

January 1973

# Aero Modeller

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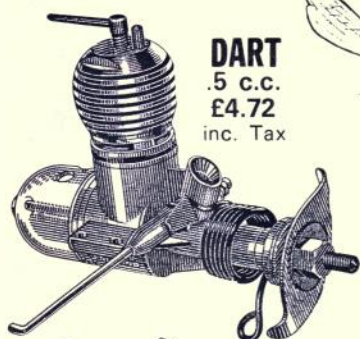
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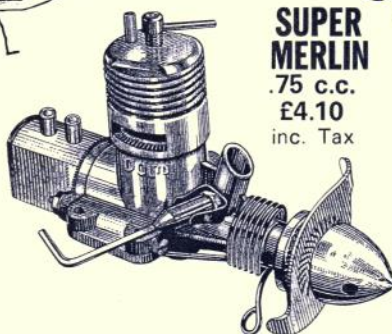
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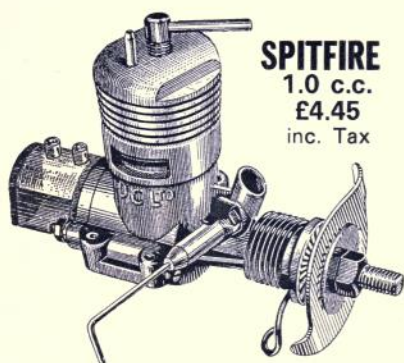


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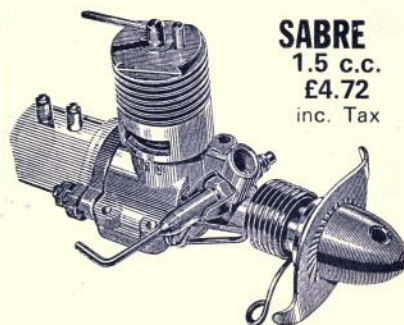
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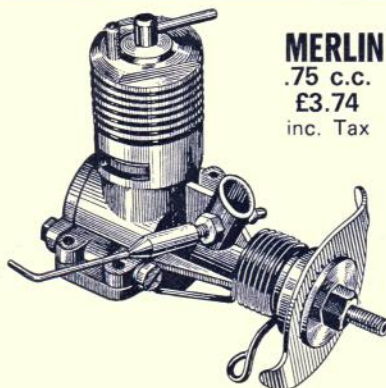


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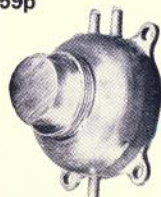


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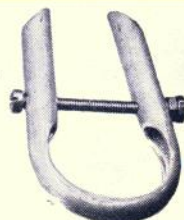
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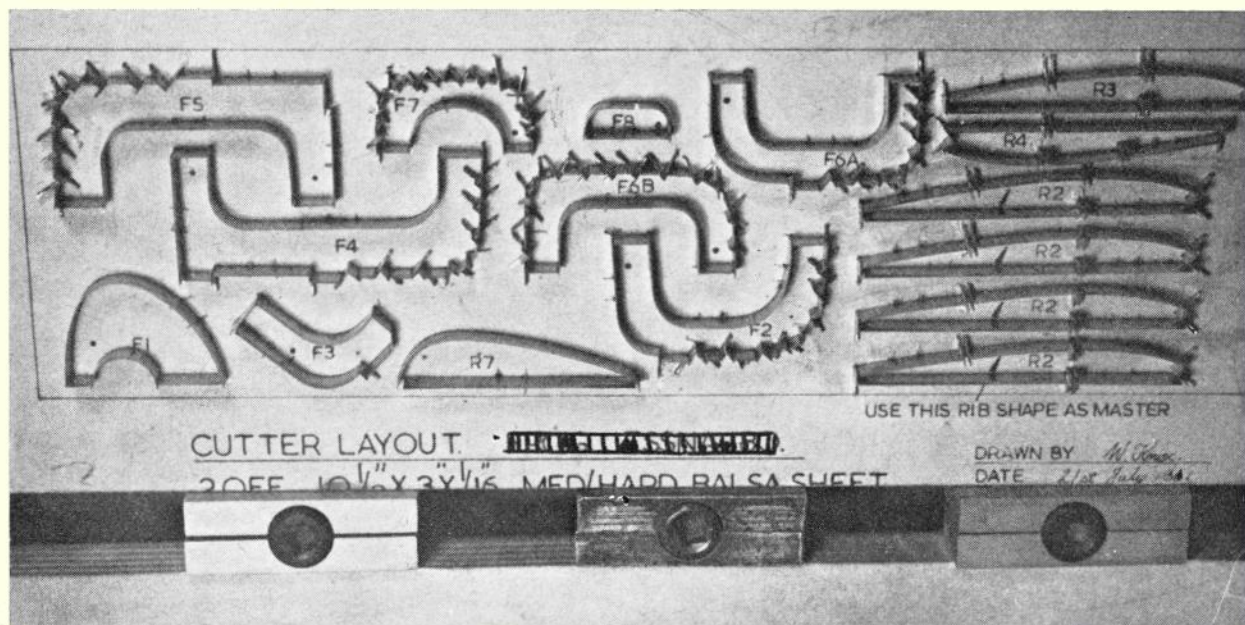
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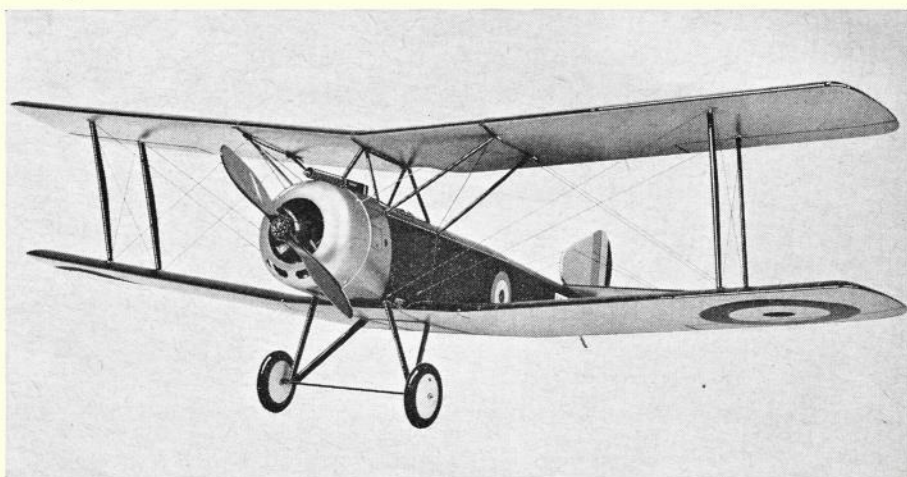
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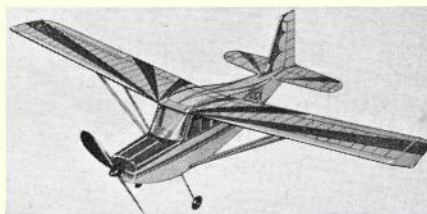
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# Aero Modeller

INCORPORATING  
MODEL AIRCRAFT

January 1973

Volume XXXVIII No. 444

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## COMMENT

One of the most inventive modellers this world has ever known, passed away in November. His creations had such profound effect on aeromodelling in their time that the designs, rather than the designer, have been remembered. Like so many other geni, he lived in obscurity, unknown to those who enjoyed the products of his labours. Consider this basic catalogue of achievement: Co-founder of what was to become part of the largest toy and hobby company in the world. First to make an aluminium stamped fuselage, paper winged ready-to-fly model (the amazing *Interceptor Mk. IV*); creator of ready-to-fly scale models of the *Puss Moth*, *Mail Plane*, *Hart*; mass producer of moulded fuselage pressed paper winged, Woolworth distributed, *Imp*, *Speed Demon*, *Avenger*, *Raider*, etc., models that sold by the million; inventor of the plastic kit (with the *Empire Flying Boat* as a starter!); first with the pre-fabricated flying model kit (for a Wakefield); first to make a kit for distribution via National Newspaper competition (the *Daily Express* glider); inventor of *Jetex*, of sandwich balsa mouldings, of a hundred and one other details from miniature gearboxes to a 32 ft. target glider towed by *Miles Masters* in the War. Close study will reveal the initials WM in the trademark for the FROG (Flying, Rise, Off, Ground) range and the Penguins (non-flying plastic models) which led the world by years. The W stood for Wilmott, the M for Mansour. It is Joe Mansour that we mourn, and to whom this issue is dedicated on behalf of the tens of thousands he introduced to aeromodelling.

## on the cover

Winner of Experimental Aircraft Association award at U.S. Nationals 1972, for best R/C scale model of a full-size homebuilt aircraft (what EAA is all about), this beautiful 'Liberty Sport' biplane was built by Dick Graham, of Otumwa, Iowa, U.S.A. A Dick Stouffer photograph.

## next month

Bumper issue once more, with two full-size plans—one for a delightful rubber-powered version of the *Westland Lysander* (ideal for Peanut Scale enthusiasts), the second for an ultra simple catapult launched glider, based on the *Boeing 747*. Plans, too, for Claus Maikis' striking control line stunter, the *Commodore*. Our beginners feature continues with elementary building advice, while our regular contributors look after the interests of the more experienced. Plenty for all in the February issue, on sale January 19th.



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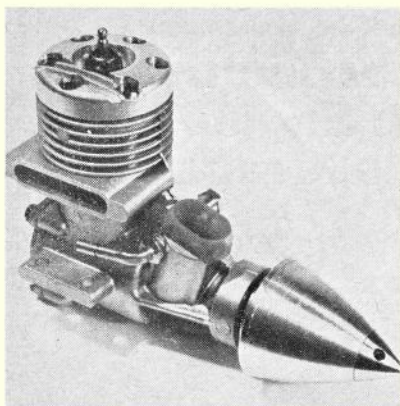
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# SUPER Tigre

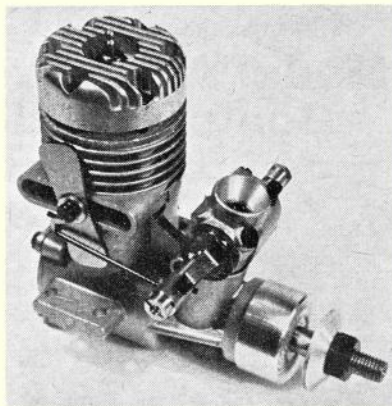
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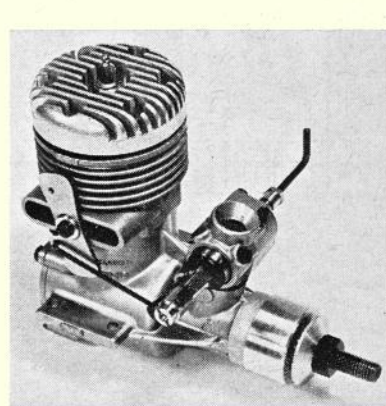
G.15 F.1 GOODYEAR

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S35 fits ST35S, ST35C, ST35 R/C	£3.30
S40 fits G.40	£3.30
S56 fits ST51, 56, 60	£3.30
S71 fits G.60 F.1 & R.V. & G.71	£3.75

To Commonwealth Dealers, Importers and Wholesalers - We are the agreed suppliers for Super Tigre engines and parts. Just drop us a line for copies of our latest price schedules. We give the fastest possible delivery.

## SUPER TIGRE MOTORS ARE AVAILABLE FROM THE VERY BEST MODEL SHOPS

**WE HAVE** just returned from our annual visit to Italy where we were shown over Super Tigre's new factory at Pianoro. This is now getting fully into its stride in meeting delivery schedules. This plant is exclusively devoted to the manufacture of model engines and has been equipped with the most modern manufacturing machinery available, much of which is custom-built to meet the high standards required for a quality product.

There are several new and exciting motors going to appear during the coming months. These will be in addition to the already extensive range. Unfortunately, like most manufacturers, there will be a new price structure from January 1st, 1973 from Italy, so prices shown are only effective until this date. We for our part will only pass on the smallest possible increase.



# WORLD ENGINES

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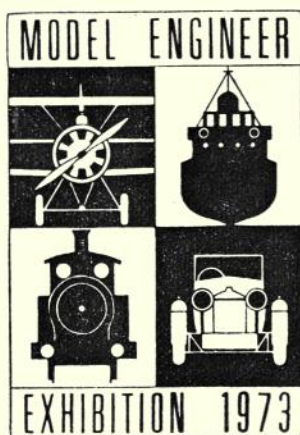
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# 42nd GREAT SHOW!

## SEYMOUR HALL, LONDON, W.1.

2nd January - 13th January 1973  
(Not Sunday)

Daily 10 a.m. - 9 p.m.  
2nd January opens 2.30 p.m.; last Sat. closes 7 p.m.

**Model Aircraft, Locomotives  
Boats, Traction Engines  
Military Models, Crafts**

### WHAT WILL BE ON DISPLAY

Last year's OPEN PLAN arrangement of the MAIN HALL was so widely praised that we are continuing this general scheme with ever better access and viewing, whilst retaining the concourse round the WINNER'S PODIUM - (This year, we hope winners will fit this stand!) A slight change in S.M.E.E. WORKSHOP will allow spectators better viewing without blocking a door. 'Bill' Carter will again be in charge of the S.M.E.E. PASSENGER RAILWAY with non-stop service during opening hours for young and old. The team of experts from the Society will be providing practical work and advice to visitors.

**LARGE FLYING CIRCLE** - balcony to balcony - again in operation with even more exciting and expert models, and operators. All-electric models that do most of the things that i.c.-powered control-line models do. It gets better every year.

**TRADE STANDS** - We have slightly increased numbers this year in view of increasing demand from exhibitors. These are in MAIN HALL; a few smaller, DEMONSTRATION STANDS in BRYANSTON ROOM will show construction techniques and use of tools.

Introduction of a MODEL ENGINEER WORKSHOP manned by the S.M.E.E. last year proved immensely popular and will be increased in size and scope, again with experts from S.M.E.E. in charge and assisted by M.E. consultants. Working models under compressed air will also be on show. CRAFT DEMONSTRATIONS will include Gildas Jaffrenou with his FOLK HARPS... making and playing.

**BRYANSTON ROOM** will again be a CLUBMEN'S CORNER with stands manned by the principal governing bodies, plus club unit demonstrations, and trade demonstrations.

**STOP PRESS!** Magnificent moving DIORAMA of Napoleon reviewing troops, from Army Museum, Paris.

**LECTURE HALL** will house the clubs connected with MILITARIA - British Model Soldiers Society, International Plastic Modellers' Society, etc. - and also display the entries in the MODEL SOLDIER classes, including new Special Air Service Trophy entries.

**COMMITTEE ROOM** will provide regular 50-seat sessions for BATTLE GAMES on announced themes with expert commentary. Advance booking by ticket at the exhibition.

**BOATING MARINA:** Following last year's successful launch of this feature some improvements will be made to spectator accommodation. Timed sessions will be held. TRADE DEMONSTRATIONS of RADIO-CONTROLLED BOATS will be welcomed (please let us hear early), which will be varied with CLUB EVENTS (mainly in evenings) and STAFF EXHIBITS. There will be no selling at the poolside, but demonstrations can be announced and suitable display cards shown advising visitors where products obtainable and information given. Club features or displays specially invited - drop us a line!

**GALLERIES** provide sitting-out space for several hundred persons, and offer best view of model aircraft flying. There will also be club exhibits displayed and entries in our BOYS' EXHIBITION.

### REFRESHMENTS

Snack Bar in the Balcony Cafe, with teas, soft drinks, sandwiches, cakes, Restaurant Service (licenced) available on ground floor. Parties may book in advance.

### ADMISSION

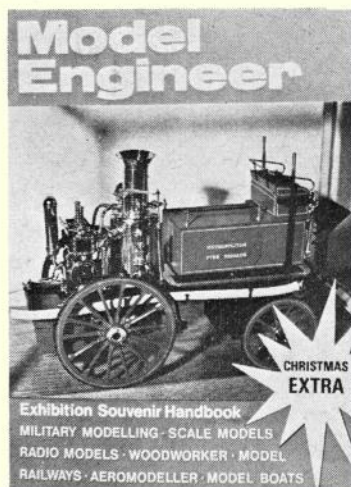
Price of admission at the door will be: 30p adult, 15p child. A child is regarded as anyone still at school. Children under five who have not started school and are accompanied will not be charged.

Reduced admission charges for pre-booking as under: Single and small number pre-booking tickets available from these offices. Adult 25p, Child 12½p. Parties of more than 10: Adult 20p, Child 10p, Teachers i/c parties free - one per 10 in party.

A combined family ticket can also be bought in advance.

### SOUVENIR GUIDE

Another CHRISTMAS EXTRA issue of Model Engineer will be coming out 2nd Friday in December with entries, trade stands, articles galore to assist the visitor and solace the stay-at-home.



**Advance Bookings and details from:  
EXHIBITION MANAGER,  
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FOKKER D-7 58 1/2" span scale ..... £27.95  
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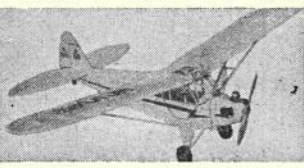


PIPER CUB J-3 54" span ..... £10.60  
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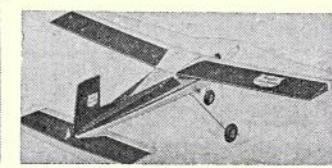


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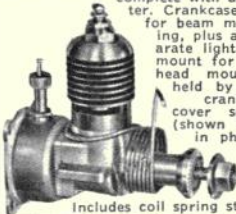
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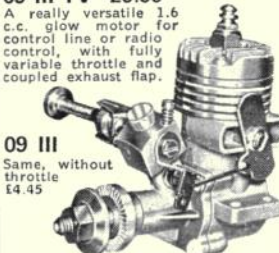
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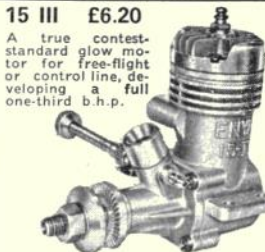
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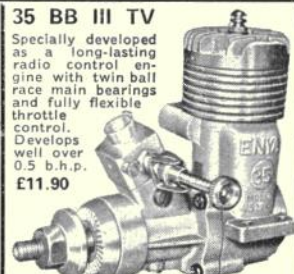
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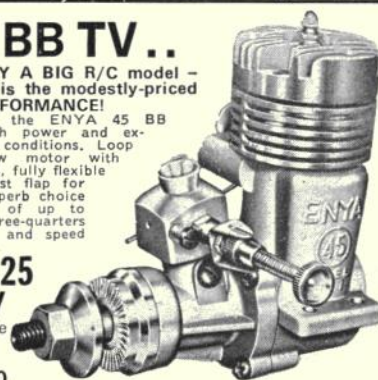
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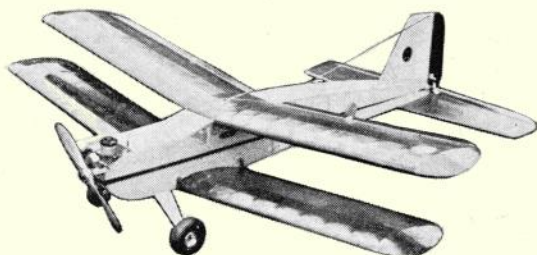
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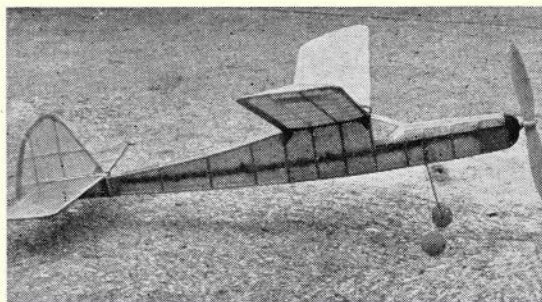
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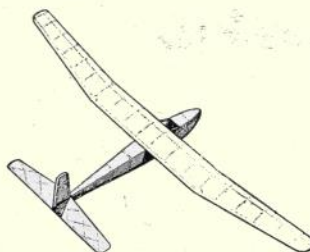


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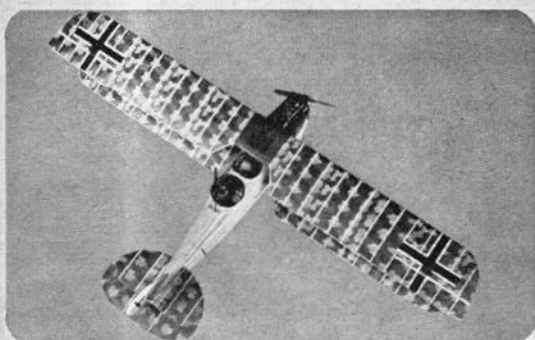
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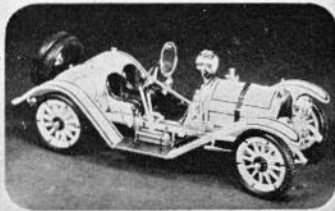


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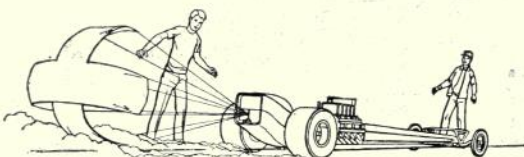
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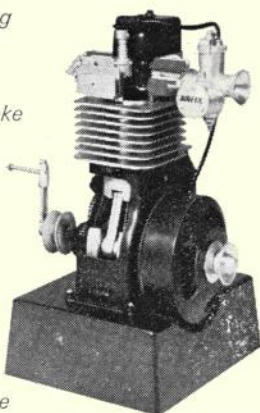


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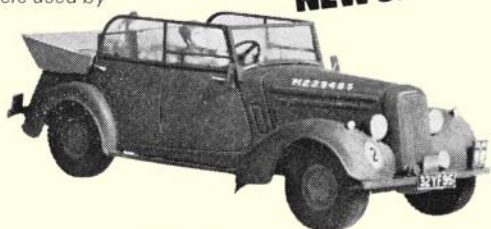


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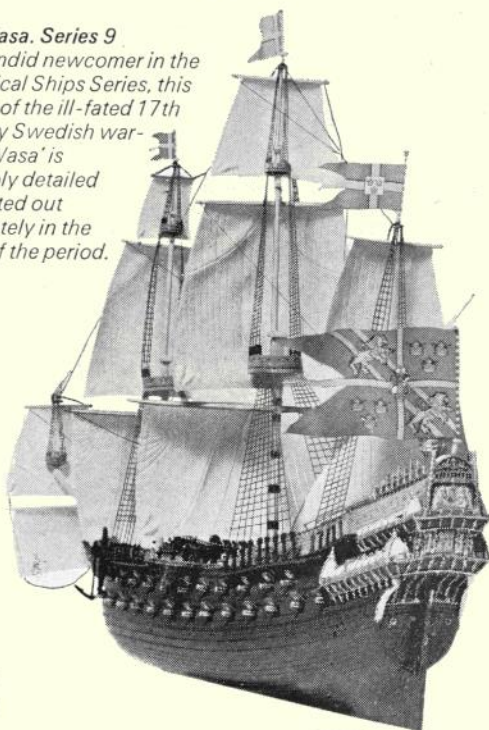


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## HEARD AT THE HANGAR DOORS

**S.M.A.E. JUBILEE** reception of Fellows at the United Service and Royal Aero Club, Pall Mall, London, on November 22nd was a memorable occasion. Patron of the Society, H.R.H. The Duke of Edinburgh presented each of the Fellows with a Certificate of Office and conversed with all of them as well as the Officers and Delegates of the present Council. A photo record of the evening will be included in our next issue. Alwyn Greenhalgh produced some historic models and engines for the Duke to see, alongside examples of modern models. But he did not, as in his recent R.Ae.S. lecture, astound the assembly by flying half a dozen different types!

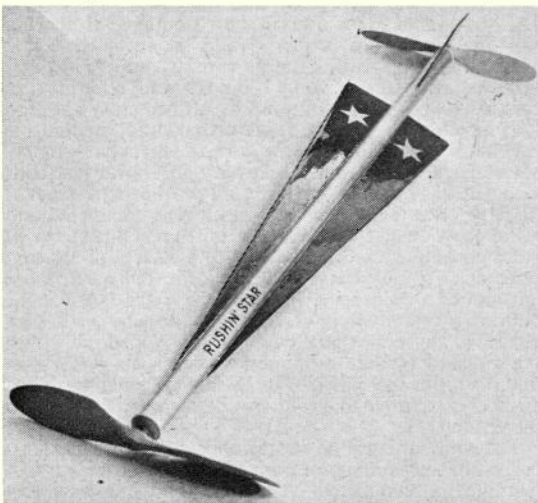
Earlier in the month, on November 6th, Alwyn, the Society historian, had lectured on the development of aeromodelling in the U.K. to the Historical Group of the Royal Aeronautical Society. The lecture opened with a minute tissue covered indoor flyer, went to a hot air balloon, two ornithopters, a canard and a sizeable indoor lightweight. Seldom has the historical branch seen such a large attendance, or produced such an enlightened questions period. The learned members of that august body of aeronautical scientists, and the lesser mortals present, were equally fascinated by Alwyn's rapid patter and very practical demonstrations of aeromodelling from the 19th century



Centre point of the recently opened Royal Air Force Museum at Hendon is the Sir Sydney Camm Memorial Collection, containing beautifully presented examples of Camm-designed Hawker aircraft from the early Cygnet to the Kestrel. Among these famous aircraft are photographs of Sir Sydney at various stages in his life. Aeromodellers will be particularly gratified to find that the photo from 1915 shows the young Sydney Camm with a 'T' frame oiled silk rubber-powered model.

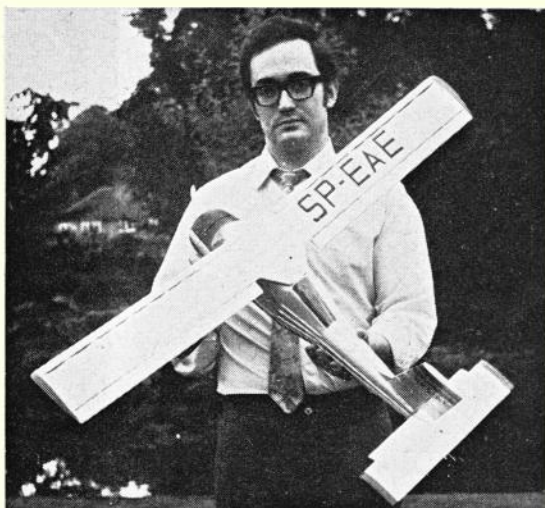
to 1939. Congrats are due for a job well done, so well done, in fact, that we wonder if the operation could be repeated north of the Metropolis for others to enjoy.

**ELECTRIC** round-the-pole flying will once more be continuously demonstrated at the Model Engineer Exhibition (January 2nd-13th) where our own efforts will be supplemented once more by enthusiasts from the Leicester, Grantham and Luton clubs. Should any other modeller wish to demonstrate their own models, they are welcome to do so – but are advised to contact the Editor to clarify any points concerning power connections to the model, etc., as well as to check the best time to attend. Remember Saturdays are very popular and you may have to wait all day for a trip round the pylon! The Exhibition is open each day (except Sundays) from 10 a.m. to 9 p.m., and you will be particularly welcome to fly your models midweek in the mornings or afternoons. Line length used is around the 20 foot mark, and provision for attaching a safety line must be made. See you there?



