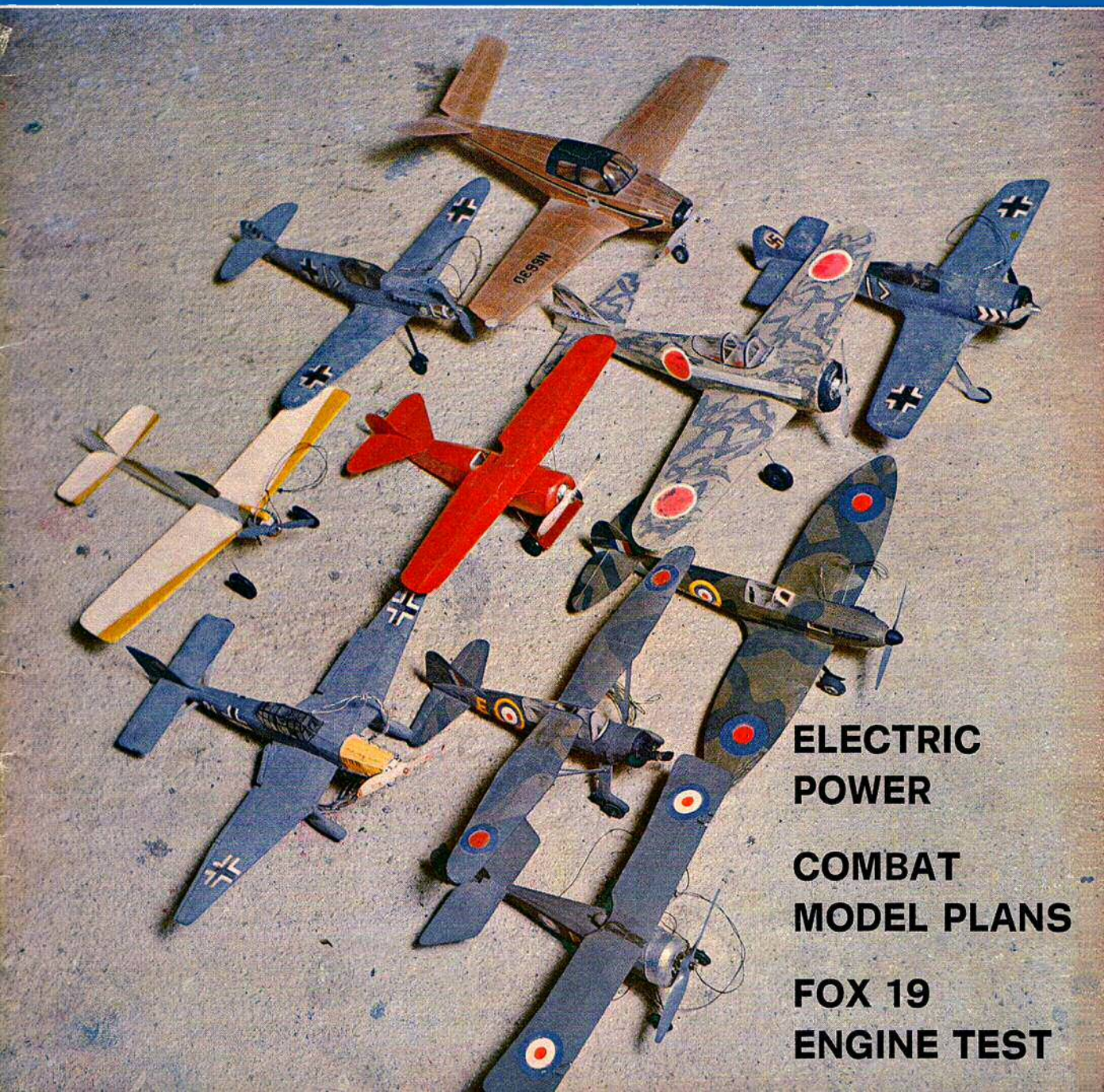
April 1974

Aero Modeller

MAP HOBBY MAGAZINE

20p USA & Canada $1

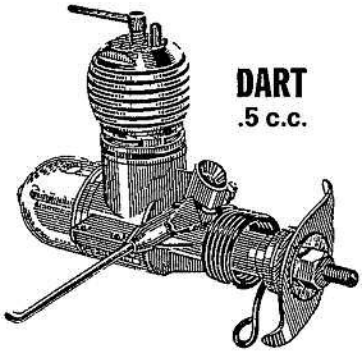
INCORPORATING
MODEL AIRCRAFT



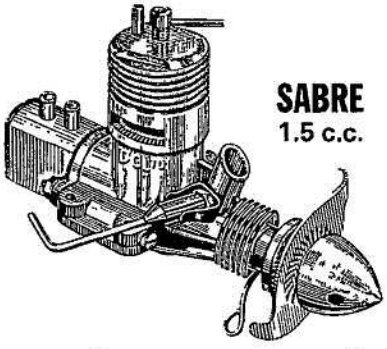
ELECTRIC POWER

COMBAT MODEL PLANS

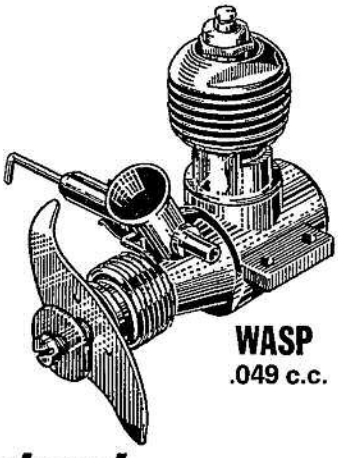
FOX 19 ENGINE TEST



DART
.5 c.c.



SABRE
1.5 c.c.



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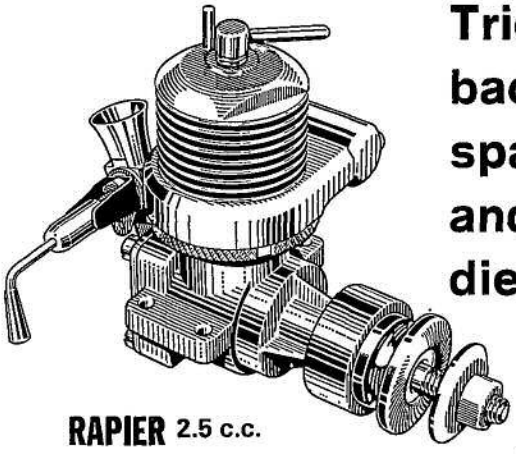

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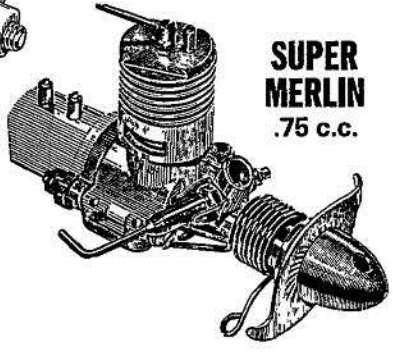
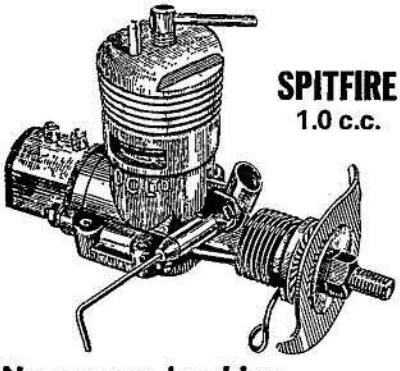
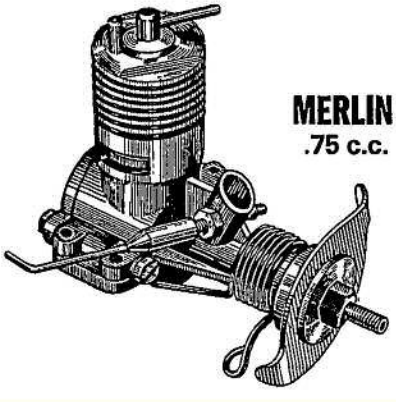


SUPER MERLIN
.75 c.c.



SPITFIRE
1.0 c.c.



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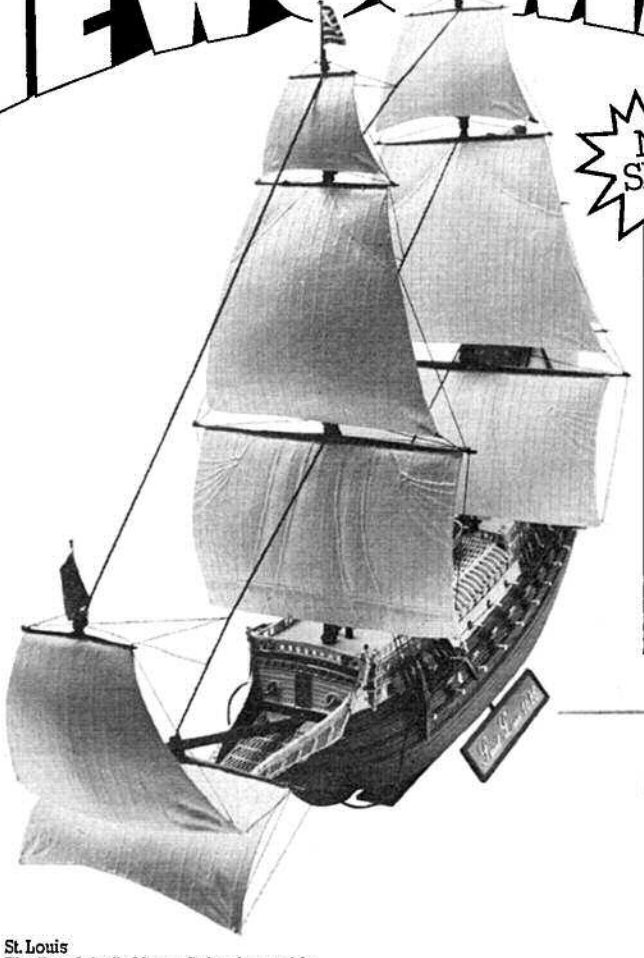

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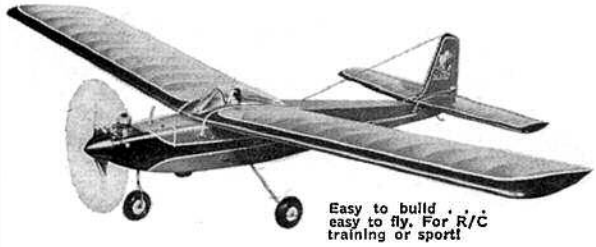

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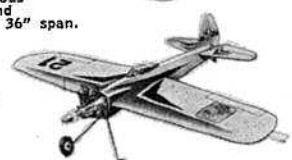

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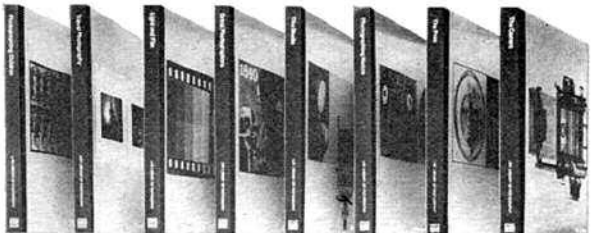

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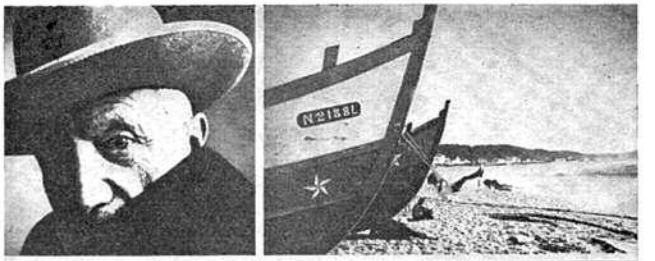

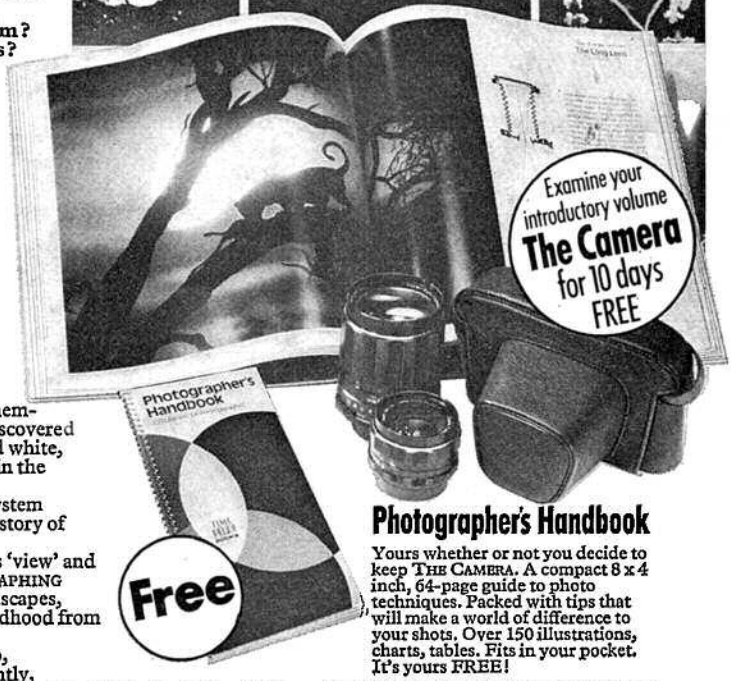

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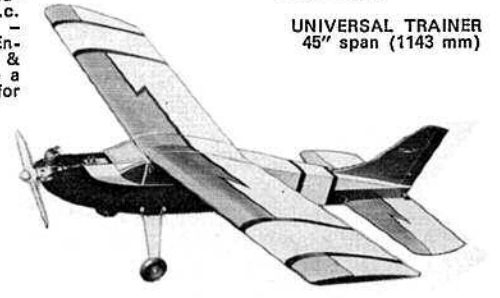

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MODEL AIRCRAFT (B'MOUTH) LTD – NORWOOD PLACE – BOURNEMOUTH

Heard at the HANGAR DOORS

Electric power is certainly topical – but the aircraft shown here is not for r.t.p. operation, but radio control. Bob Boucher (of Astro Flite) switches on his motor, aided by George Bushell. The model's subsequent take-off from a country road(!) convinced us of the practicality of electric-powered R/C.

THE WORK of such dedicated enthusiasts as Leslie Hunt, George Jones and Gordon Riley has ensured that ready reference works are available to provide a record of surviving aircraft, wrecks and relics of aviation in the United Kingdom and elsewhere, and much effort is being applied to the very worthy task of recording aviation history from its earliest phases to the current date, but little seems to have been done to note the many interesting memorials which commemorate historic events in aviation or individuals and crews who, in many cases, lost their lives in flying accidents.

Some which come readily to mind are Cody's tree at Farnborough, the various memorials to Alcock and Brown and several memorials to aircrews in the Lincolnshire and East Anglian fields.

Brian Robinson of 25 Cromwell Grove, Manchester M19 3QD, is endeavouring to compile a list of these memorials – whether they be statues, plaques, stained glass windows or whatever – but so many of them are known only in a limited locality, and he would be most grateful to any reader who might be able to supply him with information about such relevant items. With their help, he hopes to build up for eventual publication, as complete a record as may be possible to fill what he believes to be an unfortunate gap in our knowledge of aviation history.

A 'WORKING' HOLIDAY? Control-line enthusiasts looking for an excuse to visit the Continent may be interested in the following contests of which we have just received details. Firstly, the *Cataluna Championships* to be held at Barcelona, Spain, on April 27th-28th where the three F.A.I. categories of speed, team-race and aerobatics will be organised; as a real incentive to compete, the organising body (*The Royal Air Club of Barcelona – Sabadell, Avenida Generalisimo Franco, 417, 3°*) offer competitors free board, free hotel and free transportation within the city! Interested? Then write now to the Air Club – entries should be received by around March 15th, so do be quick.

Combat fliers will be pleased to learn of the Munich Club's event, to be held on April 13th-14th at Frottmaninger Heide (Heath), near Munchen Freimann. Person to contact in this instance is Johann Dubell, of 8,000 Munchen 50, Karlingerstrasse 43, W. Germany. Incidentally, first prize is a Bugl 15 – tempting, isn't it!

COUPE D'HIVER 1974, the 30th in the series organised by *Le Modele Reduit d'Avion* and the French modellers, was held in bright but bitter conditions at Le Plessis-Belleville on February 24th. Full report next month: but here's advance news of the results. Winner was Andre Meritte, 2nd in 1973, using his latest *Gadget* and *Yousasank* (U.S.A. 5!) section. France took first 11 places, including two ladies, then Giolitto was top Italian at 12th and Ian Sutton top Briton at 14th (and also 21st). Ian Dowsett flew Canadian Stuart Sarage's model to 18th and sole German entrant Erwin Neumann was 27th. Ray Fleetwood placed 29th and top U.S.A. proxy was Dave Linstrum's at 67th flown by Pierre Chaussebourg. Though over 160 entered, about two-thirds actually flew in the very tough conditions.

OUR APOLOGIES to Messrs. **HUMBROL Ltd.** for a mistake in their advertisement in the March issue. The price stated should, of course, have been 10p for the 15ml size tinlets of their excellent enamel paints.

★ ★ ★

STOP PRESS !

1974 British National Championships, May 25th-27th, at R.A.F. Little Rissington, Glos.

On the cover

Quite a variety – and all these models perform extremely well as electric round-the-pole subjects, most having been converted from KeilKraft or Comet kits, or built from commercial plans. Full details of the flying equipment, motors used and suitable aircraft are provided in Harry Butler's informative article on page 189 of this issue. (Photograph by Harry Butler.)

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Another top-notch combat model from the stable of that prolific builder –

FRANK SMART

MOST PEOPLE, after flying a swept wing model have their reservations as to making a change from the basic 'wing' design which has reigned so long in this country, due mainly through lack of development. Such development requires a group of people working together, such as in the Northwood days when the APS *Razor Blade* came to the fore. It takes a long time for an individual to develop a model up to competition standards from scratch.

So at this stage we must thank Mick Tiernan and his brother Dave for starting it all off. Having all been chased round the sky in 1972 by Mick we got the message, then with the combined effort and enthusiasm of the Glevum (Gloucester) team (Mick Lewis, Derek Dowdeswell, Dave Cox, Tim Court and yours truly), the 1973 swept wing designs were developed very quickly over the winter, everyone trying out their own different ideas.

First impressions of a swept wing model is that it feels light on the lines and the 'know where it is' feel has gone. But the most important feature to look for is that its turning ability is different. I say this because in some cases the *Ironmonger/Warlord* can be equally as tight in the first 'loop' or 'bunt', but the recovery of speed is slower than this design which will do consecutive 'loops' or 'bunts' without the motor being overworked and losing height. (Keep the motor happy!) A consistent engine, especially a Copeman Mk. IV Oliver, will solve most of your problems.

The other features that attribute to its manoeuvrability is in its shape. Area has been transferred to the centre of the model where it is more effective and this together with a narrow tip chord allows use of full control without loss of speed. This wing shape is more flexible than the normal wing, where cracks frequently occur in the trailing edge curve close to the elevator.

After sorting out tank problems, with internal flaking of copper vent pipes, at the '73 Nats (remedies please!) I achieved 6th place at the Dutch International, 3rd place at the Luton club's Burns/Brown rally and at the Western Area, with my hard working pit crew and this lively model.

A final word: this model is designed for lightweight nylon for the best strength/weight ratio and should be built at 15 oz. or under, $\frac{1}{4}$ in. thick leading edge for calm weather, 1 in. section for windy conditions. Test fly on a calm day as elevator settings are critical on this design to obtain equal diameter 'loops' and 'bunts'.

Just to be different, the construction starts with the trailing edge! Firstly, cut out the T.E. from $\frac{1}{4}$ in. sheet, butt join the halves together and add the triangular infill piece, using fast-setting epoxy. Now cut through the triangular infill piece to accept the spruce T.E. spar, which must be in one piece, running from tip to tip. Using P.V.A. adhesive, glue this spruce spar to the balsa, holding in place with elastic bands, using scrap pieces of spar material to protect the edge of the balsa T.E. When dry, add the forward piece of the triangular infill once more, then sand the completed unit flat before pinning down over the plan.

Add the tips, fuselage flat centre, rib centre pieces and all gussets, butting everything up against a piece of scrap, straight, hardwood at the leading edge position, which is discarded later. Fit the half ribs to the top surface (except left-hand rib at centre) as well as the tailplane which is made as a separate unit, then butt jointed to the wing. After glue has set, remove the complete unit from the plan, and add the $\frac{1}{4}$ in. wide beech veneer top and bottom of the centre section – taken back over the tail. Using 1 in. wide $\frac{1}{4}$ in. ply strips for cramping blocks, cramp down to press veneer on to balsa centre and tail. Leave overnight.

Turn model over and butt up against the 1 in. hardwood strip once more – packing the T.E. to suit. Add the remaining half ribs. Make up the leading edge from the Veron pre-moulded section with $\frac{1}{4}$ x $\frac{1}{8}$ in. spruce spar fitted flush inside – or alternatively produce a 'do-it-yourself' moulded leading edge, as described on page 186 in this issue.

At this stage, offer the L.E. up to the wing (dry), check for 'high points' on the rib ends – sanding off as necessary. When satisfied, glue L.E. to wing, holding in place with wide elastic bands. Next, drill the in-board tip and insert large bore lead out guides of single strand electric cable – pull out copper centres with pliers when epoxy has set. Make up bellcrank assembly and mount as shown. Fit infill blocks to

The 'pot-polisher' herself, Mrs. Pat Smart displays a 'Hornet 2' (with 'balanced' elevator) and a 'Hornet 3' which Frank built for the Dutch International. Note also his use of colour tissue trim – very effective but with no weight penalty.

fuselage to take bearers and pod, all flush with the leading edge. Make up infill blocks to pod by drawing round the L.E. profile, cut out and offer up to L.E. Epoxy in place, sand level, then add $\frac{1}{8}$ x $\frac{1}{2}$ in. hard balsa packing strips top and bottom of fuselage (alter thickness if necessary to suit crankcase width of your motor).

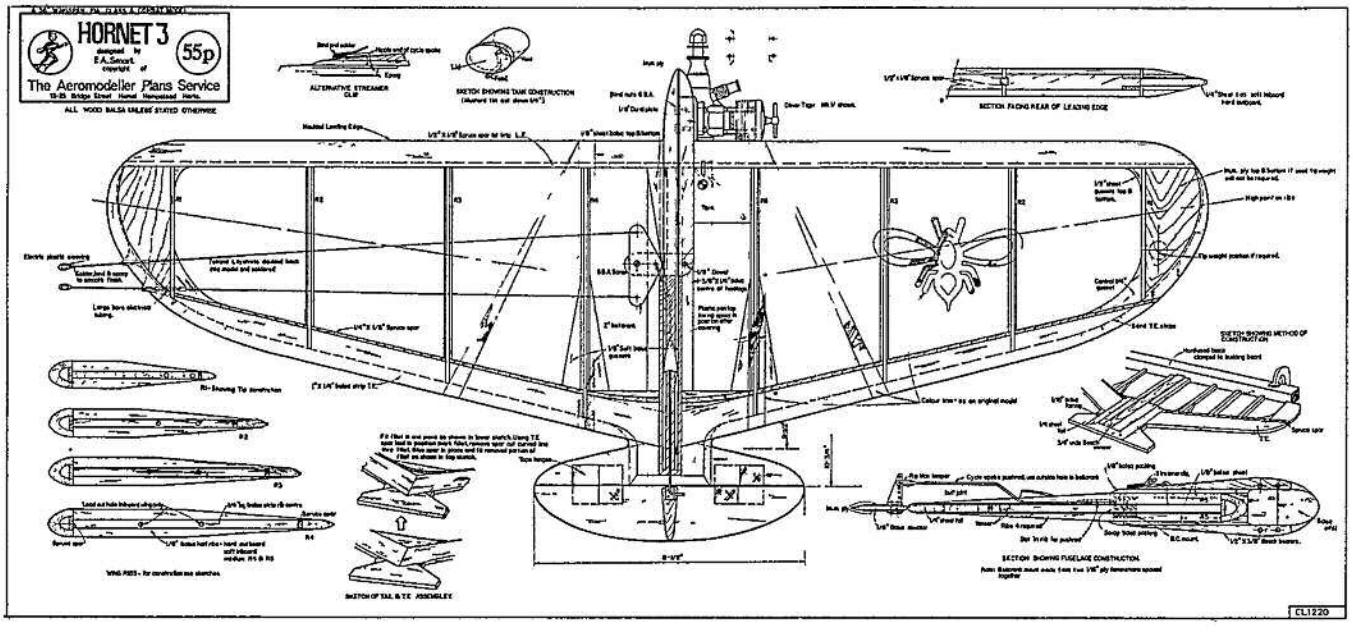
Assemble the engine pod and cover with nylon for strength and leave on one side – do not fit yet. Make up the tank from a Coleman's Mustard tin (available from *Pegasus Models* if you have no genuine ones containing mustard left!) which is shortened by $\frac{1}{4}$ in.

