	A. Cantoni	Italy	219.3*	000.0	000.0
31	B. Sanchez	Cuba	211.3*	206.4	204.5
32	J. Infante	Portugal	000.0	000.0	206.0*
33	J. Arakelian	Brazil	205.0*	193.8*	000.0
34	A. Feil	Canada	000.0	203.6*	000.0
35	J. Pinho	Brazil	203.0*	201.4	000.0
36 M. R. A. Baez, Cuba, 199.2, 199.4*, 000.0; 37 H. Heinsius, Holland			000.0, 169.3, 188.5*;		
38 C. Schuette, U.S.A., 000.0, 000.0, 182.8*.					

AEROBATICS F2B			1st	2nd	3rd	4th	Total
1	B. Hunt	U.S.A.	2782	2963*	2921	2955*	5918
2	A. Rabe	U.S.A.	2924	2954*	2879	2949*	5903
3	L. Compostella	Italy	2905*	2870	2886	2953*	5858
4	L. McDonald	U.S.A.	2887*	2848	2966*	2961	5853
5	R. Gieseke	U.S.A.	2875*	2833	2880	2922*	5797
6	G. Billon	France	2816*	2811	2951	2963*	5779
7	T. Hara	Japan	2706	2832*	2799	2921*	5753
8	S. Rossi	Italy	2568	2808*	2868	2884*	5692
9	S. Masuda	Japan	2605	2725*	2666	2874*	5599
10	G. Tayeb	France	2643	2763*	2715	2824*	5587
11	G. Sbragia	Italy	2620*	2613	2766	2922*	5542
12	G. Egervary	West Germany	2465	2554*	2512	2743*	5297
13	J. Newnham	United Kingdom	2446	2537*	2628	2669*	5206
14	P. Tindall	United Kingdom	2241	2644*	2502	2552*	5196
15	J. Tidey	Australia	2499	2573*	2612*	2514	5185
16	J. Manall	United Kingdom	2477	2532*			2532
17	L. Eskilden	Denmark	2353	2528*			2528
18	M. Lavalette	France	2510*	2358			2510
19	O. Andersson	Sweden	2263	2507*			2507
20	R. Liber	Belgium	2306	2506*			2506
21	D. Harlow	Australia	2313	2452*			2452
22	S. Ratsch	West Germany	2440*	2326			2440
23	G. Higgs	Canada	2435*	2263			2435
24	F. Tellier	Canada	2370*	2198			2370
25	B. Trudler	Israel	1713	2362*			2362
26	O. Markovich	Israel	2142	2343*			2343
27	R. Petersen	Denmark	2291	2333*			2333
28	Y. Sedlatchek	Switzerland	2318*	2040			2318
29	H. Pokorny	Austria	2318*	1973			2318
30	P. Tupker	Holland	1899	2310*			2310
31	J. Fernandez	Cuba	2309*	2267			2309
32	U. Kehnen	West Germany	2026	2245*			2245
33	G. Liber	Belgium	2174	2233*			2233
34	A. Fakla	Canada	2059	2231*			2231
35	J. Leuba	Switzerland	1857	2221*			2221
36	E. Affonso	Brazil	1838	2221*			2221
37	O. Perdomo	Cuba	2071	2220*			2220
38	P. Doesburg	Holland	2209*	2186			2209
39	B. Filho	Brazil	1773	2203*			2203
40	D. Fagnoul	Belgium	2123	2201*			2201

41 A. Rodiles, Mexico, 0072, 2168*, 2168; 42 H. Henriksen, Denmark, 2029, 2090*, 2090;
43 E. Cuevas, Mexico, 2085*, 2002, 2085; 44 T. Salathe, Switzerland, 1949, 2047*, 2047;
45 S. Mitchell, Australia, 1945, 2043*, 2043; 46 B. Delgado, Cuba, 1926, 2017*, 2017;
47 B. Hook, Holland, 1927*, 1765, 1927; 48 L. Silva, Mexico, 1866*, 1862, 1866; 49 M. Doyle, Ireland, 1068, 1696*, 1696; 50 J. Hamilton, Ireland, 1685, 1690*, 1690; 51 B. McDonnell, Ireland, 1643*, 0058, 1643; 52 E. Santa, Brazil, 0244, 1529*, 1529; 53 S. Metwally, Egypt, 0205, 0205.

SPEED F2A		1st	2nd	3rd
1	FRANCE	0741.700		
2	WEST GERMANY	0737.300		
3	SWITZERLAND	0735.900		
4	UNITED KINGDOM	0729.000		
5	ITALY	0705.100		
6	AUSTRALIA	0695.100		
7	SOUTH AFRICA	0694.500		
8	U.S.A.	0686.200		
9	BRAZIL	0408.000		

AEROBATICS F2B		1st	2nd	3rd	4th	Tota
1	U.S.A.	17623				
2	ITALY	17298				
3	FRANCE	16369				
4	UNITED KINGDOM	15502				
5	WEST GERMANY	14334				
6	AUSTRALIA	13938				
7	DENMARK	13624				
8	CANADA	13556				
9	BELGIUM	13543				
10	CUBA	12810				
11	SWITZERLAND	12432				
12	HOLLAND	12296				
13	JAPAN	11352				
14	MEXICO	10055				
15	BRAZIL	9808				
16	ISRAEL	8560				
17	IRELAND	7840				
18	EGYPT	205				

Reaching out for the catch Hamilton/Wright at a pit stop.
Good combat from Gibson and Mittler during quarter finals.



TEAM RACE F2C		1st	2nd	3rd
1	UNITED KINGDOM	11:46.4		
2	AUSTRALIA	12:01.3		
3	HOLLAND	12:01.4		
4	ITALY	12:06.8		
5	SWEDEN	12:17.8		
6	U.S.A.	12:22.8		
7	DENMARK	12:36.5		
8	FRANCE	13:23.4		
9	SWITZERLAND	13:40.2		
10	CANADA	14:04.2		
11	CUBA	14:47.2		
12	BRAZIL	16:07.7		
13	IRELAND	16:17.1		

COMBAT F2D		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th
1	UNITED KINGDOM	7													
2	WEST GERMANY	12													
3	BELGIUM	12													
4	FRANCE	12													
5	CANADA	13													
6	U.S.A.	13													
7	ITALY	13													
8	IRELAND	14													
9	HOLLAND	14													
10	AUSTRALIA	15													
11	SWEDEN	16													
12	MEXICO	17													
13	BRAZIL	17													
14	SWITZERLAND	18													



TEAM RACE F2C			1st	2nd	Semi	Semi	Final
1	Metkemeyer/Metkemeyer	Holland	3:49.5	4:13.7	3:44.0	4:10.4	7:32.5
2	Getschwendtner/Mau	Denmark	Disq.	3:49.7	3:56.2	3:49.9	8:41.8
3	Heaton/Ross	United Kingdom	3:54.4	4:35.6	3:55.0	3:52.9	Disq.
4	Georgiadis/Prior	Australia	4:06.8	3:48.7	3:53.5	Disq.	
5	Clarkson/Woodside	United Kingdom	3:53.4	3:57.8	4:01.6	4:01.2	
6	Oddy/Relchart	Australia	3:56.3	3:57.1	3:55.6	3:53.4	
7	Smith/Brown	United Kingdom	3:58.6	Disq.	4:01.7	4:11.3	
8	Visser/Buys	Holland	4:06.0	3:59.1	3:57.4	4:00.0	
9	Perrachi/Cipolla	Italy	4:01.7	3:59.4	Disq.	3:59.3	
10	Nitsche/Fischer	Austria	4:00.2	4:14.5			
11	Larsson/Andersson	Sweden	4:00.5	4:01.2			
12	Fontana/Amodio	Italy	4:01.8	4:22.9			
13	Dodgo/Nelson	U.S.A.	4:03.1	4:20.1			
14	Albritton/Joy	U.S.A.	4:04.4	4:09.5			
15	Gurtler/Baumgartner	Austria	Disq.	4:05.1			
16	Voghera/Menozzi	Italy	4:06.1	4:05.6			
17	Pontan/Winkler	Sweden	4:08.3	4:09.5			
18	Bohlin/Bengtser	Sweden	4:11.1	4:09.0			
19	Lenzen/Pieper	West Germany	4:12.1	4:26.0			
20	Christen/Saccavino	Switzerland	4:12.5	4:45.7			
21	Wakkerman/Weerd	Holland	4:24.0	4:12.8			
22	Jolly/Kusik	U.S.A.	4:39.3	4:15.3			
23	Wilson/Wilson	Australia	4:28.0	4:16.3			
24	Kelly/Parent	Canada	4:17.3	4:47.0			
25	Geschwendtner/Petersen	Denmark	4:18.4	Disq.			
26	Delor/Guillomes	France	4:22.3	4:23.4			
27	Filho/Mary	Brazil	4:22.8	Disq.			
28	Surgue/Magne	France	4:46.8	4:23.3			
29	Duran/Carrasco	Cuba		4:26.9			
30	Sejersen/Edslev	Denmark	4:45.1	4:28.4			
31	Borer/Studer	Switzerland	4:52.3	4:33.2			
32	Topalian/Topalian	France	4:38.7	4:37.8			
33	Baker/Ker	Canada	Disq.	4:38.9			
34	Thomason/Thomason	Ireland	5:04.5	4:45.7			
35	Borer/Schraner	Switzerland	4:54.6	4:57.9			
36	Estrada/Agraz	Cuba	5:00.3	5:05.2			
37	Kane/Doyle	Ireland	5:18.4	5:04.1			
38	Fairey/Fairey	Canada	5:08.0	5:14.9			
39	Infante/Moreira	Portugal	5:18.0	5:14.3			
40	Calcines/Panpillo	Cuba	Disq.	5:20.0			
41	Leonel/Ferrarezi, Brazil,	5:34.3, Disq.;	42	Desmet/Delrue, Belgium,	Disq.,	5:43.5	
43	Monacc/Vicentini, Brazil,	6:10.6, 6:39.0;	44	Hamilton/Wright, Ireland,	Disq.,	6:27.3	

COMBAT F2D		Points	Engine	Propeller	Fuel	
1	M. Tiernan	United Kingdom	340	S. Tigre	Tornado 7x4	10%
2	D. Wood	United Kingdom	289	{ Rossi	Tornado 7x4	10%
3	J. M. Fraisse	France	267	{ S. Tigre	Taipan 7x4	10%
4	O. Mittler	Belgium	225	S. Tigre	Tornado 7x4	5%
5	S. Holland	Ireland	318	Taipan	Tornado 7x4	15%
6	U. Edslev	Denmark	267	S. Tigre	Tornado 7x4	15%
7	C. Gibson	Canada	267	Cox	Kelly 7x4	15%
8	S. Tomelleri	Italy	211	AD 15	Taipan 7x4	0%
9	C. Rudner	U.S.A.	324	Fox	T. F. Wood 7x4	50%
9	Tourne	Belgium	323	S. Tigre	Tornado 7x4	5%
9	G. Frost	U.S.A.	282	Fox	Tornado 7x4	50%
9	P. Wilmer	West Germany	242	{ S. Tigre	T.F. & Tornado	Dies
				{ & MVVS	7x6	
9	W. Grothe	West Germany	234	{ Rossi G	Tornado 7x4	5%
				{ Rossi D	Top Flite 7x6	Diese
9	P. Henry	France	206	Rossi	Tornado 7x4	10%
9	A. Reichle	West Germany	106	{ Rossi &	TF & Tornado	
				{ S. Tigre	7x4	12%
9	F. Meijer	Holland	0	Rossi	Taipan 7x4	5%
17	J. Stivey	Australia	438			
17	D. Holmes	Australia	425			
17	G. Cleveland	U.S.A.	397			
17	J. Andersson	Sweden	365			
17	A. Adler	Australia	360			
17	K. Lunde	Norway	340			
17	L. Wakkerman	Holland	330			
17	R. Vargas	Mexico	263			
17	T. Millar	Canada	258			
17	N. Van Zip	Holland	218			
17	B. O'Gorman	Ireland	213			
17	R. Melhuish	Canada	149			
17	F. Lanfredini	Italy	138			
17	C. A. Barbosa	Brazil	40			
17	P. Stjarnesund	Sweden	30			
17	C. Montagna	Italy	0			



Left, Bohlin and Geschwendtner about to be joined by Nitsche in their second round heat. Above, Poor Derek Heaton can only sit back and watch after his model ran in during the final.

Visser/Buys had broken the outboard wing leading edge and were now busy in the pits repairing with cyano and Sellotape.