Just two days before the Flightmasters club ran a rubber speed contest, Bill Hannan received his Aeromodeller containing a sketch of the Russian record holder. He rapidly built a similar machine, using a model rocket tube for the fuselage and 1/16 in. balsa wings, plus a carved pine prop at each end. Performance was only mediocre (wrong props?), but the demoralising effect on the opposition astonishing!





THE AIRCRAFT pictured on these pages is in fact the second such model made—the original having met an unfortunate end under the wheels of a van at the 1970 Nats., without ever having become airborne. We must all be aware that whilst there is not always an official speed limit at rallies sited on airfields, commonsense should prevail. If the driver had been travelling at a reasonable pace the unfortunate incident could have been avoided. As it was, one model was reduced to matchwood in one second flat—not a fitting finish to several months' careful work!

A second version was built once again scaled from the *Aero Modeller* scale drawings (plan pack No. 2910, price 35p.) At 1/12th scale, with a wing span of slightly over 3 ft. and powered by a DC Dart, I was still convinced that it would make a beautiful model, and moreover a lovely flyer. The fruits of labour were not in vain, the *Wilga* proved to be everything I had hoped it would be! When trimmed out, the flight pattern proved to be a steep left hand climb followed by a gentle left hand glide. Flown straight off the board (as the saying goes), apart from slight packing under the tailplane to increase elevation, the model flew in very tight circles, but it was felt safer to open out the turn as the tendency for the nose to drop is always there.

Careful selection of woods is a 'must' if the weight is to be kept down, while fuselage construction with anything but very soft wood will prove difficult. Basically easy to build, the fuselage construction is unusual and the following notes on construction might prove helpful.

Firstly, the fuselage main formers are cut out, laminating where necessary, and adding the reinforcing sections for gluing, etc. Sew and epoxy the undercarriage, after bending from 14 swg, to the rear of former C. Basic assembly is a hand held affair, so careful alignment is a must. The various components key together, and if cut accurately the assembly will be self-supporting. The builder can then decide how far to take the assembly in

a 36 in. span, free-flight

scale version of the

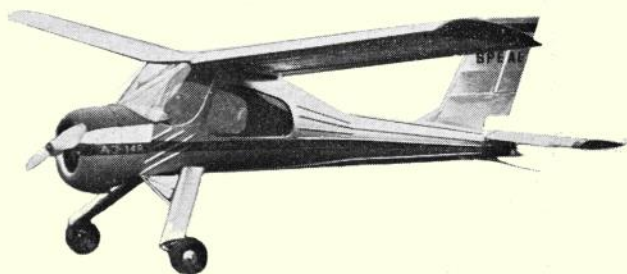
Polish glider tug, the

## PZL WILGA 35

designed for 0.5-0.75 c.c.

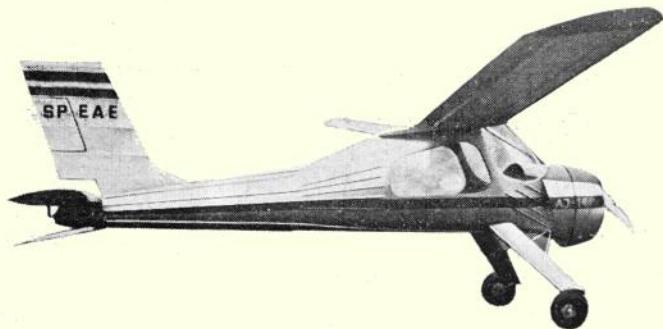
engines by P. HAYWARD

one go—the isometric sketch shown on the plan reveals the fuselage construction clearly. Once the basic assembly is completed the  $\frac{1}{8}$  in. square stringers are added and the top rear longeron fitted and glued. If the nose of the fuselage is placed on the edge of a table or building board, the engine bearers and front former can be carefully checked for alignment, which is naturally most important. Completion of the undercarriage is next; the forward cross pieces being soldered to the main legs and



then once more stitched and epoxied to the fuselage. Fuselage sheeting must be undertaken in two halves, each half overlapping the keel and top spine. The cabin area is sheet covered completely and then when the glue is dry, the glazed areas are cut out. Centre section wing ribs are keyed onto former C and the incidence angle must be checked with extreme care, as well as making sure that all is square. Brass tubes for wing retention are epoxied into position followed by all necessary sheeting to complete the assembly. It is worth mentioning that the two hardwood dowels at the rear of the cabin window are important and most necessary for rigidity in this area. Block balsa is used to fair-in the extreme rear fuselage once the rear wheel assembly is completed and installed. Cowling construction is from  $\frac{1}{8}$  in. strips of balsa assembled around a suitably sized and tapered receptacle—a plastic beaker being ideal. The inside front face must be built up to facilitate the sharp taper at the bottom. Acetate windows are installed using an impact adhesive, any excess glue can easily be wiped off with a rag dipped in cellulose thinners, and it is suggested that this operation be carried out as late as possible in the assembly, in order to avoid any damage or scratches to the glazing.

The wings are very basic assemblies; the flaps and slats being built separately and added after all covering and painting is completed. Tailplane and fin assembly





present no problems, the fin being glued in position and the tailplane retained by elastic bands. Hooks for wing retention slot into the fuselage section and elastic bands hold everything together rigidly. Lightweight tissue was used to cover the entire model, including the fuselage, and sufficient thinned clear dope applied until all tissue pores were filled. Two or three coats should be ample. The full size aircraft was covered in fluted panelling and whilst this could be reproduced on the model, the weight must be watched carefully.

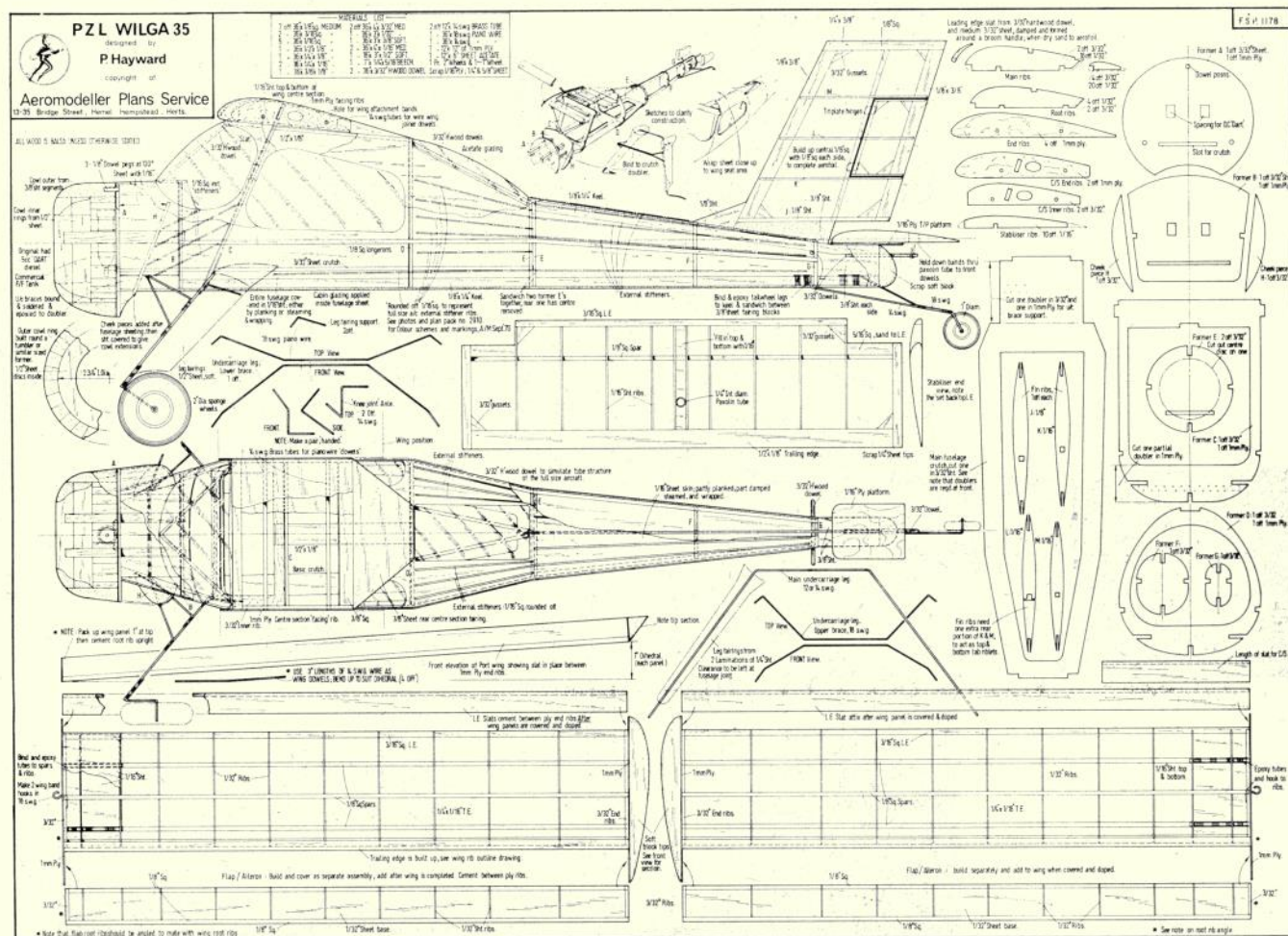
Finish is silver overall with red and black trimming, and whilst on the subject of silver finishes I must add that I find silver dope to be extremely easy to use. It seems that much has been written on the difficulty of applying this silver finish and on the problems of fuel proofing it, but I find that no problems occur with *dope* and proofing can be either clear polyurethane or enamel with no ill effects, whether sprayed or painted on.

With all construction and painting completed, we now come to the flying, again a subject upon which much has been written. We are always being told that the model should fly, and it is always supposed that 'all is well'. What to do if it isn't? Just what is supposed to be the answer when wing incidence cannot be increased and the thing just won't fly, as has been my experience on more than one occasion with differing types of planes, scale and otherwise? Possibly Mr. Eric Coates, whose excellent articles are of immense value, would like to comment on this problem. However back to *this* model, where the



incidence angles may be altered by balsa packing if desired. Long grass is essential for trimming flights, both for the glide and early powered flights. The only alternative is allowing the model to take-off from a runway, gradually increasing revs until full power is being used. The flight pattern once trimmed is very realistic and a R.O.G. can be undertaken without fear of repercussions—the tail wheel comes up in a few feet and once airborne, she sticks her nose up and flies beautifully. What a shame the weather has been so bad this summer—still, here's hoping for next year!

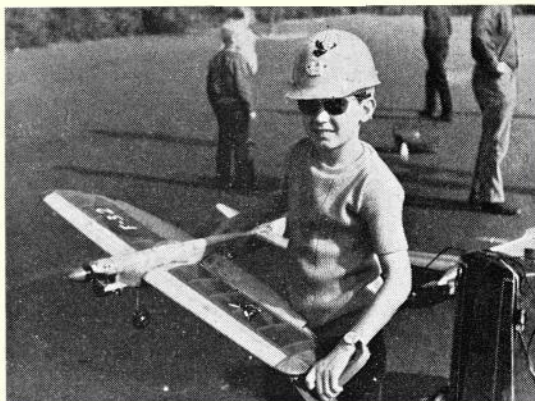
FULL-SIZE COPIES OF THIS ONE-SIXTH SCALE REPRODUCTION ARE AVAILABLE AS PLAN No. FSP 1178, PRICE 60p PLUS 5p POST, FROM AEROMODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE ST., HEMEL HEMPSTEAD, HERTS HP1 1EE.







Broeren (left) and Jaspers are a pair of promising newcomers to team-racing, and indeed they placed third at the Utrecht International. The 'Turtle' model design of Rob Metkemeyer is certainly popular in Holland; in fact, F.A.I. is rapidly becoming a 'one model' contest over there!



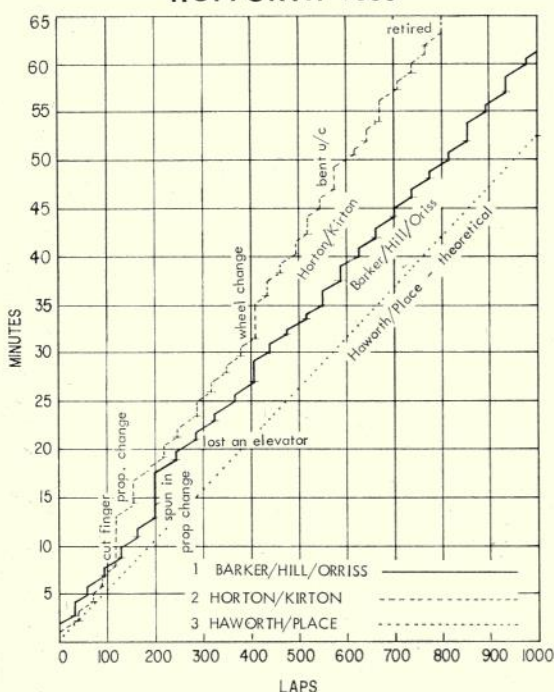
Eleven-year-old Dominique Fragnoule, of Belgium, flew the entire F.A.I. aerobatic pattern with his Enya 19-powered stunter. Watch out, folks, give him a little more experience and . . .!

## CONTROL LINE NEWS

THE THIRD ANNUAL Utrecht (Holland) International event held over October 7-8th attracted a good entry from West Germany and Belgium as well as the host country, who no doubt appreciated the superb Autumn weather which followed the early morning fog, reports Paul Tupker.

Poorest support was in speed, where only five of the nine entrants actually recorded official flights. Outright winner was Emil Rumpel of Germany with two flights of 246.58 km/hr – how consistent can you get! He flew his usual asymmetric model – the same he flew at the World Champs and the Bochum meeting. His club mate Jurgen Lenzen was less fortunate, indeed failing to record a time, and second place was taken by fellow German Dieter Scheidereit, way behind at 216.86 km/hr. Josef Frohlich's run of bad luck continued (he failed to record a flight at Bochum) and he could not even top 200 km/hr.

### 'RUFFORTH 1000'



These piped engines are not so easy to handle!

A rare face to be seen at the speed circle was that of Winfried Holle, one of the top Dutch speed fliers a couple of years ago, but he too joined the ranks of the 'no fliers'.

It was no surprise to see an easy win for Louis Van den Hout in the aerobatic class, flying his now familiar Veco 45 powered *Spider*. He was followed by our correspondent (Paul T.) and R. Raeymaekers (Belgium), each with a score of 2053 points. Second place went to the former on the basis of a better third round flight.

Biggest surprise in this class was the performance of 11-year-old Dominique Fragnoule from Belgium. Handicapped by a small .19 cu. in. powered model, and with a poor engine run at that, he flew the full FAI schedule and managed to place twelfth out of the fourteen entries.

F.A.I. teamrace attracted the most entries – twenty – with eight teams breaking the five minute 'barrier' in the qualifying heats. Marshalling was strict, as witnessed by the number of disqualifications, which put paid to Brendel/Glodeck's challenge in the first round while in the second they failed to complete the distance. The semi-finals saw five more sub-five minute flights although the fastest (4:41 by the Metkemeyers) could not match the best heat time of 4:37 set by Schwarz/Rumpel. The final itself was once more an 'all-Turtle' affair, with the Metkemeyers once more finishing first. Only fair really – *Turtle* was designed by them after all!

### Results:

#### Speed

- |                   |               |              |
|-------------------|---------------|--------------|
| 1. E. Rumpel      | (W. Germany)  | 246.58 km/hr |
| 2. D. Scheidereit | (W. Germany)  | 216.86 km/hr |
| 3. H. Heinsuis    | (Netherlands) | 200.00 km/hr |

#### Aerobatics

- |                   |               |             |
|-------------------|---------------|-------------|
| 1. L. v.d. Hout   | (Netherlands) | 2212 points |
| 2. P. Tupker      | (Netherlands) | 2053 points |
| 3. R. Raeymaekers | (Belgium)     | 2053 points |

#### F.A.I. Team Race

- |                     |               |        |
|---------------------|---------------|--------|
| 1. Metkemeyer Bros. | (Netherlands) | 9:13.8 |
| 2. Visser/Buys      | (Netherlands) | 9:43.2 |
| 3. Broeren/Jaspers  | (Netherlands) | 9:52.0 |



## Rufforth 1000

Somehow, the year would not seem complete without John Horton's traditional chart and report on this one-thousand-lap race for Class B team racers – so 1973 is no exception!

October 22nd dawned cool, but dry, and with a strong North West wind which proved to be more than a little hazard. In the previous year, the opposition neatly eliminated itself during practice thus obviating the need for qualifying heats. This time (incidentally the 13th such race) some six teams actually competed, so 200-lap heats were run. In the first of these, were Haworth/Place with their long-range Eta 2.8 cc motor, and despite an unexpected pit stop and some 'dodgy' landings due to the wind, recorded 11:46.

Fellow Wharfedale members Horton/Kirton used their *Dalesman V* with a piped ETA 29, but they were short on range and had starting problems, resulting in 13:47. Clarkson/Daly were supposed to have flown in this heat but scratched when their O.S. 29R refused to keep running in the air.

The second heat saw the fastest time of the first round recorded when Barker/Hill/Orris turned in 11:45 with an Eta 29 in an elderly model producing average range with moderate starting. Morrissey/Morris were going well until the wind caused an 'incident' when it came in for a pit stop at 135 laps. Horton and Kirton reversed roles and flew an Oliver powered model which was just running in. They retired shortly after half distance when the motor came loose.

In the second round, Barker/Hill/Orris improved to 10:47.5 while Horton/Kirton deteriorated to 15:34, thanks to the troubles of the first round increased by the fact that the propeller grew smaller when they found that the rear-wheel layout disliked the strong wind. Haworth/Place changed models to help combat the wind and reeled off an estimated (stop watch malfunction) 10:10 – the fastest time of the day. Kirton/Horton, in the same race, failed to qualify their long range diesel at 86 laps, and as John Horton landed early to beat the wind (but too far out) the starboard wing tip removed the valve from Don Haworth's tank. Cries of sabotage, especially since Haworth/Place had completed the 200 laps and were firm favourites for the final!

More disaster struck Davies/Langworth/Strangroom when the fuselage of their F.A.I. model broke up, causing the model to loop, just missing Place's parked machine, but the Merco 29 escaped undamaged.

Thus only two models remained for the final, round 2 having proved unnecessary as the three other teams scratched their entries.

In the 'big one' itself, Horton/Kirton were first away with a hastily modified machine. The pipe was discarded and an extra wheel added to the nose-skid in an attempt to improve take offs.

Their ETA 29 was now turning an 8x9 prop and managing 40 laps per tank but at a reduced speed (heavy lines and no pipe). They had done 20 laps before Barker/Hill/Orris got away and they stayed in the lead for about 8 minutes when Horton cut his 'flicking' finger on the spinner.

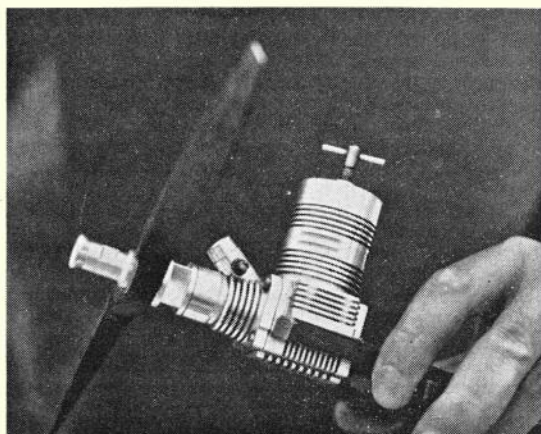
Barker/Hill/Orris gradually opened up the lead for the rest of the race with their superior speed and shorter stops. Their only hold-up was a prop. change at 200 laps when they spun-in on take-off. Horton/Kirton also changed their 8x9 in. (wood) for an 8x8 in. (nylon) in an attempt to cure their rough running engine. However the fault was thought to be due to a loose fitting rotary disc because of the poor starting and range. Barker/Hill/

*Continued on page 21*

## 'GOODYEAR' RACING LEAGUE POINTS

Team	Club	1970	1971	1972	Total
<b>Expert Teams (More than 10 points)</b>					
1. Tribe/Tribe	Cosmo	0	0	60	60
2. Clarkson/Daly	Stockport	0	26	31½	57½
3. Haworth/Place	W'Dale	12	25	14	51
4. Horton/Kirton	W'Dale	10	9	26	45
5. Heaton/Ross	Liegh	0	13½	29½	43
6. Johnson/Shaw	F.A.C.C.T.	8½	30	4	42½
7. Dixon/Radcliffe	Feltham	0	25	6	31
8. Harknett/Smith	Feltham	17	6	6	29
9. Hughes/Willis	Cosmo	0	0	28	28
10. King/Rudd	Feltham	11	6	11	28
11. Brewster/Langworth	W'Dale	0	10	10	20
12. Carson/Hamilton	Hayes	16	4	—	20
13. Cooke/Everitt	Chester	0	13	7	20
14. Coote/Small	S. Bristol	15	0	5	20
15. Skitt/Ward	M.A.R.S.	0	16	—	16
16. Summerfield/Willoughby	Feltham	0	0	13	13
17. Jones/Walker	Cosmo	0	2½	8	10½
18. Ansell/James	Cosmo	5	5	—	10
19. Jones/Taylor	Rolls Royce	9	0	1	10
<b>Novice Teams (Less than 10 points)</b>					
20. Gray/Lopez	Feltham	0	9	—	9
21. Pickles/Rhodes	W'Dale	0	2	7	9
22. Ansell/Cook	Cosmo	0	0	8	8
23. Evans	S. Bristol	4	0	4	8
24. Crampton/Gray	Rothervale	0	1	6	7
25. Fry/Smith	Feltham	0	0	6	6
26. Giles/Horwood	S. Bristol	0	6	—	6
27. Martin/Taylor	Cosmo	0	0	6	6
28. Jones/Woodside	Liegh	0	5½	—	5½
29. Barker/Hill	W'Dale	0	—	4½	5
30. Bowett/Rabjohn	Luton	0	5	—	5
31. Goddard/Temporal	Wakefield	0	0	4	4
32. Morgan	Finchley	4	0	—	4
33. Clarke/Lees	Feltham	0	0	3	3
34. Davy/Devonish	W'Dale	0	3	—	3
35. Goddard/Whincup	Wakefield	0	0	3	3
36. Hill McAlroy	Sunderland/W'Dale	0	1½	2½	3
37. Revell	Cosmo	0	3	—	3
38. Hardcastle	M.A.R.S.	0	2	—	2
39. Pittaway	M.A.R.S.	0	2	—	2
40. Taylor/Taylor	Speke/Warrington	0	0	2	2
41. Nash De Villiers/Pickering	Dagenham	0	0	1	1
42. Parker/Wallace	Rothervale	0	0	1	1

Gad, it must be hot in Barcelona! Juan Pacheco, the well-known Spanish team race enthusiast, sent us this picture of the latest José Perez hand-made motor. It uses a Schnuerle three-port transfer system, and, as can be seen, is 'super refrigerated'.







## Back to .....SQUARE ONE!

a new series of features with the beginner in mind

THE PURPOSE of this new series is to introduce the hobby of aeromodelling to the absolute novice – whether young or not so young. In this respect, every aspect of modelling and flying technique that is necessary to get the first (and second, and third . . .) model into the air will be covered in words, pictures and sketches. It is also our intention to keep the *cost* to the absolute minimum. Why? Few people getting involved in a new sport for the first time wish to expend much in the way of capital. They prefer to 'have-a-go' as cheaply as possible so that they may then assess whether the satisfaction they derive is worth the expense/effort, and this is the way in which we will plan the series.

In the interests of economy, the first building exercise will be centred around a glider – surely the cheapest form of modelling with no engine or rubber strip to buy, the only 'running' expense being a length of nylon towline! For an example, we have chosen the *Mercury Scan* – not because we feel it to be the best/biggest/cheapest or easiest design; but, because it will form an ideal introduction to aeromodelling. The various parts are printed onto the balsa sheet – *not* die-cut – and while this may seem old-fashioned, it provides good experience and is also reflected in the relatively low cost of the kit at £1.25. The fuselage is again perhaps old-fashioned in detail; but this type of work is the very backbone of modelling, while the built up wings will give plenty of scope for tissue covering and doping, jobs which frighten off many would be modellers! Perhaps a final reason why the *Swan* was chosen is that it does fly well – which is what the hobby is about – and being under 50 in. wingspan, is eligible for Junior Kit contests, provided of course that the builder is under 16. . . .

It should be stressed that those following this series do not have to build this design, many of the tips and building procedures will be common to many other equally popular kits or plans.

But perhaps before even obtaining this first kit, the individual should be prepared to do a little 'ground-work' of his own. Firstly, read as much as possible about the subject, gleaning information from (dare we suggest it?) such magazines as *AERO MODELLER*, and also from the range of books upon the subject – available from good bookshops, model shops and from Model and Allied Publications of 13-35 Bridge Street, Hemel Hempstead, Herts. – a self addressed envelope will bring you a list of these publications.

The next step is to join the local club. Many beginners seem shy of joining a club, possibly being ashamed of their lack of experience. Forget it! All aeromodellers started with little or no knowledge of the subject, and are willing, and pleased, to pass on their information and experience. Without doubt, a person who joins such a club will progress considerably faster with help received from fellow enthusiasts than the 'lone wolf' type. And

Contents of the *Mercury Swan* kit, which we shall use as a basis for a 'first model', reveals a clear plan, together with die-printed balsa parts and a bundle of strip wood. By using a commercial kit, the novice is spared the difficulty of choosing his own wood at this early stage.

with far fewer heart-rending failures. Other advantages a club can frequently offer (apart of course from the most basic item of all, a suitable flying field) are balsa wood and fuel at below-average prices, which naturally reduces the cost of your new interest.

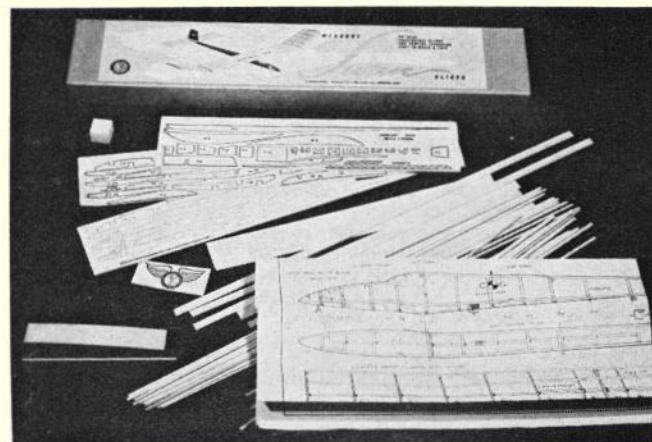
Where is your nearest club? Inquire at the local model shop – the proprietor must know who his most frequent customers are – or else ask at the local library where there is normally a list of all the club secretaries for the various activities within the area. Failing this, write to us – we can probably help with the address of an organised club in your area.

One last word of warning before getting engrossed in the actual 'work' of the model. Leave scale models of all types well alone for the time being. The models we describe may be far from the type of machine you envisage, but be patient. Tackle a scale model at this stage and you are heading for a frustrating disaster! Why? Full-size aircraft have pilots with them. Ours do not, nor is the wind effect any less on a model than it is on the 'real' machine. Other factors also come into this, in particular aspects such as high wing loadings, but these will be explained as we continue. Better to make progress slowly. . . .