The model is now given two coats of thin dope over all wooden parts before it is covered – using close-weave, lightweight nylon. Cover in two pieces – underside first, starting by sticking at tail and down centre of model. When dry, pull out to tips, dope leading edge, then work along trailing edge. Repeat for top surface, marking push-rod hole and tank vents, making small holes to slide over. As there is no centre section sheeting to secure the nylon to, lightly rub in epoxy through the nylon to the fuselage ribs. This prevents the pushrod hole from 'moving' and allows you to start pulling the nylon spanwise fairly soon.

Cover the elevator in nylon, epoxy the ply plates for the horn in place, and hinge to model. Now fit the engine pod with plenty of epoxy and dowel as shown. Also, smear epoxy glue on the nylon around the tank area to prevent fuel seepage (especially around vents). Now apply three coats of 50 per cent dope-thinners, add tissue decoration if required, and give a further couple of coats. Between each coat, allow to dry out thoroughly and lightly sand down. Finally, add transfers, and fuel proof with two thin coats of clear polyurethane varnish.

The final balance point should be as shown – further back and you will have a very tricky model to handle, further forward and it will lose its manoeuvrability. Keep the C.G. as shown, and with a flying weight of 15 oz. or less, it will really GO!

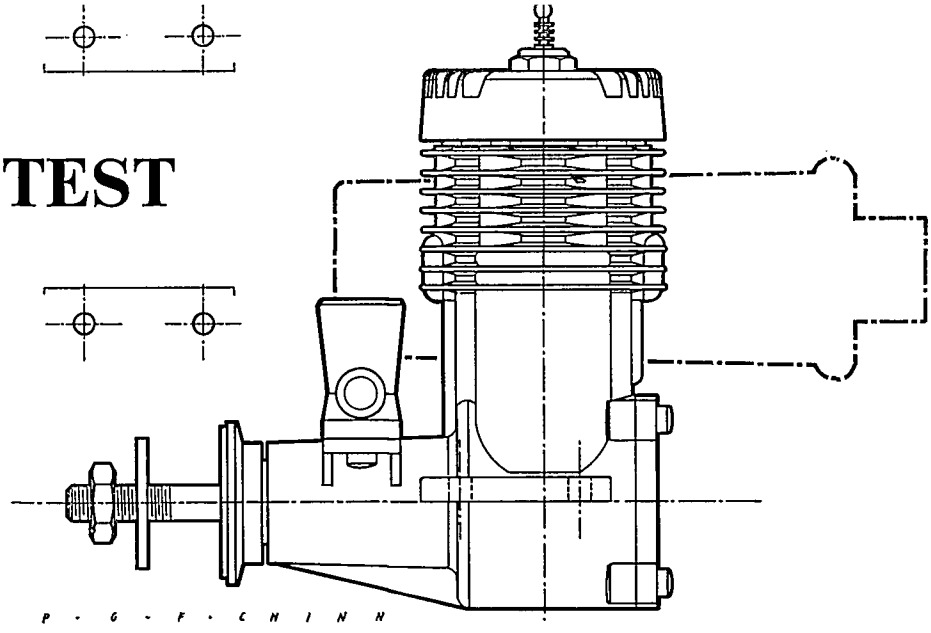
FULL-SIZE COPIES OF THIS 1/6th SCALE REPRODUCTION ARE AVAILABLE AS PLAN No. CL1220, PRICE 55p (INCLUSIVE OF POSTAGE AND V.A.T.) FROM AEROMODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.



Aero Modeller

ENGINE TEST

FOX 19



by Peter Chinn

FOR MORE THAN a quarter of a century, one of the most widely used model engine sizes has been the '19'. Originating from the former American 'Class A' regulations limiting cylinder swept volume to 0.20 cu. in. (3.277 c.c.), such a size has been offered by many of the leading model engine companies including Enya, K&B, McCoy, O.S., Super-Tigre and Veco, all of which are, or have been, involved in producing a wide variety of engine sizes. The notable omission here is obviously the American Fox Manufacturing Company which, having built just about every other size, from the smallest to the largest, since the late 1940s, including the continuous production of large numbers of engines in the small to medium displacement groups, has not given much attention to the .19 displacement. If we remember correctly, Fox produced some 19 engines in 1954 and again around 1958 but all through the '60s and until recently, Fox 19's were conspicuous by their absence.

SPECIFICATION
Type: Single cylinder, aircooled glow plug ignition two-stroke with crankshaft rotary-valve and bushed main bearing.
Bore: 0.650 in.
Stroke: 0.600 in.
Stroke/Bore Ratio: 0.923:1
Swept Volume: 0.1991 cu. in. (3.263 c.c.)
Checked Weights: 157 grammes – 5.5 oz. (less silencer)
198 grammes – 7.0 oz. (with Fox B size extractor silencer)

GENERAL STRUCTURAL DATA
Pressure diecast aluminium alloy *crankcase/cylinder-casing/front-housing* unit with bronze-bushed main bearing and drop-in steel *cylinder-liner*. Pressure diecast aluminium alloy *crankcase-backplate* secured with four screws. Case-hardened steel counterbalanced *crankshaft* with 0.437 in. dia. journal, 0.315 in. bore gas passage and 0.156 in. dia. crankpin. Lapped Meehanite c.i. *piston* with straight baffle and 0.125 in. dia. solid *gudgeon-pin* pressed into rear piston hole only. Machined aluminium alloy *connecting-rod* with plain eyes. Pressure diecast aluminium alloy finned *cylinder-head* with .015 in. aluminium gasket and secured to cylinder casting with six screws. Pressure diecast aluminium alloy *prop driver*. Pressure diecast aluminium alloy flanged-base *carburettor body* secured to crankcase nose with two screws and reversible for left- or right-hand needle valve control. Brass spray-bar. Beam mounting lugs.

OPTIONAL EXTRAS
(i) Size B open front silencer (Part No. 90211)
(ii) Size B closed front silencer (Part No. 90212)

TEST CONDITIONS
Running time prior to test: Approx. 1 hour
Fuel used (i) 25 per cent Newton-R castor oil, 75 per cent methanol (Running-in)
(ii) 5 per cent pure nitromethane, 25 per cent Newton-R castor-oil, 70 per cent methanol. (Tests)
Glow plugs used: Fox standard platinum-rhodium filament, short reach and long reach.
Air Temperature: 13 deg.C (56 deg.F)
Barometric Pressure: 30.4 in.Hg.
Silencer used: Fox Size B open-front type

The first inkling that Fox would be re-entering the 19 market came when the 1972 Fox catalogue was issued and included the announcement of a new engine of this size scheduled for production in the summer of that year. An illustration showed the engine as closely resembling the current Fox 29 model. In fact, the 19 did not appear until last summer and was then seen to resemble the Fox 25.

It is, of course, common practice for manufacturers to make a single main casting (and sometimes other parts as well) serve two or more engine sizes, provided that capacities are not too far apart, and this was an obvious approach with the Fox 19/25 combination where the bore and stroke are separated by only .03 in. and .08 in. respectively.

At first glance, the 19 does look just like the 25, complete with its unusual flange-base vertical carburettor mounted on a rectangular saddle cast onto the crankcase nose. Closer inspection however, reveals that the engine is lower in overall height, has one less cooling fin on the cylinder casing and has the propshaft portion of the crankshaft shortened and reduced from $\frac{1}{4}$ in. to $\frac{3}{16}$ in. dia.

Internal changes include a 15 thou. increase in the wall thickness of the cylinder-liner (thereby accounting for the engine's smaller bore) and a smaller piston to match. Obviously, the 19 also has a new cylinder-head.

Equally obviously, to take care of the engine's reduced stroke, the crank-throw is shortened. In addition, the shaft has a heavier crankweb and a considerably wider valve port. This latter (from measurements made on the test engine) extends the induction period by a full 20 degrees compared with the Fox 25. The rotary-valve is now open for 195 degrees of crank angle, closing 15 degrees later than the 25 at some 58 degrees after TDC.

The cylinder port timing is also different with both exhaust and transfer periods extended. On the test engine, the exhaust period was six degrees longer at 140 degrees and the transfer period four degrees

longer at 124 degrees. The carburettor is unaltered and has the same effective choke area as the 25: approximately 12.5 sq. mm. which is quite generous for a stock 19 engine.

The weight of the 19 is almost exactly the same as that of the 25 tested earlier in this series: the heavier cylinder-liner and crankweb cancelling out the lighter piston and shaft front-end and shorter casting. (Of course, the latest 25s, if they incorporate certain other small differences now used in the 19, may be slightly heavier.)

Performance

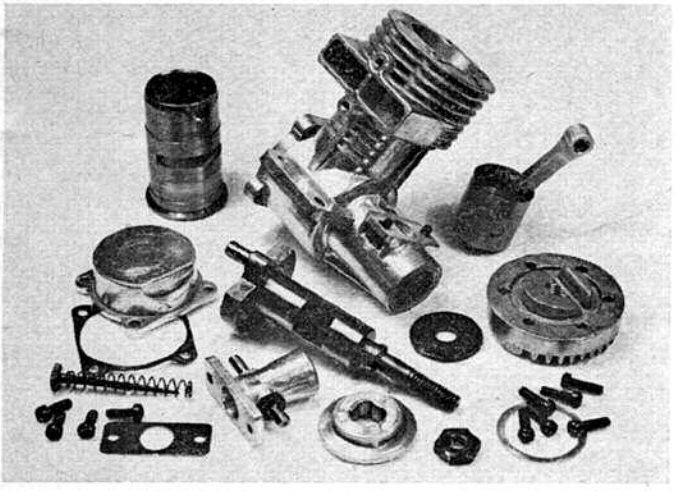
Our test motor came direct from the factory in Arkansas, U.S.A., where all Fox engines are test-run before despatch, a check which not every manufacturer carries out these days. The Fox company admits that this may occasionally result in an engine reaching the customer with a blown plug and, actually, this was the case with our test sample.

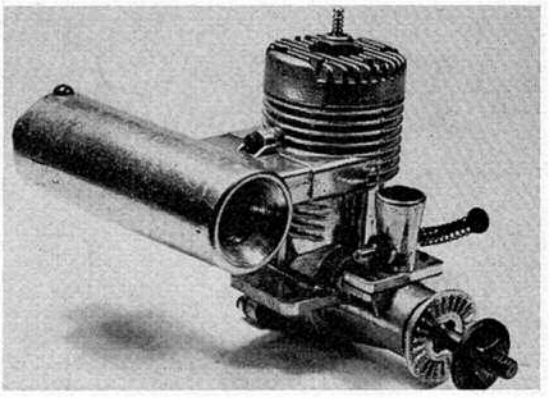
However, it needs to be said, straight away that, notwithstanding its simple, unpretentious appearance, the Fox 19 turned out to be one of the most powerful 19 size units that we have tested to date. Perhaps our absolutely stock test unit was an above-average example, but the peak output shown by the power curve of approximately 0.39 b.h.p. at 17,000 r.p.m. on 5 per cent nitromethane fuel (compared with 0.40 b.h.p. at 15,000 r.p.m. for the 25) is outstandingly good for a plain bearing engine of this size.

This performance is a result of the 19's ability to breathe more freely than the 25 at very high revolutions, thanks to its extended port timings, and to the fact that, for a 20 per cent smaller volume, it has the same size gas passages as the 25, e.g. carburettor choke area, shaft passage, etc. Of course, the 19 does not have so much torque as the 25, so its power is substantially less when the engine is heavily loaded.

Clearly, to approach its maximum power output, the 19 must not be overloaded and needs to be used with smaller props than the 25. The instruction leaflet issued with the engine warns against the use of too large a prop and suggests an 8x4 for most purposes. Our motor turned one of the new Australian Taipan glassfibre/nylon props of this size at a steady 15,800 r.p.m. on our standard 5 per cent nitromethane test fuel, which should mean that the engine will easily reach its peak on such a prop in the air.

The only snag to running the engine at much over 16,000, we found, was that it then began to consume glow plugs and it might, therefore, be better to opt for a 'slower' type of 8x4 (the Taipans absorb less power than the average and do, therefore, tend to turn quite





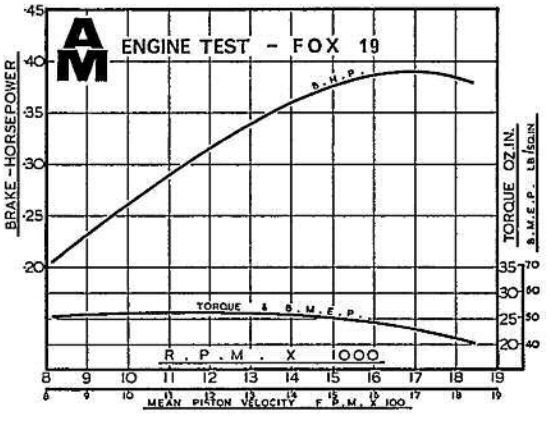
fast) such as a TopFlite or Tornado 8x4. We also tried the Fox on an 8x5 Power Prop, recording 14,400, and on an 8x6 Power (13,200) and a 9x4 TopFlite nylon (11,800). Loaded for speeds below this, the Fox began to run less steadily.

The Fox 19 accepts the Fox 'B' size silencer which is also common to the Fox 25, 29, 35 and 36 and which is available in a choice of closed front or open front types. We chose the latter as this had already been used for the 25. Actually the performance curves were based on the open exhaust performance, but the power loss was nil at all speeds up to about 16,000 r.p.m. and only barely perceptible (100-200 r.p.m.) at the peak. The silencer, with its very large area, doesn't do much to quieten the engine.

As regards handling qualities, the 19 was a bit slow to restart when hot (the manufacturer's instruction leaflet seems to confirm this with the words 'Do not attempt to restart until the motor has cooled off') but cold starting, after priming the cylinder, was prompt.

When it was introduced to the U.K. market last year, the Fox 19 was priced at an astonishingly low £4.92 (at this price it was actually cheaper here than in its native country) but rising costs and the depreciating value of Sterling over the past few months have taken their toll and the price is now £6.95. Even so, the Fox is still one of the cheapest 19s on the market and on a 'power per £' basis, must have the edge on all its competitors.

Power/Weight Ratio (as tested):
1.13 b.h.p./lb, less silencer.
0.87 b.h.p./lb, with silencer.
Specific Output (as tested)
1.96 b.h.p./litre (less silencer).



SO YOU THINK YOUR CLUB CAN ARRANGE A FLYING DISPLAY!

Ron Magill describes 'the big one' in New Zealand.

Members of the Roskill Modellers with the stunters they used for the display. Profile-fuselaged, fully-flapped designs powered by .35-.40 cu. in. motors were chosen, and performed most efficiently.

THE NEW ZEALAND EASTER Show is the biggest agricultural, pastoral, trade and scientific show of the year in this country. On the entertainment side, it also attracts the best in international 'show' talent, as well as the most beautiful girls for the 'Miss N.Z.' beauty contest. Therefore, it came as a surprise to be approached by a member of the Committee to ask the *Roskill Modellers* to fly a 15-minute display in the arena.

Initial response by the club members was enthusiastic and after much discussion it was decided that we build 18 models, to be mass-produced by the 60-strong Roskill modellers. Club leader Steve Townley was most insistent that we would need at least this many models to last through the duration of the show.

Models had to be big enough to be readily visible from the grandstand, in artificial lighting so .35-.40 cu. in. motors were indicated. Models also had to be rugged, as we had few experienced aerobatic fliers; simple enough to be built by juniors and inexperienced modellers, but aerobatic enough to be flown through the manoeuvres. A flapped profile model was chosen by the club's aerobatic fliers Steven Townley, James Urry and David Knaggs. Steven prefabbed the models on his bandsaw. Jim Urry installed the control systems, and team race fliers Wayne Allott and Maurice Baker made the tanks. About 20 members actually helped Steven build the models, which occupied some six months of his spare time. However, once the models were finished, there was no shortage of helpers and fliers, particularly as the display participants were given free passes to the Show! Ultimately we were asked to fly five daylight shows, and 15 night shows.

First rehearsal in daylight was satisfactory, and the second was on a cold gusty night, and experimentation with the form of lighting soon showed us what was most suitable. Young Peter Jesson, 15 years old, flew while the lights were swapped from floodlight to spotlight to overhead lights with intervals of complete darkness, without mishap which proved that his eyes adapt quickly or he flies by sound with his eyes shut!

Format of the show was to be one pilot flying aerobatics for 3-4 minutes when a timer-operated streamer would be released from the wing tip, whereupon three more models were to be released at short intervals for some hair-raising and model-bending combat. Last model up was to be handed to the best aerobatics flier to finish off with some more aerobatics, and here Jim Urry delighted the crowd, when it was not too damp, by flying a pattern on his back!

The time slot was rigid and engines had to be started without a warm-up within 30 seconds as the sound of motors would have detracted from the stage act prior to ours. Easy starting motors were a must and pre-flight checks and

continued on page 201

It was just a trifle damp – a mere trifle! This 'lake' is in fact the main arena of the agricultural show – not the best of conditions for organising a slick C/L demo, but nonetheless, the N.Z. lads coped well.

READERS' LETTERS...

Dear Sir,

Having read Dave Clarkson's 'Viewpoint' on nose skids, I feel I must mention one or two points left out of this rather biased article. I have no wish to start an argument with Dave – he is entitled to his opinion – but he should give all the facts.

The reason for my suggestion was safety; it was noted by myself that there was an increasing tendency for skids to be mounted on the existing undercarriage leg, pointing forwards. This type of skid is obviously lethal. The more normal skids, which are curved slightly backwards at the bottom, are almost always rigidly mounted and permanent, therefore being subject to wear and even after only a few landings can, and do, become quite sharp.

Dave states that the SMAE Control Line Committee had no evidence on which to base a decision. Safety, however, must always be a major consideration of any Technical Committee; these rigid 10 swg wire skids will be the first part to hit a pitman or a spectator and one need not wait for someone to be killed, injured or maimed before taking action. Dave's inference in his remarks on the previous Technical Committee are totally unjustified. ½A and Class B were left out due to low usage of skids in these classes, though I agree that the danger element is the same; we had of course no jurisdiction over the FAI Class. Far from making decisions in ignorance, I personally have tried models both with and without skids within the past three-and-a-half years, and in no way did I find they affected the landing of a C.G. wheel model. I am sure Dave will forget he ever had a nose skid before the season is half-way through.

Hope this throws a little more light on the subject. I'm not trying to defend my action; as a competitor I feel I was justified in bringing this matter before the Committee, on the grounds I have mentioned.

Leeds. *D. Haworth*

Dear Sir,

Often people suggest that combat models are built because they are simple and quick to build. This to me suggests that you can be careless when building them, but this is not so. As one who has started to fly combat (or at least try) I have found that building errors on this type of model can be just as bad as a competition stunt model, or even worse.

How many models are critical to the balance point within 1/16 in.? Combat models can be. Next comes the point of them being quick to build. Well I suppose that they are, one at a time. I have just completed building three models together for the first time and all I can say is: 'It was hard.' Imagine building three mustard tin tanks, three engine pods, etc., and what's more many people build six at one go! To deal with the point 'simple to build'. Well, if you 'chuck' them together, I suppose they are, but most combat flyers try to make their models the best they can within the confines of the design.

If you go to a competition and take a look at one of Richard Evans' models you will be amazed at how well they are built. This I suppose leads onto the question of similarity. I would think that fifty per cent of combat flyers fly *Ironmongers*. Well you've said it yourselves that if being original can cause you to be beaten then it seems unacceptable. Take the club I'm in *(Outlaws)*, all of the members when I and my two friends arrived flew glow motors. When we asked them why they do this when they never win a competition they replied 'we enjoy flying glow motors more than Olivers' – so much for the people who say that competition flyers don't enjoy their flying. Also one last moan, could you please give combat more magazine space? After all it is the most popular competition.

Lichfield. *Colin Fretwell*

Dear Sir,

After reading the January issue of your magazine, and an ardent aeromodeller for some 25 years, I have never written in to comment on any mention of rules, etc.

I have often entered competitions for the fun and enjoyment of being with other aeromodellers. Over the past few years I have been very interested in Goodyear racing and have entered a number of competitions both locally and distant.

The Editor is not bound to be in agreement with any views expressed in these pages.

In the January issue it is stated that the SMAE Council has decided to prevent the use of skids on the front of the model. Now if I recall, Goodyear racing was brought out because F.A.I., etc., was becoming specialised and it was not helping things for the newcomers and novices.

Over the past year I have built some new models with skids, the reason being that we were having prop damage and it helped to support the undercarriage. Now whether or not the people on the Council can give some sound reasons as to why a simple addition, which I might add must help a lot of novices like us a lot, I am amazed.

To get good performance out of the engines which are available, propellers play a part, and fibre glass ones help extremely. Now let's face it at £1 + a time, we are not made of money even if the members of the Council are.

Now let's just leave the Goodyear alone or at least the skid. It might not look semi-scale but after all this was introduced for novices, and now when novices can be helped, they start mucking things about. For goodness sake wake up and stop specialising Goodyear. We don't want it, the rules as they are are OK for us novices.

Perhaps the council would like to make a trip up North like we go to competitions down South and explain what I must do with two brand new Goodyears on which I have incorporated nose skids in the construction.

Stockton-on-Tees. *K. McDermont*

Dear Sir,

Seeing the plan and article on E. Fillon's 1937 Wakefield winner gave me a distinct attack of the nostalgics for I remember having built and flown a copy of the model in the pre-war period. Looking back, it occurs to me that there are features of the model not covered by the article but which might be of interest to vintage fans.

It will be noticed from the plan that the tailplane area is large, even by the standards of that day, also that it incorporated a quite full blooded, lifting type aerofoil. This use of the tailplane almost as an auxiliary wing was a design approach favoured both by the French and U.S.A., flyers. However, such a tandem arrangement was not without its hazards, and when nowadays we think in terms of good inherent stability we look to a nice forward position of the C.G., but on these large tailplane models the C.G., was located on the trailing edge or even beyond. The Americans found that the arrangement was a good means of holding against the stall on high power without the need for excessive downthrust or the use of high dihedral in a tight spiral climb. Indeed, this type of set up favours a wide circle type of climb as any degree of bank usually results in a turn in. The French, on the other hand, went for low power and a wafting type flight, using all the lifting surface to the full. Both types of flight pattern were suited more to calm air than the turbulent conditions we all too often experience in this country, and is why, perhaps, the British approach kept to more conventional lines.

Coming now, by comparison, to the British set up, this kept to the 30 to 33 per cent of wing area tailplane which for some years had been found necessary for essential model stability, but used a slimmed down Clark Y type aerofoil as a means of utilising the tailplane's lift capacity. This brought the C.G. to a point around midway along the wing chord as opposed to the one-third way back that the old flat plate or symmetrical section gave. Generally, the tailplane would be set at zero or perhaps a slight negative angle, whereas many of the large tailplane models would have a positive angle setting. For general flying under all conditions the British approach was less adventurous but possibly right as further development tended towards a reduction in tailplane size rather than otherwise.

When flying these pre-war Wakefields it should be borne in mind that the rubber to airframe proportion was invariably quite modest. M. Fillon used only 3.10 ounces in his model, arranged perhaps in 14 strands for a long, slow climb. The propeller, 20 inch diameter and course pitched, was large for its day, and would make the model tricky to fly, given the same shallow dihedral, if more power was supplied. In fact, the model was seen to turn in on a few occasions, but no conclusions can be drawn from this, as this was a common hazard of r.o.g'ing.

We do know, however, that M. Fillon's model was modified during the actual Wakefield contest. The first flight was relatively poor; the model being distinctly underpowered. For the second and winning flight the prop diameter was whittled down, but to what degree we do not know.

It would be interesting to see this particular model matched against R.N. Bullock's beautiful streamliner which came second in the same contest.