In the 1st semi final Round 1, Australians Georgiadis/Prior were again left behind needing extra flicks to get started, yet some thirty laps later at the first pitstop they were ahead thanks to their superior airspeed. Geschwendtner/Mau flew on with a range well in excess of fifty laps, a real hare and tortoise situation, albeit a 100 mph tortoise, but the Aussies finished nearly three seconds ahead with 3:53.5, with Smith/Brown following up with 4:01.7. 2nd semis produced undoubtedly the most exciting race of the meeting, all three teams, Heaton/Ross, Oddy/Reichart, Visser/Buys performed immaculately, the lead swapped and changed through the pitstops until on Estrada/Agraz top placed Cubans.

their last tankfuls, all were equal. The illuminated lap counter flashed up 80, 80, 81, 81, 81 and the crowd, pit crews and managers were all up and shouting "Whip, Whip, Whip." All the pilots let fly in a desperate dash for the finish with warnings flashing up like a pinball machine, who would get there first. Derek Heaton 3:55.0, Hutton Oddy 3:55.6, Visser 3:57.4. The first ever semi with all teams under 4:00! The 3rd semi was the Metkemeyer brothers against Clarkson/Woodside, Holland and Britains top teams, with Italians Peracchi/Cipolla who were using a prototype Cipolla Team Race Motor. The Dutch produced the fastest time of the meeting, 3:44, another World Record which overshadowed the other performances with the Italians being disqualified for high flying.

A redraw of flying order for the 2nd semi final round and the last chance of a flight in the final, only the Metkemeyers were virtually assured of their place. A prophetic draw matched them with Geschwendtner/Mau and Heaton/Ross. A control snag during landing for Derek Heaton at the second pitstop, dug the model in the tarmac, to stop short requiring a quick dash by Malcolm Ross back to the next segment. Yet their time had improved to 3:52.9 whilst Danes stormed home with 3:49.9. Good times but the British were certainly sweating being already the third fastest with six teams still fly. The 5th semi and chances were slipping away for Georgiadis/Prior, eight flicks at the start. Similar problems at extra pitstops caused by a cooked up motor and ultimately a disqualification for pilot infringements by Theo Georgiadis thereby ended the strongest potential challenge. Smith/Brown landed simultaneously with Italians Peracchi/Cipolla causing Colin Brown to miss his catch in what was to end as a messy heat for all concerned. 6th Semi, and truly make your mind up time for the final. If Clarkson/Woodside won this heat, UK would be certain of at least one finalist. However they flew slowly (4:01.2 was slow at this contest) and the challenge came from the other Australians Oddy/Reichart

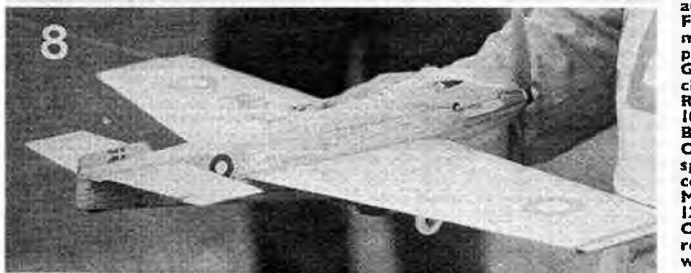
flying a storming race which could easily have squeezed them past Heaton/Ross's time, but by the 100th lap they had missed out by 0.5 seconds. Close, but not as close as the second team prize they had helped secure over the Dutch by 0.1 second in a 12:01.3 team total!

Before the final all the competitors and spectators rose to stand in silent memory to Paul Bugl. A minute's silence was broken by the voice of Don Jehlick who declared "Let the final race commence". An emotive beginning to the finals of the Championships.

The double distance 200 lap final, a rerun of Metkemeyer bros, Geschwendtner/Mau and our own Heaton/Ross. A tense dramatic race and a sparkling performance from the Dutch with Rob on the ground work, and their model rocketing to maximum speed much faster than their opponents. Derek and Malcolm were struggling to keep in the race, and go for broke take off which shook the model from Malcolms hand, resulting in a run in which stopped the motor and ended their chances early. Meanwhile the Danes, although slower in the air, were surely superior at the pitstops, catch refill, single flick and launch were performed in one smooth continuous flowing action at every pitstop, the crowd cheered them on but the Dutch were invincible. Rob and Bert were World Champions with another world record time of 7:32.5. Drama on landing as the lines momentarily snagged Dereks head and the sudden landing fractured the undercarriage leg, snapping it clean off the model. How close had they been to disaster? Fine performances showing the continuing growth of skills world wide, in team racing, with the universal motor, the Nelson which has done so much to improve standards, ultimately being pipped at the post by the special Dutch motor, the FMV, the brainchild of Enrico Flores.

Final congratulations go to the British team and Richard King their manager who helped them secure their first team place and re-established Britain at the top of Team Race.





1. "Through God's will we shall do valiantly" motto on wing of Albritton Joy USA. 2. Georgiadis/Prior potential winners after only a couple of years racing. 3. Malcombe Ross in action. 4. Nelson/Dodge model, wheel partially cowl in deep fuselage. 5. Swedens Bohlin/Bengtsar, out of luck with slow times. 6. Fontana/Amodio with airbrake model. 7. Flemming Jensen propellers used by many placed 1st and 2nd, Mau's propeller shown below blank. 8. Mau/Geschwendtner model wide root chord taper wing. 9. Aussies Oddy/Reichardt used single blade prop. 10. Last minute repairs for Visser/Buys before semi. 11. New World Champion Rob Methemejer with special built FMV motor. 12. Encouragement from team manager Margara for Italys Peracchi/Cipolla. 13. Jim Woodside pitting for Dave Clarkson in second place after 1st round Britain won the team prize with all crews under 4.00 mins.





Moment of launch in excellent Holland vs Tiernan bout.

THE first world combat championships has been a long awaited event. Unlike other stopwatch events, no comparisons between competitors scoring potential is possible until they compete together. Dependant upon the intuitive reaction of one flyer against another during the excitement of a bout, it was not until an Austrian flew against an American, Brazilian flew Norwegian or Swiss flew Mexican that comparison and judgements in the skill and art of flying, so long awaited could be determined.

Combat is currently a most unique and exciting event going through, as it is, massive "growing pains" with a wealth of Charlie Johnson over with the U.S. team shows typical mylar covered all balsa mono boom american layout, surgical tube tank goes inside rocket tube.

new ideas, models, designs, and flying styles that makes it unrecognisable, though not necessarily better than even a few short years ago.

The approach to FAI Combat is greatly diversified, although glow motors dominate, the choice of power plant, propeller or fuel system is varied, none proving to be dominant in use. As to the models themselves, there is a clear definition between each side of the Atlantic. Europeans prefer large area "Foamies" based on the parallel chord triangular tail *Superstar*, the taper wing *Titan* or the French *Boomerang* with many methods of hollowing, lightening or strengthening. Models from the American continents varied, from the Canadian Balsa frame model reminiscent of designs from the early 1970's to the US and Mexican twin or mono-boom flying elevator models, all lovingly crafted from balsa wood, unbelievably time-consuming in man hours.

National flying styles also varied as did ability, despite the "world" status of the event. Many early losers lacked aggression or the competence to follow and merely manoeuvred in their own airspace presumably hoping for a combat to 'occur' if the opponents flight path overlapped. In general the European style was to chase continuously tight and low, restricted to the downwind quadrant whilst the generally quicker American models flew wide and fast using the full circle, with the Australians flying high swooping down for quick striking attacks.

The 'rule book' became the ogre of the meeting, with the ludicrous penalties concerning pit crews and conduct often dominating the performance of the flier. Combat is not a team event nor should it be, only one person gets on the winner's rostrum. It should be an event to find the best pilot irrespective of how many pit crew members, how fast they can run or the exact position of feet relative to arbitrary lines marked on the ground. At times, scoring was more relevant to 'Come Dancing' than combat. Imagine the nonsense of Gary Frost disqualified for letting his handle go momentarily before the model landed after gliding down from a 3 cut to 0 victory; or Montagna disqualified when his pitman launched his model one second early — to what advantage? or Fred Meijer dis-

qualified when his handle was ripped from his hand during a mid-air collision; or Tomelleri knocked out by his pitman accumulating meaningless penalties for not entering the circle perpendicularly; or Dave Wood disputed to be attacking the opponents model by simply chasing it when only the string remained — what a precedent that might have set! What else can a pilot do? Clearly the meeting proved the rules to be useless and in need of immediate modification, let's hope all countries present, will now pressure the FAI for change.

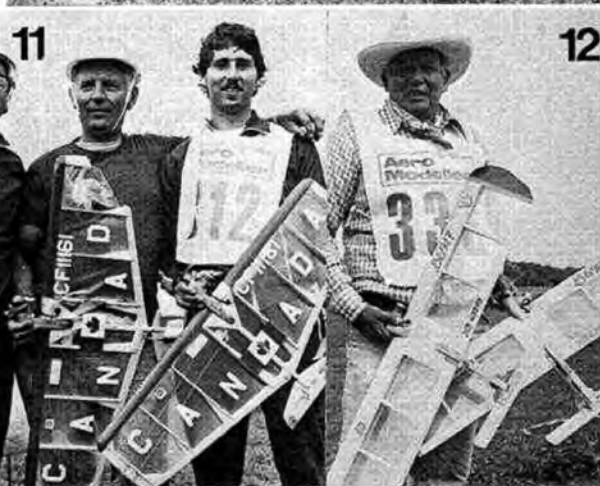
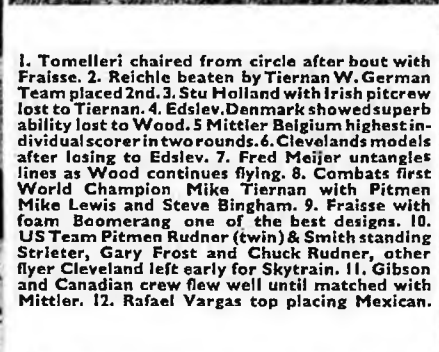
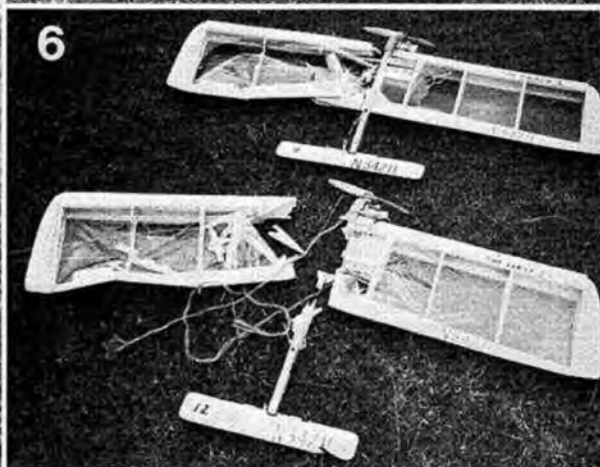
Winning performances of British fliers at previous international events made them favourites for the championship yet there was a growing awareness that improved standards world-wide had certainly narrowed the gap. In fact, the opening bout of the first round proved to be one of the sensations of the meeting with the defeat of Vernon Hunt. A disastrous build up to the championships for Vernon, which in itself would fill a report, included destruction of all his models and equipment after a fire. After months of development on new models, he was left with only days to replace his fleet and borrow engines. His run of bad luck continued with tough draws; Fralsse of France, in round one and Cleveland of the USA in the reply. Two messy bouts gave him no chance to show his flying ability and Britain lost its favourite for the title.

Other first round losers included all the Swiss, Mexican and Irish teams including Stoo Holland plus America's Cleveland Frost, Dane Edslav and Canada's Gibson, all of whom were to win their replies and show good ability later. At the close of the round, individual scores were as follows: First: Mittler, 640 points, second: Montagna 604 points and third: Holland, 540 points.

The second round saw the defeat of all three Australians — Stüvey, Holmes and Adler. Cleveland from USA and experienced Dutch flyers Wakkerman and Van Zip also made an exit. End of second round individual scores placed Wilmer on top with 540 points and Frost with 513 points followed by Holland — 503, Edslav — 452 and Meijer 440 points. Tiernan was sixth with Wood tenth. West Germany led the team prize with all three remaining in the last sixteen, followed by USA with Belgium, France and England equal third.

