MODEL Aircraft

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SEPTEMBER 1950

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THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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The plans and the articles that exist within, you can find published at full dimensions to build a model at the following websites.

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http://www.rcgroups.com/forums/member.php?u=107085

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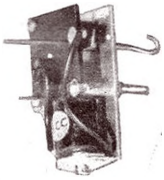

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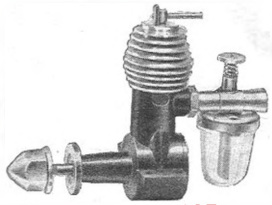

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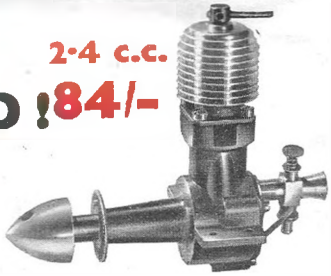

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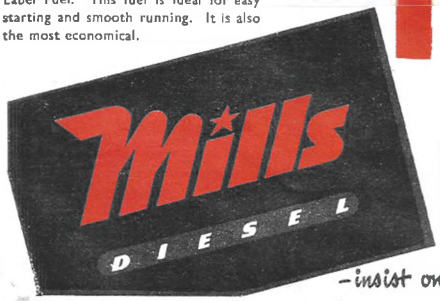

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MODEL Aircraft

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SEPTEMBER 1950 VOL. 9 No. 8

Contents

EDITORIAL

THE outstanding thing about this year's Wakefield Trophy Contest is the fact that Aarne Ellila, of Finland, has succeeded in winning the trophy for the second year in succession, thus equalling the record set up by J. Erhardt, of the United States of America, in 1930 and 1931.

The contest this year was unique in that the flying took place between 7 p.m. and 11 p.m. for the first two rounds, and from 5 a.m. to 6.30 a.m. for the third round. This was, of course, made possible by the daylight conditions existing in Finland during the summer months and it ensured that the results were a true measure of the capabilities of the machines since no thermals existed.

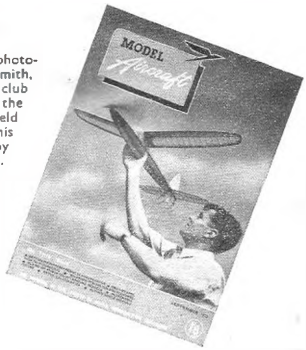
Ellila's win will undoubtedly raise considerable argument concerning the technical aspect of rubber model design and it is safe to say that many an aero-modeller will now give serious consideration to the tandem motor arrangement which he used in both of his winning models.

The results indicate that we have by no means reached stagnation in Wakefield model design and it seems that well conceived departures from the orthodox may yet reap dividends. The fact that E. W. Evans's model which gained second place featured a new conception in feathering propellers strengthens this belief.

Sixteen nations were represented at this event and this proves without doubt that the Wakefield Trophy Contest is still the most popular international model aircraft contest.

Cover Story

This month's cover photograph shows E. Smith, of the Icarians club and member of the 1949 British Wakefield Team, launching his "Clipper." Flown by the designer, E. W. Evans, in the recent Wakefield Trophy Contest in Finland, a development of this model gained second place for Great Britain.



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HERE AND THERE

The Editor Comments on Current Topics

WAKEFIELD "100" VENUE Quite a number of letters have been received from Wakefield "100" finalists concerning the organisation and general arrangements. The chief complaint, at least from those outside the London Area, is against the choice of Fairlop Aerodrome as the venue for this important event.

Whilst it must be agreed that Fairlop is not the ideal flying ground, in fairness to the S.M.A.E. Council it should be explained that it was originally intended to hold the trials at Cranfield Aerodrome, the scene of last year's Wakefield Contest. Unfortunately this was found to be impossible as the aerodrome was required for flying purposes on the date of the trials. Kidlington Aerodrome, near Oxford, was next tried, but again the negotiations fell through.

With the finals drawing near the Council had to make a prompt decision and, as at the meeting where this matter was discussed none of the Area Delegates could suggest any other venue, Fairlop was somewhat reluctantly decided upon.

Next year it would help, of course, if the selection of the trials venue was put in hand earlier.

PHOTOGRAPHERS AD LIB. Surprising thing to me was the fact that no protest seems to have been made concerning the number of photographers who invaded the take-off area at the trials. In an event such as this where competitors have so much at stake they should not be expected to fight their way through hordes of camera fans before finding a space for take-off.

Mind you, some of the competitors themselves did not help matters. I saw one chap who arrived on the tarmac with three helpers (one to hold the model, one to light the D/T fuse and one to give the wind direction), *plus* three club-mates armed with cameras!

Next year the S.M.A.E. might well consider issuing press badges to photographers from the aeromodelling and daily press and to recognised agency and freelance camera-men, only those wearing such a badge being allowed on the actual take-off area.

RETRIEVERS I understand that there is a strong feeling that at future trials a recovery service for all competitors should be organised. The provincial flyers are of the opinion that the local boys had a big advantage over them in this respect.

Writing in *Aero Notes*, that excellent little magazine of the Blackpool and Fylde M.A.S., J. Owen, reporting the trials says: "Many of the local chaps, however, were in the position to use cars and motor-cycles or had bands of retrievers stationed down-wind. At times Fairlop resembled a cross between the Isle of Man and Silverstone. This was a great asset to them and, while I don't begrudge them the co-operative efforts of their own club members (in fact I admire them) or the use of vehicles, it does seem that some pooling of resources would even things up a little."

There is a lot in this suggestion and it is to be hoped that it will be borne in mind in future. Incidentally, Messrs. E. Keil & Co. Ltd., again provided one of their vans for retrieving purposes at Fairlop and it travelled many miles during the day bringing back models which had been reported found. This seems to have been overlooked by most people, including some of the officials present!

MODEL IDENTIFICATION It seems inconceivable in these days of high performance models with the urge to pick up thermals that so many aeromodellers fail to take the elementary precaution of marking their models with their names and addresses so that they can be identified if they are lost. This has been brought to our attention by the large number of models which have been returned to the officials at this season's major events and which have been found to be entirely devoid of any means of identification as to who is the owner.

Obviously one cannot expect the finder to go to a great deal of trouble to locate the owner of an unidentifiable model and if you lose your model through not taking the elementary precaution of marking your name and address on it, you have only yourself to blame.

Another point. Do not label your model "Finder

will be rewarded " unless you are prepared to pay such a reward. At this year's Nationals quite a number of fliers seemed rather surprised that the local lads would not part with the models until they had been paid.

R.O.G. v. H.L. Amongst the many area proposals for next season's contests which were discussed at the last S.M.A.E. Council meeting none showed more variation of opinion than those dealing with take-offs. This will be seen from the following list of proposals :

(*a*) Hand-launching shall be optional in all contests. (Midland.)

(*b*) Hand-launching with a penalty of 10 sec. (East Midland.)

(*c*) Hand-launching be permitted in *all* contests. (South Western, Northern, South Eastern.)

(*d*) Hand-launching be permitted in all power duration contests. (London.)

(*e*) Hand-launching be permitted in trials at judge's discretion. (South Western.)

(*f*) There shall be *no* hand-launching. (South Midland.)

(*g*) All competitions r.o.g., but pushing allowed. (South Wales.)

The Council decided to recommend no change in the present rules, but feel sure that we have not yet heard the last from the hand-launching advocates. They claim, with some justification in my opinion, that contests are intended to test a model's *flying* capabilities and not its undercarriage. Also they do not agree that because a full-sized aircraft has to have an undercarriage that a contest model should also be compelled to have one. On the other hand those in favour of retaining r.o.g. claim that there must be hazards in any contest and they consider r.o.g. a justifiable one. In addition it is felt by some that members of the general public who watch contests are far more impressed by a model taking off like a full-sized machine than they would be by the sight of one being hurled into the air. What do you think ?

FREE-FLIGHT JET A London model dealer informs us that one of his customers reported to him that a 6 ft. span flying wing jet powered model landed in his back garden at North Finchley recently. The owner of the model, which had been launched from Hadley, near Barnet, Herts, had followed it in a Rolls-Royce car and was on the spot as soon as it landed. It was not possible to ascertain his name and address, but Hertfordshire modellers might look out for this individual and point out to him the very great risks involved in flying jet-driven models in free-flight and, presumably, uninsured.

THE " M.E." EXHIBITION Whilst the continued increase in the sales of MODEL AIRCRAFT gives us a good deal of satisfaction it has also provided some headaches for our production staff. It is now necessary, for example, for each issue to go to press three weeks before the date of publication and this explains why *The Model Engineer* Exhibition, which has just closed its doors, is not reported in this issue.

The October issue, however, will contain reviews of the trade and competition exhibits, together with photographs of the winning models in the model aircraft competition section.

NEW WORLD RECORD We have just learned that a new international altitude record has been promulgated by the F.A.I. This is for rubber driven hydroplanes and was set up on August 18th, 1949, by Mathia Gasko of Hungary, whose model attained an altitude of 939 metres.

THEY SAID " NO ! " I witnessed an amusing incident at the Northern Heights Gala Day which is worth relating. Max Coote was endeavouring to clear a space for Queen's Cup competitors to launch their models and after much pleading, shouting and bullying he managed to persuade the spectators to move. All except two large foreign looking gentlemen who stood right in the line of take-off and seemed to be deaf to Max's entreaties. He walked up to them and asked them to move—no response. When tackled they replied, " We are Russians " !

THE NEW S.M.A.E. TIE

Supplies of this attractive tie, which has small S.M.A.E. badges in silver on a royal blue background, are now obtainable from the S.M.A.E. offices. The prices are : Silk 14s., Rayon 11s. 6d.

The Wakefield Trophy Contest

The 1950 Wakefield Trophy Contest has resulted in a well deserved triumph for Aarne Ellilä, of Finland, using an improved version of the model with which he won the trophy last year. Any suggestion that he was lucky to win the 1949 contest in the severe weather conditions which prevailed have thus been disproved, since the conditions for this year's contest were the very reverse.

Second place was gained by E. W. Evans, of Great Britain, with his very consistent *Vansteed* model and third place was taken by A. Leardi, of Italy. A great effort by P. W. Seton, of Holland brought him into fourth place and H. R. Stevens, of Great Britain came fifth. Sixth was the United States entry by L. L. Salisbury, which was proxy flown.

The organisation of the contest and the accommodation provided for the contestants and officials was excellent and everyone connected with the running of the contest are to be congratulated.

THE COMPLETE RESULTS WILL BE FOUND ON PAGE 338

(1) The gliding club building which was the headquarters of the contest. The flags of the competing nations can be seen in this photograph.
(2) Aarne Ellila is congratulated by Mr. A. F. Houlberg who, as president of the F.A.I. Model Commission presented the prizes.
(3) E. W. Evans with his "Vansteed" model which gained a well deserved second place with very consistent flying.
(4) The winner, who lec in each of the three rounds, launching his model for one of its winning flights..
(5) The British team.
(6) A. Leardi, of Italy, who placed third, prepares to wind up.
(7) A Finnish proxy flier prepares to fly one of the Canadian entries.
(8) The Dutch team with P. W. Seton, who gained fourth place, on the left of the picture.
(9) The French team.
(10) H. R. Stevens, who proved to be the "dark horse" of the British team and came fifth, getting his model away.
(11) Processing the models.
(12) The Swedish team.

DO NOT MISS NEXT MONTH'S "MODEL AIRCRAFT" WHICH WILL CONTAIN

- Complete report of the Wakefield Trophy Contest by A. F. Houlberg
- Full details and illustrations of the winning model
- British team member, Ron Warring, on the technical aspects of the contest
- More exclusive "Model Aircraft" photographs
- Tabulated final results


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FLYING SCALE MODELS

(Concluding article)

By A. W. Garry

The author's S.E.5 model which incorporates many of the constructional features described in the article.

IN the two previous articles in this series, we explained how the advent of the miniature diesel engine made the flying scale model aircraft a practical possibility. We also dealt with the types of full size aircraft suitable for reproduction as flying scale models ; methods of construction most suitable for scale models in general, and biplanes in particular.

Why biplanes ? you may ask ; are they not fragile compared with the monoplane ? ; are they not difficult to trim ? ; and is not their flight performance much inferior to monoplanes ?

Any scale model flier who has successfully built and flown a biplane will agree with me that this type of model aircraft, when in flight, is a most pleasing sight. Biplanes have a steady purposeful flight, that is not often obtained by monoplanes.

Successful biplane flight depends—primarily—upon the correct mainplane incidences. These are not—within narrow limits, say a degree or so—critical. The mainplanes must also be designed as a braced unit, in such a manner as to ensure that their angles of incidence ; gap and stagger are maintained in flight. The method of attachment to the fuselage must enable them to withstand the shock of heavy landings, minor crashes, etc., without damage. One factor which assists towards the solution of this problem is the fact that biplanes, generally speaking, fly and glide much slower than monoplanes, owing to their greater wing area, and the "drag" of the biplane structure. From this point of view, they are much less liable to damage than fast flying monoplanes. Let us, by way of illustration, take the case of a flying scale biplane making a fast down-wing landing. When the model lands in a nose-down attitude, the top mainplane is jerked violently forward, and the lower mainplane—owing to the pull of the interplane struts—is dragged upwards and forwards. The interplane bracing system is heavily stressed. Now, how are we to see that these heavy landing shocks are absorbed, without damage to the structure ?

Obviously the top mainplane must be attached to the fuselage with sufficient rigidity for flight purposes yet with a suitable degree of flexibility to enable it to move forward under the impact of a heavy landing. The interplane struts must be capable of "rolling" forwards in their sockets, without tearing adrift, and the lower mainplanes must allow of sudden and violent misplacement without damage to the fuselage. Finally, the bracing-wire system must be capable of withstanding extreme tensioning, without tearing away from the fuselage and interplane strut fastenings. It is not a problem easy of solution, but, over the years, the author has evolved constructional methods, which have proved to be successful. Extensive flying with biplanes has proved the practicability of these methods, and the writer's S.E.5 has sustained absolutely no damage after scores of flights—many of which were, incidentally, of an average duration of five minutes. Have no fears that such a model is difficult to trim and fly. I would go as far as to say that trimming and flying a scale biplane is much easier and safer than trimming high-powered fast flying monoplanes of the freak pylon type. With these even a fractional degree of misalignment can result in the devastating crash and a complete "write-off." I do, however, wish to say that the foregoing assertion holds good only where the scale model has been designed from an inherently stable prototype, and built to a reasonable scale.

Now let us leave this discussion of biplane flight performance and problems, and deal with the actual building of a one-eighth scale biplane. The methods described were used in the construction of the author's S.E.5, illustrated above, but may be used in any type of power-driven scale biplane.

Having selected the prototype and prepared the one-eighth scale working drawings by the methods described in the previous articles, I usually spend one or two evenings tracing and cutting out all the sheet parts such as fuselage formers, wing tips, ribs, rudder outlines, etc.; main spars, leading and trailing edges are cut to length and notched where necessary. When this has been done the construction can proceed without hindrance. Before the fuselage longerons are laid on the drawing ($\frac{3}{16}$ in. square hard balsa must be used for these) a $\frac{1}{2}$ in. wide strip of 1 mm. ply 2 in. long, must be "inlaid" in the lower longerons, at the point where the undercarriage fastening wire-clip is bound and glued. This is essential to prevent the pivoted undercarriage legs from wearing away the longerons. The fuselage may

now be built up in the conventional box-fashion. Do not build in the centre section assembly until the basic fuselage has been completed. The 16 s.w.g. wire centre section struts may now be bound and glued to the $\frac{1}{8}$ in. × $\frac{3}{16}$ in. spacers (*A* and *B*) and the sheet paper tube carrier (*B*) cemented in place between them. The tubes may now be cemented in place across the fuselage. Finally, the four 20 g. eyelets are bound and cemented to a $\frac{1}{8}$ in. × $\frac{1}{4}$ in. hard balsa strip, which in turn is cemented across the fuselage, between the tube carriers. The eyelets project, of course, outside the carriers. The fuselage coaming formers and stringers are now cemented in place. Next bind and cement the undercarriage clips to the lower longerons, and fit a length of 18 g. brass tubing across the longerons to take the rear undercart wire fittings. A little soldering is now required. Bind the top wing runners, and cross braces (see centre-section detail sketch), in place on top of the centre-section wire struts, using florist's tinned wire, and soldering well. Make sure that this fitting is "square" by "sighting" across the fuselage, and check that both runners have identical angles of incidence. Clean up the soldered joints with a fine file. The fuselage should now be "sheeted-in" with $\frac{1}{16}$ in. balsa, as far back as the cockpit, on the sides and bottom, and 1/32 in. sheet for the top rounded coaming.

Finally, the centre-section wire struts should be "faired-off" with balsa and sanded to a streamlined section. Do not cement the lower end of the balsa fairings to the fuselage, they should terminate $\frac{1}{8}$ in. short of the coaming, so that the wire struts are free to flex naturally. This occurs only on a hard landing.

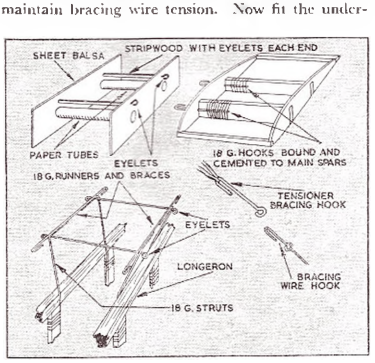
The writer's method of wing construction is simple and straightforward. The top mainplane is built as one complete unit. If it is desired to make the wing in halves for the purpose of transport, the wing can be divided after construction has been completed. In this case, the paper tubes for dowel fixing, should be cemented across the centre section before the wing halves are separated. This ensures accuracy of the assembled mainplane in the assembly stage. The old, well-tried "Clark Y" section should be used in preference to an undercambered section. Use hard $\frac{1}{8}$ in. balsa for struts and root ribs, and $\frac{1}{16}$ in. hard for all intermediate ones. The ribs should be "notched" $\frac{1}{16}$ in. into the trailing edge. This adds greatly to the strength and rigidity of the wing. Half inch lengths of 18 g. brass tubing are now bound to lengths of $\frac{1}{4}$ in. × $\frac{1}{4}$ in. spruce or obechi (do not use balsa here) with florist's wire and soldered. Do not use cemented binding here, or it will inevitably work loose. These hardwood strips are now cemented between the ribs, and to the mainspars in their correct position, with the brass tubing just "proud" of the tissue covering. Pieces of $\frac{1}{4}$ in. × $\frac{1}{16}$ in. are cemented in place, one on each side of the tube fitment. This strengthens the strut fitting and prevents the tissue being torn by the wire strut fittings. Finally, sheet in the underside of the top mainplane centre section with $\frac{1}{16}$ in. balsa sheet and the top with 1/32 in. sheet.