Romford, Essex. *L. Ranson*

BETWEEN THE LINES

with Dave Clarkson

THE PAST MONTH has been a 'no news' month with no contests being held. This being so, I have decided to devote most of this month's column to the various aspects of glass fibre propellers. Nothing more can be said about the manufacture of glass fibre propellers than has already been printed in Jim McCann's epoc making article in the May 1972 *Aero Modeller* and also in the description of Jurgen Bartels' activities in the 1972-73 *Aero Modeller Annual*. I recommend both of these articles as required reading to all who wish to learn about glass fibre propellers, even for those who have no intention of making their own props, a thorough knowledge of how they are made helps in understanding their advantages and limitations.

The name of Jurgen Bartels will always be connected with the commercialisation of glass fibre propellers. Alas for Jurgen, the activities of the 'home moulders' and the reduction in value of our British Pound compared with the Deutschmark have made his propellers seem of late to be rather expensive. However, it should be remembered that Jurgen remains the only manufacturer of glass fibre propellers on a commercial scale, his propellers have always been of a consistently high quality and the range of propellers available from Jurgen is unequalled by anyone. It is good to see that Jurgen intends to keep his products in the forefront of team racing 'goodies' as evidenced by the introduction of three new props, described below.

Super Props for Team Racers

I suppose that the most influential designers of propellers for team racers have been the Czechs – indeed the 'standard' team race propellers have been the Bartels *'MVVS type 7 x 8'*, Bartels *'Drazek Special'*, MVVS wood *'180 x 180'*.

These propellers were designed for manufacture in wood i.e. with no extraneous bits 'hanging out' that could easily be split off, and also easily machined using fairly normal woodworking machinery. The Czechs made a beautiful job of making their originals (and still do), there can be few who would argue that they have not made some of the best wooden props the World has seen. With the advent of glass fibre propellers – a much more suitable material for team race props than wood – manufacturers naturally copied these Czech props since they were the best then available. However no real thought was given to the possibilities of improvements in propeller design allowed by the use of glass fibre until, in my view, the Russians started their big 'push' in team racing.

The first time that we in the West really began to notice what the Russians were doing was in the late 60s when Babichev/Krasnorutsky particularly, started winning things. They used a deeply cuffed 'speed' type prop of large blade area with 6¼ x 9 in. nominal dimensions. Of late the Russian props have become less extreme, that used by Plotsin/Timofeev to win at Helsinki in 1972 was a slightly cuffed 'speed' type prop of moderate blade area with 170 x 190 mm. nominal dimensions. I am not sure what influenced the Russians, but tend to think that it was the cut down Topflite 8 x 8 in. speed props used by Stockton/Jehlik in 1966 during practice sessions. Whatever influenced the Russians, there can be little doubt that one of the reasons for their absolute superiority at this time in team racing is because they have developed excellent props. Probably one of the first Russian props to fall into Western hands fell, I think, into West German hands and have obviously influenced Paul Bugl and Austrians Fischer/Nitsche in their design of the latest props to be introduced by Jurgen Bartels.

The three propellers recently introduced by Jurgen are:

Bartels *'Bugl (old type)'*
Bartels *'Bugl (new type)'*
Bartels *'Fischer-Nitsche Hyper Prop'*

The Bartels *Bugl (new type)* prop has been pioneered on the UK team racing scene by the brothers Tribe but the other two props have not been seen in the UK before. I measured the following dimensions; trey are approximate and only refer to the examples I have examined:

	Dia. (mm)	Pitch @ *Root*	Pitch @ *Mid-Blade*	Pitch @ *Tips*
Bugl (old)	165	100	200	190
Bugl (new)	180	160	185	175
Hyper Prop	165	170	200	190

The photograph shows that these three new props certainly look different, indeed the Bugl (old) and Hyper props have what I call 'Dirk' shaped blades. The Austrians have gone very fast indeed using these props and Bugl engines; it will be interesting to see how effective they prove to be in the UK where our 'approved' piloting style is rather different from the Austrian one. It is interesting to note that Paul prefers the 'new type' prop, finding the 'old type' rather small for his engine. Incidentally Jurgen tells us that he will make 7 in. diameter props in carbon fibre (supplied by Morganite Modmor Ltd) to special order, but they will not be 'stock' items.

The Selection and Working-up of GFRP Props

With so very many people now moulding their own propellers, the variety of props more or less available is large and so is the quality variation. It is, therefore, necessary to know what you are doing when selecting a GFRP prop. With any hand-made object (and virtually all GFRP props are), quality control is a problem and so the purchaser of any propeller is wise if the desired prop is critically examined before parting with money!

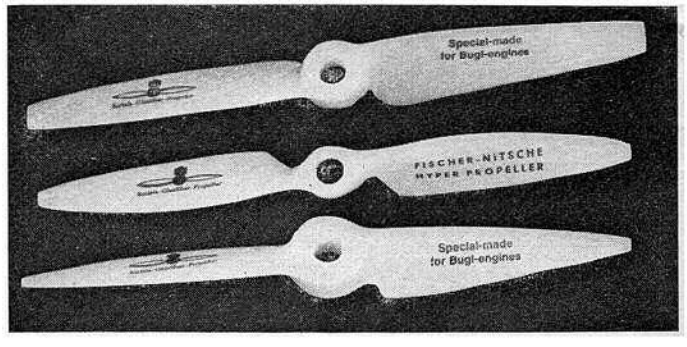
There are four common flaws in glass fibre props: (a) Dry areas; (b) Splits; (c) Air bubbles; (d) No-glass areas.

Items (c) and (d) are common, but not very important. This is fortunate since many home moulders pigment their props thereby making detection virtually impossible of all but major flaws of this type. Only if large air bubbles and/or no-glass areas were present in the blade roots would I reject a prop. I may however 'down-grade' a prop which does have air bubbles or no-glass areas.

Splits can be harmless and equally can be most dangerous. If the hub is split, then the wise man would reject the prop. Fortunately split hubs are very rare, although split tips are not. Split tips mean a short-life prop since the split may rapidly propagate and a 'frayed' prop will result. A split tip is not particularly dangerous, but it destroys the propeller efficiency. Therefore the conclusion is – do not buy a split prop.

Dry areas, i.e. areas of the prop deficient in resin, are one of the most perplexing flaws for the manufacturer. Even when exercising the greatest care in manufacture, dry areas can still result. For the modeller, dry areas only present problems in recognition. If any prop has a dry area anywhere, it should be rejected forthwith. Recognition of this fault is easy; they are always white and slightly spongy to the touch (or dig). With a pigmented prop recognition

The latest glass-fibre props from Jurgen Bartels. At top is the new Bugl prop (developed in conjunction with Austrian flier, Baumgartner), the Fischer-Nitsche prop is beneath it, and at bottom is the 'old' type Bugl prop. Jurgen also reminds us that until the 1974 World Champs, he can only supply Fischer-Nitsche props to competitors at this event.



is very easy, except when the pigment is white.

Selecting an un-flawed prop is only half the game, the rest is selecting one of correct dimensions. Here, I do not mean nominal dimensions but am referring to actual dimensions, particularly pitch. It is an unfortunate fact that the declared nominal dimensions frequently are not even close to the actual ones, I quote a few such below:

	Actual Pitch
Bartels *Drazek Special 7 x 7½in.*	7¼in.
Bartels *MVVS type 7 x 8in.*	6¾in.

These props are not bad props because their pitch is incorrectly marked, but they can be improperly applied by the inexperienced. An example of this is in Goodyear where the lower pitch of the Bartels MVVS type 7 x 8 in. makes it much more useful than the higher pitch of the 7 x 7½ in. and yet most novices fit the Drazek because they believe (understandably) it to have the lower pitch. The reverse situation occurs in FAI team race where the higher pitch of the Drazek is to be desired. The only solution to this problem is to pitch-gauge props (approximately if necessary) and to believe the *measured* pitch and not the *declared* nominal pitch.

The purpose behind working-up glass fibre props is to produce a prop balanced both mechanically and aerodynamically and also of correct blade section. I learnt virtually all I know about working-up props in a ten minute session with Don Jehlik at the 1972 Helsinki World Champs. It is quick and easy once one has learnt what one is trying to achieve, and developed the technique of getting this. The technique used is:

Step 1 – De-flash and true up hub

Using a small file with fairly fine teeth, carefully remove all moulding flash taking care not to encroach upon the blade proper. File the front and rear faces of the prop hub to remove all lumps and notches. Both faces of the hub must be flat and parallel, and most important must be trued up so that both blades have equal pitch. This latter requirement is most important and is easiest done using a pitch gauge. Hub trueness should be checked after both blades have been worked-up and corrected if necessary to give the desired equal pitch.

Step 2 – Flatten backs of both blades

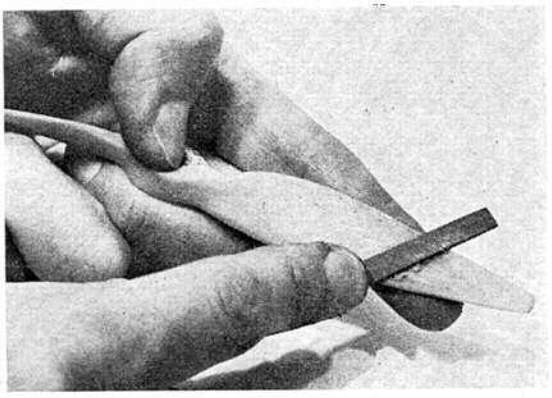
This is the most important operation in working up a prop. The rear face of both blades must be accurately flat from roots to tips. The 'grip' is illustrated in the photo, with one blade held in the palm of the hand, support the entire length of the blade to be flattened with the index finger so that it does not distort whilst the filing operation is performed. Now flatten the blade carefully using a small, fine file at a slight angle to the axis of the blade. It is vital during this flattening operation to continually check the pitch to see that it remains at the desired angle along each blade. With the back of both blades flat and of desired pitch, the prop is now almost finished.

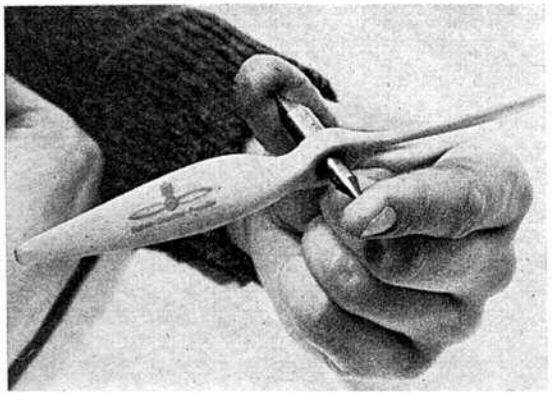
Step 3 – Work blades to section

The blades may still be quite thick and to finish them it is essential to work them down to a nice thin, uniform section. This thinness is important. For optional aerodynamic efficiency sharp entry, flat bottomed sections are necessary varying from about 10-12 per cent at the root to 5-6 per cent at the tip – a pair of small calipers can be very useful in gauging thickness. Again using the 'grip', supporting the blade with the index finger, patiently file the top surface only until the blade sections are as required. With a thick blade one can start off with quite a coarse file, but the final filing must be done with a fine file to avoid deep scratches in the finished prop.

Step 4 – Trim to diameter, balance and polish

Trimming to diameter is fairly self explanatory; again making use of the fine file to avoid splitting or fraying the tips. Both blades should be of the same length. Balancing can be a frustrating operation, but if you have a good eye or use calipers to get equal blade thicknesses on both blades, balance can be obtained quickly by sanding the top of the heavy blade using 400 grade wet-or-dry paper used wet. I use the American *PB Products* prop balancer to indicate balance as seen in the photo, the 'two razor blades, dowel and block' method is well known and equally effective if not so convenient to use. A well balanced prop is vital if model and motor destroying vibrations are to be avoided – a particular problem with our relatively heavy glass fibre props. The final operation is to polish and for this I use 600 grade wet-or-dry paper used wet. The very minimum of this sanding should be employed since the pitch and section can be damaged by enthusiastic over-sanding. Glass fibre props are resistant to all fuels so painting the prop with fuel proofer is unnecessary; I do not recommend fuel proofing because it can lead to prop unbalance and also inevitably increase blade thickness.





Above shows 'the grip' used when working on a prop – note how the index finger supports the blade while a small file is used to remove material. Below this is shown a simple type of prop balancer in use – this one being produced by PB Products in the U.S.A. Just hold lightly between thumb and forefinger: remarkably little friction present.

The prop is now finished except for making the centre mounting hole of the right diameter. I always ream to size using a series of reamers to bring up the hole diameter in small steps. This procedure avoids the hub splitting that can be caused by drilling. The mounting hole should be a light push-fit on the shaft; too tight a fit may cause prop damage and too large a hole re-introduces the risk of prop imbalance.

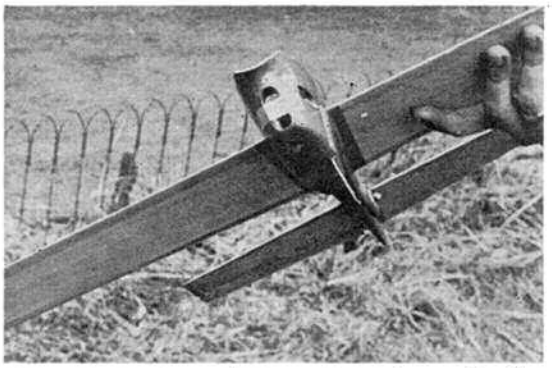
With practice this whole procedure, from Step 1 to finished prop, should take half to one hour – time well spent if the very best performance is desired.

Pitch-gauging Props the Cheap Way

We always read about the necessity of using a pitch gauge in re-working props if the best results are to be obtained and such an item is also very useful if you want to carve your own masters for moulding glass fibre props. The use of a pitch gauge on commercial props can also be quite an education – how many of you Goodyear fliers think you are using a 7 x 6 in. prop when you are actually using a 7 x 4 in. or 7 x 5 in.? Unfortunately commercial pitch gauges are very expensive indeed so a cheaper method is to be highly desired.

I use the method described below (which only requires a pencil, paper and a rule), for approximate pitch gauging. With care one can use this method to gauge pitch to an accuracy of some ¼ in. This accuracy is a great deal better than nothing and is, in fact, good enough for all but the most exacting purposes.

Draw a line on a piece of paper and then another line at 90° to this first line. Mark on back surface of the prop blade the stations at which the pitch is to be measured, each station to be a known distance from the centre of the mounting hole of the prop. On the first line drawn on the paper, mark positions at twice the prop stations. Hold the rule against the back blade of the prop with the top edge of the rule hard against the desired station and at 90° to the tip-to-



Well and truly plastered! The model that is, not the pilot. Over-cooling can affect performance just as much as over-heating – try 'tuning' the air duct on your model to see if speed and consistency can be improved. Then next time, take a little more care when designing the ducting of the cylinder head.

tip axis of the prop. Holding the prop and ruler vertical to the paper with the tip of the prop on the station mark on the paper, rotate the prop until the back face of the prop hub is in-line with the horizontal pencil line and mark off on the vertical line (B) where the rule crosses it. Repeat this procedure at the desired stations, marking the cross-point on the vertical line. Now measure the distance down the vertical line from the horizontal line to the cross-point and multiply this dimension by π (22/7 or 3.142): this is the pitch at the set station. I hope that the sketch explains all of this!

This is a fiddly 'three-handed' way of pitch gauging and unless one is careful, can be grossly inaccurate. However use of care and practice can obviate the necessity for a commercial pitch-gauge, which due to their limited market, are expensive. Those though who wish to achieve the accuracy and convenience of such a device, should contact Irvine Engines of Unit 8, Alston Works, Alston Road, High Barnet, Herts., who can supply these items, made by Emil Rumpel.

Tuning the Cooling System on Team Racers

I have been asked quite a few times why our K&B powered 'Sprint' team racer sometimes appears with a piece of sticky tape blocking off part of the cooling air intake and sometimes without it. This is not very easy to explain, but nevertheless I shall try! The effect of it is quite simple; in cold weather, it makes setting the compression a great deal easier. It took us quite some time to develop this 'trick', we only started doing it after Cranfield last year.

The symptoms we had been suffering from in cold weather were a 'burpy' start to the tank and a 'hard' finish. First we dropped the nitrate content of the fuel to 1½ per cent and this made it worse, so we increased the nitrate to 4 per cent and this partly cured it but brought its own problems, so we dropped back to a very standard 3 per cent – almost what we had started at. It was a totally new engine anyway and we had many other problems to solve besides this compression setting problem in cold weather. At Fairford and Bochum – both blessed with really hot weather – the motor was perfectly behaved and in fact really fast and could be set to give 33-35 laps, so when the motor was equally horrible at Elvington and Cranfield (both cold and wet) we correlated motor behaviour with air temperature. In other words, after Bochum we decided that the motor was being over-cooled in all but the hottest of weather conditions.

The weather at the Northern was terrible, being cold, wet and windy so expecting over-cooling problems, we borrowed a piece of sticky tape from John Barker (of Barker/Hill) and it worked. No setting problems, although a by now rather worn engine had meant us saying good-bye to our 33-35 lap range, and so we were second to Place/Haworth in the final. Shortly after at Wroughton, again in cold weather and again with the same piece of sticky tape on, we outclassed the field and won very easily indeed. Over-cooling theory confirmed! We looked forward to the Trials with confidence because we suspected that, due to its late date, the weather at the Trials would be cold.

As suspected the weather at the trials was cold. By now the original sticky tape had deteriorated so it was replaced by a larger piece (we had none of the same type as the original). This proved to be a mistake in retrospect because, at the Trials, every time I was 'blocked' in the middle (and this occurred almost continuously in every race), the motor overheated slightly and slowed down. At the time we knew something was wrong but other problems (like the model falling to bits) seemed more important and took all of our efforts. At Topcliffe this year, we had a smaller piece of tape in position and, in the cold prevailing conditions, the motor behaved perfectly even though it had been rebored a matter of hours before the race.

The picture is clear for us now with respect to our old *Sprint* model. My new *Sprint* is having smaller duct sizes so tape may never be necessary. But if we do start getting over- or under-cooling symptoms, we now know what to do.

I have explained about the tape in a story fashion because, not only does it explain some of our ups and downs last year, but it also illustrates how we learnt from our experiences – a process which has been going on ever since John and I started competitive racing in 1970.

Nationals 1974

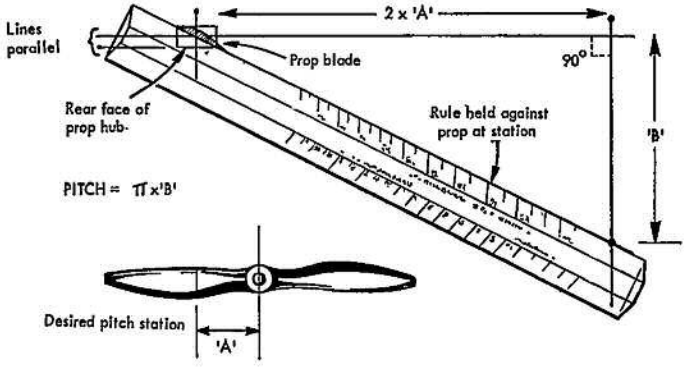
At the time of writing it is not known where the SMAE will be organising the 1974 Nationals. This is because airfields are hard to find due to the current security situation and the fact that few airfields are suitable for free flight as well as C/L plus R/C. I sincerely hope that we will have a Nationals in 1974 because in recent times our Continental friends have been coming to the Nationals in increasing numbers, particularly in Combat and FAI Team Racing. Not to be forgotten is the fact that the 1973 Nationals Goodyear winner was Konrad Kaul in his first such event setting up new records for both heat and final times in doing so! Also last year we had virtually the full Danish, Dutch and German national teams competing in FAI Team Race. I regard this foreign competition as being of high value to we locals – no one can deny that Schwarz/Kaul's victory in FAI in 1971 was one of the most influential, with respect to model design, pitting technique and race strategy, of recent years. We should expect a similar foreign invasion this year including, perhaps, competitors from South Africa and Finland and the results of such an invasion must again be salutary!

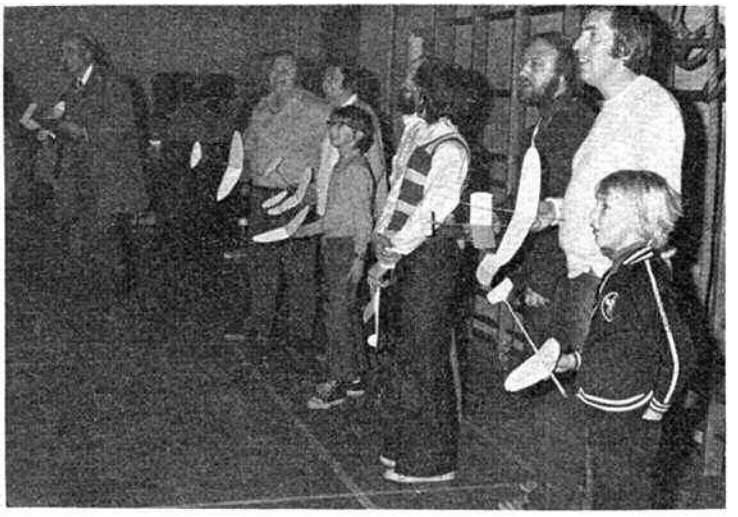
Of course, even with this doubt hanging over us, we must go ahead and make full arrangements for the holding of the Nationals and the most important at this time is finding event organisers. I do not think that anyone would like a repeat of the procedure gone through in 1973 to find an organiser for FAI Team Race (if you remember, a great deal of arm twisting was necessary).

The two problem events are, of course, Goodyear and FAI Team Race. Goodyear because of the usual massive entry which makes it difficult to complete the event in one day, and FAI Team Race because of the high and consistent standard of rule enforcement that must be applied. This is not to say that finding organisers for the other events is easy; of all the C/L events, only ½A Team Race has, to my knowledge, an organiser at this time. As an incentive to ensure the provision of event organisers in sufficient time, the SMAE has set a dead-line of 14th May. If after this date no organiser exists for any event, then *the event will not be run*. A bit harsh perhaps, but possibly the only way of ensuring that event organisers will come forward in time for the necessary arrangements to be made with respect to facilities, etc., as required by organisers.

Please, anyone who feels that he alone or with friends can help in the organisation, or indeed handle the organisation of one whole event, write in and volunteer your services. The SMAE is not really ungenerous to organisers and so fiscal penalty is not involved. The person to write to is: C/L Technical Committee Chairman, Doug Blake, 104 Laughton Road, Middx.

Diagram of Pitch Measuring technique.





FREE-FLIGHT COMMENT

by John O'Donnell

WEATHER CONDITIONS this winter have been windy enough to discourage outdoor flying in any quantity. Paradoxically the handful of winter rallies held over recent weeks were remarkably lucky in their choice of dates – as will be seen from the reports that follow.

Near gales in the few days preceding the **Falcons Gala**, held at R.A.F. Chetwynd on 2nd December, must have had the organisers worried about their policy of guaranteed prizes. Consisting of an eye-catching array of pre-engraved cups, the awards represented a sizable investment, not to mention considerable confidence in the anticipated attendance. Whatever one might like in the way of reward there can be no doubt that a definite 'prize list' is a greater incentive than the mere redistribution of entry fees that is so often encountered.

Early arrivals at Chetwynd found very cold, calm conditions that were ideally suited for flying Open Rubber models. There proved to be some quite noticeable drift at altitude – but not sufficient to give any retrieval or time-keeping problems. Trebles were almost a formality, as evidence by there being only four flights (out of 14 fliers) under the three minute max. Power was nearly as easy, and the resultant five-way fly-off could (and should) have had some additional participants.

In comparison the Open Glider event was distinguished by a marked absence of maxs, apart from a brief spell in early afternoon as the wind drift started to increase. Lift was not only sparse – but also short lived which handicapped the tactical exponents. Despite the allowing (and use) of re-entry, no one managed to string together three maxs, and I eventually won the event with an 8:50 total. Perhaps I should admit that I was one of the re-entrants! Runner-up was Al Wisher flying a ten ft. 24 oz. model quite early in the day for a total of 8:31. This was just a single second ahead of Ivan Taylor, a recent recruit to the host club. Pete Redhead and John Boon made the next best scores, but discarded them in the vain hopes of improvement via re-entry.

The Open Rubber fly-off was the sort often quoted by critics of this event. Increased drift and indifferent visibility (compared with earlier in the day) caused most flights to disappear o.o.s. in 3½ to 4 minutes or so. Top by almost a clear half minute was Norman Elliott with an ancient model, veteran of many fly-offs a decade ago but only now winning them. Second and third were John Carter and Russell Peers with scores just on the four minute mark. Their margin of visibility over the rest of the opposition is attributable to having a little more wing area and plenty of 'day-glow' paint.