The opening bout of the third round should have been a classic, Meijer v. Wood, but after 10 seconds it was all over for Fred, after his handle was ripped from his grasp during a mid-air collision. There was nothing he could have done except wear a wrist strap, and as a result he was disqualified. The second bout, Reichle vs. Tiernan started with the German pit crew, which included Frau Reichle starting the Rossi's, unfortunately unable to get the motors running, becoming a walkover due to excessive ground time. The third bout, Henry vs. Gibson, was a very fast bout with the Canadians setting the pace fast and wide with his glass-fibre propped Cox powered models. Gibson proved repeatedly that the pilot himself is now a valuable member of the pitcrew — retrieving his own models, saving valuable seconds and of course always running out perpendicular to the circle. The fourth bout, a classic match between Frost and Holland represented flying styles from each side of the Atlantic. Frost was soon two cuts up, flying well; but problems during





1. Tomelleri chaired from circle after bout with Fraisse. 2. Reichle beaten by Tiernan W. German Team placed 2nd. 3. Stu Holland with Irish pitcrew lost to Tiernan. 4. Edslev, Denmark showed superb ability lost to Wood. 5. Mittler Belgium highest individual scorer in two rounds. 6. Cleveland's models after losing to Edslev. 7. Fred Meijer untangles lines as Wood continues flying. 8. Combats first World Champion Mike Tiernan with Pitmen Mike Lewis and Steve Bingham. 9. Fraisse with foam Boomerang one of the best designs. 10. US Team Pitmen Rudner (twin) & Smith standing Strieter, Gary Frost and Chuck Rudner, other flyer Cleveland left early for Skytrain. 11. Gibson and Canadian crew flew well until matched with Mittler. 12. Rafael Vargas top placing Mexican.

pitting with burst fuel bladders (a recurrent problem for the US team) slowed the action. Back in the air, Holland chased the fuel soaked model of Frost to win back cuts and take the bout with some superb flying. The fifth bout was Mittler vs. Wilmer, whose motor had a strange attachment which proved to be a compression screw, being the only diesel in the remaining sixteen. Mittler with superior air speed dominated the flying, sizing up his opponent, chasing continuously, staying out of trouble, not rushing things, to easily to take two cuts towards the end of the bout, cool tactics. The sixth bout saw Fraise vs. Grothe, probably Germany's top flyer unfortunately let down by poor ground work. Fraise at one time two cuts down lacked aggression but eventually concentrated sufficiently to take a cut and win the bout. The seventh bout was Tourne vs. Tomelleri who used the new Italian AD15, a very fast combination with his flat aerofoil taper wing models. Superior models and piloting left the Belgian outclassed and defeated. The eighth bout brought together Edslev the Danish Champion and Rudner, the sole remaining American. Another great Euro-American combination. A flurry of cuts reduced each to towing strings which in turn produced some of the finest flying as Edslev, aware of an impending belcranking, having taken an early lead, showed brilliant following ability with some of the tightest manoeuvres witnessed. A victory for the Dane, a pilot to be respected, and a farewell to the US team.

Quarter Finals

The first bout, Edslev vs. Wood, both great pilots in tight chasing manoeuvres with Dave having the superior model for speed and stability. Edslev started well, but took all except for the knot. Wood shook off all attacks by out-running his opponent inverted or level to then snap quick turns in behind Edslev and eventually flying him into the ground. Back in the air, Wood then cut back also leaving only the knot which he took after an inspired chase.

The second bout Gibson vs. Mittler, the more experienced pilot, however the well equipped Canadian provided a tough opponent. Mittler lost valuable points after



Big Mike Tiernan battling it out against Ireland's Stoo Holland.

crashing both models and losing a pacifier in a mid-air collision. The third bout, Tiernan vs. Holland, one of the best combinations, showed a fine display of flying. Again super tactics from Mike chasing tight for some quick cuts then running wide and fast to avoid trouble. Stoo Holland flew well but lost the initiative and eventually lost the bout. The fourth bout was Tomelleri vs. Fraise two of Europe's top flyers. Fraise almost handicapped with superior turning models seemed at times unable to control their potential. By contrast Tomelleri flew smoothly to take the cuts yet surprisingly kept crashing soon after pit-stops. Nerves or tactics – who could tell? At the end of the bout Tomelleri was chaired shoulder high from the circle only to find his pitcrew had made numerous penalties which added to his ground time gave the bout to Fraise.

Semi Finals

First bout – Wood vs. Mittler. Wood flying

in great style took all of the streamer with two cuts before a mid-air, putting Mittler down. Two new models and fabulous flying from Mittler gaining one cut which stopped his motor. Wood was now in danger and still towing lots of streamer trying to evade Mittler. Confusion reigned as orange solar film fluffed off Woods model another mid-air took the streamer and cut Wood's model free to end the bout with Mittler losing on ground time. The second semi-final pitted Tiernan against Fraise. Immaculate pitting from the French team matched by the English team made this truly a pilots' bout. However, all too quickly Mick had two cut and Fraise took all the streamer to rob the crowd of a longer bout.

Finals

The third place fly-off, Fraise vs. Mittler. Fraise quickly took all of the streamer with two cuts before an incredible mid-air. Both contestants relaunched simultaneously with Mittler taking a cut before another amazing mid-air imbedding his model into Fraise's wing, which continued to tow the locked models, the result a win for Fraise. At last the moment combat fans have waited twenty years or more for to witness the first ever final to decide the world champion, and true to form in an all British Contest. Extra pitmen were requisitioned to create two crews and at the start Wood was left grounded with a dead motor. Such a delay may have made the pilots over anxious as both Mike and Dave had soon removed all of the others streamer with only one cut each to require no further manoeuvres and make Mike Tiernan the Combat World Champion, with Britain also taking the team prize.

Never have two world champions been so disappointed at not producing a good bout for the crowd, so much so that fresh streamers were fitted and soon the combat continued in an exhibition to demonstrate what might have been. They were joined by Fraise, Tomelleri, Rudner, Hammersly, Bingham and others in a tribute to the sport of combat and the global camaraderie of combat flying.

It is the very nature of combat requiring excellence on the day that some of the best fliers never appear at the top of the result sheet, so what of the Pilots themselves. Naturally the top four were brilliant, but Edslev the Danish champion or Stoo Holland could well have matched their skills on a good day. Italy's Tomelleri and Holland's Meijer must also be rated world class. Who knows what might have been for America's Chuck Rudner and Gary Frost, but for burst fuel bladders; Germany's Wilmer but for his slower diesels or Grothe but for having drawn tough opponents too early and of course our own Vernon Hunt but for his overwhelming misfortune. No doubt in two years time all will have improved, hopefully the rules changed and the stage set for another great championships.

Organization, judging and scoring under the leadership of John Hammersly was impeccable, comprising of a pool of dedicated-experienced pilots, any of whom could have given a good performance in the event itself. Duplicate sets of judges, not actually required by the FAI, simultaneously scoring each bout independently, allowing a double check of scores thus minimising human error. Results were rarely more than seconds apart, none of which affected a single result!

The Champions Dave Wood, runner-up and Mike Tiernan who together with Vernon Hunt also took top team prize for U.K.



Woodvale FF Scale International

report by Alan Callaghan

Appeals to incorporate a Free Flight event in the Scale Championships came to fruition on Saturday 5th August with a modest entry from the UK and USA. Considering the volume of interest in free flight the total of nine British models and five American models, four of which were proxy flown by local fliers is hardly representative; but at least a start has been made!

Static judging was shared between the manager of the Canadian RC Scale Team Ted Sharpe, and myself.

John Blagg's nicely detailed rubber powered *Isaacs Fury* happened to be first on the list of entries to be judged and proved to be a nice middle range model to set the standard. Conditions were ideal with a reasonably warm temperature, a slight overcast, and only the gentlest of breezes by 6 pm, so with three models judged for static points a draw was made for flying order while the good weather lasted. After the first round was completed the conditions remained so good that the second in reverse order was flown straight away, leaving the possibility of a third flight on the Sunday. As it turned out, there was a ghastly change for the worse in the weather overnight. The hangar was partially flooded, with continuous rain and strong winds persisting all through the following day. We had been very fortunate to have the contest in the bag on the first Woodvale day.

Flying rules called for a qualifying flight of 30 seconds. A number of models had difficulty in achieving this time with numerous 27 - 28 sec. attempts being made much to everyone's disappointment. Two of the CO2 models, Bill Hannan's *Farman Moustique* and Doug Hunt's *Comper Swift*, as well as Bill Warner's Rubber-powered *McDonald S-21*, easily put in qualifying flights, and this, together with the perfect conditions meant that there was no justification in reducing the qualifying time to 20 seconds as provided in the rules if conditions should dictate.

At this level of competition a high standard should be maintained and encouraged - after all they are flying scale models, and since everyone who took part was eligible for some sort of prize no complaints were heard!



Rubber powered twin P-38 Lightning by Richard Falconer, a rare sight.

Flying standards varied enormously from Eric Coates's venerable and well-trimmed *DH9A* to Pete Sutherland's excellent CO2 *Heath Baby Bullet* which looked as if it was being tested for the first time. The *Bullet* is a very difficult subject to fly free-flight as it has tiny tail surfaces and no dihedral. Pete's model was a superb piece of craftsmanship with its motor being totally hidden inside the scale *Bristol Cherub*, and to back it up a documentation folder was included that left nothing to be desired. The *DH9A* is a mere youngster compared with Tom Stark's fourteen year old *Loening M-8* being flown proxy by Bob Underwood (who was more successful with his own *Sorrel Hiperbiplane* flown to second place in RC Scale). Of all the American models entered the *Loening* most closely matched the type of FF scale model normally seen at competitions in the UK. It was superbly and realistically detailed and would have scored much higher statically had some of the major dimensions checked out more accurately, together with its aileron shapes which were noticeably wrong even according to Tom's very own documentation plans. Just missing a valid time by a

second or two, the Cox 049 powered model stalled rather heavily onto the tarmac and investigation revealed that the wing may have been misaligned during assembly. It survived such scrapes with little protest and I am sure it still has many years of flying yet to come.

Bill Warner's silver low-wing *McDonald S-21* (did it ever really exist?—Ed) for rubber power (proxy flown with great confidence by Joe Barnes) was very much in contrast to the *Loening*, and seemed to typify the American approach to FF scale with a simple model, lightly built, and flying very well. Note its flight score. Flying in realistically banked left circuits, only the take-off was down-pointed slightly since it consistently followed a curved rather than a straight path as it left the ground. This model did extremely well despite its modest static score (notwithstanding the documentation being covered in jokes and pin-up pictures!) and happily demonstrates the practicality of concentrating on the flying rather than the more normally chosen static side to scale modelling.

Bill Hannan's Brown Junior CO2 powered *Farman Moustique* was a more balanced

Group shot of all competitors taken just prior to announcing the final results, hence the happy faces.





Left to Right: Pete Sutherland's Heath Baby Bullet was very accurately built and detailed. Documentation seemed sufficient to build full-size plane but was easy to use. One of those who combined their spectating of the F/F International with a spot of unofficial flying was Ed Allebone with this pair of CO₂ models. Having weighed up the opposition perhaps Ed will be tempted to try his hand as a competitor himself in future. Bill Hannan's entry placed 4th Proxy flown by Peter Redhead. Typical of the American approach this CO₂ powered lightweight was accurately built and flew well.

compromise than the McDonald, hence its higher final placing. This little red monoplane put in flights of 45 - 50 seconds from a take-off but at the same time it was as dimensionally accurate as any other model in the competition thus making its very respectable static score raise a few surprised eyebrows. Bill's special feature was a strikingly realistic sculpted pilot clearly recognisable from the photo of the real fellow, but this cannot be marked since the pilot is not part (physically, that is!) of the aircraft. A great pity since some superb models have been let down by the worst kind of stuffed effigies ever to be seen in a cockpit, yet there is little incentive to improve upon this state of affairs.

The two other American models, Walt Mooney's Peanut *Upton Baby Ace*, and Bill Stroman's *Stinson Model S*, were both rubber powered. The Stinson seemed to have seen better days but the Baby Ace is Bill Dennis' Handley Page 0/400 banked over in a turn, highest static score, below Eric Coates' De Havilland 9A taxis out for its take-off to become eventual winner.

a fairly recent addition to Walt's prodigious output of peanut models. I am fairly used to handling this type of model but after an initial glimpse of it and having seen what seemed to be quite bulky construction before in photos, I was greatly surprised at the light weight of the model, which incidentally went from initial idea to test flying in only one week. It only missed qualifying by a second or two and had therefore been within reach of seventh place in this quite substantial field.

Of the British rubber models, John Blagg's *Fury* was flying the best I've seen it do, but just missed the mark on duration at each attempt. Richard Falconer's Twin rubber *Lockheed p-38* looked splendid climbing away from its unique handlaunch but came nowhere near the required time in duration. Does anyone know when the last twin rubber scale model was entered in a comp in this country? Apart from the three diesel models the only other one with a motor that qualified properly was Doug Hunt's excellent CO₂ *Compor Swift*. This very accurate model was only let down statically by no attempt having been made to disguise the cylinder head of the motor as part of the scale Pobjoy radial which was otherwise a very good piece of work. When it was being judged after the flying it was noticed that both ailerons were drooping prominently. Although it still would not have been quite right, had they been angled upwards the model may have flown much better due to the stabilising effect of simulated wash-out.