Four 18 g. wire hooks are bent as sketch, passed through the root ribs of the lower mainplanes and bound and cemented to the mainspars. The hook ends should be bent as shown, and should be an easy sliding fit on the paper tubes. Finally, the mainplanes should be notched at the point where the dihedral angle commences. Now pin down the centre section to the working board or bench, so that it lies quite flat, and prop up the wing tips to the correct dihedral angle. Plywood dihedral "keepers" are cemented in place on to the mainspars, and gussets of hard balsa cemented to all angle joints. Be lavish with the cement at these points. Remember, the top wing is fully cantilever, and supports the lower mainplanes, so make sure of a really efficient dihedral angle assembly.

The tail plane and rudder, both of non-lifting section, need no description. Do not be tempted to hinge the elevators to the tailplane with aluminium strips. It is thoroughly bad practice, and is deplored by the writer. The whole tailplane should be adjusted to obtain longitudinal stability. This also applies to the rudder.

The undercarriage has already been described, and need not be dealt with except to repeat that the soldered joints should be well made, as they are heavily stressed in a fast downwind landing. The degree of "damping" should be adjusted until the undercarriage has only a limited amount of backward travel. The axle can be attached to the legs with elastic bands, if so desired. This assists in damping out landing shocks. Make the rear legs from soft leather strip, trimmed to streamlined section. Wire fitments to slide into the fuselage tube are bound to the ends of the legs, and held in place by an elastic band beneath the fuselage.

When all the component parts of the airframe have been completed, covered and doped, the machine can be assembled. First, however, make the four bracing wire tensioners from 20 g. wire, and pass them through the centre section eyelets. Use two elastic bands stretched between the tensioners to maintain bracing wire tension. Now fit the under-

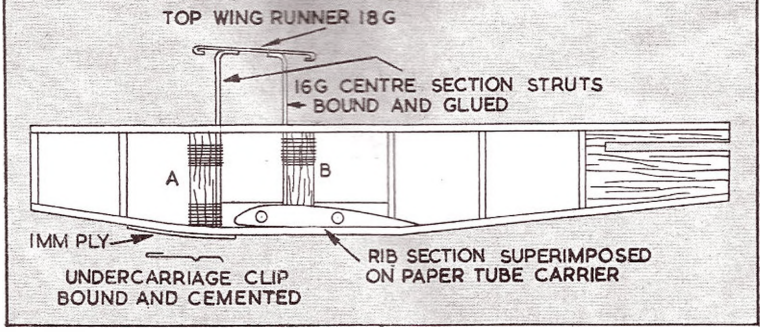


carriage and tail surfaces. Make a hook from 18 g. wire, in order to pull the elastic bands through the lower wing paper tubes and attach bottom mainplanes. The top mainplane is attached to the centre section with elastic bands, and the interplane struts slid into place. Note that these should engage easily, with no tendency to distort the mainplane assembly. Make sure of this by sighting mainplanes both from the front and the side. It is most important that neither wing should be bent in even a slight degree in order to permit the struts to be engaged.

Finally the "bracing" system may be "built-in." Use carpet thread—not linen—and make the small hooks from 20 g. wire. The ends of the bracing wires should be $\frac{1}{4}$ in. "short" so that the tensioners have to be pulled out to engage the hooks. Note how firm and rigid the whole airframe assembly now feels. Surprising, isn't it? It will now be appreciated how this rigidity is maintained in flight, and yet be capable of absorbing heavy landing shocks. Now stand assembled machine on table top and "sight" along fuselage, between the mainplane, to ascertain whether tail surfaces are "square" with mainplanes. The tailplane will be set at zero incidence for preliminary flight tests, and rudder should be offset to counteract torque. Finally, ensure that motor is firmly mounted on bulkhead, and that side thrust and down thrust have not been altered by the screwing of the motor bulkhead to the fuselage. The completely assembled plane should balance in the case of a staggered biplane at 50 per cent. of the chord, and with a non-staggered model, about one-third chord. It only remains now for you to await calm weather before commencing trial flying, as explained in the first article.

In concluding these articles, I would like to comment upon two aspects of scale model flying with which I have not already dealt. I have kept the articles strictly practical and based them upon many years' scale model flying experience. They have been written as a guide to the average aeromodeller who wishes to take up scale model flying as an alternative to the conventional duration type monoplane. To any such, I would say, do not be tempted as your first venture, to build a scale model employing pendulum control. The very fact that such devices are necessary, proves that the model is inherently unstable. For instance, take a model with pendulum operated ailerons. Obviously, the pendulum can only operate satisfactorily when the machine is flying level in a longitudinal plane. What happens when the machine assumes a sharp nose-up (or down) attitude during flight? The pendulum either becomes non-operative or binds to such an extent, that it is incapable of exerting sufficient leverage to operate the ailerons—particularly if these are unbalanced. No, the answer to successful scale flight does not lie in pendulum-operated stabilising surfaces. It depends upon a correct choice of prototype, and inherent stability, as I have already explained. Leave pendulum-operated scale models to experts who have learned scale model flying technique and are willing to accept the risks involved in flying models of this type. Make your first biplane of the simple easily trimmed, stable type, such as the *Tiger Moth*, *S.E.5*, *Avro Avian*, etc.

Finally, it must be remembered that scale model flying is "sport flying" pure and simple. The technique is totally different from that employed in the flying of high-powered, fast flying, contest-type monoplanes, and it is not reasonable or fair to expect them to fly in other than calm weather conditions. In any case, no scale model man, or "precision" flyer likes to see his model emulating a wind-blown leaf. Fly your scale model on those days when the club windsock hangs limply from its pole, or on those long still summer evenings when the breezes have died away and the smoke ascends vertically from the chimneys. Under such conditions scale model flying is a pure joy, and the sight of a well-trimmed biplane, climbing slowly in wide sweeping circles, droning up into the blue evening skies until the motor "cuts" and then coming-in on a long, flat, floating glide, is one of the most soul-satisfying sights known to the aeromodeller.



SCIENCE AND THE *Speed model*

By F. E. Deudney, B.Sc. (Eng.), Hons.

"FACTS and Figures" do not mean much to the normal modeller—the speed fans' reaction to this apparent intrusion of theory into the hitherto unspoiled regions of C/L will be: "Just as we're getting somewhere with speed flying, here's one of those 'armchair aeromodellers' going to show us how easy it all is and how all our methods and ideas are utterly wrong, according to some high-falutin' mathematical mumbo-jumbo!" A little introduction is called for, on this account. Your author is a normal contest-minded clubman whose interest is, first and foremost, in "live" modelling, in spite of (or because of) an incursion into the deeper waters of full-scale technicalities and, in his opinion, *most* "theory" is best left to the people who are not only fully qualified to deal with such things, but have the necessary outlook which derives satisfaction from complete devotion of time and interest to the task of finding a formula for everything.

It would have been far easier to write this, and other articles in a purely theoretical manner: the presentation would be far more concise, but the whole point might well be missed by the majority of readers who are more accustomed to thinking in strictly practical terms of "cause and effect." The essential matter is to "get over" the way in which the figures fit into everyday observations of model performance, hence the presentation is not as a mathematical proof of anything, but as a sound basis for discussion. Most of this work was done in late 1948 and early '49, the conclusions being pretty well substantiated by what happened during the "season." It was neither intended nor expected that anything remarkable would transpire, nor any radical means of improvement be discovered; the intention was not to "prove" the experts wrong, but to attempt to settle, from purely personal interest, some of the controversial points based more on opinion than fact. We cannot get the whole story, for any technical investigation invariably leads to complications and "loose ends" which just do not justify the effort involved in trying to get everything "buttoned up," but sorting out, *if only partially*, some of the half-truths and popular misconceptions which abound through too careless a correlation of observed facts and explanations, can at least be interesting. This is written for the modeller who wants, not figures and formulae, but an explanation of what the "sums" mean—do not be put off by the graphs, for Figs. 1, 3 and 4 are the whole substance of this article.

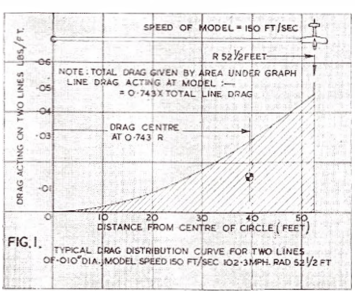


FIG. 1. TYPICAL DRAG DISTRIBUTION CURVE FOR TWO LINES OF ·010" DIA., MODEL SPEED 150 FT/SEC 102·3 MPH. RAD 52½ FT

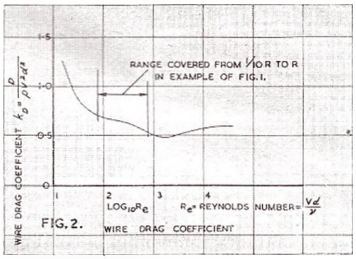


FIG. 2.

Now, the top-notch modellers got there, not by deft use of the slide-rule, but by perseverance in developing their own designing and flying techniques; they acquired the "know-how" which is the surest guide to good flying, so that the best models today generally represent something pretty close to the best possible, since they are the outcome of strictly practical development based on stopwatch evidence. With this in mind, the problem arises: "What is wrong with our speed models?" Somehow, our speed performances, in general fall a long way short of the American contest results, not to mention their records. At first sight it seemed that we could short-circuit the long process of evolution which led to present-day U.S. design practices and step in *at exactly the same level of performance* merely by embodying in our designs all the salient points of their highly developed contest-proven jobs. Yet the first "serious" speed models to appear were a big disappoint-

ment and ideas of actually improving on American performances soon went by the board. Modeller's instinct was not enough; there were so many unknowns that one could not be sure where the main difference lay. Strange ideas circulated about the potency of the U.S. atmosphere as compared with our "climate" and more than a little doubt was cast on the honesty of American fliers (and timekeepers!).

Clearly, much of the explanation is the simple solution "Teething Troubles." Lack of experience, in particular the sheer lack of numbers of active specialists made our contests little more than proving-grounds where the proportion of entrants to make flights at all, regardless of good or bad motor runs, rarely exceeded 25 per cent. Even so, the current best (in over 3 c.c. classes) is a good deal short of figures which have stood for some time in America. By the time this appears in print the situation will almost certainly have improved—better fuels and more experience must inevitably close the gap. It is a practical problem, with an essentially practical solution, but by looking into some of the factors affecting performance we can place them in a more proper perspective and see what we are up against; we can clarify the picture if we know not only "how," but "how much."

The obvious starting place is the subject of line drag, a matter which has been studiously ignored by the "regular" slide-rule devotees. The explana-

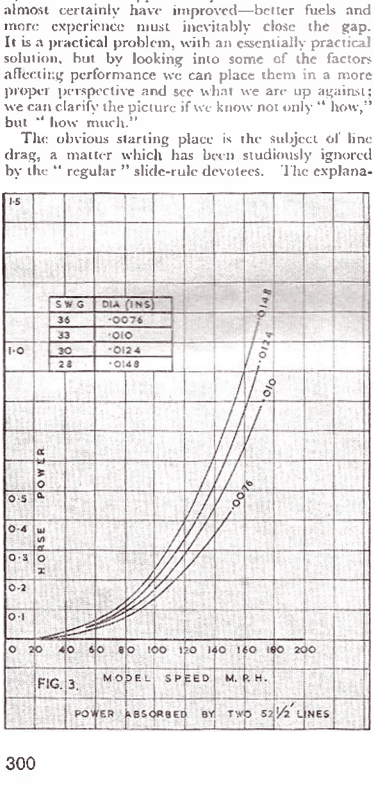


FIG. 3. POWER ABSORBED BY TWO 52½" LINES

tions are condensed to a point where they serve only to justify the answers—there would be little point in making longwinded explanations of how to calculate line drag; the calculations have been done once and for all, so skip the description of the method if you are prepared to accept the answers as genuine!

Method of Calculation

For a constant drag coefficient k_D, model speed V

$$D = \int_0^R k_D \rho \, d\left(\frac{Vr}{R}\right)^2 dr \text{ (for one line)}$$

$$= k_D \rho V^2 d\left(\frac{R}{3}\right)$$

i.e. total line drag is one third of the value it would be if the *whole* of the line moved at speed V

$$\text{Total moment of drag} = k_D \rho V^2 d\left(\frac{R^2}{4}\right)$$

$$\therefore \text{Radius to drag centre} = \frac{R^2}{4} \div \frac{R}{3} = \frac{3}{4}R.$$

Hence line drag acting at model = ¾ total line drag. (This is obvious from the drag distribution curve of Fig. 1.)

(*b*) In practice, k_D varies with Reynolds Number, so using the data of Fig. 2, we can calculate drag per ft. at steps of, say, 1/10 radius, using the true local values of k_D.

A tabular method was employed: suitable speeds were chosen and at each speed the drag loading figures for each diameter were calculated. The area under the curve was found by a process based on summation of ordinates, and, without going into another half page of details, it is sufficient to say that the error involved was computed, found to be exactly one half per cent., and was duly subtracted from the answer! Actual drag figures were not considered of particular interest, so the results have been expressed as horse power required from the model—the exact drag centre position was determined in each case and was between .742R and .747R (instead of the value .75R which holds if k_D is constant).

Reliability of Results—First, it must be stressed that what these figures represent is the power absorbed by two separate lines, with no interference effects; the data is accurate, the calculation is precise, but the fact remains that in practice we have two lines which are not necessarily separate and, in particular, are close together, one behind the other, at the model end, where speed is greatest. From the nature of things aerodynamic, it is unlikely that the interference will be favourable and it is pretty safe to regard the accompanying figures as a reliable guide which is not far wrong and *may well be an underestimate*.

Consideration of Results

A quick check, using the average drag coefficient, shows that nothing has gone astray in the arithmetic —that these remarkably high figures are, in fact, a true measure of the power it takes to haul the lines round. Most fliers are quite resigned to the fact that their hard-worked motors have to cope with a bit of

extra drag due to the lines, but few seem to have considered just how important this is. Perhaps it is because the lines *look* so insignificantly small in diameter. Yet, to quote an example, the frontal area of two 52½ ft. lines, 10 thou. diameter, is no less than 12½ sq. in., i.e. appreciably more than that of the whole "29" powered model, and wire of circular cross section has a very inferior sort of streamlining! The rapid increase in power absorption is inevitable and regardless of actual numerical values the power will increase with the cube of the speed—in other words, a 5 per cent. increase in speed gives about 16 per cent. increase in power absorption of the lines, 10 per cent. more speed takes 33 per cent. more power, and so on. These results take some getting used to, but they certainly throw a new light on the speed business. Bear in mind that these figures represent actual thrust horse-power required, so that the brake horse-power required will be considerably greater: for a propeller of 62½ per cent. efficiency it is necessary to increase these figures by 60 per cent. to put them in terms of engine power output.

Take a Class IIIb speed job on 52½ ft. lines—the *average* 1949 speed was around 135 ft./sec. 92 (m.p.h.). At this speed, a couple of 10 thou. wires take .131 h.p., less about 4 per cent. for the length enclosed in the wings, say, .126 h.p. At 60 per cent. prop efficiency this is equivalent to .21 b.h.p.; if the motor is developing .35 b.h.p. this means that 60 *per cent. of its output goes in overcoming line drag* and only 40 per cent. to the model. It is difficult to try to fix a proportion because we do not know what power corresponds to a given speed: the above figures are reasonable in view of published b.h.p. figures for various motors and also in view of the fact that the speed quoted is by no means the best achieved with a standard motor in this country. It could be 75 per cent. output to the lines, it might be only 40 per cent., but the important matter is that it unquestionably takes a lot of power to tow those lines round.

Let us consider those American speeds more closely. It is absurd to compare the results obtained by the merest handful of British fliers with the *top* figures set up by the long-standing expert specialists of a traditionally speed-conscious nation. Much has been written condemning the situation in America—it is said that the more casual amateur entrant does not "stand an earthly" at their big contests; the competition is fought and won largely by the professionals who spare no effort or expense in tuning their motors far beyond the performance of the usual "over the counter" job.

We have no real yardstick of performance; what we read about is News, not the everyday run of events, and it is a pretty safe bet that the everyday hobbyist who buys, say, a Speedwagon "30" kit and a McCoy "29" to go with it, finds it just as hard to get much above 100 m.p.h. as we do in this country. We do not hear of the speeds below third place at their big meets; the junior and novice events give a clue, however, since performances are appreciably lower; comparable with our speeds. Indeed (if such fliers as Cyril Shaw and Don Powell will excuse the apparent insult!), the latter classes are a much fairer basis of comparison, since they are most likely to be employing "straight" motors.

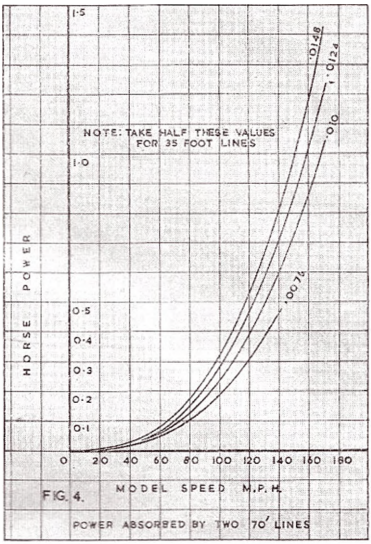


FIG. 4.

The interpretation of the situation, as made clear by these line drag figures, is simply this: where our models are lacking is definitely in sheer brute h.p. It is not because some of the Americans used a dozen or more coats of proofer rubbed down to a mirror finish, not because they had fancy aerofoils, crafty cowlings, offset thrust-lines, etc., that they went so fast. Such details are all contributory, but since they had just as much line drag to contend with as our models, it is now obvious that those record holders *must* have churned out a prodigious amount of power *just to overcome line drag alone*. It is established now that the 138 m.p.h., or thereabouts, which has been officially achieved could not possibly have been due solely to model design, with a "good average" engine, for even *complete elimination of model drag* could not account for the difference between this speed and the average.

In our example, zero model drag would push the speed from 92 m.p.h. to 109 m.p.h., so that we can clearly fix a limiting speed which cannot be surpassed by model improvement alone. According to our graph, 130 m.p.h. calls for .36 thrust h.p., or roughly .5 to .6 b.h.p., to overcome line drag alone at this higher speed, total power for the example being .9 b.h.p. This infers that the assumptions are a bit

(*Continued on page* 304)

MODEL REPORT

By Ron Warring

Evans's Clipper Wakefield

Ted Evans, second place winner in the 1950 Wakefield Trophy Contest.

BESIDES being an exceptionally good model flier, Ted Evans has the undoubted gift of being able to design Wakefield models on unorthodox lines and get away with it. It is easy enough to produce an unorthodox design, but certainly not so easy to make a success of it.