There was little doubt about the Power fly-off. Two of the contenders, Pete Harris and John Bailey, suffered over-runs and eliminated themselves in the process. Ray Monks, observing that the wind was stronger at altitude, opted for a short run in the hopes that good air and less drift might provide a winning combination. This failed to 'come off' and a score of only 3:39 resulted. Russell Peers used his K&B 40R model throughout and made a respectable 4:47 decider. Arriving back from his third max as the fly-off was under way, Doug Scott made no mistakes getting his G15/19 *Dixielander* style model away to a good climb and a winning five minute score.

Run as part of the Gala was the Wigan Club's annual winter chuck glider contest! For the past few years this has been held as a separate single-event meeting near the club's home town – but had suffered from some fall-off in participation as specialisation and expertise began to dominate the results. This year, combination with the Falcons Gala was tried – but this could hardly be considered a resounding success. Amalgamation of events invariably results in one or other taking precedence. In this case the event became little more than another Gala category.

Nevertheless competition was keen amongst the eleven entries, and scores were high in consequence. Winner was Ewan Jones, all the way from Sunderland, with 5:34 for his best five from nine. Maximum used was 90 seconds (compared with the minute now used by the S.M.A.E. with its recently revised rules for this class. Now it's five-from-nine for national events as well as elsewhere.) Runner-up was Roy Roberts, just ahead of Phil Ball at around 4½ minutes.

* * *

The traditional Boxing Day competition at Chobham Common was run on this occasion by the Cookham club. Their P.R.O. Geoff Smith sent a report and results, whilst Martin Dilly supplied photographs.

Heading picture shows the line-up of chuck glider entrants at the first Liverpool Indoor Meeting – suitably attired youngster in the foreground is Robert Duce, son of the well-known free-flighter Mike (standing next to him), who eventually won the event.

Jack North, of the Croydon club, has difficulties with the tailplane as he launches Alan Wisher's 10 ft. span Open Class glider at the Crookham Gala.

Peter Brannigan (left) with his Andrews-influenced 'Easy B' entry at the first Liverpool meet – uses the jig to align the offset tail boom. Above, Pete Redhead flying in the same event, favoured ground-level launches. Placed second. At right, winner of both indoor chuck glider events at Liverpool, Mike Duce. Model is fantastically light – 4 grams.

Considering the time of year the weather was very good – quite mild, no measurable wind, and only the slightest traces of lift. Consequently there were no retrieving or timekeeping problems (despite the inevitable comments regarding the effects of seasonal refreshments at lunch-time).

An informal atmosphere prevailed – and extended to unlimited re-entry. This proved popular in glider, the best supported event with 21 entries. At first Phil Ireland seemed a likely winner with 8:34, flying a somewhat enlarged *Caprice*, only to be overtaken by Al Wisher's monster Incidentally on his first entry Al recorded three successive flights of 2:25, a remarkable example of consistency! Late in the day Colin Morris completed what was the only full house in the event and emerged as the clearcut winner.

Combined mini was also hard fought, with Ian Kaynes and Cliff James joustling for first place. Eventually Ian's total of 9:39 proved to be sufficient by just a single second. Both were flying A/1 gliders, whilst third place went to John Buskell's Coupe d'hiver.

Open Rubber was a flyover for Trevor Grey who made the full quota of three maxs – two more than I would have bothered with in similar circumstances! Open Power was also poorly supported with but three participants. Father and son, Fred and Andrew Chilton took the events. Fred's model was involved in an unfortunate incident when it landed very close to the road causing one passing car to swerve into another, luckily without causing any injuries.

Despite travel and petrol difficulties having restricted attendance to the London and Southern Area stalwarts, this meeting was reckoned to be most enjoyable.

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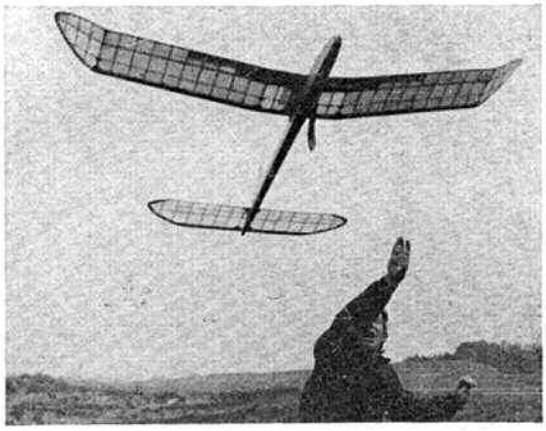
One of the few innovations in the free flight side of the 1974 S.M.A.E. Contest Calendar was the introduction of a Winter area centralised meeting. Scheduled for 13th January, events comprised chuck glider and the three mini classes.



Although the basic concept has its merits, the choice of date could hardly have been worse. Participation for all practical purposes demands S.M.A.E. membership, the renewed date for which is 1st January! Since fees were revised by the A.G.M. only a month earlier, the necessary documentation could not be issued to existing members until the latter half of December. Furthermore it was requested that clubs rejoin 'en bloc'. Finally, membership had to be obtained prior to applying for contest licences. No part of this situation is conducive to a good entry for a January contest.

The Northern Area took the opportunity to combine their Winter Rally with the area centralised events, and to run the whole affair at Topcliffe (now under the auspices of the Army as Topcliffe Barracks) on an 'open-to-all-areas' basis In view of the membership difficulties mentioned already I was agreeably surprised at the attendance and gather that many of those there were flying 'on credit' in that their membership was still being processed. Certainly I was the only person present with a 'contest' licence. Obtaining this in time had demanded that my club sacrifice its voting strength to affiliate its contest minded members before Christmas – plus some prompt work by both the S.M.A.E. and Whitefield's secretary. I cannot see how this procedure can be expected to work in such haste on a large scale.

Topcliffe was very lucky with the weather on this occasion When flying commenced at 10 o'clock there was broken cloud but only a light breeze. Increased overcast brought showers around mid-day but this cleared to give a bright but breezy afternoon. From what I've heard this was vastly superior to conditions further South.

With a programme of eight different free-flight events (four S.M.A.E. plus four different Gala classes) participation at Topcliffe was diluted to a mere handful in some categories.

Best supported of all events was that for Open Glider, attracting 16 entries plus two re-entries. Considering the weather, scores were remarkable only for being low. Perhaps the lift was too short-lived to provide real thermals, certainly this was the case for my own flights, all of which came down before D/Ting. Nevertheless my 8:35 total was enough to win by nearly a minute – the A/2 used is ten-years-old this summer! Runner-up was Alan Williams of Grantham just a few seconds ahead of Tony Cordes.

Open Power started off with Russell Peers being forced to re-enter following a very poor flight, attributed to a sick motor run! He then went on to record a treble – and win without need to fly-off. Second was Alan Brown of Sunderland, followed by Doug Scott and Mike Hargreaves. All three had two maxs apiece, but very indifferent 'odd' flights

There was little interest in Open Rubber until late in the day when George Jennings and Paul Lester put in three flights apiece to take the top two placings out of an entry of only four. Even this was better than that for the Vintage Duration event, where only Ewan Jones and John Turner completed. Ewan won but had to enter twice, flying both a *Super Phoenix* and a *Mallard*. The long engine runs permitted gave him the edge over John's *Satu* and its 250 ft. towline.

S.M.A.E. Competition Secretary Ian Bracken releases Peter Jellis' A/2 at the Crookham Gala. Model is perhaps somewhat unusual for showing little regard to modern trends. . . .!

I would like to be able to report the outcome of the S.M.A.E. events as well – but with the advancement of 'press date' (to suit power limitations at the printers) the National results are still unavailable. Nevertheless I would suspect that the scores recorded at Topcliffe by Tony Cordes (A/1), Ewan Jones (chuck glider), Jim Moseley (½A) and myself (Cd'H) will be more than useful!

* * *

There are alternatives to fighting the weather; and indoor flying is an obvious suggestion – particularly at this time of year. Small halls of the school or sports varieties are not that difficult to obtain and can offer worthwhile flying and competition at a level likely to appeal to a wider audience than that of the expert's paradise of Cardington.

I have been over this low ceiling philosophy before, so I will avoid reiteration here. Suffice is to say that such events proved successful in the North West last Winter, and have continued this winter with even more participants. These events have been run on a competitive basis – and perhaps this gives some clue to their success. In comparison I understand that similar meetings at Brize Norton are essentially non-competitive. Factual information is however not available to me.

Liverpool and D.M.A.S. have held two meetings in the YMCA Sports Hall, Southport, this winter. The first was on 9th December and was supported to the tune of double-figure entries in each of the three events held – Easy B rubber, Chuck Glider, and what has become known as 'Keyhole' scale. The last title is attributed to American Bob Stalick and covers an event with more emphasis on flying than scale detail, and without the size limitations of 'Peanut'.

'Easy B' suffered from 'hang-ups' in the small hall (82 x 50 x 23 ft. high to the girders). Pete Redhead and I were using torque meters and could at least judge height attained to some degree. In the end I managed to beat Pete, thanks to getting in a six minute plus flight. Main opposition was provided by Pete Brannigan (late editor of the now defunct *Message)* with his Pete Andrews influenced design.

Mike Duce proved an easy winner in chuck glider with a model designed specifically for the hall. Extremely light weight was its secret, attained through use of a ¼ in. x 1/16 in balsa fuselage, .020 tail surfaces, etc. Best flight was 26.2 seconds after a set of officials that totalled 68.8 seconds. Runner-up was Barry Kershaw, closely followed by Brian Picken.

The scale event caused some controversy as it was won by Dave Barnes with a *Volksplane.* This was criticised as resembling an open rubber model rather than 'The real thing'. It was completely without detail but flew well, both in manner and time (28 seconds). In fact it could easily have been beaten if some of the 'better' scale models had been trimmed sufficiently to fly for 15 seconds or so. Second place went to Dave's father Joe with a *Pietenpol Air Camper,* and third to Mike Reeves with his SE5.

The second meeting at Southport was held on 3rd February, and was obviously very similar to its predecessor. There were even more people present, almost to the extent of over-crowding. Certainly the amount of movement 'to and fro' made for very draughty flying conditions. Times, especially in Easy B, suffered in consequence.

I managed to repeat my top position in this rubber duration event, despite numerous collisions with the walls and one 'mid-air' with Pete Redhead's model. Although no damage resulted, this incident cost him much valuable time and a drop to third place behind Dave Barnes.

The expected opposition from Peter Brannigan failed to materialise as his model remained lodged on one of the roof girders for part of the afternoon. When eventually poked loose (with a number of joined together sticks waved by Brian Picken) it drifted onto a wet window ledge. The resultant warps as the tissue dried out finished off Peter's hopes with that model.

Another repeat win was seen in Chuck Glider with Mike Duce again filling the top spot, this time with a two flight total of 48:3 seconds. Timing to tenths of seconds was found to be necessary very early last winter! Runner-up was Dave Yates with two identical flights of 21 seconds apiece, whilst Brian Picken was little behind at third position.

Scale was run as two events in an attempt to satisfy the differing viewpoints of the 'flying' and 'scale' protagonists. Without pre-empting what will be said elsewhere, I can report that Joe Barnes won 'Keyhole' with his *Air-Camper* with Eric Herbert runner-up with a much detailed *Fournier.* The same two models then placed in the reverse order in the less popular 'S.M.A.E. rules' event a clear indication of where the rules place their emphasis.

Participation in more than one event is clearly popular and was encouraged by the presentation just prior to this meeting of a genuine pre-war trophy to be decided on the best overall performance at these indoor meetings. There promises to be lots of interest on this score alone for the 3rd and final meeting of this winter series. I am sure there are lessons to be learnt that could apply elsewhere.

Results

LIVERPOOL INDOOR MEETING, Y.M.C.A. SOUTHPORT, 9th December 1973
Easy B Rubber (11 entries, total of best 2 flights): 1. J. O'Donnell (Whitefield) 10:56 2. P. Redhead (Westfield) 10:03 3. P. Brannigan (Liverpool) 9:52. **Chuck Glider** (14 entries, total of best 3 from 10): 1. M. Duce (Liverpool) 68.8 seconds; 2. B. Kershaw (Wigan) 63.0 seconds; 3. B. Picken (West Lancs.) 62.0 seconds. **Scale Rubber** (14 entries): 1. D. Barnes (Liverpool); 2. J. Barnes (Liverpool); 3. M. C. Reeves (Whitefield).

FALCONS GALA, CHETWYND, 20th December 1973
Open Rubber (13 entries, 11 in fly-off): 1. N. Elliott (Croydon) 9:00+4:30; 2. J. Carter (Falcons) M+4:03; 3. R. Peers (Falcons) M+4:00. **Open Glider** (30 entries): 1. J. O'Donnell (Whitefield) 8:50; 2. A. Wisher (Croydon) 8:31; 3. I. Taylor (Falcons) 8:30. **Open Power** (10 entries, 5 in fly-off): 1. D. Scott Morley) 9:00+4:59; 2. R. Peers (Falcons) M+4:47; 3. R. Monks (Birmingham) M+3:39. **Chuck Glider** (11 entries): 1. E. B. Jones (Sunderland) 5:34; 2. R. Roberts (Wigan) 4:31; 3. P. Gall (C/M) 4:29. **Top Junior:** D. Barnes (Liverpool) 3:53.

CROOKHAM BOXING DAY F/F MEET, Chobham Common, 26th December, 1973.
Open Glider (21 entries): 1, C. Morris (St. Albans), 9:00; 2, A. Wisher (Croydon), 8:43; 3, P. Ireland (Southampton), 8:34. **Combined Mini** (12 entries): 1, I. Kaynes (Croydon), 9:40; 2, C. James (Hayes), 9:39; 3, J. Buskell (St. Albans), 9:25. **Open Power** (3 entries): 1, F. Chilton (Crookham), 8:50; 2, A. Chilton (Crookham), 8:09; 3, P. Buskell (St. Albans), 6:00. **Open Rubber** (1 entry): 1, T. Grey (Sittingbourne), 9:00.

NORTHERN AREA WINTER RALLY, Topcliffe, 13th January, 1974.
Open Glider (16 + 2 entries): 1, J. O'Donnell (Whitefield), 8:35; 2, A. William (Grantham), 7:38; 3, A. Cordes (Leeds), 7:32. **Open Power** (10 + 1 entries): 1, R. Peers (Falcons), 9:00; 2, A. Brown (Sunderland), 8:07; 3, D. Scott (Morley), 7:52. **Open Rubber** (4 entries): 1, G. Jennings (Leeds), 8:37; 2, P. Lester (York), 7:58; 3, B. Kenny (Vulcan), 2:26. **Vintage Duration** (2 + 1 entries): 1, E. B. Jones (Sunderland), 8:08; 2, J. Turner (Darlington), 7:02.

2nd LIVERPOOL INDOOR MEETING, Y.M.C.A. Southport, 3rd February, 1974.
Easy B. Rubber (13 entries – Total of best 2 flights): 1, J. O'Donnell (Whitefield), 9:10; 2, D. Barnes (Liverpool), 8:31; 3, P. Redhead (Whitefield), 8.10. **Chuck Glider** (20 entries – Best 2 from 9): 1, M. Duce (Liverpool), 48:3 seconds; 2, D. Yates (Wigan), 42 seconds; 3, B. Picken (West Lancs), 41:4 seconds. **'Keyhole' Scale** (7 entries): 1, J. Barnes (Liverpool); 2, E. Herbert (Blackburn); 3, M. Duce (Liverpool). **S.M.A.E. Scale** (3 entries): 1, E. Herbert (Blackburn); 2, M. C. Reeves (Whitefield); 3, J. Barnes (Liverpool).

Scale judge Arthur Searl had a pleasant task judging the 14 entries in the indoor scale event at the first Liverpool Meeting. Significant perhaps that this is better than any normal 'outdoor' event can muster?

FRANK SMART describes his 'do-it-yourself' approach to

MOULDED LEADING EDGES

AFTER THE 1973 Nationals the Glevum (Gloucester) combat team began to put their thoughts together on some special models suitable for the coming Dutch International, where previous experience had taught us that smaller and lighter models would be required for their calmer conditions.

Mick Lewis was the only person in the team fortunate enough to acquire some very light RipMax pre-moulded leading edges, so with time running out, I decided to make some.

First thoughts were directed at the A.P.S. *Ruteress* design which has a balsa front spar and 1/16 in. balsa sheet covering, but I wanted something which would be made as an independent unit so that I could build up several at a time and 'mass produce' wings. Eventually, the following procedure was adopted and six 1 in. leading edges were made, using a 3/16 in. square spruce spar up front instead of balsa, and with 1/16 in. light balsa sheeting to all three faces, finally double wrapped in lightweight tissue. These models were to be kept for the closing rounds should we be fortunate enough to get that far!

All up weight of the *Superfly* design was around 5¼ oz., the leading edges being ¼ oz. finished. With a Copeman tuned Oliver Tiger up front and a total weight of 12 oz., the model really went with a considerably increased turning ability – hardly bricks on strings!!! However, the leading edges were still not strong enough to withstand more than two rounds of high speed manoeuvres and the stronger ones illustrated here have now been produced with just a slight increase in weight, providing a reasonable selection of wood.

Making the Jig

First we require a good flat baseboard of 1 in. or ¾ in. marine plywood, some 3 ft. long with a width to suit the number of 'recesses' required; I found four sufficient.

Now make two hardwood spacing strips to be used later as leading edge removing tools, easing the L.E. from the jig when set. These spacing strips should be the same width as the finished leading edge's final depth, ¼ in. wide and 40 in. long so as to project from each end of the jig.

When machine planing the spacing strip (1⅛ in. wide to suit Oliver Tiger bearer spacing), machine to size 1⅛ in. x ¼ in. battens in hardwood, with sufficient run through to have, say, four spare ones so that the early stages of L.E. construction may be assembled on them before reaching the jig. (These building battens should be clearly marked for the position of all ribs, 'inboard' and 'outboard' halves, etc.)

Using the spacer, fix the battens to the ply baseboard with screws at 4 in. centres, but do not glue as you may wish to change the spacing at a later stage. If thick ply is unobtainable, prevent warping of the baseboard by battening on both sides at the same spacings, and keep the jig in a constant temperature, away from damp. Figure 6 clearly shows the jig construction.

Building Sequence

a) Carefully prepare a 1 mm. plywood former template, then using this, cut out the required number of formers from balsa strips slightly wider than the template, keeping the surplus shapes for internal gussets if required (see illustration). Mark all formers on one face as you cut them out, then line up using a short length of 3/16 in. sq. spruce in the leading edge cut-out, pin together sandwich method and mark (in the order that they will fit the model). Lightly sand the straight surface followed by the curved surfaces to remove any unevenness.

b) Cut ¼ in. thick balsa back spar to length (width to suit your section) and pin ready marked hardwood batten.

c) Using fast setting epoxy, glue all formers in positions indicated on sides of hardwood batten (Stage 2) then slot the ¼ in. balsa back spar at the extreme ends to take the thickness of the tip pieces to be added to the model later.

d) Select a straight 3/16 in. square spruce spar and epoxy into 'V' cuts in formers, allowing sufficient overhang at each end to accept the tips. Hold spar in position with small elastic bands at each former, then remove pins. (Small gussets can now be added using P.V.A. glue, if additional strength is required – Stage 3.)

e) When all is set, remove from hardwood batten, cut strips of balsa sheet of required thickness to a width just sufficient to overlap the back spar when pushed into the jig. The sheet is then glued with 10 min. epoxy in two stages (Stages 4-5) and when set the surplus balsa is planed and sanded back to the spruce spar (Stage 5) so that the unit will seat squarely in the jig. A note here; do not use P.V.A. glue on the spar as the sheeting will spring apart when damped later.

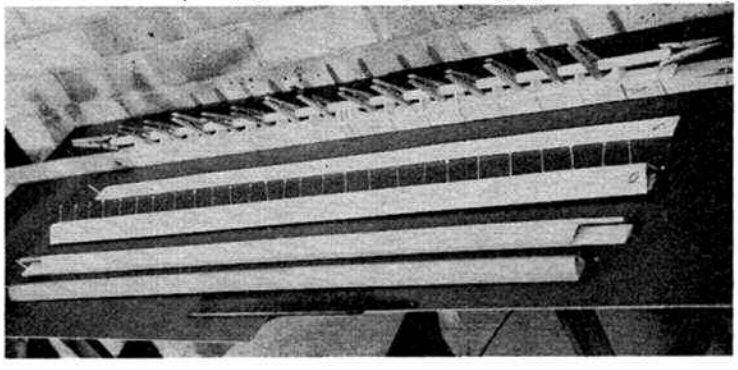
f) At this stage, have a 'dummy run' at the jig to make sure all is well, as balsa thicknesses do vary. Do not glue, but dampen sheeting internally with water applied via a soft brush – this will help the forming.

g) When satisfied (make sure rib positions are marked on back spar before fitting to jig) commence applying P.V.A. glue to all formers, working from the spruce spar backwards and using a hard balsa wedge to get the glue into the front. Leave the two long edges of the back spar till last. Using a long strip of hardwood engine bearers or similar, press the unit into the jig: this gives even pressure and prevents damage if thinner balsa is used. Remove surplus P.V.A. glue with square edged balsa scrap or damp rag.

h) Leave overnight, then remove from jig with the hardwood strip, trim ends off sheet leaving spruce spar and balsa back spar projecting from ends to accept the tips. If extra strength is required, add tissue doped on, using sanding sealer first (Stage 7). However, if Solarfilm covering is to be used, do not tissue cover as bubbling is caused when ironing the film on and can look unsightly. If spruce back spars are not to be used on the model, it is advised that twin ¼ in. x 1/16 in. spruce spars in short lengths be added over the centre five ribs.

j) One final note. Accuracy in all marking up, so that rib/formers line up properly, etc., will pay dividends in increased strength, and the selection of wood should be as careful as that for the rest of the model, with the heaviest on the outboard.

Leading edges in the process of being formed. In the background may be seen the formers glued to the backing sheet, resting on the softwood support, and with clothes pegs clamping half of the sheeting to the spruce spar. The formers used should correspond with wing rib positions plus one between each rib to prevent the balsa sheeting from 'sagging'.

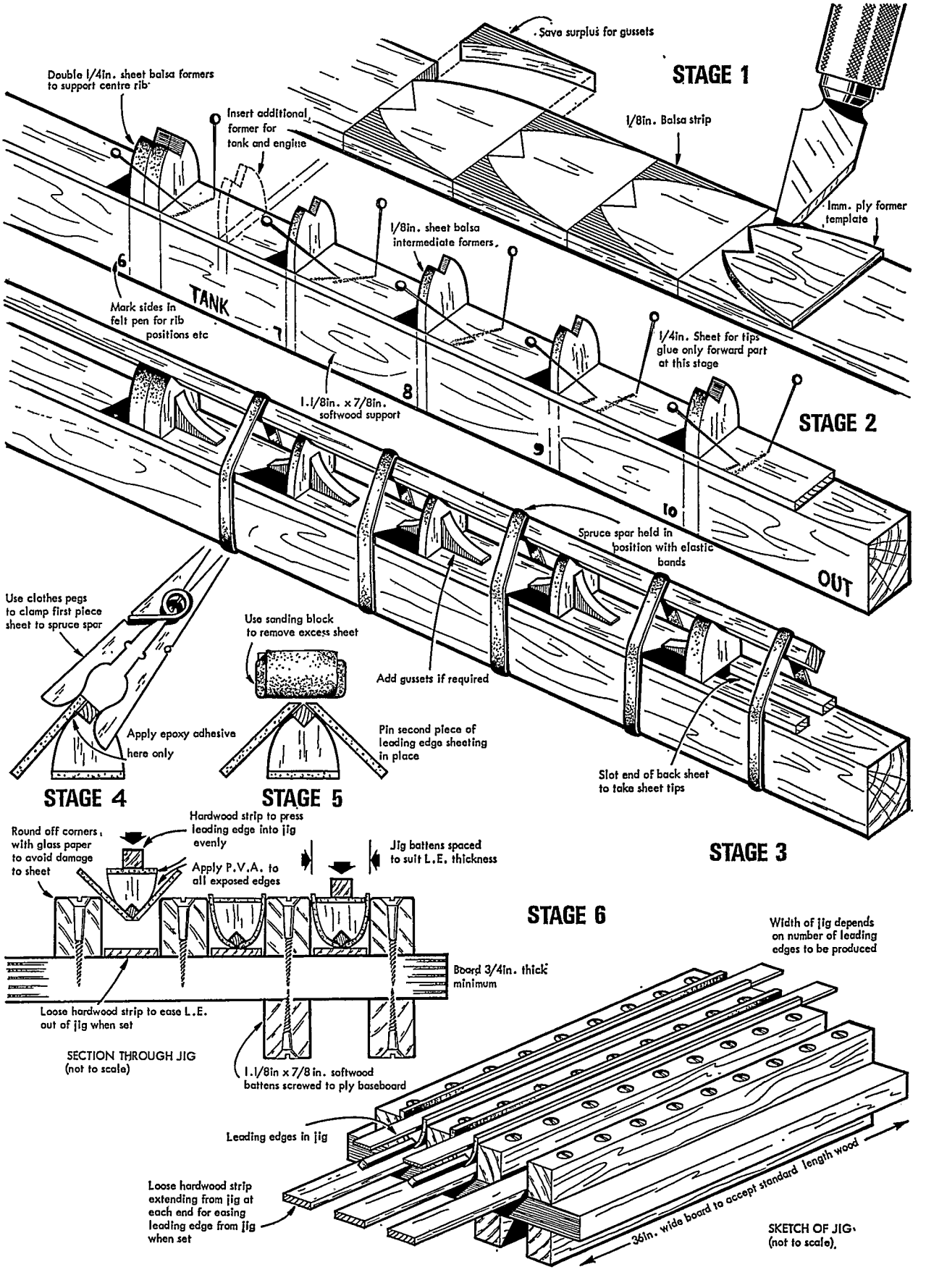


Advantages and Disadvantages

Basically, there are more good points than bad! Leading edges can be made to suit your particular model, rather than you having to design a model to suit stock leading edge sizes. Also, sheet balsa is far cheaper than 1 in. square or moulded sections, and there is a far better possibility of finding the correct grade of sheet as the choice is greater!

