

# Aero Modeller

April 1972

INCORPORATING  
MODEL AIRCRAFT

15p. U.S.A. & Canada 75c.

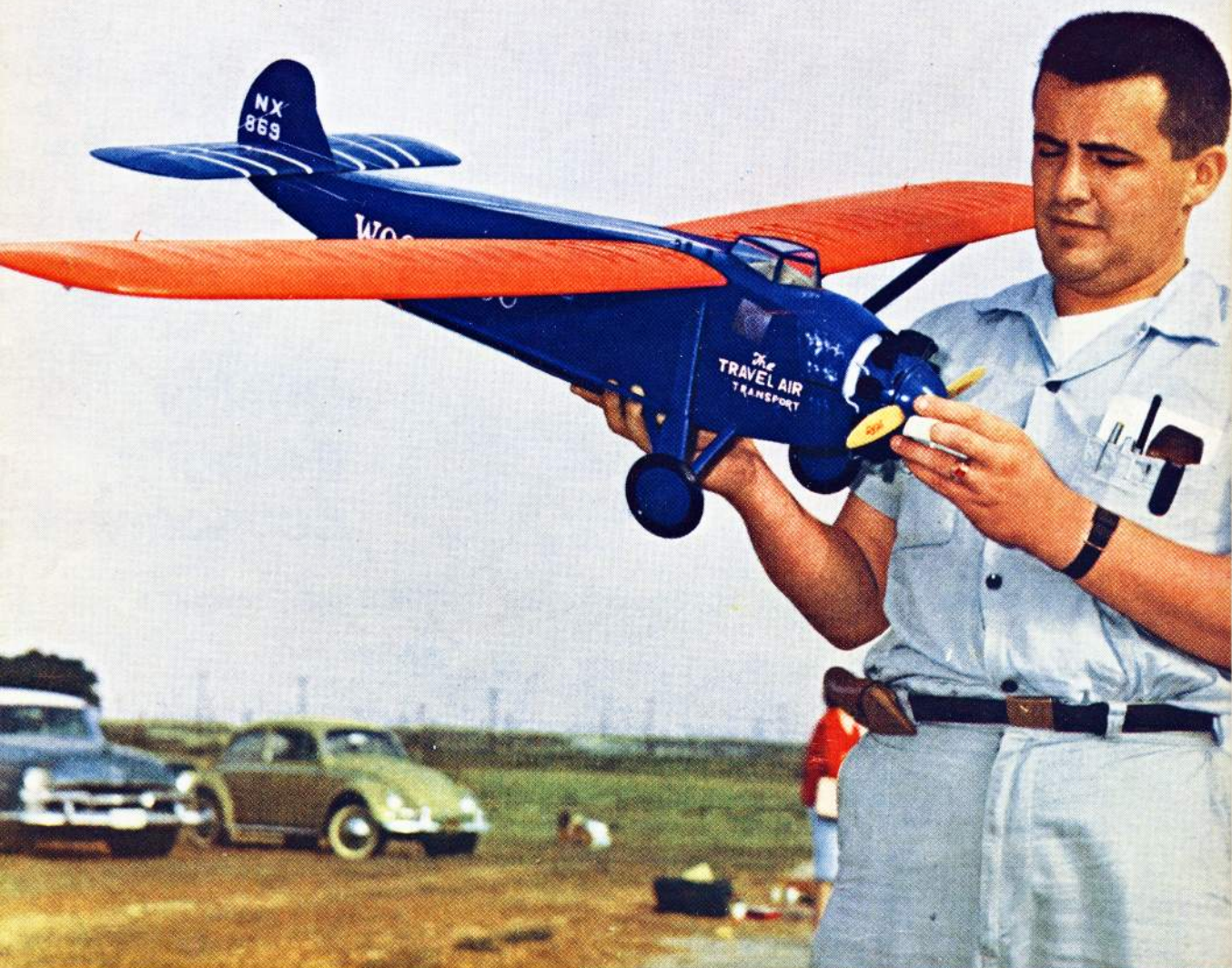


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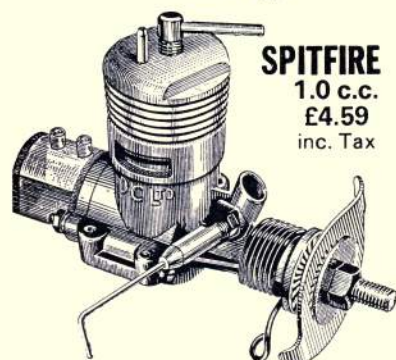
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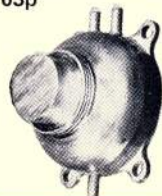
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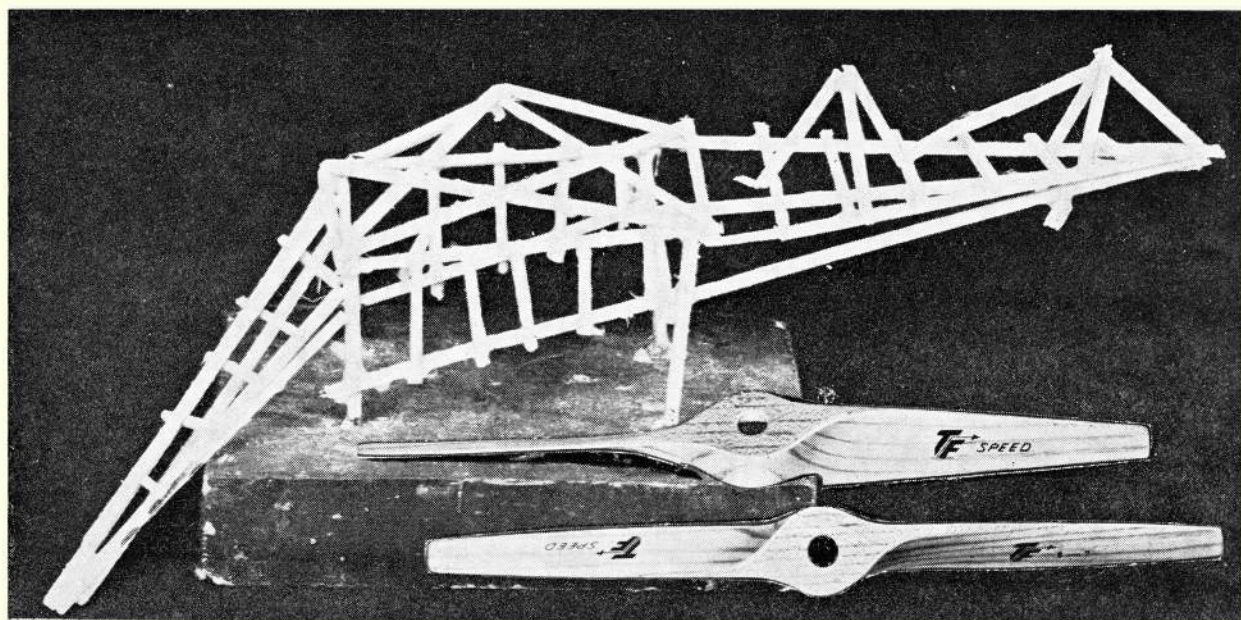


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MODEL AIRCRAFT

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EDITOR **P. S. RICHARDSON**  
Advertisement Manager **ROLAND SUTTON**

**April 1972**

Volume XXXVII No. 435

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## COMMENT

The fact that Britain has more separate manufacturers and import agencies for Radio Control equipment than any other nation - even Japan - has frequently been the subject of overseas comment. Moreover, this vast range of equipment is largely for the domestic market, few sets being exported. The cost of an average set is cheaper in the U.K. than anywhere else in Europe and the range of single-channel control practically unique in the world. One only has to cross that other channel to appreciate how British R/C modellers have the pick of the market at lowest prices, yet backed up by the fine tradition of after-sales service which has become the hallmark of the British model shop. But as we all should appreciate, familiarity brings with it a degree of contempt. We doubt if more than a low percentage of British R/C modellers are aware of their advantage. To the rest, we say, COME TO THE EXPO! On Easter Sunday and Monday we are sponsoring the biggest R/C show ever arranged in this country. Every manufacturer and distributor of note will have a full display of his 1972 wares. There will be a continuous flying display, coupled with a full-size Barnstormers' show each afternoon, and we are planning some extra surprises to add to the fun. Note the place: Sywell Aerodrome, near Northampton. Note the dates: April 2nd and 3rd. SEE YOU THERE!

## on the cover

Chuck O'Donnell, of Sparta, New Jersey, displays his one-eighth scale Travel Air Woolaroc - the aircraft which forms the subject of this month's Aircraft Described feature. The model spans 55 in. and uses a Webra 1.5 c.c. diesel for power. G. Madison photograph.

## next month

Plans for T-Bird - a combat model which can be built in two versions for training or contest work. Jim McCann explains how to mould your own carbon-fibre reinforced plastic propellers, while John O'Donnell unravels the mysteries of variable camber wings on free flight contest models. Gadget Review appears once more, as does Latest Engine News and all the regular features. On sale April 21st.



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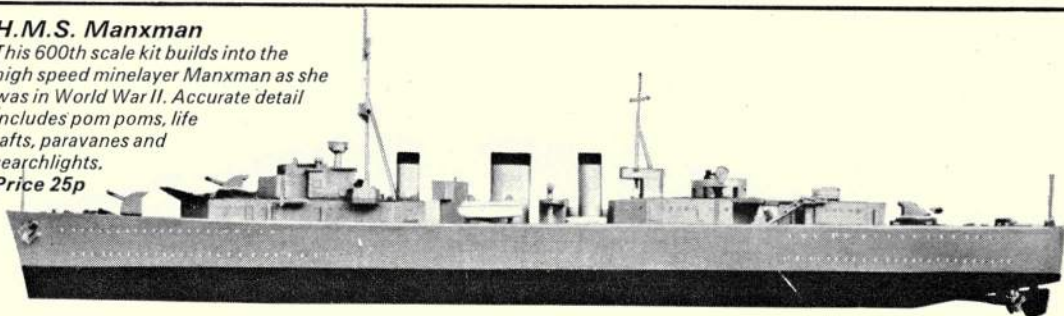
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**I**t's a question that strikes coldly on the ear of the middle-aged. A generation has grown up which may not even have seen the film 'The Dam Busters', much less remember the real-life chapter of a famous RAF squadron. For a generation to whom Agincourt, Trafalgar, and Waterloo are more familiar names than Möhne, Eder, and Sorpe, we briefly retell the splendid story.

It's a story in which the heroes are numbered in hundreds and the supporting players in their thousands, but none of them would begrudge a special mention of Dr Barnes Wallis, who invented the bouncing bomb, and Wing Commander Guy Gibson VC DSO DFC, who formed and led 617 Squadron—the Dambusters.



It is not easy in 1972 to realise how small the available forces of destruction were when the Second World War started, almost thirty-five years ago. The aiming of bombs was literally a hit-and-miss affair, and a 500 lb bomb was the largest that the aircraft of those days could get off the ground. The technique was to cover an area with a carpet of small bombs, and trust they would do the maximum damage to people and other flimsy structures. But really massive concrete was almost impregnable at that time.

Barnes Wallis was, at the outbreak of war, slightly more than halfway through a career as engineer and

## “617 SQUADRON? NOW WHO WERE THEY?”



inventor that spanned sixty-five years. His mind was on the Ruhr Valley, home of a concentration of German industry and, therefore, German war effort. It would take an unimaginable number of bombs to cripple that industry, but—he observed—the Valley already contained a potential destructive force many times greater than any Britain could deliver. There were hundreds of millions of tons of water held in check by dams—seemingly invulnerable concrete dams.

If those dams could be reached, fantastic avalanches of water would flood down the Ruhr valley destroying factories, robbing steel works of their industrial water, putting hydro-electric power stations out of action, starving thermo-electric power-stations of their vital cooling water, wrecking agricultural production, bringing traffic on the canals to a standstill. And all this could be accomplished at a relatively small cost in civilian life.

To compress into a few sentences years of work and frustration, Barnes Wallis invented the bouncing bomb. The task he set himself was to devise a bomb that would skip over protective anti-torpedo nets, make contact with the up-

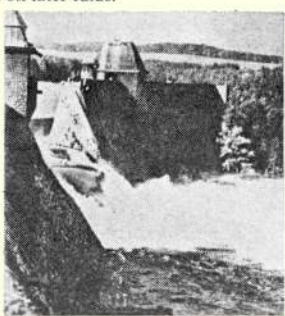
river side of the dam structure, and then slide down the face of the dam to explode exactly thirty feet below the surface. In the end (as we now know), he succeeded perfectly. But he relied on others to deliver the bomb—or rather the many bombs to be aimed at a whole series of dams in the Ruhr Valley.

Early in 1943, Guy Gibson was chosen to form and lead the Lancaster squadron that was to be identified as 617. Not yet twenty-five, he was already a Wing Commander with exceptional experience over Germany, and a DSO and DFC. He had to learn—and train his men in—utterly new bombing techniques. The squadron's Lancaster bombers had to fly at a speed of 240 miles an hour and an exact 60 feet above the surface of the water, releasing the bomb 450 yards from the dam. No altimeter was exact enough to ensure accuracy of height, so two spotlights were fitted beneath the Lancasters

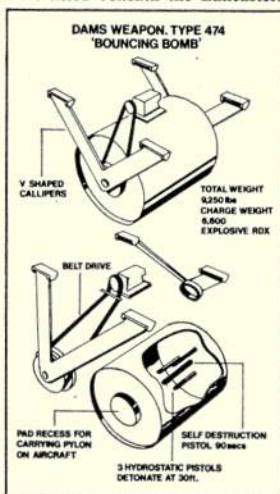
at such an angle that their beams would converge at exactly 60 feet. So the aircraft on this most precise of all raids would actually be carrying lights!

The month of May was chosen for the raid, because the dams would then be holding back the maximum tonnage of water. The first aircraft took off at 21.10 hours on the 16th. Nineteen Lancasters in all took part in the raid—a total of 133 men. Some, like Gibson himself and his crew, were involved in two attacks (on the Möhne Dam and then the Eder) in the one night. One crew approached the Möhne Dam no fewer than six times before getting into position accurately to release their bomb... and returned safely home, though without the aircraft. They were shot down crossing the Dutch coast, and picked up from their inflatable dinghy. Two aircraft were shot down with a total of three survivors who became prisoners of war. Some never even reached their targets. Of the 133 who set out, only 80 survived.

But the operation was a success. Over 300,000,000 tons of water swept down the Ruhr Valley, accomplishing (in the words of the official German report) “a dark picture of destruction” within a few hours. Guy Gibson was decorated with the Victoria Cross by King George VI, but he and a number of other survivors of the dambusting raid of 16th May 1943 were killed on later raids.



To include 'The Dambusters' in the range of authentic Revell model kits is only a very small tribute to the heroism of these men, but it may help to keep alive a flame of memory down the years.



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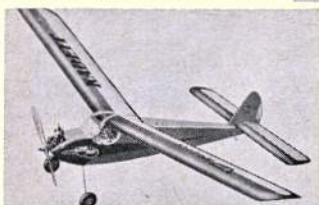


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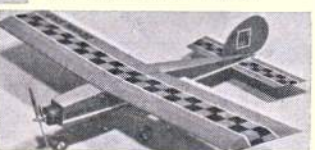


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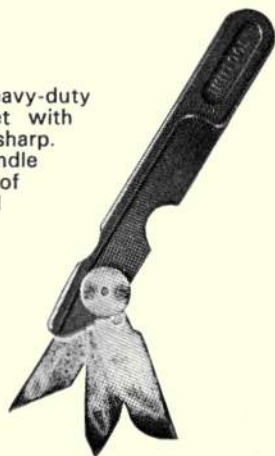


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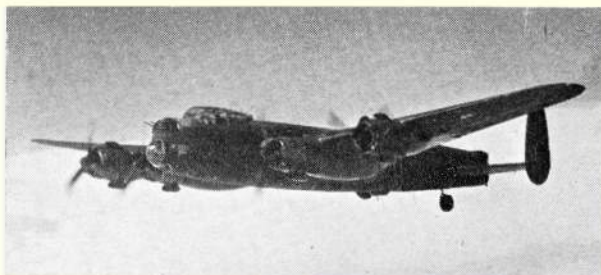
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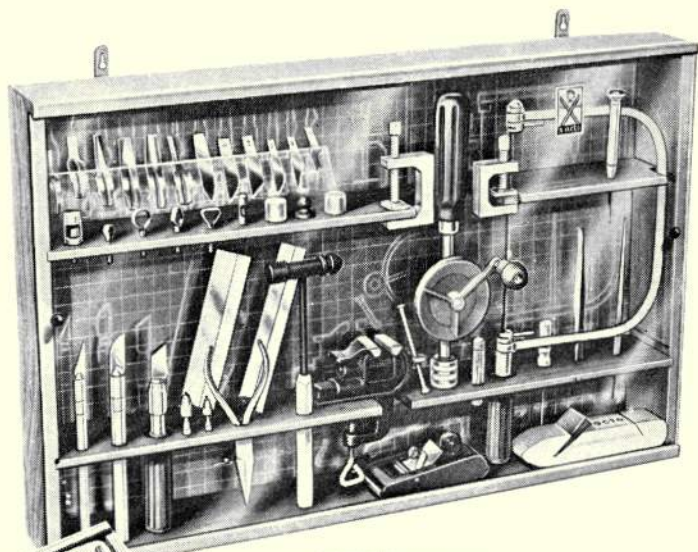
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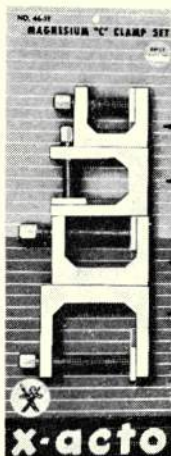
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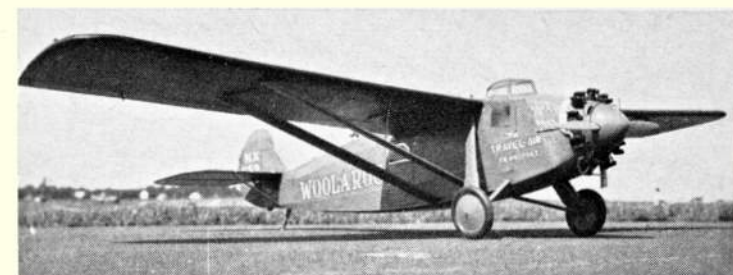
## Heard at the HANGAR DOORS

**CARDINGTON** Indoor Flying Sessions for 1972 are arranged. All S.M.A.E. members are welcome, but they should notify the Indoor Sub-Committee Chairman, L. G. Barr, 4 Hastings Close, Bray, Berkshire, not less than one week prior to meeting date, with names and addresses of those seeking permission to attend. The dates are:—April 16th, June 18th, July 30th, August 13th (August 26/27/28th World Champs) and September 3rd. S.M.A.E. Team Trials for the World Champs are to be held on May 31st and July 23rd.

**OTHER INDOOR VENUES** have also been in use, one is a hangar at R.A.F. Chessington with a 25 foot ceiling. This site, where it is hoped to encourage 'Peanut Scale' flying as well as other indoor classes, is next available on Sunday, April 2, from 1300 to 1800 hours. Since the attendance is limited, those wishing to fly are requested to notify Bruce Edwards before March 29th. His address is 170 Ladbroke Grove, London W.10. R.A.F. Brize Norton has also been used for Saturday sessions, only one of which now remains before the Cardington season opens as above. This is for March 18th, report via the guardroom to the gymnasium, S.M.A.E. members only.

**DURING THE 1971** World Free Flight Championships at Säve, Sweden, a film crew from the National Film Board of Canada made a documentary on model flying. Directed by Bill Pettigrew, himself an aeromodeller, the film is provisionally titled '180 is Max', will run for 16 minutes and is designed for commercial distribution.

The film is due to be completed around mid-May, and, if it is up to the normal standard of N.F.B.C. films will be well worth seeing, since they are generally considered to be among the world's best two or three makers of shorts and documentaries. The director has been kind enough to arrange to



have a print sent to Britain so that a preview showing can be arranged for S.M.A.E. members. This will probably take place in London during the summer. In order to assess the number of persons interested, a stamped addressed envelope should be sent to the London Area P.R.O., Martin Dilly, 20 Links Road, West Wickham, Kent BR4 0QW, so that he can notify them when a date and place have been finalised.

As an added temptation, the A/2 sequence has been designed around the Russian team's attempts to fly tactically under Elton Drew's 'Lively Lady'.

**GOOD NEWS** for all competition-minded control-line fliers is that the 1972 World Championships are ON. Host country will be Finland, the venue Helsinki, but the dates are now changed from the provisional mid-July to August 11-16th of this year.

**INDOOR WORLD CHAMPS** are now scheduled for August 27/28th in the Airship Shed at Cardington. Team members from the anticipated Ten Nations are to be accommodated in the Institute of Technology at Cranfield, where a simultaneous event will be run for F.A.I. pylon racing. The S.M.A.E. is planning to make the International Pylon Race for the 'Sopwith Trophy' a truly spectacular meeting, supported by demonstrations of other modelling classes representing the hobby in a manner befitting its Jubilee Year. Entry in the Pylon Races is already attracting a charter party from the U.S.A. and the first applications for details have come from America's fastest and most famous Pylon Race experts.

**FEATURE FILM** on aeromodeling was made through 1971 by a professional crew under the guidance of Robin Lehman, and this too, will be having a preview showing fairly soon. The British Nats., World Free Flight Champs,

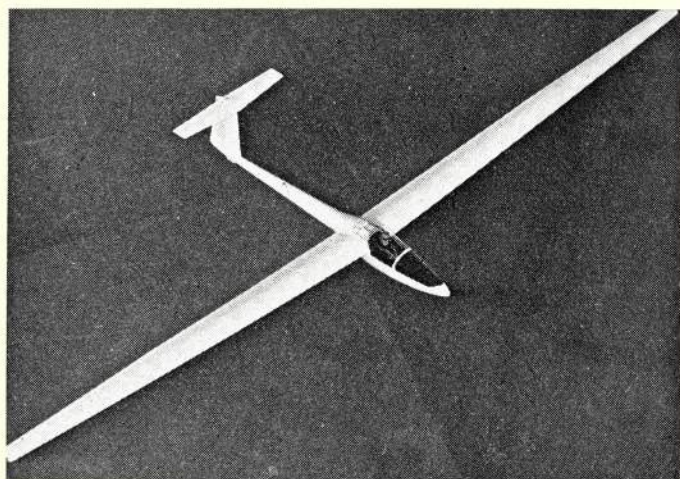
Another view of Chuck O'Donnell's 'Woolaroc', as featured on the cover, shows the realism achieved in this model. Note the beautifully reproduced engine - no doubt its additional weight helped to bring the centre of gravity back to its rightful position!

Indoor Flying Scale, and control line activities are featured in this full-length epic.

**M.A.P. INSURANCE** terms are altered as of April 1st. Membership fee is increased to 50p and the membership holder must bear the first £25 of each claim. These increases are due to claims experience in recent years and reflect the true value of the Modellers' Accident Policy arranged in conjunction with regular orders for M.A.P. magazines. The changes do NOT affect existing memberships; but apply to all renewals and new applications after April 1st.

**COUPE D'HIVER** Challenge in France on February 27th, saw many changes. The venue moved from Chavenay to Le Plessis-Belleville on the North East side of Paris and the specification for model weight was increased from 80 to 100 grams. This change created many doubts, for many American and British modellers have not seen the value of the increase other than to permit use of a clockwork timer as ballast. However, the progress of this 28th International event, with over 150 models entered, made clear that the increase of weight has not affected performance unfavourably. A full report will appear next month. Winner this year was Roger Garrigou (France) after a fly-off against Franco Malnati of Italy. Roger's deciding flight was exactly 6 minutes! He also took 5th place, while his son was 16th and he flew Hicks' (U.S.A.) model proxy to get 49th place. Italians were 8, 9, 10, 12, 13 and 16th (tie) while best British performances were 16th (tie) by John O'Donnell, 23rd (Mike Fantham), 38th (Dave Tipper), 45th (Henry Tubbs), 52nd (Frank Elton), 53rd (Colin Morris), etc.





First of a two-part article concerning the application of this modern material to aeromodelling needs  
by A. E. S. WHITE  
and G. D. ISLES

## CARBON FIBRE REINFORCEMENT

MOST AEROMODELLERS will have heard of carbon fibre and its outstanding mechanical properties which are being utilised in the aerospace industry, but few will have had any direct experience of its use in modelling. However, there seems every reason to suppose that its advantages for full scale aircraft could equally well be utilised in model aircraft.