The first of Evans's designs to attract world-wide attention was, of course, the *Jaguar*, which is so well known as to need little further description. Design layout here was based on C. H. Grant's C.L.A. theory which, despite much opposition from several theoretical sources, has been applied and used with success by many prominent modellers.

Introduced some four years ago, the *Jaguar* has succeeded in piling up a most impressive contest record during the '47, '48 and '49 seasons, with one model in the '48 team and two in the '49 team. But our personal opinion, and comment at the time, was that this layout with underslung (belly) fin could not be stable in a sideslip inwards—a manoeuvre which is commonly introduced by gusty air.

This, in fact, does appear to have been borne out in practice. Under certain conditions *Jaguars* have a definite tendency to go inverted, i.e., roll over on to their backs. Over-banking produces this tendency, with the nose being held down all the time. Very many people have got into trouble in this respect.

At the same time, flying properly, the *Jaguar* is a very good contest model indeed. The climb is exceptional, the design seemingly able to hold a very steep angle of climb on little or no downthrust and with less tendency to stall than most other models. Possibly the underslung belly fin accounts, in part at least, for the considerable amount of sidethrust which can be used with safety, although if this has been obtained at the expense of reduced stability margin under certain other circumstances, it is a heavy bill to pay.

Before condemning the *Jaguar* on this score, however, it must be remembered that a very considerable number have appeared at contests. Not all have been perfectly trimmed, and the design being so distinctive it is easy to form a false impression of the true proportion of failures. Yet at the same time Evans himself came to grief in the '48 Trials through just this basic fault—the model rolling on to its back and diving in.

It is particularly interesting, therefore, to study the latest design from the same stable. Unlike most other leading Wakefield designers, Evans has never been opposed to making radical changes from one model to another and the *Clipper* is virtually an entirely new design. About the only major point of similarity is the retention of the diamond-shaped basic fuselage.

The 1950 flying season has already given us the opportunity to assess the merits of the *Clipper*. It has done very well indeed and has been adopted by such leading fliers as Chesterton and Smith, who last year flew *Jaguars* at the Wakefield events. The Northampton club as a whole seem almost exclusively to have adopted the design, Revell being apparently the only exception, and the Northampton club are noted for their general excellence in Wakefield events.

Broadly speaking the *Clipper* is a high wing, diamond fuselage slabsider with fairly conventional proportions. The method of mounting the wing, however, is unorthodox. A cabin-type centre section fairing is built up on the basic diamond fuselage, the wing being assembled on this in a somewhat similar manner to the *Jaguar* wing mount. In the *Clipper*, however, internal rubbers are used for anchorage. The wing position is adjustable, fore and aft. Also incidence adjustments should be relatively easy. The actual centre section fairing—celluloid covered—gives an increase in effective wing area within the present rules, in the best modern streamlined-slabsider tradition.

We must give the designer full marks for this most ingenious wing attachment, but our personal opinion would be that it is quite unnecessarily complicated. It cannot be easy for the average modeller to duplicate accurately and get a good appearance. Sheet celluloid is notoriously difficult to apply successfully to any light framework. A major field repair to a damaged centre section would appear to be a very difficult job to tackle indeed.

Aerodynamically, the disposition of the fin area is of particular interest. Fin area is disposed almost equally above and below the centre line of the fuselage and many modellers have expressed their satisfaction at the spiral stability characteristics of the design. In common with the *Jaguar*, it appears that a considerable degree of sidethrust can be used for trimming out the power (thus reducing or eliminating the need for downthrust), which is a very desirable feature.

Wing and tail planform are roughly of blunt elliptic shape. The actual aerodynamic gain over a normal straight tapered wing with elliptic tips is problematical, but it is nevertheless nice to see a different wing shape appearing. The wing construction retains the same anti-warp features of the *Jaguar*, using two flat $\frac{3}{8}$ in. × $\frac{1}{4}$ in. balsa mainspars (top and bottom) and sheet-covered leading and trailing edges. This gives an exceptionally rigid and light frame. But to keep the weight right down it is necessary to select carefully the 1/32 in. sheet covering.

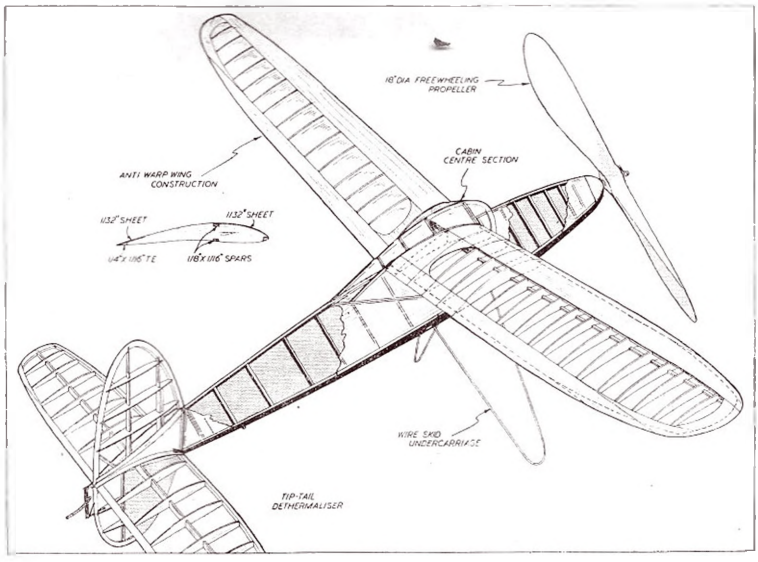
Tailplane construction, by comparison, is on the flimsy side and would appear rather liable to warp. Most Wakefield tailplanes do, in any case, warp, unless built exceptionally heavy and rigid. The main thing to avoid is asymmetric warps, where one side has more incidence than the other. Equal washout warped into each tailplane tip may even be helpful. In keeping with the wing construction, however, it would appear that some form of anti-warp tailplane construction might have been tried.

One cannot take too kindly to the wire skid undercarriage in place of the conventional bamboo or wire legs and wheels. No doubt it is effective, for none of the *Clippers* at the Wakefield Trials appeared to have take-off difficulties, but it does not *look* right—and something that does not look right often is *not* right!

The weight of such an undercarriage unit must be heavier than an orthodox bamboo plug-in type. The latter can be reduced to $\frac{1}{2}$ oz., or very slightly over. A normal piano wire undercarriage of the type specified may weigh as much as three times this amount.

Possibly the designer has been swayed in this decision by the fact that it is very difficult to obtain strong bamboo of adequate section these days. More and more people are, in fact, going over to all-wire or wire and bamboo undercarriages for this very reason. But not to the extreme shown on the *Clipper*.

Evans's own model with which he gained a place in the Wakefield team was actually a later development, the most noticeable difference being the fact that a one-piece wing is used, resting on top of the fuselage cabin-pylon. A single wire loop (skid) undercarriage is used with similar thin wire skids under each tailplane tip. This particular model, incidentally, was built down to the amazing airframe weight of $3\frac{1}{2}$ oz. and carries $4\frac{1}{2}$ oz. of rubber. A feathering propeller is used of the type developed by Evans, which first attracted widespread attention at the 1949 British Nationals. The *Clipper* was flying well then and so has been thoroughly proven before being released in plan form. Four members of the '49 British team—Chesterton, Smith, Clements and Hinks—immediately set about building this model in preference to their own designs!



For any Wakefield enthusiast who is keen on getting top performance and is prepared to put a fair amount of effort into the construction of the model, the *Clipper* is a very attractive proposition. Potential performance is as good as any contemporary design, the layout is sufficiently original to be interesting and the model does not appear to have any definite vices. It is not, however, a beginner's model. It is not, in fact, a model which one would fly with impunity under rough weather conditions without worrying about what might happen to the centre section assembly in a "treed" landing.

Plans of the *Clipper* are marketed by Super Model Aircraft Supplies, of Northampton, printed sheets and propeller blanks also being available. The development design—the *Vansteed*—is still in the proving stage and is more in the nature of an experimental model. Few modellers, for example, would attempt to duplicate the intricate feathering propeller mechanism and no plans or other details of the design are available, as yet. Performance is roughly identical to that of the *Clipper*, although the proportion of rubber carried is greater.

Detailed structural weights of the *Clipper* are as follows :—

Fuselage and undercarriage	...	1.7 oz.
Wings and connecting brace	...	1.1 ,,
Tailplane and fin ...	...	0.5 ,,
Propeller and noseblock	...	1.2 ,,
Motor weight	...	4.0 ,,
	Total ...	8.5 ,,

Comparative figures for other well-known Wakefields are :—

Component	*Jaguar*	*Zombie*	*Copland ('49) Streamliner*
Fuselage	—	1¼	1¼
,, plus undercart	1.9	—	—
Undercart	—	⅜	⅜
Wings	1.0	1½	1½
Tail and fin	⅜	⅜	⅜
Propeller assembly ...	1.0	1¼	1⅜
Motor	3.8	2⅝	3¾
Totals ...	8.3	8⅛	9

Science and the Speed Model

(Continued from page 301)

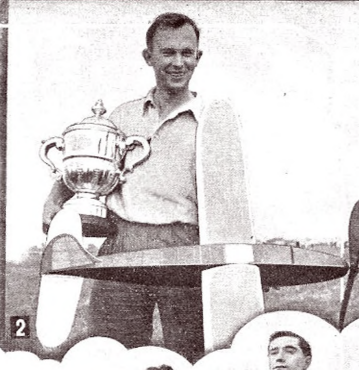
out ; it does not necessarily mean that the line drag figures are wrong, for if in fact the prop. efficiency was 75 per cent., then our example may have been developing .28 h.p. instead of .35 at 92 m.p.h., requiring .72 b.h.p. at 130 m.p.h. Model drag may also have been less, so that the total power was about .25, thus it may be that only .65 h.p. is required at 130 m.p.h. The author hopes to find time to collect a few measured figures just to prove his point : the most direct proof is to measure model drag in a wind tunnel, measure prop. characteristics, also in a wind tunnel, obtain a power curve for the engine and then go out and fly it. This takes a lot of time which is all too short in the contest season, so it may not be done for some time ; just the model drag alone would show, however, that a large proportion of our power output must be going elsewhere.

From our line investigation, then, we have derived substantial backing for the contention that the *average* British *model* is just as good as the *average* U.S. job, that those extra high record speeds are the exception rather than the rule and further that such speeds depend primarily on "hot" engines rather than on secondary considerations of model refinement in the aerodynamic sense. Do not be "blinded by science" though ; without careful consideration, these results present a very pessimistic picture. Remember, we have not *proved* anything, we have only shown the real set-up behind the speed flying story ; we have settled the fact that relatively small increases in speed call for a lot more power—far more than is generally realised. Remember that the high speeds have been achieved (by downright practical fliers who did not realise how "impossible" it was !) so it is clear enough that the tough problem on paper can be beaten in practice. The solution is, of course, in the hands of the specialists ; the point to bear in mind is that we just cannot get there by model design alone, for in the example a 30 per cent. reduction of model drag results in 12 per cent. reduction of overall drag and adds only about 4 m.p.h. to the speed. The fact that we *do* see appreciable differences in speed reflects on the importance of the other variables ; motors loosen up throughout a season, we change props., fuels, plugs, lines, fly in different atmospheric conditions and, above all, it is often true that we are working below the ideal "best" combinations of these quantities so that a relatively greater improvement is possible than might otherwise have been the case. In speed flying *everything* matters ; we may have to resort to engineering subtleties in a search for "horses," for we stand to gain more by improving power output, but none the less although model drag has been shown to be much less important than is commonly imagined, the writer is certain that design will not tend to stagnate just for that reason. Those U.S. record holders are a credit to the industry and talent of their owners and, regardless of any advantage they may have had concerning the power plant, the fact remains that it is the model + owner team that counts, and the ability to achieve the utmost in performance on the field.

It is a complex situation, but a review of some of the details can perhaps help with a few home truths on just how much we can hope to gain in various ways. We have yet to discuss odd points on line lengths, changing diameters, enclosing them in the wings, effects of stretch and expansion ; in the meantime, the foregoing should provide some food for thought.

(To be continued)

Northern Heights Gala Day

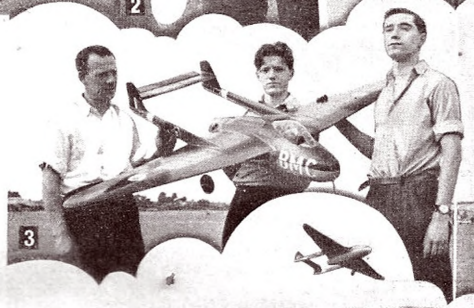


Once again this popular annual event was favoured with superb flying weather and attracted large numbers of fliers and visitors from places as far distant as Kendal (Westmorland), Manchester, Yeovil, Worcester, Northampton, Portsmouth and Southampton.

Only a very small proportion of fliers present entered the contests, however, but nevertheless the standard of flying in these events was very high indeed. In the Queen's Cup Contest two competitors, J. A. Howard and R. Copland, tied with three maximum flights each —the first time that this has happened in a major contest since the introduction of the 5 min. rule. In the fly-off Howard proved the winner.

J. Tangney, American member of the Croydon club, made an outstanding flight in the Thurston Helicopter Trophy event of 2 min. 43.5 sec. to set up a new British Record for this class of model (subject to confirmation).

Altogether a very enjoyable meeting for which the organisers (and the weather man !) deserve great credit.



RESULTS

Flight Cup (Glider). Agg. 2 Flights

1. B. Gardner	...	Fulham	600 secs.	Fly-off 300 secs.	
2. L. Barr	...	Pharos	600 ,,	,, 94.75	,,
3. P. A. Ward	...	Wayfarers	600 ,,	,, 91.75	,,

Fairey Cup (Rubber). Agg. 2 Flights

1. A. G. Gennis	...	...	Streatham	...	... 600 secs.
2. J. Tangney	...	...	Croydon	...	... 540 ,,
3. L. Barr	...	...	Pharos	...	... 533 ,,

Coronation Cup (Power). Agg. 2 Flights

1. A. Setchfield	...	...	Willesden	...	... 487.2 secs.
2. R. Hill	...	...	Hillingdon	...	... 366.6 ,,
3. P. Buskell	...	...	Surbiton	...	... 298.4 ,,

Queen's Cup (Rubber). Agg. 3 Flights

1. J. A. Howard	...	Kentish Nomads	900 secs.	Fly-off 140.4 secs.	
2. R. Copland	...	Northern Heights	900 ,,	,, 113.0	,,
3. B. West	...	Yeovil	... 701 ,,		

"Model Engineer" Cup (C.L Stunt)

1. A. Pisciantini	Salisbury	...	335 points
2. N. J. Butcher	Croydon	...	328 ,,
3. R. Prentice	Chingford	...	326 ,,

Thurston Helicopter Trophy

1. J. Tangney	Croydon	354.75 points
2. I. Dowsett	Brentford & Chiswick	118.2 ,,

Concours d'Elegance
(Power). J. A. Newton, Blackheath.
(General Flying Models). N. Gregory.
(Scale). J. Nunn, Barking. Special award : H. J. Towner, Eastbourne.
(Unorthodox). F. Ashby, Canterbury Pilgrims.
Halcon Cadet Prize—Cadet P. Stanning.
Gala Champion (*Aeromodeller* Cup). L. Barr, Pharos.

(1) J. A. Howard of the Kentish Nomads club launching his model for the third of its three maximum flights.

(2) Howard with the Queen's Cup and his winning model.

(3) Johnny Nunn and his fellow Barking club members with the jet-powered "Vampire" which won the Scale Class in the Concours d'Elegance.

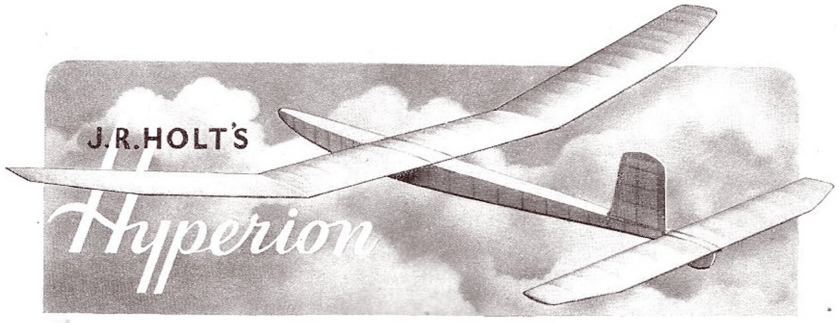
(4) Nunn's "Vampire" in flight. It gained well deserved applause from the large crowd of onlookers for its impressive flying display.

(5) E. T. Walls, of Yeovil, launching his model for a clean get-away.

(6) 1949 Wakefield Team member, F. Holland, of Swansea, making a Queen's Cup flight.

(7) Ron Warring, 1949 winner of the Queen's Cup was out of luck this year.

(8) E. Bourne, of Eastleigh, with his Jetex powered helicopter.



THIS model was designed in October, 1949, to the Nordic specification which was then being discussed. The object of the design was to produce a job capable of giving a good account of itself in any weather conditions that were likely to be encountered. It was extensively test flown over the winter months and showed itself capable of an average of just over four minutes in still air.

In the first competition for which it was entered, the 1950 Pilcher Cup, it took second place. This competition, as readers will probably remember, was flown in a gale, but in spite of this unfavourable weather the model went up straight on the towline and flew in steady circles when it came off. Unfortunately, the towline (of waxed fishing line fitted with a rubber tensioner) was not strong enough to take the model up under these conditions and it snapped on each of the three flights before the model was able to reach a reasonable altitude. It should be noted that the model was still in perfect flying order at the end of the competition, thus showing its robust construction and general airworthiness.

Fuselage

The sides are built on the plan in the usual manner, fairly hard 4 ft. wood being used for the longerons and medium for the uprights. The sides are then joined at the rear, the weight box formers added, followed by the cross-pieces. Bind and cement the towhooks to the ¼ in. square braces and fill in with ⅛ in. sheet either side. Complete the remainder of the sheeting, then fit tailplane platform. The chute box is then built and glued firmly into place. Those modellers who prefer to use the tip up tail dethermaliser should, of course, omit the box.

Wings

Cut out the wing ribs by means of a ply template. Drill the holes for the dowel tubes in the centre section ribs. Thread the ribs on to the dowel tubes, complete the construction of the centre section, then glue the tubes firmly in place. Do not be tempted to omit the gussets shown on the plan, they are functional, not ornamental. Medium stock is used throughout.

Covering

The original was covered in a fairly heavy type Jap tissue obtained recently from a London model shop, but coloured Modelspan is quite suitable. The colour scheme on the original was black fuselage and fin with white wings and tailplane. Give the fuselage and wings at least three coats of good quality clear dope and follow this with a coat of clear fuel proofer if you intend flying in wet weather. When the covering of the fuselage is completed the auto rudder is fitted.