Jig built leading edges are fairly strong, light and very straight – a finished L.E. can be left in the jig until required to fit the airframe, and of course the formers guarantee a true section without the mess of carving and sanding. Two leading edges can be easily produced in an evening, after one has of course made the jig – no doubt the biggest drawback. However, this is very simple, and your local do-it-yourself supplier can easily machine

continued on page 193

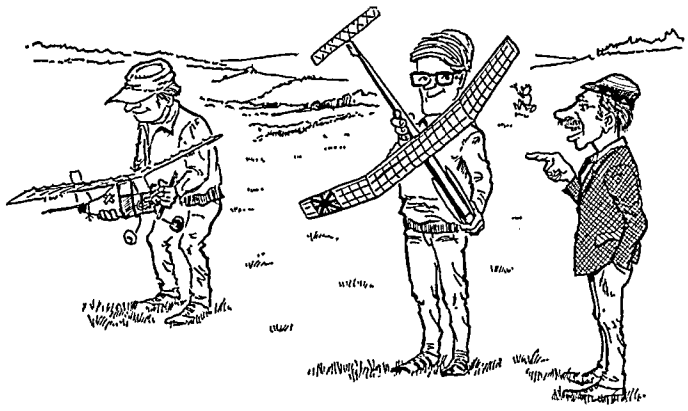

Save surplus for gussets
STAGE 1
Double 1/4in. sheet balsa formers to support centre rib
Insert additional former for tank and engine
1/8in. Balsa strip
1mm. ply former template
1/8in. sheet balsa intermediate formers
TANK
6
7
8
9
10
Mark sides in felt pen for rib positions etc
1/4in. Sheet for tips glue only forward part at this stage
1.1/8in. x 7/8in. softwood support
STAGE 2
Spruce spar held in position with elastic bands
OUT
Use clothes pegs to clamp first piece sheet to spruce spar
Use sanding block to remove excess sheet
Add gussets if required
Apply epoxy adhesive here only
Pin second piece of leading edge sheeting in place
Slot end of back sheet to take sheet tips
STAGE 4
STAGE 5
STAGE 3
Round off corners with glass paper to avoid damage to sheet
Hardwood strip to press leading edge into jig evenly
Apply P.V.A. to all exposed edges
Jig battens spaced to suit L.E. thickness
STAGE 6
Width of jig depends on number of leading edges to be produced
Board 3/4in. thick minimum
Loose hardwood strip to ease L.E. out of jig when set
SECTION THROUGH JIG (not to scale)
1.1/8in x 7/8 in. softwood battens screwed to ply baseboard
Leading edges in jig
Loose hardwood strip extending from jig at each end for easing leading edge from jig when set
36in. wide board to accept standard length wood
SKETCH OF JIG (not to scale).

Aero Modeller

topical twists

by 'Pylonius'

illustrated by Sherry



'I suppose that after learning on these elastic band models you go on to power models like that.'

Permission Society

At one time planning permission applied only to structures and establishments, but now we see it applies to human activities. It is not sufficient that you find a place to fly your models – hard enough – with all contracts legally drawn up and so forth, you now have to get planning permission before you can get that first chuck glider airborne. From free-flight modelling we have progressed through radio-controlled modelling to state-controlled modelling. The way things are going the day may not be far off when we have to submit an application form in triplicate before making a model flight. This would be costly in time, money, ballpoint pen refills (useful for making model steam engines, etc.) and red tape. But say that after wading through all that bureaucratic bilge the model were to crash. In that case you would not only have to submit reports to at least four Ministries, the local and county councils, the Chief Constable, the Fire Chief and Pan's People, you would have to lose time off work attending the public inquiry. And don't forget, too, that even after getting planning permission it may be found that you are illegally operating a kite or similar elevated obstruction within 30 miles of an airfield. . . .

Just Stick It Up

We live, I am told, in an affluent society, which means, generally, that people have more money to spend than the sense to spend it with. This appears to apply to model flying – or rather hoped for model flying – as well as anything else. I came to this conclusion after seeing two fit-the-parts-together models on sale at a number of pounds per time. Now, as one who can claim some expertise in the crashability of models, the two 'kits' in question were to my wary eye both candidates for the wooden spoon, except that one at least would hardly have got sufficiently airborne to have hit the deck from a crashable height. But even these seemed quite good value to a certain ready-made, and widely-advertised, model I saw on a shop display stand. At first I thought it was a child's plastic windmill, but a closer inspection revealed that the illusion was caused by a truly colossal wing warp.

Still, perhaps we should be thankful for this. Now that model flying space is in such short supply, it would be in even shorter supply if the mass-produced, ready – or nearly – to fly models really flew. You would have to put down your name at birth to get in a flight on the crowded open spaces.

When you consider, though, that a piece of 1/32nd packing can make the vital difference between a successful flight and a heap of matchwood you have to accept that aeromodelling is for aeromodellers and not for affluent types in search of momentary diversions.

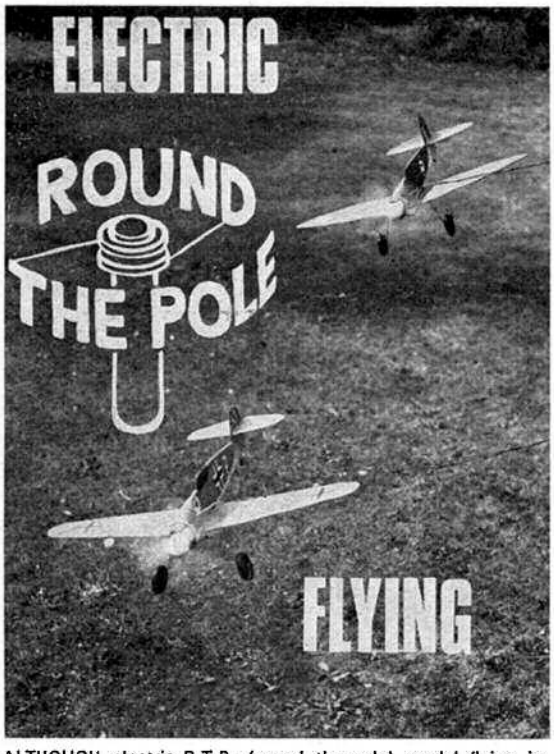
Arithmetic of Failure

The thing that sets a model aircraft apart from all other forms of functional model craft is its essential prangability. Build a model ship and you can start thinking in terms of your great great grandson taking the masterpiece into his eager little hands after it has voyaged through a series of dusty attics, but the model plane has the finger of doom upon it from the word go, being always a heartbeat away from disaster. To make matters worse the prangability factor increases by the square of the balsawood used and probably by the cube of the man hours involved in producing it. Build a simple glider and it will ultimately expire of woodworm, but the super scale model gets a veteran tag if it hairily survives its maiden flight, and, as for the multi-engine models, they always attract a faithful band of ghoulish followers who are ever hoping that the next flight will be the last one. As for the dope and trimmings it can be said that the more spectacular the finish the more spectacular the finish.

Shop Talk

We read of someone recently retiring from the model trade after seeing through a whole evolutionary cycle from the wind-it-up-shilling-a-time primitivism of 1938 to today's press-button-thirty-quid-a-time-minus-engine-and-electronics decadence. I don't suppose there was all that money to be made in the business when man was content with a 2/6d kit or a year's supply of balsawood at five bob, but the retailer no doubt had the satisfaction of popping over to the local park or common to see his products getting a companionable airing, but as what he dispensed became less hard, workroom material and more what our American friends call 'goodies' the amount of airborne activity he was likely to see in his locality must have steadily diminished.

I am basing these observations on the various model flying areas, particularly the local common, where I threw my bits of balsa and tish about in those days when a model kit cost the price of a packet of fags, and when neither was considered dangerous to health. On these hallowed places were always to be found (Sundays I mean) a group of harmless and happy model flyers, but I have noticed that, as the model trade became more prosperous, fewer and fewer model flyers were to be seen at their pleasures, and now that 20 quid kits and second mortgage priced radios are selling like hot cakes, and flying similarly, the only life to be seen on the common are people on horses and only-too-obvious members of the permissive society. I am told, though, that if I were to make a 30-mile journey into the rural hinterland I might be lucky enough to actually see a model plane in flight – and a radio one at that – but I waver when I think of the cost in petrol.



A form of model flying that is quiet, clean, relatively cheap, needs little space to operate and yet above all is fun sounds too good to be true. It isn't! HARRY BUTLER explains his approach.

ALTHOUGH electric R.T.P. (round the pole) model flying is not new, indeed working models have been part of the *Model Engineer Exhibition* on a fairly regular basis since 1945, this branch of our hobby has been somewhat slow to 'catch on'. From conversations the writer has had with a cross section of uninitiated modellers, it would appear that many feel the end product, i.e. model performance, is very restricted and the effort of getting a model airborne hardly worth while. Nothing, of course, could be further from the truth. As many visitors to the 1974 *Model Engineer Exhibition* will confirm, looping, and a wide range of similar manoeuvres approaching those performed by internal combustion engined control line models, are now possible.

Experience has shown that line lengths of 40 feet and above are quite feasible and the range of model types, and sizes, virtually limitless. Multi-engined models present no special problems and the inclusion of landing light, retractable undercarriages and a host of other 'working features', can be built in – limited only by a modeller's ability.

Probably the most attractive feature with electric R.T.P. is its versatility. Besides satisfying the needs of the fastidious and experienced modeller, it can also play a vital part in introducing a youngster, or indeed modelling newcomer of any age, to aeromodelling. Firstly costs can be kept within reasonable bounds, once the basic equipment (i.e. pole, transformer and rheostat) have been purchased, reasonable treatment will return many years of trouble-free usage. The beginner's model may be a simple profile all-sheet balsa type, capable of withstanding hard knocks and simple to repair. This may be exchanged in a few seconds for any number of other model types, from super-scale to speed or aerobatic types. All use the same basic equipment, the only change being the actual model.

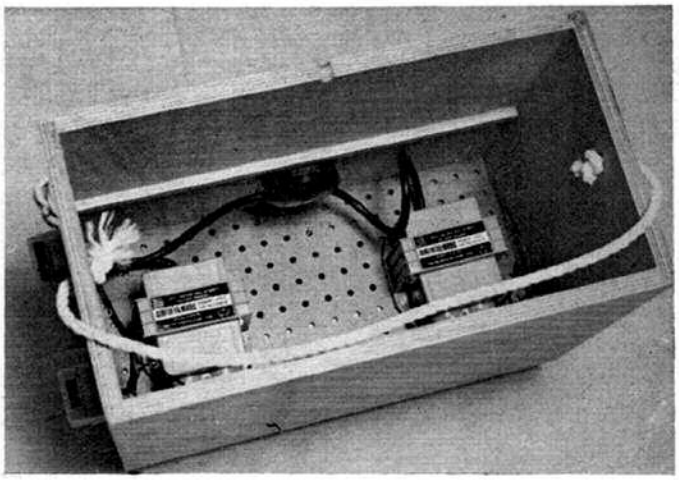
Electric flying is suitable for indoor or outdoor use and line lengths may be arranged to suit the available space. An 'indoor dining room' flying circuit, for instance, could use lines as short as 4 ft. 6 in. but where space permits, line lengths may be extended to 40 feet and more. In summer an ideal location for flying is the back garden as there is no noise or smell, and no straying models to annoy the neighbours. With a gentle breeze, flying thrills come thick and fast, especially with dual model flying!

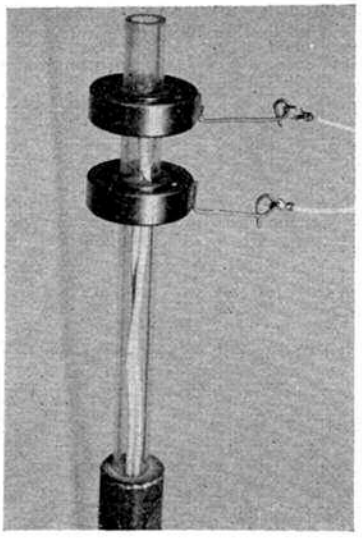
General Principles

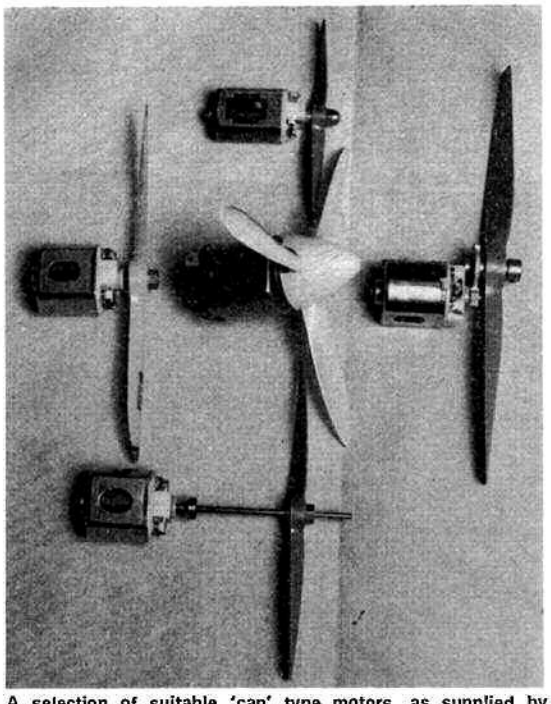
Basically, electric R.T.P. systems consist of pole equipped with a series of freely revolving contacts. Pole height may vary from two to six feet, depending upon line length and material, type of model and space for flying. The model to be flown is equipped with a 12 volt D.C. electric motor of the 'can' type fitted with a suitable propeller, and connected to the pole-mounted revolving contacts through fine wire. The contacts are connected to a 12 volt (or more) power supply, run through a hand-held rheostat.

Pilot control of the model is basically through the rheostat, but this is coupled closely with model trimming. A means of elevator control may be built into the system, but this has very little advantage and is somewhat difficult to handle. The wide range of motor speeds, coupled with instant response, provides excellent control to the correctly trimmed model and looping is possible without additional control. By carefully gauged and timed throttle adjustment, the model

Below, if using transformer/rectifier units as the power source out of doors, they must be enclosed in a non-conductive case. The wooden case illustrated below uses pegboard to lift the units well clear of the ground (which may be damp) and provides ample storage space for lines, control units, etc. Note also the sockets on the end of the case – hand control units simply plug in. At right, the pole head for operation of one model ball races are eqoxied to the hollow non-conductive pole.







A selection of suitable 'can' type motors, as supplied by Harry Butler (Models) – see Classifieds. At top is the Johnson III motor, which contrasts in size with the Johnson 36D in the centre, shown here with a three-bladed 5 x 3 in. prop. To the left of this is the smaller Mabuchi FT 26D while at right is the same motor fitted with 2.6:1 gear reduction. Yet another version is seen in the foreground in this case fitted with a ball-race supported extension shaft.

may be very accurately controlled; here of course experience will extend the range of possible manoeuvres.

Figure 1 illustrates a simple pole contact head; here three contacts are provided for each of two models, the third wire is included to actuate a small model-mounted electromagnet, installed as bomb or parachute release gear. Experience has shown the most reliable, easily available, type of revolving contact to be a ball race. Here a good electrical contact is assured and the race can be relied upon to run smoothly, even with an acute angle pull. It is of course important that races in reasonable condition be used: secondhand ball races are often suitable but these must be carefully spun and examined after washing in petrol, to check that they are not binding.

Several alternative methods of pole contact head construction, including details of incorporating elevator control, are fully explained in the M.A.P. publication *Electric Round-The-Pole Flying* by Peter Bullivant, price 50p.

The number of ball races to be used depends on the number of models to be flown, and whether accessory control is to be included. The simplest type of pole consists of just two contacts and is of course restricted to single model flying. Races are either a tight push fit or epoxied on to a rigid central tube about nine inch long and

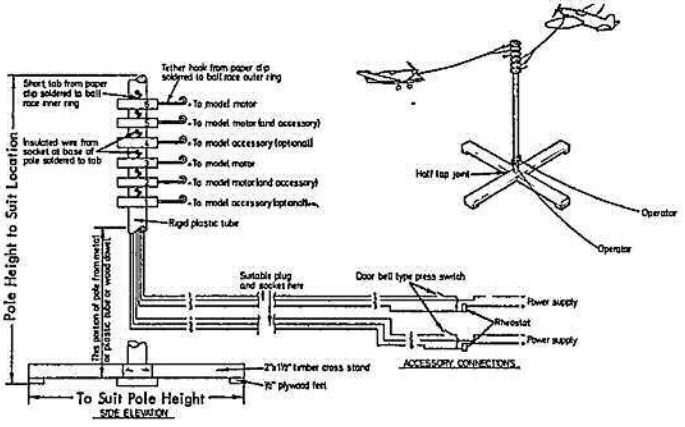


Figure 1 – simple pole contact head

constructed from some form of non-electrically conductive material. Electrical supply wires are run up the centre of the tube and soldered to the ball race inner ring. A model wire attachment hook, bent from a paper clip, is soldered to the ball race outer ring, as illustrated.

The main pole may be built using metal or plastic tubing, or even a length of timber batten. With tubing, the contact head core may be fitted inside the main pole and electrical wires run to plug sockets at the base. With a timber batten the head core may be simply taped to one end, wires running down the side of the batten. As mentioned earlier, pole height will depend upon space for flying, model type and line length. Ideally, a combination pole should be constructed with a total height of about six feet and including a removable portion to reduce overall height to about three feet. Recommended pole heights for various application are listed in Table 1 (page 192).

Basic Electrical Layout

The electrical power supply may be either from a 12 volt car battery or a 12 volt transformer/rectifier unit. Where line length exceeds about 15 feet, voltage drop in the wiring will reduce the model's performance and this can only be restored by increasing the supply voltage. Two, or even three car batteries connected in series may be used, but care must be taken not to overload the model's motor. Normally these motors are designed for 12 volt operation and will inevitably suffer damage if subject to high voltage. Ideally the system should be connected and the number of batteries adjusted to provide a 12 volt supply at the model end of the tether line. Transformer/rectifier units with a range of voltage tappings may be used in place of the batteries.

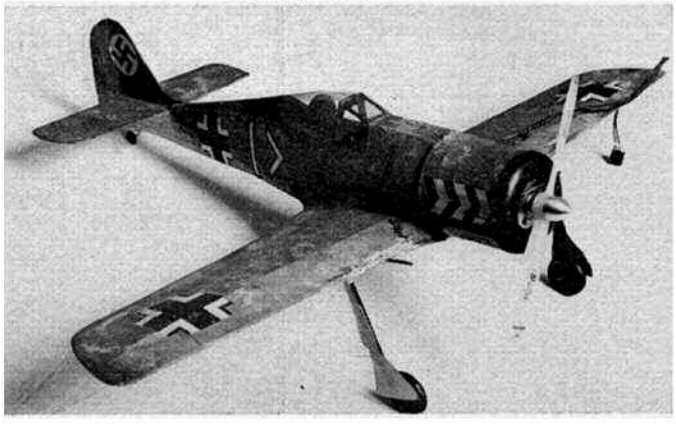
Where a 12 volt transformer/rectifier unit is to be used, i.e. lines up to about 15 feet long, it must have at least a 2 amp. output. Slot-car type units are generally fine but some of the older type train transformers are rated at only 1 amp. and are not suitable.

Power is run through a rheostat, wired onto the system as in Fig. 1: small electrical plugs and sockets are used where connections occur. Whilst 2 amp. mains plugs and sockets are suitable here, these should not be used where similar mains plugs are installed in the house – the potential danger in a child's hands is obvious. Purpose made low voltage plugs are available and must be used where safety is in doubt. Similarly great care must be taken to ensure that all electrics are safe, a qualified electrician being consulted in cases of doubt.

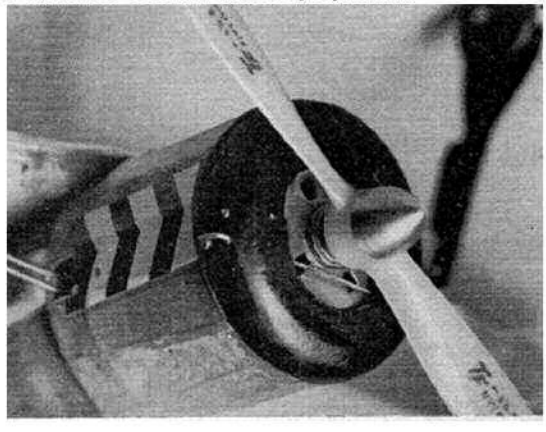
Generally, slot car type transformer/rectifier units should non-electrically conductive casing. The photograph on page 189 illustrates a simple housing unit built from ply and pegboard.

The hand controller (rheostat) may be a slot car push button type but, where higher voltage is to be used consistently, then a heavy duty type should be used. Life of the

Kits for electric powered models are cheap as it is so easy to convert the many rubber powered scale models. This Focke Wulfe 190 was built from the KeilKraft kit and flies extremely well.



The motor in the FW 190 is quickly removable – it is merely a tight push-fit in the ¼ in. sheet nose former and is retained by the piano wire 'bolt' passing through brass bushes in front of it. The end is shown 'locked' by a pin head.



press button type may be greatly extended if control is used in the form of 'blipping' rather than the control being held steady at intermediate speeds.

Flying Lines

Wire for flying lines may be either fine p.v.c. insulated radio wire, or insulated copper winding wire, choice depending on line length and also on the age and experience of user. Copper winding wire, for instance, although returning a better model performance, is difficult to handle and store. Fine insulated radio wire, on the other hand, is ideal where the system will be subject to heavy usage by a youngster and where ultimate in performance is not so important. Generally, where line length is less than about 12 feet, radio wire is the simplest material to opt for.

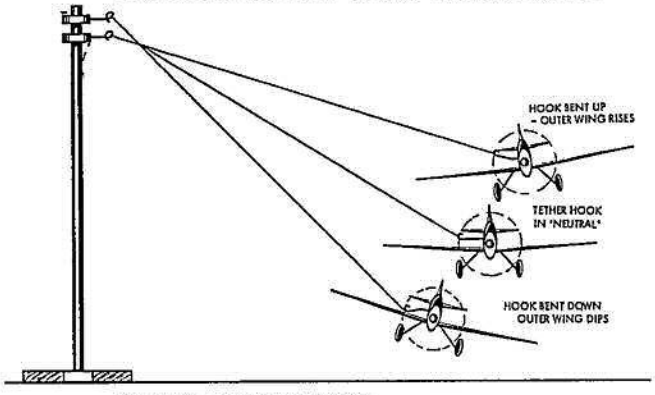


Figure 2 – model attachment

Pole Connection

With both types of wire, connection to the pole-mounted contacts is the same. One pair of ends is bared and formed into an eye about ¼ in. in diameter which should be reinforced by soldering. The pull of the model is sufficient to ensure a good electrical connection between hook and eye, and the lines not being fixed, are free to slide around the curve of the hook with the movement of the model. This arrangement reduces the possibility of line failure, due to a break near the attachment point; this is much more likely to occur where the contact is fixed.