Top honours, therefore, went to the three diesel-powered models each with an optional in-flight working feature. Under the rules being used, Bill Dennis was unable to pick up bonus points for both his bomb-dropping feature and his twin engine arrangement on the *Handley Page 0/400*, and so opted for the bombs. This was a disappointment to Bill in view of the remarkable achievement that his model represents, but with the benefit of hindsight one can see that it would not have altered the final placing since only another fifty points would have been added to his score.

The model did not fly as superbly as it did at the Nationals, turning here as it did in much tighter circuits, but the transition to glide turning from left to right and the slow gentle glide were a pleasure to watch. In compensation, perhaps, the model topped the static scores by a very narrow margin. Terry Manley's *Blackburn Swift* flew disappointingly with a stally, nose-high attitude, and violent transition to glide. Had it not been for the torpedo drop the score would have been bettered by the McDonald. It is difficult to imagine better detailing than is found on the nose section and engine compartment on Terry's *Swift*, but we were surprised to find he had fallen for a common error in that the alignment of the

Superb craftsmanship and attention to detail is clearly evident in this close-up of Terry Manley's *Blackburn Swift*. Only slight inaccuracies reduced his static score, but a torpedo drop during the flight helped redress the balance.





Tom Stark's Loening M-8 was closest in techniques to the British Models. Subject full of character was highly detailed.

ribs in the fin and rudder did not agree with both the photos and drawings in his folder. Eric Coates' DH9A deservedly made the highest flight score by a healthy margin. His second-round take-off was given maximum points for a smooth tail-high run, lift-off, climb to, momentarily settle at altitude before commencing its wide steady turns. It was only slightly let down by the definite stalled change into gliding flight that is inseparable from the diesel powered scale models flight routine. This model is a clear example of the benefit of having a tried and trusted subject well trimmed out if you are going to take FF competition scale flying seriously.

As this competition had acquired a fair

degree of importance as the first international event held at a World Champs, we decided before starting the static judging that the models ought to be checked to a fairly critical standard. The handsome AeroModeller trophy and an excellent spread of prizes also helped make this decision, but it also seemed the best way of initiating what will hopefully blossom into an event with the prestige it is due. In scale flying the documentation of the model must be regarded as an important part of the whole idea. Folders of information at this event varied enormously from Pete Sutherland's splendid effort to Bill Warner's spread that obviously was meant to provide light relief. Very noticeable was

the inconsistency in scale rules; some were wrongly marked, some were not long enough, and one was completely to the wrong scale. This meant that many models could not be properly checked for fidelity to scale, and could probably have scored much higher had this not been so. It makes judging so much easier and quicker if a few straightforward measurements can be taken to establish whether tail areas have been increased, etc. An irritating controversy arose when it came to light that the winning model had been presented for judging without any colour documentation whatsoever (it wasn't the only one!), and had been down-marked statically as a result. This was protested on the grounds that the model had never been penalised before because of this, everyone knew what colour they were, and the judges on this occasion were out of step! Unswayed by such nonsense, since colour details are a fairly basic requirement, and out of respect for some of the other presentations, the judges held to their decision, and were left wondering what all of these previous judges must have thought they were doing... The onus should always be on the competitor to provide full and plausible documentation of every item he hopes to be given credit for — this really isn't asking a great deal.

Everyone would have liked to have seen more of the regular British fliers lending their support and encouragement to this, their own event which could still become a very worthwhile feature to add to any international calendar.

Very special thanks are due to Mick Duce, who organised everything at extremely short notice, and whose efforts are greatly appreciated.

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Eric Coates receives MAP Trophy and first choice of terrific prize spread from Ted Sharpe, Canada's RC Scale team manager. Event organiser Mike Duce in background.

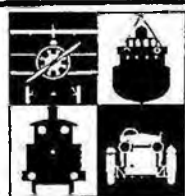
Far Right Clockwise Fournier R.F.4. Cockpit closeup of Pilot is recognisably F4C winner Mike Reeves in miniature. Brian Taylor's Northrop Black Widow recently completed to replace model damaged at Trials. J. McCollum's Topsy Nipper very high static score, failed to achieve flying scores. Class II scale winner Fed Coulson with his Thunderbolt.

FINAL RESULTS WOODVALE F/F SCALE INTERNATIONAL

				Static	Flight	Total
1. E. Coates	UK	DH9A	P	710	1,170	1,880
2. W. Dennis	UK	HP 0/400	P	726	1,030	1,756
3. T. Manley	UK	Blackburn Swift	P	724	840	1,564
4. W. Hannan	USA	Farman Moustique	CO ₂	511	740	1,251
5. W. Warner	USA	Macdonald S21	R	232	810	1,042
6. D. Hunt	UK	Comper Swift	CO ₂	556	485	1,031
7. P. Sutherland	UK	Heath Baby Bullet	CO ₂	673		873
8. J. Blagg	UK	Isaacs Fury	R	514		514
9. T. Stark	USA	Loening M8	P	499		499
10. W. Mooney	USA	Baby Ace	R	296		296
11. R. Falconer	UK	Lockheed P38	R	293		293
12. B. Hotham	UK	B Jungmann	R	266		266
13. W. Stroman	USA	Stinson Model S	R	242		242
14. B. Sinclair	UK	Nieuport 17	CO ₂	194		194

RADIO CONTROL SCALE F4C

			%	Static	Round 1	Round 2	Round 3	Static plus Best flight
1	M. Reeves	G. Britain						
2	R. Underwood	U.S.A.						
3	J. Rousseau	France						
4	R. Nellitz	Canada						
5	T. Melleney	G. Britain						
6	R. Fouquereau	France						
7	R. Wischer	U.S.A.						
8	B. Taylor	G. Britain						
9	S. Sauger	U.S.A.						
10	A. Steinberger	W. Germany						
11	F. Knowles	Canada						
12	W. Reger	W. Germany						
13	P. Muller	Switzerland						
14	W. Eisenreich	W. Germany						
15	E. Hirt	Switzerland						
16	E. Stromquist	Sweden						
17	H. Dagg	Ireland						
18	R. Dery	France						
19	J. McCollum	Ireland						
20	T. Shortt	Ireland						
21	J. Stromquist	Sweden						
22	J. Swift	Canada						
23	H. Bjorquist	Sweden						



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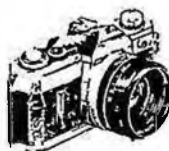
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MEMO

To : All Modellers

From : Model Engineer Exhibition Manager

Don't forget October 27th 1978 is the closing date for your entry for the January 1979 Model Engineer Exhibition. An entry form has been published in the August issue of this magazine or you can obtain a form and full details of the rules and the classes from Peter Freebrey, Exhibition Manager, Model Engineer Exhibition, 13-35 Bridge Street, Hemel Hempstead, Herts. HP1 1EE.



MODEL PHOTO COMPETITION

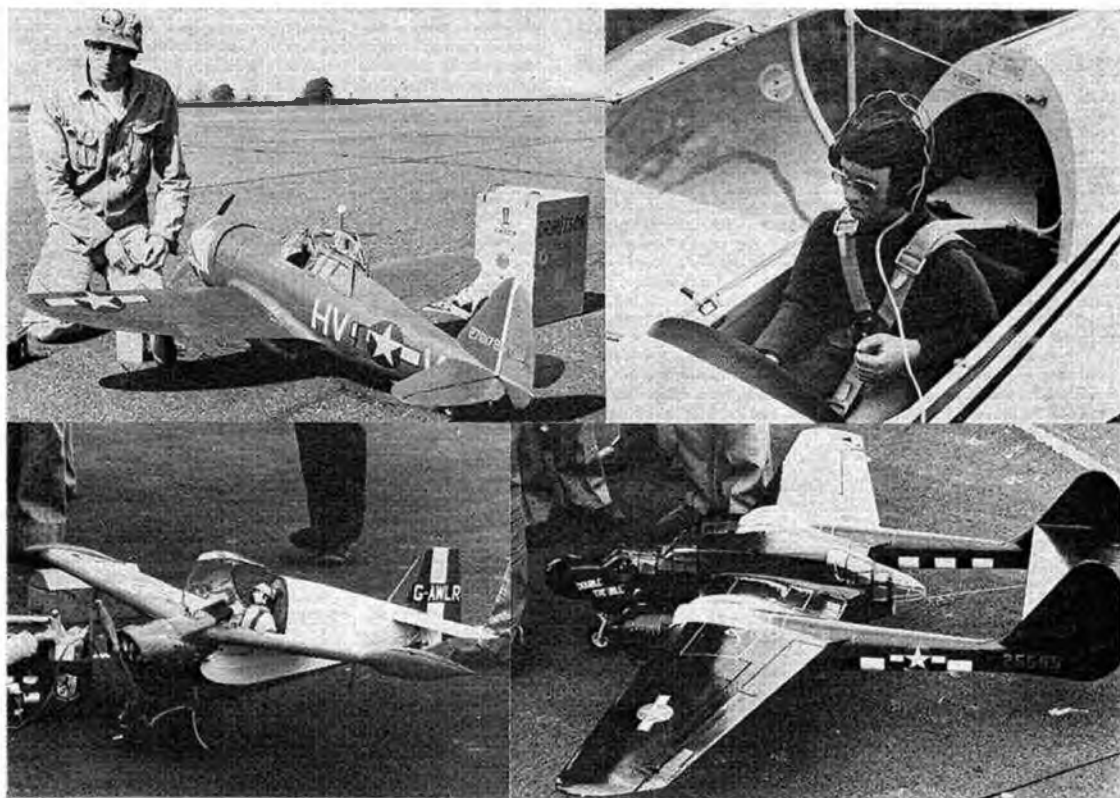
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A/M
OCT. 1978
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Colour or Monochrome Coupon

RULES

1. The theme of the competition is to select the photograph judged to be the best pictorial presentation of Aeromodelling. All submissions must be certified as the work of the entrant, by signature on the rear face or mount.
2. There are two competition classes:
 - (a) Colour slides which should preferably be vertical format 35mm, or larger.
 - (b) Black and white prints of any size up to 10x8ins., negatives need not be provided.
3. The following information must accompany each entry:
 - (a) Sender's name and address,
 - (b) full details of the model, location, builder, event,
 - (c) title or caption.
4. Entry is free. Each entry (however many pictures it contains) must be accompanied by a contest coupon taken from an issue of AeroModeller magazine. There is no limit to the number of entries that may be made – but remember that quality will count, not quantity.
5. Clearly mark the entry "Model Photo Competition" and send to AeroModeller, 13-15 Bridge St., Hemel Hempstead, Herts.
6. Proof of postage cannot be held as proof of receipt by AeroModeller. While every care is taken of material received, this journal cannot take responsibility for any loss or damage to entries whatever the cause.
7. Entries can only be returned after the judging if suitable postage and packing is provided.
8. The Judges' decision is final in all matters and no correspondence can be undertaken in connection with the contest.
9. Entry to the contest implies full acceptance of all rules.
10. AeroModeller reserves the right to publish any photo during or after the contest. Copyright of all entries rests with the entrant.
11. Closing date for entries 29th September, 1978. Winners will be announced in December AeroModeller on sale 17th November, 1978.

Prizes include: Kodak's latest EK100 instant camera and film, with other prizes of Colour transparency, Black and White Kodak film and Instaplug Pocket EF1 camera with flash unit supplied by importers and distributors Paul Plus Ltd, members of the Photopia International Group. Cosina Compact 35S camera supplied by Photographic Instruments Ltd. Photographic equipment and accessories from Patterson Products including a THERMO-DRUM print developer, for colour or black and white. Micro focus finder and bottles of developing chemicals and accessories. Other prizes include Photography Year Books and AeroModeller Annuals from Argus Books.





1979 FIC Team Ray Monks, Stafford Screen and Pete Harris, all from Birmingham. FIB Team, Bob Wells Anglia, John Cooper Biggles and Dave Hipperson Croydon

Free Flight Scene *reported by...*



1979 U.K. F/F TEAM TRIALS—July 15th/16th

Held over two weekends at Everleigh Dropping Zone on Salisbury Plain, the Trials to pick the 1979 free-flight team were subjected to an interesting variety of weather. The first pair of days were windy, and severe turbulence, both downwind of a small hilltop wood and due to the undulating ground downwind of launch, caused problems for many flyers. The second part, in mid-July, brought hot, thermally conditions, with drift of only some 5 knots for most rounds; what was missing, due to the late starts for each day's flying, were rounds flown at times when fairly still, non-thermally air was likely. As a site, although far from flat, and covered during the trials with grass that was sometimes waist-high, most flyers I spoke to felt that it was one we could well use more often. It compares well, for instance, with Rozendaalse Heide, where the late-lamented Amsterdam Cup used to be held in the Netherlands; retrieving could be hard, even using a compass and landmarks, but the tank and Land Rover tracks that criss-cross the area definitely make cross-country retrieving by bicycle a possibility, and speed up the process considerably. The fact that after one or two very cautious traverses of the tracks by Escort van I broke a rear leaf spring the following day in Croydon, may suggest a certain course of action. Luckily the area is extensively overflown by Army Air Corps helicopters, and Morris Gilmore for one had cause to thank them for collecting a lost A/2 after the first weekend.