Dethermaliser

The type of dethermaliser used is left to the individual modeller. The writer considers the parachute type operated by a fuse to be best for gliders, but those modellers that prefer some other type such as a tip-up tail could, of course, use it.

The chute may be either circular or hexagonal with six shroud lines, a small celluloid spacer being fitted on to these. A 16 in. diameter chute with a 2 in. diameter hole in the centre is ideal for this model. The material used is thin silk or nylon.

Trimming

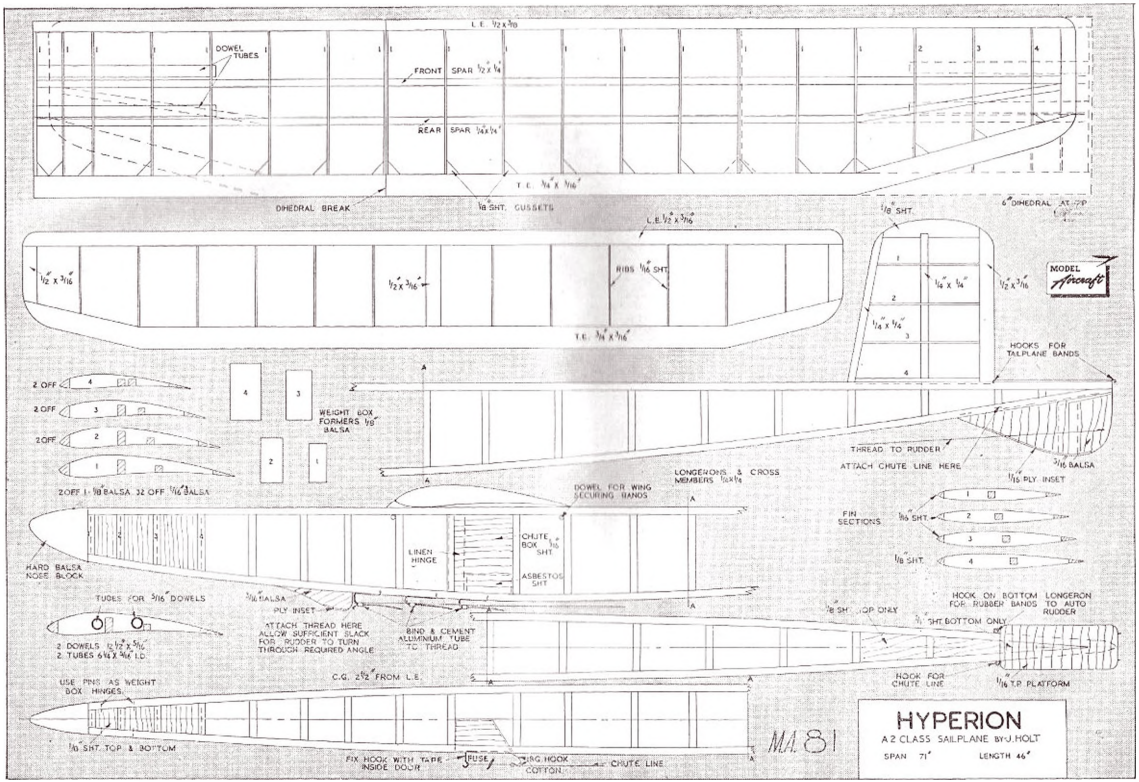
Balance the model at a point 2½ in. from the leading edge of the wing by adding lead weight to the weight box. Check the glide with a few hand launches and adjust the amount of ballast if necessary.

Tow the model up on a short line using the middle hook. It should go up quite straight. If it turns to either side due to a warp or incorrect line up a small trim-tab should be glued to the upper fin at such an angle as to correct the turn. As soon as the model tows up straight adjust the auto rudder to give the required amount of turn on the glide, then trim for best glide.

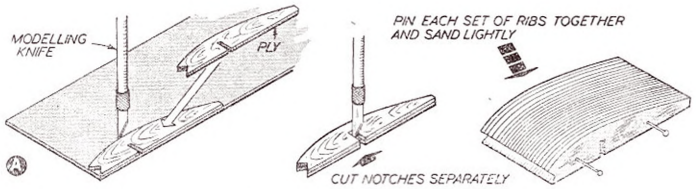
Flying

If the model is towed up correctly it will reach the full height of the line before flying off. Best results are obtained when it is towed up fairly fast. The middle hook is usually used. In *very* calm weather it is advisable to use the rear hook, and on a *very* windy day the front hook.

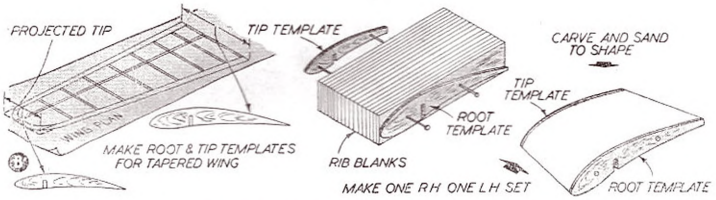
Always set the dethermaliser.



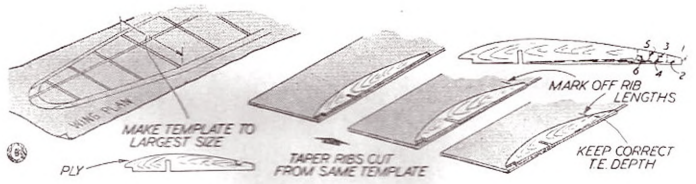
FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 23, GREAT QUEEN ST., LONDON, W.C.2. 5s. 0d. POST FREE.



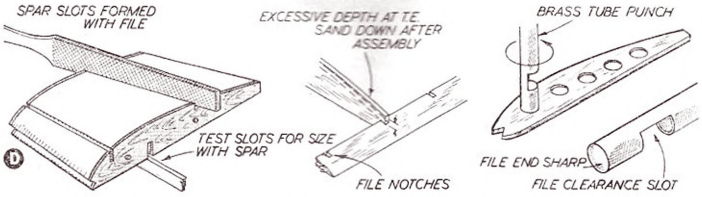
Cut ribs individually for parallel chord wing.



Taper wing ribs cut by " sandwich " method, quick, accurate.



Another method of cutting tapered ribs for tip panels.



Use file for cutting spar slots, etc. ; punch for lightening holes.

How to make it

NO. 8. CUTTING WING RIBS

(A) For best results, always select your wood carefully for wing ribs. Wood *thickness* does not necessarily ensure adequate rigidity. Ribs from poor $\frac{1}{16}$ stock can be heavier and buckle more easily than ribs cut from good 1/32 stock.

Quarter-grain sheet is required. That is, sheet which is rigid rather than flexible ; brittle rather than soft. But if you are building a lightweight model, make sure also that the sheet is of medium light stock.

For wings up to 200 sq. in. area, 1/32 sheet is generally adequate for close-spaced ribs. If the spacing exceeds about $1\frac{1}{2}$ in., use $\frac{1}{16}$ or 1/20 sheet. 3/32 sheet is adequate for wings up to about 350 sq. in. Above that size use $\frac{1}{8}$ sheet, or 3/32 sheet with every fourth or fifth rib a " stiffener " of $\frac{3}{16}$ sheet.

For parallel chord wings where all the ribs are identical the best method is first to trace the wing section accurately on to a piece of $\frac{1}{16}$ ply and cut out to form a template. Using this template as a guide, cut out the required number of ribs with a modelling knife or razor blade. Cut slots for spars, etc., separately, one rib at a time. Then pin the complete set of ribs together and sand down very lightly to ensure uniformity throughout.

(B) When dealing with tapered wings, instead of plotting each individual rib separately and cutting to shape, make ply templates of the two end ribs—the root or largest rib, and the tip rib. This should be the true *projected* tip rib—not the last rib as drawn on the plan.

Then cut the same number of rib blanks as there are ribs in the wing. Actually these blanks can be progressively smaller in size, but by far the easiest method is to cut them all oversize and roughly the same, i.e., slightly bigger than the root rib. Otherwise you may find that one or more blank in the final set of ribs is undersize and does not conform to the full depth of the rib profile at that particular station.

Sandwich the required number of rib blanks between the root and tip templates, lining these templates up on some common point, such as the mainspar position. Hold in place with pins.

Then treat the whole as one block of wood and carve and sand down to shape. Take care in cutting any undercambered portion or you may split some of the blanks and break off part of the required rib profile.

The same method can, of course, be used for rapid production of parallel chord wing ribs, using identical templates at each end.

(C) In some cases where only a small number of tapered ribs is required, such as in the tapered tip panels of a wing, the full size rib template can be used to cut the shorter chord ribs. This usually holds true, provided the spar lines remain unaltered, i.e., remain straight from tip to tip.

Having cut the first rib by means of the standard rib template, mark off on the sheet the exact length of the next rib required, taking this off the plan. Also mark the depth of the trailing edge portion of the rib at this point. Then simply lay the template over the sheet with the leading edge at its correct position, but with the template slewed slightly so that the upper surface contour comes over the required trailing edge position and depth already determined. Cut out with a modelling knife as previously. Simply repeat to cut out all the remaining ribs.

This method of using the template is better than cutting the actual template to the new rib shape. Templates, once made, should be kept, with aerofoil section and chord marked on for easy reference. They will almost certainly be of use later on for another model. Provided you use them properly and do not damage them with the knife when cutting ribs, templates are always there for future use, once made.

(D) Cutting spar slots and trimming off the leading and trailing edges of a set of wing ribs demands care. Unless the spar sizes are exceptionally large a small file will be best for cutting these slots. Such files are obtainable in 1/32, $\frac{1}{16}$, 3/32 in. width, upwards and a set will form a useful addition to any modeller's tool kit. For really large slots, the sides can be cut with a fine saw and the slots then chiselled out, although again a file will come in handy for finishing.

Check that the slots so cut really do fit the spar sizes. Undersize slots will simply mean that the ribs are deformed when the spars are forced in place. Oversize slots mean a sloppy fit, possibly a bad cement joint and every chance of inaccurate assembly.

For cutting slots in leading and trailing edges for insetting ribs, again a file is the best tool to use. Choose a file of the same thickness as that of the rib and the result will be an excellent fit with sufficient clearance for a good cement joint. Do not make these slots unduly deep, otherwise you will weaken the spars. As a general rule, depth of slot should never exceed one fifth of the spar (leading or trailing edge) width. Never notch mainspars, as this will weaken them unduly.

Over the Counter

A FEATURE WHICH BRINGS TO YOU UP-TO-DATE NEWS OF THE LATEST TRADE PRODUCTS

THE VERON "SKY SKOOTER"

SEMI-SCALE 48-in. span high wing cabin monoplane. Free-flight payload or R/C. Power: 1-1.5 c.c. diesel or glow motors. Wing area: 310 sq. in. Recommended maximum payload: 12 oz. Tricycle undercarriage.

Designer: P. H. Smith. Manufacturers: Model Aircraft (Bournemouth). Kit price: 25s. Produced: June, 1950.

* * * *

The *Sky Skooter* is the first of the smaller R/C kit models, made possible by the advent of the lightweight commercial radio receivers of the E.C.C., E.D., Flight Control and Tele-Trol type. It is obviously produced as an R/C design although, of course, it can also be flown as a normal free-flight model with or without a nominal payload. Thus, it should also appeal to those "sport" fliers who are not interested in, or cannot afford, R/C. As a sports model (i.e., without payload), wing loading is 6.3 oz. per sq. ft., so that glide performance should be excellent. Climb should be moderate on the 1-1.5 c.c. motors recommended, but it would not appear advisable to use larger and heavier motors without some modification to the design.

In appearance, the *Sky Skooter* is a cross between a *Rudder Bug* and a *Luscombe Sedan*. Rigging set-up is very similar to that of the *Rudder Bug*, but with a proportionately larger fin. Stability should be excellent. We are somewhat surprised, however, to see that the illustration shows the design motor (the E.D. "Bee") mounted upright and therefore protruding above the cowling line. The motor would be completely hidden by inverted mounting, thus adding to the semi-scale appearance.

Construction is quite straightforward, the fuselage being of basic box type and the wings (nominal) two-spar. We feel, however, that both the leading and trailing edge sections of the latter could have been made larger, with advantage. Some protection—such as celluloid facings or cloth binding—is definitely necessary on the centre section trailing edge to prevent the rubber bands holding the wing from cutting into the wood.

The tailplane, of symmetrical section and construction, is ingenious. A normal flat undersurface tailplane is built and the remaining portions of the symmetrical ribs then added later. The unit locates itself against the bottom of the fuselage and is held in place by rubber bands. The method of anchoring these bands—two pins pushed into end grain balsa—is *not* recommended, however.

The addition of wing struts, recommended for R/C, is of doubtful advantage. Method of attachment to the wings could be improved. With the struts

Phil Smith, Veron kit model designer, with his "Sky Skooter" which is the subject of this month's kit review.

in place, too, it is impossible to open the doors.

Suggested location of the radio components is also open to criticism. The actuator appears to be much too far forward for efficient operation—long extension drives to the rudder are always a source of trouble. Forward placement also means a shorter rubber servo motor, which again is not best practice.

Rubber suspension is shown for the receiver, which is not well placed. A more forward location would be better, where the whole of the receiver is directly accessible. This would help to balance out a more rearward position of the actuator. For the batteries a simple form of box is suggested, with all other details left to the imagination. Placement against the plywood front bulkhead would have given greater safety in crash landings.

The tricycle undercarriage is well designed and correctly located, although possibly the nosewheel leg should have been shorter to give a nose-down ground angle. The nosewheel unit should be strong enough for normal landings, but will undoubtedly be bent back in rough landings. Binding the main wheel unit directly on to balsa is also open to criticism.

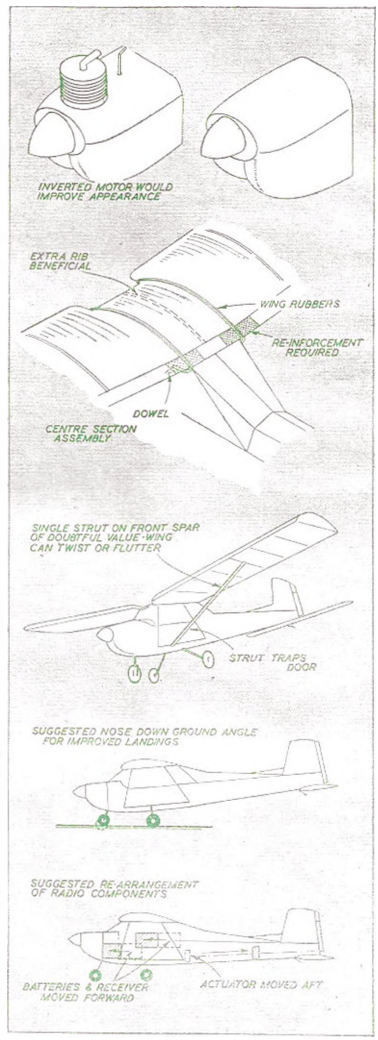
Our overall impression is that although we like the model very much and think that it should be excellent for radio work, we cannot help but feel that the requirements of the radio installation have been glossed over. A separate instruction leaflet could with advantage have been provided to detail a typical radio hook-up. As it is, most of the more difficult points on which the relative newcomer to radio work requires guidance are ignored. Battery installation is one example. The builder has to rely on his own initiative entirely. Nor will a rigid attachment of the extension shaft to the actuator—as implied by the plans, give anything but trouble. Also tape is far from being the best method of hinging the rudder. In fact, all the radio details appear to have been added as an afterthought to a free-flight model design—and then more in the nature of a tentative suggestion. This contradicts the design layout, which is obviously that of a very practical R/C machine.

As to the quality of the kit, we have nothing but the highest praise for this. Pre-cut wing ribs, cowling blocks, ply formers, and wing tips are especially welcome. Also, unlike some kits we have examined, the ribs really are identical and accurate, the spar slot sizes being a most excellent fit.

The plan is extremely well drawn and illustrated, various stages of the construction are illustrated by isometric drawings, which are always helpful.

The inclusion of wheels and spinner completes the impression of a luxury kit at a very modest price. But like most kits of this nature, however, insufficient cement is supplied. We ourselves would prefer omission of tissue cement in favour of another tube of balsa cement.

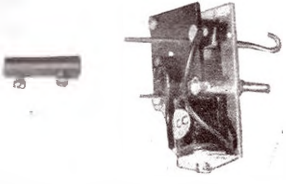
The Sky Skooter, *fitted with the new E.D. Mark III lightweight radio equipment, will be the subject of "Model Report" in an early issue where the flight and control capabilities of the design will be fully investigated.*



POWER PLUS . . .

TRANSMITTERS

This illustration shows one of the four new "951" series of transmitters to be added to our now famous "950" range. Prices and technical specifications will be announced later.



ESCAPEMENT

Well made and robustly constructed, this escapement is very light, weighing only $\frac{3}{4}$ oz. It is self-centring, rubber powered and supplied complete with coupling. Its overall size is $1\frac{3}{8} \times 1 \times \frac{1}{2}$ in. Price 25s. **(The first commercial escapement to incorporate a current saving device.)**

RECEIVER

The "950" receiver represents all that the discriminating radio control enthusiast could desire. It has already proved itself a contest winner. Its latest successes being **1st place**, British Nationals, and **1st and 2nd places**, West Essex Gala.

The receiver is of light and robust construction, the case affording complete protection to the delicate components. It includes plugs, sockets, insulation material, flexible wire, potentiometer, aerial trimmer and tuning key. Price complete, **£3 10s. 0d.**

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INTERNATIONAL CONTROL-LINE MEETING AT KNOKKE, BELGIUM

By A. F. Houlberg

THE European control-line championship meeting inaugurated by the Federation de la Petite Aviation Belge last year was sufficiently successful to encourage the organisers to hold another at Knokke this year which was supported this time by a British team selected by the S.M.A.E. consisting of I. G. Eifflaender, B. Hewitt (aerobatics), G. A. Shaw and D. R. Powell (speed). The meeting was also supported by two independent British entries in the persons of J. K. MacNess and D. A. Salter, both speed.

The contest was organised by the Federation de la Petite Aviation Belge in conjunction with the Royal Belgian Aero Club, the Municipal Administration of Knokke, the International Association of the Sporting Press and the Committee for the Development of Sport at Knokke, Le Zoute and Albert beaches.

Knokke is a fashionable seaside town and the market place is large enough to permit the use of a circle of 20 metres diameter.

The contest opened on the Sunday morning, in the brightest of weather, with the British team making a good start in the *Concours* side of the event. B. Hewitt gaining top marks for general appearance and finish amongst the "aerobatic" machines. I. G. Eifflaender did not place quite so well but was still amongst the best models, a fact which stood him in good stead later.