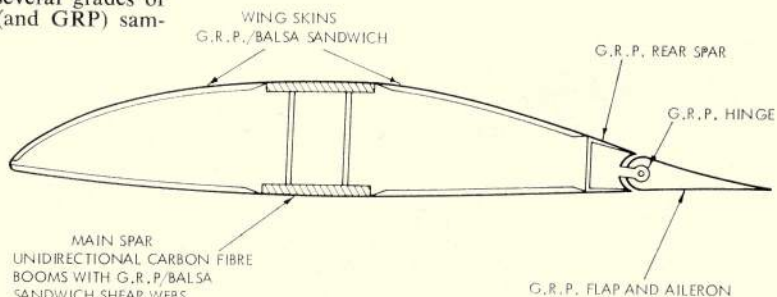
Carbon fibre, as normally made, consists of bundles or 'tows' of 10,000 fibres, each fibre being only about 0.3 thou diameter (8 microns). The individual fibres are extremely strong, very stiff and of much lower weight than most metals, but they are too small to be used individually. The fibres are therefore utilised by bonding them together with resins, which distributes the load among all the fibres and gives a usable engineering material. The outstanding properties of the material, referred to as carbon fibre reinforced plastic (CFRP), are that it gives amongst the highest stiffness-to-weight and strength-to-weight ratios of any structural material and it is these properties which are utilised in aircraft. The accompanying table shows these advantages clearly.

In terms of stiffness per unit weight, CFRP is clearly well ahead of all the other materials, whilst in terms of strength per unit weight, only oriented glass-fibre reinforced plastic (GRP) can approach CFRP. (It will be noticed that a range of properties is quoted for CFRP. This is because several grades of carbon fibre are available.) CFRP (and GRP) sam-

ples with the fibres along the stress direction show properties in other directions which are less good and in this respect CFRP and GRP are like wood. In order to overcome this directionality, GRP is often made with either random chopped fibres or with a woven mat of fibres in two directions, though in these cases properties in any one direction are not as good as obtainable with fully oriented fibres. However, because of the high cost of CFRP compared with GRP, this technique is less used in CFRP and it is usual to lay the carbon fibres either all in the main stress direction or in controlled directions matching the stress pattern as far as possible.

It is not necessary to use all-CFRP articles, and relatively small CFRP additions can be used to boost up other materials. Thus, for instance, GRP sports car body panels can be doubled in stiffness or the weight reduced by one-third by the use of only 3 per cent of carbon fibre 'tows' laid in a tartan pattern in the GRP. The fatigue life of the body is also considerably increased. Aluminium aircraft beams have also been strengthened and stiffened by sticking CFRP strips onto the flanges, and 3 lb. weight of aluminium can be saved for every 1 lb. of CFRP used. Similarly, spars, booms and masts in sailing boats can be stiffened by inserting ribs of

Heading picture shows the graceful Slingsby T59c Kestrel glider (Daily Express photograph) which makes extensive use of both carbon and glass fibre reinforced plastics, as is shown in the section at right. No other material could provide such stiffness to the high aspect ratio wings at so little weight.





CFRP into the surfaces or covering the outside surfaces with CFRP sheet. These last two examples show that, where bending forces are concerned, CFRP is most efficiently utilised if it is attached to the outermost surfaces where the stresses are highest.

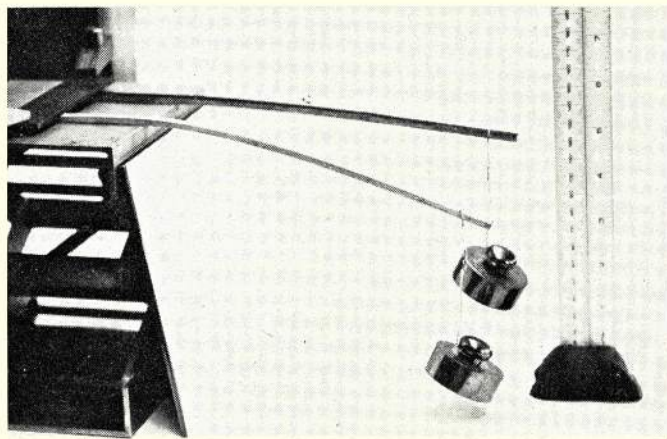
As far as the normal aeromodeller is concerned, this 'boosting up' technique seems likely to be more useful than using all CFRP parts. For this purpose carbon fibre 'tow' can be used and these can be purchased for a few pence per metre length, well within the financial scope of most aeromodellers. These can be used to strengthen and stiffen up GRP structures, laying the carbon fibre tows in with the GRP mat at the lay up stage, with normal polyester resins and otherwise standard GRP techniques. A recent development is a 3 in. wide woven tape made with a regular pattern of 3 glass and 1 carbon strands laid side by side and held in place by a cross-thread of fine glass yarn.

This can then be handled like glass cloth and incorporated with additional glass fibre in mouldings to improve the stiffness. Alternatively, wood or other pre-formed parts can be stiffened and strengthened by laying up carbon fibre tows impregnated with resin on the surface or in grooves cut in the surface. The stiffening effect of one carbon fibre-polyester resin tow laid on a balsa spar is clearly shown in the accompanying photograph. Where the ultimate in properties is required, all CFRP components can be made by normal GRP techniques, laying the carbon fibre tows in appropriate directions, and this is particularly applicable to long, thin parts.

It should be stressed that this is a new material to aeromodelling and each application should be carefully considered in order to use it to the best advantage. Some suggested applications of carbon fibre in aeromodelling would be: stiffening and strengthening GRP fuselages, especially for gliders, control line and radio control models; strengthening and stiffening wings (particularly high aspect ratio gliders); propellers: replacing steel control rods with all CFRP 'tow' rods; stiffening and strengthening microfilm indoor models; helicopter blades.

The following examples show a few practical applications.

Simple illustration of how a single tow of carbon fibre can increase the stiffness of a piece of balsa—in this case laid along the top edge for maximum efficiency.



## COMPARISON OF MATERIALS

Material	Density (D) lbs per cu. in.	Density (D) gms per c.c.	Stiffness (Y) Youngs Modulus along sample Million lbs/in <sup>2</sup>	Relative Stiffness per unit Weight Y/D	Tensile Strength along Sample (S) Thousand lbs/in <sup>2</sup>	Relative Strength per unit Weight S/D
CFRP, fibres oriented along sample (60% fibre)	0.06	1.6	18-30	11.2-17.6	100-200	60-125
Glassfibre reinforced plastic (GRP), fibres oriented along sample (60% fibre)		1.7				
Low alloy steel EN 19	0.28	7.8	30	3.9	145	18.6
Balsa Wood, lengthwise grain	0.006	0.16	0.55	3.4	2.5	15.6
Spruce wood lengthwise grain	0.016	0.43	1.4	3.3	10	23.3
Aluminium (L65)	0.10	2.8	10.5	3.8	67	24
Titanium (DTD 5173)	0.16	4.5	16	3.6	133	30
Glass-fibre reinforced plastic (GRP) chopped strand mat (30% fibre)	0.065	1.8	1.1	0.6	14	7.8

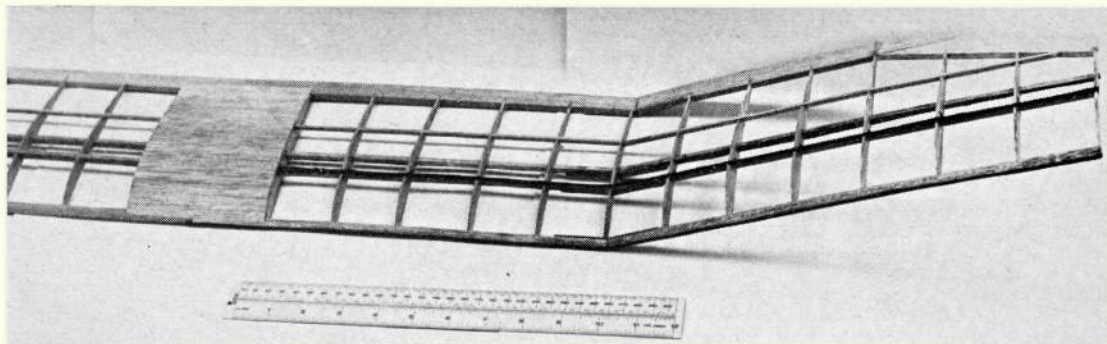
## GLIDER WING (by A. White)

A test wing was built in order to compare the effects of carbon fibre reinforcement. Firstly, a carbon fibre 'tow' was impregnated with a normal polyester resin (plus hardener) by dipping it into a bath of resin. Excess resin was removed by drawing the tow through the fingers and this tow was then pressed onto the narrow face of the  $\frac{1}{4}$  in. x  $\frac{1}{8}$  in. main balsa spar and allowed to set. In order to reduce the size of the spar back to  $\frac{1}{4}$  in. x  $\frac{1}{8}$  in., a strip of balsa roughly  $\frac{1}{20}$  in. thick was removed from the opposite face of the spar, which could then be used in the normal way. In use, the CFRP was on the outer surface and both spars were similarly treated.

The  $\frac{1}{4}$  in. square balsa leading edge was also reinforced, after sanding to shape, by cutting a groove in it and laying the resin impregnated tow in this groove.

One half of the wing was reinforced in this way and the other half made in the normal way. The relative stiffness of the two wing halves was then compared by holding the centre section of the wing rigidly, attaching similar weights to the ends of each wing and noting the deflections. The unreinforced wing bent roughly 50 per cent more than the reinforced wing, clearly showing the advantage of the CFRP. There is a slight weight penalty attached to this stiffening and the reinforced wing half weighed about 10 per cent more than the unreinforced one.





This wing design was not ideal for reinforcement and it seems that better results would have been obtained if the two spars had been directly above each other (as in Fig. 2) as the balsa ribs between the two spars tended to distort slightly.

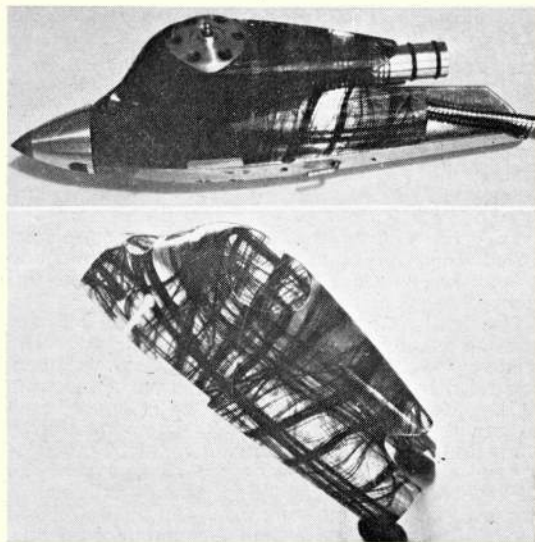
### CFRP STIFFENED GRP FUSELAGE PARTS

(by G. D. Isles)

In general, for this type of application, CF tow is best used in conjunction with glass-fibre cloth and a sandwich of carbon fibre between two layers of 0.003 in. cloth is adequate for most purposes. This is quite suitable for most model aircraft fuselages except where very flat surfaces with no compound curvature are contemplated; in such cases more cloth or carbon fibre may be employed, but remember the thicker the cloth the more resin is required and it is the resin that increases the weight of the moulding. A better solution in this case is to bond into the moulding a 1 mm ply rib (drilled for lightness if required); this increases resistance to side forces as, for example, when holding a model firmly when starting an engine.

Anyone who has used glass-fibre and its resins will have no difficulty in using carbon fibre providing one or two points are borne in mind. Carbon

Two views of a carbon fibre stiffened glass-reinforced plastic cowl for a speed model – the carbon fibre being laid semi-random for strength in all directions.



The glider wing as described in the text showing the panel reinforced with carbon fibre – resulting in a 50 per cent improvement in stiffness with a 10 per cent weight penalty. The builder, A. E. S. White, is a Senior Research Scientist with Morganite Research and Development Ltd., manufacturers of carbon fibre.

fibre is very fibrous. This is not being facetious, as you will find out if you try to pick it up whilst your hands have any glue or resin on them! Therefore, always work with clean hands and instruments and before any resin bondings are contemplated cut to size all your glass-fibre and carbon fibre pieces (for fuselages I usually make a template out of wall-paper, which when damp can be shaped to the mould).

After this stage, two pairs of tweezers are invaluable to handle carbon fibre, which is then accurately placed in the mould, which has previously been lightly covered with resin (don't forget a release agent must be used). Do not then touch the carbon fibre since, being resin coated, it will stick to any instrument used for 'stippling' the resin through the fibre. Put a layer of glass cloth over it and then the resin can be pressed through the cloth layers without disturbing the carbon fibre.

It is worth noting at this point that if the 'tow' of carbon fibre is wetted with a dilute solution of resin in solvent (3-5 per cent resin) and the solvent dried off, it becomes much easier to handle without fluffing out. (The resin used for this 'sizing' should not contain any hardener or catalyst.)

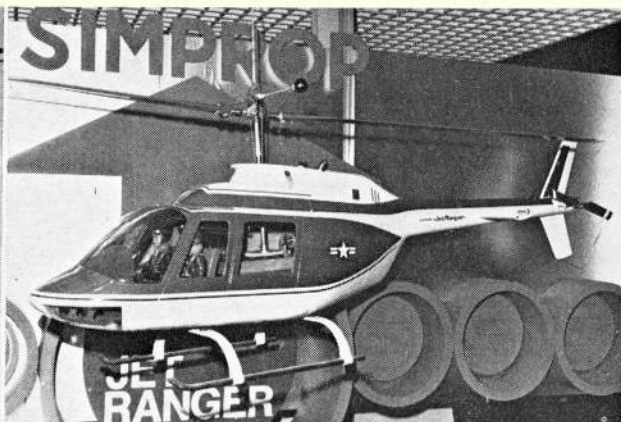
In the photograph you will see one of my speed model cowls which was made in the above way. In this, the carbon fibre tow was spread over a large area in order to give stiffening and strengthening in all directions. This method enables the cowl wall thickness (and hence weight) to be reduced, though if this thinning is taken too far, strength will eventually be reduced again. For a complete fuselage I will use two complete tows, probably on the fuselage/pan centre line.

Always remember that for good results your mould has to be more carefully made and far more carefully finished than perhaps you would make your model, but once done a series of models can be made very quickly – an invaluable point where a full competitive season is undertaken.

These early experiments with carbon fibre have convinced me that this material has a real future in aeromodelling and I suggest all serious modellers, particularly competitive flyers, should consider its applications seriously and experiment with it.

Next month, Jim McCann describes in detail how to use this modern material to produce your own propellers, for which it has proved ideal.





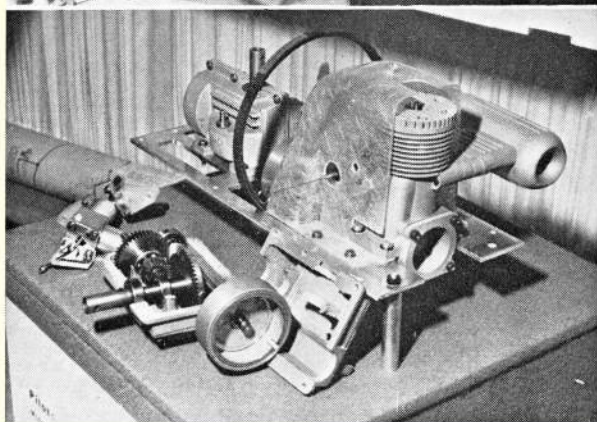
# NUREMBERG TRADE FAIR '72

a look at the latest  
trends from the Continent

PERHAPS THE most memorable aspect of the 1972 Trade Fair was the first appearance of *commercial* radio-controlled helicopters. Only last year Dieter Schlueter's Bell Huey 'copter was displayed as a 'novelty' item but now it is to be readily available in kit form from the well-known Schuco-Hegi concern — and what an incredible piece of work it is too. The fuselage is ready moulded in glass-fibre, while beautifully cast housings contain all the drive and rotor control systems — all shafts being ball-race mounted. Perhaps even more attractive is the Kavan entry to this field — in this case a version of the Bell Jet Ranger — once more sculptured in glass-fibre. A rather different approach to these two-bladed rotor designs is Cupi Model Technik's highly ingenious, yet less 'pretty' design — in this case a three-bladed rotor design featuring full cyclic and collective pitch very neatly enclosed in a machined housing. And the list does not end there — Dubro, with rather typical American simplification of design engineering, exhibited their machine, a Whirlybird 505 which differs greatly in relying on torque-reaction drive rather than the bulkier and heavier (albeit neater) shaft drives of its rivals. Amazing really, four commercially available kits for an aircraft type which, until so recently, was thought to present practically unsurmountable problems . . . still, that's progress.

With regard to the more conventional models, it was once more the popularity of R/C gliders which impressed — mainly very elegant scale or semi-scale soarers as exemplified by WIK with such designs as the beautiful V-tailed 90 in. span *Salto* and the T-tailed BS-1, slightly smaller at 86 in. span. Both were designed by Wilfried Klingner and feature glass-fibre moulded fuselages. Graupner perhaps went one better with arguably the model of the Fair — the ASK14, a motorised glider of 90 in. span with a single wheel buried

A 'swarm' of helicopters! Top left is the torque-reaction Dubro 'Whirlybird', while at top right is the Kavan 'Jet Ranger'. Below is Cupi Model Technik's more functional looking machine but with neatly enclosed cyclic and collective pitch mechanism. Below this is the 'works' of the Schuco 'Bell Huey Cobra.' Note the beautifully produced gear box housing and V-belt to start the Veco 61. At the bottom, the completed model is shown.







Above, the Damon stand displayed an enormous range of rockets by that company as well as the American Estes and Centuri concerns. The variety and number of 'options' available to the budding rocketeers are fascinating. At top right is displayed the nose cone of a rocket with electronic 'cargo' to transmit a signal to aid tracking, which is picked up by the hand-held receiver. Left, attractive control line stunter by Schuco Hegi.

in the fuselage and designed for .09-.15 cu. in. power. The kit is virtually ready-to-fly, the foam flying surfaces being pre-sheathed with balsa and the fuselage moulded in glassfibre reinforced plastic. In fact, the use of glass-fibre mouldings was one of the most noticeable aspects of the trade show—virtually all manufacturers showed examples of this material, while the use of ABS plastics seemed to have virtually disappeared—too many broken rear fuselages, perhaps, or is it a case of cost effectiveness?

The Fiberlin R/C 'Akrostar' typifies Continental kitting trends—the fuselage is a glass-fibre moulding while the wings are from expanded polystyrene. Coupled flaps/elevators/aileron employed on this model, as per full size.

Despite the natural dominance of R/C designs, it was nice to see that the beginner had not been forgotten by such companies as Günther who displayed a range of rubber-powered plastic/polyester ready-to-fly models, while Schuco Hegi had a series of simple all-sheet rubber-powered designs plus a beginner's glider. Control line was, not entirely overlooked. Schuco once again coming to the rescue with a snappy design (non-flapped) for .15-.29 cu. in. motors, while Svenson surprised us by showing a Nobler kit—

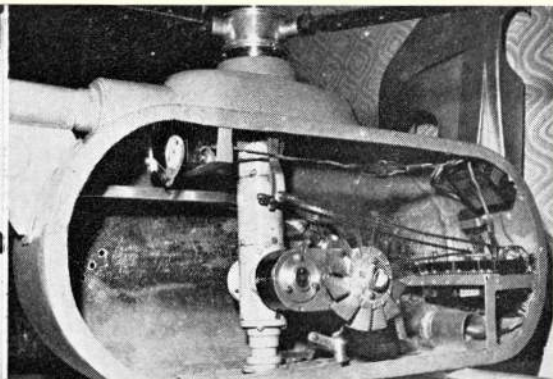
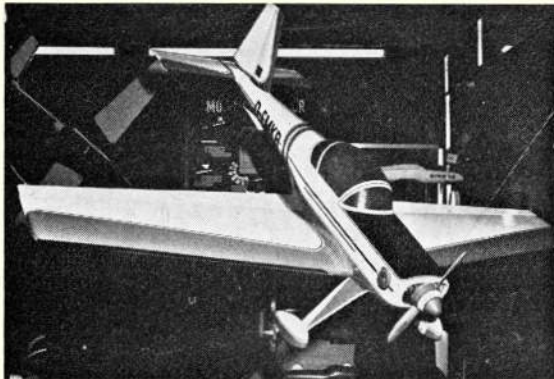
produced by arrangement with Topflite. In addition was Flappy, a most attractive ship designed by Henry Stouffs, featuring a thick wing section, coupled flaps and wing-mounted undercarriage for .19 cu. in. motors.

Contest free-flyers were less fortunate, but an interesting line of new products was displayed at the Super Tigre stand in the form of glass-fibre booms made by Lega Garofali. These are intended as rear fuselage booms and are rather different in concept to our own commonly-used rods in that they are large in diameter yet thin walled. They are also light—for example a tube 850 mm. long, tapering from 25 to 9 mm. in diameter weighed just 14 grams. Larger diameter versions weighed some 20 grams for the same length, while a more robust item some 560 mm. long and 35 mm. wide weighed 40 grams, this being intended to be used as the motor tube on rubber-powered models.

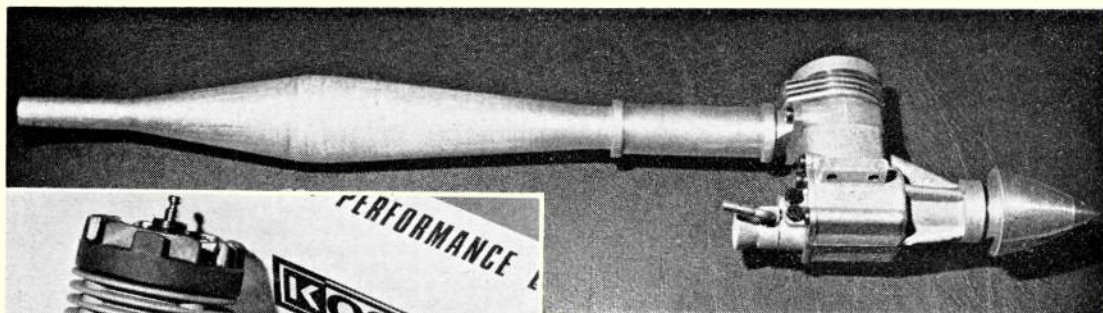
Speed fliers would have been pleased to see the prototype .15 speed engine on this stand—a Schnuerle ported, rear exhaust motor presently based on an existing G15RV casting. Speeds of 249 Km/hr. have been obtained, so it's definitely competitive.

Other new engines evident were a front rotary induction Kosmic 23 R/C—quite a departure from that company's high performance 2.5 c.c. class diesel and glow engines (which are rear exhaust, Schnuerle ported designs) and a Buto Twin of .60 cu. in. displacement which is claimed to produce 2 b.h.p. plus at a peak speed of 14,000 r.p.m. Displayed on the WiK stand, this latter

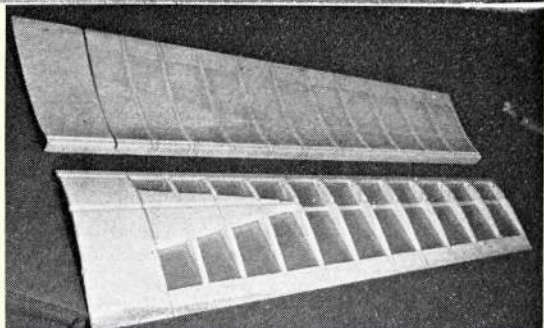
Side removed from Cupi helicopter reveals ample room for access and R/C installation. Note also cooling fan for the motor and gear driven rotor shaft. Prototype has now achieved some 15 hours of flying.







At top, the prototype rear-exhaust Super-Tigre is built around existing castings. Good performance already being obtained, but it is not in production yet. Above is the neatly produced Kosmic 23R/C - a new departure for this company.



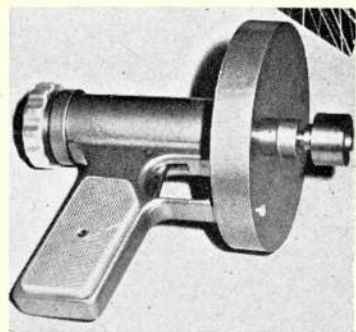
Rowan's new form of foam wing construction is really lightweight. Pieces of pre-cut foam are removed to leave thick built-in ribs behind, which are then reinforced with traditional spruce or balsa spars, etc.

engine is a beautifully-produced horizontally-opposed twin featuring a neatly cast radial mount and fitted with a Webrac carburettor.