Pete Farrimond of Wigan did a good job of organisation, and spot checking was carried out; running an event as important as the trials at a site he had never seen before cannot have been easy, especially bearing in mind the access difficulties, which made a wind swing the cause for a general cross-country migration, with trailing dust clouds that looked like a cross between the Voortrekkers and the Battle of Kursk.

After the attrition and erratic flights of the first weekend there was not a single flyer with a full score of maxes, but nonetheless the top half dozen in each class were probably those whom most of us would include in any list of 'the ten most likely flyers' from whom to pick a British team. Veteran A/2 flyer Tony Young from Croydon made one of his biennial appearances, using straight tow models to end in second place after seven rounds, while Phil Moate from Tyne-

mouth was lying third. In Wakefield it was more noticeable that several well-known flyers had slipped badly in the treacherous air, among them Greaves, Kaynes, Williams and Proctor; the notable FIC slippee was Ken Faux, lying eleventh, whose seven maxes on the second weekend were not enough to overcome his earlier poor times.

Although the second weekend was a warm, thermally one, maxing out on the final seven rounds seemed to be an elusive skill; no Wakefield flyer managed to, only Pete Williams did in A/2 and four Power flyers, including Fred Chilton, for whom it was insufficient to pull him up from twelfth onto the team. Alan Jack, well-placed after the first weekend in F1C, treed his model on the fourth round after a wind shift during a flight which gave him 2:55, a hectic pole and rope session got it down again, but an off-pattern climb on a trimming flight before the first Sunday round put the model into the ground, damaging both tips on the balsa-skinned foam wing. Initial dependency turned to frenzied Tynemouth activity with Hot Stuff and masking tape, and the model was judged battered but flyable with a minute and three quarters of the first Sunday round left. Alan launched with fifteen seconds before the airhorn marking the round end, and, although the climb was tight the model found good air and looked set to max, before D/Ting early to give a 2:40 time. Disaster dogged him again and on the subsequent round the aircraft went in off the top of the climb to put paid to Alan Jack's chances for a F1C team place.

Another F1C upset was suffered by Dick Johnson, who dropped from second place after the first weekend when he launched into poor air on the first round of the Saturday flying to score 1:34, while Roy Collins threw the propeller blades during one run and tore a hole in the piston skirt as the suddenly-unloaded Rossi had a rapid swan song before grinding to a halt. Apart from the all-but-universal Rossis, a Cox Conquest was used by Bristol & West's Dick Cummins, whose model had a fifteen year old sheet-topped wing, up-dated by the addition of a carbon fibre dihedral brace let into the wing skin. Probably the most unusual aircraft in F1C was Laurie Burrows', with an elegant T-tail on a fibreglass fuselage, broken and mended in three places; he never managed to get it performing satisfactorily during the second weekend.

In Wakefield strong lift and low windspeeds in the first round of the July weekend had models overhead of the timekeepers when the props folded, and some windshear at about 400 feet had Paul Masterman's model heading back towards the starting line for part of its flight. For Ron Pollard, who was making the 700 mile round trip from Tynemouth with Phil Moate and Alan Jack, heartbreak came having held onto second position for twelve rounds; after centring into strong lift and ending highest of the bunch his aircraft flew through the side of the thermal and glided down fast for 1:27 to drop Ron into fourth place in the final results. Mike Woodhouse, concentrating on Wakefield after a poor showing in A/2 on the first weekend, ended in sixth place, using 32 strands of the current batch of Pirelli, but in 3x1 form, rather than the more usual 6x1; he claimed that it was giving the same rate of climb that he obtained on 14 strands of FAI Supplies rubber, but was taking 350 turns against 300 on the FAI, resulting in a 35 second prop run.

For Dave Hipperson the 1979 team trials brought success after

many years of 'always a bridesmaid, never a bride', as he picked up three places to slip into the team (subject, of course, to final approval by SMAE Council) behind John Cooper, who held his leading position all through the second weekend, John also making it into the top three of the glider results as well.

In F1A 28 of the original 57 entrants decided they still had a chance and flew in Part 2. Nobody managed to max out on the final seven rounds, in spite of large patches of strong lift during six of them; at times the thermals were moving the air up faster than some aircraft could dethermalise down, with predictable results. So many models were still lost at the end of the Trials that Colin Morris and I did an air search the following week in his Piper Colt, with a pair of folding bikes tucked into its luggage compartment; although we had approximate positions of seven models not one could be seen, so perhaps the Army had forestalled us.

Tony Young flew a straight tow model with a spring-loaded hook that provided slight rudder offset into the glide turn as the line tension was increased just before release; on Round 1 he launched under Croydon club mate Ken Smith who looked in good air, but came down for 2:20, while Tony's aircraft was down to 20 feet after a minute or so, before catching lift and managing a cliff-hanging max.

The hardest round was the final one on the Saturday; a change in wind strength and direction was taking models behind some rising ground and towards a wood, so a mass exodus along a tank track began before the round started, to find a launch point that gave the best compromise between towing terrain, likely distance that models would stay in sight downwind of timekeepers and yet be subjected to minimum downwash in the lee of upwind slopes. Mike Fantham and I decided to tow well upwind of our timekeepers on the launch line before releasing, so as to have an added chance of our models staying in sight as they drifted back over the timekeepers for the first part of their flight. In the event, the stiff breeze made upwind progress tricky, and I encountered a crosswind ravine that turned out to have been part of the prehistoric earthworks that cover the site at Everleigh; Mike and I managed 2:59 and 2:58, but Phil Moate moved up to second place as Young dropped to fourth with 1:45 recorded for the round. However, Phil was the third of the Tynemouth trio to slip from among the top placers, when a disastrous 1:27 in the penultimate round of the whole Trials robbed him of a team place by 33 seconds; the loss of his circle tow model in the waist-high grass made him fall back on a straight-tow Davis-winged alternative, which may have upset the launch technique of this very-much-on-form flyer.

Tactically, in view of the low windspeeds for almost all the rounds, it seemed surprising that so few people used their circle tow aircraft to full advantage by getting clear of 'the pack' on the ground and towing well downwind of the launch line to await the arrival of a well-marked thermal. In spite of the resulting concentration of models on tow there were few line crosses, so maybe this was being used as an 'insurance tactic' by some flyers in recent years, until the 1978 rule change.

All in all this year's Trials were among the better ones, and look like providing a worthy team for 1979, the first year in which the World Championship teams picked by the SMAE Council will be grant aided by the Sports Council.

F1A (57 entries)

1 Phil Owens	Liverpool	39:24
2 John Cooper	Biggles	38:43
3 Tony Young	Croydon	37:58

F1B (42 entries)

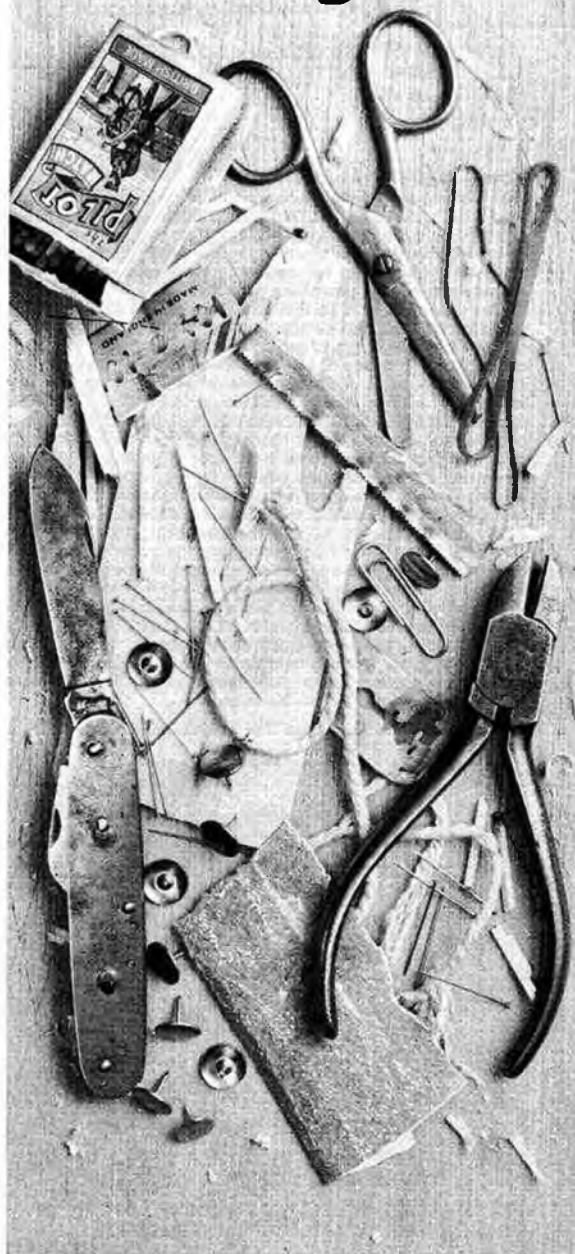
1 John Cooper	Biggles	39:28
2 Dave Hipperson	Croydon	38:18
3 Bob Wells	Anglia	38:04

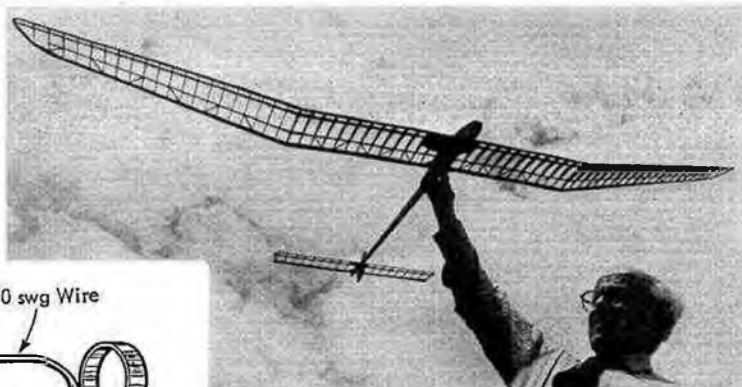
F1C (23 entries)

1 Stafford Screen	Birmingham	41:43
2 Pete Harris	Birmingham	41:23
3 Ray Monks	Birmingham	40:43

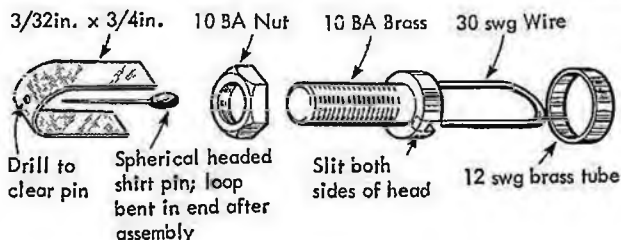
1979 FIA Team, Tony Young Croydon, Phil Owens Liverpool and for the fourth time consecutively, John Cooper Biggles.

There's only one way...





Held high before tissue covering the structure of Saper A2 glider is clearly visible if somewhat minimal to British eyes. Built from a kit this was the design flown by Pavel Dvorak when he became World Champion in 1971.

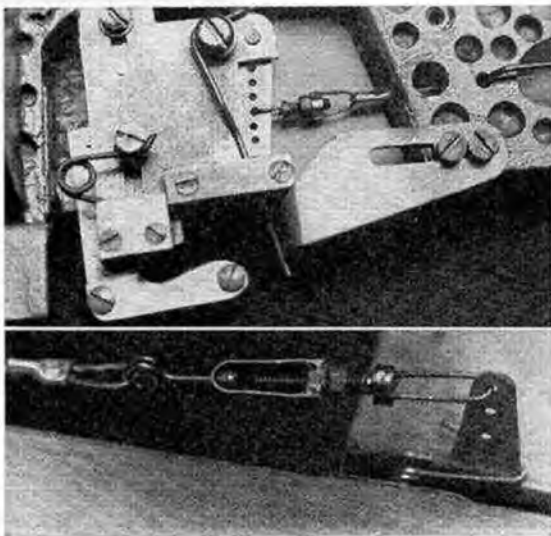


HOME-MADE TURNBUCKLES

With most types of circle towhook some means is required by which auto-rudder line length can be adjusted. While a length of soft iron wire can be bent into a length reducing zig-zag, a turnbuckle is a far more convenient way of altering rudder settings, and also enables the hook and rudder to be separated for the various mods that are necessary to get things working perfectly.