Model Connection

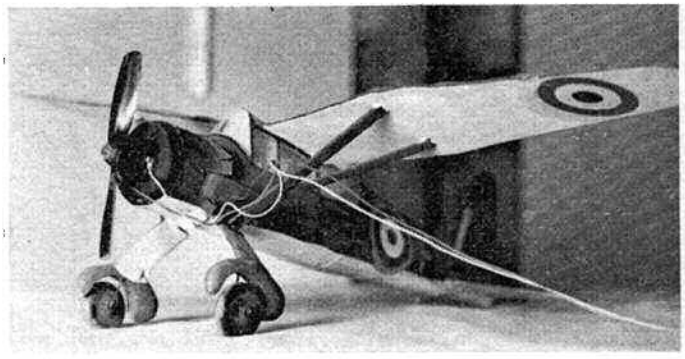
With winding wire, model attachment is best arranged through a miniature socket fixed to the model, with a matching plug soldered to the lines. A paper clip may then be knotted into the lines (use a piece of flex or string to avoid shorting out the wires should the coating abrade off) and clipped to a plywood or wire anchor, on the model.

Radio wire may be connected in a similar manner. However, where easily removable motors are fitted, the wire may be connected direct to the motor, a knot being tied in the lines for connection to a fuselage-mounted tether hook. This set up will allow rapid model change, using the same motor and leaving the tether wires connected to the pole.

Model Attachment Point

Tether wires may be attached to the model, either at the wing tip or to a fuselage mounted tether hook, and line length is the main factor to be considered. Where lines of about 20 feet and over are used, the attachment point is not critical, although generally wing tip tether, with a short pole, works very well. Where lines are under about 20 feet long are used, performance and general usability is much better with a higher pole (up to about six feet) in conjunction with a fuselage tether hook.

The main problem with wing tip tether, is that as line length decreases, a higher pole is necessary to maintain performance. A higher pole and shorter lines mean that the model's attitude at low level is most unrealistic, i.e. the outer wing tip droops and the model tends to 'swing' rather than fly, around the pole. This can be corrected using a fuselage tether (see Fig 2). Here a hook is bent from a paper clip and anchored securely to the fuselage side. For most models a suitable point for anchoring the hook is in line with the wing leading edge and midway up the fuselage side. By making the hook stem about 1¼ in. long, adjustments may be made to model trim by bending the hook. This feature is most useful especially where a nose-mounted motor arrangement is used. A tendency for the model to be nose heavy may be corrected by bending the hook forward. Similarly the model's attitude in low level flight may be accurately set by bending the hook in the vertical plane (Fig. 2). Even with the relatively acute angle pull of a six foot high pole, and 10 foot long lines, trimming the model for a flat landing is no problem and attitude through all flying heights remains 'correct'. Table I lists the various recommendations.

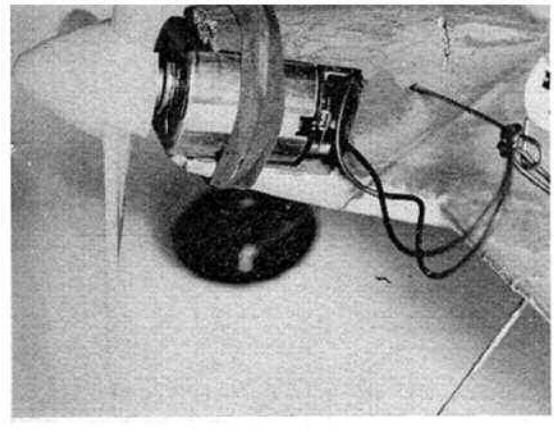


Another KeilKraft rubber scale kit converted to RTP flying – the Westland Lysander. Note how in this case the power lines run directly from pylon to motor after tying to tether hook. In this way models may swiftly be changed while the same motor is employed.

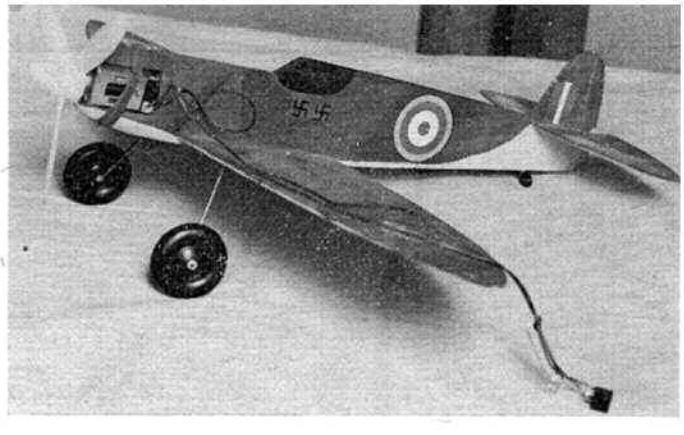
Electric Motors

Some 12 volt electric motors of the 'canned' type, i.e. those fitted to many slot racing cars, are suitable for electric R.T.P. flying. Many, however, were originally designed for ultra high speed running and will, therefore, only drive a diminutive airscrew with any degree of efficiency. One motor, notably the Mabuchi 36D type, was designed for slower running than most and has proved extremely efficient for powering electric R.T.P. models over a wide range of types and dimensions. Regrettably the 'buyers market' in redundant slot car motors of a few years back, has dried up and the Mabuchi motor in particular is now no longer available. In an effort to keep electric RTP alive, the writer has managed to obtain a supply of Johnson motors, wound to specification, and these have proved at least equal in performance to the old Mabuchi 36D.

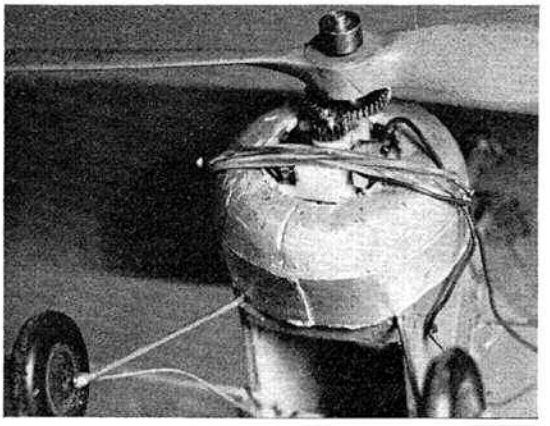
With many of the high speed motors, efficiency can be



How simple can you get! Motor in this profile fuselage is merely retained by the large rubber band – note how the power lines are knotted to the fuselage tether hook for security should the motor work loose.



Simple all sheet profile scale Spitfire, built from plans shown on page 192, which are available from Harry Butler (Models). Large diameter plastic wheels may look out of place but are essential when flying over grass.



Another way of retaining the motor. In this case the geared Mabuchi 26D is held in the KeilKraft Sopwith Camel with elastic bands anchored by pins. Motor itself is once more a push fit in the balsa front former.

improved by gearing down the drive by something in the order of three to one. This allows a larger prop to be used.

Gearing may be fitted by soldering or epoxying a bushed tube to the motor casing. A layshaft is passed through the bushes and fitted with a gear driven by a pinion mounted on the motor shaft. The propeller is fitted to the layshaft.

An alternative method is to fit a fixed shaft to the motor casing and then to make up a bushed prop/gear assembly to run on the shaft. With this method the propeller and main gear must be threaded internally to the bush. Assembly is by locking the gear and propeller together on the bush and fitting the assembly to the fixed shaft where it is retained by a collar and grub screw.

Most motors are available with either a plain 5/64 in. diameter shaft, or this may be fitted with a pinion. In the latter case, if the pinion is to be removed this must be done either by crushing the fitting in a vice or splitting it with

Line Length	Pole Height	Attachment	Line Wire
Over 20 ft.	3 ft. or less	Wing Tip	Winding
10-20 ft.	Approx. 6 ft.	Fuselage	Winding/radio
Under 10 ft.	Approx. 3 ft.	Fuselage	Winding/radio

Table 1 – pole height recommendations

a pair of side cutters. Under no circumstances must the gear be forced off with a screwdriver or similar instrument as permanent damage to the motor may result from the shaft being moved in the armature core.

A suitably sized propeller may be epoxied direct to the motor shaft but a more satisfactory means of attachment is to fit the shaft with a threaded brass bush. With the latter arrangement the propeller may be easily changed as required. When fitting the bush again every care must be taken not to move the armature along the shaft. With a press-fit arrangement, pressure must be applied to one end of the shaft and the bush held firmly and squarely, as the other end of the shaft is pushed into position. Accuracy here is vital because an unbalanced bush or bent motor shaft will reduce motor efficiency and cause early failure.

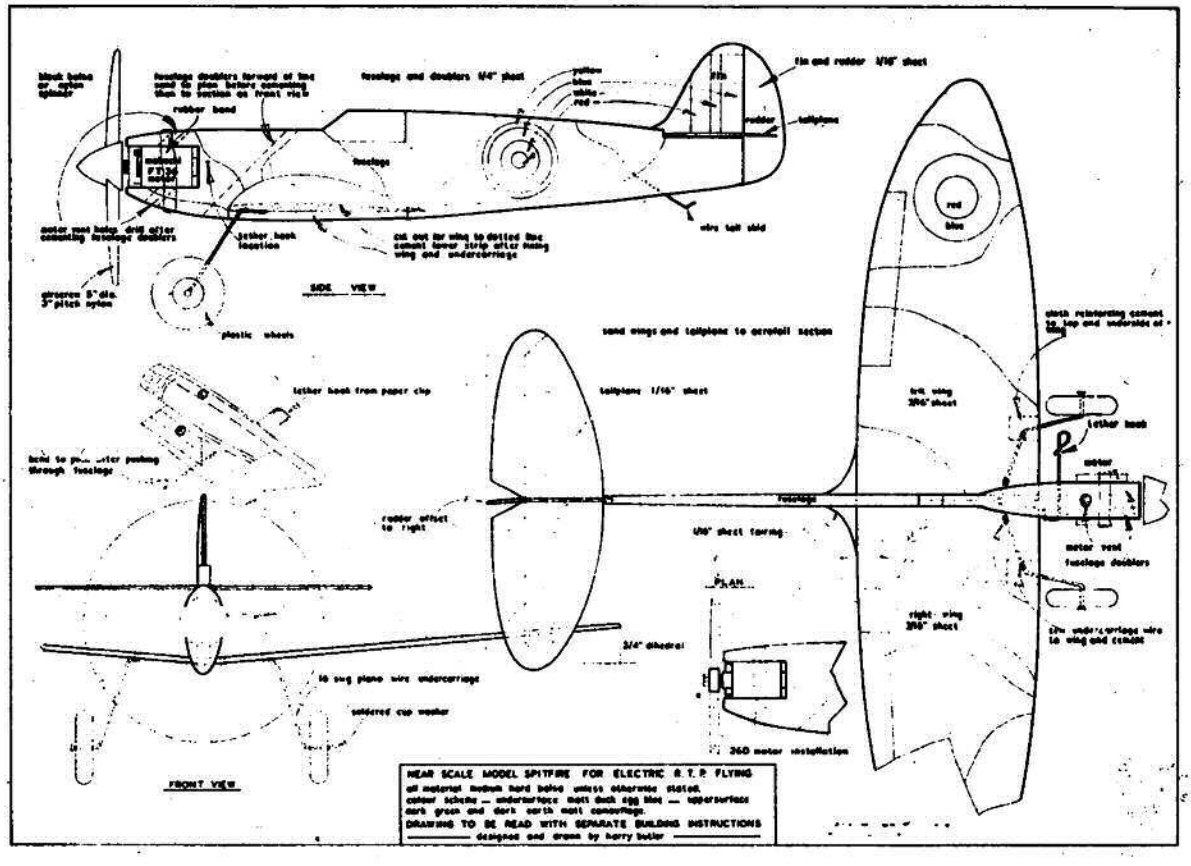
With many model types the motor will need to be installed some distance from the nose in order to retain the correct centre of gravity in the model. Here an extended shaft may be fitted in the form of a brass tube, epoxied or pressed to the motor shaft and run through a nose-mounted ball or oilite bearing. The propeller may be epoxied direct to the shaft or attached through a brass bush.

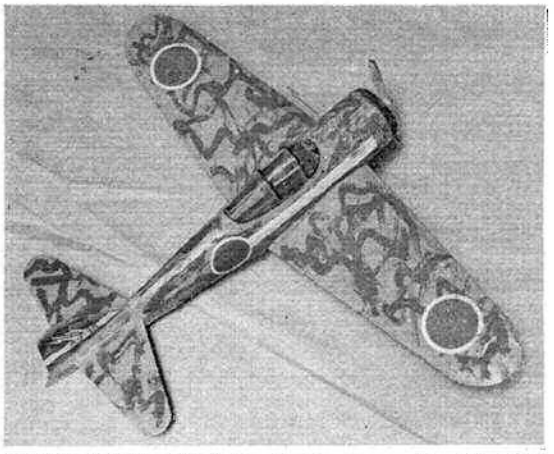
Mounting the Motor

Providing that the propeller has been accurately fitted, an electric motor will run with practically no vibration which means that a hefty mounting arrangement is not necessary. The motor must be firmly held but does not need to be 'bolted down'.

With a nose-mounted set-up the motor may be pressed into a suitably sized hole cut in a, say $\frac{1}{4}$ in. thick, balsa nose block. Most motors are equipped with a centrally located flange to either end, and an internal former should be located in the model to receive the rear flange of the motor. The motor may be retained by a rubber band, fitted to two hooks and stretched across the motor face. Alternatively a piano wire 'bolt' may be installed through brass

Figure 4 – typical profile fuselage model designed for electric RTP flying





Another perfect subject for electric power, the Mitsubishi Zero, as kitted by the American Comet Company. High or low wing, they all fly stably with this form of control – no configuration is unstable. Multi engine jobs are really very easy.

tube bushes mounted across the motor mounting hole. With the motor installed, the bolt may be 'thrown' and locked behind a suitably bent pin head.

With simple profile models the motor may be fitted in a similar manner, but with the rubber retaining band taken around the motor and model nose such as is illustrated on the plan in Figure 4.

Where a motor is to be 'built in' i.e. in the case of an extended shaft type fuselage formers should be arranged so that the motor flanges may be used for mounting. So far as possible, the metal motor casing should not be touching surrounding balsa construction, balsa is a good thermal insulant and when in contact with the motor casing will reduce heat loss and possibly contribute to early motor failure. With any type of mounting, adequate cooling air flow must be built in to the design.

Model Type

Practically any type of model may be flown 'electric', simple profile models are ideal for acquiring basic pilot technique and for dual model combat and similar competition flying. The *Aeromodeller Plans Service* includes plans for purpose designed models such as the versatile Volkswagen. Fitted with a small motor, this model is docile enough for the beginner, whilst with the Johnson 36D type fitted, it will loop quite easily on about 20 foot lines. Most rubber powered kits and many of the lighter, power model kits and designs, may be converted to fly electric. In particular, small scale models of the type marketed by *Keil-Kraft* and *Veron* are ideal for conversion and perform to a high standard.

With all models it is advisable to build in some rudder offset to assist in keeping the tether wires taut, while aerobatic models can benefit from up to 90° offset. Also, an easily adjusted elevator is most useful for trimming.

Direction of flight (i.e. clockwise or anti-clockwise) does not really seem to make much difference to model performance, although some do find that flight in a clockwise direction maintains better line tension and prevents take-off difficulties due to the phenomenon known as gyroscopic progression.

When flying over grass, which should be well cut, it is best to use at least 1¼ in. diameter 'balloon' plastic wheels even if they do look out of scale, these will still permit landings without 'nosing over'.

Piloting

Where elevator control is not fitted, control of the model is through the hand-held rheostat. By carefully gauged and timed throttle adjustment, the model may be controlled through a wide range of manoeuvres. Take off may be either slow with gradual throttle opening, or fast with immediate full throttle. Subtle control may be achieved by careful model trimming, slight 'up' elevator for instance will slow the model's speed and make it much more responsive to throttle changes. Ballast added to the outer wing tip may be necessary with some models to improve flying performance. In really calm conditions a scale model may be trimmed to almost free flight in a lazy circle high above the pole, this being achieved by ballasting the outer wing to balance the drag of the tether wires, and reducing rudder offset to a minimum

For the novice pilot, getting the model to fly level at a constant height must be the first rule. A typical problem is that of getting the model into a series of uncontrollable climbs and dives, gradually increasing in height and depth until a crash results. First flights must consist of steady take-off followed immediately by steady throttle, closing until the model is flying straight and level, then a smooth landing. Once this technique has been mastered, level flying at varying heights should be practised, but at first violent alterations to throttle must be avoided.

Dual model flying calls for experienced pilots and absolute concentration. In dual flying, line tangling is the most common cause of forced landings, but this can be reduced by skilful pilot control, in that the model hooked to the top of the pole must overtake above the other one, while the model hooked to the bottom must always pass underneath Similarly the top model must lead on take-off and then follow the model on final landing.

A wide range of competitive flying is possible, either with single or dual models, and can include spot landings, carrier deck landings, set manoeuvres, speed, balloon bursting, combat or formation flying.

The range is really only limited by your own imagination. Clubs will find that this form of flying is an ideal 'winter activity' especially as the equipment may be set up speedily in the club room to keep interest alive at this time of year.

Note: All accessories necessary for electric round-the-pole flying including motors, kits, plans, etc., may be obtained from Harry Butler (Models) – see Classified Advertisements in this issue.

Moulded Leading Edges — *continued from page 186*

the wood to the correct sizes. Mass production is easy once you get the hang of it, and work economically i.e. there is always something that can be attended to whilst other parts are drying. While two are in the jig being completed, two more could be at the previous stage having the second piece of sheeting added (Stage 5) two more at Stage 4 and two more having the spruce spar added while yet a further two could be having the formers added to the back spar. Meanwhile . . .!

It is also true that this form of construction is not quite as strong as a solid or moulded equivalent, but a 1 oz leading edge of this type is probably better than one of the same weight in the hollow pre-moulded type as the strength can be built in where necessary. Also, while not so easy to repair, it is worth remembering that after a mid-air collision with a lightweight model, there is precious little to repair anyway!

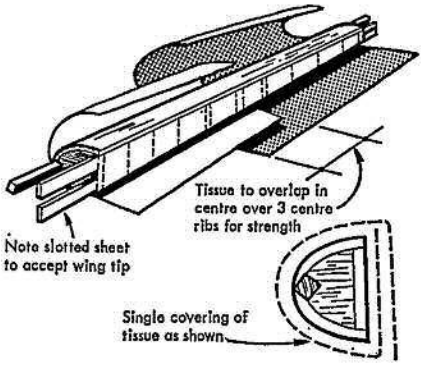
Conclusion

It is intended that the method described of making both jig and L.E. is a simple method – no doubt there are modellers with the equipment to make more sophisticated, adjustable jigs.

Doubtless individuals will experiment and come up with variations on this idea and I have in fact several that will be tried out shortly; the rolled plywood booms suggested by Trevor Faulkner in the January *AeroModeller* has inspired me to make a L.E. in 1mm ply, which will probably fly through anything wrapped in nylon (so watch it!) Thin fibre-glass sheet is also available to a few, and this is much cleaner than actually making it up in fibre-glass with a mould, and probably much lighter. . . .

With World Class combat in the offing I hope my ideas will provide food for thought in 1974.

STAGE 7



FEBRUARY 3rd saw the first gathering this year of S.M.A.E. Scale enthusiasts; under the huge umbrella of the Cardington Airship Shed. This was the first winter scale meeting held in the unlit and unheated shed and although a little cool the many flyers present welcomed the opportunity to fly in calm, dry, surroundings after being grounded for weeks on end by gales and rain! The mild westerlys may have been a Godsend to our fuel-starved island this winter, but I am afraid they do not produce those lovely cold, clear-skied, calm Sunday mornings one remembers affectionately from one's youth.

A number of new models were to be seen for the first time, interspersed with those well-tried veterans such as my own tatty old black *Hurricane,* still just about outperforming everything, and Terry Manley's *Fokker E3.* Vic Driscoll had a 90 per cent complete *Gloster Gauntlet* performing which during its first flights had a turning circle of about 10 feet. As fellow St. Albans clubmate said *'what a waste flying in Cardington. With a trim like that a lighthouse would be big enough'*! John Blagg flew his large *Bristol Brownie* – just the opposite trim – a gentle 'S' turn half the length of the shed! 'Butch' Hadland had his *Focke Wulf Stosser* performing well in left-hand circles. This is a particularly fine model; almost exactly scale in structure including sheeted wing for almost two-thirds of the chord. Well finished, with an airbrush, in its pre-war silver colour scheme, with civil registrations, it looked very impressive in flight. It was gratifying to see two examples of my *Puss Moth* design flying; built from the December 'free plan'! One point to watch here – make sure that the wings are set at the correct incidence. One modeller was having difficulty trimming his machine until I noticed the wings were set at about ½° positive instead of 2° incidence. As a temporary measure this was compensated for by negative tailplane incidence and downthrust – the model then performed very well.

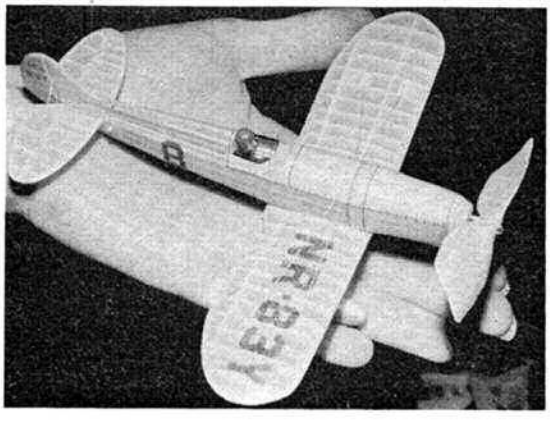
Two CO_2 powered machines were present – Terry Manley's *R.W.D.8* and my well-known *Ryan.* Neither performed very well due to the rather cold conditions which prevented anything like full power from being developed. I hope to devote space in a future column to the practical aspects of operating these motors, as I am finding out that there is a lot more to them than at first meets the eye.

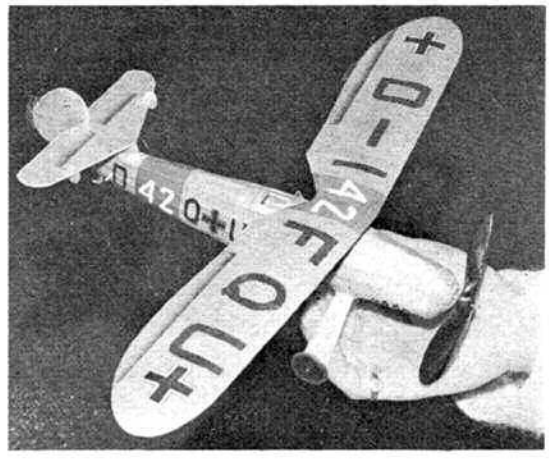
I flew indoors, for the first time, the *Porterfield Collegiate;* built from the **Tern Kit** reviewed in last month's column. This proved to be a perfect little flyer – slow, wide, right-hand circles, on power, tightening up a little on the glide. Flights of 30 sec. on 500 turns of the four stranded .050 in. Micro X Pirelli rubber being about standard.

Terry Manley flew the **Peck Polymer** *Miles M18* with great gusto. Thanks to a flying speed about twice that of my *Hurricane,* it reached a collosal altitude for a 13 in. Peanut – even if the glide which followed left a bit to be desired!

SCALE TOPICS DISCUSSED BY ERIC COATES

Below: Andrew Moorhouse's tiny (1/32nd scale) version of the Brown B.1 found the prop rather too efficient! At right, Butch Hadland's latest, the Focke Wulf Stosser.





Most diminutive model present was Andrew Moorhouses 6 in. span *Brown B1* racer which featured just about the most delicate miniature scale construction I have ever seen beneath the overall yellow tissue covering. Looking positively tiny, beside his previously described 'huge' 9 in. span *Chilton*, it unfortunately did not show too much interest in flying. The first attempts had the wings revolving in an opposite direction to the paddle prop. I may be wrong but I think Andrew has scaled it down just a little bit too far this time. . . .