Rocket models appeared in abundance, Cox, Damon, Centuri and Estes designs being prolific in their variety and novelty features. Unfortunately no one in this country can legally explore the delights of the solid-fuel fired rockets, with their two-stage booster sections, para flight descent, artificial smoke tracking devices and associated 'gimmicks'. All in all, these are certainly not toys, but can lead to the development of great skills, particularly in the estimate of wind strength and associated drift, maximum height obtained and other factors that affect accurate 'spot landings'. However, all is not so bleak - Damon have a Freon gas-operated device which is quite acceptable to the authorities here, being as it is a completely inert gas (non-inflammable, non-toxic and non-explosive). The rocket 'engine' is thus filled with gas from a can of propellant, and

may then be fired by either a mechanical or electric device. Altitudes of up to 1,000 feet may be obtained, and no doubt when further developed additional accessories such as high-speed cameras, monitoring devices, etc., will be able to be carried aloft, as in the case with the solid fuel burners.

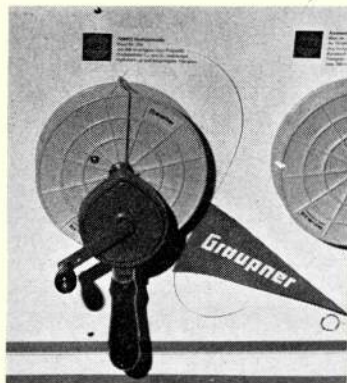
Other 'new approaches' were not so noticeable, in fact the majority of items on show were largely improvements on existing systems, but one new form of wing construction was displayed by Rowan. This consisted of a fibrous type of foam ready moulded in panels, from which many sections were removeable to leave 'cast in' ribs approximately  $\frac{1}{4}$  in. wide. To these are added hardwood spars, ply reinforcement where necessary and the surface then covered with a clear form of acetate-like material (not of the heat shrink type). Result is an accurate, very light wing form with 'instant' covering. Most intriguing, and shortly to become a feature of this company's kits.



Novel engine starter seen on the Schuco stand is clockwork - wind the knurled ring on the end, engage the end on a metal cam bolted to the prop nut, pull the trigger and off she goes!

Neat glider winch from Graupner comes complete with line and pennant - being made mainly of plastic, it is nice and light.

Best looking model at the show? Graupner's elegant ASK14 is a scale motorised glider and comes in almost-ready-to-fly condition. Spare fuselage is held aloft by Herr Graupner himself.







John O'Donnell's

## FREE FLIGHT COMMENT

Winner of the Junior Champion title was Chris Linsdell of York and although this contest was not too hotly contested, he was a worthy winner; witness his competition record last year, including scoring five maxs at the Northern Area Rally's 'Mini' Comp.

**MOST FLYING MEETINGS** these days feature several events, presumably trying to cater for all tastes. Diametrically opposed to the 'more is better' premise is the idea behind the one-event meeting – of which there are very few. One very successful example is the **Wigan Club's Winter Chuck Glider Contest**, now in its third year.

Despite being held on the Sunday prior to Christmas, this year's event attracted more entries than either of its predecessors. Chuck glider interest is high in the North-West and this is reflected in the total of 32 people who entered on the field. This was no fair-weather figure as will soon be recounted. Venue was the same as previously – Beacon Park, Upholland, near Wigan. The park consists of a number of public playing fields near the crest of a hill, just outside town, and whilst unsuitable for use as a normal contest site, it is more than adequate for chuck glider.

The weather was hardly helpful with a rainy morning being followed by a bright, but very windy afternoon. Furthermore, the wind direction was such that it necessitated launching from well down the hill. Models then drifted up the slope, and in some cases over the summit. In the conditions the terrain made for a mixture of slope-cum-thermal lift and extreme turbulence. Good glide stability was a prime requisite for success, and this is something for which chuck gliders are seldom renowned.

Results show a mixture of good and bad flights – an indication of both the conditions and a high casualty rate. Even the experts did not escape scot-free and were glad to use the full allowance of three models. Others used much five-minute epoxy to cope with repairs, but even this aid to modern living could not help the model that left its wings hanging on a set of power lines for much of the afternoon.

In one way John Boon was a surprise winner in that chuck glider is a class which he does not normally fly. In another, as he started with a very good flight of over a minute, his eventual victory was always a possibility – his one and only model was to Barry Kershaw's glass-fibre rod design but with reduced dihedral and on a Roy Roberts-style tail unit.



The whole thing was well sprayed with a red 'dayglo' to assist visibility both in the air and on the ground. For some reason, the latter consideration does not seem to receive the attention it obviously deserves.

Runner-up was Barry Kershaw flying his own-design models, and also a Mathis *Flash*. Liverpoolians Mick Duce and Dave Barnes took the next positions, just a couple of seconds apart, and both losing a model in the process – Mick's V-dihedral model made the most impressive thermal flight of the day. By a quite remarkable coincidence Dave has placed fourth for three years on the run. His simultaneous top Junior position is more consistency than coincidence.

Amenities extended to a 'refreshment tent' with hot-dogs cooked by modellers' wives while prizes included the now traditional Christmas hamper and other seasonal items. Even so, the contest just about 'broke even' financially so its success was unqualified.

Even nearer to the Festive Season was the **Chobham Christmas Cracker** (to quote the Contest Calendar) meeting, held on Monday, 27th December. With the date being a public holiday there were plenty of modellers keen for a day out. Attendance and flying were encouraged by weather conditions that were very mild, bright, even sunny, and with but a light breeze – a very pleasant flying day and quite remarkable for late December.

Drift was in an awkward direction with the choice of launching site being complicated by the Motorway workings that now extend across the common. Apart from eliminating some of the more useful flying areas, the diggings give retrieving difficulties through being large muddy areas that have to be either crossed or avoided. The original flying spot, selected to use the largest stretch of the common, involved overflying the Motorway, but this was not to the liking of many entrants, who elected to fly on the other side of the 'road works'. Their example was soon followed by the rest of the competitors and the organisers!

The events scheduled were Open Glider, Open Power and Coupe d'Hiver. This was a rather unusual combination that side-stepped the difficulties with Open Rubber in the event of bad weather. It did mean, however, that there were two thermal catching events – Glider and C. d'H. Perhaps, fortunately, the conditions were very difficult for reliable lift-detection and these two events were decided without the need for flyoffs. While unexpected, this phenomenon certainly kept up the interest in glider throughout the contest – ultimate winner proving to be Jim Punter with one 'safe' thermal and two very marginal ones. His last flight in fact was a few seconds short of a max but this did not matter. I was second, closely followed by Clifford James and Tony Young. It is hardly surprising that Cliff's models show the influence of his Hayes clubmates – even to the use of the Hirschel section. (This apparently should be traced from p. 658 December 1967 *Aeromodeller* and not plotted from published ordinates!)

Coupe d'Hiver was won by Mike Fantham – again with his 'Model Engineer' exhibit. This has been lost twice, but survived unaffected. Not much short of a treble was P. Cogland, while Jim Wright was third.

Even Open Power did not look as if it would need a flyoff John West with his fast climbing, if tricky to trim. Open model which uses a piped Miesbach G.15 for power. Pity to waste those now redundant (and expensive) F.A.I. motors! No, that is not the Common in the background – picture was taken at the '71 Nats.



until late in the afternoon – although there were several scores of over 8½ minutes. The two trebles finally recorded came from John West and Mike Keevil and they flew-off very smartly after the end of the contest. John West was first away with a good climb from his *piped Miebach G15* powered open model. This has a flat bottomed wing and really moves under power – but seems very sensitive if the amount of on-the-day check flying is any guide. In comparison Keevil's TD049 model had a lower (but still good) climb – and better air. This could have given him the contest but he had set a conservative D/T fuse to ensure that the model did not reach the downwind woods! Consequently John West won by nearly a minute – and recovered the model with no trouble! Mike's model looked rather small – and well it might. The wings were off Christian Menget's *Deuzio C. d'H.* design, and are but 36 in. span by 4½ in. chord if I read my December '69 Free Plan aright!

There was a real 'Winter Rally' the very next weekend. This was not advertised nationally as it was restricted to members of the **East Anglian** area. They have recently changed their competition secretary, but Les Brambley is following Barry Halford in keeping me informed of his area's activities.

They have held a rally annually in early January for the past decade – flying three open classes combined. An all-in F.A.I. class was added this year by popular request – but, with the allowing of 'doubling-up', meant that several entrants flew two events with but one set of flights!

Considering that those who attended drove through fog and mist, the turnout was good, this no doubt attributed to their newly-acquired venue of R.A.F. Wethersfield being more central. Early arrivals claimed that maxs were just possible despite a cloud base of around 200 feet. After mid-day the weather deteriorated rapidly through drizzle, rain, sleet and finally a moderate fall of snow – and visibility worsened in consequence.

In the F.A.I. event, Bob Wells set an early target of 11:16 flying glider, only to be beaten by two of his former club-mates Steve Bowles and Bill Parker. The latter was the only one to fly Wakefield. The Combined Open event was closely fought with only 14 seconds separating the top four. Paul Masterman left his third flight till late and stayed in sight long enough to win with a 7:30 total, flying a normal open rubber model. Chuck glider was on the basis of the best three from seven flights, but Bob Wells made only five launches to win easily.

Postal events are often much better advertised than reported – obviously due to the logistics involved. The 1971 **Spanish Postal A/2** event was the fifth annual event they have now held, and may be of interest even at this late date. Although we have done extremely well over the years (with three individual winners), the latest event was dominated by the Rumanians – who won the team and both individual awards.

British representation was well placed, however, with four entrants (Andy Crisp, Jim Punter, Dave Yates and Colin Morris) all recording five maxs and flying off. More lift was needed, however, and they could only place from eighth to tenth. Those interested in this type of contest might like to know that the *Cloudbusters Inc.* of Michigan, U.S.A., are sponsoring an *International Postal Hand Launch Glider* event during May 1972.

Basically a team of three is required. Each member's best six flights (out of ten launches) counts. A one-minute max

The North-Western Area's annual dinner is always a popular event, and this year was no exception. Here, Chris Wyatt collects his Junior Champion prize from June Pickering.



Clifford James with conventional looking (especially for the Hayes club!) A/2 – 3rd at Chobham Christmas meet, and which performed well throughout 1971.



applies to flights and any fly-offs. The complete team must fly on the same day – but this can be of their own choice during the month.

Details, etc., are available from Cloudbusters Inc., c/o George M. Lewis, 29536 Bonnie Drive, Warren, Michigan 48093, U.S.A.

★ ★ ★

Overseas the title of *National Champion* appears to be held in high esteem and readers of the American model magazines will be aware of the publicity given to their various Championship winners. In England the situation is rather different. Whilst the overall Club Championship (for the **Plugge Cup**) is still viable, the individual titles attract little interest either beforehand or afterwards.

Indicative of the status of these events is the fact that the 1971 results have not previously appeared in print! Mention is worthwhile at this late date as it might generate some interest for this year. I collected the overall **Senior F/F Championship**, as distinct from winning it – halfway through the season it was apparent that no one else was trying, and the outcome was a walkover (or perhaps flyover) rather than a competition.

The **Junior Championship** was contested rather better although the claimants could be counted on the fingers of one hand. Overall winner was 15-year-old Chris Linsdell of York, whose speciality is glider. He flew in the three eligible glider contests and that was sufficient! A better indication of his abilities was his five-max Mini-comp score at Lindholme on the occasion of the Northern Area Rally. Chris usually flies a *Rolling Stone*, but has a *Floridian* for windy conditions.

Even the **Houlberg** trophies, awarded to all-rounders at the Nationals, have never really 'caught on' with the modellers – perhaps through asking for participation in F/F, C/L and R/C. This is rather too much to expect, and the events are usually won by someone who places high in but a couple of events. Senior winner was Dave Day of Wolves, who won C/L Stunt and flew in two R/C events. There was no Junior winner, presumably through no one claiming. Splitting the

Brian Picken had a most successful competition year in '71 – seen here receiving his trophy from June Pickering. June O'Donnell upheld the family name by winning the raffle. . . .







Nationals must affect the awarding of the Houlberg trophies, but the matter is so far undecided.

The whole situation would seem long overdue for a complete re-appraisal. Certainly many capable and competent free-flyers regard the present Championships as little more than an endurance test. The need to attend and fly in every eligible contest, regardless of weather or counter-attractions, has proved a real deterrent. In consequence the N.W. Area proposed an alternative scheme. A similar set of representative contests were eligible – but only the best half of one's possible scores counted towards the season's total. This gave the desirable leeway in the systems. It obviously helped to fly a lot, but it would no longer be essential to fly an Area contest in gale conditions, and even missing a meeting need not be fatal.

Despite being made early in 1971, this scheme has still not been approved or rejected. For 1973, the S.M.A.E. F/F sub-committee is also contemplating an all-F.A.I. scheme. Readers with strong views on this or the following matters should tell not only the Editor or myself – but also the sub-committee. They are the people who should be able to do something *directly* about the situation.

★ ★ ★

This month's *Aeromodeller* should 'hit the news-stands' within a few days of the first S.M.A.E. Area-Centralised meeting and the start of the 1972 season proper. It might be a good moment to mention a few impressions of previous years – and it might just conceivably influence the future.

Anyone even loosely connected with contest flying soon realises that not all entries actually materialise. At centralised meetings where entries are taken on the field, there are almost always a number of 'no scores'. There are plenty of reasons for this, ranging from damage (or even loss) while testing, deterioration in the weather, etc., to simply running out of time while flying other events. One other possibility will be discussed later!

Meetings that demand pre-entry, such as the Nationals and other S.M.A.E. centralised meetings, show the same phenomenon to a very marked degree. This is hardly surprising since entries are required before some contestants know whether their models will be trimmed (or finished) – or even if they themselves can attend the meeting. The situation has been aggravated by the comparatively recent introduction of the contestant's licence. Once purchased, S.M.A.E. events can be entered all year without further fee. There is a natural tendency to enter everything for which one *might* have a model or might have time to fly, whilst it certainly will have boosted pre-entry numbers. The last Nationals had but 54 per cent of the F/F entry actually recording a score.

There is, however, one group of contests that does not exhibit this discrepancy between entries and scores. The exceptions are the S.M.A.E. Area-Centralised events that consistently report a very high degree of participation. For the six meetings of 1971, scores represented over 96 per cent of the entries. Whilst I would hesitate to use the word 'im-

possible', this result is statistically extremely improbable! It is completely at variance with other contests, and it ought to make people curious. I wonder if some Areas think that only entries with scores need be forwarded to the parent society?

Another interesting and disconcerting phenomenon that has become noticeable of late is a marked reluctance by certain well-known fliers to admit that they ever make poor flights. Like everyone else they 'drop' flights from time to time – perhaps often! But these scores do not appear in the result sheets for everyone to see – as the poor flights are never recorded!

The procedure is simplicity itself. In these D.I.Y. days the competitor often has to provide the timekeepers and usually returns his own card to the contest controller. If a flight is bad enough to make continuation pointless, then the flier does not hand in his card. Consequently the contestant either records 'no score' or stops after one or two maxes. This gives a much more agreeable picture than the truth!

Timekeeping has been a perennial problem in free-flight ever since I had an interest in contests. Nowadays competitors are left to find their own time-keepers as best they can. Fairly recently there has been the option of using only one timekeeper at the contest director's discretion but there is still the requirement that this timer (or one of a pair) be from other than the flier's own club.

The origins of this concept are clearly to prevent bias of the result. Nowadays most regular contestants know each other – especially at the more local events – and 'friends' are just as likely to exist in another club as one's own. In fact many flying partners are in *different* clubs purely so that they can time each other. There are even cases where two small clubs exist where amalgamation would be advantageous from every consideration except timekeeping. Furthermore, if one has a 'willing helper' prepared to time but not interested in flying, then they might well join the S.M.A.E. – but they certainly do not become club members. Modellers' wives are the classic example!

Seeing that the climate has changed, is it not time the rules were amended to suit? There is a growing attitude of ignoring and breaking what is regarded as 'petty regulations', but this is a dangerous game to play – even in this permissive era! It would seem much more sensible to permit simply 'one timekeeper' without club membership qualification.

## RESULTS

**EAST ANGLIAN WINTER RALLY, R.A.F. Wethersfield, January 2, 1972.**

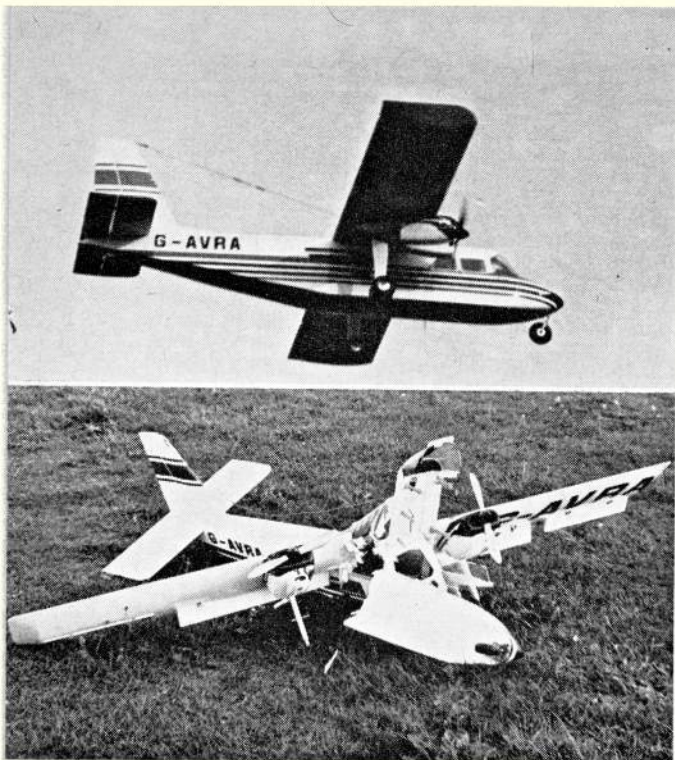
**Combined F.A.I.** (8 entries) 1. S. Bowles (Norwich) 12:11; 2. W. Parker (Norwich) 11:20; 3. R. Wells (Anglia) 11:16. **Combined Open** (10 entries) 1. P. Masterman (Havering) 7:30; 2. P. Kimber (Stansted) 7:24; 3. S. Bowles (Norwich) 7:20. **Chuck Glider** (3 entries) 1. R. A. Wells (Anglia) 2:11; 2. D. Roche (Anglia) 1:16; 3. L. Brambley (Norwich) 1:02.

**V-CONCURSO A/2 POSTAL INTERNATIONAL, April 1971**  
**Individual Junior** (70 entries) 1. S. Vasile (Rumania) M + 300 + 197; 2. P. Eugen (Rumania) M + 300 + 117; 3. P. Train (Rumania) M + 240 + 251; 38. S. Williams (U.K.) 594; 52. D. Williams (U.K.) 459. **Individual Senior** (82 entries) 1. C. Simion (Rumania) M + 240 + 283; 2. F. Ion (Rumania) M + 240 + 216; 3. F. Zdenek (Czech) M + 240 + 26; 8. J. Punter (U.K.) M + 176; 9. D. Yates (U.K.) M + 116; 10. C. Morris (U.K.) M + 111; 14. J. Baguley (U.K.) 888; 17. J. O'Donnell (U.K.) 845; 23. P. Oliver (U.K.) 821; 44. A. Moss (U.K.) 697; 47. B. Worthington (U.K.) 673; 58. R. Williams (U.K.) 595; 63. B. Picken (U.K.) 550; 69. T. Rogers (U.K.) 482.



Charlie Wyatt has flown this Ian Ellison design for over a decade. This 1962 photo shows Bill Hadfield with the first of the two that Charlie built.





Eric Coates'

## FLYING SCALE COLUMN

Sad 'before and after' views of Dave Bishop's R/C scale B.N. Islander, the pile of wreckage being due to one motor cutting out after a 'touch and go'. Cause? Lack of fuel left in the tank. . . .

satisfactory backward sprung U/C. The fuselage is far from simple either, the top longerons plunging diagonally downwards, in the region of the cockpit, to allow the very rounded front fuselage to blend in with the box like rear section. Notwithstanding all these structural problems, John decided he wanted a big one and proceeded to make it 1/9 scale; giving a wing span of 53 in. With a chord of  $7\frac{1}{2}$  in. the wing area is in the region of 800 sq. ins. Well beyond the ability of the dear old 1.3 c.c. Mills. A Mills 2.4 c.c. however was acquired which provided adequate power.

The period of construction occupied the best part of a year on and off before, in the usual clear doped undetailed state, the machine was ready for test flying. The period of test flying has been going on ever since! It soon made it known to us that it had no intention of taking off of its own accord - tearing round the runway in circles and skidding at a frightening speed, without showing the slightest tendency to lift. It was unbelievable for it only weighed about 40 oz. and with the wing area it possessed should have flown at about 15 m.p.h. Hand launches were not much better. They were not assisted by an engine which coughed badly however smoothly the model was launched. (The Mills 2.4 is not a good scale motor. Builders of large F/F scale jobs are much better advised to use the E.D. Racer; which is still in production). As likely as not it just flopped to floor! If it did fly, and when it did it displayed marvellous lateral stability, it often started stalling after 30 secs. airborne time, for no apparent reason, or dive in on the glide. Downthrust and elevator settings were altered endlessly all to no avail. It just did not respond like any other model I had ever trimmed, and I professed myself beaten! Giving one final look, the penny then dropped. The thing didn't possess any incidence! Now I knew that 'Brisfits' were a bit short in this direction because the Old Warden

THIS MONTH sees the start of the new style *Flying Scale Column* which, as I explained last month, is to be the sequel, by popular demand, to the thirteen-part *Flying Scale Models* which I concluded last month.

The new column will have no specific format and will deal with all forms of flying scale models; with the emphasis on free-flight. I would especially welcome correspondence from readers and news of their projects; with photos if possible.

I have been looking again at Fig. 2 of Part IV (Fuselage Construction) of *Flying Scale Models* which appeared in June 1971 *Aeromodeller*. This showed a typical wire braced cabane structure which I regard as the 'heart' of a biplane. It is certainly one of the most tricky parts to get right and it is essential that it is right, both from a structural and a geometrical standpoint. If it is not accurate the upper wing incidence will be wrong which can effect the whole flying performance of the model. This point has been brought home to me very clearly in recent months and I will diversify for a few paragraphs to emphasise the point.

Some three years ago John Turvey, a fellow member of Lee Bees club, embarked on the construction of a Bristol F2B Fighter. John is an aeromodeller of many years standing and has built several C/L scale models. Having watched several of my F/F models taking to the air at Lee airfield, shortly after I moved to these parts in 1967, he became a convert to the F/F world and produced the delightful little Bristol Scout illustrated last month. Inspired by the success of this the ambitious F.2B. was started upon. I say ambitious because although of a fairly stable layout it is a structural beast; 4 bay with the lower wing attachments, below the bottom of the fuselage, mixed up with the U/C legs necessitating a second inverted cabane structure and preventing a

Gene Lapansie, of Michigan, is certainly a monster F/F scale enthusiast - here he cowers beneath his Berliner Joyce, powered by an Arden 19.

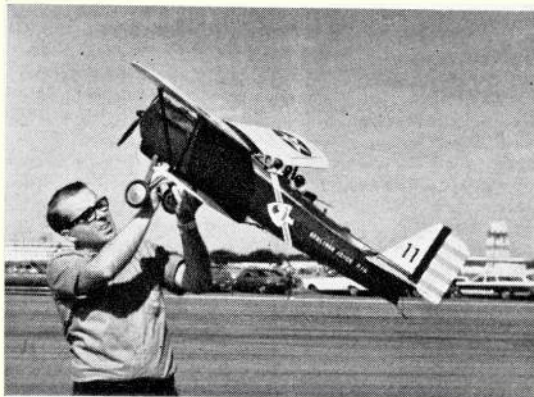






exhibit always flies in a nose up attitude. In actual fact there should be  $1\frac{1}{2}$  degrees incidence on each wing (about half the normal amount). John's model did not possess any and what is more the tailplane was set at zero incidence also. The whole thing possessed absolutely no longitudinal stability.