Certain basic tools will be needed to construct the *Swan*, but they are few and will last you for years. Firstly, a building board will be necessary. Now, there are many 'exotic' boards that may be constructed to enable one to build every size of model conceivable, and while more experienced modellers may find their own board ideal, it will probably be more expensive and elaborate than you need. Remember, basics are what we need for the moment, although this item is one which you will fairly soon outgrow, but by then you will have a clearer idea of your own particular needs.

So, for now a *flat* piece of wood such as chipboard or even  $\frac{1}{4}$  in. plywood, approximately 2 ft. long and 1 ft. wide will suffice. Remember that pins will have to be pushed into it, so the softer the better unless you have a small tack-hammer, a useful accessory anyway.

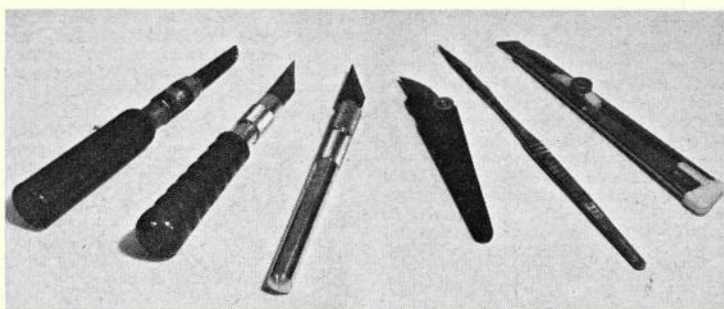
Next most important item is a balsa knife. A visit to the model shop will probably reveal a bewildering choice, and prices, so choose one within your pocket



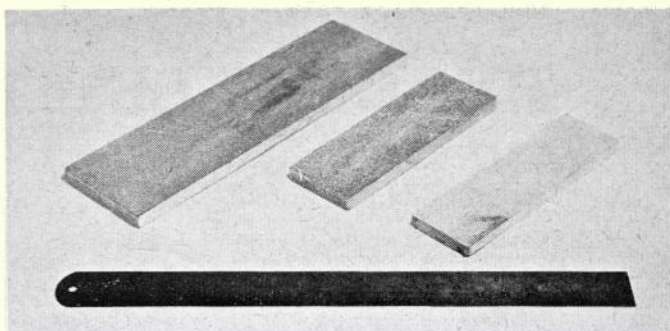


range and which you find comfortable. One of the cheapest is the Swann-Morton craft knife, which retails at just 13p complete with two spare blades. This is perfectly adequate although is a little restricting as to the different blades which the handle accommodates. X-Acto and Humbrol Multicraft sell a wide variety of handles with an enormous range of different blades. The choice is yours – but do choose a knife which grips the blade securely, a blade which is free to wobble from side to side is practically useless for precision work. As you gain experience you will probably collect a variety of knives for different duties.

We mentioned pins. Ordinary dress-makers' pins are ideal – although choose the thinner variety available, preferably the type which are soft enough to bend; the brittle type can have a nasty habit of breaking at inopportune moments, often with painful results. Personally, we have reservations concerning the special 'modelling pins' sold with glass-beaded heads. Fine for pushing into balsa, but the heads can splinter off when pushed into hardwood, and that leaves approximately  $\frac{1}{8}$  in. of steel sticking into your finger. A variety of glass papers will be necessary, ranging from fine to medium. It is as well to prepare a few sanding blocks, as a flat block is essential for accuracy in certain sanding jobs. These may be made from pieces of scrap balsa – not less than  $\frac{3}{8}$  in. thick and may be of any size from 6x2 in. upwards. Rather than cut-up good balsa for this task, obtain one of those 'balsa packs' from your dealer (these are offcuts of various thickness wood) and use an impact adhesive to glue the glasspaper to each side – use different grades each side for preference and convenience. A steel ruler is another 'must', as it is used in conjunction with the balsa knife. Do not economise on a wooden ruler – it will soon be too chipped to be of any use! A small engineer's try-square completes the list of 'specialised' tools needed at this stage, any others needed will probably be found lying around the home of the average household.



A small selection of balsa knives currently available. Extreme left is the X-Acto No. 5 handle, with the Humbrol Multicraft equivalent next to it. Both will carry a wide range of accessories, including cutting blades of all shapes, plus saws, gauges, etc. Next is another Humbrol-Multicraft knife, which accepts numerous blades within their range. Fourth from left is the Swann-Morton craft knife, which is very cheap but takes just three blades. Next to it is another Swann-Morton product, a scalpel, which is for restricted use only, as the very thin blades whip. At right is the Papanese 'NT Cutter' – unusual in that as the blade blunts, the end may be snapped off, revealing another sharp point.



Sanding blocks are very useful accessories, and are much to be preferred to simply wrapping glasspaper around pieces of scrap material. Steel rule is a 'must'.

Finally, the remaining essential ingredient – the adhesives. Balsa cement will be quite adequate for all the joints made on this glider, but as an alternative a P.V.A. (Poly-Vinyl Acetate) glue may be used. Balsa cement sets by the evaporation of solvents contained in its composition and thus tends to shrink a little, and in addition the outer surface of a 'blob' sets before the inside, thus when an excess of glue is applied it may appear to have set before it really has done so – therefore be warned before stressing a joint. Balsa cement does set quite quickly at a normal room temperature, although it is hard to state a time. Provided only a thin film has been applied a joint should be safe after 20 minutes in a warm room.

P.V.A. glues on the other hand set by the evaporation of water. It is easy to see when the joint has set as the glue which is normally white, dries clear. This glue is also cleaner to use (it wipes off the fingers easily) but takes several hours to fully set and this is perhaps a little less convenient. It has a stronger bond than balsa cement, although when gluing balsa to balsa either type of glue is likely to be stronger than the wood!

Next month construction begins

## Control Line News

Continued from page 19.

Orris finished in 61 minutes 15 seconds and Horton/Kirton then retired at 802 laps. Assuming a trouble free run Haworth/Place would have won in about 52 minutes based on their 200 lap heat times.

Another of John Horton's activities is the promoting of interest in Goodyear racing via the drawing up of a 'League Table'. Teams with more than 10 points accumulated are termed 'experts', and receive 6-5-4 points for placing in a final, while 'novices' can receive 3-2 or 1 points for placing in a separate 'novices final'. The nett result has been considerable eagerness to score points in order to emerge the end of season 'Champ'. The accompanying table shows the current points situation

since the League was instituted in 1970. Best three 'experts' this year were:

1. Tribe/Tribe	(Cosmo)	60 points
2. Clarkson/Daly	(Stockport)	31½ points
3. Heaton/Ross	(Leigh)	29½ points

Six events ran 'novice' finals this year, and this is what the 'table' is really about. Best novices this year were:

1. Ansell/Cook	(Cosmo)	8 points
2. Pickles/Rhodes	(W'dale)	7 points

3rd equal:

Grampton/Grey	(Rothervale)	6 points
Martin/Taylor	(Cosmo)	6 points

Organisers! Please find time to run a 'novices final' – only a few minutes are needed, and prizes are not necessary. The competitors themselves want such finals – which surely proves the success of this table?



# READERS' LETTERS...

## a selection of letters concerning the question of the 'Junior Problem'

Dear Sir,

I think I may have the answer to the problems mentioned in the 'Comment' at the beginning of the November *Aero Modeller*.

I am now 14 and about two years ago became very interested in aeroplanes. Eventually, after reading a book in the library, I decided to take up control line aeroplanes. I built a profile stunter from the plans in the book and put the DC Merlin in. Firstly, it took me over two months to get the knack of starting the motor on a test stand and then once in the model I had difficulty in starting it. However, once started it never flew. Thinking it could have been the design, I bought the KeilKraft *Phantom Mite*, using the Merlin. Because of the undercarriage I was able to start the motor quite easily. For the third time after two unsuccessful tries the plane was started and launched; immediately it climbed and at a height of about 20 ft. started to dive. By the time I had got to it I had to search quite a large area for the pieces. Disappointed by this I took the pieces home and rebuilt the plane, however, very reluctant to fly it again. I saw an advertisement for the KeilKraft *Hurricane* in an *Aero Modeller*. Realising it was virtually unbreakable I thought it a good idea to get it. Luckily my parents paid for most of it but at £7.40 most people in this situation cannot afford it. First time in the field it dived and the engine locked.

I am quite prepared to believe that it is my inexperience that causes all this but isn't there a less expensive way to learn? Wolverhampton, Staffs. J. A. Woodcock

Dear Sir,

I hope I can give my views in answer to *Aero Modeller* November 1972 'Comment'.

I am a member of the Golden Wings club and always followed the progress of the Junior Competitions with interest. I did not enter the first Kit Contest because I had just become very interested in sport POWER free-flight, and did not want to go back a step to gliders.

I would have entered the Junior Control line stunt contest at the last Nationals (I went as a spectator) but at the time I had no stunter and my aerobatics are mostly confined to the 'below terra firma' type.

My answer then is to make the contest a bit more engine-orientated. I feel sure that many young modellers completely miss out the glider and rubber powered stage and go straight away to power models (this is especially so with control line).

I propose two competitions.

1. *Payload Free-Flight*. The engines could be limited to a maximum price of £5 and a capacity of 1 c.c. The all up weight of the model could be say, 18 oz./c.c., with a 20 sec. engine run and 2 minutes max. The models would carry no lead dummy and the weight could be used in construction to make good strong models.

2. *½ A Combat*. Combat is a lively contest—more fun than aerobatics. The reason

why I recommend it is that it already has a large following at higher levels, showing that it is what people like (me too!) unlike C.L. stunt which is rather under contested at F.A.I. level.

The basic Specification could be 1.5 c.c. engine limit, £6 limit on engine cost, 30 foot lines.

As a final thought, the entry age could be increased to 18 with 10% deduction of score with every year over 14. Hampton-in-Arden, Warks.

Neil Stainton

Dear Sir,

In reply to your 'Comment' in the November issue of *Aero Modeller*, I think a few points need straightening out. 'Where is all the enthusiasm now?' This is where it has always been; in the mind of the junior modeller. However, when the modeller wishes to express himself, say by entering a competition, he immediately finds himself up against a stone wall.

Can he obtain transport to the competition venue?

Who will accompany him?

Can he afford to build a competitive model?

I am not referring to members of clubs but the individual who is entirely out of communication with fellow modellers and clubs etc. The person who looks forward to that third Friday when he can purchase his *Aero Modeller*.

Yes, there is such a person, in fact rather more than is appreciated. This is where the tremendous wastage of prospective modellers occurs.

The number of letters Mr. Favre received indicated the interest and potential of these modellers. These Juniors cannot join clubs if they don't know that they exist, and they will not keep going if they are cast aside and left to Chance's cruel devices. Therefore instead of complaining about the lack of enthusiasm, put yourselves in their shoes and urge clubs to take interest in new recruits to their group, whilst trying to obtain new members. Of course if nobody is self-sacrificing enough to spend a little time promoting our hobby, that is their concern but don't go on crowing about lack of enthusiasm. It makes my blood boil.

Mirfield, Yorkshire.

Kevin Wise

Dear Sir,

After reading 'Club News' in the November issue of *Aero Modeller*, decided to write to you for information on the Sittingbourne & D.M.A.C. I am a Junior Modeller, and live near Sittingbourne. I have tried to find a place to fly my towline gliders. I have not succeeded.

I noticed the 'Comment' in the same issue, my reply is that no-one is taking any notice of the needs of junior modellers. When I joined the school, which has (apart from some Rugby posts) a perfect flying field, but no model club. The situation is the same for other schools as well. I found one advantage at my school, nine other pupils willing to start a club. So we asked the Head for a room

every lunchtime (20 mins.) and permission to fly on the school fields. The answer was very restricted; no engines except rubber and 'manpower'. Well, the club is going but after a desperate struggle. Also, I only know of one other properly established club in the area, Gravesend, too far for most people who live in Chatham and Gillingham 5 or 6 miles away. Even if I get into the S.A.D.M.A.C. it is 2 or 3 miles away, but that's nothing. Gravesend for me is nearly 10 miles away. So I think there are enough Juniors interested but not enough clubs or societies to help us. Rainham, Kent. P. J. Marshall.

Dear Sir,

On reading the 'Comments' in November 72 *Aero Modeller*, it at once aroused my thoughts. You say that entries at Junior Kit contests have been very low. In my mind, I feel that the age limit is too low. The organisers are trying to attract juniors into the hobby, by holding these contests. But put yourself in the juniors 'shoes'. Take for example a person about 10-13 years old. His model, as he is a beginner, will probably be rather inexpertly built, perhaps it does not fly one hundred per cent. Would you expect him to enter a competition? He or she may be scared at the fact that he or she could make a fool of him or herself. So I do not think that the competition should have such a wide age range, or ages in one class. Why not have a section for complete beginners under the age of sixteen. Then have another section for non-beginners under the age of sixteen. But this leaves a good percentage of people between say 15-17 who may never have entered a competition, who are reasonably competent modellers, but feel that they are not good enough, or rather, do not have enough or any ability to get a model, trimmed and flying. (i.e. be able to fly a model competently under competition standards). How would you, or rather organisers, expect these people to fly against really experienced modellers, who have most likely won many competitions of some sort. So why can't an intermediate class be developed, for such people? Like myself.

If a system like this were developed, then entrants would know that they were competing against people of their own calibre, instead of people of mixed calibres.

Perhaps the first section could be run first, then the second, and then the intermediate (i.e. beginners, non-beginners, intermediate) if say the winner of the beginners group did really well, then perhaps through his own choice, he could enter the non-beginners class, then the winner of the non-beginners go on to the intermediate, again through his own choice. The same would apply to the Intermediate Class.

The winner of each class, could receive a prize, and perhaps a small one if he entered the next class.

I have had no experience of competitions, so I do not know whether these suggestions would be practical, but you did ask, and here they are!

Goodwood, Chichester.

M. Bacan

Dear Sir,

After I read the 'Comment' column of the November edition of *Aero Modeller* concerning the lack of entries at Junior competitions, I felt I had to write. As regards the control-line Junior Stunt competition I feel that an engine capacity limit (say 2.5 or 3.5



c.c.) would help. I think that many junior stunts with small aircraft are discouraged from competing by the prospect of flying against 6 or 7 c.c. powered, large area stunts, and not without some justification. Larger planes certainly do tend to outclass the small ones, as well as having the added advantage of longer lines and hence more sky area in which they can perform larger and smoother stunts.

I also think that a junior combat event would be well received using say  $\frac{1}{2}$ A models. (There are many good designs for this in the A.P.S. No. 1 plans handbook), so why not give it a try?

Malvern, Worcs.

M. R. Nichols.

Dear Sir,

On reading your 'Comment' in the November issue, you appear puzzled about the lack of 'Junior Modellers'. I am a 'raw' beginner at aero modelling but buy your magazine in order to learn about and how to build models—BUT—I find most of your articles above me and can only glean a few ideas and tips from them.

If I find this, I am sure a 'Junior' would find the same, maybe more so, especially if there is no club or person to advise him.

This leads me to suggest that you have a Beginner's page giving advice on how to build simple cheap models and tips, preferably in the 'pocket money' price bracket. Some of these articles could explain why and what things are, i.e. Why dihedral wings—dethermalisers and how they work—why is Solarfilm better than tissue?—and other such basics in model making.

In short instead of making your magazine appeal entirely to the experienced modeller add two more pages explaining the 'basics' for the 'raw beginners' keeping the rest of the magazine the same.

Do something yourselves instead of scratching your heads.  
Stanmore, Middx.

A. J. Buxton

Dear Sir,

Your 'Comments' in the November issue of *Aero Modeller* referring to lack of support and interest from the youngsters, prompts me to write, as a father desperately trying to create an interest in aero modelling in my eleven year old son (I want to share a common hobby with him during the next six or seven years).

As one who started building and flying models in April 1972 (therefore I feel I am encountering the same difficulties as a youngster) could some of the following comments have a bearing on the initial interest not being maintained?

I say 'initial interest' as there must be many thousands of kits sold (some with poor or no flying potential).

Having bought a kit, what lies ahead?

Path 'A' offers the glamour of gas power and radio control, with power having the added attraction, to a youngster, of noise. Shopkeepers stock, and fall over themselves, to sell these expensive items for power and radio.

Then come the disappointments; cut and bruised fingers trying to start a reluctant motor, a crash, not so easy or cheap to rebuild so many prefabricated parts.

Finding a site where these models can be flown is another problem.

Path 'B' takes you along the much scorned and sneered at stick and tissue, rubber and towline way to Wakefield and A/2. Here I find the stumbling block is being unable to get information and suitable materials. Referring to information, your book *All about Model Aircraft* should, I feel, have the word 'All' deleted and a more advanced book published, to contain more recent developments.

Your monthly magazine *Aero Modeller*, is tantalising; you write of props having a pitch of 24 inches. How on earth does one measure or construct a prop to a desired pitch? You write of an 'SPL design' or a 'Jedelsky wing' without explaining, just once in the first paragraph, what the initials or name stands for.

We are thinking about getting youngsters interested, yet your magazine assumes we have all been at it for fifty years, and have grown up with each development.

Questions your mag. articles have prompted (some solved, but most not) are where can you buy, and what is Ronytube? Where is Pirelli available, how, if one is to build in strength and lightness, does one get the right balsa? ('Quarter grain, sir? Never heard of it', said my local shopkeeper). Ask for thrust bearings, plans for a wire hub folding prop and you get blank stares from the other side of the counter or 'No it's all radio now, that's museum stuff.'

I could go on, but to sum up I would say, youngsters are not sticking to aero modelling because:-

- Glamour and power and radio does not encourage them to serve their apprenticeship on rubber and gliders, thereby learning the art of trimming and the satisfaction of achieving a lot for a little.
- Lack of information re construction techniques (two letters to *Aero Modeller*, with s.a.e. unanswered).
- Lack of information i.e. chance to see potential of rubber and glider. So many events are hidden behind service station wall that spectators are deprived of the chance to become converted to participants.
- Lack of materials easily obtained. Visit to six shops before finding one involving a round trip of seventy miles for one item.

(name and address supplied)

Dear Sir,

I was interested to read the observations in 'Comment' in the November '72 issue of *Aero Modeller* with reference to the lack of support given to junior contests. Such figures are indeed sad, and their implications for the future equally disturbing. I am concerned with junior recruitment.

Surveying the present state of aero-modelling I feel that our hobby has become too sophisticated, too technically involved, and too costly to attract the younger lads. This technical sophistication shows itself in a number of ways, but perhaps in three main areas.

Firstly, there are not enough clubs organised primarily for the juniors, and those already in existence do not encourage their senior and expert members to make the jump down from their multi-channel technically-encrusted pedestals, and to help out with the down-to-earth elementary needs and aspirations of their younger

brethren. 'Please mister what is "down-thrust"?' still needs an answer.

Secondly, plans and articles in model books and publications. A quick survey produced the following rather sad statistics. From six issues of a magazine (420 pages in all) there was not ONE design that young Joe could trace-off, build, and fly. The magazine I hasten to add was **NOT** the *Aero Modeller*.

Thirdly, the present kit situation. The range for the beginner is limited. Few new designs seem forthcoming. One design (a good one) is now nearly 30 years old! Moreover those that are on the market receive scant publicity in magazine adverts. Referring to the survey mentioned above, out of 132 pages of advertisements, only ONE was directed towards the beginner and provided any help in the choice of a suitable model.

Finally, and in all humility, perhaps I may be allowed to make a few suggestions that may attract more youngsters into the hobby:

- More clubs, preferably centred in our schools, youth groups, etc., and catering primarily for the younger lads. Contacts could be made with headmasters, youth leaders, masters in charge of craftwork, woodwork, metalwork, possibly linked with aero-modelling, as part of the school curriculum.
- A junior section of the S.M.A.E., officered with those who have a wide expertise, and in addition, are in close contact with the young, and appreciate their particular needs. Meetings, a quarterly news sheet with plans and articles, attractively designed hand-outs sent to schools and youth groups as mentioned in (a) above, could be among its terms of reference.
- Possibly the introduction of a magazine for the younger modeller (a junior *Aero Modeller*?). For the record, one American publisher is already pursuing this suggestion.
- A wider variety of kits that really are suited to the young builder, and more publicity in magazine adverts for same.
- Television. A programme(s) slanted specifically to arouse interest in, and to help, the younger aeromodeller. Such a programme(s) would need expert presentation, but would have tremendous impact.

Perhaps these suggestions may be of some help in junior recruitment, but, as you mentioned in your 'Comment', we do need the ideas of the people who really count—the juniors themselves. After all they are the V.I.P.s of aeromodelling tomorrow. We older aeromodellers need their enthusiasm, ideas and energy, just as much as they need our knowledge, expertise and experience.

I realise that some of the suggestions I have outlined above may cost money, but I for one would gladly subscribe to any fund which has as its objective, the helping of young aeromodellers, and to welcome into the great hobby that vast band of youngsters who want to 'know all about it'—and to experience, as we 'oldies' have done for so many exciting and rewarding years the thrills of model flight—and the joys of that occasional (I) HAPPY LANDING.

Harlton, Cambs.

Ray Malmstrom



# FLYING SCALE COLUMN

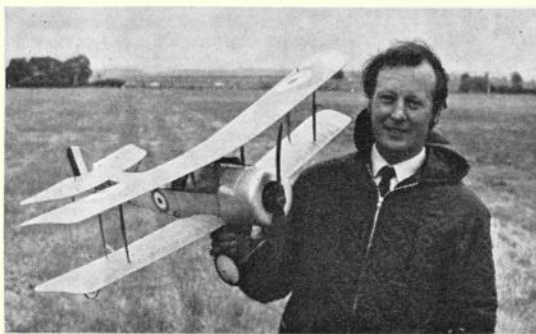


a round-up  
of the scale  
enthusiast's  
year by  
**ERIC COATES**

THE 1972 SCALE CONTEST season closed with the **Southern Gala** held at R.A.F. Odiham on October 29th in, if anything, more miserable weather than it opened at the Nationals last May. The wind was around the 20-25 knot mark, very cold with intermittent rain, so by mutual consent the five prospective contestants present for the F/F competition decided not to fly. A well trimmed model, with plenty of power *could* have got away but it stood well over a 50% chance of being smashed either during or after landing. As there was no 'pot' at stake there seemed little point in flying under such conditions.

Four brave souls, however, ventured forth to fly in the Class 2 R/C competition; which Mick Charles and myself judged. Three of the entry were biplanes, but the R/C model's ability to force into the wind, with the assistance of a large motor and, what is most important, keep heading into wind during the critical landing itself removes most of the hazards F/F models have to undergo. On this occasion the biplanes were landing at an overground speed of about 5 mph; within grabbing distance of an assistant. A F/F model, flown in similar conditions, would probably land with the wind up its tail at an overground speed of about 40 m.p.h., three-quarters of a mile from where it was launched; far away from a stabilising hand. The ability to fly in conditions far from ideal is no doubt the reason for the great popularity of the radio controlled model.

When conditions are really bad, as on this occasion,



the more heavily loaded monoplane is at a definite advantage and sure enough a *Hurricane*, flown by C. Inwood, won the event. Flown remarkably smoothly, considering the conditions, the performance was only marred by the fixed undercarriage. I confess to being a bit of a purist in these matters, and to see a W.W. II fighter performing aerobatics with its wheels down jars somewhat! They look all right flying straight and level as the proximity of the ground gives the impression of being 'in circuit' but upside down with the wheels pointing to the sky—ugh!

## Results:

- |              |                      |             |            |
|--------------|----------------------|-------------|------------|
| 1. C. Inwood | <i>Hurricane</i>     | (Chobham)   | 153 points |
| 2. R. Brown  | <i>Tomtit</i>        | (Lee Bees)  | 134 points |
| 3. N. Lovett | <i>Bristol Scout</i> | (Maidstone) | 57 points  |

As these words will be published during the closing days of 1972 it is perhaps fitting that a review of the past year, from a scale aspect, be made.

Without doubt the British scale modeller will remember the past year mostly for the truly appalling weather! With the exception of a glorious ten day period in the middle of March, I don't recollect a decent calm weekend until July 9th—the weekend of the S.M.A.E. Scale Meeting at North Luffenham. Prior to this the Nationals was all but ruined. The Old Warden meeting and the Scale Trials were also both held in pretty awful conditions.

Taking the Nationals first I was thankful that, for the first time for several years, I was static judging the R/C class and not out on the flight lines as I have been on so many previous occasions. On a hot day judging models in a tent is a thankless task but on the 28th and 29th June it was just about the softest job at Hullavington! After my lapse from Nationals static judging I was intrigued to see, in detail, how much the standards had changed—I think there is a much wider variation in standards now than existed say five years ago. Of the 25 or so models entered this year one could segregate

J. G. Watkins took the top award for free-flight at the Old Warden Scale Meet with his fine flying Bristol Scout. Always a good performer, it excelled under the rather dismal conditions experienced for this year's event. Despite the weather, this most popular meeting was packed with enthusiasts and spectators.



about five which were a definite cut above the rest in standards. This did not use to be the case, most models being of a similar standard. Occasionally a very outstanding model appeared and then, as now, there were two or three definitely rougher than the rest (the 'fly for the hell of it' brigade without which the Nats. wouldn't be complete, bless 'em!). As each model is marked, under the various headings, from 0-10 this means that in order to preserve a fair balance the top models score in the range 8-10 whereas the middle average models are in the 4-6 category and the 'rougher' element only get 1's and 2's. A few years ago models which now get 4-6 would have scored 7's and 8's. This must be discouraging to the chap who, although his standard of modelling may be slightly improving year by year, his actual recorded marks diminish due to the fact that the top men's standards have improved at a fantastically high rate. Under the present system I can see no alternative. One cannot award 14 out of 10 for a really top model in order to allow 7's and 8's to be awarded to average models. One has got to strike a balance of marks to suit the standard of entry. Most experienced judges today like to group the whole entry together, prior to marking any individual model, so that the level of marking can be fairly determined at the outset. Very often too, marks may be revised after a particular model has been judged, as some factor in another model, which had not been taken into account originally, deserved a relatively higher mark.

Of course one can sub-divide marks into tenths to get greater separation but I think this would only lead to the ridiculous situation that one sees at Ice Skating Contests where, I believe, the top mark is 6.0. No one ever gets more than 5.9 and even if you fall on your backside they still give you 5.1 so as not to upset your feelings! In actual fact they are still marking from 1 to 10 but 5.1 out of 6 sounds much nicer than 1 out of 10. Aeromodellers have tougher hides than Ice Skaters!

Whilst I realise I am diversifying rather away from my review of the season it is a point which I am

conscious is giving rise to rather vexed feelings within the R/C Scale fraternity. I am sure it is for this reason that the campaign to include Class 2 Scale as well as Class 1 at the Nationals has been successful. I had mixed feelings regarding the desirability of this move—apart from the organisational problems incurred.

I have thought for some time now that a competition a little more exacting, with regards to the standard of model, was required than the provisional S.M.A.E. Class 2 rules stipulated. A 'Class 1½' if you like was really what was wanted by the majority of S.M.A.E. Scale competition fliers. The Class 2 rules were fine for a fly for fun rally but they didn't encourage the builder of a decent model.