Probably best of the new models present, from a flying aspect, was Andrew Callaghan's 1/18 scale (14 in. span) *Isaacs Fury*. Fully rigged, this flew as well as any biplane of this size that I have seen – so often the drag of small biplanes reduces the performance to a pitiful level, but not so in this case. Andrew intends to market plans for this and other models from his stable in the near future. I have a copy of the *Isaacs* drawing in front of me as I write these words and I must say Andrew's standard of draughtsmanship is of just as high an order as his construction. Watch the 'small ads' at the back of this magazine for further details!

I cannot detail every model present but all in all a very successful informal meeting – no contest, just a fly-for-fun session in guaranteed perfect conditions making the journey well worth while. Next meeting April 7th (see *Contest Calendar* for other dates) and remember, S.M.A.E. members *only*.

* * *

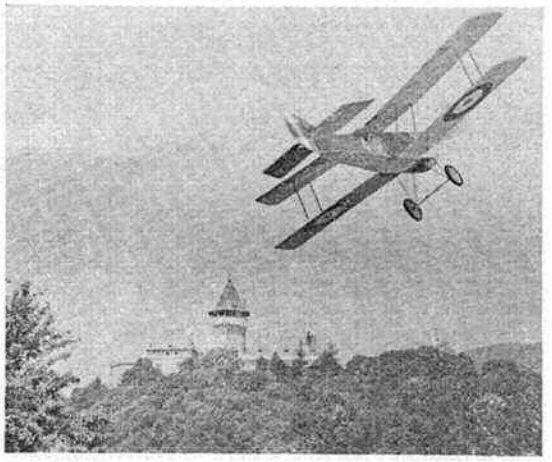
In contrast to the foregoing I have recently received details of the 1973 rubber powered scale modelling scene in Czechoslovakia from Lubos Koutny in Brno. During last summer a series of seven contests for this class of model were held, outdoors, in ideal conditions. It is interesting to compare the photographs I took recently at Cardington with those taken by Mr. Koutny to see how contest regulations can influence design – the S.M.A.E. regulations which call for a minimum flight time of 15 sec. and give no points for duration above this figure whatsoever have developed the realism of the British rubber model tremendously in the last couple of years or so. Scale structures and airbrush painting are now standard amongst the leading competitors and in fact looking at the latest batch of models, the gap in realism between indoor rubber powered models and the larger outdoor models, powered by internal combustion engines, is now very narrow indeed. The Czech regulations bring a duration factor into their rules and, therefore, a light wing loading is of paramount importance. The result would appear that open duration model type structures are very much to the fore and finishes tend to be of the dyed-tissue variety. All very reminiscent of the wartime British scale model, before the advent of the miniature diesel engine, which swept rubber power under the British scale modellers bed for 20 years. I am not in any way decrying the Czech models, many of them are superb examples of craftsmanship, but it is a fact that unless rules are carefully compiled and continually revised to take into account new techniques, stagnation in model design san easily occur.

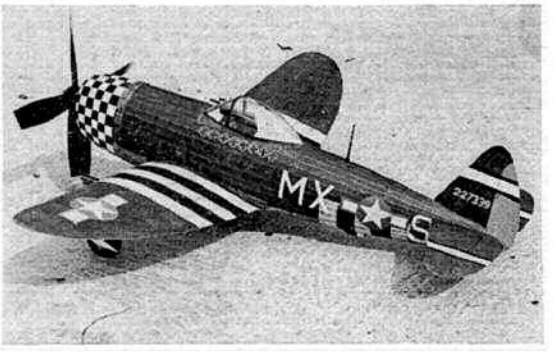
To return to the account of the 1973 Contests. For the second year in succession Lubos Koutny himself was the champion; flying a *Martinsyde Buzzard*. Regular readers of this column will remember that last year he used an *Elephant*. In second place was

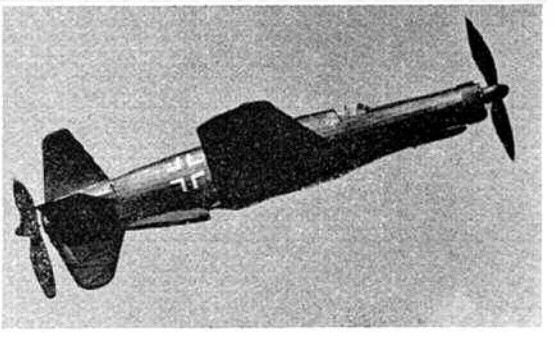
Above: Czech modeller, George Merta's rubber-powered Focke Wulf FW189 is finished in colour scheme of the Slovak air force – spans nearly 3 ft.

Above: Lubos Koutny's Martinsyde Buzzard F4, proved best of all at Czech rubber scale contests – every competition flight exceeded the minute mark! Below is a model of the Avia BH-21 by M.Ch.Ludvik – original belonged to the first 'King of the Air' of Czechoslovakia Capt. Frank Malkousky.

Below: Hladik reached fourth place in the Czech Champs with this Sopwith Triplane, whose performance in the air made up for its over-simplification of scale details.







Above, Charles Ludvik's Sopwith Pup takes off against the superb scenery surrounding the Czechoslovakian town of Trnava, where competition for World War I style aircraft takes place every year. Above right is another of this keen modeller's products – a Thunderbolt P47. A veteran now, this model is still a regular sight at the flying field. At right is another of George Merta's products – he obviously likes rubber-powered twins Prototype in this case is the unconventional Dornier Do 335 – a most unusual yet challenging scale subject. Participation at these 'rubber only' contests is good, with never less than around 20 entries.

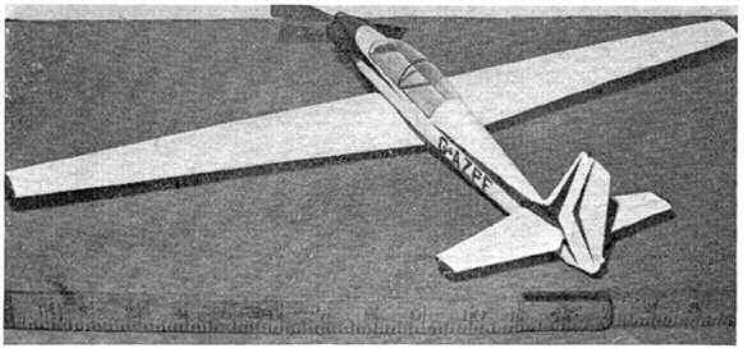
Charles Ludvik flying a *Sopwith Pup*, and what an interesting picture this grand old British Scout makes against the Eastern European architecture! Mr. Koutny does not mention the third placed contestant but in fourth place was a junior, Mr. Hladik, flying yet another British W.W.I scout – a *Sopwith Triplane*. There is no doubt, judging from their world-wide modelling appeal, that we British built the most stable machines in that war!

I believe all the Czech models are built to a common 1/20th scale and so some of the contestants are quite large – approaching 36 in. wing span. The rules probably favour earlier fabric covered machines, as the results show, but nevertheless this does not seem to stop some very enterprising prototypes from being produced. The *DO-335* for instance, or the *FW-189*, both by George Merta. I was particularly interested in Charles Ludvik's *Avia BH-21*, as I have often fancied this machine myself as a very suitable subject for an aerobatic R/C scale model. The proportions and structure are ideal, but I never managed to obtain a decent drawing and enough photographs though!

Although not particularly scale like, as a piece of model photography, I think the 'up sun' shot of Mr. Mahovsky's *Fokker DV II* (see heading picture) takes some beating. Looking at it on a cold February day, as I write these words, how it seems to sum up the best of aeromodelling in high summer!

* * *

After mentioning last month that I did not think skinned expanded foam scale models would be commercially viable, I have recently received details of a *Fournier RF5*, built by Eric Herbert of Haslingden, Lancs., from this very material, but omitting the balsa skinning. Considering what a difficult material this is to finish, Eric's efforts are to be commended. Thinned emulsion paint sprayed on was in fact used as cellulose would have, of course, just 'eaten' the foam away. The model is fitted with a single skein 2.4:1 step up gearbox and is claimed to fly well with exact scale surfaces. No doubt the good performance is due to the very low all-up weight achieved using this lightweight material – ½ oz. with a 25 in. span!



Eric Herbert's rubber-powered Fournier RF5 seen at right is built from polystyrene foam to 1/24th scale. Further scale details are yet to be added, but it flies very well due to its low wing loading. Canopy is moulded from 5 thou. acetate sheet. Will form a feature in a future issue of AeroModeller.

25th INDIAN NATIONAL CHAMPIONSHIPS

Reported by Prasanta Banerjee

HELD UNDER good weather conditions at Behala airport once more the 1973-4 Nationals attracted 358 contestants from all over the country. The day was fine and bright with a calm morning being followed by a certain amount of breeze in the afternoon. Thermals were both strong and plentiful but were accompanied by some surprisingly protracted periods of sink – particularly during the mid-day period.

Open Power attracted 84 entries and was the first event of the day, being won with a perfect score by young Deepak Khemka of Calcutta flying an O.S. 19 version of Conover's *Lucky Lindy*. Sekhar Dutta was second with an AM 35 *Swiss Miss* ahead of Tamilnadu's Sekhar Chandrasekharan who flew a taper-tip high thrust line ½A design but with a Frog 1.49 up front.

Next, and with 168 competitors was Open Glider which was topped by Calcutta's Deepak Bhowmic despite dropping a few seconds on his first flight when his Banerjee-designed short-nose A/2 flew O.O.S. behind the hangars, 7 seconds short of a max. Sekhar Dutta flew 'on his own' to collect another second whilst Ravi Kumar (now flying for the No. 2 Bengal Air Squadron) managed to edge Satpal Singh of Punjab out of third place – both Ravi and Satpal flew A.P.S. *Lucifers* and had one badly downdraughted flight apiece.

This year's R/C aerobatics event was flown to the F.A.I. schedule and resulted in a comparatively easy win for Mahavir Jalan of Calcutta who had been putting in a lot of practice with his Fox 59 powered, Skyleader-equipped *Circus* – although the results might well have been different had not Siddharta Roy eliminated himself by trying to bunt too low with a Merco *Skyqueen* after leading for two rounds! Single channel attracted 28 entries and was closely fought. Eventual winner proved to be Calcutta's Javed Anwar who flew an O.S. powered A.P.S. *Bazz Bomb* with great competence and managed a 30 point lead over clubmate Nilesh Mamiar who used home-made radio gear (that he makes and distributes) in a slightly-scaled up A.P.S. *Sawdust*. Ravi Kumar filled the third position with his well-worn Veron *Robot*.

Control Line stunt had 54 entries and was flown in the newly-constructed tarmac circles at the far end of the airport. Winner for the third year running – and setting a new record in the process – was Vanu Majumdar flying the same Veco 19 model at last year. 2.5 c.c, *Speed* was pretty dismal with just four of the 29 who had pre-entered managing to record times. Sekhar Dutta made a successful return to the speed circle to take top spot with but a single 96 mph. flight from his four-year-old *Pink Lady*. Power-plant was a re-worked O.S. Max-II which ran on suction feed (from a metal tank) and turned a Topflite 6 x 7 in. speed propeller. Ravi Kumar was second in both events.

Undoubtedly the hardest-fought event of the day was the *AeroModeller Challenge Cup* (Open R/P/G) which attracted no fewer than 241 contestants. Top was Cadet Ashis Haldar from *No. 1 Bengal Air Squadron* with a total of just under nine minutes from his all-red AM 35 *Dream Weavers*. Last year's winner, Cadet Om Prakash Mehrotra flew a *G-90* A/2 into the second position, a scant three seconds behind Haldar whilst third place produced a distant four-way-tie between power fliers S. M. Banerjee and Tapan Baghchi, and glider users T. V. Gupta and Sekhar Chandrasekharan – the last named with a 100 in. span lightweight.

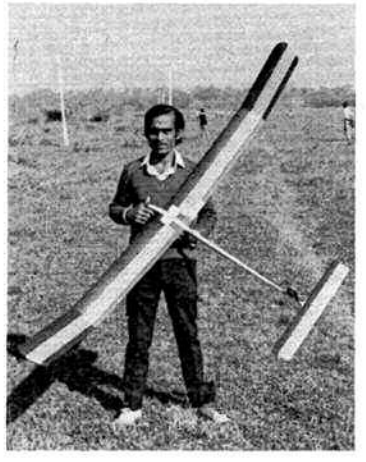
Precision (F/F Scale) went to Miss Sikha Ganguly with a Mills .75 *Pushpak*. This was to ¼th scale and was finished in the colours of Behala Flying Club – all yellow with black registration numbers. Runners-up were Tamilnadu's J. Vasu (Frog 1.49 *Cessna Skyplane* and Vanu Majumdar (Mills .75 *Zaunkonig*). Concurrently flown, Payload was a clear win for Debu Ghosh's veteran P.A.W. 2.49 powered design. Surajit Bose made second with a similarly powered *Deacon* whilst Tapan Baghchi was third mainly by dint of scoring the event's only max flying a trike-geared, swept-fin *Pay Loader*.

Final event of the day, F/F Seaplane attracted 39 enthusiasts and was once again dominated by power models. Pravash Dhar of *No. 2 Bengal Air Squadron* placed top with an A.P.S. *Eliminator* that featured a timer-actuated retracting front float as well as V.I.T. Following places were taken by Vanu Majumdar and Debu Ghosh with comparatively low scores. Satpal Singh provided the top rubber score with a float-equipped Mercury *Mentor* at fourth place.

This year's Senior Championship award went to Ravi Kumar. Ravi flew consistently in all ten events and fully deserved his win. Main opposition came from Sekhar Dutta and Tapan Baghchi. Avijit Majumdar annexed the Junior Championship title while Miss Sikha Ganguly emerged as the Lady Champion for the third time in four years.

Heading picture shows Deepak Khemka, aged 16, posing with his Open Power winner which made three three-minute maxs. Design is a Lucky Lindy, powered by an O.S. 19.

At left, Sekhar Chandrasekharen displays his reserve power model. In the contest he flew an identical model into a hard-fought third place. Uses a 5 per cent thick airfoil for both wing and tail. At right, Deepak Bhowmic with his A/2 glider, designed by Prasanta Banerjee, which employs a Hirschel airfoiled wing. Span is 88 in.



Are you between 10 and 16 years of age? Then don't delay, join today

Junior Activity Programme

MENTION of the *S.M.A.E. Junior Activity Programme* in the February issue has brought forward a very good response, but if you missed that issue or simply forgot to write in, then please do so now. Basically, we asked that all schools, youth clubs, etc., with an actual or potential interest in aeromodelling, should write to the following address giving the name of the organisation or school, the scope of the current interest and indicating whether or not you think it would be a good idea for this scheme to provide guidance material, advice or a focal point. Remember, this scheme is being run by the Society of Model Aeronautical Engineers for the benefit of all juniors – S.M.A.E. membership is not necessary, nor is it being sought. Only by telling this committee what you want can it possibly hope to provide it! Therefore, if you are a pupil, member of staff at a school, youth club member or organiser, etc., please write in to:-

S.M.A.E. Junior Activity Programme,
P.O. Box 35, Bridge Street,
Hemel Hempstead,
Herts HP1 1EE.

So far responses have come from both schoolmasters and pupils and they all show that there is a pretty consistent requirement for beginner's information. In addition, several very worthwhile new ideas have been suggested and a few unusual questions asked. Here are some of the points raised:-

1) *How about a juniors-only 'fly-for-fun' day at an airfield?*
2) *'Can I fly in my local park? I keep getting chased off!'*
3) *'Why doesn't the S.M.A.E. organise a coach trip to the Nationals for Juniors?'*
4) *A useful service would be a sort of 'correspondence course' starting with a beginners' kit and gradually working up to more difficult models. Each stage could be given an achievement to reach, e.g. flight time or suchlike. Beginners could thus be successfully introduced to the hobby.*

These points and many others sent in are now being actively considered by the S.M.A.E. and we expect to be able to publish the outcome soon. In the meantime, point (2) above seems urgent enough to give some guidance on straight away.

Flying in Local Parks

It is stressed that the following notes are a brief guide only. Firstly, let's start with the 'legal' side. Basically you can fly on any local park, recreation ground or council open space provided there are no Byelaws against it. Naturally one must be sensible in this respect, if you are acting dangerously you can be stopped on these grounds, so first make sure that the space you are using is suitable. For example, do not attempt to fly your 60 powered R/C job on a 50 yard square patch!

In order to find out if there are Byelaws against model flying at any particular place, you should write to the Town Clerk and ask for a copy of the current Byelaws. He is *obliged by law* to provide you with a copy and you should enclose a 5p postal order for it. From these you will see the legal situation in your district.

Sounds very simple doesn't it? Unfortunately, difficulties can and do arise, and even if you do get a copy of the Byelaws easily, it still needs a lot of courage to face an irate park-keeper who says 'Clear Off'! For this reason we recommend that you seek the support of an adult early on in the proceedings. A few other points are important:-

a) Keep copies of any letters you write.
b) Be courteous in writing and in any discussions you may get into.
c) Do not accept *from anyone* written or verbal statements that flying is not allowed, until you have seen the current Byelaws. (By the way a quick way of seeing the Byelaws is to go to the Town Hall – by law they must have a copy for inspection.) Park-keepers, and even high Council officials, are rarely aware of all the Byelaws in the great detail necessary for your purposes.
d) The notices at park gates are not usually full Byelaws – just extracts.
e) We have never yet seen any Byelaw which affects gliders or rubber-powered models, although we have seen many which affect engine-powered models. (This is also a main point of confusion – many officials fail to appreciate the difference and in their minds lump all model aircraft together when Byelaws against engine powered models exist.)
f) Above all, be prepared to be persistent and patient. Aeromodelling is a legal activity and you are entitled to a fair share of your local council land on which to carry it out. Experience has unfortunately shown that you do often have to start getting a bit 'tough' unless you have an enlightened council, and so for this reason we stress that an adult would be a great help.

However, there is no reason why you shouldn't have a go yourself – we feel that the more councils who know that aeromodelling is 'alive and well' the better it will be for everyone!

Contact with your local clubs would also be a great help and, of course, if you are an S.M.A.E. member you can get direct assistance from that Society.

Finally, why not let us know how you get on: do not hesitate to ask John Bridge for advice if you get stuck.

Junior Kit Contests

Yes, there will be *Junior Kit Contests* for both gliders and rubber-powered models in 1974, although dates of competitions have not yet been decided. A contest will certainly be held at the Nationals, although the venue has not yet been decided. In the meantime, you have no excuses for not building models! This year, any model built from a kit exactly as per instructions (although dethermalisers may be fitted if desired) is eligible, provided that the wingspan does not exceed 45 inches. This will give competitors a much greater choice of model, so it is hoped there will be bigger entries at the competitions. Remember, the contests are open to anyone under the age of 16 on the day of the contests – persuade your friends to make models and fly with you as well, it gives you both a 'target' – someone else to beat is always a good challenge! Remember, prizes for these contests are good, the competitions fun, and there is always plenty of advice on hand if needed.

Remember

We are always interested in your views on Junior Contests, as well as other subjects for beginners to aeromodelling. Also, why not send us a black and white photograph of your latest model?

Dear John Bridge,

I am between 10 & 16 years of age and would like to become a member of the 'Golden Wings Club'. With this application I enclose postal order (International Money Order) for 25p to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL.....

ADDRESS .....

.....

YEAR OF BIRTH.....**SCHOOL**.....

NAME OF ANY OTHER CLUB OR CLUBS TO WHICH I BELONG (if any).....

Send to: **GOLDEN WINGS CLUB, AEROMODELLER, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.**

4/74 15p In the £1 Rebate
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NEW ZEALAND NATIONALS

27th December 1973 to 1st January 1974

reported by Paul Lagan

Control-line scale showed a marked increase in popularity, and thus the competition was fiercer. Here, B. Stanish displays his Avro 504K – it's unlikely that the model's line tension could pull him off balance!

HELD AT HAMILTON in the North Island, this was the first Nationals held north of Feilding for over 15 years, and possibly due to being nearer New Zealand's centre of population density, it drew a record entry of 228 contestants.

As in past years, the majority of contestants brought their families camping at the headquarters site, the Te Rapa Racecourse. Free Flight and Radio Control activities were conducted on farm land at Puketaha some 13 miles from the headquarters with C/L at a local domain.

The weather was superb for all five flying days; no rain, sunny skies, warm temperatures (typically around 24 degrees C at 3 p.m.), and only the lightest of breezes made this Nationals undoubtedly the 'sunniest' ever, too sunny for many as sunburn and mild heat exhaustion were a real problem!

Free Flight

Thermal activity was very similar on each day – at the commencement of official flying (5.30 a.m.) the air was a little damp but quite still and 'thick' producing just a little lift. This condition would last until about 6.15 a.m., but from this time until the first light 'real' thermals started, the air deteriorated markedly. As the five round events were all flown in rounds, it was mandatory to complete ones first flight by 7 a.m. and the second between 7 and 8 a.m. and it was in these two rounds in such marginal air that most events were won or lost.

In *Nordic A/2* there were 73 entries and not one maxed in the first round! Few were prepared to fly at the beginning of the first rounds, and thus there were 40 or more flyers waiting in the last 20 to 30 minutes for a piece of helpful air that never arrived and all were forced to tow up into the gentle 'sog'! Later, thermals strengthened, becoming turbulent with accompanying patches of severe down draught, giving a wide range of conditions for the event and so the lead changed almost every round. Bruce Turner found one of the few thermals in a turbulent final round to take his first Nats A/2 title, using a modified *Kiwi 2* design to achieve a 13:44 total – Dave Richardson used the same design in second place, some 47 sec. behind. There were two Russian type circle tow hooks in use – Bruce Turner had one and last year's winner John Malkin the other, although conditions and the small size of the flying field did not lend themselves to such towing tactics. Both circle hooks were made to Garry Burrow's design.

F.A.I. Power was highlighted by a full-house score from newcomer Dallas Gibson – his Rossi powered high-thrust model *(Viking)* heading off a fairly high-class field. Ray Summerfield also in his first season of Power flying, flew very well (Second place – 13:32) with a gadget-free *Pearl* design. Joe Johnson and Paul Lagan both qualified for the 1974 New Zealand team (for the Trans Tasman Championships in October) but generally did not fly up to their best form. In *Wakefield* the standard was a little down on previous years, despite near perfect weather and both Paul Lagan and Alan McDonald were able to suffer one badly down draughted flight apiece yet still retain their top placings. Paul used an auto-rudder equipped own-design and Alan his torque actuated tailplane model that was so effectively proxied by Alan Jack in Austria last year.

Chuck Glider is keenly contested in New Zealand, over 70 entrants making this the best contest ever! Rules call for six flights of 90 second maximum and Murray Stringer flew very well, taking the whole morning to record five such maximum in a row plus a 55-second flight. Gary Prohm also scored very well as did Paul Lagan and Mike Bundock who each totalled over seven minutes. Murray used a *Sweepette*-type model. Most flyers use fuse operated D/T's and, tactical flying is essential for success. In *Open Power* only three reached the fly-off despite a large entry, no doubt due to the fact that about 90 per cent of the entry used ½A models, and in the thermally conditions such models do not have the performance reserve necessary to be sure of maxing in the down draughts that accompany such thermals. Notwithstanding, it was actually a ½A model that won the event after all three fly-off contenders launched into a large patch of sink! Winner, Ken Jones, had an engine over-run on this flight and was able to retrieve the model which sunk very fast, and re-fly into a good thermal (8:28) within the five minute period allowed. Ken's model was a *Vindaloo* with a *Dynamo* tailplane – this combination being the remains of the two types after each had been damaged!

Ian Henry leans out the Cox TD.09 in his neat 'Junior Safari' which he used in the Open Power event.

Combat has the same action the world over – here, Jim Urry launches Murray Stringer's 'Dominator'-based design.

Ray Summerfield prepares to give his F.A.I. 'Pearl' a little extra altitude with a helpful heave – placed second.

Dallas Gibson flew his Rossi 15 'Viking' into top spot in F.A.I. Power with a perfect score. Model has neither auto rudder nor V.I.T., yet 'flies on rails'!

Gavin Shute with 'remains' of his Taipan 2.5 c.c. powered runner-up in Combat – Alan Kuysten's O.S.19 'Splinter' made it through the event to win unscarred.

Gren Thompson and Joe Johnson both flew FAI models.