John didn't fancy making two new sets of cabanes, for this was what was entailed if the thing was to fly as a F/F model, so I, wanting a scale R/C hack to replace my ageing S.E.5a, 'relieved' him of it and fitted 3-function proportional radio, the lateral stability obviating any necessity for aileron control. I thought that by having continuous trimming available on the elevator the lack of longitudinal stability would prove no handicap. I can now report that the Bristol is the worst handful I have had to control from a Radio Box! By removing the downthrust, take offs are quite reasonable, but in flight the aeroplane pitches continually – how it ever flew a yard free-flight I just don't know! I am still experimenting with different engine downthrust settings and elevator trims. Once airborne and with the engine throttled back to less than  $\frac{1}{2}$  power (an O.S.30 has been substituted for the Mills 2.4) and plenty of height to play with, then things are reasonably safe. Landings are a nightmare. You think you have everything under control: engine ticking over on a nice glide path approaching the runway about 30 ft. up when you notice the nose starting to fall. If uncorrected the thing would dive straight into the tarmac. It wouldn't be so bad if the elevator response was good, but you ease back the stick and nothing happens. Then all of a sudden the elevator 'bites' and up comes the nose with a jerk; leaving one with no option but to open up and go round again or stall into the runway.

Test flying came to a temporary halt in late January when I stalled the thing on take off and it slipped in onto the port wing tips; cracking the wing spars. I intend to resume again in the near future as the whole problem now fascinates me. I think the changed incidence angle must have altered the downwash flow; upsetting the elevator control.

I have recounted the foregoing at some length to illustrate the necessity to build the centre section accurately. Be warned!

In Fig. 2, referred to earlier, the cabane struts are shown bound with fusewire and soldered directly to the wire wing dowels, the latter passing through brass tubes epoxied to the forward faces of the centre section spars. I now consider it better practice if cabane struts are made as a continuous wire encased in brass tube epoxied to the front of the spar. The wing dowels are carried

So, they fly Jungmeisters in the States! Richard Wetzel built this  $1\frac{1}{2}$  in = 1 ft., 34 in. span version with a Cox .049. Nicely finished, but the painted aileron lines are rather prominent.

through further tubes epoxied to the rear of the spars. By splitting the dowels and the cabane struts it means that the dowel tubes can be epoxied to the centre section spars, and allowed to set, before offering the centre section to the completed cabane structure. This means that the centre section incidence can be adjusted to some degree before the epoxy is applied between the cabane tubes and the spars. It is essential that spruce is used for the centre section spars and high strength (slow curing) epoxy used as there will be high shear loads transmitted from the cabane struts to the dowels; which of course are not present if the dowels are soldered directly to the cabane struts.

### Wing sections

As I have mentioned in previous articles the most common wing sections used on biplanes are the thin undercambered R.A.F.15 (W.W.I. types) and the flat bottomed Clark Y, usually thinned, for later machines. Below are given the ordinates for these sections.

#### R.A.F.15.

Station	0	1.25	2.5	5	10	15	20	30
Upper Surface	1.56	3.14	3.94	5.00	6.09	6.67	6.96	6.94
Lower Surface	1.56	0.76	0.50	0.18	0.02	0.18	0.53	1.02
Station	40	50	60	70	80	90	95	100
Upper Surface	6.63	6.13	5.52	4.79	3.91	2.81	2.17	0.94
Lower Surface	1.02	0.71	0.33	0.06	0.09	0.21	0.32	0.94

#### CLARK Y.

Station	0	1.25	2.5	5.0	7.5	10	15	20
Upper Surface	3.50	5.45	6.50	7.90	8.85	9.60	10.68	11.36
Lower Surface	3.50	1.93	1.47	0.93	0.63	0.42	0.15	0.03
Station	30	40	50	60	70	80	90	100
Upper Surface	11.70	11.40	10.52	9.15	7.35	5.22	2.80	0
Lower Surface	0	0	0	0	0	0	0	0

All the ordinates are expressed in terms of percentage chord. That is the above figures would be read off directly in inches for a 100 in. chord. Of course, we do not want anything as large as that. For a 5 in. chord then the above figure would be multiplied by  $5/100 = .05$  and plotted from a base line. In actual practice our chord

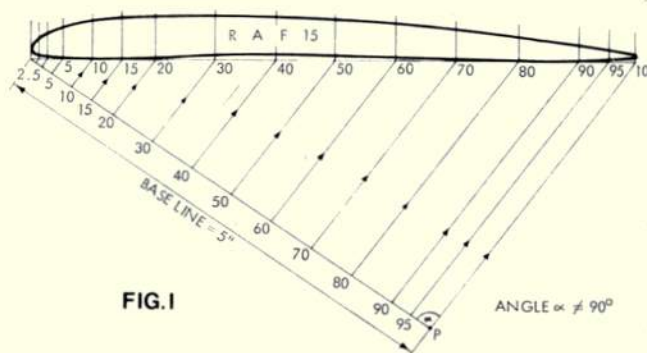


FIG.1



is usually some horrible figure like  $6.35$  in. So we have to multiply the ordinates by  $6.35/100 = .0635$ . An easy task on a slide rule; but a tedious one by longhand.

Fig. 1 shows an easy method of dividing the chord up into the various stations. In this case a  $6.35$  in. chord is divided from a  $5$  in. base line.

Very often the slight upturn of the lower surface of the R.A.F.15 section is omitted, it certainly simplifies matters when building a wing.

To thin the Clark Y section all the ordinates are multiplied by the thinning factor i.e. if only a section  $70\%$  as thick as the ordinates plotted normally would produce, then all the ordinates are multiplied by  $0.7$ . This can be taken into consideration when multiplying the ordinates by the chord length figure, i.e. for our  $6.35$  in. chord  $70\%$  thick the ordinates would be multiplied by:-

$$\frac{6.35 \times .7}{100} = .0445$$

### News of the Month

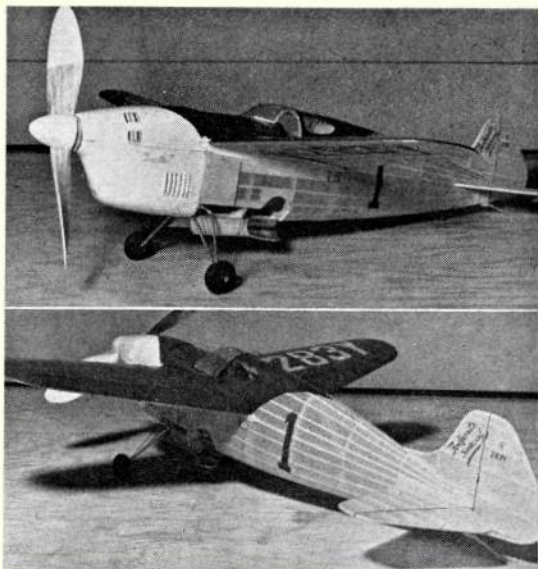
The S.M.A.E. Scale Committee met for the first time in 1972 on January 27th and its first task was to re-elect Denis Thumpston to the Chair. After a long deliberation it was decided to retain June 25th as the date for the Scale Trials. Although it is only five weeks prior to the World Championships, it was considered just sufficient. To bring the date forward any significant amount would have clashed with the Nationals and though it was briefly considered whether the National Competitions could be used as trials, this was soon rejected as impracticable.

It was decided that more Scale competitions were required in the calendar and two extra dates were arranged as follows:

- |          |  |                   |                |
|----------|--|-------------------|----------------|
| 14th May | Venue to be arranged, preferably in the E. Midlands.             | R/C Scale Class 2 | S.M.A.E. Rules |
|          |  | F/F Scale         | S.M.A.E. Rules |
|          |  | C/L Scale         | S.M.A.E. Rules |
| 29th May | At the Southern Gala. The venue of which is yet to be announced. |                   |                |
|          | Events as for the 14th May.                                      |                   |                |

These events will be organised by the committee on a less formal basis than the other two S.M.A.E. Meetings, it being hoped they will be get-togethers of all members interested in scale models and bring forward people who would not normally enter scale events for fear of being outclassed. This particularly applies to R/C. Hence only Class 2 events are being organised in this category.

1972 looks like being a year of de Havillands as far as free-flight is concerned. Both Terry Manley and John



Ralph Kuenz, of Detroit, flew this neat  $1\frac{1}{2}$  in=1 ft. rubber-powered scale model of the Folkerts SK-2 at the '71 U.S. Nats. Span is just 20 in.

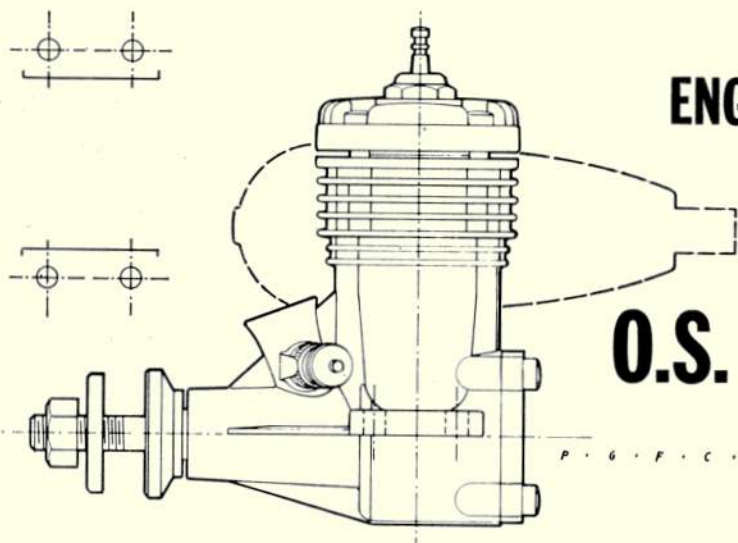
Turvey are building D.H.4's. John's to  $1/11$ th scale, giving a span of  $46\frac{1}{2}$  in. Terry's is somewhat larger; at  $50$  in. span. Knowing him, the scale will be about  $1/9\frac{3}{4}$ th! I personally am building a D.H.9A. This will be the second one I have done, the last one was to  $1/12$ th scale ( $46$  in. span), back in 1952. I entered my first scale comp with it that year, the *Eddie Riding*, at Woodford. Came 4th, I seem to remember. I believe the cup was won that year by Frank Lees, flying a Luscombe Sky Pal (APS Plan FSP 503, 50p) and Jim Bridgewood was second with a Curtiss Owl. My new model, I hope, will be somewhat of an improvement on the one 20 years ago but, like its predecessor, will be powered by a Mills 1.3 c.c. A  $50$  in. span biplane may sound a lot of aeroplane for such a motor, but all the D.H. two-seaters were high aspect ratio machines with minimal frontal area, so offering relatively little drag.

I have just returned from a short winter holiday in the Austrian Alps as I write this. Each day I had to make a  $\frac{1}{2}$  mile walk from the hotel in the village, where I was staying, to the chair lift. The path led through a huge field, of about 100 acres, in the valley bottom, covered in nice soft snow about  $4$  in. thick. For a whole week not a breath of wind blew across that field. What a waste I thought. It was the answer to a F/F trimming session dream! If I had had an aeroplane with me I would have gladly given up a days winter sporting. I have noticed on previous visits to alpine regions, in both winter and summer, that the wind hardly ever blows yet there seems to be very little interest in scale models in such regions. I wonder why that is? In countries such as England where it always seems to blow and the really calm days can be counted on the fingers of one hand, interest is extremely high. It is the old story that when something is commonplace it is squandered, whereas when it is a rarity, such as an English calm Sunday, it is treasured and full advantage taken of it. An interesting thought, anyway.

Edward Fort's entry at the '71 U.S. Nats was a one-tenth scale Rearwin 6000 M Speedster, which weighs  $30$  oz. for its Cox .049 power unit. Ideal layout for a scale model - super stable and with easily reproduced features.







## ENGINE TEST

by Peter Chinn

# O.S. PET-III .099

a powerful little  
motor for all sport  
flying applications

OF THE MANY TYPES of O.S. engines that have been distributed in the U.K. by the KeilKraft organisation over the past dozen years or so, possibly the most popular in terms of numbers sold have been the 3.2 c.c. 'Max-19' and 1.6 c.c. 'Pet-II' models. Both these, however, have recently been superseded by redesigned models, namely the slightly enlarged Max-20 and the completely re-styled 'Mark III' version of the Pet and the first deliveries of both new models are currently being made to KeilKraft stockists.

The very earliest Pet engine appeared some 14 years ago. It was aimed at the beginner and the economy end of the market being the O.S. company's first attempt at a low-priced motor. Some production economies were made, compared with the O.S. 'Max' series, but the engine was, nevertheless, well constructed, reliable and had a better-than-average level of performance. In its latest form, the Pet is still the O.S. company's cheapest engine but it remains a nicely-made little motor and now has, we think, a rather more attractive and purposeful appearance.

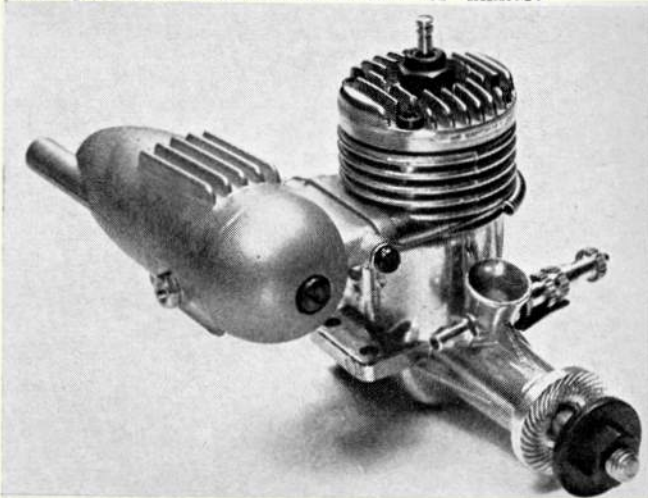
All the parts of the Pet-III are new. The most obvious change is the main casting which no longer has radial mounting lugs but now extends upward to include a full-length finned cylinder casing. In place of the Pet-II's integrally-finned cylinder, the Pet-III uses a drop-in cylinder sleeve. This has a very thick wall, allowing internal flute-type transfer ports to be used, and is located at its base by an annular seat in the crankcase. A revised cylinder head, with 2.7 mm. wide squish band surrounding a bowl-shaped combustion chamber, is featured and a small but sensible change is the use of a soft aluminium gasket instead of a composition one.

The crankcase, unbushed, still serves as the main bearing material but there is now a shallow oil groove, correctly located to feed lubricant under crankcase compression to the bearing surfaces. The crankshaft is case-hardened and finely finished and is a good fit in the bearing. It has a rectangular valve port, timed to open at 45 deg. ABDC and to close 180 deg. later. The connecting-rod now has a bronze-bushed big-end and is coupled to a slightly lighter piston by a fully-floating conrod. The piston has a step-type deflector as before. It uncovers the transfer flutes for 55 deg. of crank angle each side of BDC.

The exhaust ports are open for 66½ deg. each side of BDC.

For a long time, the Pet was the only O.S. engine imported into the U.K. for which the manufacturer did not offer a silencer. Now, especially for the Pet-III, the O.S. are making the Type OS-701 silencer which is basically a smaller and more simplified version of the new range of expansion chamber-type silencers made for the current 2.5 c.c. to 13.2 c.c. O.S. Max engines. The 701 silencer is made of pressure-cast aluminium and weighs a modest 0.7 oz. The main body of the unit, including inlet duct and an offset 4.5 mm. i.d. tailpipe, is cast in one piece to which is added a domed nose-cap. There are cooling fins top and bottom and a brass screw-in priming nozzle opposite the exhaust port. The muffler slips over the Pet-III exhaust stack (it is *not* suitable, by the way, for earlier Pet engines) and is retained by a spring around the cylinder casting.

Our test motor was an early (possibly 'pre-production') example obtained in advance of the Pet-III's general release to retail markets. Quite obviously, however, it was not a specially chosen one as we had considerable difficulty, at first, with the needle-valve. This gave somewhat erratic control of mixture





strength when, after running-in, attempts were made to lean it out to optimum full-power setting. We informed the factory of this problem and learned that a modification had, in fact, been made to the spray-bar assembly. On fitting a replacement needle-valve assembly we encountered no more difficulties.

Most small glowplug engines like a reasonable amount of nitromethane in the fuel, so a mixture containing 15 per cent nitro was used for the tests on the Pet-III. In fact, the manufacturer's leaflet, issued since our tests were completed, suggests 5 or 10 per cent. A re-check confirmed that the Pet-III does run quite happily on these milder fuels with only a slight loss of performance.

Very little running-in is required with the Pet-III. There is no reason why the user should not put the engine straight into a model and carry out the running-in process in the air, provided that the needle-valve is set rich for the first 20 or 30 minutes' accumulated running time.

The prop sizes recommended by the manufacturer for the Pet-III (as a starting point) are 7x4 and 8x3. With the silencer fitted, our engine turned up 12,800 r.p.m. on a 7x4 Top-Flite wood prop and 10,600 on an 8x3½ Top-Flite. Other figures included 11,100 on a (fast) 8x4 Power-Prop and 14,800 and 15,600 on two 7x3 Top-Flites. These latter, obviously, would tend to unload to too high a speed in the air, having regard to the engine's peaking speed as indicated by the performance graph. Therefore, the maker's recommendation of a 7x4 should be about right for high performance with the average free-flight, R/C or control-line model. For larger, slower, sport-type free-flight models, an 8 in. dia. with 3 to 4 in. pitch may be better.

The Pet-III's power output of nearly 0.15 b.h.p. at 15,000 r.p.m. on 15 per cent nitro fuel and with silencer fitted is very good indeed for a general-purpose engine. The silencer, incidentally, absorbs quite a modest amount of power – only about 10 per cent b.h.p. at the peak – yet effectively muffles the sharp exhaust note that the engine produces with an open exhaust.

General handling and running characteristics were quite good. We found hot restarts a little slow at times but cold starts were easy enough and the Pet showed no inclination to kick or bite. Running qualities were good and the engine held steady r.p.m.

#### SPECIFICATION

**Type:** Single-cylinder, air-cooled glowplug ignition two-stroke with crankshaft rotary induction valve and plain main bearing.  
**Bore:** 13.4 mm. (0.5276 in.)  
**Stroke:** 11.4 mm. (0.4488 in.)  
**Swept Volume:** 1.608 c.c. (0.0981 cu. in.)  
**Stroke/Bore Ratio:** 0.851:1  
**Checked Weights:**  
 92 grammes – 3.25 oz. (less silencer)  
 112 grammes – 3.95 oz. (with silencer)

#### General Structural Data

Pressure diecast aluminium alloy crankcase/cylinder/main-bearing unit, with detachable rear cover secured with four screws. Hardened steel crankshaft with 8 mm. dia. main journal, 5.5 mm. bore gas passage and 4 mm. dia. crankpin. Lapped, cast-iron, stepped-deflector piston with 3 mm. dia. fully-floating gudgeon-pin. Pressure diecast aluminium alloy connecting-rod with bronze-bushed big-end. Thick-walled steel drop-in cylinder-liner with internal flute-type transfer passages and located by narrow annular seat in crankcase. Pressure diecast aluminium alloy finned cylinder-head with 0.3 mm. soft aluminium gasket and secured to cylinder casing with four screws. Machined aluminium alloy prop driver keyed to flat on crankshaft. Brass, spraybar-type needle-valve assembly. Beam mounting lugs.

#### OPTIONAL EXTRAS

- (i) Expansion chamber-type silencer, type O.S.-701.
- (ii) Barrel-throttle valve (for use with existing spray-bar assembly).

#### TEST CONDITIONS

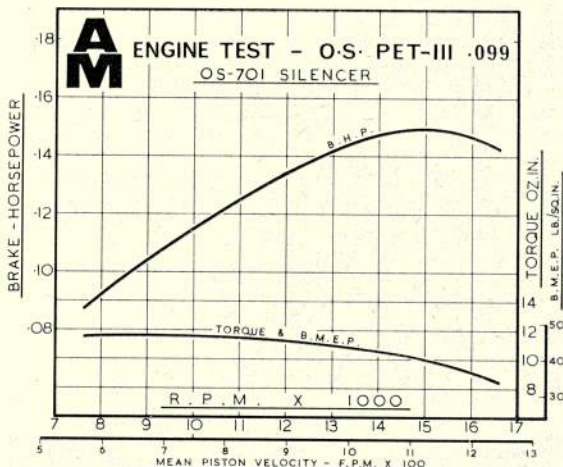
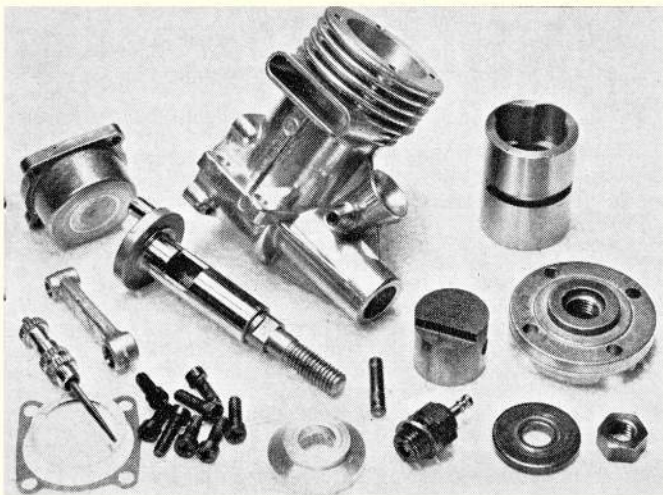
**Running time prior to test:** 1 hour  
**Fuel used:** 15 per cent nitromethane, 25 per cent Duckhams Racing Castor-oil, 60 per cent methanol  
**Glowplug used:** O.S. No. 9 (medium reach, platinum filament)  
**Air temperature:** 21 deg. C (70 deg. F)  
**Barometric Pressure:** 30.25 in. Hg.  
**Silencer:** O.S.-701 expansion chamber type

readings through a wide range of load speeds – i.e. from 7,000 r.p.m. up to 18,000 r.p.m. There was no power loss as the Pet warmed up from cold and, on dismantling it after test, we found the engine very clean and, as expected, bearing no evidence of having been overheated or stressed in any way. The O.S. No. 9 glowplug survived all running-in and testing.

In all, this seems to be a most worthy successor to the popular Pet-II model.

**Power/Weight Ratio** (as tested with OS-701 silencer): 0.60 b.h.p./lb.

**Specific Output** (as tested with OS-701 silencer): 92 b.h.p./litre.







a lightweight,  
28 in. span, free-flight  
design for use  
with the Jetex  
Paa-loader 150  
motor unit.

A lightweight model is essential to get the most out of these 'rocket' motors, so put aside that 'hard' balsa for shelf material, and hunt around your scrap box for some good stock. Very little wood used in this model - making for economy in both weight and cost.

IT IS, PERHAPS, one of the disappointments of the model flying movement that, because of the technical complexity of the turbo jet unit, it has never been possible to reproduce it in a simple, miniaturised form. This, in a way, has kept the model aircraft a critical step behind full-size development, particularly in the area of scale verisimilitude. True, a pulse jet engine was available for some years after the war, and made an exciting impact on the model scene, but the only

ure. These failures are not only irritating but rather expensive. Also frustrating are the ignition failures due to damp fuel pellets; it is essential that the pellets be kept in a dry place (the wick too) and the lid of the tin replaced immediately upon the removal of pellets.

I found the unit to be very consistent in its power output - that is, from flight to flight. This was due to the incidence of leakage from the cylinder/end

## YOUR TWO FREE, FULL-SIZE, PLANS!

really acceptable form of jet-type flight has been afforded through the simple, solid fuel cylinder, working on a gas expansion principle. Now popularly known by its trade name, Jetex, it has proved over the years, a safe, and relatively cheap method of jet, or rocket propulsion.

The writer's experience of Jetex power goes back to the early 1950s, when there was a whole range of motors to choose from, of which the most popular were the famous 50 unit, still in production, and the larger, *Jetmaster*. The latter was capable of powering a duration model of some 30 inch wingspan, albeit that the model had to be built extremely light in order to achieve a good rate of climb. The models, however, were exciting to fly and the units quite cheap to operate. A number of Jetex contests, flown on a power run overall flight time ratio, were organised during the 1950s both by the S.M.A.E. and the manufacturers.