There has been a lot of discussion on this subject within the S.M.A.E. Scale Technical Committee and at a recent meeting it was proposed to revise the rules, for this class of model, for 1973 as follows:

The flying schedule will be exactly as per Class 1. (K factor total 64). This means that the model will now have to fly the set pattern of Taxi—Take off—Straight flight—Procedure turn—Figure of 8—Followed by five optional manoeuvres (including course flying for non-aerobatic types). The flight will be concluded with the rectangular approach and landing. Realism in flight will also now be judged.

Instead of being looked at from 10 feet the models will, in future, be given a more close inspection. The basic dimensions of Span and Length will be measured and marked accordingly for accuracy. Unlike in Class 1 the components of the model will not be sectionalised. The model will be judged as a whole under several headings. The schedule being as follows:

1. Basic Dimensions (Span/Length)	K=15
2. General Appearance	K=10
3. Workmanship	K=14
4. Finish Colour and Marking	K=10
5. Complexity	K=10
6. Originality of Design	K= 5

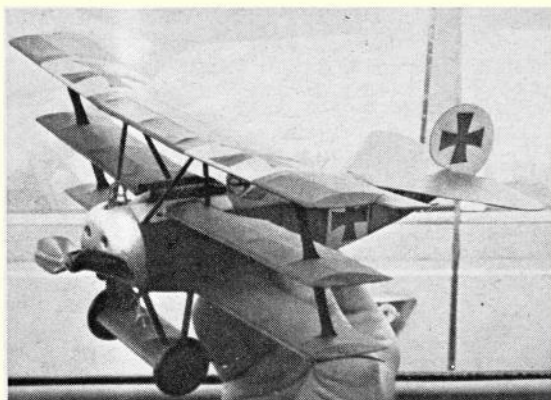
Total K=64

Heading picture shows a line-up of First World War machines by Messrs. Manley and Coates at the July 9th meeting at North Luffenham. Ranging from left to right, we see the B.E. 12b, FK8, D.H.4 and the D.H. 9A. Oh for some nice 'easy-to-remember' names rather than stark numbers!



Right, rubber-powered models are far from dead – and they make a nice, silent, change on the flying field. Ted Smales won the Northern Area Rally at Lindholme with this Douglas OC-38, built to Ken McDonough's design as published in 'Aero Modeller', and available as plan No. FSR 1123, price 75p including postage.





The outstanding flyer at Cardington's Indoor Meet was Doug McHard's CO<sub>2</sub>-powered Fokker DR1. The detail which he includes on these miniature lightweight masterpieces has to be seen to be believed.

This will give a 50/50 split between flying and static.

As before a three view drawing of 'Profile' or something similar is required together with two photographs. Also the leading dimensions and the aircraft's speed to be quoted now.

I am sure these new rules will meet with more universal approval than the previous set and the models can be judged much more quickly than Class 1. Cockpit detail need not be fitted and even if it is, will be ignored by the judges. By making the flying rules identical, both Class 1 and Class 2 events can be flown concurrently; using the same set of flying judges. What is more these rules should encourage modellers to tackle out-of-the-rut prototypes, on which limited documentation is available, on even terms with the more popular prototypes on which volumes have been written. This, to my mind, is what Class 2 scale modelling is about—not an excuse to build a tatty semi-scale model!

The Class 1 R/C, C/L and F/F rules have also been amended for 1973 to give a better balance between flying and static but I am afraid a discussion on this subject will have to wait until later.

Vic Driscoll won the *Super Scale Trophy* this year but did not appear to fly in any further competitions with his *Wapiti*. After demonstrating its rough weather capabilities at the Nats. I thought he should have cleaned up the rest of the F/F competitions!

Most consistent F/F model of the season undoubtedly was the *D.H.4* of Terry Manley. Apart from the Nationals, where he placed second, this model won everything else it was entered in:—The North Luffenham Meeting, *Selby Trophy* at the Northern Area Rally and the *All Scale Meeting* at Little Rissington. This latter event being held in traditional '72 rough conditions. Apart from the Luffenham meeting the Selby was the only other contest not spoilt by the weather. This event was notable for two things: the allowance for the first time, to my knowledge, in a National Scale competition to enter more than one model and the outstanding flight made by Ted Smales with his rubber powered *Douglas O-38*.

The *Eddie Riding Trophy* flown for once more at Woodford, which I was regrettably prevented from attending, was won by John Palmer's *Sopwith 1½ Strutter*. It was nice to see John competing regularly again this season.

For myself, the best scale day of the year was the North Luffenham Meeting which, incidentally, was the least well supported. The recollection of Terry Manley and myself making an endless number of flights with our respective *D.H.4*, *F.K.8*, *D.H.9a* and *B.E.12b* on that perfectly calm day stands out like a beacon in the past gale ridden summer!

The other outstanding meeting, which of course the weather could not ruin, was the Indoor event at Cardington. This I think will be looked back on, in the future, as the start of a completely new class of scale flying in G.B. A class which has long been popular in the U.S.A. The availability of suitable hangars is likely to be the only retarding influence here.

Ideal for indoor flying but just as adaptable for calm weather outdoor flying are miniature CO<sub>2</sub> powered machines introduced, or should it be re-introduced, into the country by Doug McHard. His *Fokker D.R.1* performing aerobatics in the Cardington Hangar, powered by one of Bill Brown's diminutive engines was, to me, the best bit of scale flying I saw this year. There is some fascination in one of these miniature models which I think is lacking in more sophisticated larger models.

1972, of course, saw, the second World Championships for Scale Models—R/C and C/L only that is. Apart from helping select the British teams I had very little to do with the event, not being able to make the journey to Toulouse for the occasion. The Trials were flown at the end of June, at Cottesmore in the usual blowy conditions. The lack of interest in the event by the C/L flyers being apparent by the fact that only 2 entrants competed for three places. Derek Goddard eventually agreed to make up a full team with the 1970 winner Mick Reeves and Mick Staples. Mick Reeves also surprised everyone by qualifying for the R/C team along with 1970 team members Yates and Melleney.

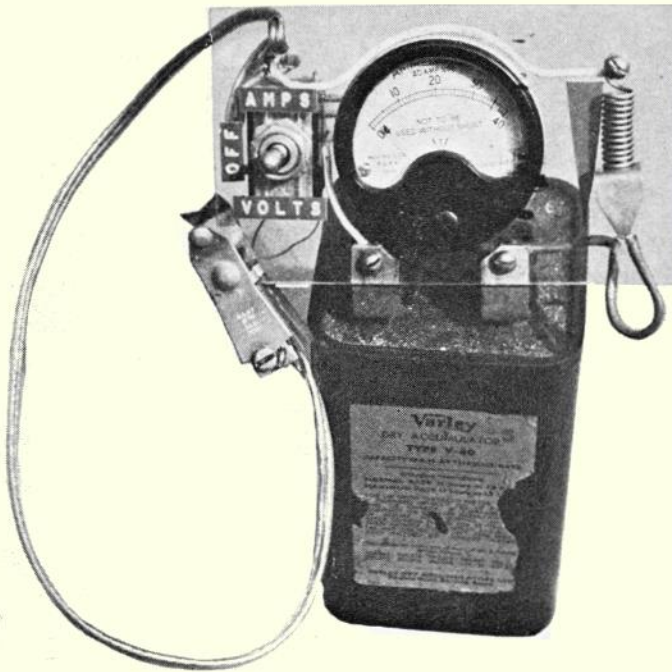
Terry's *Moth Minor* gets my vote for the outstanding R/C model of the year. I was most surprised to hear that he hadn't in fact won the World Championships with it. Roy Yates must be the unluckiest R/C flyer of the year—having watched his *Avro Tutor* destroy itself, due to radio failure, at the R.Ae.C. Display at Booker in July I was very sorry to hear his venerable *Proctor* had suffered a similar fate during one of its World Championship flights.

As to the Championships themselves, as I said I was not present and I have heard so many conflicting reports on the models, judges, standard of flying and organisation in general that I decline to comment! It would appear that the event was not quite the rousing success that the inaugural event had been at Cranfield two years previously.

Well there it was—1972 from the eyes of one scale enthusiast. There is no doubt about it, even if the weather generally is abominable, the year is now so packed with events that at least some meetings must take place in reasonable weather. Even when grounded one can always enjoy a good scale natter with the growing band of scale enthusiasts in the airfield 'local'.

Here's to better conditions in 1973!





## WATCH IT!

Keep an eye on the condition of your battery and glow plug with the adaption of a meter, a few odds and ends and a little soldering

by David Bloom

IS THE GLOW PLUG working? Is the glow clip shorting against the engine? Is the accumulator in good fettle? Wish I could beef up that dull glow!

These are typical thoughts when having trouble starting that glow motor. All these questions can be answered quickly with this check-meter and variable resistance described below.

Basically all you need is:

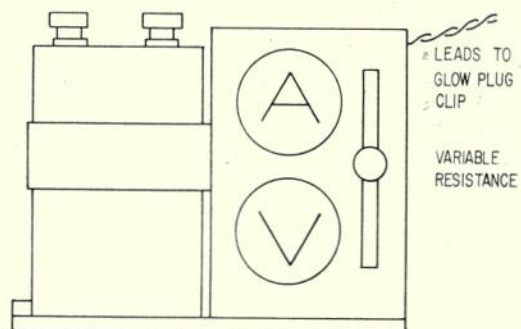
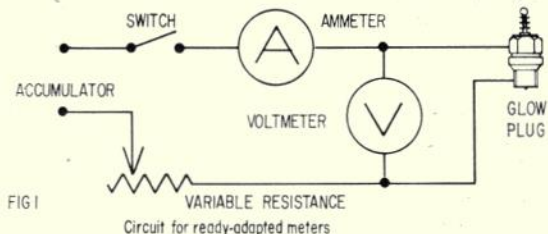
1. A voltmeter to show accumulator condition and to ensure that the plug is not supplied with more voltage than is good for it.
2. An ammeter to show a good circuit through the plug.
3. A cheap and easy-to-use variable resistance.

If the bank balance is in good shape, then simply buy an ammeter reading up to 5 amps d.c., a voltmeter reading up to 2 volts d.c., a switch and a variable resistance of 1 ohm able to carry 5 amps. This little lot could cost you £6 or more and would be somewhat bulky. However, if you decide to do this, then the bits should be connected as shown in fig. 1 and could be mounted as in fig. 2.

If you are like most modellers and find that cash is rather a rare substance, then a bit of extra brain work can result in a large reduction of cost. My own unit, made over two years ago, cost about £1.30 with the help of some good scrounging contacts!

First let's sort out 'amps' and 'volts'. Volts may be likened to the amount of pressure trying to push electricity through the circuit, amps are like the quantity (gallons per minute) of electricity trying to get round the circuit in a certain time. If the pressure is too high, the pipe bursts. If the voltage is too high, the amount of current (amps) pushed through is too high and the filament in the glow plug burns out.

The unit shown in the photograph consists of a meter which is adapted to read amps or volts, a switch which selects 'amps', 'volts' or 'off', and a coil of thick resistance wire to drop the 2 volts from the accumulator to 1½ volts needed by the glow plug. These parts are mounted on a small insulated panel and attached with slotted contact lugs onto the accumulator.





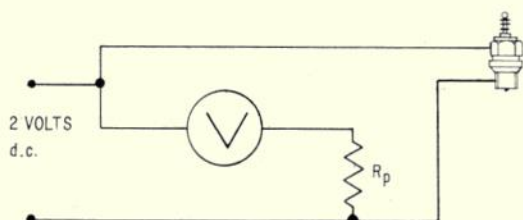


FIG 3 Circuit for measuring voltage across glowplug

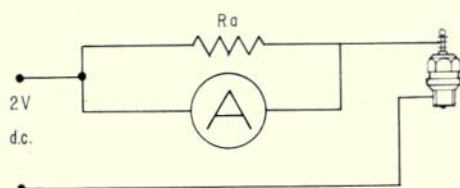


Fig 4 Circuit for measuring amps through glow plug

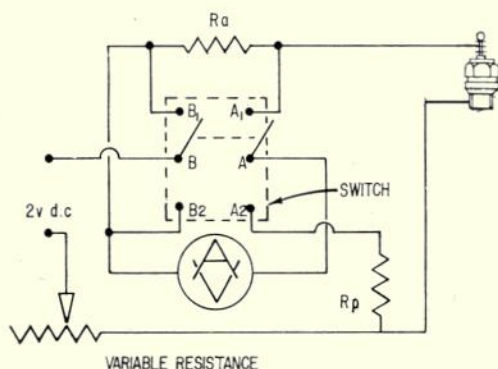


FIG 5 Circuit of final assembly

### Stage 1 – adapting the meter

Shop around for an ex-Government or second-hand meter which may be marked with some outlandish scale, but which clearly shows the number of milliamps giving full scale deflection (f.s.d. or a.f.s.) and the number of ohms internal resistance. These are usually shown in small print low down on the dial. Alternatively, buy a new milliamp meter unit (about £1.60) which again must be marked with f.s.d. and internal resistance.

Now do a sum—don't run away, I'll make it easy for you. This is to find what resistance the meter needs to convert it to volts. The formula we use to find this out is:

$$R_p = \frac{V - ir}{i}$$

where  $R_p$  = the resistance in ohms to convert to a volt-meter  
 $V$  = the maximum voltage the meter has to read at f.s.d.  
 $i$  = the current in amperes which will make the needle move to f.s.d. Usually in milliamps (mA. 1000 mA = 1 amp) or sometimes microamps ( $\mu$ A. 1,000,000  $\mu$ A = 1 amp)  
 $r$  = the internal resistance in ohms of the meter itself.

For example, suppose we find a meter which moved over to full scale deflection when 10 mA flowed, the internal resistance was 20 ohms and we want it to show 2 volts at f.s.d.

$$R_p = \frac{V - ir}{i} = \frac{2 - (0.010 \times 20)}{0.010} \quad (10 \text{ mA} = 0.010 \text{ amps})$$

$$= \frac{2 - 0.2}{0.010} = \frac{1.8}{0.010} = 180 \text{ ohms}$$

This means that this particular meter needs a resistance of 180 ohms in series with it, to make it move to full scale deflection when it is connected across a voltage drop of 2 volts. Also, if we are using a 1.5 volt glow plug and we connect this 2 volt meter across the plug as in fig. 3, the d.c. supply can be increased until the meter reads 1.5 volts.

Another sum, and I'll make it as easy as before. This time how much resistance needs connecting across the meter to make it read amps? The formula now is:

$$R_a = \frac{ir}{I}$$

where  $R_a$  is the resistance in ohms to bypass most of the current around the meter,  
 $i$  = the current in amperes which makes the needle move f.s.d.  
 $r$  = the internal resistance in ohms of the meter  
 $I$  = the current we want the meter to read at f.s.d.

For example, using the same meter, in which 0.010 amps gives f.s.d. and it has an internal resistance of 20 ohms, we want it to read 5 amps at f.s.d.

$$R_a = \frac{ir}{I} = \frac{0.01 \times 20}{5} = \frac{0.2}{5} = 0.04 \text{ ohm.}$$

Yes that's right  $\frac{4}{100}$  of an ohm!

So we connect our meter as in fig. 4 to read the current passing through the plug, which can often be up to 4 amps.

If the element is burned out, no reading results. If the connector to the centre of the plug accidentally touches the engine as well, the needle will bang hard over to maximum; disconnect or switch off immediately.

A meter adapted to read 2 volts and 5 amps will cover most needs.

### Stage 2 – putting it all together

Let's tie this lot together into one unit so that one switch will select 'volts' or 'off' or 'amps'. If you look carefully at fig. 5 it combines figs. 3 and 4. The supply from the cell is immediately dropped in the variable resistance to the voltage we need. The dotted line in the switch shows that both halves of the switch are mechanically connected so that A and B are connected almost simultaneously to  $A_1$  and  $B_1$  where it will read volts or to  $A_2$  and  $B_2$  where it will read amps.

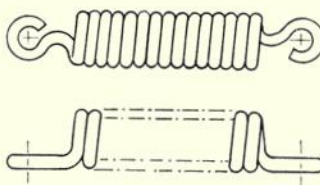


FIG 6 Variable resistance coil

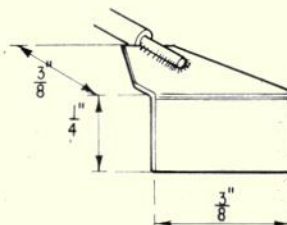


FIG 7 Voltage selector



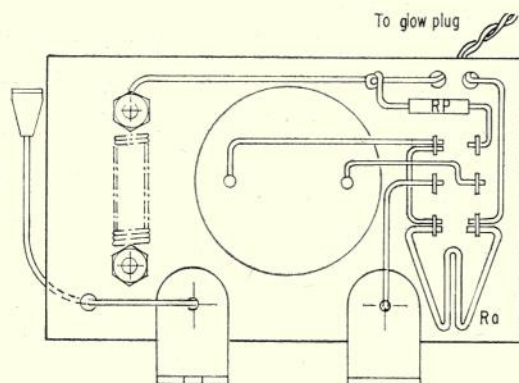


FIG 8 Rear view on completed panel.

The purist may shudder to see the  $R_a$  shunt forming part of the volts reading circuit, but this is a crafty way to make sure that the ammeter shunt is already in circuit when the meter is switched in to read amps. Various other circuits were tried, but if the bare milliammeter connects only a split second before its shunt, the whole current tries to get through the meter, the poor little needle whangs across so hard it nearly bends around the stops—not good for meters! The volts reading is only very slightly affected by this method and we are not pretending to obtain precise readings but just a visual indication of this invisible ‘electricrery’ stuff.

### Stage 3 – the variable resistance

We need to get some idea of how much total resistance this must have. Assuming our accumulator is a 2 volt one, and we need a voltage of  $1\frac{1}{2}$  volts, the voltage has to drop by  $\frac{1}{2}$  a volt as the electricity flows through the resistance. Also the probable current may be as much as 4 amps.

Mr. Ohm says— $\text{resistance} = \frac{\text{voltage drop}}{\text{current flowing}}$  so this resistance will be  $\frac{0.5}{4} = 0.125$  ohms. I wonder if this will be suitable for a plug which only allows 2 amps to flow through it? Let's try— $R = \frac{V}{I} = \frac{.5}{2} = 0.25$  ohms. Good thing we checked because now we know that our variable resistance should be at least  $\frac{1}{4}$  ohm to avoid blowing a small glow plug. This is not a commercial size resistance so we shall have to make it. Fear not, easily and cheaply done like this.

Take an old electric fire element made with a spiral of resistance wire, or else buy a replacement spiral. Uncurl about 4 yards of the spiral into straight wire by passing a thin rod into the coil and then pulling the wire across the rod. If it is old wire then clean it by rubbing along the length with emery cloth. Cut the wire into 24 in. lengths, straighten each length by stretching it slightly. Gather all 6 ends neatly together and nip in a vice. Gather the other 6 ends neatly together and hold in a Mole grip or pliers with a strong rubber band round the handles, and get twisting. Keep on twisting until you have a really compact little cable. Now wrap this cable around a  $\frac{1}{4}$  in. diameter bar like a coil spring, keeping the turns close together, they can be opened later as

necessary. The ends of the coil are formed into fixing eyes as in fig. 6. The holes for fixing the resistance coil to the panel are drilled about  $\frac{1}{4}$  in. further apart to keep the coil slightly stretched and still provide some friction to retain the voltage selector. (Fig. 8).

We have made our resistance, now to make it variable. A piece of thin sheet brass or thickish tinfoil is made up as shown in fig. 7. A 6 in. length of flexible wire (not too light please) is soldered to its top. The vertical  $\frac{1}{4}$  in. deep part is pushed into the coil at various places, until the correct resistance is found which just makes the filament glow the correct brightness. This should make the voltmeter read 1.5 volts. Spaces between coils should only just allow item 7 to be pushed in with a little friction.

Now assemble the parts onto the ‘circuit’ board which may be Perspex, Formica, or some other insulating board. Place the meter in the centre of the board, the switch on one side of it and the variable resistance on the other. The switch can be a centre-off, two pole, two way switch such as the R.S. Components ‘centre toggle DPDT’ priced at about 60p, or a Henry's type 3c at 30p. A single pole two way rocker switch from Woolworths could be used, but when not in use, it must be set to ‘amps’ and no shorts allowed across the plug clip. With the single pole switch, the circuit in fig. 9 should be used.

The connecting lugs onto the accumulator which support the panel must be made to suit your own accumulator. The  $R_a$  resistance is simply a length of 22 gauge copper wire soldered to  $B_1$  and  $A_1$ . Start with the wire too short and increase it until the reading rises to mid-scale with a medium duty plug. No attempt at accuracy is made as we are only after general indications.

The  $R_p$  resistor is an ordinary  $\frac{1}{4}$  watt or  $\frac{1}{2}$  watt radio resistor.

Use thick copper wire, about 16 swg if you can get it, for all interconnections. A length of flexible twin wire is anchored to the circuit board and kept fairly short for connecting to the plug clip.

To use your new equipment, switch to ‘volts’ without connecting the plug. Note the needle position for a fully charged ‘accy’ and mark it. Connect the glow plug and adjust the variable resistance until the meter reads 1.5 volts. It is best to do this for the first few times with the plug out of the engine to check the brightness of the glow. Switch to ‘amps’; with no reading the plug element is either burnt out or the plug connections are bad. Normal readings on ‘amps’ will vary slightly according to the wetness of the plug. An engine which fires but will not run can sometimes be rewarded by notching up the variable resistance, BUT, do this with care. If the needle whangs hard over, the clip is short circuiting. Do something quickly!

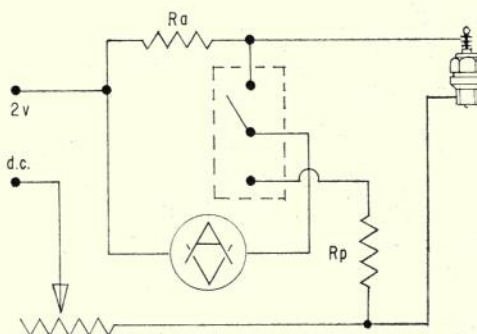
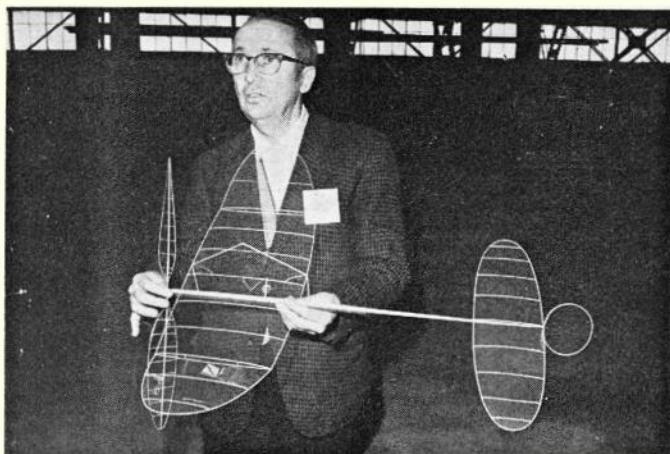


FIG 9 Circuit used with single pole switch





On August 25th, 1972  
Melvin 'Pete' Andrews of  
the U.S.A. flew his 65cm.  
F.A.I. class indoor model  
to an unofficial record of  
more than 41 minutes.  
LAURIE BARR reveals  
the details of . . .

## 'The Model of a Champ'

THE INDOOR WORLD Championship at Cardington 1972, was won by one of the all time greats, Pete Andrews of the U.S.A. His model is a perfection of design and construction, and I feel he won the world championship not only because he had one of the best models there, but also because he mastered the conditions better than anyone else.

Throughout the meeting, and during the practise sessions, every time that one looked up, there was one of Pete's models, levelled off just under the centre cat walk, doing a great flight! In fact, the only time he hung-up, was when 'going for broke' during the competition, when he already lead, and had flights in hand.

My own rather torrid time at the champs was more than made up for by Pete's most generous gift of the winning model; a truly wonderful gesture from a really nice guy. I have since flown the model at Cardington, and it did 36:00 minutes. Compared to that which the English have got used to, the model is set up to fly not only on much smaller sizes of rubber, but also on a really large diameter/high pitch prop, and is able to climb to the roof on prop r.p.m. we seem to come down on!

Pete flew several variations of this model, some with different wing sections, and also with both negative and positive-flaring props. For the benefit of the uninitiated, a 'flaring' prop is one that distorts under full power, into either higher or lower pitch, depending on the amount of blade area behind or in front of the prop spar. The prop shown provides

positive flare, and is used in good conditions, helping to slow down the amount of climb at the upper limit of maximum turns.

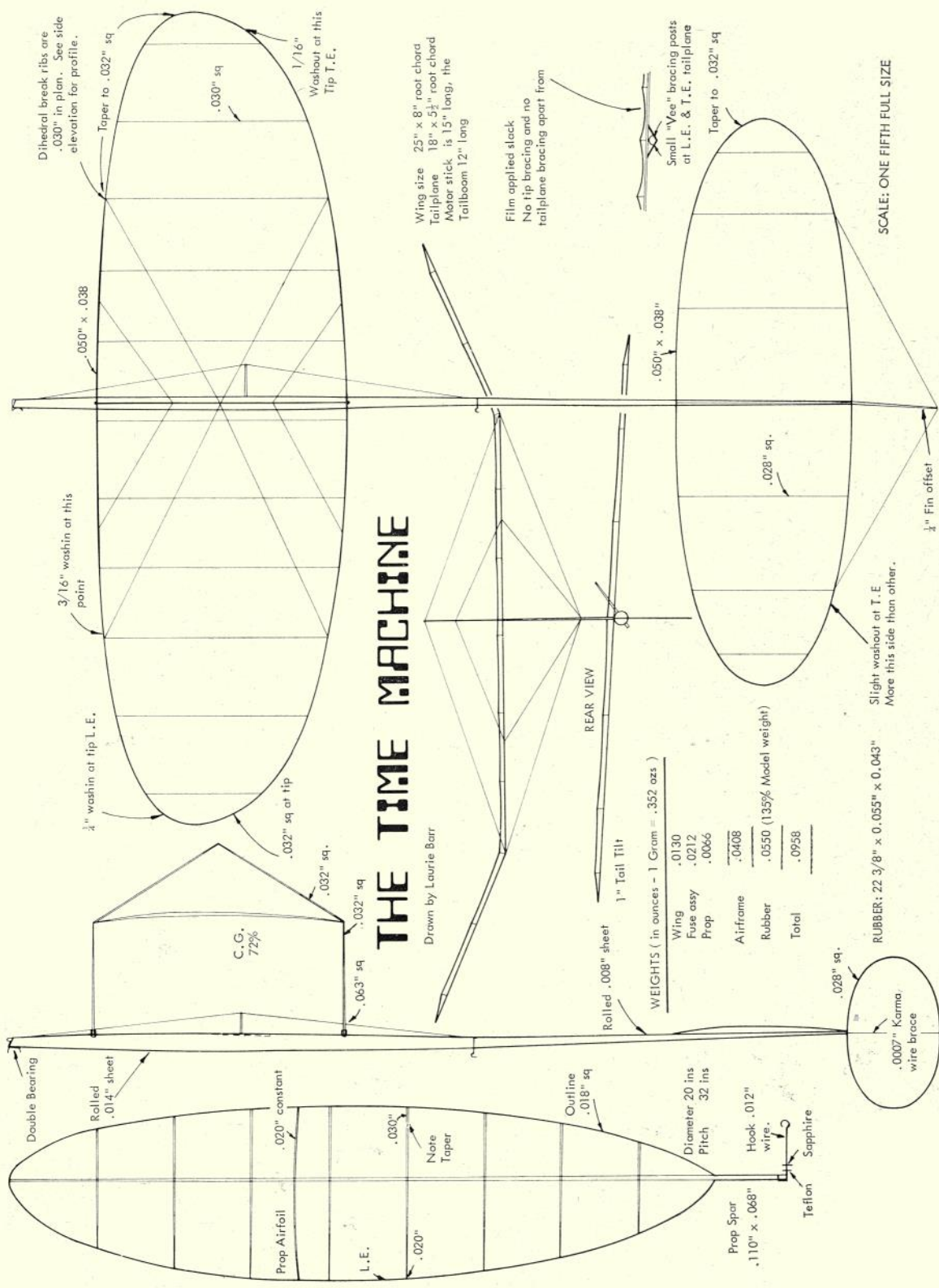
One combination did over 41:00 minutes in practise, and to do this with a small, comparatively heavy 65 cm. span, 1 gram model (FAI rules) is a very great achievement, and must rank at least equal to K. Reike's all time 45:00 minutes with a 90 cm span, no weight-limit flight. Pete was also the first man to break the 40 min. barrier, as well as the 30:00 barrier in 1948.