After having a look at the commercial items available for the model yacht fraternity, I decided to produce my own, since the idea of a quarter of an ounce of brass at the back end of an A/2 did not appeal. Cut a $\frac{3}{32}$ in strip of 10 thou shim brass about $\frac{3}{4}$ in long, bend it into a U shape and make a small hole at its centre; I used a steel pin for this, although a very fine drill could also be used. Solder the resulting stirrup to a 10 BA brass nut and slip one of those shirt pins with a spherical metal head through the hole, bending the other end into a closed loop. Next, take a $\frac{3}{4}$ in long 10 BA brass screw and carefully slot the sides of its head to line up with the existing screwdriver slot, using a Junior Eclipse or similar hacksaw blade, and being careful not to burr the screw threads in the process. Solder a 30 swg wire 'U' into the new slots, and finally slide a $\frac{3}{4}$ in length of suitable brass tubing over the screw head, soldering it in place to retain the wire in the slots. Depending on your preference for rudder horns, it may be necessary to slip the wire 'U' through the horn before soldering it in place on the screw. A lock nut on the screw prevents mishaps, and brass is preferred to steel to avoid rust. The auto-rudder line loops are formed by crimping a short length of aluminium tubing onto the line, which is both quicker and neater than various clever fishermen's knots. The photograph shows the completed turnbuckle in use.

Turnbuckles used to adjust line lengths at towhook end and below at auto rudder end.



THE SAPER SAGER (continued from AeroModeller 1976 p. 102)

Having finally built the Czech-kitted Saper, the A/2 that Pavel Dvofak used to win the World Championships in 1971, I have now had a chance to fly it, equipped with a modified Isaenko circle towhook. As you can see from the photograph, the wing structure looks a little minimal to British eyes and in fact flexes alarmingly during a hard catapult launch. Initially this caused problems, as I had used the heavy grade Japanese tissue that Ripmax market to cover the centre panels and several splits quickly appeared on the lower surface, where the lack of spanwise tension resistance in the covering probably allowed the flexure to increase even more. Had I used the white tissue supplied in the kit, which has marked grain on it, on all the wing instead of just the tip panels, the problem might well have been avoided.

On the subject of this 'Czech Jap', it *slackens* when water sprayed so don't bother with this step! Anyhow, to prevent the splitting I doped some of the 30gm/m² polyester fibre-reinforced tissue that Klaus Salzer sells (see F/F Scene, June 1977) on top of the existing covering and this seems to have cured the problem, at a weight increase of about 4g per panel, bringing them up to about 72g each. I found the wingtip structure a little weak, the rather pointed shape tending to catch on things and crack; on any future version I would probably use laminated semicircular tips instead.

The tailplane structure has a flat 1.5mm spar set in the centre of the ribs, giving very little resistance to bending, and several other Saper builders have mentioned the high 'attrition rate' that this produces; so far I have not had the same problem, but the lack of hardwood reinforcement at the centre section leading edge is beginning to result in distortion of the balsa where the D/T bands bear against it. The tailplane is surprisingly heavy at 14g, in view of the rather low weight of the wings.

After having some very hairy experiences towing the model with the wing warps suggested in the instructions, mainly involving a wing drooping viciously, I steamed and doped about $\frac{1}{8}$ washout into both tip panels, which seems to have calmed things down. Presumably the sharply-tapered tips were stalling at a higher airspeed than the centre of the wing, due to the lower Reynolds number ($\text{airspeed} \times \text{wing chord} \times \text{air density}$)

coefficient of viscosity of air at which they were operating; certainly more washout is usually required on tapered wings than on parallel chord ones. In a further attempt to prevent a recurrence of the wing drooping, I also put turbulators on the tip panels, about an inch behind the leading edge and half an inch aft of the existing one shown on the plan. This is simple to do on the field with small tabs of masking tape to locate thick thread on the surface of the wings; the thread can be finally doped in place at home and the tape removed.

CARDINGTON - 30th July 1978 - report by Bob Bailey

As we have come to expect this year, the weather was dry most of the previous week but came Sunday morning, the usual rain appeared, ruining the conditions yet again. Ironically, I missed the only good day so far, being on holiday. The events were Manhattan, CO₂ Duration and EZB. Jim Richmond, who was in the US team for the '78 champs, described the conditions then as an indoor fog; he hasn't seen anything yet since it really was misty and very damp in the shed.

Manhattan attracted more interest than usual despite not everyone having remembered to bring their models. I established a lead early



on but Laurie Barr at last got his going and won with two excellent flights of 6:47 and 7:20, the latter being a new record. Incidentally Laurie's Manhattan flies in right hand circles and mine in left; you can take your pick as to which you choose.

Regrettably CO₂ only attracted one entry — Dave Hipperson. Flying a model similar in size to Ian Dowsett's, he produced very good flying with a 9:40 total. Where were you, Ian?

EZB was difficult in the damp conditions. Bernard Hunt, a new name in Indoor this year, is very much the man to watch in EZB at the moment; he did 18½ mins. in practice without exceeding 100 ft. altitude *and* using some of this year's Pirelli! Must be better rubber than we thought; it certainly takes lots of turns. Bernard won with some very consistent flying. Ron Green pulled all the stops out to try to hit the roof with his 'B' but couldn't get enough turns on to catch Bernard. A pity Dave Pymm wasn't there; it would have been a somewhat closer contest.

EZB — 1. B. Hunt 16:25+16:29=32:54; 2. R. Green 15:02+13:26=28:28; 3. A. Barr 13:15+14:00=27:15 (4 entries). **Manhattan** (4 entries) — 1. L. Barr 6:45+7:20=14:05; 2. R. Bailey 6:00+6:25=12:25; 3. H. Tubbs 5:25+5:41=11:05. **CO₂** (1 entry) — D. Hipperson 5:05+4:35=9:40.

CLOCKWORK TIMER RE-ASSEMBLY

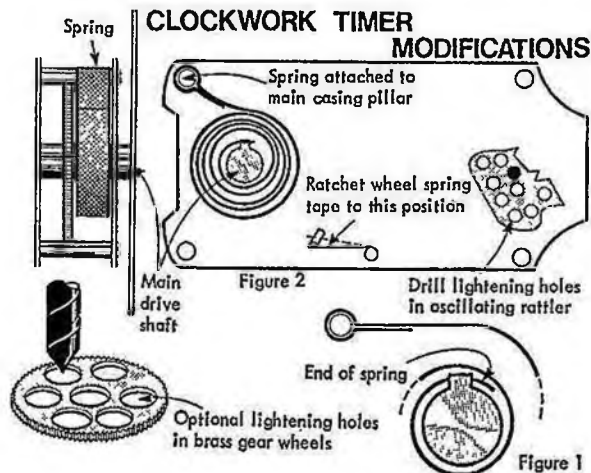
Jon Fletcher has contributed the following tips on re-assembling/improving timers.

- 1 The accuracy of a KSB ½A timer can be increased somewhat by making it run faster. This is done by lightening the oscillating 'rattler' which can only be done by dismantling the timer. Don't panic — read on!
- 2 Some weight can be saved by drilling lightening holes in the brass gear wheels.

Re-assembly

Before starting on this job, the mainspring needs to be kept under control as follows:

- 1 Bond the inner end of the spring so that it is a snug fit on the lug of the drive shaft (Figure 1). Wind up the spring and tape up to prevent it unwinding, leaving the looped end free.
- 2 The base of the timer holds a small hairspring (figure 2). Tape this spring to the position shown to clear the slot; you will need to remove the tape after assembly.
- 3 Assemble the gear wheels with rattler to the base plate; conveniently, the drive shaft with mainspring fits in last. Don't take any tape off yet!
- 4 Assemble the top cover with retaining screws. Remove the tape holding the ratchet wheel spring and then the tape holding the mainspring. Job now done!



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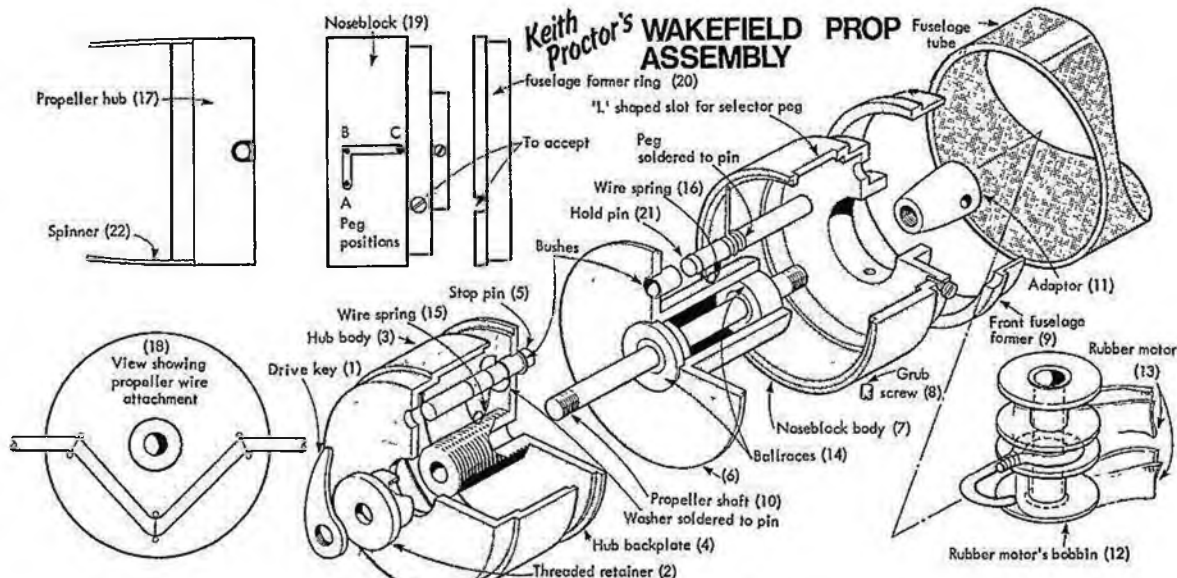
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KEITH PROCTOR'S WAKEFIELD PROP ASSEMBLY

In last October's *AeroModeller*, Mike Fantham described Sergey Samokish's Wakefield prop assembly which features one major advantage over the basic system shown in my last article (July *AeroModeller*). The 'wind and hold' device requires that once the motor is wound and the propeller is hooked up, that the stop pin be pulled forward to clear the noseblock and the hold pin, engaged to stop the propeller, before the spinner, if being used, can be fitted. Many regular Wakefield fliers have used Graupner spinners which being plastic snap on and off; these are still readily available from Ripmax stockists who import them—the code when ordering is 185/1.

Keith has followed the Samokish system which does not require a detachable spinner—a great improvement. The diagram shows the component parts of the assembly which goes together as follows:

Part 2 screws on to 4, retaining 3 to form the propeller hub (17), which is shown in rear view (18). Part 6 is assembled to part 7, the two being held together by a grub screw (8). The stop pin (5) is retained in the hub, the hold pin (21) is retained in the noseblock (19). The ring (9) and (20) is the front fuselage former into which the noseblock fits. The propeller shaft (10) has the front ballrace (14) attached to it; the ballrace being a close fit in the noseblock.

The propeller shaft is threaded to receive the drive key (1) which bears on to the stop pin. At the shaft's rear is another threaded portion which holds an adaptor (11) into which the rubber motor's bobbin (12) fits.

The whole system is operated as follows. The hold pin has a peg sticking out through an L shaped slot shown in the view (1). Rotate the propeller until the hold pin and stop pins are dead in line. Slide the peg forward from position C to position B; this pushes the stop pin forward against its spring and at the same time locates the hold pin in the propeller hub and stops the prop from rotating. Slide the peg across to position A.

Now the motor is wound up and the propeller assembly attached. Note here that the fuselage former has a notch cut in it to accept a screw in the noseblock; a feature like this is very important for consistent flying since the noseblocks will fit to the fuselage in one position only. It is oh so easy in the heat of the contest to drop a clanger and put the noseblock in the wrong way round! Result usually disastrous in that the model is now off trim!

You now have your Wake fully wound with the propeller attached and prevented from rotating by the hold pin. Now you wait for that all important thermal. When ready to launch, slide the peg to position B and take up the motor torque by holding the prop. The hold pin, carrying the peg with it, slides back to position A, and allows the prop to rotate. Now you can launch. All very neat and simple to operate. Incidentally, although most of the components on Keith's assembly are machined, this is not essential to produce a satisfactory assembly.

SWEEPETTE TROPHY SERIES SECOND HEAT

30th July 1978—Cardington—Report by Mike Fantham

The day of the second heat was dull and calm with occasional rain making for a very heavy but still atmosphere in the shed.