The *Paa-loader* is an obvious development of the old *Jetmaster*, taking identical pellets and giving a similar performance. It differs, however, in two respects: the casing is of a harder substance and instead of a jet nozzle the gas escape is through a domed outlet in the end cap. Loading is simple, but the utmost care must be taken not to disturb the rather brittle ignition wick from its copper core. The minute fractures which can occur when ramming home the gauze or feeding the wick through the end cap are the most common cause of ignition fail-

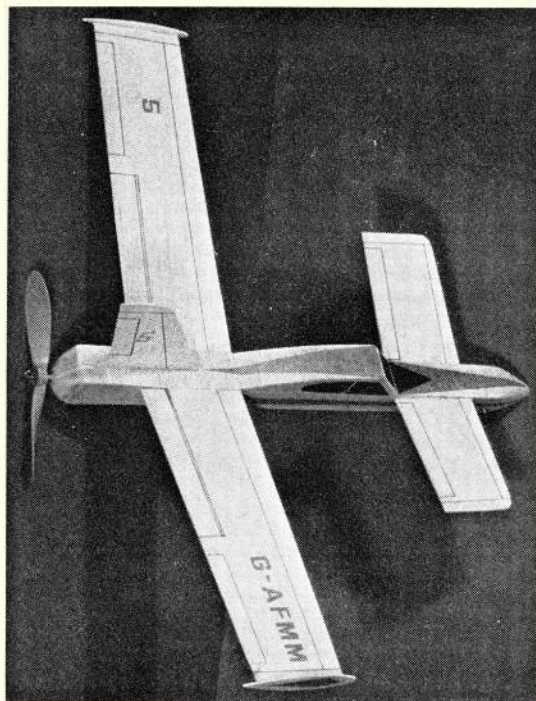
cap joint being almost negligible - the *Paa-loader* being better in this respect than the early *Jetmaster*. My only criticism here is of the tendency of the asbestos sealing washers to disintegrate, sometimes after only one firing. Duration of thrust per pellet I found to be 6-7 seconds, and approximately 13 seconds for two pellets. I did not fire three pellets, as I felt that two pellets per flight was quite expensive enough, say five new pence, and also, given a reasonable model, a two-pellet flight was sufficient for small field flying.

Taking up this question of cost per flight, the figure of five new pence per two-pellet firing, is not perhaps excessive if the model is used just for competition but could be considered high for sport flying, particularly for the younger modeller. Personally, I would welcome a larger, cheaper pellet, and a more reliable wick (indeed, the latter is now improved, the latest sample from the distributors, KeilKraft, overcoming all the shortcomings of the previous item).

Models designed for the *Paa-loader* must necessarily be efficient and highly consistent if the best use is to be made of the limited thrust time available. This means that the model must attain a fair height on each flight in order to economically convert fuel expenditure into useful flying time. Unlike an orthodox airscrew engine you cannot make up for poor performance by adding an extra drop of fuel;

*continued on page 212*





MOST MODEL AIRCRAFT follow a pattern, and have their tails in the usual place – on the back-end of their bodies (sorry – fuselages!). *Candice* changes all that and has the wing where the tailplane normally fits, and the tailplane where the wing should be! A bit confusing? Never mind, the result is what is called a 'canard-type' model, excitingly different, and a fine flier. Let's build one, shall we? Here's how its done.

Cut two identical fuselage sides from medium grade 1/16 in. sheet balsa, adding reinforcing pieces A. Cement formers F1, F2, F3, F4, to one side, and then adding the other side. Cover the bottom with pieces of 1/32 in. sheet, noting grain direction. (Sketches 1, 2, 3). Lay fuselage aside. Cut a right and left-hand wing panel, noting fin slot on centre line. Sand panels to section shown. Pin one panel flat on the building board, then cement the other panel to it, raising the tip onto the dihedral jig X (cut from 1/8 in. sheet) Sketch 4. Repeat the procedure for the front elevator using dihedral jig Y. Give wing and elevator one coat of thin dope remembering to dope one surface at a time, and pinning flat on a board during drying to avoid warps. Add tip-tanks (pieces B) to each tip. Very lightly sandpaper wing and elevator. Cut where shown on wing trailing edges to provide aileron trim control. Cement wing and elevator in position on fuselage top, and adding pieces C and 1/32 in. top covering, finally fin (check that it is vertical) and nose-cone carved from a balsa block. Insert a 3/32 in. dia. dowel rod in front holes. Sketch 5. Give completed fuselage one coat of dope, sanding between each coat. Cut out the propellor block pieces D, E, F, G, H, from sheet and assemble as shown in

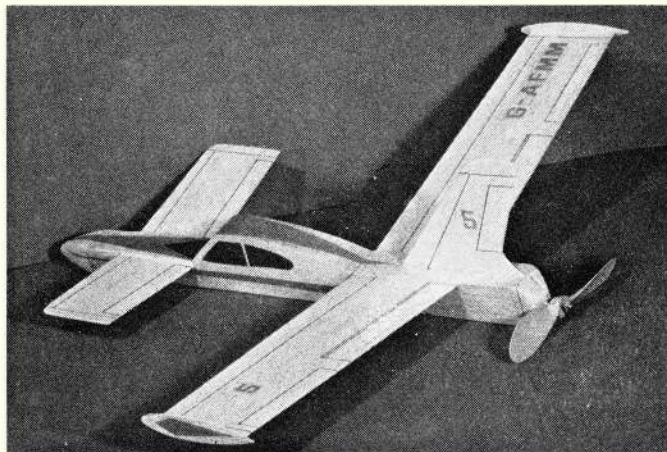
Unconventional, yet pretty, 'Candice' follows the general layout chosen by the Wright Brothers – and they were pretty lucky with it! Simple all sheet construction makes for ease of building, yet this model will teach the beginner all the basics of trimming for free-flight.

# CANDICE

**A 'simply for fun' canard model for rubber power by  
RAY MALMSTROM  
– ideal for the novice or to provide  
a little relaxation for the hardened  
enthusiast!**

Sketch 6. The 18 swg brass bush (obtainable from your model shop) must be firmly cemented in the slot between pieces E and F. Carve and carefully sandpaper the finished propeller block to shape and give four coats of dope, again sanding lightly between each coat. Also from your model shop obtain a Keil-Kraft 5 in. dia. plastic propeller. With a fine hack, or tenon saw cut off the spinner portion as in Sketch 7. Bend a length (approx. 3 1/2 in. long) of swg piano wire into a winding loop (Z), insert through the back of the propeller (the prop has to be back-to-front as it were, because *Candice* is a *pusher* type model), slip a couple of cup washers on to the propeller shaft, and then pass the shaft through the brass bush in the propellor block. Finally, with sharp nosed pliers form the rubber retaining hook. Put a drop of thin oil on the prop. shaft. Take 24 in. of 3/16 in. flat strip rubber and make into a 12 in. loop. Fit this between the propeller hook and the front dowel rod, not forgetting to rub some rubber lubricant on to the motor first.

*Candice* is now functional except for any colour trim you may desire. Our own *Candice* is trimmed in colour tissue cut out and doped in position. The registration lettering is from water slide transfers and the control surfaces were drawn in with a ruler and black ball point pen. Take care to balance your model before flight-testing. This is important, and saves heart attacks later on! Suspend the model from the balance point, as shown in Sketch 8. Put a small piece of lead or folded empty cement tube etc. in the recess in the nose cone until the model hangs level fore and aft.





Choose a calm day and some long grass for testing. From a shoulder-high launch *Candice* should glide straight, and touch down about 25-30 feet away. A slight turn either way is O.K. too, but a really steep (and dangerous) bank indicates warped flying surfaces, so check your wings and elevator. Warps can be removed by holding the warped surface in the steam from a kettle (mind your fingers!) and twisting out the warp. When a satisfactory glide is achieved you can put about 150 turns on the test motor. *Candice* should climb a little, fly a short distance, and come in to a smooth landing. Too much bank is best trimmed out by gently bending the ailerons

on the wing tips. For example a left-hand bank can easily be reduced by bending the left aileron down about 1/16 in. the test motor will show you if all is well (maximum safe turns about 225). If all is well you can install the permanent flight-motor; this is a 36 in. length of 3/16 in. flat strip rubber tied into an 18 in. loop and well lubricated with rubber lubricant. With this motor you can gradually increase the turns with each successful flight to a safe maximum of 700 turns. *Candice* is a stable, consistent flier and like all her kind, delightfully stall-free when correctly balanced and trimmed. So, if you have always wanted to try a tail-first job, here's the model for you.

## JETSET

(Continued from page 210)

short flights and non flights use the same amount of fuel as a long flight. Then again, you must fly from the start on all-out power: you cannot throttle back, as it were. However, trimming is helped by the absence of torque and gyroscopic effects, and given that you are testing the model over fairly long grass, the very light Jetex models are not highly subject to damage.

The *Paa-loader* has been reviewed here from the point of view of an average modeller looking for a diversionary interest, and here the unit can give a tremendous amount of flying field pleasure.

## The Model

In order to make more practical use of the motor, a suitable model was then designed and built - hence *Jetset*. Naturally, a good flight must incorporate a good glide, which means that your Jetex model should be as large as possible consistent with a high rate of climb. Previous experience of such models would indicate a 28 in. to 30 in. span for the *Paa-loader* unit, built to a weight approximately equal to that of the unit: 1½ ounces. It is not too difficult to build down to this weight, at least not for the experienced modeller, provided that care is taken with the selection of the balsa. However, the model must be strong enough to take an occasional full-power dive in, and if damaged, should be so constructed that repair is easily effected.

This fuselage is triangular in section, the base and upright being of 1/16 in. medium sheet and the angle fillets of 1/32 in. medium sheet. After cementing the upright to the base, the fillets can be measured and cut in. This is a cleaner, more accurate method than tracing each former piece from a plan. In the same way the wing support struts should be measured and cut after the wing platforms have been cemented in place and correctly aligned. The tail platforms do not require such supporting struts.

It is possible to build the whole fuselage of 1/32nd sheet, perhaps desirable if you have competition flying in mind. For this, really good quality sheet is essential; very soft or very hard woods must be avoided. If the fin is of 1/32 in. outline cover only one side otherwise severe warping may result.

The motor mount is securely screwed to a strip of 1/16th plywood cemented on the underside of the fuselage.

Wing and tailplane construction is slightly unconventional in that they are not built into a set of notched ribs but rather built up on a simple jig consisting of two spanwise supporting strips. The leading and trailing edges should be shaped and notched (but not at tips) before being pinned down over the undercamber support strips. The ribs can then be

inserted into the prepared notches to the depth indicated on the plan. Naturally the outer panels must be constructed separately, chamfering the spars to form the dihedral angle. Note that the tip pieces of 3/32 in. sheet should be slightly oversize, and then cut in to fit. Finally, sand down ribs to the prescribed airfoil shape, and clean up the whole assembly.

The tailplane is constructed in a similar way to the wing. Epoxy the D/T hooks in position as shown.

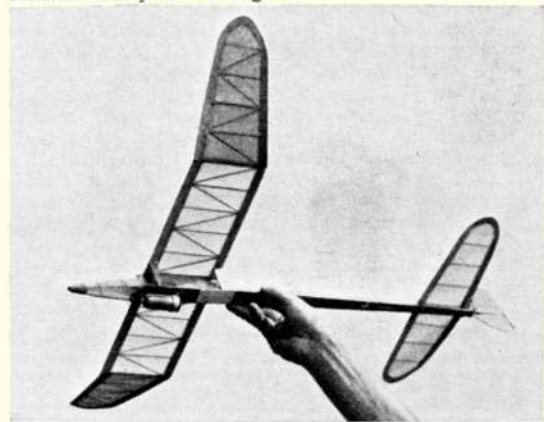
Dope the whole structure and lightly sandpaper before covering with lightweight Modelspan. Lightly watershrink, and then, remembering you are dealing with a very light structure, dope with a thinned down solution, adding up to 50 per cent thinners. This is most important, as a too strong application of dope can warp the model out of all recognition.

## Flying:

Adjust fore and aft trim by moving the motor unit back and forth. It may be that the model is still over-elevated when the motor is in the most forward position - in this case do not adjust the flying surfaces, but add small amount of plasticene to the nose - on no account pack up the tailplane or alter the wing incidence.

Take time with hand glides, as the Jetex engine is flat out on power from the word go. See that the glide is flat with little or no tendency to turn. Jetex models tend to 'twizzle' up as the momentum builds, and in this way appear to find their own natural turn; any degree of induced turn can lead to a disastrous spiral. Altogether, a flat, straight hand glide makes for a safe first flight. Glide turn, if insufficient, can be increased by tail tilt.

Two pellets should be adequate for reasonable flight performance on this model, though for a really high ceiling three must be used. One pellet should be sufficient for your test flights.

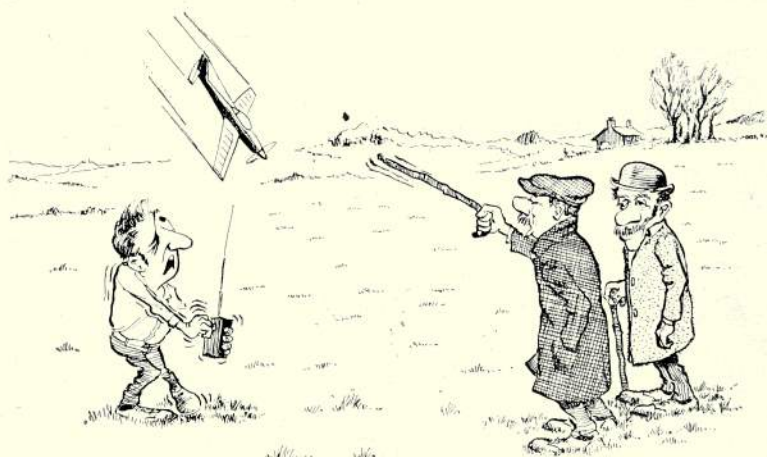




# topical twists

by 'Pylonius'

Illustrated by 'Sherry'



'It's another of those power cuts'.

## Tipping the Scale

We are told that the scale modeller can never quite achieve the ideal of full-size realism, unless he goes the whole hog and builds his model full-size. The snag is something which, oddly enough, is known as Scale Effect. Those little creatures called air slugs, which collect around the surfaces in the cause of aerodynamic complication, are the same size whether performing their antics on a model wing or a full-size airfoil. This means that whereas on a full-size surface the slugs are just crawly little things, on the model wing they become veritable monsters.

It is the elephantine action of these monster slugs which cause the spectator to suppress a giggle as the gleaming scale model suddenly opts for the sort of vertical-type landing which, on the full-size scene, would have fire engines and ambulances screaming to the rescue. And again, it is the heavy lolloping of the monster slugs which gives rise to the frustrating fast/slow syndrome from which most scale models suffer. You have the choice of flying your cabin-type scale model at a speed where it performs in the style of an out of control jet fighter, or at a true scale speed, where it wallows about like a lame duck in a thunderstorm.

Usually the more realistic looking the scale model, the greater is the reluctance of the owner to fly it. A nice realistic wing tip landing might give the spectators a thrill, but also gives a nasty shaking up to the intricate products of the 2,000 building hours, quite apart from the thumbs down it gets from the judges.

And it is the poor old judges who get all the nasty decisions to make as a result of Scale Effect. There is a sort of proportional ratio between ability to fly and degree of realism. You might be sure that the model with working flaps, horn balanced controls and red nosed pilot is going to look pretty pathetic at anything above zero feet of altitude, even though it were able to record such altitude on suitable diallage if it ever made it. On the other hand, the rugged, near scale model, which looks realistic enough at 'eyeball' distance, will fly like a dream, or at least very like a model aircraft. Who is then to get the prize?

## Getting the Bird

At one time the only things to be supported by dollies were speed models, but now if you want to get a photo of that contest-winning model published you have to get it held decoratively aloft by a rather self-conscious young lady, thus giving the true value to a bird in hand.

Just now the free-flighters are setting the pace in the dolly-holding stakes at the rate of one mini-skirt per Maxie model. But whether some of the weirdo craft held so demurely aloft are recognisable to the public as model planes is another matter, and there are already rumours of complaints to Lord Longford. On the other hand, the radio models, to which most of the glamour attaches itself these days, give a greater degree of realism, but are generally too hefty for the dolly birds to wield aloft. True, there is a joint effort on the part of two of the more muscular young ladies to achieve a waist-high snatch, but success is limited in that their vital statistics are obscured by the more ample, if less vital, statistics of the billowing model. Still, seeing those attractive misses crouching around the radio models make a change from all those near misses we hear so much about.

## Fit to Drop

Model display flying is no longer the odd circuit or two squeezed in between the Bonny Baby competition and the Dog Handling demonstration, but a full-blooded air display, with every sort of realism from dogfights to bombing raids. Afficiendos of the Church Fete do not seem to believe in the more peaceful type of demonstration, and the model display experts are hard pushed to keep up with the public demand for violence on the rectory lawn. New spectacular ideas are constantly called for:

*'What sort of display do you intend to put on at the Kiddies Open Day next year?'*

*'We are torn between a mass-bombing raid on Hamburg and the Japanese attack on Pearl Harbour.'*

*'Aren't those projects a little ambitious?'*

*'Question of necessity. We've just about exhausted the World War One scene, and the reconstruction of the 1930 Schneider Cup Race didn't go down all that well; the kiddies started to riot when they learned that no bombs were to be dropped.'*

## Free Flight

Model flyers are now advised to buy their own flying fields. Not individually, as this would be hogging the air space a bit too much, but as a group or club. Snag is the cost: thousands of pounds, payable back over something like ten years. Sounds all very nice, but considering that few people on the R/C scene are likely to be around in ten years time it all depends on the survivability of the club; the lucky members of which, after ten years, will be enjoying free flying on the field paid for by the earlier members. It's going to be great to be young.





## 24th NATIONAL CHAMPIONSHIPS

Paul Lagan reports from

## NEW ZEALAND

AFTER A BRIEF EXCURSION to the South Island last year, the Nationals venue returned to Feilding again for the 24th annual meeting. Feilding is a small farming community near Palmerston North in the south of the North Island and has good camping facilities for the 300 or so modellers and their families that attend the Nats. Unfortunately, the Free-Flight field at Taonui aerodrome is fast becoming unsuitable for contest flying due to some aggravated farmers and an increasing number of trees around the 'drome. Doubtless, consideration will now be given to alternative Free-Flight sites for future Nats.

Weather this year was excellent for all but the fourth flying day (Payload, H.L. Glider, 'A' Radio and FAI Team Race). Morning F/F events were flown to the usual 5.30 a.m. start and it was calm and practically liftless for the first few rounds each day with the wind freshening and the ther-

John Malkin (Wellington) launches Brian Roots' 4th placed combat model - an A.P.S. Dominator, which is both an 'ideal basic design', while still highly competitive.

mals developing for later rounds and fly-offs around noon. The breezy fourth day led to considerable farmer trouble during retrieving - one even threatened to produce the traditional shot-gun!

As well as the 155 N.Z. entrants at the Nats, there were three Australian entrants - Allan Edwards, Bob Emslie and John Borrill who considered a N.Z. trip more worthwhile than travelling to their own Nats in Western Australia.

### Free-Flight

Good entries in all F/F events indicated the continuing healthy state of the category. Typical entries were: A/2-60; Wakefield-24; A/1-63; Open Power-36. Standards of flying continue to improve and despite the early morning 'still' rounds there were 'full-house' scores in all three FAI events, Ladies Cup, Open Rubber and Power. Our keen Australian visitors added a little more edge to most events and they proved to be

Ken Jones shows the strain towards the end of the half-hour Aggregate event. If you don't believe it's tiring, try even a 5-minute chuck-glider scramble. . . . Worth it though, he won the contest.

very competitive but a little out of luck in some classes.

A/2 was won and lost in the first round where only three made the magic three minutes in very 'light' air. Over 20 flyers managed to record maxes in all subsequent rounds but the two could not be displaced. Nearest miss was Paul Lagan who was using a Gary Burrows adaptation of the Russian circling towhook and who lost vital seconds by gliding out of sight behind a hangar. Flown very tactically there were a number of line tangles during the mass launches. Brian Roots' *Altair* design did a magnificent fly-off to oust John Malkin whose model flirted with light lift.

There were perfect scores too in FAI Power and Wakefield but no fly-offs were required. Murray Stringer built his power winner in a week and based it on Roger Simpson's latest. Murray flew very well and used a Top Flite 7 x 4 in. nylon on his tuned G.15. Joe

Speaking of chuck gliders (sorry H.L.G.'s!), Dave Richardson (Hastings) certainly came well prepared but unfortunately could not 'mass produce' his luck and failed to place.







Spectacular H.S. 748 R/C scale model by Doug Marsh was finished in Mount Cook colours. Not entered in the contest, but made impressive demonstration flight afterwards.

Johnson also used a new model with the ex-Lagan Rossi up front and Paul Lagan a fast G.15 (24,400 on 7 x 3½ in. Bartels/Cox) in a rather inconsistent model. The Aussies flew well in this event with Allan Edwards being unfortunate to 'cream' in the last round when sitting in second place. Although flying in Wakefield was tactical for the last few rounds, the first two rounds were flown in dead air and required a good performing model. The Wellington trio came out a good minute ahead of the rest of the field with right/left trimmed models of similar performances.

Open Power and Open Rubber each had good fly-offs—Power in calmish air with very light lift for half the fly-off contenders and Rubber in very rough air taking models O.O.S. in about three minutes. John Borrill's *Dixielander* with G15 up front went as all 'Dixies' should and rode out a light thermal to win Power convincingly. Joe Johnson used his FAI model and Tony Hill and Grenville Thompson each had ½A's—poor Linc Vincent over-ran with his ETA .29. In Rubber, Paul Lagan's Wakefield was buffeted down for a poor flight and the three true open models did little better. Ron Magill renewed his lease on the Open Rubber trophy with an O.O.S. flight on a borrowed motor!

Payload and H.L. Glider were flown in very turbulent conditions with much 'prangery' in each event—indeed in Payload only a couple managed to last until the final round (those little dummies really make a mess of things when they want to keep going after the model stops on a tree or fence post!). Wellington again figured well in the results and in H.L. Glider, Australian Bob Emslie exhibited a good arm to take fifth place.

The Ladies' event was again

won with a perfect score—this time it was Rose Douglas's turn flying glider. A/1 was difficult in early still, and later gusty, air but young Gary Prohm really excelled with his *Sinner 3*. John Ensell used the John Gard Wakefield section on his A/1 and displayed a fine glide in the early rounds.

The half hour aggregate event is a mad scramble to record as many sub-three minute flights as possible in half an hour—the highest aggregate winning. Approaches are many but the most successful seemed to be a Mills .75 cabin model pattering around at 15 feet for about a minute. Paul Lagan had a novel approach with a VHTL Schlosser powered model that D/T'd under power and was retrieved with the engine running—a D/T on to a fence soon put paid to that idea! Held on New Year's Eve, it was easy to see who had competed a little later in the evening!

### Indoor

Indoor results were very much a repeat of past Nats with only Martin Gregorie being a new name in the results. The hall used had an absolute ceiling of 28 feet but with a 'V' roof and considerable clutter the usable height was only about 23 feet.

Warren King's winning Class C radio model was an A.P.S. Slik-Fli, powered by O.S. H60F GP and fitted with Multi-con retract gear. Flaps proved to be an advantage in the calm conditions encountered.



### Control Line

After a few years in the doldrums, Control Line events, particularly Team Racing, picked up a little this year and although there was no noticeable improvement in standards, the old enthusiasm was back and there was even talk of introducing a new class based on Goodyear rules for future contests.

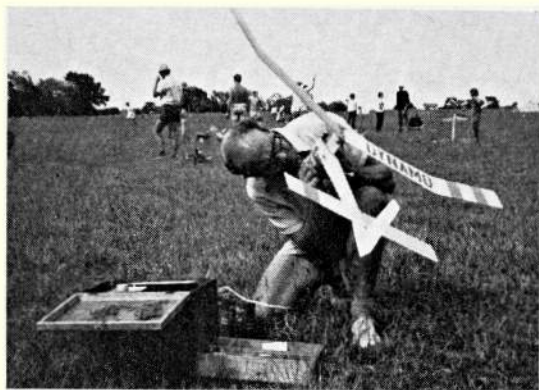
½A Team Race is flown over an odd distance of 5.6 miles and this year was very closely contested with 10th place only being 30 seconds out of a place in the final. Murray Stringer was in a class of his own with an Oliver Cub and cut down 7 x 7½ in. Bartels/Drazek prop. ½A looks like becoming very competitive in 1972.

FAI Team Race times were nothing fantastic, but it too had a good entry (24). A few disqualifications resulted from some rather stern decisions from the race jury that even gave one pilot a warning for not keeping his handle against his chest when overtaking! The jury did, however, underline some of the difficulties in flying literally to the rules. Bill Forbes' Oliver Tiger model deserved a win and he was really well ahead of the rest of the field.

Class 'B' team race was a bit of a debacle when all three finalists were disqualified! Again the jury became officious rather than official. Placings were determined on laps completed and heat times. Wayne Allott completed a good Nats with his win. Super Tigres and OS's are still the most popular motors in this event.