**Model technicalities:** Like many of the best models at the champs, Pete used a tailplane with no wire bracing, employing just two small wood braces where the tailplane joins the boom. The idea is that if the model gets upset by a disturbance during a flight, the tail will twist and 'ride it' better than the stiff braced variety. He says '*it's kind of automatic*', and you can actually see the tail working during a flight. The wing has no tip bracing, and is set well forward. An off-set 'Reike' style motor stick bracing strut is used, with Tungsten wire, all other bracing appears to be either .0007 in. Karma or .001 in. Nichrome wire. The wing warps are slight (see plan notes), as is the rudder off-set for turn. The motor stick is parallel in the centre and tapers at each end, is immensely stiff for its weight, and must be made from a rather 'special' piece of wood!

The prop is interesting apart from its revolutionary (pardon the pun) diameter and pitch, in that the ribs

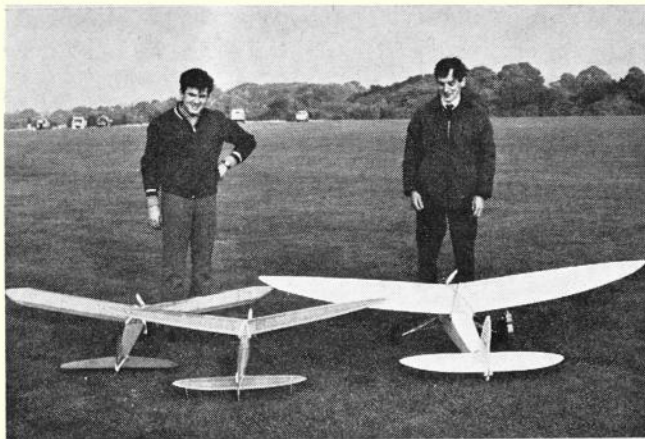
are tapered in plan thickness, presumably to increase the flaring quality. The main spar is not round but oblong in section, with the longest side of the oblong facing the L.E. and T.E. of the prop. The shaft runs on a dual bearing, the back end of which is the 'pig's tail' type, and has both a Teflon washer, and a Sapphire bearing (like those found in wrist watches) to minimise the friction under load. The tailboom is set at a large negative angle, with also a slightly washed out tailplane, to encourage a nose up attitude in flight. This slows the model up, and increases duration, provided it is not overdone. As a consequence the wings are set either level or at a negative angle of incidence. The whole model is covered in slack film, which is only attached to the outline during covering while flat, and is made to attach to the ribs later on after bracing, by small drops of saliva or water, applied with the point of a fine soft brush at  $\frac{1}{4}$  in. intervals. The idea behind this being that it helps to reduce the amount of shrinkage to the film (and thus distortion) if it was attached by drawing a brush all along each rib length. The wing has no compression ribs as normally used, but instead the dihedral break ribs are deeper, and tapered from a thicker centre to a smaller size at leading and trailing edges. The idea being that the usual compression ribs are too stiff, and in this way the whole wing, if it is forced to flex, does so uniformly. For its weight, this model is true, stiff, and very easy to fly, and it is the model of a Champion.





SCALE: ONE FIFTH FULL SIZE





Above left, a trio of vintage machines by Messrs. Wyld (left) and Stovell. These are a 'Junior 60', and a 'Southerner 60', both rather dwarfed by the enormous 'White-wings'. Above right is the Open Power winner, John Bailey with his own-designed machine, O.S. Max 15 powered. Another view (a\* left) of J. Wyld with his 'Southerner 60' which placed sixth in the Precision class. Jack Fisher (of Performance kits fame), another keen vintage enthusiast, looks on. In contrast, at right, is Dave Tipper with his Open Glider winner.

## SOUTH BRISTOL M.A.C.'s SILVER JUBILEE GALA

R.N.A.Y. Wroughton, 15th October 1972

### RESULTS:

**OPEN GLIDER** (19 entries)

1. D. Tipper (St. Albans)	M+2:01
2. P. Scrivens (Cheltenham)	M+1:04
3. G. Bunney (B. & West)	7:59

**VINTAGE PRECISION** (17 entries)

1. W. Manning (S. Bristol) 'Apex'	1.19%
2. R. Greenslade (S. Bristol) 'Tomboy'	1.39%
3. A. Crisp (F.A.C.C.T.) 'RAFF V'	2.53%

**OPEN POWER** (13 entries)

1. J. Bailey (B. & W.)	M+3:52
2. D. Pym (Walsall)	M+3:26
3. D. Wain (B. & W.)	8:48

**OPEN RUBBER** (11 entries)

1. J. Bailey (B. & W.)	M+5:17
2. D. Wain (B. & W.)	M+4:20
3. P. Harris (Evesham)	M+2:50

**R/C THERMAL SOARING** (15 entries)

1. T. Gane (S. Bristol)	1061
2. N. Webb (F.A.C.C.T.)	958
3. C. Thompson (S. Bristol)	918

**F.A.I. TEAM RACE**

1. Coote/Small (South Bristol)	10:36
2. Giles/Horwood (South Bristol)	11:25
3. Woodside/Jones (Leigh)	12:00

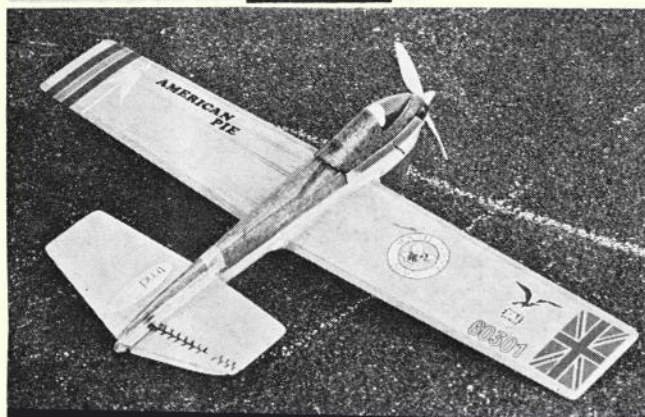
**GOODYEAR**

1. Clarkson/Daly (Stockport)	11:01
2. Clarke/Evans (South Bristol)	14:28
3. Coote/Small (South Bristol)	14:31

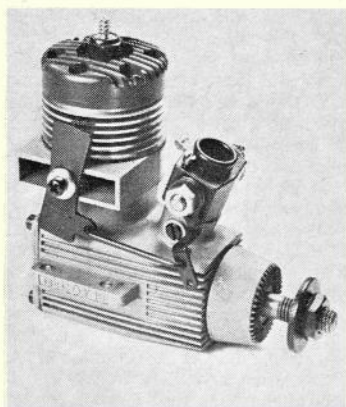
**COMBAT**

1. M. Tiernan (Leicester)	
2. F. Smart (Glevum)	
3. R. Evans (South Bristol)	

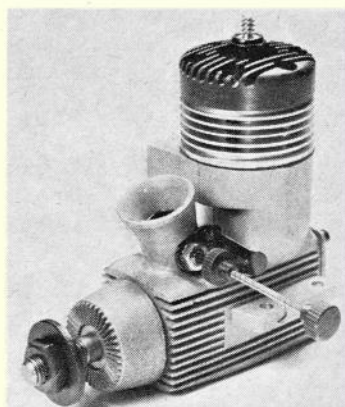
South Bristol member (left), R. Greenslade, also flew a Frog 100-powered A.P.S. 'Hi-ball' in the Vintage event, but placed second with a 'Tomboy'. Below left is David Giles' Kosmic-powered 'American Pie' F.A.I. team racer, which pitted by Dick Horwood, took second place. Below right are Dave Clarkson and John Daly, who added another Goodyear win to their recent successes. M.V.V.S. power used. At right, Richard Evans compares model shapes with Mick Tiernan - the latter being eventual combat winner, Richard placing third.







The distinctively-styled McCoy 19 'Series 21' engine offers considerably higher power and better handling than the previous McCoy 19 model. This R/C version uses a Perry carburettor.



The McCoy 19 also comes in a 'standard' form for control-line or free-flight use. Motor is bulky in appearance, and in fact, is rather heavy at 7½ oz. Not yet currently available in this country, although on sale in the United States.

### Wankel Report – December issue

Some readers may have been puzzled by what appeared to be a somewhat premature third-page ending to last month's Engine Test article on the O.S. Graupner Wankel motor, in spite of its being a longer report than normal. In fact, as those who took the trouble to hunt through the magazine will have discovered, a further half-page on the performance of the engine was to be found among the back pages. Just a case of the vital words: 'continued on page 719' having been omitted from the foot of the third page!

### McCoy 19 'Series 21' Tested

We are not too sure why the current series of Testor McCoy engines are called 'Series 21' models. There was a 'Series 20' but this referred to the final version of the famous McCoy Red-Head 60 racing engine and goes back to 1948. Since then there have been a lot of other McCoys. Perhaps, unlike some manufacturers, Testors did not want to 'date' their engine by calling it the 'Series 71' – 1971 being the year in which the first 'Series 21' models were introduced. We would guess that it is this big American company's intention to stick with the present design for some years.

The 'Series 21' range covers .19, .29, .35 and .40 cu.in. models and succeeds the previous low-priced Red-Head models of these sizes that were first produced in 1957. Like the earlier motors, the 'Series 21' engines are of conventional layout using crossflow scavenging and with induction via crankshafts running in bronze bushed plain bearings. However, the newer design is quite dis-

tinctive in appearance, of generally higher quality and much better performance. It is interesting, too, for the fact that it features a ringed aluminium piston instead of the lapped sintered-iron piston used by most of the medium-size McCoys built in the previous dozen or so years.

This makes the 19, in particular, quite unusual since, with one or two exceptions, ringed aluminium pistons are currently confined to motors of .40 cu.in. and larger. At one time, ringed pistons in the smaller sizes often resulted in a lack of compression and poor starting compared with an equivalent lapped piston motor. This certainly does not apply in the case of the Series 21 McCoy 19, which has excellent starting qualities; far superior to those of the old lapped-piston 19. Performance, too, is well up on that of the previous model.

Our two test samples came direct from the factory in California but were absolutely standard, had received no more than a brief check-out

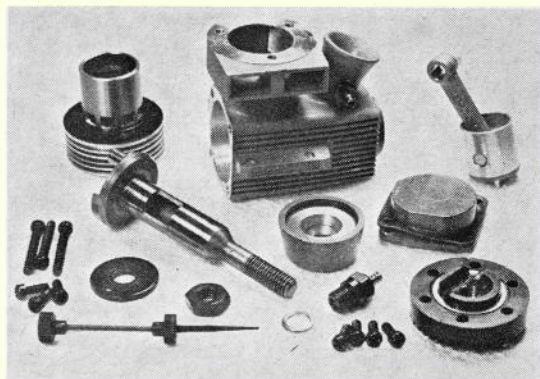
Peter Chinn's

## latest engine news

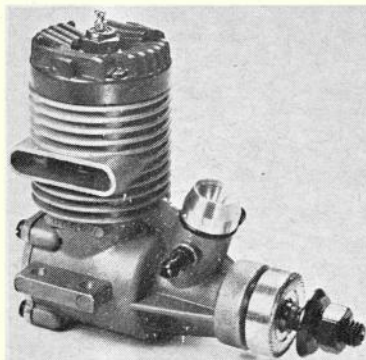
and, we believe, are fairly representative production samples. Using standard 5 per cent nitro fuel, typical prop revolutions were as follows:

	rpm
10×5 Punctilio	8,500
9×6 Top-Flite Maple	9,400
10×3½ Top-Flite standard (wood)	10,600
9×5 Top-Flite standard (wood)	10,600

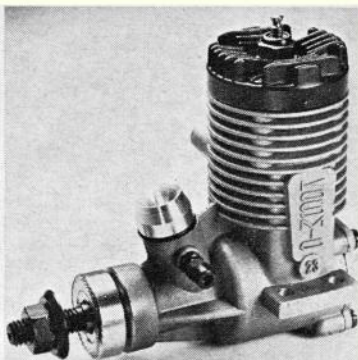
Parts of the 'Series 21' McCoy 19. Engine is unusual among smaller motors in featuring ringed aluminium piston.







All Italian motors may be readily distinguished by their exceptionally neat, clean, castings – and the Kosmic K-23 is no exception.



Another view of this 3.65 c.c. Italian glow engine emphasises its purposeful look. Weight is 6.14 oz. A throttle-equipped version is also available.

9×4 Tornado nylon	11,400
9×4 KeilKraft nylon	11,600
8×6 Power-Prop standard (wood)	12,650
8×5 Power-Prop standard (wood)	13,800

The Testor Corporation has not yet begun to offer silencers for its engines and the above figures, therefore, apply to the 19 in open-exhaust form but they are, nevertheless, very good and comparable with some of the best recorded in the .19 cu.in. glow engine class under similar conditions and on the same fuel. Compared with the old McCoy 19, brake-horsepower is improved by around 25-30 per cent.

For a .19, the 'Series 21' McCoy 19 is not particularly light at a checked weight of 7.76 oz. This is largely due to the hefty construction of the engine. As can be seen from the photographs, the crankcase is a very robust component with a distinctive rectangular front end embodying longitudinal cooling fins. Theoretically this should mean less preheating of the fuel/air mixture entering the crank chamber and thus the transfer of a more dense charge to the combustion chamber for more power.

Induction is via a large, trumpet-shaped intake, integral with the crankcase and fitted with a small, plastic throat restrictor held in place, in the usual manner, by the spraybar. Effective choke area is approximately 13.5 sq.mm. which is quite large for a 19 and is no doubt partly responsible for the engine's good power output. The engine does not, however, seem to suffer any deterioration in fuel draw characteristics and one concludes that this is due to an improvement in crankcase depression brought about by the Series 21's smaller crankcase i.d., shorter transfer passage and reduced connecting-rod length.

The crankshaft has a 7/16 in. dia. journal and runs in a porous bronze bush. It has a rectangular valve port timed to open at 35 deg. ABDC and to close at 47 deg. ATDC (our measurements). The shaft has a 0.310 in. bore gas passage and a 3/16 in. crankpin on a full-circle crankdisc with crescent counterweight.

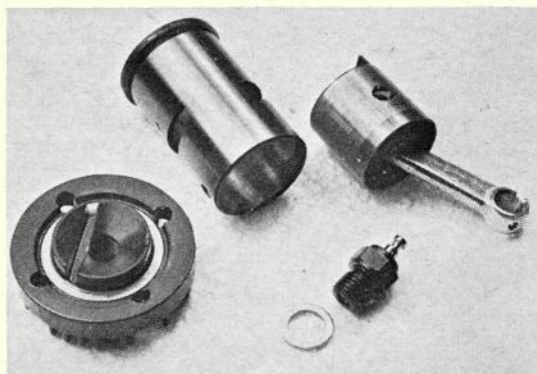
The nominal bore and stroke of the McCoy 19 is 0.642 × 0.617 in. giving a displacement of 0.1997 cu.in. or 3.272 c.c. The cylinder has thick

walls and integral cooling fins which are zinc-plated to prevent rusting. Three long screws secure the cylinder-head and the cylinder to the crankcase and three more short screws seal the head to the top of the cylinder with a soft aluminium gasket between them. There is a composition gasket between the cylinder base flange and the top of the crankcase.

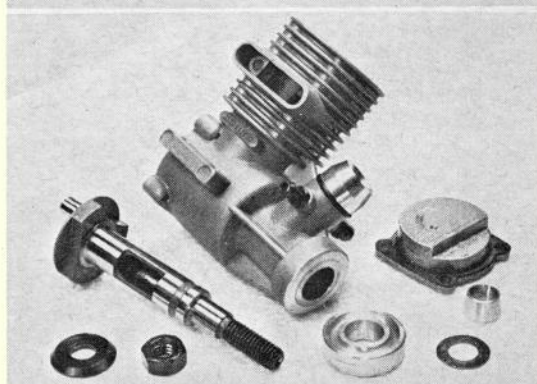
The new piston is machined from an aluminium forging and is fitted with a Dykes type piston ring. The use of a ringed-type piston has, of course, necessitated bridged ports in the cylinder: the exhaust is divided into four, and the transfer into three, rectangular ports. The exhaust ports are timed to open and close at 65 deg. and the transfer ports at 59 deg., each side of BDC. The piston has the usual baffle on the transfer side and is coupled to a forged aluminium connecting rod by means of a large diameter fully-floating gudgeon-pin with PTFE pads. The cylinder-head has a bowl-shaped combustion chamber, interrupted by a slot for the piston baffle and surrounded by a squish-band.

At the moment, only the little 0.8 c.c. McCoy 049 engine is being sold in the U.K. but, presumably, the larger McCoy models will become available here in due course. In the U.S. the Series 21 McCoy 19 sells for

Cylinder-head, liner, piston and rod assembly of the Kosmic K-23. Engine has orthodox porting and a 17 × 16 mm. bore and stroke.



Crankcase and crankshaft assembly of the Kosmic K-23. The 10 mm. shaft runs in a single ball-bearing plus a bronze bush.





\$14.95 which, if one buys direct from the U.S., is around £6.20 to £6.40 (depending on the rate of exchange at the time of purchase) plus customs duty and purchase-tax. Also available is a Perry carburettor equipped R/C version of the same engine. This is appreciably more expensive at \$22.95.

### Kosmic K-23

Kosmic motors, produced by the manufacturer of the Komet Kart engines, are made at Pavia, near Milan. Having established the Kosmic name with their high quality K-15 2.5 c.c. racing engine, the makers have now turned their attention to the production of a slightly larger motor for general purpose and R/C flying. This is the 3.6 c.c. K-23.

Unlike the K-15, which is a Schnuerle scavenged, disc-valve, rear-exhaust twin ball-bearing motor, the K-23 is a conventional crossflow-scavenged, shaft-valve unit. It has a side exhaust port and its crankshaft is supported in a single ball-bearing at the rear, supplemented by a short, bronze bush at the front. Its layout, in fact, is similar to that of another Italian motor of the same size, the well-known Super-Tigre G.20/23.

We were recently loaned, for a preliminary inspection, one of the first two K-23s to reach the U.K. distributor and an examination of the component parts confirmed that, whereas the outward appearance of the engine is quite different, there is obviously rather more than just an accidental resemblance to the Super-Tigre G.20/23 in the Kosmic's internal design and construction. Nominal bore and stroke, crankshaft journal diameter and length, crank-pin size, gudgeon-pin diameter, combustion chamber shape, crankcase i.d. and backplate dimensions all closely follow those of the G.20/23.

Imitation, it is said, is the sincerest form of flattery and the Kosmic is not the first engine to borrow the basic design of another motor. One thing in its favour, however, is that, while the Super-Tigre is a very sound design on which one might base a motor of this size, the Kosmic does not repeat one of its less desirable features, namely, the fact that its cylinder height is inadequate for an engine with a 16 mm. stroke. The Super-Tigre G.20/23, it may be recalled, is a bored and stroked version of the 2.5 c.c. G.20/15 and uses the latter's compact cylinder/crankcase casting. As a result, the height of the G.20/23's cylinder ports is limited and does not allow a full depth piston skirt to be accommodated between the lower edge of the exhaust port and the crankshaft counterweight at BDC.

Strictly for 'the mature hobbyist and experimenter', this valveless-type pulse-jet engine, the Thermo-Jet J3-200, has recently been put on the U.S. market by Thermo-Jet Standard Inc., of Kerrville, Texas. It is 21 in. long, weighs 20.7 oz. and runs on liquid petroleum (propane).

The piston skirt therefore had to be cut away, thereby uncovering the exhaust port at the top of the stroke and causing contamination of the crankcase mixture with exhaust gases (and thus loss of power) when a silencer is used. On later model G.20/23s, this was overcome by sweeping the lower edge of the exhaust port upwards, fore and aft, but at the cost of some loss of scavenging efficiency. In the Kosmic, this difficulty did not arise. The main casting, 3 mm. taller and with the exhaust duct raised appropriately, accommodates a suitably-lengthened connecting-rod and a 16 mm. piston length without uncovering the exhaust port at TDC.

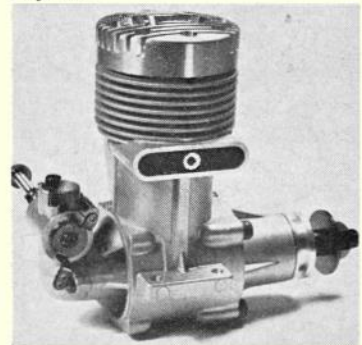
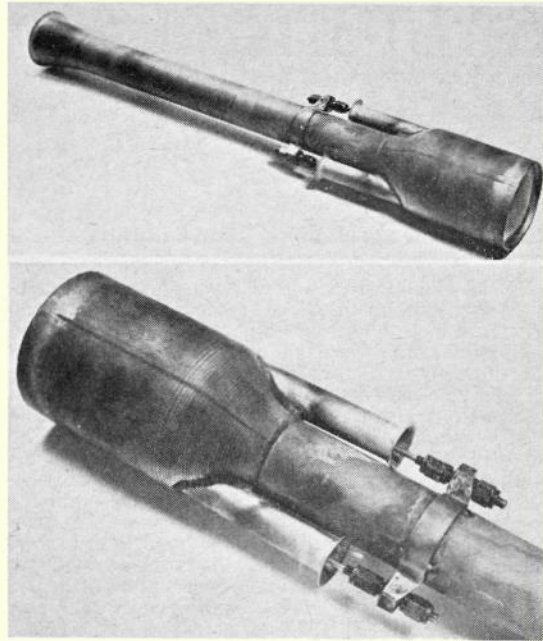
The example of the Kosmic K-23 submitted for examination was the standard stunt type fitted with a 4 mm. throat, machined aluminium intake venturi. Checked weight was 174 grammes or 6.14 oz. The engine is also available in a radio-control

version having a barrel throttle carburettor with automatic mixture control. We hope to run some tests on the K-15 when regular deliveries begin.

### In Brief

The shaft-valve version of the Super-Tigre G.15 has been manufactured in many variants over the past few years. Now being put out is the 'G.15-FI Goodyear' C/L version with a plastic intake (like the original G.15 but coloured red) and including a spinner, and the G.15-FI R/C with Super-Tigre 'Mag-III' carburettor and with the sub-piston induction period eliminated.

The Fuji range of engines, unchanged for many years, may include a couple of new models during 1973. Currently being tested are prototypes of a new Fuji 19 R/C and a disc-valve Fuji 40.



The latest version of the 13.2 c.c. O.S. Max-H.80 R/C engine, the largest single-cylinder model aircraft engine in current production. A full description and test report on this motor appears in the current issue of 'R.C.M.&E.'



# GADGET REVIEW

a selection of Readers' hints and tips

THE TRADITIONAL way of retaining wings on free-flight models (and small R/C models) is to use elastic bands anchored by hardwood dowels. In order to retain the wings securely, the bands must be stretched taut, and this often means that in the event of a 'prang' the wing stays in place and is subsequently damaged. Lancastrian reader H. Pickles has overcome this problem by using 'Masco' wall plugs in lieu of the wooden dowels. These are made of plastic, and in the event of a hard 'arrival' flex sufficiently to allow the wings to slide off undamaged—see drawing A. He is a civilian instrumenter with the local ATC, where he and ten lads interested in aero-modelling have used this idea with complete success on models of around 60-70 ins. span. Mr. Pickles advises that they may be easily cut to length and epoxied in place—but keep the 'overhang' short in order to prevent a premature release!

Frank Smart of the Glevum club is well known as a combat enthusiast, and also as a builder who likes neatness on his models. His simple idea (sketch B) is to simply take the cap from a discarded 'Bic' ballpoint pen, and cut it in half lengthways. This when epoxied in place forms a very tidy fairing for the pushrod exit hole—an idea which many modellers with exposed control rods or lines may wish to employ.

Of course, trim tabs on free-flight models (or even control line models) should not really be necessary—they are usually a cure for a building error or warps that have crept in. However, nobody is perfect, and at times such devices are essential. P. A. Scorey, a member



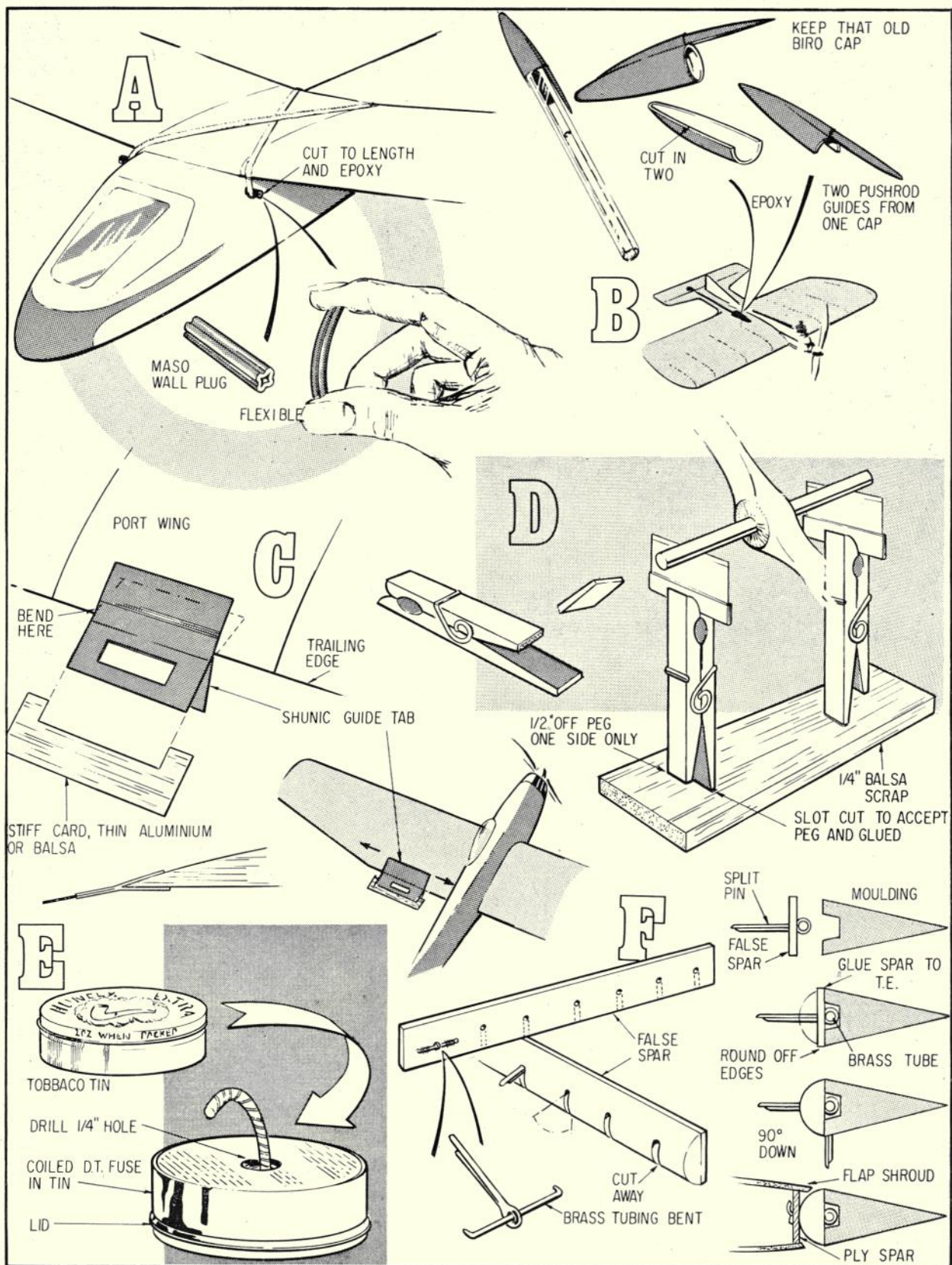
of the modellers section of the *Shuttleworth Veteran Aeroplane Society* has a neat solution for this when trimming aid is needed. He uses *Shunick* metal signals and guides (used for identifying office files, and available from stationary shops) clipped to the trailing edge, and inserts stiff card or thin aluminium sheet into the identification part of the tab. This may then be easily bent up or down, varied in size and will not move under heavy landings. See sketch C for details.