Payload models carry a dummy weighing five ounces per c.c. of engine capacity – ½A models invariably predominate. This year was no exception, Paul Lagan's winner being an .09 size *Sloworm* wing and tail on a fuselage to .049 dimensions with his TD.049 on a 6x3 in. Cox prop and 55 per cent nitro. Grenville Thompson winner on the two previous occasions had to settle with second this year using his TD.049 *Paahopper* – Rowan Ford in third also used a *Paahopper*. There were a number of near misses for *Open Rubber* and eventually only two *Wakefields* and one 'true' Open model reached the fly-off. Alan McDonald's *Rubber Boots* should have won the event easily but he suffered two motor breakages in the fly-off and could not launch in the five minute period. U.K. expatriate Clive Gardner eventually won with a very neat Wakefield at his first New Zealand Nationals, score being 1:34.

Nordic A/1 was flown to New Zealand rules – five flights of three minute maximum – the event being dominated by experienced senior flyers, the top four all using the Lagan *Sinner 3* designs – a model based on Paul's successful Wakefield wing. Dave Richardson, Gren Thompson and Bruce Turner topped this event as they did the A/2 event to make themselves undoubtedly the top towline men in New Zealand at present. No full house scores, though winning scores were 13:52, 13:28 and 13:02. *Aggregate* is flown in a half-hour period when one endeavours to record the maximum possible flying time with the total of a number of flights, retrieved personally and on foot, having a maximum of three minutes and a 'no flight' time of 20 seconds. Physical fitness, a reliable motor and a consistent low flying model that will not go up in thermals are the prime requirements. The Mills .75 (yes, there are still a number around over here!) provides the reliability; a *Humming-Bird* or similar sports model gives the consistency and Ken Jones undoubtedly has the fitness as proved by his repeat win this year with a total of 12:52. Grenville Thompson completed a very successful F/F Nats with a place and Alwyn Graves also proved to be quite fit in the final reckoning. A very enjoyable event – especially for spectators at the start when over 50 models take to the air like a flock of gulls!

Indoor

Indoor activity appears to be stagnating a little after a recent resurgence. Consequently, in the two indoor rubber events times and the names seem to alter very little from Nats to Nats. Paul Lagan, in fact, admitted to flying his indoor models only at the Nats and at this Nats used the same model in Class B (Easy B) that had won the previous two years. Trevor Martin won the Open spar event (Class D).

Indoor H.L. Glider is a little different, being keenly contested and of a good standard. A low ceiling this year and poor air for the latter part of the contest kept times down but the results were very close, with each person in the top four places being separated by 0.1 seconds! Paul Lagan used a *Stompette* to win with a 24.3-second flight.

Control Line

Best supported was *Combat* with over 50 facing the judges. Basically, the FAI event was flown but with up to 3.5 c.c. engines allowed; the N.Z. Combat events run strictly to a pyramid or knock-out system. This came in for some criticism after a number of 'top' flyers drew against each other in early rounds. Models follow British trends but the engine selection is wide and varied – most find a good 3.5 c.c. glow motor capable of providing sufficient urge and reliability without too much expense. Alan Kuysten got to the final after some good bouts unscarred – Gavin Shute's final place came after a number of 'incidents' and his model was well patched and missing most of its outboard wing for the final, giving Alan an easy win.

Speed events had a good entry and top man was undoubtedly Harvey Westland whose home-built engines won, and set new N.Z. records in Classes I (2.5 c.c.) and III (5 c.c.) at 138 and 151 m.p.h. respectively. Laurie Chrystall and Phil Staples were the other two Speed flyers to stand out – Laurie winning the 10 c.c. and 3.5 c.c. classes at 125 and 135.3 – in that order! FAI speed was flown as an unofficial event to pick the 1974 Trans Tasman team and resulted in some disappointing times which will hopefully improve as the N.Z. flyers become used to operating their models under FAI conditions. Phil Staples and Harvey Westland tied in this event with just 109 m.p.h. each.

Peter Wheeler again won *Aerobatics* over Bruce Turner. These two have dominated the Aerobatics scene for a

Left, Bruce Turner who took top awards in A/2 glider event which was held in very tricky air. Uses a modified 'Kiwi 2' design.

Very realistic, and very nicely built control-line version of the Curtiss Kittyhawk 1A by B. Borland placed second. Uses an O.S.19 for power.

number of years now. Alan Lawrence looks likely to dethrone Peter in the near future though and his flight at the Nats showed a lot of class. ¼A Team Race is another event that Alan Lawrence does well in and this year year he flew faster than the N.Z. record in his heat and won a close final (5:26) from Laurie Chrystall.

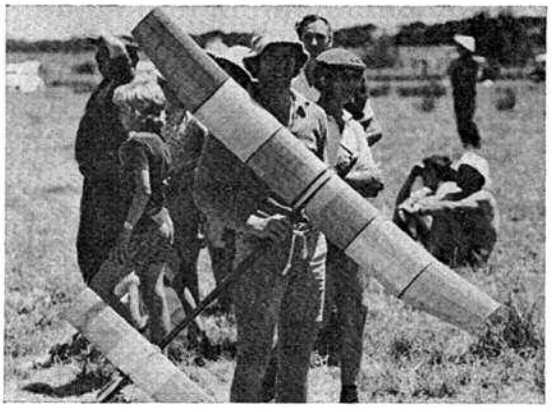
FAI Team Race had 32 entries and a much improved general standard. There were a number of new, fast engines including a sole Bugl on the field and although the fastest heat was only 5:24, it won't be long before sub-five minute heats will be commonplace in N.Z. Bruce Turner showed his versatility by winning this event (and he intends to fly Radio as well next year!) from Laurie Chrystall and Bill Long – Bill is making a successful return to Team Race activity after some years absence.

Class B team race was faster than ever with many models doing in excess of 100 m.p.h. Phil Staples proved to be the master here with a very fast heat and final (6:45 for the 10-mile course). Class B still enjoys a large entry and enthusiastic support.

Scale – reported by David Hope-Cross

Free Flight Scale was a disappointment this year because of the very poor turnout, many registered but few turned up. Was this due to over optimism by modellers who failed to finish in time, or was it due to the natural reticence of some scale modellers to enter the competition? Certainly there were more F/F scale models at the Championships than were flown in the event. This year's winner was again Brian Borland from the Roskill Club with his 1/12th scale *DH 4* which performed well and frequently. Strategy became important, with most entrants choosing to qualify with a handlaunch and then attempting to put up a better flight (point wise) with proper take-off. The *DH 4* not only flies well but it is very well built and is technically very accurate and continues to be New Zealand's unchallenged top F/F scale model. Second place went to Noel Maurice from the Auckland Model Aero Club with his well tried *Piper Super Cruiser*. Third place went to David Hope-Cross with his smaller *Fox Moth* after his larger one was damaged by a person falling on it shortly before the event.

Radio Scale also showed a drop in the number of entries and the standard of flying was also lower than in previous years. Some of the glamour of the event was obviously missing. Dave Richardson flew his *Nieuport XXVII* steadily to gain a reasonable number of flying points which combined with a good number of static points gave him the trophy. Second was a very pretty *Bolkow Junior* by Pete Scowan of the Wellington Radio Flyers. His 1/5 scale model flew well but too far away from the judges and that cost him valuable points. Best flying points went to Colin Mudford with his *Fokker D8* which performed in the air in a very appropriate manner but these points were insufficient to beat a talented junior Maurice Akroyd from Wanganui who again with the right combination of flying and static points won third place against people of twice his age.



Joe Johnson used his own designed F.A.I. Power model to achieve third place in that event, but was some 2½ minutes behind the winner. Only five rounds were flown.

Control Line produced a large field this year and apparently recovered from the doldrums of the past two years. The standard of flying was high as was the standard of building. Models being built from, or derived from, APS plans dominated the event and it is apparent that many modellers are, because of the pressure of modern living, being forced to use commercially produced plans instead of drawing up their own. In many cases the designs are developed further to produce the degree of accuracy that is vital for such an event. Last year's winner of control line scale, Don Hague of the Whakatane Club, managed to repeat his performance with his magnificent *Anseldo SVA 5* built from APS plans. Brian Borland of the Roskill Club nevertheless chased him hard with his *Curtiss Kittyhawk 1* and he in turn was closely followed by Arthur Pearce with his splendid *Turbulent*. Only just out of the running was Noel Maurice with his impressive *P61 Black Widow* again built from APS plans. In fifth place was Dr. Rees-Jones from far away Dunedin and was one of the further travelled contestants. His *Fokker E III* had full working controls on a well and accurately built model. Under normal competition conditions it would have been better placed, but the standard was indeed high.

So you think your club can arrange a flying display!

continued from page 178

fuelling had to be meticulous. When a motor stopped it was retrieved, refuelled and re-streamered before release in a 'keep-the-kettle-boiling' routine. We quickly found that it was better to land the models on the far side of the circle from the pit crew and let them run for them, to avoid congestion and chaos in the pits. This point was soon realised after we lost a couple of models and sets of very precious lines. No lines were available in the model shops at this time, and we had to scrounge them from other clubs and modellers. A prang a night was about average for the entire show, and every night from 9 p.m. onwards saw us back at the clubrooms repairing models, making up fuel, and lines, and talking about the next show.

As the situation developed we found that the pilots were soon reduced to a select nucleus, four pilots and pit men being required for each night. Apart from this, we needed a guide to stand with the announcer for his running commentary over the public address system. Also, a 'team captain' to direct the ground crews, a position ably handled by Mike Elmore on most nights. A couple of modelling spectators in the grandstand were also useful to judge crowd reaction and comment on the models, e.g. models flown too high were not able to be seen and light-coloured models, yellow streamers and yellow 'Perspex' wheels were easiest to see against the night sky.

Successful? Definitely. The crowd at the show would start to run towards the grandstand as soon as the first motor fired up – one spectator (female) said that it was better than the 'Miss N.Z.' show! The club benefited by the sum of $800 which was twice the sum originally agreed upon, but we kept on with our displays when everyone else quit. The photographs will tell you why the show jumping and dog trials, etc., were a wash-out! Less tangible but significant was the boost to club morale and the satisfaction of achieving something which other clubs in the area said was too difficult for them and beyond our capability. Obviously, aeromodelling got a bit of 'good' publicity.

Highlights: One enthusiastic Junior falling head first into the water, good for a laugh; Jim Urry walking nonchalantly across the arena and flying the model through a runaway hydrogen balloon, good for a round of applause; every line tangle, chop, collision, prang and rapid arrival, the crowd loved them.

Hardest part of the whole show? Finding 18 suitable motors, which we could not have done without the assistance of members of other Auckland clubs. Thanks, chaps. Next year? The office was inundated with requests for displays at other functions. Easiest part? Accepting the huge cheque!

CLUB NEWS

THESE HIGHLY TECHNICAL times seem to call for a considerable degree of specialisation in that branch of the hobby to which you are devoted, so that we hear less and less of that man of many parts; the all-rounder. Yet recent difficulties with petrol supplies suggests the wisdom of having another shot in your locker. The local open space may well be unsuitable for, or not available for, power models, and may not give scope for free flighting in fullest sense of the term, but many other types of model can be flown in the small public space without fear or favour. I am thinking of A/1 glider, Coupe D'Hiver Rubber, Vintage and Scale models, all of which can give you plenty of fun whilst at the same time putting your modelling skill to the test. Then, of course, there is control line flying, for which you do not need oceans of space, and for which most local councils would make some provision.

Just to show what can be done in the free flight field, the members of the **Richmond & D.M.A.C.,** an exclusive F/F competition club, do not shy from competing with other, more mechanical forms of model life, for public attention. At the *Hanwell Model Society Exhibition* they set up an attractive stand, and caught the imagination of the visitors with demonstrations of Mike Fantham's indoor models; the slow, silent progress of which were in sharp contrast to the other demonstrations of engine powered boats, trains, etc. All persuasions of model builder take part in the exhibition, says Mr. H. A. Thompson in his report, but he has yet to see a matchstick representation of St. Paul's Cathedral. The club is relatively small, but the twelve or so members are keen and active. Even so, new members would be welcome, and anyone living round and about the west of London is invited to contact Mike Fantham at 7, Richard Knight House, Favart Road, London SW6 4AY. Tel. 01-736 7163.

Well known, too, for its free flight achievement is the **Norwich M.A.C.,** although we are told by Mike Tomalin, the club P.R.O., that there is plenty of R/C and C/L interest to be found in the 80 membership, with R/C sport flying the most popular. But whatever you fly in this corner of East Anglia there is plenty of space available. The main flying field provision is R.A.F. Coltishall, but there are a number of backing up fields. Getting the members together fieldwise is therefore no problem, but to make for a common flying interest a big comp. is being planned for later in the year. This to be for all classes of Scale model: F/F, R/C and C/L, and a generous hand out of prizes for the occasion is being made by the local model shop. The first prize carries a cup and model kit up to £25. The club puts in its share of display work, but goes airborne only when conditions are safe. The big display of the year is one given in conjunction with Norwich Corporation. In spite of the already large membership there is still room for more. Pop along if you can to the meetings held on the first Wednesday of each month at the Festival House pub, opposite St. Andrews Hall in Norwich.

Back again to a singular interest, this time from a wholly control line club, the **Alfreston & D.M.A.C.** The report on this Nottinghamshire based club has been sent in by John W. Kelsall. The main obsession of this mainly junior contingent of around 40 members is combat, but Goodyear and FAI team racing get more than just a look in. The club has only been in existence for a year, so early days yet in their hopes of putting it on the national map contest wise. Even so, a good start was made with the open combat competition held by the club back in January. The weather, cold with a slight breeze, provided excellent conditions for the 22 entrants, included among whom were some of the country's top flyers, journeying from as far afield as Watford and Leicester. The club was particularly proud of the stiff fight put up by 13-year-old Peter Degg against Vernon Hunt in the second round. The final was a close fought affair between Steve Bingham and Vernon Hunt, with Steve Bingham coming out top with two cuts to one.

Up to Cumberland for our next report, which comes to us from Paul Kinkowski, the P.R.O. of the **Penrith & D.M.A.C.** He tells us that, at a successful club social evening, an unusual type presentation was made to Mr. Alan Cosheril as the 'Most Improved'

Contest Calendar . . .

March 17th	**S.M.A.E. 2nd AREA CENTRALISED.** F.A.I. (F1A) Glider, Open R/P – Area Venues.
March 24th	**S.M.A.E. 1st C/L CENTRALISED.** Cancelled.
March 31st	**C/L STUNT COMP.** At Rickmansworth, Herts. Details from Glen Alison, 62 Berry Lane, Rickmansworth, Herts. Tel. Rick. 72675.
April 7th	**ST. ALBANS M.A.C. 'SPRING GALA'.** F.A.I. R/G/P, flown in rounds from 10.30 a.m. Also ½A, A/1, Cd'H, Chuck Glider. Venue: Bassingbourn, near Royston, Herts.
April 7th	**GLEVUM (Gloucester) M.A.C. COMBAT RALLY.** Pre-entry (40p) and map of directions from M. Lewis, 16 Tilnor Crescent, Norman Hill, Dursley, Glos. Venue: Ham, Glos. First prize Cassette tape recorder. Also 1st, 2nd and 3rd place trophies.
April 7th	**S.M.A.E. INDOOR SCALE.** Venue Cardington.
April 7th	**N. BERKS R/C ½A PYLON RACING.** Venue Nr. Garford on A388 Wantage-Oxford Road. Pre-entry 50p to P. Clarke, 7 Candwell Close, Grove, Nr. Wantage, Berks.
April 14th	**S.M.A.E. INDOOR MEET.** Venue Cardington.
April 14th	**ELLIOT C/L SPEED MEET.** F.A.I., 2.5 Open, 5 c.c., .40 & .60 c.c. at Elliot Bros., Airport Works, Rochester, Kent.
April 14th	**NORTHERN AREA VINTAGE & PANNET MEETING.** Vintage Duration Open Power (Pannet Trophy) A/1, Cd'H, S.M.A.E. members only at R.A.F. Topcliffe, Yorks.
April 20-21st	**S.M.A.E. 2-DAY F.A.I. MEET.** Qualifying – European Champs. FIA, FIB, FIC (Jnr. Champs). Venue Strubby.
April 21st	**S.M.A.E. R/C PYLON RACING.** Venue: North Luffenham.
April 28th	**BLACKBURN W.W.I R/C SCALE FLY-IN.** Informal comps. Pre-entry 20p to E. Herbert of 2 Elizabeth Drive, Haslingden, Lancs. Venue: Witton Sports Ground, Blackburn, Lancs.
April 28th	**S.M.A.E. 2nd C/L CENTRALISED.** F.A.I. T/R, Combat, ½A T/R, Stunt, Speed. Venue R.A.F. Little Rissington.
April 28th	**MALVERN SOARING ASSOC. CROSS-COUNTRY SOARING TASK EVENT.** West Malvern. Pre-entry 50p (40 max.) to A. Hobkirk, 216 Northwick Road, Worcester WR3 7EH.
May 5th	**S.M.A.E. 3rd AREA CENT.** FIC (Power) Open R/G – Area venues.
May 5th	**LONDON AREA C/L MEET.** F.A.I., Goodyear T/R, Combat. Venue Charville Lane, Hayes.
May 12th	**S.M.A.E. INDOOR MEET.** Venue Cardington.
June 2nd	**KIRKCALDY M.A.C. C/L RALLY.** Combat, Goodyear Stunt at Beveridge Park, Kirkcaldy, Scotland.

modeller in the club. The cup was donated by Mr. John Davies. Another donation came from Mr. Stuart Harper: A C/L kit for the raffle. Mr. Harper is the proprietor of the local bicycle shop which is being rapidly expanded into a model business. Local modellers can now get most of the things they need – even propo gear. The main club interest is Radio, but it isn't all sport flying. Indifferent to the cloudy, blustery weather, members turned out in force for the series of Boxing Day competitions. Top performer was Cumberland club star, Mike Fyrth, but no one succeeded in bursting a balloon, so the event was, in fact, a Balloon Nudging contest. The club extends a welcome to any aeromodellers, resident or itinerant, at their Brougham Field any Sunday afternoon.

Good news from the **Telford M.A.C.**, according to the club bulletin: fees are down. They are now only £2 per wage earner and 50p only for the non-wage earner (layabouts please note). And to add an extra touch of magnanimity, members wishing to join the S.M.A.E. will be given a £1 contribution towards the subscription. Linking perhaps with this idea, is the feeling that the club could do with a healthy bit of contest stimulus, and for a start it is suggested that the club hire a minibus to attend local competitions and perhaps to visit other clubs.

Just a point from the **Watford Wayfarer's M.A.C.** short newsletter which may give other clubs food for thought: no Venturi type silencers are acceptable on the club flying field.

It seems a long time since we saw a copy of **South Eastern Area's** *Seadog*, but it is nice to see it again. It is now under new editorship; the old team of John West and Dave Welch having hung up their seaboots. Mr. T. J. Grey is now in the editorial seat, and this change coincides with the retirement of Norman Couling as the National Secretary of the S.M.A.E. Norman was for some years the Area Secretary, and, altogether over the years, has put in a long, administrative slog which has been well appreciated. I think I am correct in saying that the bedevilling factor in this corner of England is the lack of flying space, and I would have been interested to know where the Area comps are now held – Ashdown Forest is not my ideal.

The worst pun of the year comes from the newssheet of the **Wolves M.A.C.** – a topical column is entitled *Aerochatics*. This covers the club's wide sphere of activity – anything from chuckies to multi aerobatics. In fact, the all branches hand-out of cups and plaques for the past year is quite impressive: 8 cups and 12 plaques to give every possible interest a look in. All of which suggests a fair amount of contest interest in the club and this is also reflected in the number of meetings attended throughout the year plus the club's own well-stocked programme. And to add a touch of drama to the C/L side of things the notorious *H.M.S. Flycatcher* has been acquired. On this you get points for hitting the deck rather than otherwise.

Of sad consequence to the **Anglia M.F.C.** is the loss of its clubroom, or should I say pubroom. Like all good things in this frantic day and age the Old Cock at Stock is being converted into a plastic eating house. In the future, meetings are to be held at the Cricketers, Danbury, where the old courtesies still prevail. There are lots of useful contributions in this issue such as the article in which radio flyers are advised not to lean out their engines too much for general flying, as the reduced lubrication makes for increased wear.

The copy of the **Three Kings'** *Court Circular* I have to hand is a bit out of date, but the club seems to be keeping the C/L front as lively as ever. A notable aspect of this club is its production of super Scale models, ancient, modern and in-between. A typical example is Wal Cordwell's *Boeing P26A*. Nicknamed the *Peashooter*, the P26 was an advanced pursuit ship way back in 1932, and the last of the old fixed undercart school. The superb piece of glossy cowling on Mr. Cordwell's model was fashioned from the bottom of an old, dented aluminium kettle, which I think is one up to the anti-reddi-made brigade. Another interesting model on show at the club is Paul Eisner's small, red speed model. Its tuned pipe nestles into the top of the fuselage. Its objective is Open 2.5 in. Speed, in which monoline and nitro are permitted.

Another batchelor bites the dust! St. Albans club member and Chairman of the Free Flight Technical Committee, Dave Tipper, 'took the plunge' and married Eileen Keer at Wood Green with appropriate guard of honour. Congratulations to you both!

A lament opens the **East Anglian Area** newsletter: that of too close a synchronisation between the blowy spells of wind and the weekends. Area flyers were obviously spoilt by last winter's benevolence when keen types, like the Norwich boys, were out on the wide open every Sunday. Wind or no wind, though, and in spite of higher petrol costs, there was a good turn out for the 1974 Winter Gala cum Centralised S.M.A.E. event at Watton on January 13th. Sad to say, the wind blew just that bit too boisterously, so that more model box lids remained undisturbed than otherwise. Just to give an idea of the wind's rate of knottage, Julian Hopper bravely offered his model into the launch position, and all that got airborne was the wing plus the pylon. With great pertinacity – and a spot of epoxy – he stuck it back on and completed his series of flights.

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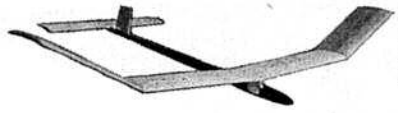

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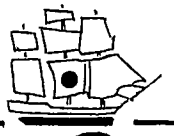

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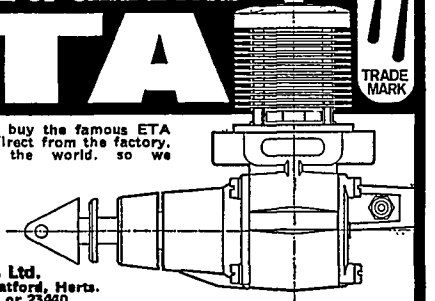

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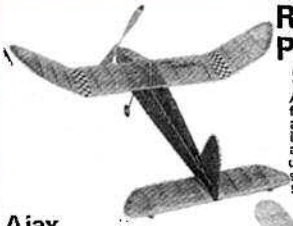

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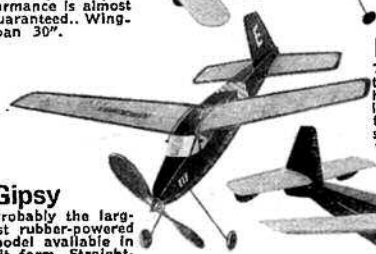

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Probably the largest rubber-powered model available in kit form. Straightforward construction and a ready-cut sawn propeller blank included. Wingspan 30".

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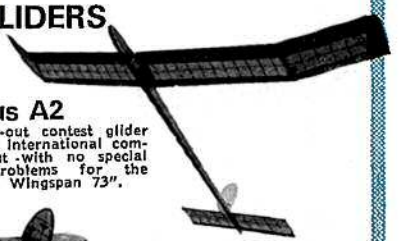
GLIDERS



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CONTROL LINERS

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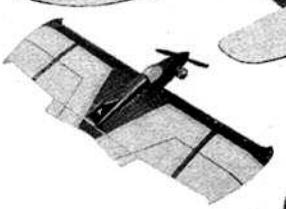

Talon

An unusual flying wing design with an exciting performance. Engines 2½-3½ c.c. Wingspan 32".

Phantom

Basic control liner, and all-sheet and block construction. Very tough model. Engines 1-1½ c.c., Wingspan 21".

Spectre

A large, fully aerobatic model with assymetric wing and full flaps and elevators. Engines 2½-3½ c.c., Wingspan 40½".

FREE-FLIGHT

Snipe

Easy building (many sheet parts) and good flying characteristics provide a good introduction to powered flying. Engines under 1 c.c. Wingspan 40".

Ladybird

Radial cowl and semi-scale lines plus a very strong airframe make Ladybird an ideal sports model. Engines about 1 c.c. Wingspan 42".

Super Scale Series

Fine details and interesting construction make these really modellers' models. Can be converted to R/C by experienced modellers. Engines under 1 c.c.