Speed events were very much as usual with no great improvement in speeds except for Class 1 (2.5 c.c.) where Harvey Westland's home-made motor was ably proxied by Peted Wheeler to beat the current N.Z. record. A prop test





Colin Bruce (Whakatane) flew a T.D. .049 Dynamo (yet another A.P.S. design!) in Open Power but could not find any 'helpful' air in the fly-off.

(straight fuel). Pylon interest is growing steadily thanks mainly to Bill Cook's promotional efforts.

## Scale

Again the three scale events gained good support and a high standard. Particularly notable were Laurie Ackroyd's magnificent R/C *Tiger Moth* which really looked the part in flight, Doug Marsh's R/C *Avro 748* and Don Hague's F/F model that won with a rather average flight but with a very high static score—eight recorded qualifying flights in F/F Scale, the most for some years.

It looks as if a new scale category will be introduced to the N.Z. scene in the coming year—that of a 'stand-off' type where emphasis is placed on general appearance rather than detail or absolute adherence to scale.

## Results

### NORDIC A/2 (5 x 3)

1. G. Roots	M +14.35
2. J. Malkin	M +2.55
3. P. Lagan	14.56

### FAI POWER

1. M. Stringer	15.00
2. J. Johnson	14.53
3. P. Lagan	14.08

### WAKEFIELD

1. P. Lagan	15.00
2. G. Roots	14.57
3. J. Malkin	14.43

### OPEN POWER (fly-off scores)

1. J. Borrill	+14.02
2. A. Hill	+4.56
3. J. Johnson	+3.54
4. G. Thompson	+2.56
5. L. Vincent	+0.00

### OPEN RUBBER (fly-off scores)

1. R. Magill	+3.44
2. A. McDonald	+2.56
3. J. Templeman	+1.31
4. P. Lagan	+1.11

### PAYLOAD (5 x 3)

1. G. Thompson	9.23
2. A. Pearce	9.17
3. P. Lagan	9.16

### H.L. GLIDER (6 x 1½)

1. M. Elmore	6.00
2. J. Tickner	5.52
3. G. Taylor	5.45

### NORDIC A/1 (5 x 3)

1. G. Prohm	14.07
2. J. Ensoll	11.57
3. T. Bundock	11.42

(Continued on page 218)

after the event showed Harvey's motor to be quite fast—24,500 on 3:1 fuel and the 7 x 3½ Bartels/Cox test prop on a standard glow plug. Brian Roots did well in Classes 1 and 2 and Phil Staples likewise in 3 and 4/5 combined. It is unlikely that Class 2 (3.5 c.c.) will be persevered with at future Nats.

Bruce Turner won Stunt in fine style displacing Peter Wheeler from his throne. Peter flew a new model, *Phoenix*, which rose from the ashes of the old *Phoenixian*. Phil Staples also managed to head Peter off in a surprise result.

Thirty entries were enjoyed in Combat which saw some new approaches. A couple of 90 m.p.h. G.15 models showed that this motor is quite a feasible proposition with Gavin Shute's in particular being most impressive, however, it was the usual *Dominator* type of Murray Stringer complete with Oliver Tiger that came through in the end—Murray flew 'winning' Combat, only taking risks when absolutely necessary.

## Radio Control

N.Z. is one of the few countries that still flies rudder only and rudder/elevator pattern classes and the rudder/elevator class (Class B) has recently developed into a very keen event. In Class A (rudder) proportional and 'bang-bang' equipments are differentiated between in sub-classes A and AA. Both Class A and AA were won in gusty weather by Grenville Thompson on the same morning as he won Paa-load. Grenville hadn't flown his model for six months prior to the event!

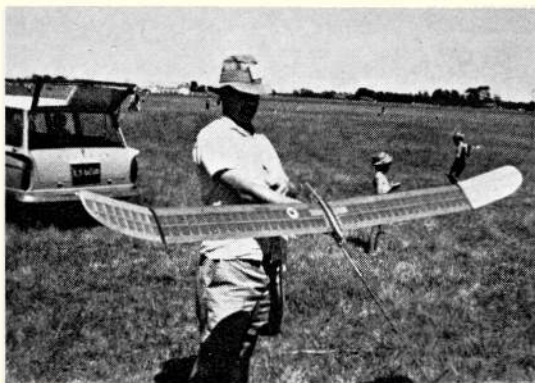
Class B was very close with Angus Macdonald's *Skinny B* design well to the fore although Warren King flew an own design. The Class B pattern is really a slightly modified version of the

British rudder-only event and many believe it is time a more difficult pattern was introduced to differentiate between top flyers.

Class C is flown to FAI rules and like the FAI event is subject to vagaries in judges' scores. The 'best' flights often do not receive best scores and when, as in this event, the top three are within 1-2 per cent of each other then it is very difficult to declare an absolute winner. Nevertheless, Warren King flew very well with his flapped, retract gear model and will be very hard to peg back in future contests. Alf Leong appeared to be flying under a handicap as most agreed his scores were conservative to say the least! Bill Cook used a Merco 61 *Superstar* for third.

Pylon racing attracted about 10 'true' pylon models and six or so stunt-type models. Times were down near two minutes and the racing was dominated by F.1 K & B Minnows with Warren King's little ST.29 *Urchin* sneaking in among the fast boys. This is the last Nats to the open Formula Kiwi rules—future contests will use the new N.Z. Formula A rules which enable F.1 and FAI racers to compete on common ground

John Ensoll, member of the 1971 A/2 team, checks his latest model for alignment. At least this proves that you don't have to fly an Aero Modeller design to get your picture published!







## OVERSEAS NATIONALS 2 -INDIA

reported by  
P. J. Banerjee

Instructor of aeromodelling at the No. 1 Bengal Air Squadron, Prabhat Banerji launches for Cadet S. Pal, who finished a close second in Glider. Both the fuselage and a wing panel had to be rebuilt following a trimming error.

THE 110 COMPETITORS who competed at Behala airport enjoyed a day of very pleasant weather, with a lightly overcast sky and little drift (which at times became virtually non-existent). Both lift and sink were plentiful – but not particularly strong – and as the day progressed it became increasingly apparent that the thermals were 'spotty' and rather short-lived. Recovery was (for once!) a very straightforward affair despite the fact that the prevailing breeze lay towards some extensive, waterlogged paddy fields.

First events of the day were Open Power and Single Channel Radio. Open Power attracted 45 entries and was flown from the upwind edge of the airport. Maxs were commonplace although only one 'perfect' score was recorded, but there were several near misses. Winner, by a single second, was Cadet Ashoke Bhaduri from No. 1 Bengal Air Squadron flying the same taper-tip, diesel-powered (stock P.A.W.2.49) lightweight model that *almost* won the event for him last year! Runner-up was Cadet Pravash Palit with a *Dream Weaver*, while Debashish Dhar was third, again by a single second, with a 2.5 c.c. *Eliminator*. Popular, these *Aeromodeller* plans!

Single Channel Radio (12 entries) was a tussle between Sidharta Roy's foam-winged Veron *Robot* (featuring MacGregor R/C) and Nilmoni Ghosh's Grundig-equipped, own-designed *Skylark*. Both flew extremely well with Sidharta ultimately clinching the event with a superb spot landing in the final round.

Best supported event of the day was Open Glider, with 64 entries. Models were mostly A/2s although the eventual winner, D. K. Bhowmic, relied on his faithful *Meanderer* (now incorporating a D/T timer) to record the only 'full house' of the event. Bhowmic flew early, and successfully utilised the weak but steady lift from the main runway. Second and third places went to A/2s flown by Cadets S. Pal and S. Roy, both of whom 'dropped' their middle flights.

Flown around mid-day, the *Aeromodeller Challenge Cup* was a purely thermal-catching contest, especially after the sun came out of the clouds towards the close of Round 1. Scores were very close with D. K. Bhowmic's *Meanderer* just failing to max on the final flight to let young Rajiv Barman (with a well-worn *Lucifer*) take first place. A few seconds behind Bhow-

mic was Sekha Datta who clearly left his last flight too late.

Rajiv also captured the Junior Duration (open Rubber/Glider/Power) event with the same model. This time his total fell short of a 'treble' although he managed a lead of more than two minutes over his nearest rival, Ravi Kumar. Ravi then went on to top the Junior Championship tables thanks mainly to an almost perfect score in the Chuck Glider event (which he won) and a second place in the Solid Model contest. Ravi also flew in Glider and Power, obtaining a couple of seventh places.

The two control line events (Stunt and Speed) were flown in the safety-barriered circles just behind the hangars. Stunt (15 entries) was a clear win for Vanu Majumdar flying a smallish design that looked like a scaled-down *Nobler*. Runner-up was Shivaji Ray (back, flying stunt after a long lay-off) with an attractive own-designed model finished in silver and black, 50 in. span and close-coupled. Speed was disappointing with no one exceeding last year's top speeds and of the 16 entrants only five recorded scores with Vanu Majumdar clocking around 92 m.p.h. to take the event ahead of Ashim Dey's Cox Special-powered *Speedwagon*.

Meanwhile, two F/F events were being fought out near the taxi-track. Precision (flying scale) had 12 entries with exactly half of the fliers using biplanes –



Power event winner Bhaduri (left) with third placeman Palit display the former's reserve model.





Pradeep Singha's A/1 has all moving fin and plywood keel - held here by a junior flyer, Sam Banerjee.

mostly *Tiger Moths* and *Camels*. The event was topped by Vanu Majumdar with a Mills .75-powered, 1/8th scale *Auster Alpine* outpointing Tapan Bagchi's veteran A.P.S. *Tiger Moth*. With this win Vanu came out on top to win the coveted Senior Championship award (after trying for quite a few years). His three firsts, five fourths, a sixth and a tenth place constitute a new points record, breaking the previous record of Capt. Suchitro Bose by a handsome margin. Payload featured several interesting entries but most of the models did not like the 'still' conditions and persisted in running off the tarmac on to the grass. A lightweight straight-dihedral design by Cdt./Sgt. Aloke Chaudhury came first just in front of two complicated designs by Sreivastava and Surajit Bose.

Final event of the day, Open Rubber, was held late in the evening in rather 'uninspiring' conditions. The air was rapidly cooling off while the rising mist gave indifferent visibility. Newcomer U. S. Bose flew well for the conditions and recorded a respectable total (with a Wakefield-sized model having 3½ oz. of rubber) to destroy D. K. Bhowmic's hope of a hat-trick. Bhowmic placed second and could do little better after breaking his best model.

Organisation at this year's Nats was generally good with the events running smoothly and to schedule, although the complete lack of scoreboards in some of the F/F events must have been keenly felt by the contestants.

## NEW ZEALAND NATS RESULTS

continued from page 216

### LADIES' (3 x 3)

1. R. Douglas	9.00
2. M. Bundock	8.09
3. A. Hewitson	7.57

### AGGREGATE

1. K. Jones	19.20
2. G. Thompson	17.40
3. W. Treen	17.03

### INDOOR H.L. GLIDER (best of 6)

1. M. Stringer	27.2
2. P. Lagan	26.4
3. T. Martin	25.7

### INDOOR EASY B (best of 3)

1. P. Lagan	5.33
2. T. Martin	5.13
3. J. Malkin	5.00

### INDOOR CLASS D (best of 3)

1. T. Martin	7.52
2. M. Gregorie	6.00
3. G. Burrows	4.59

### 1/8A TEAM RACE (5.6 miles - final)

1. M. Stringer	5:11.5
2. K. Truscott	5:48.9
3. W. Buckingham	6:16.2



### FAI TEAM RACE (final)

1. W. Forbes	11:18.0
2. W. Allott	13:30.5
3. P. Wheeler	14:17.2

### B TEAM RACE (10 miles)

1. W. Allott	7:37.6
2. F. Bennett	8:25.4
3. R. Brown	8:34.0

### I SPEED (2.5cc)

1. G. Westland	137.4 m.p.h.
2. G. Roots	117.6 m.p.h.
3. L. Vincent	115.4 m.p.h.

### II SPEED (3.5cc)

1. G. Roots	120.8 m.p.h.
2. A. Clarke	100.0 m.p.h.

### III SPEED (5cc)

1. P. Staples	132.4 m.p.h.
2. L. Chrystall	120.0 m.p.h.
3. A. Clarke	117.6 m.p.h.

### IV/V SPEED (10cc/Jet)

1. P. Staples	138.7 m.p.h.
2. A. Pearce	123.3 m.p.h.
3. B. Deakin	112.5 m.p.h.

### C/L AEROBATICS

1. B. Turner	793
2. P. Staples	749
3. P. Wheeler	689

### COMBAT

1. M. Stringer	
2. P. Staples	

### A RADIO

1. G. Thompson	1785
2. J. Comrie	887
3. E. Galloway	852

### AA RADIO

1. G. Thompson	1892
2. E. Galloway	1587
3. W. King	1578

### B RADIO

1. W. King	4557
2. A. Leong	4316
3. A. Macdonald	4082

### C RADIO

1. W. King	7770
2. A. Leong	7645
3. W. Cook	7630

At left is Tony Hill of Auckland with his T.D..09 powered own design model which he flew to second place in Open Power, while at right is Joe Johnson's o/d 'Pink Panther', now equipped with a Lagan Rossi. Placed 2nd in F.A.I., 3rd in Open Power. Rossi turns 25,800 on 7 in. x 3½ in. Cox/Bartels glass fibre prop - 7 in. x 4 in. used for flying.

### RADIO PYLON

1. N. Dawson	801.4	(2:05.8)
2. W. King	652.3	(2:20.0)
3. A. Leong	649.5	(2:04.4)

### FREE-FLIGHT SCALE

1. D. Hague	809 pts
2. D. Hope-Cross	790 pts
3. C. Bruce	717 pts

### CONTROL LINE SCALE

1. A. Pearce	855 pts
2. D. Hague	846 pts
3. N. Maurice	806 pts

### RADIO CONTROL SCALE

1. L. Ackroyd	692 pts
2. M. Ackroyd	605 pts
3. D. Marsh	543 pts

### FREE-FLIGHT CHAMPION

P. Lagan, Wellington

### CONTROL LINE CHAMPION

P. Staples, Wanganui

### RADIO CHAMPION

W. King, Hamilton

### JUNIOR CHAMPION

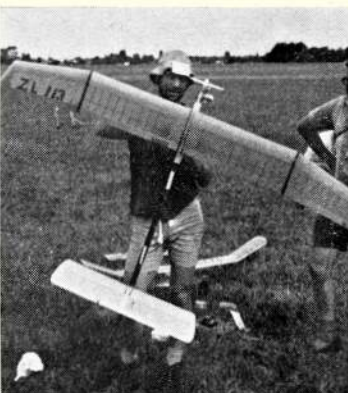
G. Prohm, Roskill

### CHAMPION OF CHAMPIONS

P. Lagan, Wellington. R/up M. Stringer, Christchurch

### CHAMPION CLUB

1. Wellington	563 pts
2. Auckland	352 pts
3. Christchurch	319 pts







ONCE AGAIN we have had a Nats for keen travellers. Northam, 60 miles from the Western edge of Australia, is 2,500 miles from the Eastern edge where over half the population lives, and to make the trip you have to be keen – like our most famous Nats personality, Ivor Stowe, who left Sydney on Boxing Day, and had travelled just 400 miles when his car engine blew up. He caught a train back to Sydney, bought a second-hand motor, returned to his car, installed it, and finished the journey three days late!

The long distance did discourage many modellers, however, with the result that the Eastern States outnumbered the West in the great majority of events. The weather was pretty much the same for the entire week – shade temperatures between 95 and 102 degrees, clear skies, four to eight m.p.h. breezes with a lull around midday.

### Scale

Of the 18 entries among the three classes, only 11 models were flown, two crashed and only six had the 5 per cent accuracy needed to qualify, and only one of these had sufficient documentary support! R/C Scale was won by Tom Prossor of N.S.W. with his faithful *Pawnee*, winner of several previous Nats. It is detailed inside and out to a uniformly

2½ c.c. Ratrace runners-up G. and M. Bourne used Super-Tigre power. Winner Finn Siegmann and pitman J. Pfeifer (left) used a Taipan, which although the slowest in the Final gave them victory when they became the sole survivors of the 'Big Prang'!



## OVERSEAS NATIONALS – 3

# AUSTRALIA

reported by MIKE MILDREN

A/2 winner Stuart Sherlock fought the sun and flies with a 'Ku Klux Klan' type hood. His model was a Hirschel design scaled up from an Aeromodeller drawing.

high standard, and flies equally well. Runner-up was Ray Sherburn with his 58 in. *Victa Airtourer*.

C/L Scale was won by Theo Merrifield, W.A.'s Secretary and F/F Contest Director, with a P.Z.L. P 11c built to 1/8th scale and enlarged from the *Aeromodeller* drawings. Though some of the details were still unfinished, it was light and aerobatic which gave it the edge over Ken Whenham's *Mustang* (winner last year), heavy with a new paint job and slow with a slightly sick motor.

### Radio Control

Events were held at the racetrack 1½ miles out of town, where the enclosed area is about 80 acres, and with the Judges' Tower, Grandstand, P.A. System, and other facilities, it made an ideal setup for R/C contests. The take-off area had been mowed and rolled flat, but had no greenery – just dust and stubble.

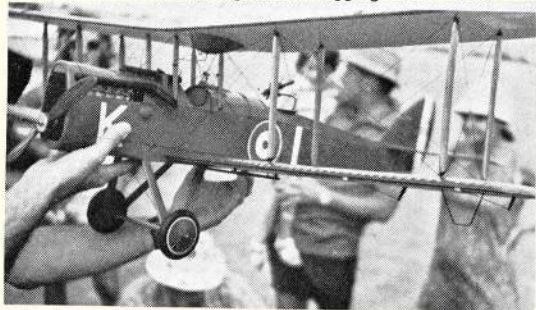
Novice Multi (nine entries, five flew) for those not ever having placed in a Multi contest previously, showed a standard of manoeuvres befitting a novice event; the quality varying from manoeuvre to manoeuvre and from flight to flight. The judges were pleased to report that their task was to JUDGE the manoeuvres, where on previous occasions the task had been to RECOGNISE them!

Open Multi (11 entries, eight flew) placegetters were separated by a comfortable 10 per cent, with regular winner Tom Prossor doing it again, and Novice winner Keith Follett, of Victoria, second. This was the first time silencers have been made obligatory in Australia.

F.A.I. R/C Towline Glider (23 entries, 15 flew) is rapidly becoming the most popular of the big contests. The breeze was stronger this day, and didn't give the contestants much chance to hunt thermals – those that tried to circle never got back to the landing area, and the only tactic was to weave slowly, keeping the nose upwind and hope for a bit of lift now and then. Winner Doug Murray managed to hold at 50 feet for an extra minute in the first round by this technique, putting him in an unbeatable position, as the best contestants were consistently netting two-minute flights.

Pylon Race (10 entries, seven flew), flown basically to A.M.A. rules (we're changing to F.A.I. rules this year), came up with a record-breaking flight by Tom Prossor, timed at 2 min. 0.2 sec. Keith Follett was nine seconds behind him and it was hard to tell whether the difference was due to model speed or close flying. Apart from one model overdoing a turn (splat!), the event was without incident.

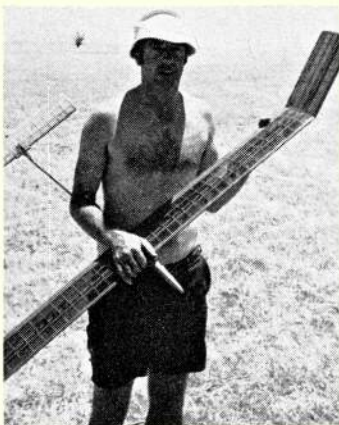
Superbly detailed D.H.4 by Gerry Hancocks won F/F event. Span 50 in., powered by an E.D. Comp Special and is fitted with pendulum operated rudder and elevator. Total weight is just 34 oz. Shirring elastic rigging wires used.







Above, Tom Prosser won the 'Sportsman of the Year' title, winning events in R/C, F/F and Indoor. He won Wakefield with this model employing aluminium tube 'front end' - the rear fuselage simply plugging in with no securing devices.



Left, Mike Pettigrew came second in A/2 glider with 'Migrator' wings on his own fuselage, employing a glass-fibre rod.

## Control Line

The oval was the unfortunate victim of circumstances. In September there was a flood, shortly followed by a Rodeo which churned up the surface resulting in a decision to topdress the grass a few weeks later - a fortnight before the Nats - with sand. Imagine a Class B combat model skidding to a halt in that!

Combat events were the most popular C/L ones, attracting a total of 59 entries, 40 of whom flew. In Senior F.A.I., Super Tigre diesels were used almost exclusively and the flying was good and lively. The Juniors used Taipans. Open Combat (same as S.M.A.E. Class B) was impossible! At the high speeds, most pilots simply couldn't control the models accurately enough to attempt a cut without being in grave danger of collision. Only two finalists seemed capable of handling their models effectively.

Next in the popularity list was the 2½ c.c. Ratrace (18 entries in Senior, 11 in Junior). In Australia these are run for 10-minute heats and 20-minute finals, the score being the number of laps clocked up in the time. Pitstops are required, but modellers don't bother with cutout devices, they just use an appropriate size tank. Motors were nearly all diesel - Super Tigre G.20/15 and Taipan. Winner, Finn Siegmann (S.A.), used a Taipan, had the slowest model in the final (370 laps) but won by being the only one to escape the five-model prang!

F.A.I. Teamrace (22 entries, 12 flew) was the most upset event of the Nats. It was run on the far side of the oval, and periodically one could hear the exasperated voice of the Contest Director on the loud-hailer, and see arms waving and fists shaking. It took the whole afternoon to run, and afterwards nobody would talk about it. Then the model check disqualified two of the finalists for having oversized tanks!

F.A.I. Speed was better supported than expected, with 12 entries, nine fliers and seven recorded times over 100 m.p.h., although Mike Beilby's winning speed of 114 m.p.h. was hardly outstanding. Combined Australian Speed puts all the other speed classes into one contest, with speeds converted to a percentage of the current Australian record in the class for scoring purposes (as per British rules). K. Gale set a

new Australian Class III record (equivalent to S.M.A.E. Class 5) of 178 m.p.h., thus scoring 104 per cent to win.

Stunt shared with the indoor events the honour of having no dropouts; seven Senior and three Junior entrants flew and here again it was the first time the models had to be equipped with silencers. At the beginning of the third round there were four likely winners, but a period of gusty wind and a couple of bad motor runs set all of them back, and the first two rounds turned out to be the deciding ones - a close contest with Pete Smith of A.C.T. the winner.

## Free-Flight

The field was 15 miles out; a bit of a drag with F/F events on every morning, but it was three-quarters of a mile square with only three small scruffy trees in it, and plenty of room beyond, all covered with short, dry stubble. Officials were right on the ball, contests started on time, and with the co-operation of contestants there were no last-minute rushes at the end of rounds.

A/2 Glider (19 entries) winner Stuart Sherlock of W.A. flew five maxes and a couple of duds for a score of 1,023. Placers scored 994 and 945, indicating the general standard of the contest. A/1 Glider (11 entries, six flew) in Australia requires weight of 7½ oz., and is flown to 2-min. maxes. (Rules will be brought into line with S.M.A.E. this year.) The standard was poor, as indicated by Pete Smith's winning times - 115, 120, 78, 120, zero.

F.A.I. Power (11 entries) was dominated by the W.A. boys, but showed a lower standard than at their State Champs earlier in the year. Motors were nearly all Super Tigre G.15s - no diesels. Winner Fred Tower used an A.P.S. Pulter wing on a model of his own design, his G.15 winging a Tornado 7 x 4. Winning times were 97, 142, 180, 180, 180, 141, 95 = 1,015. Hans van Leeuwen was second and the third-placer, John Voak, got three maxes off motor runs of about five seconds.

Open Power suffered a phenomenal dropout rate (just five of the 20 entries flew) and was flown to two-minute maxes by mutual agreement. Australian rules allow a total of 35 seconds motor run spread at will over five flights. Tom Prossor won with his own design powered by K & B 19, scoring 556. He also won the Wakefield event which was also flown to two-minute maxes by mutual agreement, with a score of 825 (seven rounds).

The One-hour Scramble (42 entries, 30 flew) was held at the racecourse at the end of the R/C events. This is a contest for unrestricted F/F models, in which the object is to clock up as much flying time as possible in one hour. Flight maxes are two minutes, and any less than 15 seconds are not counted. Models must be brought back to the original start point and started by hand for each flight. One retrieving assistant permitted.