Amongst the speed models, which were judged as a separate class, Dr. Millet, of France, gained a well-deserved win with his 10 c.c. Dooling engined speed model, which is unpainted, finished in clear varnish, and up to best exhibition standard.

The *Concours* over, the actual flying commenced with the special team demonstration in which each team was given 20 minutes to do the best they could conceive.

The British team, represented by Eifflaender and Hewitt, took the ring first. Hewitt took the first flight and put up a most polished exhibition of smooth and apparently effortless aerobatics which was enthusiastically applauded. Eifflaender then followed doing even better with his manoeuvres and, by way of a finish, laying on his back and drinking a bottle of "fizz" while still carrying out faultless manoeuvres. This nearly brought the barriers down!

The Belgian team then gave a demonstration of streamer cutting, followed by the French team who gave a mixed display of aerobatics and speed flying.

The Swiss team produced by far the most novel and humorous display of all, emerging from one corner of the arena attired in bathing costumes of 1900 vintage complete with straw "boaters" and "handlebar" moustaches and proceeding to act the fool in amazing style.

It was easily the funniest thing in model aeronautics which we have yet seen and it deservedly gained honourable mention in the day's results.

The British team were adjudged the winners and thus gained the prize by sheer excellence of flying, to be one up by lunchtime.

In the afternoon the first round of the contests for aerobatics to set flight patterns, 5 c.c. speed, and 10 c.c. speed was held.

D. A. Salter, who had made a private entry, started the contest with his model in the 5 c.c. class—at least he made an effort to get away but failed to do so in the stipulated three minutes. He was rather unfortunate as he got his motor running successfully and was about to release when he was stopped by one of the judges owing to a misunderstanding concerning the use of a pylon and he then found himself unable to restart his hot engine.

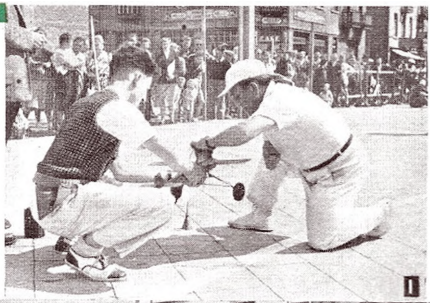
The British "speed" performers gave a disappointing display, the sole exception being Cyril Shaw who completed his two attempts successfully but could not better 152 km. hr. compared with the 223.6 km. hr. of the best performer in this class on the first day.

Nevertheless the British position at the end of the first day was far from hopeless. It was assured of the prize for the special flight demonstration, was running 1st and 2nd in the aerobatics class and stood a sporting chance for the premier prize if the speed boys could pull something out of the bag the next day.

A strong wind persisted throughout the second day to change the ideal conditions to the very reverse. Again Shaw was the only member of the British speed team to get away and complete the course, to beat his previous day's run with a kilometre at 174 km. hr. plus—which was still not good enough.

The aerobatic team performed in polished style in spite of the high wind and Eifflaender completed

Heading picture: Dr. Millet of France gets ready to attack the 10 c.c. record.



1. Labarde of France gives a few deft touches to the needle valve to obtain those precious top revs. from his 10 c.c. engine. His attempts were characterised by a soldier-like stance at the pivot point.

2. The Dutch team under the leadership of J. Van Hattum (with cap) did not have a lucky day and finished in last place. Their performances were below their usual standard.

3. The French team who were a formidable combination and were well equipped in both the speed and aerobatic sections. Their two speed experts Dr. Miller and Labarde both had 5 c.c. and 10 c.c. models with record breaking capabilities.

4. The Swiss team in their 1900 style bathing rig-out give an amusing aerobatic demonstration in the Special Class which was won by Great Britain.

5. The victorious Swiss team with their models which exhibited considerable improvements over their previous entries. The speed models were outstanding and gained 1st place in the 5 c.c. class and 1st and 2nd places in the 10 c.c. class.

6. The British contingent consisted of the official team (standing) with two independent entries in the 5 c.c. speed class. The aerobatic performers Hewitt and Efflaender were outstanding and headed the aerobatic class in addition to winning the cup for the Special Demonstration.

his flight pattern successfully, but Hewitt was unfortunate in encountering a bad gust of wind while doing his overhead eights and although regaining control unfortunately got one line hooked round the anchorage of the other with dire results. He was, however, sufficiently near the end of his schedule to finish up in third place. Eifflaender's two almost faultless performances brought him into top place to win the Aerobatics Class for Great Britain with Malfait, of France, a close second, only 2.2 points behind.

Throughout the afternoon a keen duel was fought between the French team and the Swiss team for the precious points each required to win the coveted championship trophy, and all credit goes to the Swiss team for the wonderful speeds they put up and for gaining first place in both the 5 c.c. and 10 c.c. classes.

The prizes were distributed to the winners by the Burgomaster of Knokke in the Town Hall, immediately following the contest, supported by Mr. Victor Boin, the president of the meeting, Major B. E. M. Borgniet, vice-president of the Federation de la Petite Aviation Belge and M. Albert Roussel the indefatigable secretary-general of the Federation and of the meeting.

While Great Britain failed to attain the premier prize its team did not disgrace the S.M.A.E. and much experience has been gained which will be invaluable next time, but in the meantime speed fans in this country have got to find another 50 m.p.h. on their present speeds to be able to hold their own with the Continental speed experts.

Of the social side of the meeting we have nothing but praise. The teams were all housed together in the same hotel near the sea front and the food was excellent. An institution which met with universal approval (except by the team managers) was the "White Horse" Club in the hotel, which possessed an excellent bar and kept open all night.

Here, to the strains of a Swiss accordion and the excellent resident pianist, the teams were able to pass some pleasant hours together and the occasion is now marked by a variety of power propellors nailed to the semicircular arch which forms the background to the bar.

Altogether a very pleasant weekend with good sport and good fun and we are sure that all who took part will want to be there again next year.

Final Results

Concours d'Elegance (Speed Models)

Prize of Honour : Dr. Millet (France)

Contest for the Special Flight Demonstration

Prize of Honour	...	Great Britain
2nd	...	Switzerland
3rd	...	France

Speed, 5 c.c.

1st	Peclet (Switzerland)	197.802 km./hr.
2nd	Labarde (France)	192.503 ,,
3rd	Lippens (Belgium)	189.473 ,,

Speed, 10 c.c.

1st	Meuwli (Switzerland)	229.299 km./hr.
2nd	Vallet (Switzerland)	223.602 ,,
3rd	Millet (France)	222.222 ,,

Aerobatics

1st	Eifflaender (Great Britain)	328 points
2nd	Malfait (France)	325.8 ,,
3rd	Hewitt (Great Britain)	294.6 ,,

Criterium Scores

1st	Switzerland	...	11 points
2nd	France	...	12 ,,
3rd	Belgium	...	19 ,,
4th	Great Britain	...	20 ,,
5th	Holland	...	24 ,,

Dr. Millet with his 10 c.c. Dooling engined speed model with which he won the Concours d'Elegance.

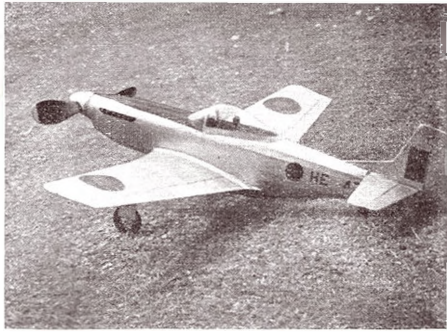
The jury and timekeepers functioning behind their protective wire netting. Note the local sustenance.

J. K. Macness of Great Britain makes a few adjustments garbed in a spectacular line in shirts.

Mustang IV

By N. Gregory

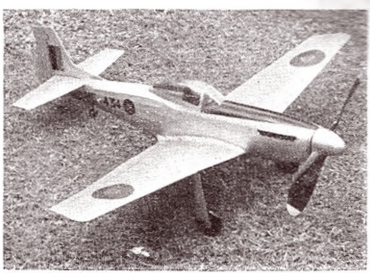
A RUBBER-DRIVEN FLYING SCALE FREE-FLIGHT MODEL OF 30 IN. SPAN



THIS scale fighter has been designed and engineered expressly for flying of the full-scale type, and the model has been made sufficiently robust to survive high speed contact with hard ground without damage. The undercarriage fixing is novel. It is almost indestructible and it gives an extremely shock-absorbing suspension. The undercarriage may be removed for a better flight performance : in this case, the nose will take any crash loads with its three compression members distributing the stress over the wing root. The airscrew is arranged so that if the unit is levered out by a blade in contact with the ground, the hook folds and avoids damage to the top of the fuselage.

Construction is best commenced by making the wing boxes, tongues and outer panels. The undercarriage springing should be bound to the boxes which are then built into the wing root. Carefully cement fuselage formers 7, 8 and 9 into position and then cover the top of the wing root with 1/32 in. sheet. The wound fuselage formers should be separated from their templates to make certain they are not stuck, and then replaced. Line up all formers, and the wing root, on a straight piece of ½ in. square hardwood as a jig and add the stringers and planking.

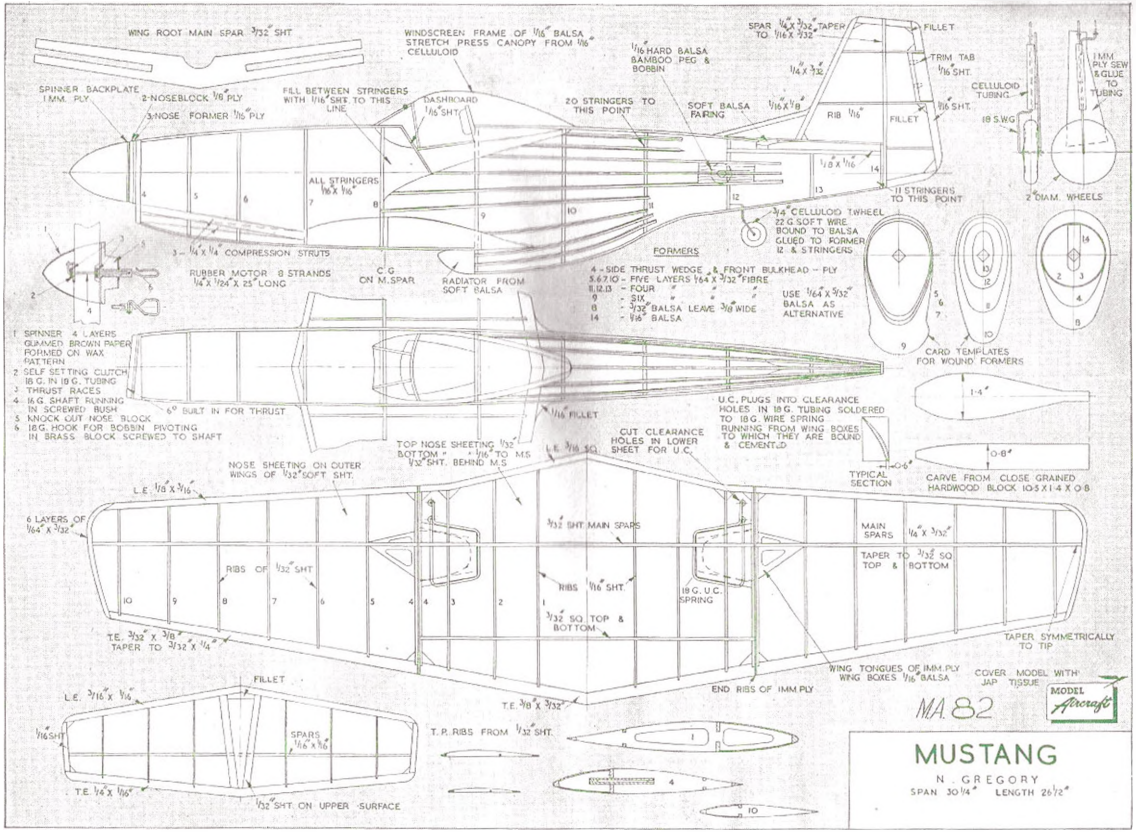
The model is covered with Jap tissue and finished silver for lightness. The tailplane and fin should not be water shrunk, and should receive one coat of banana oil only. The required finish can be obtained by mixing aluminium powder with the shrinking dope and banana oil used. Roundels should be cut from coloured transfer paper and control surfaces marked with Indian ink. Colour doping should be kept to a minimum.



The pilot's cockpit canopy is stretch-pressed from ⅛ in. sheet celluloid. A block of hardwood should be carved to the final shape with a skirt of about ½ in. The block should be filled and finished as smooth as possible. A female template is cut to the maximum section of the pattern plus a drawing allowance of ½ in. all round. A sheet of celluloid should be pinned to the template with many drawing pins, fixed at least 2 in. away from the edge. The template and celluloid should now be heated in an oven or close in front of an electric fire until the sheet begins to sag under its own weight. The pattern may now be pressed home until flush with the template ; a simple system of guide rods will ensure a straight press. The resulting canopy should be about as thick as a film negative. It should be polished to perfect transparency with good metal polish.

The spinner is made from four layers of the gummed brown paper strip used for sealing parcels. The pattern is simply turned from a lump of paraffin wax or candle wax with the aid of a wheel brace and a metal edge. Well grease the pattern and lay down four layers of paper petals. Leave 24 hours to harden and remove. Fill the spinner with cellulose grain filler, sand smooth and finish.

The finished model should balance on the main spar. It is essential that all flying surfaces should be absolutely true and free from warps. Insert the tensioned motor and roughly adjust for glide. I prefer to fly without the undercarriage which is replaced by a small piece of plasticene ballast in the nose. When adjusted, the model should have a fast climb and cruise for about 20 sec. and will cover about 220 yd. over the whole flight. The stall of the model is abrupt and should be avoided ; under torque the left wing will drop. This may be taken advantage of to yield a spectacular " ground-strafe " type of flight if the model is slightly over-elevated. Under full turns, the model will rapidly climb to 100 ft., do a 180 deg. stall turn, and dive back at the launcher, levelling out at zero height and then climbing away downwind for the rest of the power run.



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 23, GREAT QUEEN ST., LONDON, W.C.2. 4s. 0d., POST FREE.

M.A. Engine Tests

No. 15—THE YULON "49"

IN the new 8.2 c.c. Yulon "49," the British enthusiast is introduced to a new capacity class in British made engines. Although the 0.49 cu. in. competition class was introduced in America and examples of this size engine have been seen in this country in the shape of the McCoy "49," Madewell "49" and Atwood Triumph, the new Yulon is the first British product to be made specifically to this capacity limit. Actually, the American 0.49 cu. in. competition class has now been dropped but the equivalent British S.M.A.E. Class V category (8.5 c.c.) is continued.

The Yulon "49" is unusual in many respects when compared with other engines of similar displacement. First and foremost, it weighs only 6¾ oz. and is thus a good deal lighter than American "49's" and no heavier than the average 5 c.c. engine. Secondly, it features the annular port layout hitherto only used (among commercially built engines) for the smaller capacities.

The engine is, of course, based, like its smaller companion, the Yulon "29," on the original 5 c.c. Yulon "30" introduced last year. The general construction of the engine is, in fact, identical with that of the "29," the main difference being in the increased bore; the stroke of the two models being the same. The "49" thus has an extremely low stroke/bore ratio—actually only 0.717—but, apart from the larger diameter cylinder and a slightly longer crankshaft, is practically indistinguishable from the "29."

The test engine featured in this article was actually one of the first "49's" to be produced and the production model which will be reaching the model shops when this article appears will be an improvement on this earlier engine having greater power. Unfortunately, a new model was not available in time to complete this report.

The modification responsible for increased performance with the new model, however, is in the increased area of the choke tube, the only other visible modification being in the cylinder head and barrel which are now produced in two parts.

Specification

Type: Single-cylinder, air-cooled, two-cycle. Glow-plug ignition. Rotary-valve induction through hollow crankshaft. 360-deg. exhaust and transfer porting with flat-top piston.

Swept Volume: 8.16 c.c. (0.498 cu. in.). Bore 0.960 in. Stroke 0.688 in.

Compression Ratio: not disclosed. Stroke/Bore ratio 0.717 : 1.

Weight: 6¾ oz.

General Structural Data: die cast aluminium alloy crankcase with detachable rear cover. Meehanite cylinder liner, honed and lapped and secured to crankcase by threaded locking ring. Detachable cylinder-head and barrel of low-expansion alluminium alloy. Lapped piston with separate gudgeon-pin yoke. Durachromed nickel-steel crankshaft with replaceable dural propeller stud. Plain bearings.

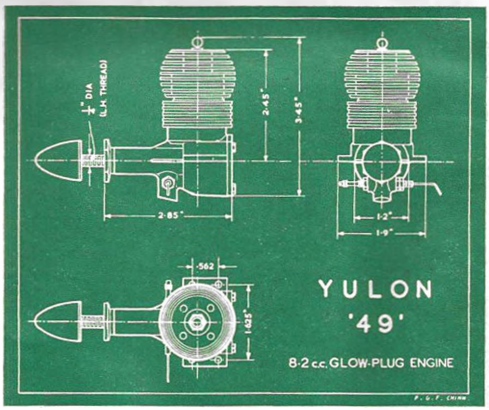
Test Engine Data

Total time logged prior to test: 1 hour.

Ignition equipment used: K.L.G. "Miniglow" short-reach glow-plug. 1.6 volts to start.

Fuel used: Record "Powerplus" Racing Blend.

Special Note: Dynamometer tests made with original ¼ in. diameter choke tube in position.

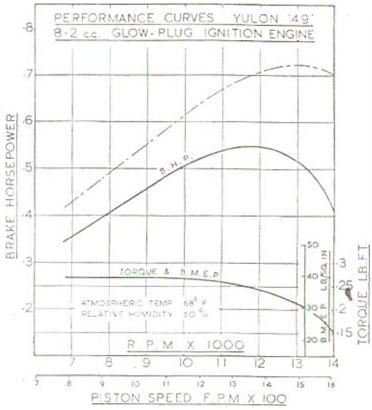


Performance

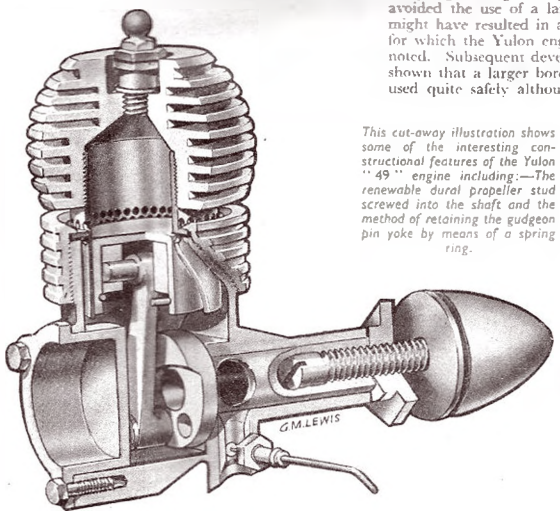
In testing the "49," it was inevitable that an estimate of its performance would first be made, based on the specific output shown by the "29" and "30" models and, by this indication, an output exceeding 0.6 b.h.p. might be expected. However despite the general similarity of the two engines, the very fact that the "49" is, in effect, a much "bored out" version of the "29," rather than a scaled-up edition, makes the possible effect of its larger capacity much less predictable.