Fortunes varied wildly, with Pete Bayram, the winner of the first heat, producing terrible form and two 44 second scores. In contrast Messrs Buskell and Simms of the Crookham Club, new to indoor hand launch glider flying, had instant success placing second and third respectively. John Buskell went on to make a 71.5 second flight which is being claimed as a new National Record. This great flight came during an informal knock-out contest organised late in

the afternoon by Kevin Brown. John put out his rival with a 67 second flight and was then encouraged by the assembled fliers to "go for broke". This meant that there was no shortage of watches available to time a record attempt and John did not disappoint us. A really big launch and perfect transition was followed by a long floating glide. The cry of "Sixty" came with the model still at around 10-15 feet and the verdict of the official and unofficial watches was 71.5 seconds after a communal click signalled the landing.

John's model is unusual in that it features a stepped wing section. The wing is made from $\frac{1}{2}$ sheet balsa with a flat-bottomed section and normal shaped front portion. The upper surface flow meets a 0.4mm step down at 36% the high point of the section. Aft of the step the upper surface tapers in a straight line to the trailing edge. Otherwise the model is conventional with a 22 inch by 4 inch wing and would be considered "heavy" at 1½ ozs.

The two newcomers from the Crookham Club must be considered a threat in the overall results although they only have one score and do not show in the table. (Only the best two of the three heat scores will count toward the final totals).

Phil Ball is the current overall leader and won the second heat but Mick Page is not far behind and who knows what 17th September and the third heat will bring?

Second Heat—1. P. Ball (Grantham) 60.5+61.5=122; 2. J. P. Buskell (Crookham) 58+59=117; 3. W. R. Simms (Crookham) (56+) 58+57=115; 4. M. Page (Peterborough) (54+) 58+57=115; 5. C. Edge (Welland Valley) 55+58=113; 6. D. Edmondson (Peterborough) 55+54=109.

Overall after 2 heats—1. P. Ball 114+122=236; 2. M. Page 117+115=232; 3. D. Edmondson 106+109=215; 4. K. Brown 111+102.5=213.5; 5. S. R. Philpott 104+107.5=211.5; 6. P. Bayram 120+88=208.

12 Inch Span—1. M. Page (Peterborough) 46.5+48.5=95; 2. C. Edge (Welland Valley) 44.5+44=88.5; 3. B. Malton (Peterborough) 44+43=87; 4. D. Edmondson (Peterborough) 40.5+42.5=83. 4 entries.

New National Indoor Hand Launch Glider Record—John Buskell 71.5 secs (subject to ratification).

Sweepette prizes donated by Solarbo Ltd—wood (89 sheets); Jones Bros, Turnham Green, Kits; Radio Models, Mattock Lane, West Ealing, Kits and book; Ealing Sports, The Mall, Ealing, Junior Cardington Cup; Lee Hines, Costa Mesa, California, 'Sweepette Trophy'; Geoff's Stores, Penn, Bucks, Skateboard plus complete outfit.



CLUB NEWS

THINKING BACK, SOMEWHAT belatedly, on the Nationals, I cannot help feeling that such get-togethers are of immense value to the model aircraft movement. Over the years model flying has moved from its rubber powered identity into many divergent interests, and one result of this has been to split the Nationals into related activities instead of holding the one airfield jamboree as in past years. Even so, a single identity was maintained in that there were common camping facilities and the events were held simultaneously on two closely related airfields, giving emphasis to a requirement common to us all: flying space. And it is only through a unified movement that this essential need can be met.

From the free flight point of view the Cranwell scene was particularly encouraging. Considering that this is a 'Campers Only' holiday the turn out of free fliers and families was quite fantastic by any standards, with nearly all models 'built up' rather than factorised, clearly demonstrating that the home workshop is just as busy as ever.

Still very much on the Nationals theme, we open with a recital of successes achieved by the Western Area, sent in by Tony Rogers, Hon Sec and PRO of the Area. He proudly claims, not without justification, that the Area took the event by storm with 35 entrants competing over the three glorious days. The big win was John Bailey's Wakefield (FIB) effort: seven maxes plus a convincing four minute fly off time. In Glider, Elton Drew, the A2 maestro, came down a grade to take A/1. In Open Glider Rod Audley took seventh place and Derek Wain eleventh. And in FIA Glider Gerry Pink finished in 9th position, and in FIC Power Dick Cummins came sixth. Chris Chapman suffered a disastrous motor breakage in Open Rubber but still did well, but it was left to Chris Batty to battle it out in the Fly off with only a 6th place as reward for a seven minute fly off time — the competition was that tough. Coming to the FAI Trials, the event was marred by very strong winds. Rex Woodruffe did well in A2 Glider and Dick Cummins kept the Area end up in Power.

Down in the Kentish environs of Sevenoaks the whisper is all of the new sound standards now rigorously enforced by the Sevenoaks DMAC, according to Phil Bolderson the Club PRO. Seems the specified 82 db at seven metres has grounded a few of the noisier models, but, generally, the club field is now a much quieter place, assisted in this golden trend by the very silent Thermal Soarers now abounding, whilst such sports models that buzz around do so in a dutifully muffled state, with one '60' powered

model Biplane measuring a mere 76 db. Needless to say, the club's annual contest season got quietly under way, with about 15 of the regular members competing in the first three comps. Such 'regulars' are not by nature contest orientated; they would not for instance enter Open competitions, but enthusiastically support the club events.

Whether through lack of the right sort of publicity, the holiday season or just a shortage of C/L fliers, only one outside club took part in the East Anglia Combat Rally which was hosted by the Southend & Area C/L MFC, on its club field at Benfleet. Thus it became a two club derby for the two Combat events, $\frac{1}{2}$ A and Slow 'A'. The weather, true to the spirit of this rather dreary summer, was not all that enticing, with rain holding up the proceedings until early afternoon. Fortunately the wetness did not remove the two circles marked out on the grass, which entailed a lot of hard work and was a rarity that the club was particularly proud of. The first event, the $\frac{1}{2}$ A Combat, attracted quite a sizeable entry, and the flying skills really showed up on the 42ft. lines. Some good piloting came from Vincent Hawtree, John Lynch, Mick Feaver and Simon Putt, but it was John Lynch of Dagenham, flying an OD nylon covered wing, powered by a PAW 1-49, who took the honours. Second place went to Simon Putt with a similarly powered Mini Lord. In the other event, Slow A Combat, rules were as per FAI, but for the old ground time rule: one point per second air time. Only Olivers, PAW's and AM engines, running on 8in. props were eligible — hot glows and pacifiers out — thus to widen the entry of those, particularly youngsters, who cannot afford the hotter types of hardware. The final, between Len Heinrich and Neil Wildey, became a rare old mix up, albeit an exciting one, with the give and take of combat bringing about what appeared to be an exchange of streamers. Unfortunately a collision followed and the result was declared a draw. All points go towards the East Anglian Area Cup for the best all round C/L modeller. So come on in you other Area C/L clubs.

A new club, just off the stocks, is the Coulsdon & DMFC. The prime mover is Mr A. V. Jarvis, who is a Senior Engine and Prop Inspector in the aircraft industry. The aim of the club is to accommodate all forms of model flying and to expand and expand, without restriction of membership, even up to 300 and beyond! Cohesiveness between the various branches of model flying within the club appears to be another of the Coulsdon objectives, and the two club comps so far held seem to have had this in view. The first was a Chuck Glider event, which made for a great deal of all round fun, and the second, more ambitious, was a three stage affair, involving Chuck Glider (three flights), Control Line (10 laps and two manoeuvres) and Radio Control (Distance and Spot). Very hectic, with the working out highly complicated; so much so that there were no less than three people in first place. The event, however, struck

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a responsive chord, with a general clamour for a repeat performance. There is mention in the newsletter accompanying Mr Jarvis's report of the club being opened up to the Surrey Wing of the ATC – possibly the only club in the country to make such a gesture to the ATC. Club information from Mr A. V. Jarvis, 7 Georges Terrace, Caterham Hill, Surrey.

A club very much growing in stature is the Maidstone Free Flight Group, and a welcome sign of its expansion is the issuing of a newsletter – and well presented it is. It reveals that the group has been having a very successful season. In the first Area meeting they swept the board, one, two and three, in A2 Glider and amassed a tidy number of RAFA, Shield points. They did well in subsequent Area events, too, particularly in Glider, notching up more RAFA points in the process. In the Model Engineer Team Glider Cup they made second place in spite of the 'unsighting' hazards of Ashdown Forest time-keeping. Bob Dines, Paul Fairman, John Foster and Michael Riggs made camp at Barkston Heath for an all out onslaught on the Nationals. That 8 a.m. Sunday morning start was somewhat undermined by the late night Disco in the nearby hangar, but it was the continual sun that was the most exhausting factor, although to grumble about that in our climate is like looking a gift horse in the mouth. No great honours achieved but spirited participation in six events. Best placing was Michael Riggs, with 10 mins. plus 1.06 fly off time in Coupe D'Hiver, with the other three of the quartet reaching the Open Glider Fly off. What with the perfect weather and the strong thermals on tap, it was a field day for the tactical flyers – or that is the impression I got.

Main story in the Leicester MAC Bulletin is the Flying Stage of the well supported Winter Building Competition. Weather was just perfect for the motley array of models, covering most categories of flying, to be put to the test. Scoring was on a 'go/no go' basis; 40 points being awarded for a successful 'go'. All the models passed the test successfully, although there were a few uncertain moments when the eventual winner, Dennis Pullen's 'Reiber' hovered on the rim of the Burrough Hill slope, but found height enough to make a successful landing. A sad casualty of the day was the wrecking of Tony Appleton's Hurricane at Wymeswold, but as this was due to signal interference, and as the model was a proven flyer, it was given a scoring flight. The sole C/L entry, a Stunt Trainer, put in a highly competent piece of aerobatics in the experienced hand of Roger Quilter. Second place went to Gerry Ferer with his Coupe D'Hiver and third M. Russell flying a Lively Lady. Altogether the competition attracted 23 entries, which for a single club is going some. There is a write-up in the newsletter of a participating visit to the Old Warden Scale Day. Apparently quite a feast for the eye for the lucky visitors. Apart from the workmanship on display there was the opportunity of seeing flying demonstrations of quite exceptional models such as a ducted fan Scimitar (nice to see the ducted fan making a come-back as this is the model aircraft 'jet'), a pair of B.25 Mitchell Bombers and a free flight German flying boat. The Leicester lads flew a Hurricane and an ME 109 as their contribution. There is such a wealth of activity reported in the newsletter including a C/L Stunt comp and a visit to the Ribble Valley Multi Task Glider comp, that I could go on and on, but I have only space to express my astonishment at the range of interests in the club and the extent to which they are enthusiastically pursued.

The South Bristol MAC is one of the clubs that keeps the flag of the Western Area proudly flying, and were well involved in the Area meeting in June at Wroughton. Weather was ideal, making for a day of excellent flying. Only snag was the hangar roof, always a magnetic attraction to wayward models. Keith Penny lodged his Open

Rubber model on the expanse of roof and was left with the decision either to leave it there or to cough up the £30 retrieving fee demanded by the airfield authorities. We have heard of prices going through the roof, but this is ridiculous. Quite another kind of roof comes in for comment in the report of the Indoor meeting at Hanham Hall for the Dave Martin Trophy. The trophy is for Free Flight tissue covered models, and in this case they had the benefit of a smooth, impedimenta free ceiling. Three entries only, but the winner, Chris Cootie, broke the three minute barrier not once but three times, with a best time of 4.26. Not bad going for small hall flying.

Considering the terrific following Scale flying has these days (only Free Flight and C/L Speed and Combat are purely functional) it was disappointing both to the SMAE and the true enthusiast that the All-Scale meeting at Wyton in July was so purely supported. The lament is given expression by Wal Cordell in the Three Kings Aero-modellers' *Court Circular*. Even the popular radio category had a poor entry, and on the C/L side it was but two 3K members who took the field. This participatory reluctance on the part of Scale modellers is also evident in the wider international field where the C/L side of the World Scale Championships has had to be cancelled as only four countries were prepared to field full teams. Odd, this, because Scale models are better displayed flying on lines than on radio, slower flying and close in view. Even so, members are looking forward to the World Champs at Woodvale in August, Scale or no Scale, for the opportunity to see control line flying in all its other aspects at its most highly developed. Meanwhile the 3Ks are putting on their usual fete displays, and involving themselves in all the contests going.