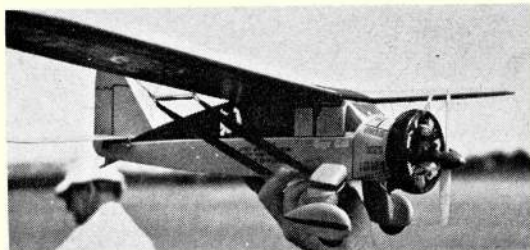
For the Night Scramble, the planes need lights, and the duration is usually half an hour - no retriever allowed. Winner John Birkin of Victoria only clocked up 765 seconds, yet he also won the half-hour Night Scramble with 794.

Chuck Glider (41 entries, 29 flew) was well supported but unspectacular, with a winning score of 148 in ideal conditions by Ron McPhee. (Our rules take the best three of six attempts with one-minute maxes.)

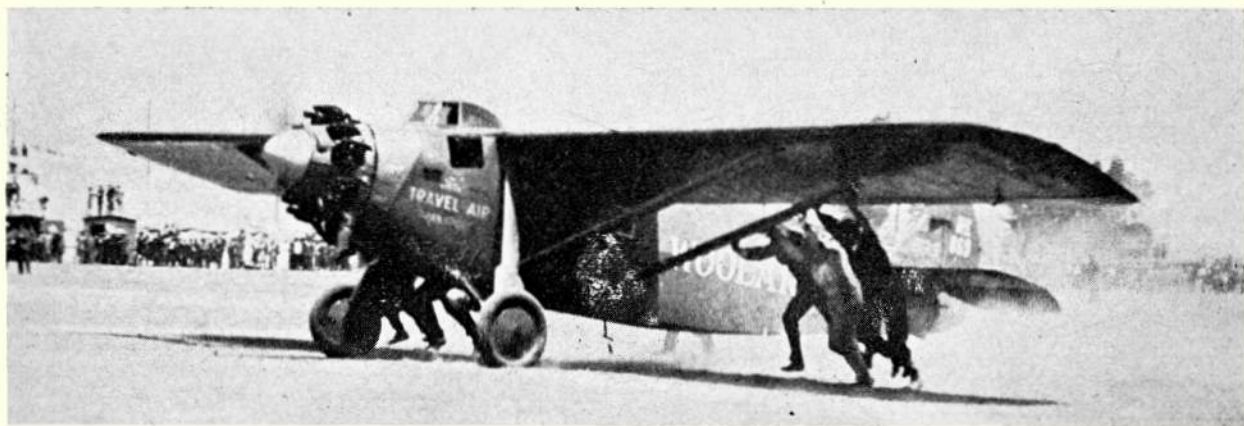
Indoor chuckie was also won by Ron McPhee - not by much, as the top three were all within a second of 37 seconds. Most of the 15 contestants built their models a day or so before the event, and arrived at the Town Hall without testing. The air was thick with models in the half hour available for trimming before the contest. Ceiling height was 27 feet. Indoor Rubber had six contestants, nearly all beginners at the game. Tom Prossor, who had tried it for the first time last year, won with a best flight time of 218 seconds, roughly double his last year's time. Fred Tower did 207, Bert Halmshaw 164.

Another record. The Organisers finished off this enjoyable Nats by breaking an unofficial record - they provided the greatest-ever amount of food for the Presentation Dinner!

Wally Schubach produced a very attractive F/F scale Bellanca for a D.C. Wasp .75 c.c. power but was disqualified for having an oversized elevator.







AIRCRAFT DESCRIBED No. 213

## TRAVEL AIR 5000 'WOOLAROC'

**Winner of the 2,400-mile race across the Pacific to Hawaii,  
described by R. H. Scheppler. Drawn by William N. Fleming**

TUESDAY, AUGUST 16th, 1927 dawned the same as most summer days in Oakland, California. The sun rose through the early morning haze and fog, while a very light wind promised that by mid-morning the air would have cleared to present a typical beautiful day. At the Oakland airport on San Francisco Bay a crowd was starting to assemble for a day that was to live forever in their memories — the start of the Dole Race to Hawaii.

Months of preparation, thousands of dollars and many hours of hard work had gone into the preparation of this great enterprise. Now nine aircraft were parked on the field in various stages of readiness for the last mass air race from the United States to Hawaii. Just three months before, on May 25th, the *Honolulu Star Bulletin* published the short article which electrified the world of flying devotees, 'James D. Dole, believing that Charles A. Lindbergh's extraordinary feat in crossing the Atlantic is the forerunner of eventual transpacific air transportation, offers \$25,000 for the first flier and \$10,000 to the second flier to cross from the North American continent to Honolulu in a non-stop flight within one year after the year beginning August 12th, 1927.' Naturally this was copied by the mainland papers and within a few days many fliers were planning and scheming how to beg, borrow or steal an airplane capable of crossing the Pacific.

Mr. Dole, of the famous pineapple plantation family, was sincere in his efforts to advance the state of aviation. However, being an astute businessman, he wisely chose August 12th, 1927 as a starting date because there would be a full moon that night, it would be anniversary of Hawaii becoming a territory, and it was before the pineapple harvest so Dole's employees could have a day off to celebrate the fliers' arrival!

As the starting date approached it appeared there would be some fifteen to twenty entries. On Monday, August 8th, 1927, a draw was held for starting times which were set at 12 noon and each two minute interval thereafter. Fifteen contestants appeared, paid their fee of \$100 and received their starting times. By August 10th, two days before the scheduled start of

the race, only four of the fifteen entrants had completed their required testings so it was decided the next day to postpone the starting date to August 16th. By this date there were only nine entrants remaining and one of these, the *City of Peoria* was disqualified shortly before noon due to lack of sufficient fuel reserve.

Finally, shortly before noon, eight planes were lined up ready for take-off. At 12:00 Ed Howard, the official starter, waved Benny Griffin in the *Travel Air Oklahoma* off. At 12:03 p.m. Norm Goddard in *El Encanto* started his take-off roll. About 2,600 feet down the runway he veered sharply to the right, partially tipping over on the left wing, crumpling it beyond immediate repair. At 12:11 p.m. Major L. G. Irving, in the *Pabco Pacific Flyer* tried to take off but cut his engine partway down the runway. At 12:30 p.m. the crowd's favourite, the William Randolph Hearst entry *Golden Eagle*, flown by Jack Frost, took off with no trouble, followed at 12:33 p.m. by Augy Pedlar in the *Miss Doran*. At 12:34 p.m. the *Aloha*, piloted by Marty Jensen, left the ground and at 12:36 p.m. Art Goebel in *Woolaroc* followed suit. The *Dallas Spirit*, flown by Bill Erwin, left two minutes later and the crowd settled down to await developments. In less than ten minutes at 12:45 p.m. the *Miss Doran* returned with minor engine troubles. Shortly after, at 12:50 p.m., Major L. G. Irving in the *Pabco Pacific Flyer* had corrected his troubles and was waved off by the starter. He only rose a few feet, less than fifty, when he apparently stalled and crashed. He crawled out unhurt but the airplane was obviously out of the race.

At 1:09 p.m. the *Oklahoma* returned and Benny Griffin and Al Henley were out of the race with various reports of engine and associated trouble. Shortly thereafter the *Dallas Spirit* returned with the fabric badly torn on the fuselage — thus Bill Erwin and Alvin Eichwaldt were also out of the race. Finally, at 2:03 p.m., repairs had been made to the *Miss Doran* and it again took to the air.

Thus of the original fifteen entrants eight actually attempted the take-off. Two crashed during take-off, two returned after take-off and remained at Oakland,



'Aloha', the Breese Monoplane NX 646 flown by Martin Jensen. Pictured at Oakland, California, before start of the Dole Race. The Yellow and White plane was the only one other than Woolaroc to complete the race. J. Dunavent photo.



four actually headed out over the Pacific and of these only two, the *Woolaroc* and the *Aloha* finished first and second at Honolulu. The remaining two were never seen again.

The winners, Art Goebel and Bill Travis, had wisely chosen one of the best aircraft of the day, a Travel Air 5000 designed and built by Travel Air Manufacturing Company of Wichita, Kansas. The standard model 5000 was originally designed as a five-seater closed cabin monoplane transport primarily for the *National Air Transport Company*. A few minor alterations were made to adapt the standard model 5000 Travel Air for the Dole Race. The pilot's windows were changed slightly, the 'elephant ear' aerodynamically balanced ailerons were changed to standard Frieze types, landing lights were eliminated, over-size fuel and oil tanks were installed, and a larger rudder was added. The windshield was altered slightly to provide a smoother air flow and all outside steps, handgrips, etc., were removed to provide better streamlining. The exhaust collector ring on the engine was removed and short stack exhaust pipes were connected to each cylinder - this change resulted in a slight increase in engine power. An external wind driven generator was mounted on the

landing gear. In addition to the standard flight and engine instruments used in the Model 5000, the *Woolaroc* had a Pioneer Earth Inductor Compass installed. Art Goebel also insisted on carrying a sending-and-receiving radio set and was the only one in the race to do so.

A comparison of the standard and the altered Model 5000 follows:

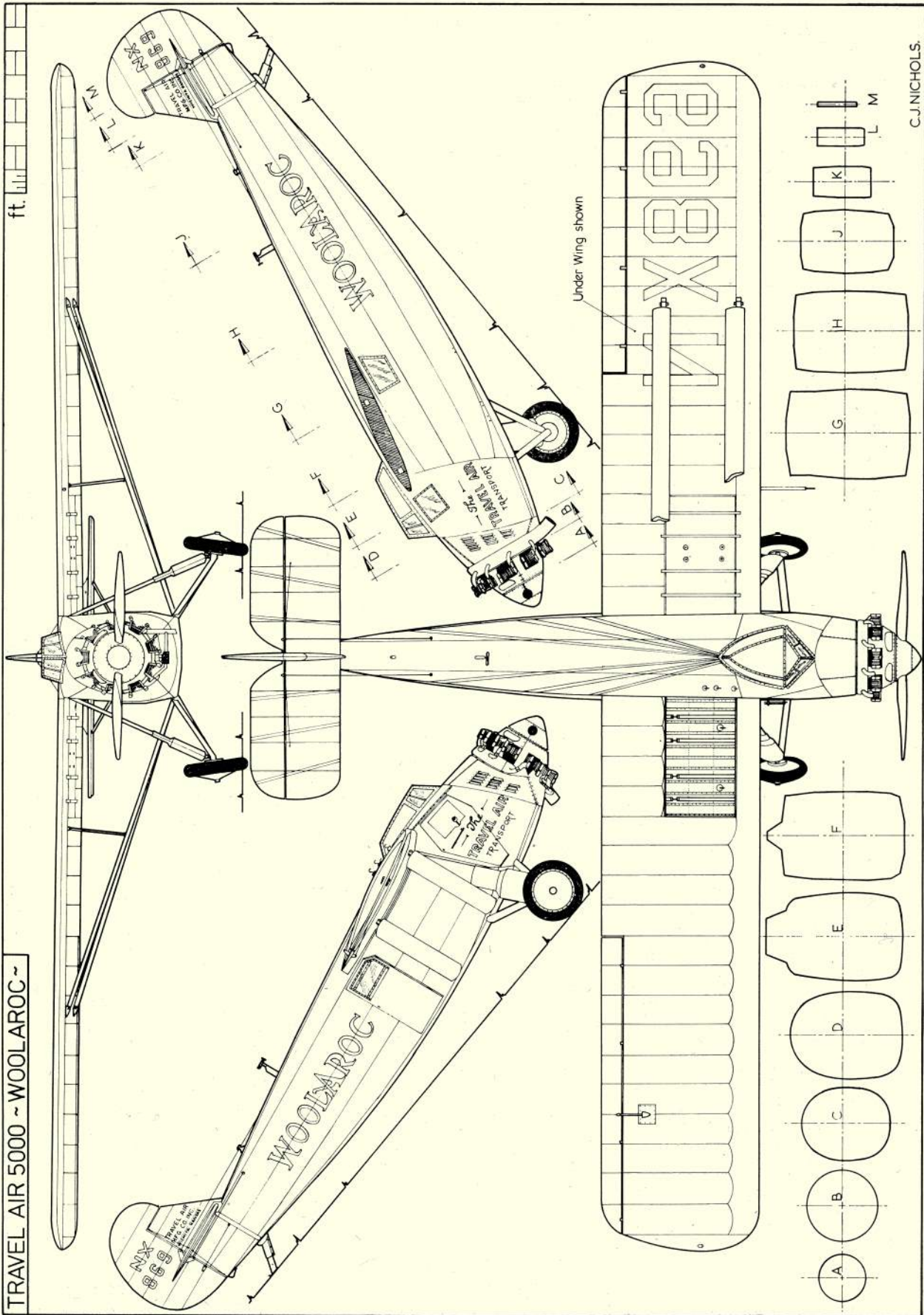
	<i>Woolaroc</i>	<i>Standard T/A - 5000</i>
<i>Wingspan</i>	50 ft. 4½ in.	51 ft. 7 in.
<i>Length</i>	31 ft. 2 in.	30 ft. 5 in.
<i>Height</i>	7 ft. 3½ in.	8 ft. 9 in.
<i>Power</i>	Wright J-5-C 230HP @ 1900 r.p.m.	Wright J-5-C 230HP @ 1900 r.p.m.
<i>Capacity</i>	Pilot & Navigator 425 gallons fuel	Pilot - 4 passengers 50 lb. baggage 75 gallons fuel
<i>Performance:</i>		
<i>Top Speed</i>	125 m.p.h.	123 m.p.h.
<i>Land Speed</i>	55 m.p.h.	55 m.p.h.
<i>Cruise</i>	—	108 m.p.h.



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Art Goebel, right, Bill Davis, left, in front of 'Woolaroc' in September, 1927, Oakland, California. This Beech Aircraft Corporation photograph illustrates the undercarriage geography, and the bi-convex wing section.







## CONTESTANTS FOR THE DOLE AIR RACE

Name of Plane	Builder & Lic. No.	Owner/Sponsor	Pilot/Crew	Remarks
Pabco Pacific Flyer	Breese, NX646 Monoplane	Livingston G. Irving Berkely, California Perraffine Co. of Berkely, California	Livingston G. Irving - Pilot	Orange. First take-off aborted. Ground looped on second. Out of race.
Aloha	Breese, NX914 Monoplane	Martin Jensen Honolulu, Hawaii	Martin Jensen Paul Schluter - Navigator	Yellow and white. Originally ordered for Claire Vance but couldn't raise money.
Miss Doran	Buhl Airedan NX2915 - Biplane	William Malloska Lincoln Petroleum Co., Lincoln, Neb.	Augy Pedlar - Pilot Lt. Vilas Knope - Navigator - Mildred Doran Passenger	Mechanical trouble on first take-off. Returned - Take-off again. Lost in Pacific.
Pride of Los Angeles	Fisk International Triplane - Twin engine.	Hoot Gibson	Frank Clark Jerry Phillips James Griffin	Crashed on arrival at Oakland.
Hummingbird	Tremaine	—	George Covell Dick Waggener	Crashed on way to Oakland at Point Lomo.
Angel of Los Angeles	Bryant Monoplane	—	Arthur Rodgers	Crashed on way to Oakland at Vail Field.
Dallas Spirit	Swallow, NX941 Monoplane	—	Bill Erwin - Pilot Alvin Eichwaldt - Navigator	Returned after take-off. Fabric ripped on fuselage.
City of Peoria	Air King NX3070 Biplane.	Tex Lagrone	Charlie Parkhurst	Disqualified - Lack of reserve fuel.
Bluebird	Hess	—	Capt. Giles	—
Golden Eagle	Lockheed Vega NX913 Monoplane	W. R. Hearst	Jack Frost - Pilot Gordon Scott - Nav.	Yellow. Lost in Pacific
El Encanto	Goddard NX5074 Monoplane	Norm Goddard San Diego, Calif.	Norm Goddard - Pilot K. Hawkins - Nav.	Crashed on take-off.
Miss Hollydale	International	—	Frank Clark Charlie Babb	Black & Orange. Dropped out.
Oklahoma	Travel Air 5000 NX911 Monoplane	Phillips Oil Co. Bartlesville, Oklahoma	Benny Griffin - Pilot Al Henley - Nav.	Yellow & Blue. Took off - mechanical trouble. Returned to Oakland.
Woolaroc	Travel Air 5000 NX869 Monoplane	Art Goebel Phillips Oil Co. Bartlesville, Oklahoma	Art Goebel - Pilot Bill Davis - Nav.	Yellow & Blue. Winner
—	—	—	Bob Fowler	No plane - dropped out.

The Phillips Oil Company sponsored both of the Travel Air 5000 models in the race, the *Woolaroc* and the *Oklahoma*. Both planes were almost identical, even to their yellow wings and blue fuselage colour scheme, the only difference being in the names prominently painted in white on each side and the licence numbers, NX911 for the *Oklahoma* and NX869 for the *Woolaroc*.

Though the *Woolaroc* was built by a company just three years old, it had remarkable lineage dating back to 1921. In that year Matty and Charles Laird formed the E. M. Laird Company and hired Walter Beech as a test pilot. After two short years this company was dissolved and was reformed into the Swallow Company with, among others, Charles Laird, the Stearman Brothers and Walter Beech. Both Walter Beech and Lloyd Stearman felt that the aircraft should be built up from a metal welded fuselage, but the remaining members of the company held to the standard wood construction. This disagreement led Walter Beech and Lloyd Stearman to form the Travel Air Manufacturing Company, formally incorporated in early 1925. Clyde Cessna, a strong proponent of monoplanes over biplanes, also joined this company.

In 1927, over Walter Beech's objections, a monoplane design - the 5000 - was completed, but very few were built. However, when the Phillips Petroleum Company and Art Goebel contacted the Travel Air Company to buy a Model 5000 for the Dole race, Walter Beech was delighted as he felt the best way to publicise the Travel Air airplane was to enter and win as many races as possible. Therefore, in June 1927 work was started on two Travel Air 5000's to be flown by Art Goebel and Benny Griffin, both partially sponsored by the Phillips Petroleum Company.

Art Goebel, through herculean efforts, had raised \$11,000 to which the Phillips Petroleum Company added \$5,000, being sufficient to buy the plane and prepare it for the race. When the plane was completed it was christened *Woolaroc* to symbolise the woods, the lake, and the rocks on the Phillips ranch in Oklahoma. Naturally it was fueled with Phillips gasoline!

The proposed starting date of the Dole race, August 12th, left little time for testing, so after a few

*Continued on page 227*





H.M.S. *FLYCATCHER* steamed into Croydon Airport and dropped anchor – at least this is how the local newspapers described the arrival of the S.M.A.E. carrier deck to the Three King's Aeromodellers' flying site at the old airport.

This was the culmination of a lot of effort on the part of the club members, many of whom took a hand in the various repair operations that the deck needed following its lengthy storage in various R.A.F. hangars. An even more major task involved the building of a suitable trailer to carry the 'ship' – no easy matter as there is a considerable amount of material in such a 'deck'.

A brief history of H.M.S. *Flycatcher*: originally commissioned by the Royal Navy at Lee on Solent, the building was placed in the hands of enthusiasts Petty Officer Morton and his merry men, aided and abetted by P/O McClaken and Naval airmen Taylor and Wormsley. The seven-part structure, constructed from  $\frac{1}{2}$  in. marine (naturally!) ply, plus all the attendant supporting legs and sand bags, were duly presented to the S.M.A.E. for the 1968 National Championships, hosted that year by the Navy at Yeovilton.

The object of the carrier was to encourage an event which is extremely well developed in the U.S.A., but hitherto practically unknown in this country, at least in the competitive field – and very well it started, too, with plenty of entrants and enthusiasm. It was featured again at the 1969 Nats and the Old Warden meet of that year, but since then the barnacles began to gather on her hull as the various contest officials discovered the enormous cost involved in transporting such an unwieldy craft – certainly the number of competitors involved could not justify such a capital outlay and it was laid to rest at R.A.F. Chessington. Then the *Three King's*, finding that too many control

Robin Little explains the intricacies of Stan Lloyd's 'Deck Scratcher' to two young enthusiasts. Power is supplied by a K & B 35. This 40 in. span profile model, of course, sacrifices its 100 scale bonus points, but does make for a quick-to-build competition machine.

## BRING BACK THE DECK!!

The S.M.A.E. Carrier Deck is alive and well and living in Croydon. Don't let it sink through disuse, appeals **WAL CORDWELL**

*Give it a try – you'll soon get hooked . . .*

Secretary of the Three Kings Club, Stan Lloyd, fixes the wind sock in position on H.M.S. *Flycatcher*. Twin-engined job at rear is an imposter – strictly a land-borne creature!

line activities were going to the wall, decided to rescue *Flycatcher* – and only just in time as already several of the ancillaries had made their contribution to the hangar heating system.

To cut a long story short, thanks to the tolerance and hospitality of Chessington's C.O., plus the enthusiasm of the club members (particularly John Perry for his work on the trailer and Bill Miles for his flight-deck re-build), the whole unit was refurbished and made eminently mobile – all for the benefit of the S.M.A.E. and its members.

The next operation was to refloat the ship – and this was done by combining an open stunt and club carrier event at the *Three King's* flying site, with the local press in attendance.







This is what it's all about! Dave Woods releases Wal's 'Corsair', with its Merco 49 power plant, for its winning flight - he made an arrested landing after just three attempts, one of the failures being shown below! Close, though, only just missed those tantalising wires.

We decided on a more flexible set of rules in order to promote greater interest and response, therefore more competition - and it worked. We now have a keen group of carrier-conscious members. The rules decided on were made as simple as possible: first, silencers were made compulsory due to our terms of tenancy, likewise insurance. Lightweight lines were permitted for engines up to .35 cu. in. capacity, heavy-weight over that limit. Model choice was optional, with or without flaps, but with additional points for scale-type construction. These rules were not intended for 'open' events, just for getting things rolling, for once the carrier appetite is whetted, we think more ambitious models will follow.

The 'launching' was indeed a success with nine entries from the club members providing a good cross section of carrier models, half of which were built-up scale models and the rest profile and varying in size from 40 in. to 28 in. span, the eventual winner was a 36 in. *Corsair*, from the Sterling range of kits, powered by a Merco .49, while one of the fastest, a trike u/c profile model, whose slow run was faster than the winner's fastest speed! Had it caught the arrest wires the deck would have been airborne! The whole event was fully written up in the local press, together with several large photographs - all good P.R.O. work, with which this club is so often associated. Others take note!

Several articles have been published on this form of flying in *Aeromodeller*, including plans of the most successful British models to date - Mick Reeves'

## PRECIS OF CARRIER LANDING RULES

1. **AIRCRAFT REQUIREMENTS.** Model must have fixed or retractable landing gear, and if retractable, must be lowered for landing. An arrester hook, which when extended must not exceed 1/3rd fuselage length, must be fitted. Maximum wing span 44 in.

**Class I** - engine displacement .40 cu. in. and below.  
**Class II** - engine displacement .401 to .61 cu. in.

Multi-engined models are classified according to total engine capacity. To qualify for bonus points, engine(s) must be of same thrust type as used in prototype.

2. **CONTROL LINE REQUIREMENTS.** Line length from centre line of model to centre line of handle shall be 60 ft. 0 in., plus 6 in., minus 0 in., and must withstand 20G pull test.

3. **OFFICIAL FLIGHT.** Failure to produce model on the deck two minutes after being called to fly results in an attempt being called. Three minutes are allowed to become airborne after contestant signals that he is ready, or begins to start the engine. Any endeavour to take-off is an attempt. Three attempts are permitted for two official flights. A flight is considered official when contestant signals for a timed low-speed run. Multi-engined models are permitted an additional two minutes starting time for each additional engine.

### FLIGHT REQUIREMENTS

4. **GENERAL.** All ground area shall be termed water. If any part of the model touches it is deemed to have crashed. An altitude of 20 ft. 0 in. must not be exceeded for more than 1/2 lap during a timed run. No whipping allowed.

5. **HIGH-SPEED FLIGHT.** First seven laps after take-off constitute the high-speed flight.

6. **LOW-SPEED FLIGHT.** The contestant must signal the start of his seven-lap low-speed run - the stern of the carrier being the starting point. Pilot must not walk round in a circle larger than 3 ft. 0 in. diameter.

Multi-engined models must have all engines running to obtain full points for speed differential. Failure to comply will result in only half differential points.

7. **ARRESTED LANDING.** Landings must be at low speed only, and be completed within eight minutes of take-off. Pilot must signal when ready to land. After this each lap flown decreases landing score by five points.