A balanced propeller is essential for vibration free (or as near vibration free as possible!) operation of a model engine, and Graham Smith of Sutton Coldfield has a simple gadget to perform this task, as seen in drawing D. Constructed from a piece of scrap  $\frac{1}{4}$  in. balsa, two single-edged razor blades, a pair of clothes pegs and a length of rod equal in diameter to the motor's crankshaft the device could hardly be termed expensive! Simply slot-out the balsa base to take the clothes pegs, spaced approximately 2 in. apart. Cut  $\frac{1}{2}$  in. off a 'leg' of each peg so that it clears the base, and glue the other legs into their respective slots. The unit is now complete except for slotting in the razor blades—these are clamped in place after putting the unit on a flat surface, ensuring that the blades are horizontal by placing the prop balancing rod on the blades and seeing if it rolls towards one side. Adjust until the rod remains still, then the unit is ready for use. Place the prop on the rod, and then place atop the blades. The 'heavy' blade will fall, so file and sand this blade until the prop lies horizontal.

Do you carry your Determaliser fuse around loose in the bottom of your field box? How often do you lose the knife to cut it with... especially when in a hurry to catch that thermal? R. Moreton of Manchester overcomes this problem with the idea shown in E. He stores the fuse coiled up within an old 1 oz. tobacco tin, emerging from a hole drilled in the lid. The required amount of fuse is then pulled through and cut-off by twisting around edges of the hole, suitably sharpened with a round file. Fits easily into the pocket too.

Scale enthusiast Brian Hunt of Wolverhampton used the method drawn in F to hinge the flaps on his Beagle 218. Construction is self explanatory, and results in a very 'tidy' hinge line, and a control surface which is extremely free-moving. Method of actuation is also left to the individual, but Mr. Hunt uses a third control line via a bellcrank with a return spring fitted so that it is possible to judge the amount of flaps needed.







# topical twists

by 'Pylonius'

illustrated by 'Sherry'

'He built it specially for the club spot landing competition.'



## Railing Against Fate

IN SPITE of all the talk of noise pollution, the thunder of the stacked jets overhead, the yahooing of the bovver boys and the screams of distant mugging, it is surprising what deathly quiet lives many people really do lead; so quiet, in fact, that they are on the constant look out for some stimulus to set the adrenalin flowing, which is why, in the silence of their suburban tombs, they keep the telly volume well down so that not the merest whisper of a foreign sound will escape their ever cocked ears. We all know, to our cost, at what extreme range they can detect the thrum of a model aircraft engine, and with what eagerness they whoop into action to get the dread sound suppressed, even so you would hardly believe to what pitch of hysteria suburbia was aroused by the intrusion into the quietude of a model engine of quite another kind, but it was all on television for us to see.

What caused the good people to do their respectable nuts was the sound and fury of the model railway engine in full spate at the bottom of their trim gardens. By the time the telly people got on the scene it was a full scale demonstration, with angry banners and threatening slogans. The poor old railway enthusiasts were quite baffled by all the furore. After all, they were only giving their engines a quiet workout. It takes half a lifetime to produce one of these 4-8-2 engines, or should I say locos. What may have begun at the time as a model of a crack loco of the day, becomes a real vintage job by the time it gets finished several decades later, which is why you find these ageing enthusiasts gaily stoking away in a press button age, their wispy grey hair bent over the wispy grey steam trickling from every seam and rivet.

Nothing in this, you may think, to give rise to public aggro, such as we might expect if a radio model clobbered the colour television aerial. Yet there they were, slogan shouting and banner waving at the railway enthusiasts, who were still blinking at the daylight, as it were, as they gave the delighted children free rides.

The residents grievance was simply stated. On those balmy afternoons during the summer—both of them—when you might wish to drowse in the garden after Sunday dinner the air would be thick with smoke and hideous with noise—not to mention the smell. The television interviewer strains to hear more as next door's motorised lawnmower drowns all other sounds.

All this, I suppose, is by the way, but it does make a change to hear of model enthusiasts, other than those aeronautical, getting the big stick from the public. Perhaps it wouldn't be a bad idea to have a few of these engine circuits strategically placed throughout the country to divert attention from the pilloried model flyer.

## Above Criticism

I'm ashamed to admit to such a weight of years, but when I was a small boy it was not uncommon for someone, upon spying a strange sight in the sky, to shout 'Aeroplane!', whereupon all the good people would rush from their humble homes to gaze, boggle eyed, at the wonder of the age. Nowadays things are different. No one troubles to even look up as a VC10 or a 707 thunders majestically overhead, except, that is, a decibel counting Heathrow resident, or the progeny of the humble home dweller casting an anxious eye out of his high-rise flat to gauge height and direction.

Yet the now almost archaic aeroplane can on occasion rivet the attention of the sky gazer, particularly when his greenhouse shatters to a sonic boom or a jumbo blast pulverises his ear drums, but in a world brimming with marvels it is only the novel and exciting that gets his chin off his tiepin. But what new wonders have we in the model world that are worth getting a cricked neck for?

Well, what does seem a possible on the horizon is about the oldest thing in the history books: a hot air balloon. But one, let me hasten to add, fitted with the inevitable radio control. Now, whether such a contraption could be used for pylon racing is extremely doubtful, but what a relief it would be to the poor old flagman.

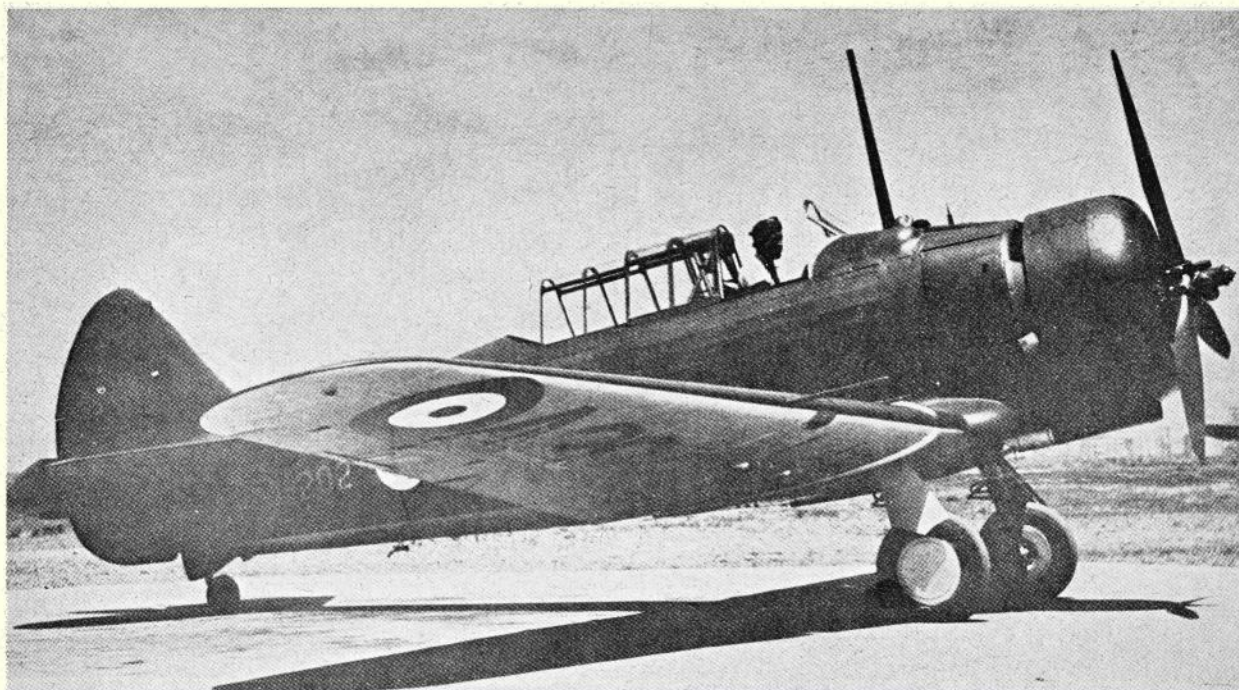
## Repairing Homewards

Repairing models can be great fun; there is a strange fascination in shuffling all those odd bits and pieces into something resembling a model aeroplane, but there is even greater satisfaction in taking your model home from the flying field in one wholesome piece. Just think to what use you could put all those wasted hours of repair work. If it wasn't for catching up on the backlog of television viewing you could even build a new model.

What causes all the wrecked bits and pieces on the work bench is a substance known as terra firma. Models are fragile things whilst the terra is very firma. Perhaps the firmest, or hardest variety of all is to be found on the pukka airfields, whose continuing loss we are always lamenting. Whenever I visit such airfields you can be sure there is a sizeable breeze steamrolling across the stone hard surface. This has something to do with the fact that such visits coincide with Sunday, when, as you know, the weather is always at the blowiest. You can also be sure that your model—or mine at least—will land on an unforgiving stretch of tarmac, no matter from where it is flown, and proceed to shed bits of itself across the surface. This is known as the law of diminishing returns.

Somehow or other I always seem to get the bits back together, but one of these days I'll have a nice bonfire and really get down to building a new model.





AIRCRAFT DESCRIBED No. 219

## C.A.-1 'WIRRAWAY'

described by J. A. VELLA, drawn by F. PAWLOWICZ

THE FIRST AIRCRAFT to be mass produced in Australia, was the C.A.C. *Wirraway* (an aboriginal word meaning 'challenge') a general purpose and trainer machine which proved to form the foundation of the aviation industry in Australia.

At a time when it had become apparent that the RAF, the then sole supplier of aircraft to the RAAF, was under pressure with its own expansion programme of the mid-thirties, and with the likelihood of its being able to meet the needs of the RAAF very much in doubt, the Federal government was advised by leading industrialists of the need for self-sufficiency in the supply of military aircraft.

In 1935 a mission led by Wg. Cdr. Lawrence J. Wackett visited Great Britain, Europe and the U.S.A. to study the state of aircraft design, engines, manufacturing processes and machinery. Conclusions drawn from the mission was that the North American NA33, a two seater monoplane of relatively uncomplicated basic engineering design powered by a P. & W. Wasp 600 h.p. single row radial engine was the best type from which to glean a knowledge of airframe and engine manufacturing techniques.

The *Commonwealth Aircraft Corporation* was established in 1936 and an example of the fixed undercarriage NA16 and the retractable undercarriage NA33 were imported to act as prototypes. These were allocated RAAF serials A20-1 and 2 respectively. The NA33 design was adopted for local manufacturing although modified to eventually include light bomb racks, radio and camera gear, replacement of the single wing gun by two Vickers .303 machine gun (located in troughs ahead of the cockpit and synchronised to fire through the propeller) plus a single hand-held Vickers .303 machine gun mounted on a hydraulically controlled hoist in the rear cockpit.

The first *Wirraway* (as the design came to be called)

A20-3 flew on 27th March 1939, thirty-three months before Pearl Harbour. By the time the 25th example was rolled out, the local content of the design had reached 95%. The RAAF received its first batch of aircraft in June 1939 and on the 5th of October 1939 the *Empire Air Training Scheme* was established with Britain financing over 200 *Wirraways* for the training of pilots in Australia. E.A.T.S. pilot trainees undertook their advanced training on the *Wirraway* after transitioning from the *Gipsy Moth* and/or *Wackett* trainers. An offer to produce *Wirraways* for Britain, the majority to be delivered by the end of 1942 was accepted but then reversed when 'Lend-Lease' came into operation.

By mid-1941 production was nearly 11 aircraft per week, and 211 aircraft were on unit strength though not all were operational or in front line units on the day Japan attacked Pearl Harbour. By June 1942, 620 aircraft had been delivered and the rate of delivery started to taper off, finally stopping at A20-757 (the 755th machine) delivered in June 1946.

In the meantime, at the start of hostilities, the RAAF had found itself lacking in aircraft and introduced the *Wirraway* to some front line units. This general purpose machine, never intended to perform as an interceptor, was asked to do just that in Malaya, New Guinea and New Britain, but was always overwhelmed by a better equipped and numerically superior enemy. It was used in the defence of Northern Australia, and in short range convoy escort but succeeded most in the role originally envisaged; that of tactical photography, dive bombing, artillery spotting, supply dropping and communication duties. All of these duties were however secondary to its primary role, that of an advanced trainer.

The only air to air kill credited to the type occurred on 26th December 1941 when *Wirraway* A20-103 of





Wirraway A20-10, the subject of these drawings, photographed at Laverton Air Base. A reprint of this feature, plus a dyeline print of the 1/24th scale original, are available as Plan Pack No. 2951, price 25p plus 5p postage, from Aero Modeller Plans Service, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE.

No. 4 Sqdn. on a reconnaissance flight near Gona and enjoying a height advantage, pounced upon and surprised a lone Zero-Sen. The pilot, Flying Officer J. S. Archer received the Silver Star. (This aircraft is on display at the War Memorial—Canberra A.C.T.). During its World War II career the type saw service with at least 20 regular units, namely 4 (QE), 5 (BF), 12 (NH), 14 (PN), 21 (MJ), 22 (DU), 23 (NV), 24 (GR), 25 (SJ), 54 (DL), 60 (EY), 78 (HU), 82 (FA), 85 (SH), 87 (QK), 548 (TS) squadrons and 1 PR Unit (PU), 3 COMM. Unit (DB), 4 COMM. UNIT (VM) and 9 Local Air Supply Unit (TX).

The aircraft continued service as a trainer in RAAF and RAN service until 1959 until it was eventually replaced by another CAC aircraft, the *Winjeel*. In the meantime with a lot of surplus *Wirraways* returned to CAC for storage and with a large spares holding, CAC introduced the CA-28 *Ceres* a much modified and strengthened version of the *Wirraway* as a crop spraying/dusting aircraft, thus the type entered the civil register.

**CONSTRUCTION DETAILS:** The wing was built in five sections: rounded tips, tapered outer panels and constant centre section of single spar construction with pressed flanged ribs covered by stressed skin of varying thicknesses. The wheel housing assembly was riveted to the outer face of the centre section front spar with the fuel tanks located in this section. The entire wing assembly could be removed as one complete unit or in individual sections.

Aircraft A20-623 and subsequent machines featured dive bombing flaps, interconnected with the landing flaps opening upwards as the flaps moved downwards.

All control surfaces were of aluminium alloy construction with fabric covering. The fuselage consisted of a welded chrome-molybdenum steel tubing framework with fabric covered aluminium alloy framed fuselage side panels, secured to the fuselage by screws. Decking and underside were aluminium sheet covered.

Two tandem cockpits, with individual canopies and reversible rear seat were fitted. A prone bombing position

(when fitted) was located aft of the port rear cockpit. After A20-623 all gun armament was deleted and the aft end of the cockpit enclosed by a streamlined perspex canopy. Eighteen heavy and light bomb racks (for light bombs and marker flares) were fitted, two on each outer wing. Normal bomb load was 500 lb, with 1000 lb. the permissible limit.

#### Aircraft Production:

A/C Type	Contract No.	Serial No.	C/N	Qty.
Wirraway GP Mk I	CA1	A20-3 to 42 (Mk I)	1-40	40
"	CA3	A20-43 to 102 (Mk II)	41-100	60
"	CA5	A20-103 to 134	103-134	32
"	CA7	A20-135 to 234	135-234	100
" /Trainer	CA8	A20-235 to 434	436-635	200
" /D. Bomber	CA9	A20-435 to 622	636-823	188
" /D. Bomber	CA16	A20-623 to 757	1075-1209	135

#### Specification:

P. & W. Single Row R1340 SIHIG radial of 600 h.p. driving a three bladed variable pitch propeller.

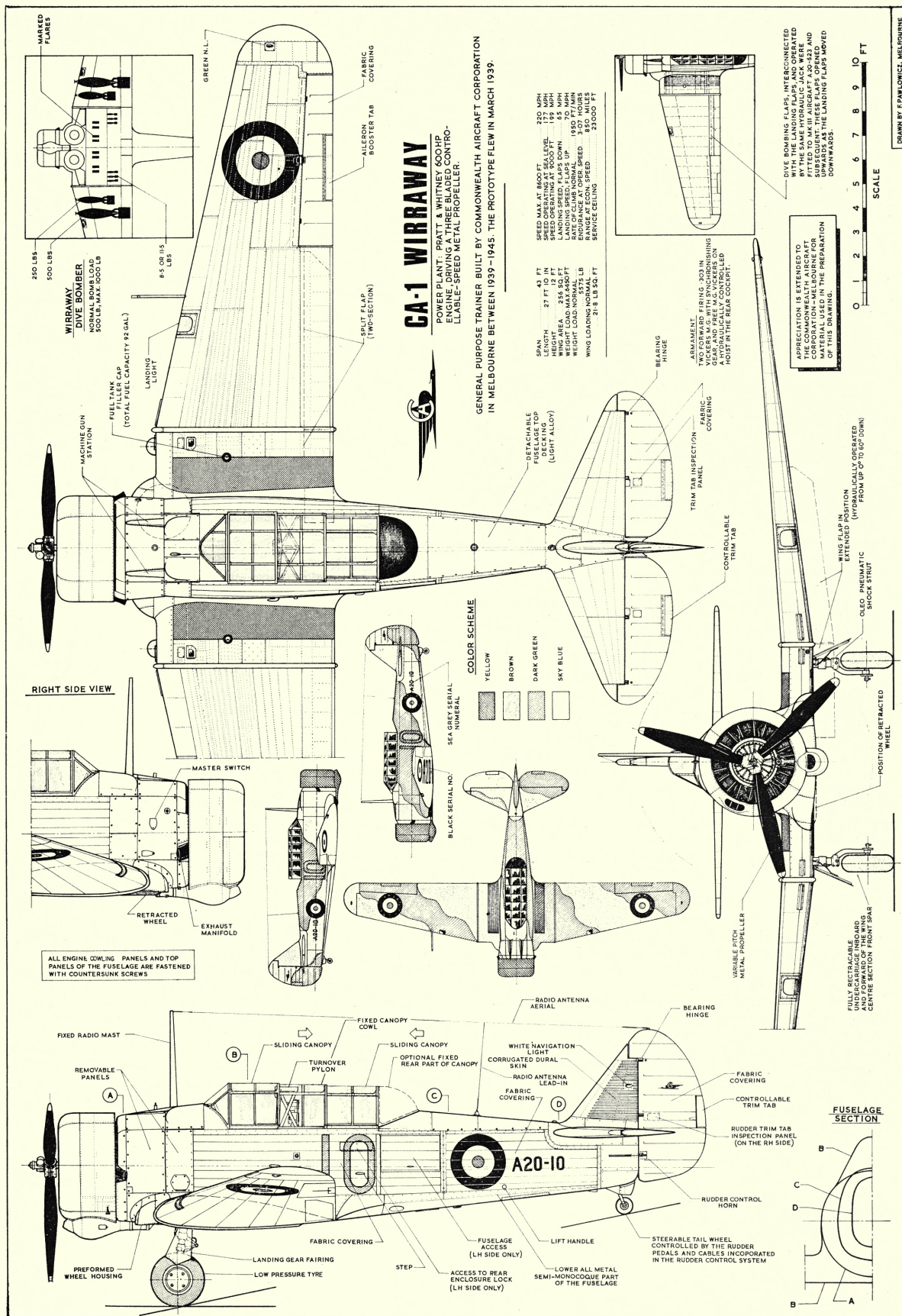
**Span:** 43 ft. **Length:** 27 ft.-10 in. **Height:** 12 in.-02.

**Wing area:** 256 sq. ft. **Wt. empty:** 3980 lbs. **Loaded:** 6353 lb.

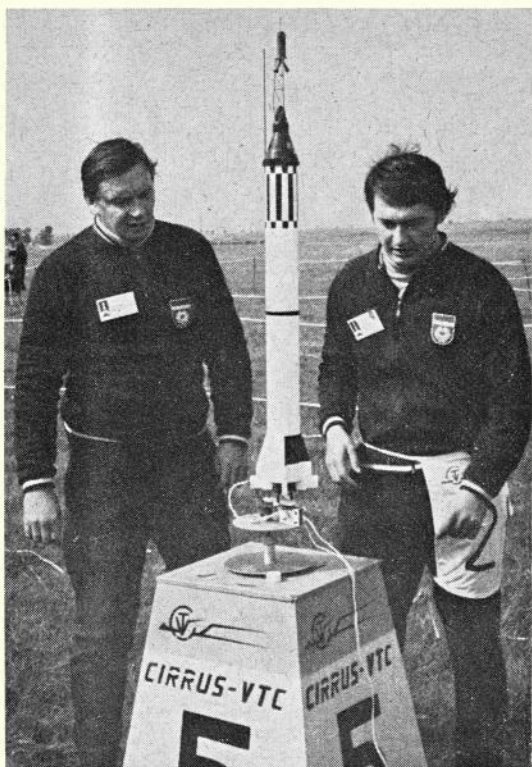
**Max. speed:** 205 m.p.h. **Cruising speed:** 182 m.p.h. s/l climb 1950 ft. min. **Service ceiling:** 23000 ft. **Range at economical cruising:** 850 miles.

*Wirraway A20-10*, the subject of the scale plan, was the eighth production machine, delivered to the RAAF in September 1939 and served with various training units including No. 2 Service Flying Training School (in whose markings it is shown and displayed) until 1945. After the war it was stored at Uranquinty N.S.W. until 1950 and then put back into service as a trainer at RAAF Base Point Coo, Vic. In 1957 it was retired from the RAAF, stored, resold to the *Commonwealth Aircraft Corporation* in 1960 and purchased by the *Australian Aircraft Restoration Group*, operators of the Moorabbin Air Museum in November 1963. It was then under a period of intensive restoration prior to being put on display at the Museum site. It is the oldest *Wirraway* in existence.









Yes, scale models too, and certainly not a plastic kit either! This, and all the other scale subjects, are capable of flight, but the use of three or four motors leads to asymmetric thrust problems. The American overcame this by the 'non-scale' approach of wing a single, powerful motor, but even they had recovery troubles.

NINE COUNTRIES sent teams to the National Aviation Centre's airfield at Vrsac, Yugoslavia – which was to be the venue for this first ever World Championships. Your two scribes, who have been corresponding with experts in the United States on the subject of model rocketry for some time, decided that they should put their theories and amassed knowledge into practice by attending this meeting, hoping mainly to pick up valuable experience. With model rocketry being illegal in this country and thus unable to practice, we realised that we stood little chance of success so therefore built essentially 'basic' models in order to put in as much flying as possible without worrying about 'gimmicks'. The meeting catered for three classes: parachute duration, boost glider and scale, and we decided to enter the former two categories. As its name suggests, the idea behind parachute duration is to achieve the longest possible flight from the limited – thrust motors permitted, while the rocket itself must be returned to the launch pad within one hour of the end of the round. Our approach was to build small, slim rockets in order to reach maximum height. As the rocket motor exhausts itself, a charge blows off the nose cone releasing the parachute, which then descends with the 'vehicle' dangling beneath. We employed what we considered to be large 'chutes – around 20 in. in diameter. 'Boost glider' involves a rocket attached to which is a glider often closely resembling a conventional chuck glider. As the charge is consumed the glider is released and its flights recorded – the rocket falling to earth with either a small 'chute or just a paper streamer to prevent damage.

To contest this latter class, Peter had built a *Delta-Katt*, a very light model of delta planform, which although rather poor in regards to gliding efficiency, was good in that it produced little drag during the boost launch, enabling greater height to be obtained. John used a different

## SPACE MODELS WORLD CHAMPS

reported by two British competitors,  
Peter Freebrey and John Wheddon

### RESULTS:

Parachute duration (95 entries, 9 Nations)			Team
1. Ion Radu	Rumania	415 secs.	1. U.S.A.
2. Elena Ballo	Rumania	411	2. Romania
3. Ellie Stine	U.S.A.	295	3. Yugoslavia
Jon Randolph			
10. John Wheddon G.B.		240	
14. Peter Freebrey G.B.		222	
Boost glide (26 entries, 9 Nations)			Team
1. S. Orly Mohammed	Egypt	165	1. Egypt
2. Peter Freebrey G.B.		130	2. Yugoslavia
3. Zoran Milicic	Yugoslavia	105	3. Czechoslovakia
20. John Wheddon G.B.		10	4. Great Britain
Scale (17 entries, 6 Nations)			Team
1. Otakar Saffek	Czechoslovakia	2945 pts.	1. Czechoslovakia
2. Urban Karel	Czechoslovakia	2776 pts.	2. Bulgaria
3. Howard Kuhn	U.S.A.	2575 pts.	3. U.S.A.

approach in sacrificing boost performance in favour of glide – his choice being an A.P.S. *Yellow Bird* 13 'chuck-kie'. Realising that we were likely to finish well down the results table, we at least aimed to have the best finished models – and this proved correct, many being decidedly 'rough'.