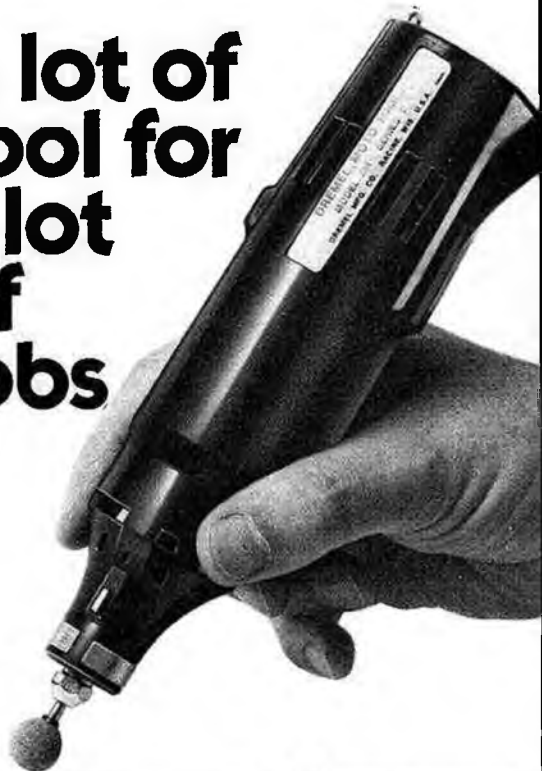
It may be that memory paints a glowing picture of the past, but I am sure way back were generally much calmer than they now are. Certainly, it is a recognised fact that the weather goes through cycles - witness our present run of mild winters - and we may well be in a windier than usual patch now. That is perhaps why we read in Northern Area News of yet another very windy free flight meeting. But balm to our ruffled feathers came the three days of glorious Nationals weather in which the strong contingents from up north revelled as much as anybody. If there is one complaint it is of the high charge of £3 per head for camping on Barkston Heath. The newsletter reports of Caravan Club and private camp sites being full for miles around, not to mention the vans and cars parked by the roadside. It is suggested that more revenue would have resulted from a more reasonable fee.

Perhaps the Hemel Hempstead MFC could justifiably call itself the 'hemmed in MFC' as the bover at Bovingdon is all about flying twixt the crops. Only Bronze Standard flyers are allowed on this highly cultivated field from which we presume that paler coloured people show up to much. But, seriously, this raises problems if models are required to land on a tarmac or concrete strip, putting at hazard the people crowding into a relatively small area, especially as radio models are not yet fitted with brakes and just roll on. Then again a perfect landing is required each time, otherwise damage will occur to the model. Let us hope their other flying field at Flaunden is less proscribed.

'Do we run too many classes of contest?' is the question asked in the current issue of *Seadog*, the newsletter of the South Eastern Area. Chris Foss writes entertainingly of the Radio situation, but are we also oversubscribed in Free Flight? Well, fortunately, f/f requires few officials, and the number of events at any meeting is more a matter of economics than organisational complexity. There is no doubt that a variety of classes makes for more interesting sport.

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Contest Calendar

Sept 17th	M. AREA GALA. <i>F1B Jubilee Trophy plus cash & O/R both in rounds O/G, O/P, A1, ½A, Cd'H & HLG.</i> Start 10 a.m. Venue: Barkston Heath. Contact: G. Ferer. Tel: 0533 886519.
Sept 17th	INDOOR MEETING. <i>EZB, CO₂, Duration, HLG (Sweepette).</i> Venue: Cardington. Contact: Laurie Barr. Tel: 062 825595.
Sept 17th	HUDDERSFIELD FAI COMBAT. <i>Top Eight plus Junior prizes.</i> Venue: Crossland Moor Airfield. Contact: Doug Shore. Tel: Hudds. 41388.
Sept 17th	WIDNES STUNT COMP. <i>SMAE Schedule plus Novice event from 10 a.m.</i> Contact: G. Plie, 18 Ganton Close, Widnes. Tel: 051-424 3901.
Sept 24th	INDOOR EVENT. <i>Peanut & CO₂ SMAE only organised by RAFMAA.</i> Venue: Cardington. Contact: Nick Zotov. Tel: High Wycombe 26200 ex. 2258.
Sept 24th	S.M. AREA VINTAGE RALLY. <i>F/F, C/L & R/C Assist. Also C/L Novice/Junior Stunt.</i> Venue: RAF Halton, nr. Aylesbury, Bucks. Contact: W. Burkinshaw. Tel: Ayles. 21676.
Sept 24th	ELLIOTT GOODYEAR ENDURO. NOW CANCELLED
Sept 24th	LONDON AREA GALA. <i>O/R, O/G, O/P.</i> Venue: Basingbourne.
Sept 24th	SOUTHERN GALA. <i>O/R, O/G, O/P, A1, Cd'H, ½A, HLG, Scale.</i> Venue: Odham. Contact: N. Couling. Tel: Eastbourne 53116.
Sept 24th	SOUTHEAST COMBAT RALLY. <i>Slow A Combat. FAI Rules except Oliver, PAW, AM or ED engines only. Plus ½A Combat on 42ft. lines.</i> Venue: Benfleet, Essex, 10.30 start. Contact: L. Heinrich. Tel: Southend 520809.
Oct 1st	DOUG BLAKE MEMORIAL TROPHY. <i>Aerobatics, Open and Novice.</i> Venue: Basingbourne.

Oct 1st	Prior notification of entry essential to Glen Alison, 62 Berry Lane, Rickmansworth, Herts. Tel: 09237/72675.
Oct 1st	WOLVES F/F GALA. <i>O/R, O/G, O/P, Combined Mini HLG. Class II F/F Scale.</i> Venue: Chetwynd. Contact: Mick Brown. Tel: 021-329 2751.
Oct 1st	INDOOR MEETING. <i>F1D Manhattan.</i> Venue: Cardington. Contact: Laurie Barr. Tel: 0628 25595.
Oct 1st	ELLIOTT AUTUMN SPEED. <i>All Classes plus Best Newcomer.</i> Venue: Elliott Marconi, Rochester Works, off A229 from M2. Contact: Ivor Roffey, 283 Burnt Oak Lane, Sidcup, Kent.
Oct 8th	6th F/F AREA CENTRALISED. <i>Team Rubber (Farrow and Plugge), F1A (SMAE), ½A. Area Venues.</i>
Oct 15th	SMAE SPEED COMP. <i>All Speed Classes.</i> Venue: Widnell Lane, Piddington, nr. Bicester. Contact: Mike Billinton. 01-699 5354.
Oct 15th	WAKEFIELD JUBILEE. <i>Pre 51 and Pre 54 rules plus modern F1B.</i> Start 10 a.m. Venue: RAF Watton. Contact: Bob Wells, 26 Nemes Way, Hornchurch, Essex.
Oct 22nd	NORTHERN GALA. <i>F/F, C/L & R/C.</i> Venue: Elvington. Contact: Clive Westerman. Tel: Pudsey 550812.
Oct 22nd	ELLIOTT STUNT. <i>Venue: Elliott Marconi, Rochester Works, off A229 from M2.</i> Contact: Brian Rodgers, 4 Conifer Drive, Walderslade, Rochester, Kent.
Oct 28th	INDOOR EVENT. <i>EZB, IHLG, Peanut Scale.</i> Venue: Pudsey Civic Centre, 11 a.m.-5 p.m. Contact: Clive Westerman. Tel: 0532 550812.
Oct 29th	WHARFEDALE SCALE DAY. <i>F/F & R/C.</i> Venue: Elvington, nr. York. Contact: Ron Greenwood, 7 Shadwell Walk, Leeds.
Nov 5th	N. AREA FAI RALLY. <i>F/F, R/C, C/L.</i> Venue: Elvington. Contact: Clive Westerman. Tel: Pudsey 550812.

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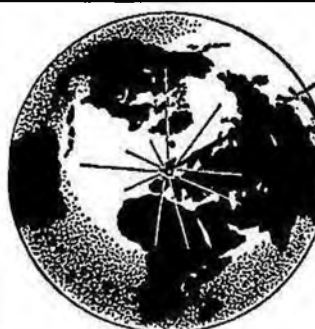
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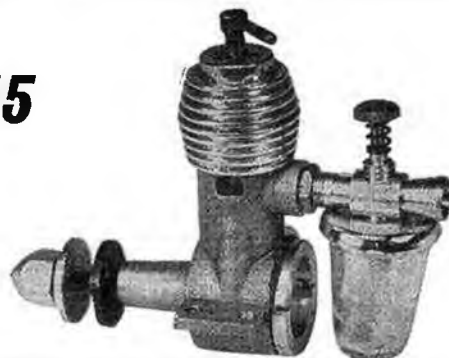
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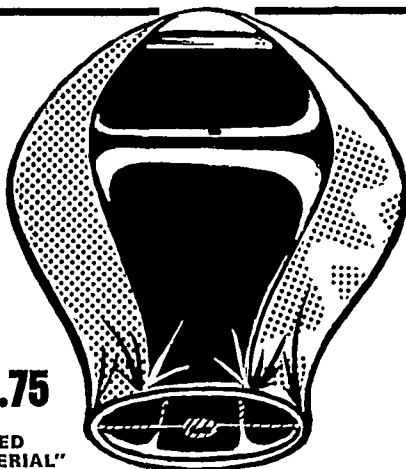
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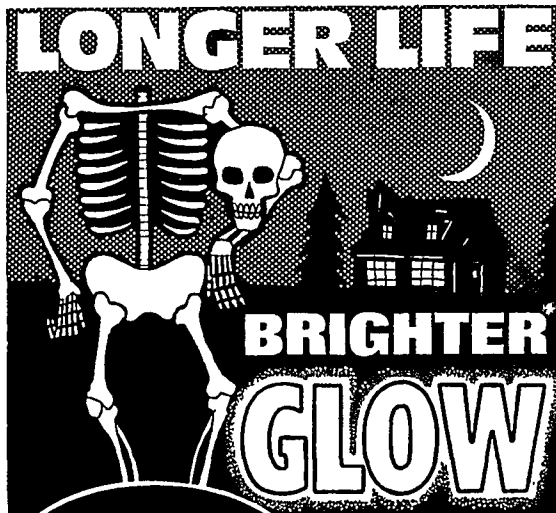
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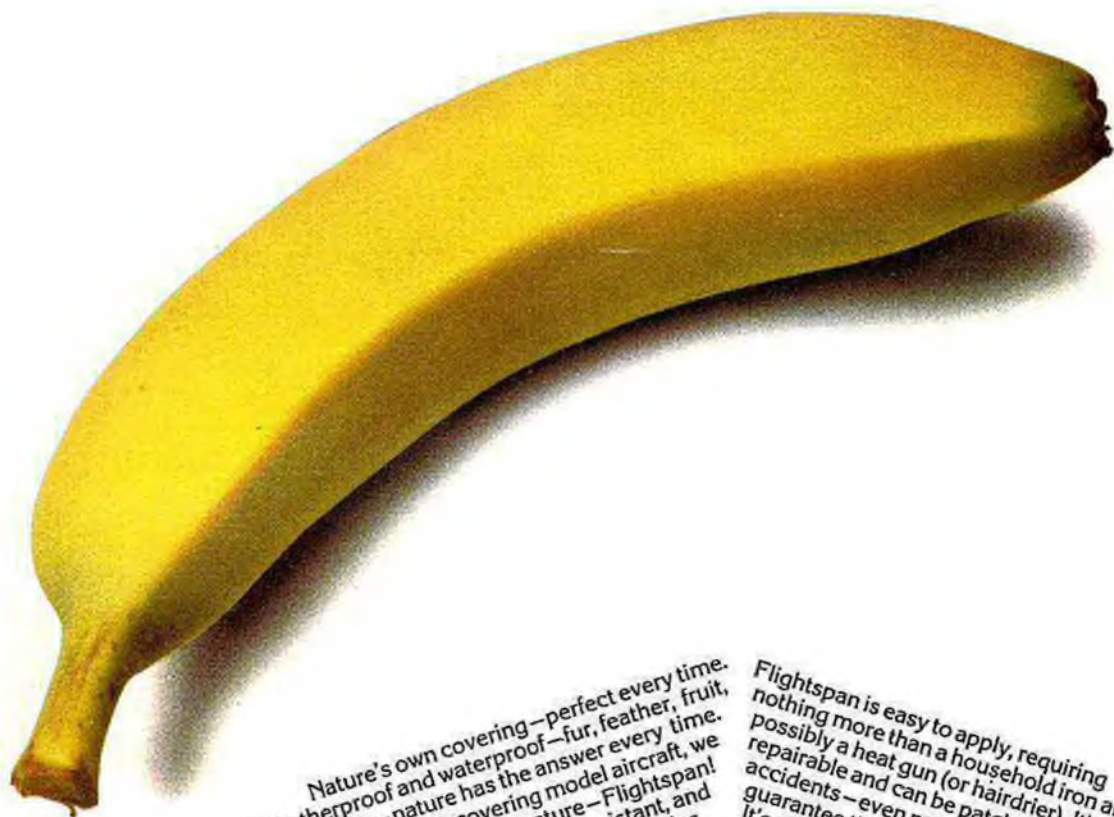
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