In actual tests, a specific output and peak slightly below those achieved under similar condition with the "29" engine were evident. Actually, this would normally be no cause for complaint, especially since the engine still shows an appreciable net gain over the 5 c.c. engines on a size and weight basis but a possible means of restoring this slight loss of performance was, in fact readily apparent in the size of the choke tube employed.

As fitted to this model a choke tube $\frac{3}{16}$ in. in diameter was used. This gives an area of 0.0276 sq. in. which, a brief calculation will show, calls for a gas velocity well above that found possible to achieve to maintain a reasonable volumetric efficiency. To bring the intake area nearer to the optimum for maximum output, a 100 per cent. increase would appear to be advisable and this has, in fact, been done with the new production model which has a 17/64 in. diameter tube giving almost exactly double the area (0.0554 sq. in.) of the old fitting.



It should, perhaps, be mentioned that induction pipe area, to achieve the best balance between peak performance and smooth firing free from hesitation in aerobatics, appears to be quite critical and, in designing the original "49," the makers intentionally avoided the use of a large bore choke tube which might have resulted in a loss of the "stuntability" for which the Yulon engine has deservedly become noted. Subsequent development, however, has now shown that a larger bore choke tube can in fact be used quite safely although it is probable that any substantial increase beyond the new size would result in the reduced stunt performance as mentioned.



This cut-away illustration shows some of the interesting constructional features of the Yulon "49" engine including:—The renewable dural propeller stud screwed into the shaft and the method of retaining the gudgeon pin yoke by means of a spring ring.

The makers mention that an average gain amounting to about 10 per cent. in revs under given loads has been recorded with the new engine and, from the foregoing information, it will be understood that these increases, corresponding to power increments of 33 per cent., may not be so improbable as they might otherwise appear. In addition to the normal b.h.p. and combined torque and b.m.e.p. curves, therefore, the graph

(*Continued on page* 337)

Prototypes Worth Modelling

By C. B. Maycock

No. 3. THE MESSERSCHMITT 109G FIGHTER

THE *M.E.* 109*G* was a thoroughbred and in advance of anything the Allies had at the time of its introduction in 1942. Why it has not been modelled as much as the *Focke Wulf* 190 is a little puzzling.

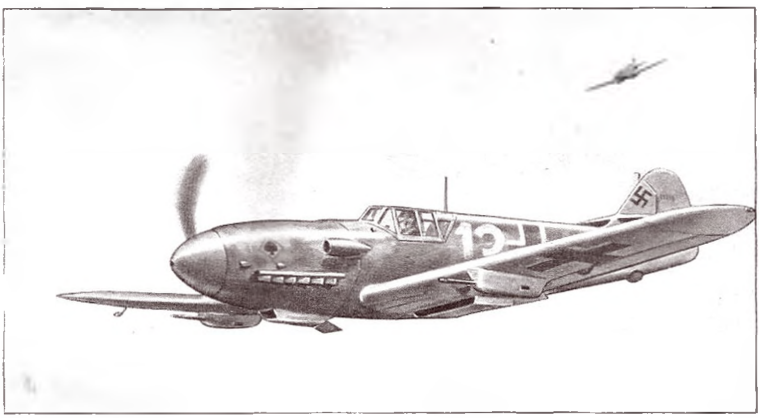
Fitted with a Daimler-Benz DB605 inverted vee petrol injection motor of 1,500 h.p. it had a top speed of about 400 m.p.h. at 23,000 ft. The armament comprised in most cases, one 20 mm. cannon firing through the airscrew boss, two 7.9 mm. machine-guns above the engine, and one 20 mm. cannon in fairings under each wing.

From the model makers point of view the large air intake on the port side of the motor cowling might be useful in concealing the contra-piston adjuster on a side-mounted diesel engine. The canopy was hinged along the starboard side and carried a sheet of armour plating to protect the pilot's back. The oval section fuselage, the wings, tailplane, and fin were of flush rivetted stressed skin construction. Ailerons, elevators and rudder were fabric covered. Handley Page-type automatic leading edge slots and slotted flaps, which were arranged to drop the ailerons for landing, together with the semi-submerged wing radiators, were the main features of the wings. The splayed undercarriage had a rather narrow track and retracted outwards into the wings. The tail-wheel was semi-retractable. Underneath the motor cowling was a fairly deep oil radiator. The cockpit layout was generally similar to our own fighters and the internal finish matt black.

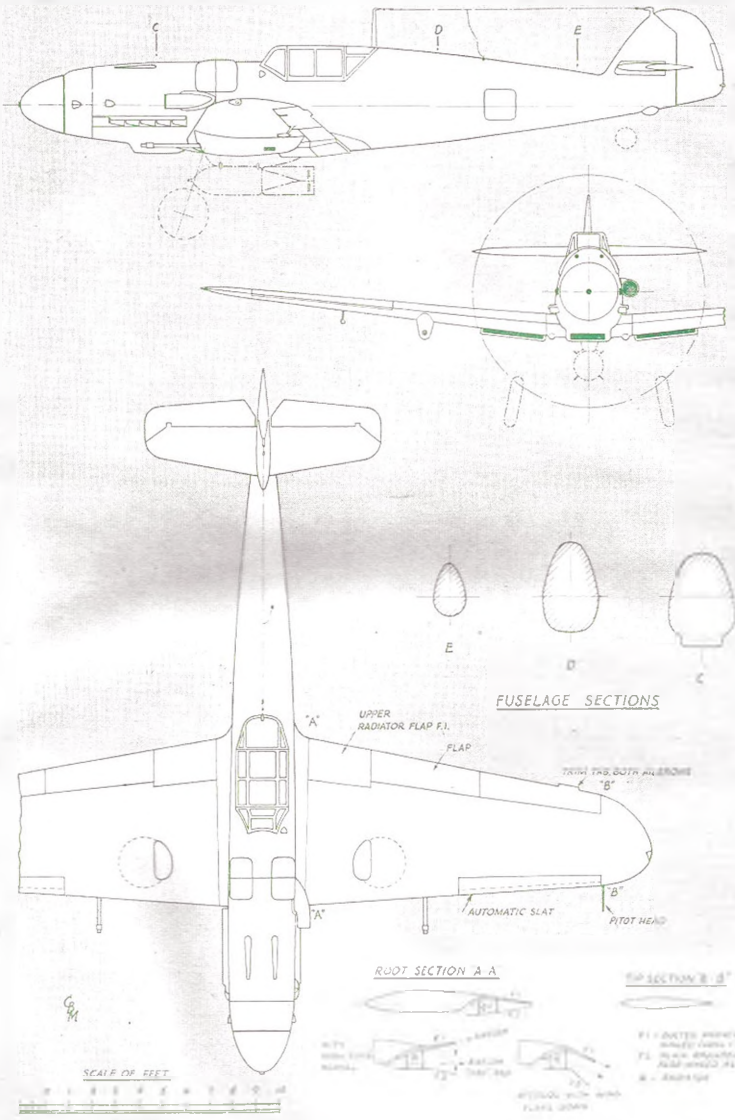
The general camouflage scheme consisted of grey mottled in lighter grey or drab grey green. Under surfaces were in very pale green, grey or blue. Spinners were often painted distinctive colours, and even spirally striped in some cases. The three-bladed V.D.M. electric, constant speed, airscrew was finished matt black. The main dimensions were as follows.

Span 32 ft. 7 in. Length 29 ft. 8 in. Height 8 ft. 6 in. Wing area 173 sq. ft.

The bulge shown on each side of the nose in the three-view drawing denotes that the particular version illustrated is fitted with 13 mm. machine guns. Also shown dotted is the position of the 550 lb. bomb carried on a central fairing in the bomber version. The lines of the *M.E.* 109*G* should not present any great difficulty to the flying scale enthusiast, but for control-line work it might be as well to dispense with the undercarriage, and to use a dolly for take off.



MESSERSCHMITT Me109G



MODEL Aircraft

photonews

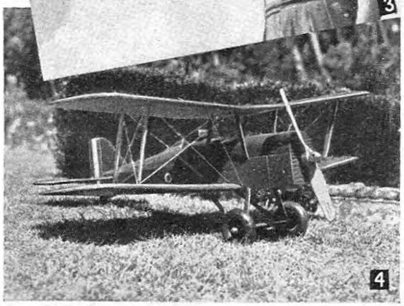
WE start off Photonews this month with a picture of a well-known Northern modeller, R. C. Pond, of Darlington. His flying wing was based on the Armstrong Whitworth "52" and has a wing span of 8 ft. 4 in. Other details are: Clark Y section; weight 4¾ lb.; engine Eta 5 c.c. diesel. The model is now undergoing minor modifications, including the fitting of larger elevons and longer undercarriage legs.

A regular MODEL AIRCRAFT contributor, E. Stoffel, sent us photograph No. 2, which he took recently at Fairlop Aerodrome. The attractive-looking power model shown was designed and constructed by K. Bennion, of the North London Society of Model Engineers. The wing span is 41 in., the weight 18 oz., and the power unit a Mills 0.75 c.c. engine.

P. McAlroy, the press secretary of the Sunderland & District M.A.C., is the subject of photograph No. 3, which shows him with his Mercury *Gillichopper*. The model has apparently a liking for thermals and he has had to fit a fuse-operated tip-tail D/T.

The photograph of the S.E.5a (photograph No. 4) came from reader A. W. Bennett, of East Farleigh, Kent, who flew this type in the 1914-18 war. The model is fitted with an Elfin 2.49 c.c. diesel and Mr. Bennett informs us that the wing-covering came from one of his lady friend's nightdresses. Well, well!

The problem of transporting models has been solved by R. A. Revell, of the Guildford & District M.A.C., by means of the large "coffin" which he has fitted on top of his Fiat car. The scale models shown are an Avro 504K and a Curtiss *Sparrowhawk*.



R. A. Adams, of New Eltham, London, was the photographer.

R. Booth, of Manchester, has sent us many fine photographs of his scale models in the past and photograph No. 6 shows his latest job which is an Avro type 638 (*Club Cadet—Hermes IV*). The splendid workmanship is clearly shown in this picture of the uncovered model which is to be powered by a Kalper 0.32 c.c. diesel when completed.

Photograph No. 7 came from Len Webb, of the Carshalton M.A.C. and shows him launching his Bowden "Contest" model on Epsom Downs. It is finished in a very pleasing colour scheme of blue and silver and the power unit is an Allbon 2.8 c.c. diesel engine.

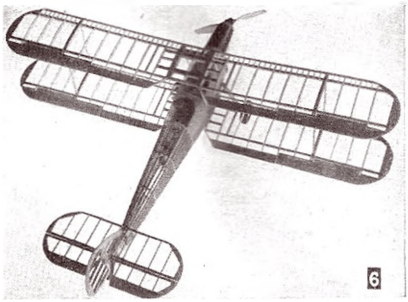
Norman Marcus, of the Croydon & District M.A.C., is the subject of photograph No. 8, which was sent in by K. J. Miller, of South Croydon, Surrey. He is shown launching the model which he flew in the power duration contest at the recent Irish Nationals. Unfortunately for Norman, the model was lost on its first flight of 208 sec. and was not recovered in time to complete its three flights.

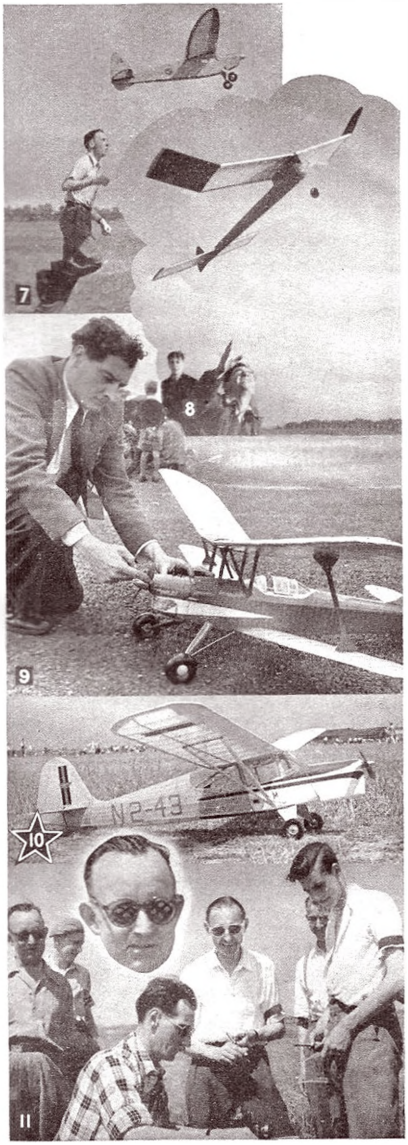
At most London area rallies, B. Brooks, of the Blackheath M.F.C., who is shown in photograph No. 9, can be seen flying his realistic-looking biplanes. His latest design which is shown in this photograph is fitted with a 5 year old French 3.8 c.c. Ouragan diesel engine which is still going strong.

Photonews star model of the month is seen in photograph No. 10. It is a 2 in. to 1 ft. scale Auster Arrow by A. F. W. Moore, who is also a member of the Blackheath Club. The engine is an Allbon 2.8 c.c. and the model is to be fitted with the new E.D. miniature radio control equipment.

"Sam" Mayo, of the Streatham club, father of Miss Pat Mayo, the S.M.A.E. secretarial assistant, whose diminished head appears above our last photograph, is not as it appears sporting a new style tartan sun-specs. Like many officials and competitors at this year's rallies he has been blinded by Henry J. Nicholls' shirt!

We are pleased to report that readers are still sending in plenty of photographs for Photonews and, what is even more important, a very large number of those submitted are suitable for publication. This improvement in the standard of readers' photographs has been particularly noticeable since Photonews became a regular feature. Keep it up chaps!





● THE ILFORD AND DISTRICT CLUB are planning a series of team racing events to link up with the 1951 Festival of Britain. These contests are tentatively scheduled for the last two weeks in September, next year—in the Borough of Ilford. We are told that valuable prizes will be offered and possibly travelling expenses provided for all competing teams. Briefly the idea is to get something like 40 clubs to enter three models each—making 120 entries in all. Eliminating flights will be held every evening, culminating in a grand three or four in a circle fly-off on the last day. Should interest in small (up to 1.5 c.c. capacity) team racers develop, a separate class for this type of model will also be included. Suggestions and comments on the above will be welcomed by the organisers, so if your club is at all interested, write to E. W. Bridgman, 144, Trelawney Road, Barkingside, Ilford, Essex.

★ ★ ★

● THE WEST ESSEX AEROMODELLERS held their third Annual Gala at Fairlop on June 18th and for the first time included a team race in the programme. Four models were flown in the finals (160 laps !)—"Skipper" Rowe flying his original design to first place, at over 70 m.p.h. This all red low-wing was powered with an inverted Amco 3.5. A close second was Norman Butcher's *Lil' Lulu*—an inverted engine mid-wing. Norman's model was considerably slower than the winner, but his team got him back into the air in record time after refuelling. Johnny Nunn was also flying in the final, but unfortunately he stepped out of the centre circle and crashed his model into the backs of a rival team.

Most popular engines in the team racers were undoubtedly the Frog 500 and the E.D. 3.46. Two interesting metal-wing designs were entered by the Malden and District club. These models both featured undercarriages bent from single strips of dural—a "wrinkle" worth noting by team racer builders. Team racing gets even more exciting when free-flight models drift into the circle—as they did on several occasions at this contest.

★ ★ ★

● AS USUAL, the weather at this year's Northern Heights Gala (July 2nd) was just about perfect. Quite apart from the seven event contest programme, there was plenty to interest the modeller who went along for a nice restful day (like us !). P. E. Norman put on his own private air display—with five free-flight replicas of 1914-18 warplanes. P. E. must have logged something like a hundred flights in all and it was unusual to look skywards and not see at least one of his fine scale jobs performing. Johnny Nunn created a stir when he flew his Dynajet powered *Vampire*. A beautiful sight in the air, this controliner is relatively lightly loaded and can be coaxed in for a perfect "full size" style landing. Johnny flew the *Vampire* close to the Hawker hangars and the Dynajet sounded even noiser than usual. The full size flying demonstration this year was provided by a vintage *Hawker Tom-Tit* and the famous "Last of the Many" *Hurricane* which carried H.R.H. Princess Margaret's colours and also flew in the King's Cup. Several models decided to roost on the roofs of the 60 ft. hangars, and the thermals took their usual heavy toll of lost models. Spectators cheered the rock-steady flying capabilities of a twin Jetex (100) powered helicopter and radio control enthusiasts took advantage of the ideal weather conditions to get in plenty of flying. A most interesting model was an E.D. R/C equipped midget, powered with an Allbon Javelin.

Bob Copland put up three maximum 5 minute flights in the Queen's Cup. But J. A. Howard later equalled this and then went on to beat Bob in the subsequent fly-off. Last year's winner Ron Warring flew his '49 model again, but this was not one of his good days. Ron had little time for pre-contest trimming this year, already having his hands full getting ready for the Irish Nationals and the trip to Finland—the latter as a member of the British Wakefield team. Some very good designs were flown in this year's contest, although the total number of entries was disappointingly small. Our own "Queen's" model was an overnight conversion, consisting of power model wings on a Wakefield fuselage. It flew quite well—but *not* in the contest.

★ ★ ★

● HAVE YOU seen a copy of the *Flypaper* yet ? This monthly newsletter is published in South Africa and many British modellers have become subscribers in recent months. Twelve issues cost only 2s. 6d. from *T. Engler, of 17, Schultaz Road, Nahoon, East London, S.A.*

Here are a few items we came across in the recent Nationals number : American designs predominated in the sailplane events—the winning senior model being a Zaic *Floater*. First place in the Jetex contest

was taken by a *Durajet* 350 and the winning model is being sent over for the International Jetex contest at Fairlop in September. Class A (up to 150 sq. in.) and B (over 150 sq. in.) rubber events went to American designs. Almost all the first four places in each of the six free-flight events went to American designs—such as the *Civvy Boy*, *Powerhouse*, *Sailplane*, *Banshee*, etc. The top three models in the CO_2 event were all powered by O.K. motors. In the open Wakefield contest (for the 1950 S.A. Finals Team) a *Contestor* took first and a *Korda* second. Third and fourth went to a *Contestor* and *Gypsy* respectively.