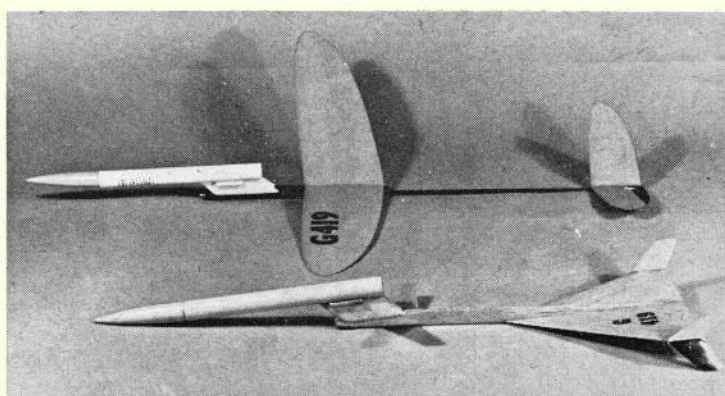
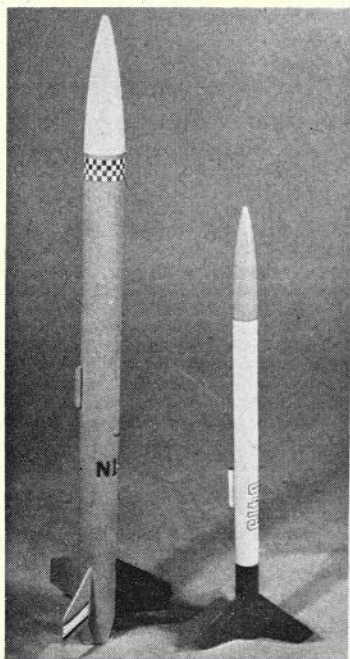
Practice day revealed an overcast sky with but light winds. It was also our first sight of the 'real thing'! The first shock we received was the size of the parachutes employed by the top men – nearly double the size of ours! Likewise our rockets were rather dwarfed by the size of the opposition. . . . However, our machines performed well – each successful launch being hailed as a 'new British record', much to the amusement of the American and Canadian contingents who had taken us under their wings. Pete's best duration with the parachute duration model was 335 seconds – quite creditable considering the small 'chute, while it was noticeable that the heights which we were obtaining were, in the main, better than anyone else.

The next day began with a most impressive opening ceremony, although its conclusion proved a little embarrassing for ourselves when it was realised that each team was expected to make a demonstration launch. Those who came prepared for this protocol had large, specially-made demonstration models, but we were not so well informed! Consequently, one of Pete's reserve models, just nine inches tall, was pressed into service. Fortunately, lift-off was achieved without a hitch and the ultimate height achieved quite impressive. We had taken the precaution of employing a very small parachute to facilitate quick retrieval, but with this day's fresher winds we sadly said goodbye to it as it sailed majestically out of sight, not to be found until much later in the day.

Two attempts were permitted in each round, the best score only counting for the results. As the two rounds were flown off one after the other, you had the option of making a short (safe) first flight in order to record a score, or to 'go for broke' at the first attempt. Most took the former passage, while we took the latter. Both of our first flights were fired in the same trajectory, and both were timed out-of-sight, a failing of such small parachutes. Pete recorded 222 seconds, John 240, which left him in fourth spot.

For the next round we tried large metalised mylar 'chutes, made from material given us by the Americans, in order to raise our performances. Unfortunately, we were unable to practice with these 'mods' and they proved our undoing, as the 'chutes failed to deploy on either occasion. Meanwhile, of course, the opposition had made





Above, a pair of Pete's boost gliders. The top one has variable incidence elevon (vee tail), while lower is his Delta Katt. Difference in parachute duration rocket sizes seen at left. Pete's 11 in. entry is dwarfed by Ellie Stine's example.

their second 'maximum effort' flights, and John slipped to 10th and Pete to 14th places. The Romanians topped the results with fairly large models, not boosting so very high, but carrying very large, easily visible, black 'chutes.

The weather had been deteriorating all day, and by the time that the Boost Glider event was flown, there were showers of rain while the ever-freshening wind had veered round, taking the models towards the nearby mountain, and Romania's border. Only the Egyptians seemed to be able to cope with this wind. John experienced considerable difficulty in actually leaving the launch rod, as the force of the wind blowing on the wings caused the model to skew on the launch. This caused so much friction that even the motor's 4 lb. thrust could not overcome it. Out of three attempts the model left the launch rod once, and then only to record 10 seconds. . . .

Pete too had his problems in this class, with the model being blown off the launcher, and the electrical ignition system playing up. However, after some two hours, a perfect launch was achieved and the tiny model was seen for over two minutes. In the end, only Sherif Orfy Mohammed of Egypt eclipsed this effort, with a time of

165 seconds, quite a remarkable climax to the contest, as the Egyptians also took the team prize, and they too were novices! They arrived in Vrsac a week before the contest to build and trim their models, with much advice given by the Yugoslavians who, at least, had the consolation of placing third.

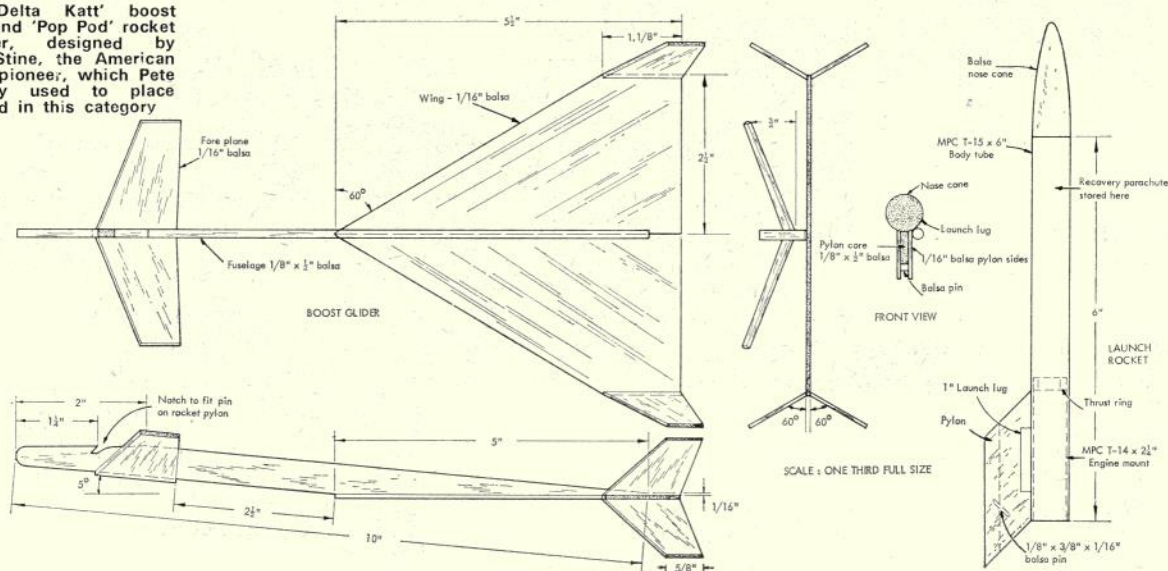
Sunday was taken up with scale flying. Most models were extremely well finished and detailed, although scale rocketry suffers from a dearth of data with the result that Saturn I and V models formed the bulk of the entry. NASA is obviously not shy about providing information!

Flying, however, was rather a disappointment. The Americans, who were using very powerful single motors, had no stability problems but all three entrants had trouble with recovery systems. Entrants from the East European countries were forced to use clusters of lower powered motors and some wild flights resulted due to asymmetric thrust. Only the Czechs who had developed a neat simultaneous ignition system for their clustered motors made three trouble-free flights. In the circumstances their first places in the individual and team competitions were most deserved.

The meeting was concluded that afternoon with a pleasant, but brief (owing to the rain) prize-giving ceremony performed at the flying site to the accompaniment of National Anthems and flag raising.

A hectic afternoon followed spent 'trading' epoxy glue, fibre-glass fuselages, mylar 'chutes, American minijet motors - anything in fact, for almost anything! Later, all competitors and officials were entertained at a banquet and after a splendid dinner all prize-winners were awarded F.A.I. certificates and team managers collected commemorative plaques on behalf of each team member. Wine and music then flowed freely (very) to bring a memorable and happy event to a most fitting close.

The 'Delta Katt' boost glider and 'Pop Pod' rocket launcher, designed by Harry Stine, the American rocket pioneer, which Pete Freebrey used to place second in this category







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

NOW IT IS the middle of winter, it is time to think about the next summer season of flying. Most adult modellers treat the winter as a period of reflection on the performance of their models over the past season, and from that build new models with 'improvements' in them. What do you do? For juniors the cost of the hobby is probably the key factor, but even on a limited budget you can find plenty of ways of getting around this. How about building an identical model? It may sound unexciting, but think about it a bit - most models of today have detachable parts (for example wings, tail-planes, etc.) and you should be able to extend your useful flying periods if you have spare parts available. Everyone crashes their models sooner or later, and nothing is worse than to do it early on a day perfect for flying! If you have a spare wing or fuselage you can carry on - in contests it is vital to have such spare parts available.

In addition, if you build two or more 'identical' planes you will find that one flies better than the other, or that perhaps one is better in calm conditions and another better in windy conditions for instance. It would be very instructive for you to try to find out why. Is one significantly heavier or lighter than the other, and if so, why? Are there different warps in one model? Are the centres of gravity the same? Are the incidence angles of the wing and tailplane the same? Is the engine downthrust or sidethrust the same? Answers to these and many other questions will help to improve your knowledge, and hence performance. Thinking forward to next summer, how about writing to let us know what type of contests you might be interested in. And whether you are interested in contests at all? It is just as important for us to know if you are not interested, so write in either way!

Your question about the combined rudder and elevator is interesting and there is no doubt that it could be done very simply - but I would strongly advise against it because it is of absolutely no use to you and you are sure to crash your plane very quickly if you do try it. Have you thought what you would do if for example, you hit a gust of wind and wanted to go up and to the left . . . ?

If you start with a safe stable model, trim it carefully as for a free-flight model and stick to rudder-only for a while, you will get on much better in the long run. If you must have some degree of elevator control then I would suggest a compound servo with a 'quick blip' device. Your local model shop will explain what this is in detail but briefly it acts like a normal servo for normal operation of the transmitter button, but if you quickly press and release, i.e. a quick tap on the button, a second servo is brought into action and could move an elevator in one direction. When you 'quick-blip' again the elevator would return to its original position. (Alternatively, the 'quick-blip' could operate a motor throttle, either 'fast' or 'slow'). Be very careful with elevator control, it is very sensitive. It is more usual to arrange the quick blip action to give a slight 'down' elevator movement to allow you to fly in stronger winds than normal. Aerobatics with a quick-blip device could be very hair-raising.

The D.C. Sabre has no commercial R/C throttle available. (In general, diesels are not very good for throttling - you will notice that nearly all R/C aerobatics people use glow plug engines nowadays). A simple engine cut-out is a practical proposition though - although I do not honestly think it is worth it for a beginner using a sports-type diesel. Your D.C. Sabre should give you great fun as it is, if you choose your model accordingly and trim it carefully. How about 'Plane Simple', 'Timber', 'Shoulder Strap' or 'Mini Comet' from our Plans Handbook No. 4?

Dear John,

I am designing a profile fuselage Spitfire and am wondering if you could tell me what the wing area and span should be for a 1 c.c. engine? Also, could you please tell me what size elevator I should use to make it a stunt model, and what size lines it should be stunted on?

Caterham, Surrey  
B. Ferguson  
Good luck with your attempt - there's no reason why it shouldn't be successful if you have built a couple of control liners before. Your main problem is going to be weight with a 1 c.c. engine if you want it to stunt. Also you may have a wing construction problem if you are going to try to follow the shape of some of the Spitfire wings. I would aim for a wing span of between about 24 in. to 28 in. and a wing area of about 120-150 sq. ins. These figures are not very critical over that sort of range, so concentrate mostly on a strong but light wing construction - certainly a built-up wing, tissue covered.

The elevator again is not very critical in size and anything of the order of 35%-50% of tailplane area would be O.K. - but don't forget to keep the deflection angle of the elevator small for the first few flights.

I would fly it on about 30 foot lines for a start but if (and only if) it pulls well you might be able to go to 35 foot in calm weather. Don't forget to try your stunts on the downwind side of the circle!

Dear John,

I am writing this letter in the hope of having a pen friend. He must be a novice at Aeromodelling as I have just started this hobby. My age is 15.  
Wythenshawe, Manchester Ian D. Grey

Get out the pens, lads! Actually, correspondence between modellers can be most useful and informative as one swaps advice and experiences, just as happens in the Club room. How about a 'Pen Pals' corner?

Dear John,

I am going to get a Macgregor Powermax transmitter, Minimax Relay receiver, Ergamite rudder servo, and an Ergamite motor servo.

Would it be possible to get the rudder servo to combine the rudder and elevator so that to go up you go to the right and to go down you go to the left. I could see only one snag to this in that you would land on a turn, so why not install the engine servo, and cut the engine to land?

However would the servo mentioned be powerful enough to do this?  
Brackley, Northants.

S. Payne

From your letter it appears you are a beginner in R/C and if I were you, I would take things one step at a time. So start off with the rudder servo only at first and leave the motor servo for a while - you won't lose anything by delaying buying the motor servo. Incidentally, the Ergamite is the motor servo, and you would need the Ergamite special rudder servo (FR53) to operate it.

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, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

1/3 15p in the £1 Rebate  
plan purchase coupon  
to W. Golden Wing Members



We don't actually have on record exactly what the 'Comment' was . . . but it was probably unprintable anyway! Actually, we can confirm that the 'detachable' wing panel is not a secret device on J.O.D.'s coupe d'hiver to save drag! However, note how the prop is still folded - this being John's adaption of the Hofsass delayed prop release on a 'm'n'i' model. Prop will (normally!) unfurl after the impetus of the launch is lost, which gives several precious extra feet of altitude.

AUTUMN is invariably the most crowded part of the Contest season—partly from organisational aspects, but primarily from the belief that the weather is more likely to be 'flyable' in September and October than at other times. However, the erratic weather of 1972 extended into the autumn months—with obvious enough repercussions upon free-flight activity.

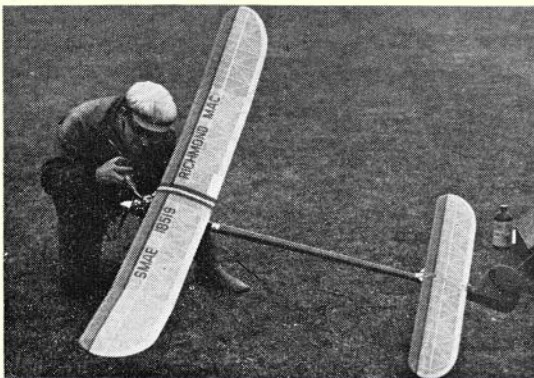
For the **S.M.A.E. Area-Centralised** events held on 10th September the weather problem was compounded by the inevitable variations throughout the country. From what I hear, and from looking at the result sheets, it was certainly possible to do good scores in most areas. In practice, however, many entrants lacked the required persistence. This situation is reflected in high winning scores, but with a rapid fall off thereafter.

The A/2 event for the **S.M.A.E. Cup** provided the most striking example of this phenomenon. Flying at Beaulieu, Pete Stewart of Crookham had a very convincing win, despite a very mediocre flyoff after a clear seven maxs. There was no one anywhere near him in the South of England. Runner-up in fact, was Brian Kenny of Sheffield with an aggregate of 19:50. This represented some very consistent flying in windy conditions that saw no one else record more than four flights at Elvington. Third place went to John Cooper, flying with the South Midland Area, who clocked just under 19 minutes. In retrospect he considered that 9 o'clock had been too early to commence flying! Following contest positions were shared between the London and North-Western Areas—but scores tailed off rapidly. Barely a baker's dozen of the 50-odd entry exceeded ten minutes. Presumably seven flights and the imminence of the Second Trials were contributory factors.

More interest was evident in the Team Rubber event for the **Farrow Shield**—perhaps partly due to its being the final event counting towards the National Club Championship (*Plugge Cup*). The need for a club to field a full team is also obvious and relevant. All-in-all there were 65 entries from a total of 24 clubs—of which only Crookham and Norwich were able to run to even a partial second team.

Winning rubber team, by a very substantial lead, was the St. Albans quartet of Bruce Rowe, Dave Tipper, R. Green and Pete Putnam. Of these, the first named managed a treble with all the others being little behind. This gave a team total of 35:08—compared with the 'second best' of 31:44 recorded by Bristol and West. They had two trebles (from John Bailey and Hamish Gunn), eight and a half minutes from Dick Cummins, but only two flights from Derek Wain who wrecked his only model. In fact the 'missing' flight could not have provided enough score to alter the overall result! Third team place went to Northampton—who cared little about the *Farrow* itself but who were trying very hard indeed to 'clinch' the *Plugge Cup*. Their enthusiasm is best illustrated by power flier Dave Short who built two rubber models specifically for the Team effort. He finished these models at 5 o'clock on the contest morning, trimmed 'by eye' rather than by test flight, and recorded a very respectable contribution to his club's total. Martin Cowley, Trevor Payne and Jim Pottinger made

Nigel Clark placed second in the South Midland Area rally's power event with this K & B 40-powered machine.



by John O'Donnell

up the rest of the *Farrow* team.

Individual scores told their own story. There were only nine trebles, despite the size of the entry. Furthermore only six of the 'qualifiers' bothered to flyoff. With no award of any sort to the individual winner, flyoffs are only useful to settle team ties or to obtain extra *Plugge* points. Best flyoff came from Trevor Payne who got over six minutes in sight and got the model back that evening. Also remarkable was his use of a single motor for all four flights, and his comments that it 'got better the more it was wound, fantastic climb in flyoff'. Runner up with a five minute plus flyoff was Tony Grantham, presumably with his usual Fred Boxall design, whilst third place went to Bruce Rowe with a very small model of about Coupe d'Hiver size.

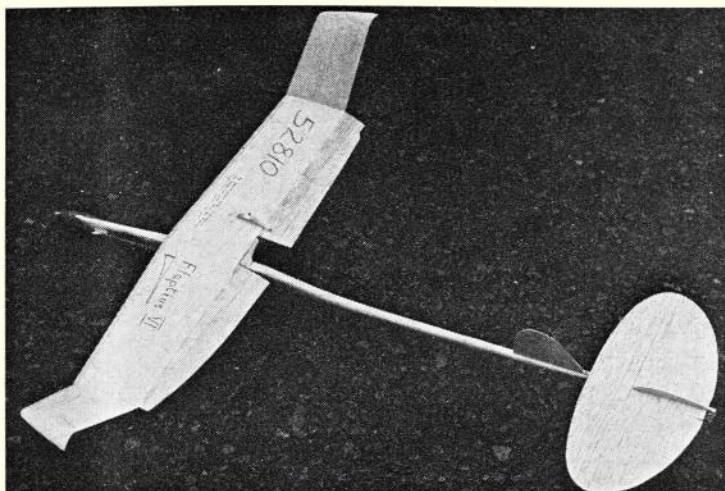
Third and final event of the Area meeting was the trophyless contest for  $\frac{1}{2}$ A Power. This saw John West repeat his 1971 victory—although with a much inferior score of only 7:39.

This was still half a minute ahead of East Grinstead's Bob Taylor. Both flew at the S.E. Area's venue of Ashdown Forest. Third was Pete Harris of Evesham, flying as usual with the N.W. at Chetwynd.

Having mentioned the influence of the *Plugge Cup* upon participation in the Team rubber event, it would seem appropriate at this point to give the outcome of the struggle for the Club Championship. Overall winners for the 1972 season were Northampton, well ahead of Leeds, Birmingham and Norwich. Results are based on a points system with 100 being awarded for first (individual) place, none for last, and equi-spaced in between. The necessary calculation is usually expressed as a formula, and seems incomprehensible to the non-mathematician! Six events count for *Plugge* points (one event per Area meeting) so the maximum possible score would approach 1800 points. Northampton's winning score was 1376, the next three were in the 1200s, whilst Crookham was the only other club to get into four figures.

All these scores *could* have been much better. The winners were without the services of John Cooper who has flown as a Country Member all year—perhaps through being 'away from home' at





Those who thought that the humble chuck glider would always remain its simple, basic self, devoid of all gadgetry, are wrong! This development is the brainchild of Mike McAskie, and features flaps plus a tip-up tail de-thermaliser. Intriguing and impressive! Another of his chuck gliders features a blow-down elevator, actuated by the rudder movement.

Belfast University. Leeds had a very slow start in the initial A/2 event. Birmingham sacrificed their hopes of a third consecutive win by 'opting out' of the Team Power event. A shortage of F.A.I. Power models, plus their having nothing but Wakefields for the Team (Open) Rubber contest, proved the undoing of Norwich.

Northampton attributed their success to steady, rather than spectacular flying, by all the active F/F members of the club. Taken alphabetically those involved were C. Champion, Martin Cowley (both students), Brian Dowling (accountant), Mike Evatt (heating system designer), Noel Parry (decorator), Trevor Payne (cabinet maker), Jim Pottinger (insurance manager), and Dave Short (engineer). The main quality demonstrated by Northampton was perseverance in the face of both bad weather and airfield difficulties. Their normal Area venue is Henlow but it has to be shared with full-size gliders. On occasion model flying has been stopped – and competitors have had to adjourn to Bassingbourn.

As an aside I would add that the location of these two 'dromes' relative to their resident areas and East Anglia hardly seems in keeping with the original concept of the Area-centralised events.

Of much less general appeal are the S.M.A.E. *Individual* National Championships. Both the Senior and Junior titles are awarded on the basis of the total score accumulated over certain events at Area meetings and the Nationals. For the *Senior Championship* the eligible Area events coincide with those counting for the *Plugge*. Even this arrangement has failed to encourage more than a handful of all-rounders to try for what *should* be a widely coveted award. Over the years this title has become something of a personal monopoly of mine – and its value has declined in consequence. For 1972 I decided to ignore the Championship altogether, and instead to fly those events I considered I could win!

Winner of the 1972 *Senior Championship* proved to be Russell Peers with an aggregate of 93:01 out of a possible 117 minutes. Opposition was provided by Bob Wells (84:51) and Martin Cowley (75:39). To be 'in the battle' one has to fly rubber, glider and power in both open and F.A.I. events. Having won the title, Russell is now talking of reverting to being an *Open* power and rubber specialist! The Junior Championship also went to a N.W. Area member – Keith Lord of the Syke club. Although only submitting a very modest total he can certainly claim to be both an all-rounder and a regular contest entrant – flying rubber, glider, power and chuck glider.

Recently proposals have been made with the intent of stimulating interest in these Championships. To remove the 'endurance test' aspect, it has been suggested that only a contender's best results should count. About half of the eligible events seems the popular idea. To equate F.A.I. and Open events, with different potential and numbers of flights, the use of a *Plugge*-type points system has been advocated. I wonder who is going to be responsible for the arithmetic if this scheme is accepted!

The annual *South Midland Area Rally* at Cranfield is one of the very few aeromodelling meetings that still cater for the general public. This means that much organisational effort must go into aspects that are not *directly* related to the contest themselves – and that various facilities must be provided. Not only does this cost

time and money – it also changes attitudes towards the whole venture.

There are contest modellers who decry the 'garden party' atmosphere of these 'public' rallies, and conclude that they *cannot* provide serious competition. Apart altogether from it being a 'non sequitur' their conclusion reveals a dreadfully short-sighted outlook. Recently, however, there has been a new reaction from the modellers – complaints about the expense of admission and/or participation at these rallies.

All these factors applied to Cranfield. There were many grumbles when the modellers found that it cost 20p for a programme to gain admission, *plus* 50p for car-parking. Free-entry to the contest was promised – but much of the effect of this concession was spoilt by there being a charge for the Wakefield event.

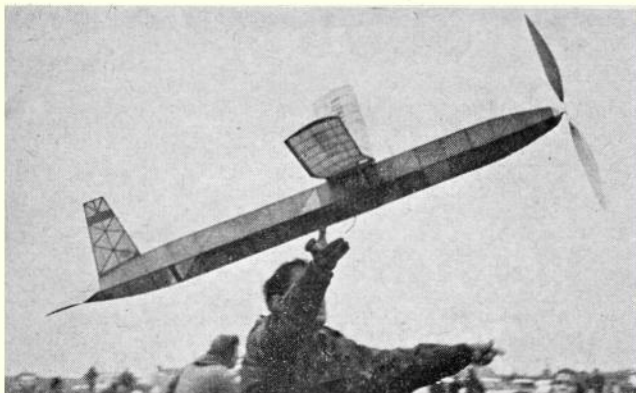
It is only fair to present 'the other side of the coin' (if the phrase can be forgiven!) as indeed I have been asked to do. Times have changed, and the terms under which this year's rally could be run were laid down by Cranfield Institute of Technology who own the airfield. They charged £100 'rent' in addition to taking the car parking fees and commission from the caterers which left only the programme sales to provide any revenue for the organising area. Technically the Wakefield event for the *Ted Evans Memorial Trophy* was run by Northampton as distinct from the S.M. Area – and the charge was to provide cash prizes as demanded by last year's competitors.

Free-flight was handicapped by an unfortunate wind direction, combined with pre-determined sites for other events. The resultant F/F launching area was immediately downwind of a row of hangars; giving extremely turbulent air, and only 300 to 400 yards of airfield in front of the adjacent farmland. At least the countryside was

Keith Lord, of the Syke club, is a true all-rounder, flying in rubber, power, glider, and chuck glider events. A regular contest competitor, he took the 'Junior Championship' title.







'Butch' Hadland, of R.A.F.M.A.A., launches his 400-square-inch open rubber model in the flyoff, at the Cranfield Rally, which suffered this year from cold winds. 'Butch' won this flyoff with a score of 6:56.

Ray uses a OS29 R with a cut-down 9 x 4 in. prop. Notable was a double flood-off pipe system to obtain a cleaner cut. Third place went to Trevor Grey with around 8½ minutes aggregate – with an OS.19 powered *Dixielander* style model. No one else cleared 8 minutes.

There were two unusual events schedules – tailless and helicopter. The former was won by Brian Stout, followed by Hayes members Josh Marshall and John Gregory. Helicopter provided a surprise when exponent Ian Dowsett had his rubber model outstripped by R. Henderson.

Thanks to having covered the Second Trials in great detail last month I can jump straight to early October. Unique in being held on a Saturday was the S.M.A.E. Northern Gala held at R.A.F. Rufforth in very pleasant flying conditions. Support was very far from what this event should attract. It might be that modellers have other things to do on Saturdays – but (from the lack of representation from the Midlands and South) I would also reckon that Richmond's Gala the very next day kept a lot of people away. The converse was true of course! The F/F side of the Northern Gala comprised only the three 'open' categories plus a *Junior Kit* contest. Easiest way to good scores was to fly rubber and power in the late morning when it was misty but very calm, and gliders in mid-afternoon when light was plentiful if weak.

Rubber had half of those flying reach the flyoff – with most of the others dropping quite a lot of score. The flyoff itself proved to be a real eyestrain. Although it could hardly be called windy, general haze and mist saw models go o.o.s. as they crossed the downwind peritrack at around four minutes. In these conditions the winner was hardly a surprise, being John Carter with his 500 sq. in. 6 ft. monster. Like several other models this held weak lift for a very good *airborne* time – but it remained in sight that bit longer. In contrast I managed second with a very small (Coupe d'Hiver size) model, simply because it flies a peculiar pattern with a long straight cruise in the middle of the motor run. This happened to be in a direction that reduced the drift. Should anyone wonder why I am using such a model I would remind them that I lost two *Maxines* at the Nats! Third was Trevor Payne with his *Farrow* winner, closely followed by several others.

Power was again a visibility win by the largest model – in this case Russell Peers' K & B 40 design. Even allowing for the size difference, his timekeepers did well to record a minute more than those of runner-up Bob Garner of Walsall. Bob is new to contest work but was flying quite a sophisticated F.A.I. model complete with Rossi, Seelig, sheeted surfaces and all the usual gadgetry. Clubmate Dave Pymm had a smaller sized G15 open model that went o.o.s. even sooner. Recovery fortunately proved no problem.