### SCORING

8. **BONUS POINTS.** Any scale model of a Navy Carrier aircraft, operational or experimental, will be awarded 100 bonus points. Scale 3 views of full size must be submitted. No points will be awarded if linear dimensions of the major components are not within 5 per cent scale tolerance. Models will not be measured unless in case of dispute. Landing gear need not be scale, but must emerge from correct location. If engine or accessories protrude from the scale contours of the model a 1/2 in. clearance may be provided around them. Five points are awarded for each engine above one used to power model, provided such engine(s) contribute power at least from take-off to completion of high-speed run.

Wing dihedral must be to scale  $\pm 1$  per cent. Cockpit area may be clear canopy or painted in a contrasting colour. Colour scheme and markings shall be representative of aircraft modelled.

9. **TAKE-OFF.** Model must take-off from free-roll portion of deck.

10. **HIGH-SPEED POINTS.** High-speed is calculated to nearest 1/100 mph. Points are awarded for each mph, to nearest 1/100th.

11. **LOW-SPEED POINTS.** Low-speed is calculated to nearest 1/100 mph. Points shall be scored as four times the difference between high- and low-speed in mph.

12. **LANDING POINTS.** Landings (including dead stick) are scored as:

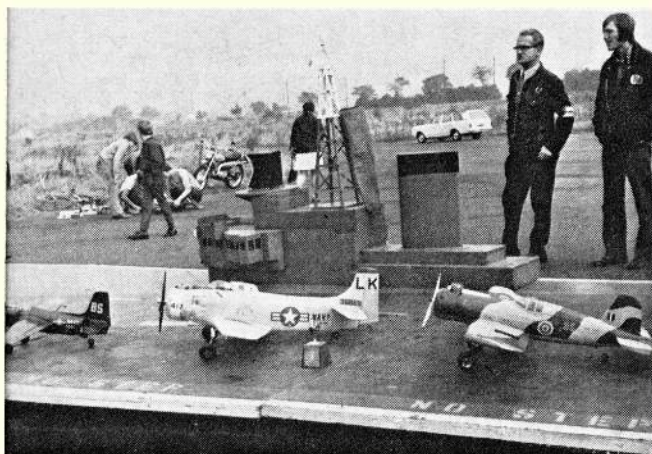
100 points for normal three-point arrested landing.

50 points for arrested landing with model in other than three-point attitude.

25 points for arrested landing with model coming to rest on its back or with one wheel off the deck.

From the above score five points will be deducted for each unsuccessful landing approach made after signalling. No landing scores will be less than zero. No points for other landings.





Three attractive 'proper' scale carrier models rest on the deck—Derek Bird's 'Grumman Guardian' in front, Stan Lloyd's most impressive 'Skydiver' in the middle, with Wal Cordwell's grey/green 'Corsair' at rear.

as important, if not more so. Practice flying just above stalling speed in varying wind conditions and then dropping on a pre-arranged spot, preferably on a raised platform such as the deck is. The high-speed run is the easiest part!

There is no event with more spectator appeal than a really well-run carrier competition – but it must be kept moving and with a minimum of petty officialdom to grind it to a halt. By this I do not mean throw all caution to the wind as far as the safety factors are concerned (items such as line checks can still be done at the beginning, then visual checks made before flights), otherwise it becomes like watching a horse race – exciting while it's on, but boring in between.

All that is now needed to really get Carrier Deck flying off its feet is a strong following by competitors – and this can only occur if suitable contests are held. Now that the carrier is mobile (the trailer may be towed behind any car) there is no real excuse for rally organisers *not* to include such an event at their meetings; insist that they do! Any organiser wishing to use this facility should contact the S.M.A.E., competition secretary. And remember, a Carrier contest is scheduled to be held at the British Nationals on 29th May at R.A.F. Hullavington.

Class I and Class II *Seamews* (available as Plan No. CL/1061, price 75p post free), as well as most informative features in the 1969-70 *Aeromodeller Annual* (50p plus 5p postage) by Jim Kloth and throttle specialist Bill Johnson, so there is no lack of 'info' on these models. One thing in particular we found out in our experiments is that it's all very well to be able to go fast, but don't forget the slow run is just

## TRAVEL AIR 'WOOLAROC'

*Continued from page 224*



'Oklahoma'. Sister ship to 'Woolaroc', on September 16, 1927, at the start of Dole Race at Oakland, California. The prop is just being 'pulled through' on the Wright J-5. Mechanical trouble caused a return to base after take-off. Colour is Yellow and Blue. J. Dunavent photo.

short flights at Wichita, Art Goebel flew the plane to Oakland, arriving on Tuesday, August 9th. The basic good design and rugged construction of the *Woolaroc* was evident as it was one of the few planes actually ready to take off on the originally scheduled starting date. The frantic pace being maintained by many of the fliers to complete their planes was emphasised by Marty Jensen who, when asked concerning his preparations, stated: 'Five days before the start of the race not even the fuselage was on my plane, but in those five days I worked night and day making preparations, always against great odds.'

The actual flight was relatively uneventful. The weather varied and rain squalls were encountered. The last actual report from the *Woolaroc* was picked up on August 16th by the S.S. *Wilhelmina*. Art Goebel reported his latitude as 36.2°, longitude as 127.3° about 400 miles out from Oakland and the radio beam 'coming in fine'.

The next day at 2:53 p.m., with little advance

warning, the aircraft landed at Honolulu. The fliers were actually surprised to be the first to land as they had not seen any of the other racers during the entire flight. Art Goebel stated he flew at 600-800 feet most of the time and that he had actually seen land two hours before arriving at Honolulu.

Slightly less than two hours later, at 4:50 p.m., Marty Jensen and Paul Schluter landed in the *Aloha*. They too had not seen any of the other fliers and were rather surprised that only one plane was ahead of them. Marty Jensen, though he operated a flying service in the Hawaiian Islands, admitted he had trouble locating Honolulu and was actually lost for a short time after reaching the islands.

Thus ended the first and last Pacific Air Race. Apparently there was little gained by the survivors, but in every pioneering effort there are many failures before the ultimate victory. Who can say how much each failure contributed to the final victory?





## CLUB NEWS

Members of the Oldham Model Aero Club show a wide range of interests, but with a definite leaning towards the 'big stuff'. This club, with its roots going back to 1945, caters for all interests from r.t.p. to radio.

ONE OF THE MOST fascinating aspects of aeromodelling is the designing of your own craft. You may not set out to make them strikingly original, but at least you can do things in your own way and within your limitations. It is not always easy to project an idea on to a plan and then realise it in terms of a three-dimensional structure, but it is a rewarding involvement, and the thing that sustains the vitality of aeromodelling and gives it its infinite variety. Short cuts to the flying field by way of intensive prefabrication may suit the temperament and time economy of some people, but 'your own design' gives you a special sort of personal pride; marking you, in a sense, as an individual modeller.

Our first report, sent in by the Control Line Comp. Sec. (no name given) of the **South Bristol M.A.C.**, remarks on the phenomenon of an inverse ratio of C/L flyers to contest success. Although the number of C/L flyers is now down to a hard core of half a dozen the amount of contest success achieved has never been greater. So much so, that the Bristol lads are becoming known throughout the country. Personality-wise, there is the 'Kosmic Importer', Dick Giles, who has been very consistent in his F.A.I., team race and Goodyear times. And there is also Richard Evans, who won last year's Burns Crown Combat Rally, and came second at both the Nationals and Cranfield. Richard Evans, incidentally, runs a club at a large comprehensive school (A and B Streams for Combat?) where he is a teacher. And to those who believe there is no hope for modern youth, we could point out that the school club has a dozen active C/L members on its list, three of whom have already been inducted into the South Bristol fold. The South Bristol club is, of course, equally well known in spheres other than C/L. Thus, modellers of all sorts and conditions, particularly juniors, are welcome at the Black Horse Inn, Old Market, Bristol, on the second Friday in each month at 7.30 p.m.

A letter from D. Robson, P.R.O., of the **North East Area**, draws attention to the N.E. Gala to be held in July at R.A.F. Ouston. Mr. Robson admits that the Area has gone through a lean period, but looks forward to a brighter future now that the use of R.A.F. Ouston has been acquired for all classes of model flying and for the monthly Area meetings. This amenity is being geared to a more intensive contest programme which, it is hoped, will encourage support for the Area activities. Anyone interested in participating in the revitalised Area life should contact Mr. Peter Short, 106 Cheviot Road, South Shields, Co. Durham. Phone S. Shields 4887 or Sunderland 77394.

Yet another club looking forward to the 1972 contest season is the **Northampton M.A.C.** This club has been well to the fore in the contest field in both individual and team events, and is confident of maintaining its enviable standard this year. Interest among the hard core of a dozen free-flight enthusiasts is directed towards the Nationals and Team Trials, although, no doubt, there will be many diverting side engagements. The club also caters for Radio and Control Line, and any modellers within striking distance are asked to contact Brian Baker at 29 Woodhill Road, New Duston, Wolverhampton, for full details of the club's activities.

I cannot recall having presented the **Bickley Modelling Club** in these columns before, but just in case the name Bickley does not strike an immediate geographic chord, let me tell you that it operates in the Bromley area of Kent. Accent would seem to be on Radio, activated on a country field. Membership is quite hefty: given as 60-odd members. But not all that odd, as the club functions much on the lines of many another radio club, with lots doing on the flying field, and a fair amount of social life off. Main part of the newsletter is taken up with a dramatised description of a first solo flight in a full-size glider.

Intimations that we are moving into a new, more organised model age comes in the newsletter of the **Wolves M.A.C.**, where the old term of Comp. Secretary has been replaced by

that of Director; a post with extended powers to cover all facets of a particular club activity, or so we presume. Thus there are Directors for F/F, C/L Radio and Display. These positions were recently filled at the club's A.G.M., where the reviews of 1971 were given a hearing. Policy-wise and financially the club appeared to be in a healthy state. Membership had risen from 28 members in 1970 to 42 in 1971. Some gratifying contest wins were on record, with man of the year, Dave King, taking the coveted *Gold Trophy* at the Nats, and Ven Venables winning the *Knokke No. 2*. Stacks of awards distributed at the prizegiving - too numerous to list.

Mrs Diana M. Gibbs is the P.R.O. of the **Market Harborough M.A.C.**, and judging from the highly intelligible report she has sent along she would seem to be functioning very competently in that capacity. Mrs. Gibbs informs us that the latest membership figure, given at the club A.G.M., was as high as 116. This, she admits, includes a fairly high proportion of nodding members, but even with that non-active wastage the club is still pretty strong on the flying field. For instance, during 1971 as many as 45 members took part in various club competitions, with several of them entering national events as well, notable of which were junior members Kevin Monaghan and Nicholas Watson for the measure of success they achieved at the Nationals and Cranfield. Unlike many clubs nowadays Market Harborough is not a radio-only circus, but covers the whole spectrum of interests, albeit with a significant movement of senior members towards the magnetic multi. Obviously with such a large membership and wide range of interests the flying field situation is of vital concern. And this, unhappily, is not as good as it could be. Two flying sites were lost in 1971 through noise objections and other unforeseen reasons, leaving but one field to cover all purposes. Needless to say the club is on the continual lookout for pastures new, and we wish them luck in their quest in 1972. Chairman is Mr. P. Gibbs. Any relation?

Reference in the January **Three King's Aeromodellers'** newsletter is made to a Christmas party where a large cake was produced, iced all over in pale green and white, and decorated on top with a C/L circle segment, complete with markings, a model with lines attached and a gadget box. It was lettered with greetings to Three King's, and was the loving work of Wal and Mrs. Cordwell. Portions were washed down with beer and cider. For some inscrutable reason this product failed to win the Model of the Month award, which went instead to Vincent Day's *Brewster Buffalo*, a 35 in. span job, sporting a throttle-controlled O.S.35, and finished in a subdued blue. In hot competition was Dave Wood's silver grey and scarlet *North American Harvard*, span 40 in. Also in the running was the more functional *Falcon Special* Goodyear Racer of Derek Bird. Finished in orange it housed not a clockwork but a Kosmic 15 with uniflow tank and cutout. The bellcrank was cunningly hidden as were the lead-out connections. The newsletter editor admits to having a feeling in his fuel bottle that this little power pot is going to take some catching up on the lap charts. There is a mention in the newsletter of a 24-page report on the law appertaining to noise complaints against model aircraft. This is interesting, as it is an aspect of the noise problem we do not often think about, as the usual arbiter of noise level tolerance is not the law but the authority controlling model flying on the particular site. However, now that more and more private sites are being acquired for radio flying it could well be that the model flyer will come into conflict with the noise laws more in the future.

New man in the editorial chair of **Belfast M.F.C.'s Nitro** is Pete Watt; Iain Willie having done his twelve-month stint. Pete is described in a short whimsical biography (there is, in fact, one for each officer, and very witty they are, too) as '... quite at home with elastomers, polymers



and misnomers . . . one of the best builders in the club . . . distinct F/F leanings'. On the flying side of club life, the A/2 league climaxed with a tie breaker fly-off between Iain Wyllie and Colin Doyle. John Hamilton accomplished the duellists to Bishopscourt on the fateful day to act as time-keeper and general dogsbody - and to do a spot of flying himself. Colin Doyle produced some doughty athletic tows, but it was Iain who got the lift with three excellent winter glider flights of 180, 158 and 180.

Not much to report from the **Maidstone M.F.C.** news letter. Mr. M. V. Cook is retiring from the job as Editor, but hopes to continue as a contributor. He believes, along with many another who has done a stint in the chair, that the club mag should be the voice of the club and not the personal document of the chap who too often produces the newsletter on his lonesome. On a brighter note, the club social seems to be emerging as a possibility after some early apathy. R.T.P. flying still going strong.

A few snippets from the **North West Area A.G.M.**, through the courtesy of *The Message*. There was some disagreement over the financial situation. *Disastrous*, said Norman Duncan. *Not so*, replied the majority, *think of all the expensive equipment purchased*. Chairman, Mike Reeves, had some gloomy things to say on the Woodford Rally - thought it highly improbable that the Woodford 'drome would remain available. Not much interest evinced towards the Woodford Rally by TV, Radio and the Press in spite of appropriate noises made in their direction. Perhaps the hobby is going through a cooling off period as far as aeromodelling is concerned. It is notoriously fickle towards the various sports as any TV viewer must realise. But our day may come again. An appreciative word given for the draughtsmanship talents of Graham Jubb in preparing all those excellent illustrations that give style to *The Message*.

From Ron Firth's *Model Aeroplane Gazette* we learn a little more of the 1972 venue for the Free-Flight Nationals: R.A.F. Strubby. It is a large 'drome, measuring approximately two miles by one. Given reasonable weather and a favourable wind direction it could mean that models would not be straying too far into open country. Even so, the retrieving land around is flat and penetrable. Toilet facilities will be adequate, and an H.Q. building and dining room will be available. Meals at 25p per time can be obtained by advanced note on the competition entry form. And in case there is someone who has not yet heard, there will be a R/C Glider event included in the flying programme. Strubby, which sounds like a cartoon character, is on the Louth-Mablethorpe road, about six miles from Mablethorpe, Lincolnshire. But what models will feature on the F/F scene in the future? We have already had the flapped wing, but now the latest piece of ingenuity is the unfolding wing power model. As far as I can gather the wing unfolds at the end of the power run. Just how well the idea works was demonstrated by J. McGillivray at the Eastern Canada Open where he won the Over .15 Power event with the fourth unfolding wing model of the series. Mostly the folding of power wings is in the reverse order, but the operation of a wing out-folding must be quite spectacular. Later in the newsletter there is a reference to a flapped Wakefield; the model maintaining a flat bottom section for the first ten seconds of climb, then resolving into a Jedelsky like under-

camber. Shouldn't have thought the slight advantage worth the mechanical complication involved.

John Haggart of London Colney, Herts, sends us details of the *First International Vintage Model Contest* between the U.S.A. and England. The contest was a precision type event for power models, with a target flight of 2 mins. Result was a narrow win for the U.S.A. team.

I had intended to visit the **East Anglian Area's Winter Gala** which was held at R.A.F. Wetherfield on January 2nd, but a dose of 'flu kept me bedbound. Even so it was a day for the intrepid contest flyer rather than the idle visitor, for you name the weather, they got it: fog, mist, rain, drizzle, sleet and a grand finale of snow. Bearing such conditions in mind, results in the Combined F.A.I. event were somewhat surprising. Only Dave Stapleton risked a Power flight, but didn't 'show' on the result sheet, and S. Bowles' A/2 took first place from W. Parker's Wake. All other flyers seemed to have opted for Gliders. Anyway, in that, and the other events, including the Combined Open, won by Paul Masterman with a Rubber model, a very good turnout.

The name of Dave Stapleton turns up again, this time as the new editor of the **Anglia Model Flying Club** newsletter. I am sure he has me in mind when he adjures us not to perform the same old tatty antics with the same old tatty models this season, but to produce a new model that will perform better, and make sure it will perform better. Trouble is, by the time my models start flying at all they are in a definite tatty state. Members are also asked to look after the nice, remote little field the club uses. After all, he says, a smashed model should fit into the car better, so why leave litter?

Anything can happen in Ron Magill's *News of the North*. There is even a couple of verses of a Cilla Black song to add substance to the model plane chat. There is also a bevy of brews, giving the recipes for such exotic dishes as *Ronnie's Pylon Poison*, which contains 10 per cent Propylene Oxide, 'Dynajet Juice' and 'Dandelion Wine'.

Issued from Washington, U.S.A., is the *Bat Sheet*, newsletter of the **Strat Bats M.A.C.** It somewhat belies the notion that all America is Radio mad, as it is devoted entirely to pre-computer age free-flight. Comment here on the lustrous Wakefield with which Jim Patterson won a Californian F.A.I. event: *'Thas no toy airplane, it's a machine.'*

Headscratcher poser in the January issue of *Tarmac Torque* (South Africa) is why should membership be increasing while the number of active flyers remains static? One answer, of course, is that building a model plane is quite hard work, and often what the newcomer needs is a project within his capabilities and a bit of guidance and encouragement. A simple club design is a good primer, with materials supplied from the club if possible.

Let's see more of your reports.

Clubman

*The flyer from Esher and District M.F.C. concerned in the landing incident reported by Clubman on Page 170 of March issue, wishes to point out that in his (and three fellow club members') view, this was not a case of slight misjudgment; but that one wheel ran over long grass which diverted the landing run and so into the ankle of a spectator.*

## CONTEST CALENDAR

March 19th	S.M.A.E. CENTRALISED CONTROL LINE MEET. Stunt, Class 'B' T/R, Combat, H'cap Speed, at R.A.F. North Luffenham, nr. Oakham, Rutland.
March 19th	S.M.A.E. 1st AREA CENTRALISED MEET. Open R/P, F.A.I. Glider. Area Venues.
April 1st/2nd	S.M.A.E. CENTRALISED F.A.I. MEET (including Trials for European Championships) F.A.I., Rubber, Power, Glider, Venue R.A.F. Syerston, nr. Newark, Notts.
April 2nd	S.M.A.E. R/C MEET. Aerobatics (F.A.I.) at R.A.F. Cottesmore, Rutland.
April 2nd	ELLIOTT SPEED MEETING, Classes 1.5, 2.5 (Open & F.A.I.), 29, 40 and 60. Note .40 class to use 60 ft. lines. Venue Elliott Bros., Airport Works, Rochester, Kent.
April 9th	S.M.A.E. R/C MEET. Pylon Racing to F.A.I. and F.1 rules. Venue North Luffenham, nr. Oakham, Rutland.
April 23rd	S.M.A.E. 2nd AREA CENTRALISED MEET. Open R/G, F.A.I. Power. Area Venues.
April 23rd	LONDON AREA C/L CHAMPS. 1st round. Goodyear, F.A.I., 1/4 A T/R, Combat, Charville Lane, Hayes.
April 30th	LUTON & DISTRICT SLOPE SOARING RALLY. R/C Multi and single channel, R/C Ladies event. Also F/F Chuck Glider/Magnet if conditions and demand permits. Superhet only. Pre-entry (30p

May 7th	multi, 20p S/C and Ladies) to T. R. Clark, 'Windyridge', 126 Alexandra Avenue, Luton, Beds (Luton 22742). Venue Ivinghoe Beacon.
May 7th	FACTT THERMAL SOARING RALLY. Venue Enstone Airfield, on B4030 Bicester-Enstone road (1 mile from Enstone). Field entry - 25p, pre-entry - 20p. Details G. H. Johnson, 37 Oxford Road, Kirtlington, Oxon.
May 7th	DEVON RALLY. Open R/P/G. All in F.A.I., Chuck Glider, Woodbury Common, nr. Exmouth - 10 a.m. Unlimited re-entry.
May 7th	WOLVES MAC C/L FLY IN. C/L Aerobatics, Fly-for-fun (most entertaining flight wins). Short glass surface, Silencers and Insurance Proof essential. Lucas Aerospace Ltd., Hobson Works, Sportsfield, Fordhouses, Wolverhampton. Details: W. A. Hatfield, 563 Stafford Road, Wolverhampton WV10 6QE.
May 7th	STAFFORD HURRICANES SCALE R/C AIR DAY. Class II rules. 10.30 a.m. start. 25p pre-entry/details from D. Martin. The Laurels, 58 Mount Road, Stone, Staffs. Venue Hixon Airfield, 4 miles east of Stafford on A51.
May 14th	ST. ALBANS MAC THERMAL SOARING RALLY. 3 rounds from 10.30 a.m. 150 m. line. No Regen. Venue Nomansland Common, Wheathampstead.



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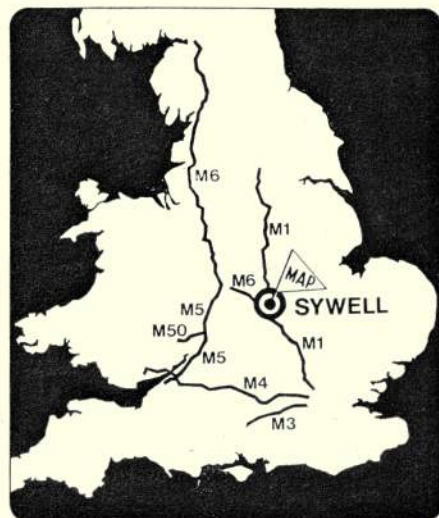
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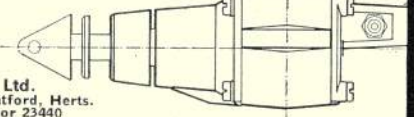
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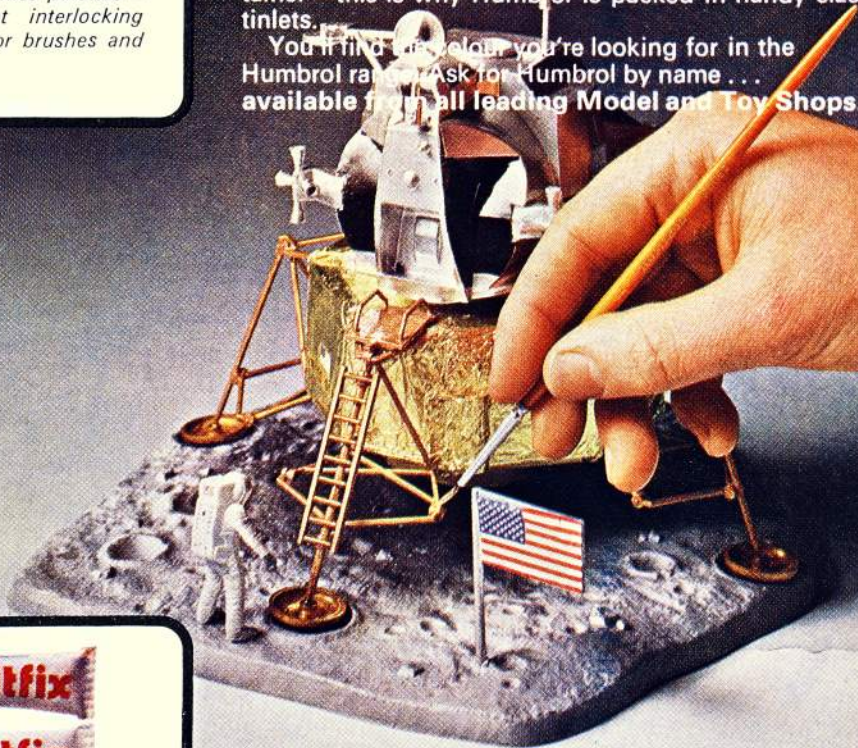
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A semi-scale model with realistic good looks. Knock-off wings are featured, and a plastic propeller is supplied. Wingspan 22½".



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