All the C/L speed events were won by American designs powered by McCoy 19's, 29's, 49's and 60's, and they all used British Stant propellers. E. Allen won three firsts—at the same time setting up new National records. Doc Allen, who emigrated from Britain some years ago, is now Chairman of the S.A.M.A.A.—the South African S.M.A.E.

★ ★ ★

● AT LAST we know why it is that so many models crash or otherwise come to grief. According to Tony Haerum, it is all linked up with astrology. He tells of his last free-flight, which spun in from the first take off. Tony was hardly surprised—he knew that he had been tempting fate to even take the model out of the box, when the aspect of *Uranus* was so unfavourable.

Maybe there's something in this "What the Stars Foretell" business after all. So don't be suprised if we start a regular feature on similar lines to those which appear in the Sunday papers. Modellers will then be able to look up their horoscopes and ascertain the best days to buy balsa; when not to risk that extra turn on a motor; forecasts for future results and even your lucky colour dope. Preliminary calculations show that in our particular case, it would be fatal to fly a Jetex model when the moon is on the wane. If we ignored the stars warning, we should be in dire danger of being struck by lightning or mown down by a Dynajet job. But on the other hand, we should definitely walk away with any seaplane contests we chose to enter on January 17th, 1973.

★ ★ ★

● JACK HEARNE, of Hearne's Hobbies, Melbourne sends over news of the 2nd Australian Nationals. He writes:

"Over 600 entries were received this year—and these varied from indoor stick models to the very latest in jets. The prizes were good too—over £400 worth being awarded. The weather was as varied as is only possible in the Melbourne area and we experienced just about the whole range, except snow. The R.A.A.F. gave us every assistance, providing Jeeps for retrieving, huge transport wagons and plenty of other help. We have a most worthy supporter in our Minister for Air and Civil Aviation—the Hon. T. W. White, M.P. With his help, aeromodelling (and full-size flying) has at last taken a strong step forward in Australia. Model clubs are now being formed all over the country and I understand that the A.T.C. will soon be taking up aeromodelling as part of their training."

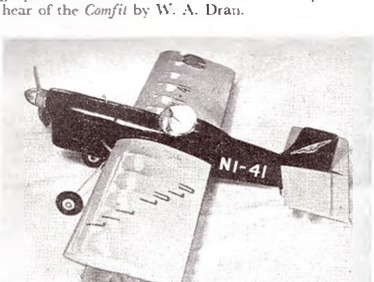
Jack also enclosed an account of the contest, as printed in the Australian magazine *Aircraft*. We see that a British design *Thermalist* won the sailplane event. Senior stunt was won by a *Monitor* and a Frog 500 powered the Junior Stunt winning design—an Australian *Skylark* kit model. Free-flight was split into two classes—above and below 3.5 c.c. The larger class went to a McCoy 49 powered *Westerner* and the smaller class to an E.D. Comp. Special powered *Slicker* 50. British firms who donated prizes were Electronic Developments and International Model Aircraft.

★ ★ ★

● G. W. BAKER, of the Royal Navy, is stationed in Hong Kong and writes of the difficulties of carrying on aeromodelling out there. Apparently supplies are available—but at a price. Typical engine prices are a Bee for 75s. and a Mills 2.4 at 137s. 6d. Query these figures and the shopkeepers turn up old obsolete price lists—which doesn't exactly help. For the benefit of other modellers in that part of the world—we pass on the tip that the cost of model supplies (plus postage) is generally much cheaper when purchased through a British mail order firm.

In Brief

Ken Muskett placed top in the London Area—in the July 9th S.M.A.E. Stunt Contest. His model featured flaps—set well out in the wings, like ailerons—and was powered with a McCoy 29. . . . At the same meeting, Ray Jenkins was doing well in the speed event, until the lines parted. Ray certainly has had more than his share of bad luck when it comes to contest work. . . . Losing your model pins? You should invest in a small pocket magnet for collecting pins and other small metal objects from the building board and floor shavings. . . . Things got a little mixed up in that list of glider kits in the July MODEL AIRCRAFT. For instance—did you ever hear of the *Comfit* by W. A. Dran.



"Lil Lulu" Norman Butcher's team racer which gained second place at the West Essex Gala. (Photograph by K. J. Miller.)

The IRISH NATIONALS

THIS year's Irish Nationals was very much the " mixture as before "—and what a pleasant mixture it always is ! Those of us who are able to make the pilgrimage to the Emerald Isle each year for this event are assured of a warm welcome and look forward to meeting again our old friends " Doc " Charles, Billy Brazier, Des Woods, Chris Bruton, Gilbert Rowe and the rest.

Baldonnel Airport was again the scene of the contests and the British lads had a very successful time—winning all three contests. The " Wakefield " event was run off in the morning in between heavy rain squalls and Bob Copland again proved the winner despite losing his model on its second flight.

Control-line flying does not seem to have really caught on in Ireland and there were only three starters for the stunt event which was included for the first time. Zombies club member, Pete Westbrooke, scored a fairly easy win in very bad flying conditions.

In the afternoon the weather improved considerably and some good flying was seen in the power contest. J. D. Dudley, of the Satyrs club proved an easy winner, but Norman Marcus was unlucky to lose his model on its first flight of 208 sec.

After the meeting a very enjoyable and well attended dinner was held in Jury's Hotel, Dublin. This afforded the visitors an opportunity of expressing their appreciation of the hospitality which they had received from their Irish hosts.

E. F. H. COSH.

Results

Power. Aggregate 3 flights.			
1.	J. D. Dudley	Satyrs	524.8 sec.
2.	R. McDonnell	Belfast	283.3 ,,
3.	S. Wells	Dublin	265.2 ,,
Wakefield. Aggregate 3 flights.			
1.	R. Copland	Northern Heights	573 sec.
2.	J. Tangney	Croydon	535.5 ,,
3.	N. G. Marcus	,,	508.4 ,,
Control-line Stunt. (Maximum 130 points)			
1.	P. Westbrook	Zombies	64 points
2.	M. J. Daley	Belfast	25 ,,
3.	J. B. Bellew	Dublin	16 ,,

Photographs

1. The control area.
2. Norman Osbourn, of Belfast, launching his entry in the Wakefield contest.
3. Another Belfast entrant, S. Young, launches one of his power contest entries.
4. A group of Belfast club members assisting Norman Osbourn at the take-off.
5. An entry in the power contest, N. Spendiove, of Dublin.
6. Second place winner in the Wakefield event, Jimmy Taagney of Croydon, getting his model away.
7. J. D. Dudley, of the Satyrs club, winner of the Power contest, launching his model for its last flight.
8. Des Woods, chairman of the Model Aeronautics Council of Ireland, the organisers of the meeting.
9. A line-up of some of the competitors and their models.
10. W. Kenny, one of the Irish entrants in the rubber event.
11. Billy Brazier's latest Wakefield. The weird layout is the result of a take-off prang.
12. Pete Westbrook (Zombies), winner of the control-line stunt contest discusses matters with M. J. Daley, who gained second place.
13. " Doc " Charles chats with Jim Bellew.

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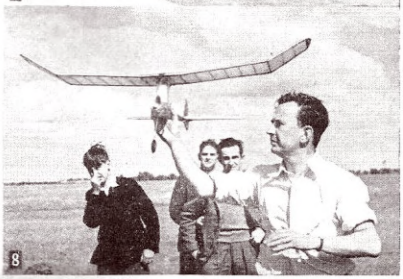

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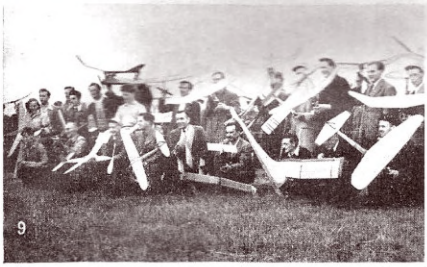

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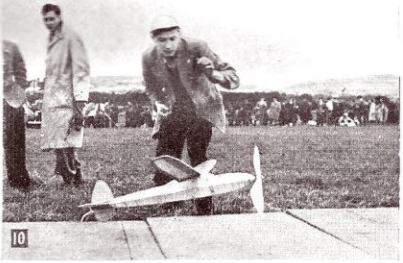

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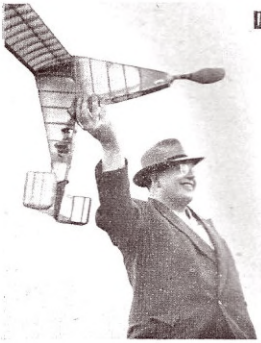

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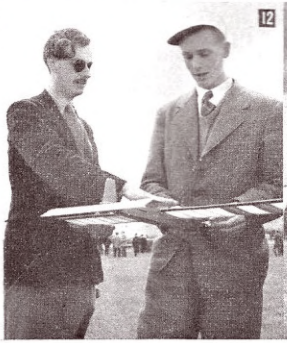

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Accent on Power

by **P. G. F. Chinn**

ONE of the most acute problems associated with the operation of speed models is that of hand starting, particularly in the case of the smaller Class I and II speed groups.

The small 1.5 c.c. and 2.5 c.c. class diesels which, with free-flight model propellers, are quite easy to start, become a very different proposition when fitted with 6-in. diameter, coarse-pitch, narrow blade propellers designed to allow revs to rise above 10,000 r.p.m., for use in the tiny models currently favoured for Class I and II racing. In such cases, the "flywheel action," necessary to start under light loads, is greatly diminished and starting actually becomes more critical than with the larger glow-plug engines using 8 in. and 9 in. diameter propellers.

In designing the small *Albon Javelin* speed model (see July and August MODEL AIRCRAFT), 10,000 r.p.m. with a 9 to 10 in. pitch propeller was aimed at and, to obtain this speed, it was obvious that the diameter would have to be 5½ to 6 in. and the blades keep quite thin and narrow. Such small propellers, even when carved from heavy woods, are just below the minimum at which reliable starting can be obtained with a *Javelin* and it was therefore decided to try weighting the blades.

The obvious method of doing this : *i.e.*, by letting small lead weights into the blades as near as possible to the tips, should not, of course, be attempted without due consideration of the possible dangers which can result. The potentialities of a small metal object suddenly released at well above 10,000 ft. per minute, due to structural failure of the blade, cannot be too strongly stressed and the utmost care must be taken to ensure that the weights cannot work loose with vibration and that they do not weaken the blade.

In constructing the first propeller for the *Javelin* model, three ⅛ in. diameter holes were drilled in each blade, $\frac{9}{16}$ in. between centres, the outer hole being ⅜ in. from the tip. Tinmans solder was then run into these and filed down flush with the blade surface, the whole being then liberally glued and bound with silk. This resulted in the blade being spoilt somewhat (due to local thickening with the binding), static r.p.m. reached was 9,400 r.p.m. and the model achieved 65 m.p.h. in initial tests ; 5 m.p.h. below the speed hoped for. With a little practice, it was found that hand starting could be performed fairly easily.

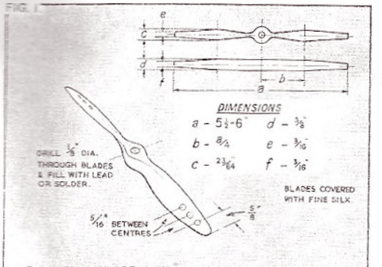
An improvement on this first effort, has been to use a single cemented on covering of silk all over the blade and this appears to be quite adequate. Ash was used in each case for the propellers and the use of a similar long-grained hardwood of high physical strength is essential. Another wood, which has been found even better, is jarrah, which has the advantage of being extra heavy (dry weight : 56 lb./cu. ft., as compared with 46 lb. for beech, 44 lb. for ash and 38 lb. for walnut). Some details of hardwoods most often used for power model propellers, incidentally, are given in Table I. In the past, bass, yellow pine and mahogany have been commonly used for free-flight models and moderate revolutions. The heavier woods, however, are to be recommended for all control-line work.

TABLE I.—PROPELLER MATERIALS
Dry Weights of Various Woods
(15% moisture content)

	Weight lb. per cu. ft.	Specific Gravity
Bass	27	0.43
Spruce	28	0.45
Poplar	29	0.47
Scots Pine (red and yellow deal)	33	0.53
American Mahogany	34	0.55
African Mahogany	35	0.56
European Walnut	38	0.61
White Birch	40	0.64
American Walnut	41	0.66
Canadian Birch	44	0.71
American Pitch Pine	44	0.71
English Ash	44	0.71
English Beech	46	0.74
English Oak	46	0.74
Maple	46	0.74
Hickory	53	0.85
Jarrah	56	0.90

Provided that the propeller itself is accurately balanced in the first place, accurate positioning of the weights will automatically assure more or less correct balance and any slight deviation can then be compensated by drilling away part of the outer weight in the heavier blade and filling the cavity thus produced with balsa cement.

FIG. 1



WEIGHTED AIRSCREW FOR CLASS I SPEED MODEL

Opinion appears to be fairly equally divided on the merits of the two popular types of speed model take-off gear ; the three- or four-wheeled dolly and the two-wheel drop-out undercarriage.

The writer's experience has only been with the latter pattern but both types, in their standard form suffer the disadvantage of risk to the model due to the possibility of the latter "jumping" its gear before adequate air-speed has been reached. This is particularly true of the smaller class model.

With the *Javelin* model, therefore, it was decided to try out an idea which had automatically suggested itself after seeing so many models "lose" their take-off gear on becoming prematurely airborne due to bumps on the take-off surface. This was to employ a simple "safety-catch" which would only release the gear when the model had actually lifted itself well clear of the ground.

With the Sadler pattern drop-out gear, a trailing arm is used, the weight of which is utilised to lever the undercarriage from its fuselage sockets, as the model rises. A fairly close fit is therefore necessary to make this effective. With the modified gear, however, the drop-out unit was deliberately made an easy, well-lubricated fit so that it would fall out easily. The forward end of the trailing arm was then formed into a simple lever, ending in a hook, which would engage a slot in the bottom of the fuselage skid.

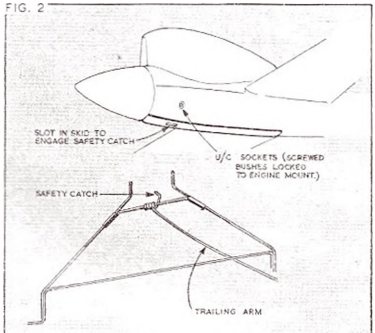
The trailing arm was also made to sufficient length to make it necessary for the model to rise 9 in. or so off the ground before the catch was released. A sketch of the assembly is shown in Fig. 2.

In practice, this take-off gear has worked out very well. With the present higher wing-loadings of speed models, of course, there is a marked tendency for the model to hug the ground due to the fact that it must lift the drop-out unit as well as its own weight before becoming airborne. This is, in fact, a distinct advantage where inset thrust is used and a high take-off speed is essential to avoid "free-flighting" into the circle.

With the *Javelin*, flying on regulation 35 ft. lines, the best part of a full lap is required before the model begins to lift off. With a wing area of only 19.5 sq. in. and an extra 1⅛ oz. undercarriage weight, it is estimated that the take-off speed is well in excess of 50 m.p.h. Once clear of the ground, the undercarriage unit is released and immediately the model jumps up to shoulder height, where it will hold an even course with no effort on the part of the pilot. The long moment arm used in this design, combined with tail surfaces of generous area are, of course, contributory to the high degree of longitudinal stability obtained.

If is, of course, possible to unstick the model somewhat earlier by applying "up elevator," but this must be done carefully ; otherwise, when the extra forward weight of the drop-out gear is released, the model will shoot up in a climb, due to excessive angle of attack, which may prove dangerous without adequate speed, especially if elevator area is small and movement limited. The effectiveness of the elevator with the *Javelin* is definitely marginal, so that attempts to fly in a strong wind have resulted in an oblique

FIG. 2



SELF LOCKING TAKE-OFF GEAR

flight circle which is difficult to bring horizontal.

Team Racing

Whether the promised popularity of team racing in Britain will materialise or not, it is still rather too early to decide, but there is no doubt that a good deal of interest in team racing models is being shown by modellers throughout the country.

Ideas on the type of model to be used appear to be fairly settled, although it must be admitted that, from the appearance aspect, ideas seem to be much more fluid. Within the existing rules, the approach is generally either from a strictly functional sense (*i.e.* a clean, well-proportioned model intended to travel as fast as possible as long as possible on a tank of fuel) or is dictated by the apparent necessity for "realism" which, at the present stage, generally seems to mean bold decoration, starting with registration letters on the wings beginning NX —, plus sundry American oil company trade marks. The lines of one or two of the team racers so far seen in action have had little to recommend them, being neither functional nor bearing much resemblance to full-size craft.

The existing S.M.A.E. team racing rules are, in the writer's opinion, perfectly satisfactory, with one minor exception : the rule which requires a "pilot's head" in the cockpit. This seems rather futile and since we are not all sculptors will, no doubt, result in some fantastic examples of physiognomy which may, or may not, amuse spectators, but which seems rather a waste of time. If the intention is to provide some scale by which a correctly proportioned cockpit is built into the design, this also seems doomed to failure : in at least one team racing design so far seen, the pilot's head and shoulders are of such a size that his seat should rightly be rubbing on the ground while his feet are in the propeller.

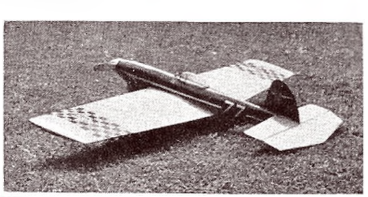
The full-size *Goodyear* type racer has been frequently mentioned as providing suitable prototypes on which

to model team racers and a brief glance at the requirements of the *Goodyear* specification will show how this is so. Under these rules the *Goodyear* Trophy racers, which are limited to a certain engine capacity and specification, while the aircraft itself has to fulfil certain requirements as to wing area, etc., have developed into compact, well-streamlined aircraft which, for their overall dimensions thus have a relatively generous wing area. Model team racers, which are similarly restricted as to engine capacity and also have to possess a certain minimum wing-area are, therefore, generally more suited to scale designs of this type than, say, to a clean, well-streamlined military aircraft such as the *Spitfire* or *Mustang*. The weight of a model of the latter type, even if suitably scaled to give a minimum of 125 sq. in. wing area, is almost certain to be greater than that of a suitable *Goodyear* design of similar area. Moreover, the wide use of horizontally-opposed engines in the *Goodyear* machines automatically solves the problem of the cowled engine required under team racing rules since a normal sidewinder can be used whereas, in the case of the Spitfire, a relatively larger model would be required to enable even the most compact engine to be cowled within its slim nose and would inevitably result in reduced performance.