Only glider was decided on relative performance. Martin Dilly produced his high aspect ratio (5½ in. chord) thin section model for the flyoff, and justified his choice with a 2½ minute flight and first place. The model was unusual in having a fuselage tail-boom

*continued on page 50*

– 'open' with only a couple of fields of standing crops. The only real hazard to easy retrieving was right on the edge of the 'drome' – a single house and associated orchard plus garden that 'collected' a number of models – to the annoyance of the occupier.

The standard of flying was far from outstanding – though turbulence and downdraughts were contributory. The difficulties in locating lift in the breezy, overcast conditions is best illustrated by open glider being decided *without* a flyoff. Winner was Dave Digby with a very straightforward design – square tips, balsa box fuselage, etc. He *should* have done a treble, but D/T'd a few seconds early on his initial flight. I was second, just ahead of Fred Sharp.

Wakefield was flown on a five flight basis, and without rounds or starting line. The top two fliers were well ahead of the field, with winner Joe Barnes proving consistent with a paper tube fuselage design. In an attempt to improve his chances, runner-up John Cooper took his final flight so far downwind that he was only just inside the airfield. Mike Gaze was third, thanks to the officials being sufficiently strong-minded to disqualify Ian Keynes' final max when he launched after the 5 o'clock closing time.

The flyoff commenced with chuck glider – flown to the best 3 from 10 launches and with a one minute max. In the 'sudden death' flyoff John Gregory made an indifferent launch to leave Barry Kershaw with only half a minute to beat. Neither was using the model with which he started the contest. Interesting was the revelation by John Gregory that he only reckons to get one 'good' chuck glider out of three. Even more interesting were the models of fourth placer Mike McAskey. One has a blow down elevator to help control the climb whilst still leaving some 'longitudinal dihedral' (difference in wing and tail incidences) for glide stability. Another design had both wing flaps and a tip-up elevator D/T. The flaps are spring loaded into the glide setting and rely on air loads to lift them on launch. Roll adjustment is made by altering the flap area giving the peculiar contours evident in the photograph.

Rubber had a surprisingly small flyoff with only five qualifiers. Butch Hadland produced his 'Jumbo' for the decider to gain greatly on visibility. He had lost this model at the R.A.F.M.A.A. Championships on a 19 minute flyoff – and in consequence had to build new flying surfaces the week before Cranfield. With but a couple of preliminary test glides it was wound up and used for the critical flyoff. It looked a shade tight on power burst, but climbed well into lift, and was seen for almost seven minutes. The D/T was set for two minutes later, and the model watched down into a large dense wood! A protracted search the next weekend proved fruitless. 'Jumbo' had 400 sq. in. wing area, a 60 in. long by 4 in. square fuselage, and used 18 strands of Pirelli. Tony Grantham took second place with his Boxall style design, whilst John Bailey, Bruce Rowe and Derek Wain followed in that order.

Power proved to be very close indeed. There were only two in the flyoff – both with largish models. First away was Nigel Clark, but he was slightly off pattern with his very fast K & B 40 powered model. Initially the glide was in very poor air, but it must have levelled out to record over 3½ minutes. His model is F.A.I. 'style', has 560 sq. in. wing area, 29–30 ozs. all-up weight, and uses a 10 x 4 in. prop. Ray Monks cut down his own D/T when Nigel looked to be in sink – but apparently went o.o.s. in only 4 minutes.

Chuck glider needed a flyoff to decide the winner at the South Midland Area Rally – eventual winner being Barry Kershaw once more (left), with a 13-second advantage over John Gregory, who used an APS 'Yellowbird'.







## CLUB NEWS

Six-year-old Ian Whittaker holds aloft a free-flight scale airship, seen at the Woodford Rally.

'SPORTS' FLYING has many aspects in these highly diversified times. Whereas once the term was used to differentiate the fly-for-fun model flyer from the active contest flyer, it could now cover a wide variety of model flyers, with particular emphasis on Radio Control where the competitive element is far from dominant. There is also the many categories of Scale modelling, covering Free Flight, Control Line and Radio. 'Sports' models are flown for the sheer joy of model flying, and long may they flourish.

Certainly they are flourishing in the **Leeds & D.M.F.C.**, according to the report sent along to us by J. Mosely, the Hon. Sec. Looking back over the past year, he notes an increase in the number of 'sports' flyers who keep things going after their serious contest flying is over. He also stresses that club interests still centre on the free flight classes for which the club is traditionally known, but there is now an up and coming control line section which has made its mark upon local events with a number of displays. Although 1972 was not an outstanding year for the club – second again in the *Plugge Cup* instead of winning the darn thing – there were a number of successes to record, with Messrs. McCann, Cordes and Tubbs upholding both their own and the club's reputation. High spot of the year was a most successful F/F Rally. Held in almost perfect conditions it attracted a large entry from a wide area. Prizes paid out came to £36. Equally successful was the club dinner, which brought together many old-timers, not the least of whom was the club President – a founder member from 1934. He presented a new 'Precision' club trophy, won on Club Day by J. Godden. The club is now a full member of the *Yorkshire & Humberside Sports Federation*, which the club regards as a step in the right direction towards national recognition of the hobby.

If there is such a thing as a hat trick in model flying it was triumphantly achieved by the **Croydon & D.M.A.C.**, in filling the three places in the Great Britain Wakefield team. The three members who made it, John Mabey, Ian Kaynes and for the second time running, Bryan Spooner, had to fight their way through two tough qualifying contests. Not far behind in the final placings were members Dave Hipperson and Ray Elliott who occupied 5th and 7th positions. Five out of the top seven says much for the club's strength in depth in the Rubber field. Let us wish them well in the International finals. This success for John Mabey comes hot on another notable triumph: the winning of the *Europe Coupe Wakefield* at Homberg, Saar, with Dave

Hipperson placing eighth. And another foreign success, this time for Ian Kaynes, who placed third in the annual pilgrimage to the *Criterium Pierre Trebod* in France. All good Common Market practice. Finally, another international eighth place to record. John Blount in the *World Indoor Champs* at Cardington. Best placed U.K. competitor in spite of a lack of sleep.

Embedded in the deep farm country of Essex thrives the **Stanstead M.F.C.** In keeping with the club's rural background the flying field is a stretch of farmland at nearby Henham. This venue was the scene of the club's 'One Model' contest. The model chosen was the popular *Keil Kraft Caprice*. The event was well publicised in advance, and this, plus the glorious weather on the day, made for a swinging event, although the chief praise must go to members from all sections of the club who helped to clear the model shops in the district of *Caprice* kits! The success of this highly clubbable event shows something of the spirit prevailing in the club; so if you are on the look-out for an active group drop in at the Ugly Village Hall on the first Friday of the month. The hall is on the A. 11 north of Stanstead. Report from Julian Hopper.

Just to show that the humble lines in this column do not waste their whiteness on the deserted air, we are told by Mr. A. Johnson, that the publicity we gave to the **Broadlands C/L Group** has boosted membership to eighteen. A correction however, to the club meeting times: they are held on the first Thursday of each month and not on Friday as we were previously informed.

I should imagine that the experience of the **Urmston & D.M.A.C.**, (Manchester Area) in getting only small field attendances throughout the year is not a unique one considering the sort of weather we have had to put up with. Nevertheless, a faithful core, including several keen new members, have weekly braved the elements to keep a continuity of flying going. A sustaining feature of club activity has been the monthly events for the Club Championship, in which twenty people have returned scores, although it is said, by way of a sly dig, that the treasurer may claim that the club has not that number of paid up members. Mostly the club champ events were control line, but with a sprinkling of more light-hearted events such as Chuck Scramble and paper glider. Winner with the best six scores was Ian Barrett, who thus becomes Club Champion. Walter Gill was a close second. Junior Champion was another Barrett, Ian, with Matthew Greenalgh the runner up. J. A. Noble, the Comp. Sec. cum P.R.O., who sent us this report, had the



chastening experience of being beaten in the Chuck Glider event by his ten year old son flying his first ever model.

Looking through the September issue of the **South East Area's Seadog** I saw a notice for the Brighton club's traditional Hydro event to be held on 22nd October. Now, as I remember it was a day of quite gruesome weather. I can only hope the conditions at Ashdown Forest were not as bad as I suspect. Perhaps of wider appeal in the Area than Hydro flying is Thermal Soaring. During the summer an event for Thermal Soarers was held in conjunction with a free flight contest, and it turned out to be a quite happy juxtaposition of Radio and other interests. The thermal soarers were out again in September, but with lots of wind cutting down on penetration. Three clubs flew. On the C/L front there were the Area C/L champs at Elliotts Airport, also in September. This turned out to be a really big meet with 57 contestants coming from far and wide. There were 27 entries in Combat and thirteen in Stunt. A touch of glamour was added by the eight Scale entries. There is a news item in the bulletin concerning a new type engine silencer developed in America. The heart of the silencer is a rapidly vibrating silicone rubber sheath. It is claimed that it not only cuts down noise but improves engine performance.

The West country has its share of keen model flyers, and none keener than the members of the **South Bristol Club**. Evidence of this comes in the club's *South Bristol News*, where the club champ list, free flight, carries no less than 14 competing names, many of whom, like Elton Drew, are names to conjure with in the contest world. Final positions for the Club trophies were S. Spencer: Glider; J. Mayes: Open Rubber and Open Power, with G. Pink holding most Club Champ points to date. Notwithstanding all that, C/L is far from neglected, the *News* including an illustrated article by Ian Perkins on a 'Combat' self launching device. Interesting, too, is the complete club record list. It covers everything from Open Rubber at 16 minutes plus to 4 minutes 19 seconds for Class 29 Goodyear.

Now what about a flying machine of six ft. wingspan, weighing 8 lbs., fully controlled and safe to fly over the heads of spectators! Such a phenomenon appears on the front page of the **South Essex M.A.S.** newsletter. No, it isn't a model aircraft; it's an eagle—real, live, feathery one. The handler is by way of association, a model flyer, but appears to find eagles less wearing on the nerves. What particularly fascinated the news-sheet editor was the way the wily old bird washed out his wing tips as he came to land with assured accuracy and grace on his master's wrist. The cover has a very nice drawing of the talon scout by Mr. Tom Davison. Seems that the Achilles heel of the Radio flyer is a penchant for a small rubber model called an *Ajax*. The club contest for this one type model produced a field of ten—if the Marsh could be called a field. Some good flights recorded, with the best a 2 min. o.i.t.s.o.a.m.b. (Out in the Thames Stuck on a Mud Bank).

Dressed up in its new illustrated cover, the **Three Kings Aeromodellers'** newsletter, *Court Circular*. (All good allusive stuff; highly regal) informs us, in no uncertain way, that if free flight is booming so is control line. The club is particularly well known for its spectacular array of hot scale models. These were in full cry at the all scale meeting at Little Rissington on the 24th September, where they comprised two thirds of the nine entries. Even so, it was to Ven Venables of Wolves, flying his immaculate *Fokker D8*, that Judge, Derek Goddard, gave his top vote. Wal Cordwell flew his *Gladiator* into second place, and R. Evans, his *Henschel* into third. The two jet (ducted fan) entries did a lot of articulate scream-

ing, but flew like vacuum cleaners. The 3 K's Scale models were on view again at the Croydon Open Day on October 8th. This time Derek Goddard was the judged rather than the judge, and earned top marks with his *Tiger Moth*. Coming now to the Open Stunt Contest on the same day, it was the turn of Jim Mannell (who else?) to top the list. A marvellous bit of Indian summer for this event, and this, together with the standard of flying, rated it the best Stunt comp of the year. Model of the Month: Mike Sexton's *Mercury Crusader*. Very smart in red and white.

Seems that postal contests are not all that popular among Australian model flyers, according to the **Southern Cross M.A.C.'s Free Flight Down Under**. Understandable perhaps with the differing weather conditions over so large a continent. You get quite an imbalance when, as in the NFFS Postal Event, there was a 15 knot wind raging across Victoria whereas in New South Wales only a light breeze was recorded. Even in our own small island the weather variations can be quite extreme, and it makes you wonder whether a weather handicap marking might not be a good idea for Decentralised and Postal events.

And to what purposes are club funds put? One answer comes in the **Hamilton M.A.C.'s Flight Lines**, which produces a list of repairs and improvements required for the club premises. Nowadays we associate such luxuries as club houses with R/C, and it is this branch of the hobby that takes up most of the space in the newsletter, although the club does cater for other interests. Pylon racing now very popular in New Zealand; a recent North Island meeting attracted 16 entries, 13 of which were genuine Formula A machines.

One way of boosting club funds is to solicit the Trade. This the **Anglia M.F.C.** did very successfully to provide prizes for the Tombola session at the club Dinner and Dance. The response from the Trade was very generous indeed. No 'house' shortage here. Honours accorded at the Dinner and Dance were the Sandman Trophy to D. Roche, the overall F/F championship to A. Wells, Power championship to R. Collins and Glider Championship to D. Roche. During the season members recorded some good results both nationally and internationally and with the recent acquisition of contest tigers, A. Wells and R. Pavely, but the club, there is now a F/F nucleus of flyers well known throughout the model world. Question raised in the club's newsletter, *High Flyin* is the old one of participation, or rather lack of it, in club affairs. Some members take the extreme view of limiting membership to those who are prepared to take a full part in club activities, whilst others see the club as supplying a need to people not quite so committed to club life. The difficulty of finding people to do the onerous but necessary chores has always been a factor in club life, and things do not seem to change.

More reports wanted. Just a few lines about your club will be welcome. Why not give your P.R.O. a P.R.O.D.?

Clubman

### Contest Calendar

December 31st **LONDON AREA F/F GALA**. Open R/G/P, Chuck, C'dH, A/1, ½A at R.A.F. Bas-singbourn, Nr. Royston, Herts.

### CLUB SECRETARIES:

Please forward details of your forthcoming contests or rallies as soon as possible to avoid duplication of dates and/or interests in next season's Calendar. Items for insertion in the Calendar must be received at this office by the 20th of the month, for publication in the next immediate issue. Details should be brief but explicit, and include exact location of venue.



## FREE-FLIGHT COMMENT

Continued from page 47

rolled from  $\frac{1}{4}$  in ply, and was in fact an award winner at the last *Model Engineer Exhibition*. Alan Jack flew a conventional glass fibre rod A/2 to second place. Both third and fourth places went to Grimsby members, R. Smart and H. Hartley, with two threes and one 'nearby'.

The *Junior Kit* entrants were featured in the heading photograph to the December 'Club News'. There were but five entrants, three in rubber and two in glider. Rubber winner Andrew Godden was the only one able to clear the minute consistently, flying a K.K. *Gypsy* — and is lucky enough to have the help of aeromodelling parents. The other rubber entrants were notable in coming from a school aeromodelling club — Allerton Grange. In glider A. J. Le-Vey edged out R. Hyde, flying a *Gnome* and a UHU design respectively. Bob Hymers ran this event and must have been very disappointed at the lack of response.

As already mentioned the following day saw the **Richmond Gala** at Bassingbourn Old Airfield. Along with others from the N.W., my ideas of heading south straight from Rufforth were changed by the threat of fog — so my report is by courtesy of Nigel Clark.

The Gala had a very full programme with separate contest for the three F.A.I. classes (with 'Stag' trophies for the winners), plus four other events. The club provided a scoreboard and a refreshment tent. They reckoned they were very lucky with the weather. The day started damp but with very light drift — and gradually cleared up bright and sunny, but with no increase in drift. A max 'used' only about one-third of the available airfield, though towing gliders through the long grass could be a struggle.

Flyoffs were needed in all events except Chuck Glider and Coupe d'Hiver — both of which were won by D. Truluck of the R.A.F.M.A.A. The F.A.I. flyoffs were started first as they were to be progressive. However, Rubber and Glider only needed a single flyoff. Mike Woodhouse had a double win, thanks to a good climb in Wakefield, and a stall-free release in A/2.

The first power flyoff (on 8 seconds) eliminated Bob Garner with an over-run and Dick Johnson who erred the other way. Dave Pym and Roy Collins both max'd — and did so again off 6 seconds. On the third flyoff Pym did 2:07 off a 3-6 sec. run, whilst Collins did 1½ minutes off 3 secs. Transitions on the short runs seemed no problem — but resetting timers was another story!

Meanwhile the A/1 and ½A flyoffs had been held with winners proving to be Colin Morris and A. Abrams respectively. The prize-giving was held in near darkness. Apart from the trophies there was a variety of modelling goods presented. Winners were allowed to select their own prizes, sequence being based on first place in the largest entry event having first choice and so on! The host club consider the contest very successful — but say they hope to make next year's meeting even better!

Perhaps I can end on a personal note. This month's **Comments** represents the Tenth Anniversary of my writing a column on a regular monthly basis — first in 'Model Aircraft' (commencing Jan. 1963) and three years later in 'Aeromodeller'. There are times when I wonder how many models I could have built instead!!

## Results:

## CLOUDBUSTERS INC. INTERNATIONAL HAND LAUNCH GLIDER POSTAL MEET, May, 1972

1. El Paso R.C. (Texas, USA): J. Parker, J. Farmer, R. Vesceira — 1,485 sec.; 2. Oakland Cloud Dusters (California, USA): M. Thompson, P. Andrade, D. Miller — 1,358 sec.; 3. Christchurch MAC Team (New Zealand): A. Burrows, S. Mc Eldowney, M. Woods — 1,072 sec.; 4. Northampton MAC (England): M. Evatt, B. Dowling, M. Cowley — 953 sec.; 5. Wigan MAC (England): B. Kershaw, B. Picken, R. Roberts — 854 sec. 60 Teams submitted scores.

## S.M.A.E. SIXTH AREA CENTRALISED EVENTS — September 10th, 1972

S.M.A.E. Cup — A/2 Glider (52 entries): 1. P. Stewart (Crookham) M+1:11; 2. B. Kenny (Sheffield) 19:50; 3. J. Cooper (C/M) 18:58; 4. M. Dilly (Croydon) 18:37; 5. J. Baguley (Hayes) 16:22; A. Young (Croydon) 13:23; ½A Power (16 entries): 1. J. West (Brighton) 7:39; 2. R. Taylor (E. Grinstead) 7:10; 3. P. Harris (Evesham) 6:48; Farrow Shield — Team Rubber: 1. St. Albans 35:08; 2. Bristol & West 31:44; 3. Northampton 31:22; 4. Leeds 29:51; 5. Norwich 'A' 27:22; 6. York 26:11; Farrow Shield (65 entries): 1. T. Payne (Northampton) M+4:05; 2. A. Grantham (E. Grinstead) M+5:15; 3. B. Rowe (St. Albans) M+3:35; 4. J. Godden (Leeds) M+3:27; 5. H. Tubbs (Leeds) M+1:46; 6. R. Pavely (Anglia) M+1:40; Plugge Cup: 1. Northampton 1,376 pts.; 2. Leeds 1,254 pts.; 3. Birmingham 1,210 pts.; 4. Norwich 1,201 pts.; 5. Crookham 1,009 pts.; 6. St. Albans 934 pts.

SOUTH MIDLAND RALLY, CRANFIELD, September 17th, 1972  
Open Rubber (36 entries): 1. C. Hadland (R.A.F.M.A.A.) M+6:56; 2. Grantham (E. Grinstead) M+4:49; 3. J. Bailey (Bristol & West) M+4:04; Open Glider (71 entries): 1. D. Digby (North Surrey) 8:50; 2. J. O. Donnell (Whitefield) 8:32; 3. F. Sharp (Croydon) 8:21; Open Power (23 entries): 1. R. Monks (Birmingham) M+4:00; 2. N. Clark (Richmond) M+3:36; 3. T. Grey (C/M) 8:41; Wakefield Evans Memorial Trophy (22 entries): 1. J. Barnes (Liverpool) 12:06; 2. J. Cooper (C/M) 11:48; 3. M. Gaze (C/M) 10:51; Chuck Glider (24 entries): 1. B. Kershaw (Wigan) 3:00+0:41; 2. J. Gregory (Hayes) 3:00+0:28; 3. C. James (Hayes) 2:48; Tailless: 1. B. Stout (Grantham) 4:10; 2. J. Marshall (Hayes) 3:40; 3. J. Gregory (Hayes) 3:13; Helicopter: 1. R. Henderson 3:47; 2. I. Dowsett (Northwood) 2:48.

## S.M.A.E. NORTHERN GALA, Rufforth, Saturday, October 7th, 1972

Open Rubber (23 entries): 1. J. Carter (Falcons) M+5:08; 2. J. O. Donnell (Whitefield) M+4:31; 3. T. Payne (Northampton) M+4:26; 4. A. G. Jack (Tynemouth) M+4:20; 5. J. Turner (Darlington) M+4:15; 6. J. G. Clements (Leeds) M+4:08; Open Glider (30 entries): 1. M. Dilly (Croydon) M+2:42; 2. A. G. Jack (Tynemouth) M+2:07; 3. R. Smart (Grimsby) 8:55; 4. H. Hartley (Grimsby) 8:40; 5. B. King (Widnes) 8:31; 6. D. May (C/M) 8:25; Open Power (17 entries): 1. B. R. Peers (Falcons) M+4:34; 2. R. Garner (Walsall) M+3:26; 3. D. Pynn (Walsall) M+3:05; 4. A. Hill (Leeds) 8:41; 5. B. Martin (Tynemouth) 8:14; 6. J. Godden (Leeds) 8:12; Junior Kit — Rubber (3 flights + 2 flights): 1. A. Godden (Morley) 4:02+2:43; 2. D. Shearsby (Allerton Grange) 2:34+1:41; 3. A. Carter (Allerton Grange) 1:54+0:59; Junior Kit — Glider (3 flights + 2 flights): 1. A. J. Le-Vey (York) 2:15+1:05; 2. R. Hyde (Leeds) 1:30+1:04.

## RICHMOND GALA, BASSINGBOURN, 8th October, 1972

F.A.I. Glider (Stag Cup): 1. M. Woodhouse (Norwich) M+2:38; 2. G. Madelin (Crookham) M+2:22; 3. B. Picken (W. Lincs) M+1:56; 4. D. Wyde (Crawley) M+1:35; 5. C. Morris (St. Albans) M+1:13; F.A.I. Power (Stag Power Cup): 1. D. Pym (Walsall) M+3:00+3:00+2:07; 2. R. Collins (Anglia) M+3:00+1:35; 3. R. Johnson (St. Albans) M+2:27; 4. R. Garner (Walsall) 15:00+0:00; F.A.I. Rubber (Stag Rubber Cup): 1. M. Woodhouse (Norwich) M+3:02; 2. C. P. Williams (Richmond) M+2:46; 3. R. Pavely (Anglia) M+2:31; Coupe d'Hiver: 1. D. Truluck (R.A.F.M.A.A.) 9:15; 2. M. Lambert (N.S.A.) 8:30; 3. D. Roche (Anglia) 7:31; Chuck Glider: 1. D. Truluck (R.A.F.M.A.A.) 4:56; 2. B. Kershaw (Wigan) 4:18; 3. M. Page (Peterborough) 4:03; A/1 Glider: 1. C. Morris (St. Albans) M+2:13; 2. G. Hannah (St. Albans) M+1:59; 3. P. Freebrey (Northwood) M+1:50; 4. J. Cooper (C.M.) M+0:55; ½A Power: 1. A. Abrams (N.V.A.) M+2:11; 2. ... Chilton (Crookham) M+1:08; 3. D. Pym (Walsall) 8:53.

## COMPETITION RESULTS

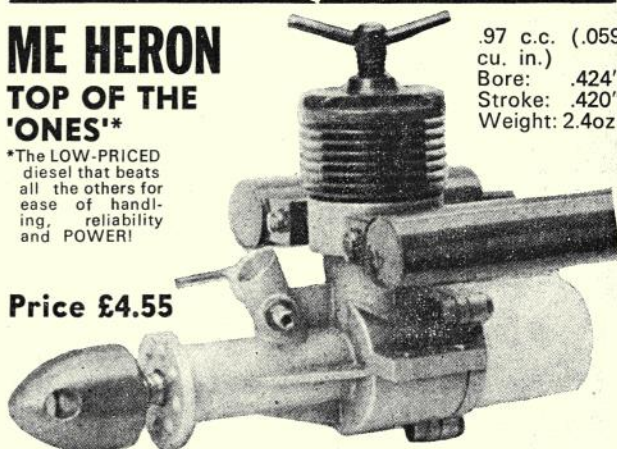
S.M.A.E. NATIONAL SENIOR F/F CHAMPIONSHIP, 1972: 1. B. R. Peers (Falcons) 93:01; 2. A. R. Wells (Anglia) 84:51; 3. M. B. Cowley (Northampton) 75:39.  
S.M.A.E. NATIONAL JUNIOR F/F CHAMPIONSHIP, 1972: K. R. Lord (Syke) 13:37.

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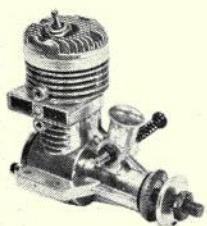
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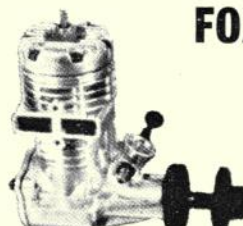
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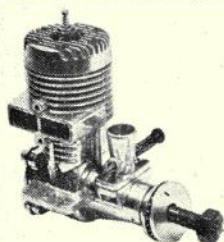


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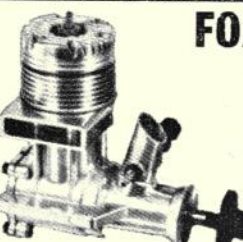
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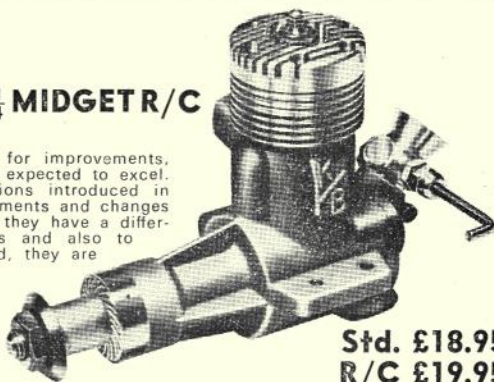
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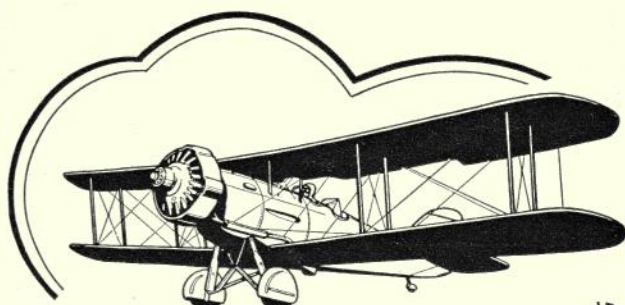


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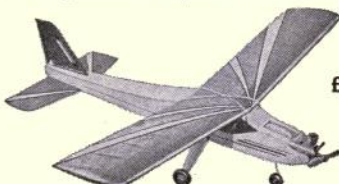
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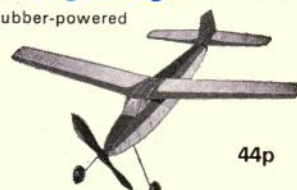
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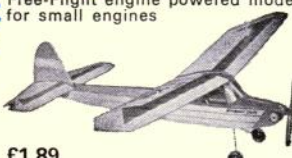
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