It has been suggested that the "fully cowled engine" rule should be waived in the case of side-mounted engines, although why this should be so is not clear. True, to the pilot, the appearance, in flight is of a fully cowled engine since he cannot see the cylinder, but the sight of one bare cylinder protruding from the side of the model must surely look rather odd to the uninitiated and a good deal less "scale" than an upright or inverted engine.

Admittedly, this rule virtually eliminates scale models with the *Spitfire* type nose but there are, after all, scores of designs from which to choose, using either the horizontally opposed type cowled engine or in-line engines, inverted or upright such as the *Mew-Gull*, *T.K.2*, etc., if one wishes to use a strictly scale model.

Obviously, much of the success of a team racer must depend on the engine used. Once a race is under way, it is the model which will fly the greatest number of laps on its 30 c.c. tank, in the shortest possible time, combined with the least possible time wasted on pit stops, that will (pilot skill permitting) win the race.



"Yulupa" built by John Chinn to the author's design. (See July "Model Aircraft"), but with "Bill Dean" fin and less flaps

TABLE 2.—TEAM RACING—RELATIVE SPEEDS

10-mile course

Allowing one minute for each pit stop, including deceleration, landing, re-fuel, re-start, take-off and pick-up flying speed.

Flying speeds required to complete course

To complete course in	No. of Pit Stops (1 min. each)							Average Course Speed
	—	1	2	3	4	5	6	
Min sec	m p h	m p h	m p h	m p h	m p h	m p h	m p h	m p h
10 00	60.0	65.6	75.0	85.7	100	—	—	60.0
10 30	57.1	63.2	70.6	80.0	92.3	—	—	57.1
11 00	54.5	60.0	66.6	75.0	85.7	100	—	54.5
11 30	52.2	57.1	63.2	70.6	80.0	92.3	—	52.2
12 00	50.0	54.5	60.0	66.6	75.0	87.5	100	50.0
12 30	48.0	52.2	57.1	63.2	70.6	80.0	92.3	48.0
13 00	46.1	50.0	54.5	60.0	66.6	75.0	87.5	46.1
13 30	44.4	48.0	52.2	57.1	63.2	70.6	80.0	44.4
14 00	42.9	46.1	50.0	54.5	60.0	66.6	75.0	42.9
14 30	41.4	44.4	48.0	52.5	57.1	63.2	70.6	41.4
15 00	40.0	42.9	46.1	50.0	54.5	60.0	66.6	40.0

To cover many laps with a minimum number of re-fuelling stops at high speed will call for high power output and moderate fuel consumption. To ensure a rapid getaway after re-fuelling, will demand reliable and instant starting and minimum re-adjustment to controls. Not many engines combine all these useful qualities in adequate measure and already the most suitable types are being quickly proved so that only a handful of types, from the larger number of engines currently in production are likely to offer serious competition in team racing in the immediate future.

Of all types available, a good powerful petrol engine, *running on petroil fuel* offers by far the best fuel consumption figures for the power delivered, and, even with a 5 c.c. type, may run through a race with only one re-fuelling stop. The disadvantage, of course (and this probably accounts for their lack of popularity for team racing the U.S., despite the abundance of good spark ignition engines available there) is that of the extra weight of the ignition gear (including a battery of adequate capacity to last the race) which, with the lightest of 5 c.c., 125 sq. in. models would account for a total increase in weight of anything up to 50 per cent.

It is possible, however, that some advantage might be gained with certain glow-plug engines, by running them on petrol base fuels, such as Mercury No. 4, in place of the usual methanol racing fuels. Power, of course, would be somewhat down on that obtainable with methanol—possibly as much as 1,000 r.p.m. down at high speeds—but there would be a substantial gain in range which might more than compensate this.

The possibility of modifying fuels to decrease consumption, in fact, should not be overlooked. Normally, the better quality commercial fuels contain more lubricant than is absolutely essential for anything less than peak revs with a racing engine. The 28-30 per cent lubricant content often specified for high-performance racing engines can usually be quite safely reduced to 25 per cent and for team racing revs (say, 10-12,000 r.p.m.) some experiment with an even lower lubricant content may prove worth while. It is interesting to note that the makers of the Dooling "29," the most powerful of current 5 c.c. engines, now specify a 20 per cent. castor oil fuel.

The importance of efficient pit drill will become increasingly evident in future events. The fact that a 10 mile race is completed in a comparatively short time—12 minutes for an average speed of 50 m.p.h.—allows no time to be wasted during re-fuelling stops, especially if the stops are numerous. This will be apparent from a glance at Table 2.

In this table, one minute has been allowed for each stop. This includes deceleration after the motor cuts, landing, "collection" by the team mechanics, re-fuelling, re-starting, take-off and acceleration up to flying speed again. One minute may not seem very long, but when one considers that pit stops in Grand Prix car racing are frequently of considerably less duration, during which time 30 or 40 gallons of fuel may be taken on and, possibly wheels changed or a minor adjustment made—and this for a race generally lasting 3 hours or more with seldom more than one or two stops per car—the time which is lost on team racing pit stops appears vastly out of proportion to the actual time in the air.

A 5 c.c. model capable, say, of 75 m.p.h. and needing four stops will, at one minute per stop, will take 12 minutes to complete the course at an average speed of 50 m.p.h. In other words, one-third of this time is lost on the ground. If, on the other hand, pit stops can be reduced to three, or, alternatively, each stop cut to an average time of 45 seconds, the average course speed will be raised to 54.5 m.p.h. and the 10 miles completed in 11 minutes.

At the moment, the range of the average team racer does not appear to be as good as it might be. No model should require refuelling more than four times in a 10-miles race. More powerful engines like the Eta "29" and Frog "500" will require re-fuelling most frequently, of course, but, even so, should cover about 2½ miles per tank with a well streamlined model using suitable airscrews and fuels. It should, in fact, with due attention to these latter items, be possible to get in 10 miles with a few laps to spare on four tanks, necessitating only three stops.

Similarly, a good Elfin 2.49 powered model should do the course with only two stops and this engine, which rates highly among diesels on a power-fuel consumption basis, may well rival the bigger 5 c.c. glow-plug engines which, following American tendencies, appear to have been the initial choice of team racing enthusiasts. This is obvious when it is observed that an Elfin team racer capable of 70 m.p.h. and such a speed is within the capabilities of a good example in a clean model) and able to complete a 10-mile course with two-three stops, will only be beaten by a bigger model requiring three-four stops, if the latter's speed is 80 m.p.h.

Fuel Feed Troubles

Mention has been made of a tendency, experienced with a Frog "500" *Stunt-King* installation, towards richening up and thus loss of power, in level flight. This is a trouble which, apparently, has been encountered in many quarters and can normally be traced to a lack of appreciation of the fundamental principles governing tank installation. The importance of correct tank positioning assumes

An E.D. "Radio Queen" R/C model built by V. Theobalds, competition secretary of the Norwich club.

added importance where a model is lapping in less than about 4-5 sec., as in the case of a 60 m.p.h. model on 60 ft. lines.

It should be remembered too, that some engines are more tolerant to variations in fuel feed than others and a tank location which may have proved satisfactory for one installation, may be entirely unsuitable if a different type of engine should be fitted to the model.

In the past, it has usually been thought that a slight increase in jet opening, over and above that at which maximum revs. are attainable on the ground, was necessary to make up for the reduced load in the air and to obtain best performance. An alternative adjustment with diesel engines has been to increase compression very slightly. This assumption is quite correct if one also assumes that the pressure at which the fuel reaches the jet remains approximately constant. With the modern high-speed C/L model, this is seldom the case. A better appreciation of the position will be gained if one remembers the extremely critical situation in regard to speed models where, despite specially shaped and positioned tanks, a proportion of the flight is usually wasted prior to the fuel level dropping and the critical mixture strength for maximum power being reached.

Different types of engines also respond differently to changes in mixture strength, diesels generally being a little more tolerant in this respect than glow-plug engines. In addition, one type of glow-plug engine may operate over a wide range of mixture strength ratios with only slight loss of power, whereas another engine may "four-stroke" or cut out quickly if any deviation from a limited mixture strength range is permitted. Different types of fuels, too, can make an appreciable difference.

The Frog "500," which is noted for its unusual flexibility, a useful quality for free-flight work, gained by its ability to "four-stroke" evenly on an increased mixture strength, does demand rather careful positioning of the fuel tank to obtain even two-stroking throughout C/L flight. This engine, of course, has an upright venturi above the main bearing, and, as side-mounted in the *Stunt King*, this results in the jet being placed about 1¼ in. to the offside of the approximate centre-line of the balloon tank as positioned for the original Yulon installation.

As has been pointed out many times, any lateral adjustment in relation of fuel level to jet position is

Taking a rest from power, the writer's brother holds aloft his F.A.I. sailplane. Span 9 ft. Weight 60 oz. Wing section MVA 301.

multiplied in the air, by centrifugal force. Thus, in the example above, the actual effect, in level flight at 60 m.p.h. on 55 ft. lines, would be to pressurise the feed to the jet about $4\frac{1}{2}$ g and, with a full tank, would be the equivalent of a gravity feed on the bench, of not less than $6\frac{1}{2}$-7 in.

Experiment with the Frog " 500 " in the *Stunt King* has shown that the best performance is obtained by placing the centre-line of the balloon tank slightly to the outside of the jet. The initial modification was to transfer the tank from the near-side of the fuselage to the offside, which did result in a definite improvement. The next step consisted of building a " bulge " on the side of the fuselage so that the tank could come over still farther. This resulted in even two-stroking in all attitudes except level flight. Finally, the tank was enclosed in a $1\frac{1}{4}$ in. diameter tube projecting about 1 in. and strapped to the fuselage side, which completely cured the trouble.

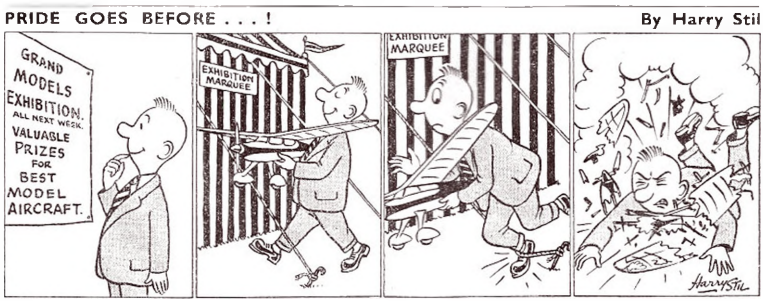
This final position means, as already stated, that the centre-line of the tank is now actually outside the jet line, and this would, under centrifugal force, be expected to give a negative pressure, thus tending to starve the engine, although such a tendency is not evident in flight. The reason for this is not clear, but it is thought that a slight flattening of the balloon tank under centrifugal force may be causing a small compensating pressure. In this case, the need for such drastic measures, particularly unwelcome in the case of a semi-scale model, as placing most of the tank outside the fuselage would be lessened by using a standard metal tank. Alternatively, a cowling of the type used on full-size horizontally-opposed lightplane engines, extending back to enclose the tank, could be used.

Again, the possibility of using an upright or inverted engine installation should not be overlooked, and, in this case, it should be possible to enclose a suitably shaped tank entirely within the width of the fuselage without risk of fuel feed troubles. The objection sometimes heard that upright engines will not stunt so well as side-mounted units is not, in the writer's opinion, a valid one and such troubles as do arise with upright or inverted units, can usually be traced again to tank location relative to the jet and are not in any way due to any mechanical difficulties of making a properly balanced i.c. engine function equally well upright or inverted.

So far, we have only mentioned difficulties arising from an excessively rich mixture being generated. Precisely the opposite effect, i.e., a tendency to misfire or cut out in the air, can result from placing the tank too far to the offside in relation to the jet. This trouble is frequently noticed with models where the carburettor intake and jet is below the main bearing, i.e. on the nearside when side mounted.

Here, of course, centrifugal force creates a negative pressure and a slight trouble in this direction was, in fact, at first encountered with the Elfin *Junior-Monitor*. With this model in level flight at over 70 m.p.h. on short lines, a c.f. of nearly 8 g. was being exerted, but by careful adjustment of the control and the use of a tolerant fuel, the characteristic " blipping " of the engine in high-speed level flight, often noticed with other models having similar installations, was eliminated.

PRIDE GOES BEFORE . . . ! **By Harry Stil**

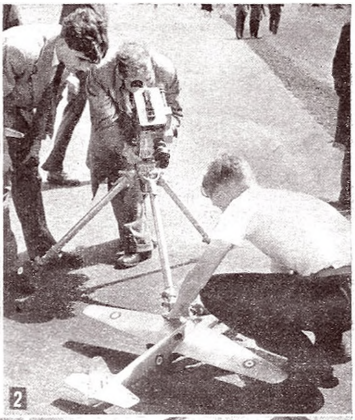


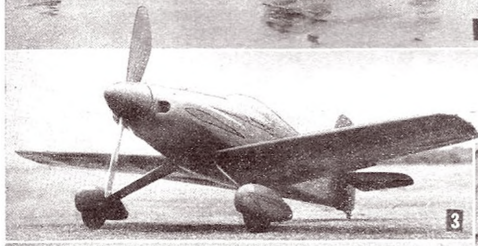
All Herts Rally

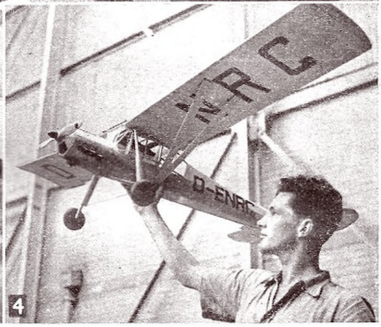
at Radlett

organised by

St. Albans M.A.C.







(1) Heavy rain showers spoilt what would have otherwise been an excellent meeting. This photograph was taken during the running of the team racing event and gives a good idea of the prevailing weather conditions.

(2) A newsreel camera-man taking shots of L. Gray, of the Ruislip M.A.C., and his Short Sturgeon control-liner. Powered by two E.D. 2.49 c.c. engines, it flies at 70 m.p.h.

(3) An Amco 3.5 c.c. powered Long Midget by P. Donavour-Hickie, of Horley, Surrey, which attracted a good deal of attention.

(4) N. Griffiths, of the Grays and District M.A.C., with his Fieseler-Storch model. The model is later to be fitted with radio control and is powered by a Kemp 4.4 c.c. diesel.

(5) In between the showers, one of the competitors, in the exciting team race contest, prepares to launch his model.

(6) A small corner of the hangar which provided a welcome shelter from the elements for the contestants and their models.

(7) Competitors lining up at the control tent to enter the Concours d'Elegance.

Northern Notes

★ THIS COLUMN seems to be causing quite a furore in the Northern Area, people are going around at all the meetings and saying "is it you?" But no-one yet seems to have hit upon the right chap : 50 per cent. of the area say its Sam Messom, but how can Sam write a column when he has to pay a secretary to write out the area minutes each month? (See your copy of the minutes of the last A.G.M.) A lot more think its Vic Duberry, but Vic strenuously denies it, and says he would never call himself "up and coming." MacLeod of Hull Pegasus has a lot of supporters; a dark horse this chap, "works" for the British Railways so should have plenty of time. The Bradford club have narrowed it down to someone who attended the Bradford club dinner—but is it? Trevor Heselwood of York has already written two novels so a few words a month shouldn't cause him much trouble ; Harry Clegg seems to get around most of the meets ; Trevor London has a nice line in beautiful agents and Henry Tubbs seems to be here there and everywhere. I'll tell you all one thing, don't let a camera fool you. The photographs which appear in these columns seldom come from your Northern Notes scribe.

If you have any news you think would be of interest—any funny happenings or even *faux pas* in your club write to Mr. Nobody, care of the Editor. This column will always support the right, but no personal grievances please.

➢ ➢ ➢

★ WHETHER PREVIOUS remarks made in this column had anything to do with it I cannot say, but I see the York club, through the stout efforts of Harry Johnson, gained themselves a spot of limelight and a National record, by a fine Tailless Glider flight of 10 min. 44 sec. I understand this is Mr. Johnson's first attempt at a "flying wing" but I am informed that it is an extremely stable job. Released at only 50 ft., the model commenced to gain height immediately, and soaring in very small circles, remained in sight for all but a few seconds of its flight. The model is a very simple one, tongue and box fixing wings with a Clark Y section changing over to a Clark YH reflex section at the tips. The only alteration from the planned model was the addition of a little tail area to counteract some instability on the line.

➢ ➢ ➢

★ I SPENT a very enjoyable day at the Wakefield Rally on June 18th ; it would have been nicer if the weather had been a little finer, but as usual, we had to have a wee drop of rain. It was quite a change to be on a flying ground with a view instead of the usual desolate airfield. The meeting was very well organised and run, apart from one or two of the spectators getting tied up in the towlines (it's about time the standard towline was specified as white) and most of the competitors got in their flights without a long wait. I am sure the Wakefield club will permit one small but constructive criticism. I did not like their method of issuing numbered tickets in lieu of competition cards. It meant a timekeeper had to remember the correct number during the flight, and in some cases it proved a little difficult, since the competitor, complete with number, had disappeared in charge of the model when the timekeeper was ready to check the flight in to control. Also some entries had three and four different numbers pinned up, all adding to the confusion. The club sec. "Slim" Shiihto made himself busy, and the club a bob or two, by taking a leaf out of "Fiddler" Messom's book and disposing of a baby *Spitfire* to both willing and unwilling participants, and even, by some strange feat of legerdemain, managed to sell the maestro himself a ticket. Deserves the O.B.E. by gad! Vic Duberry, flying his new Wakefield took the rubber competition followed by Henry Tubbs and Ted Muxlow. This was Vic's first competition flying the new model, and this is one that has flown straight off the drawing board, not the slightest mod having been necessary to the prototype. (At least so my spies inform me.) Why didn't you take this one down to the Finals, Vic? Chas. Exley had no trouble in the Glider competition, beating his nearest rival, North, of Halifax, by a

clear minute. Walker, another of the Sheffield stalwarts, coming in third. The West Yorks club cleaned up the power event, Preston, C. Farrance and W. Farrance finishing one, two and three respectively whilst Cook, of Rotherham, gave out with some Gold Trophy style to walk away with the control line competition. The West Yorks club had another prizewinner in young Headley who took the prize for the best Junior. Altogether members of 16 clubs took part in the competitions, the Wakefield members standing on one side entirely to take care of the visitors. Special mention is due to the recovery squad provided : during the afternoon they performed a sterling job and many a competitor found his model being returned before he was himself half way to the landing spot. Many thanks, Wakefield, for a good day out, I shall certainly come again next year.

➢ ➢ ➢

★ IT SEEMS a lot of criticism and suggestions for these Area events are circulating around, next month I hope to deal with them at greater length. In the meantime I hope all clubs will bear in mind the Area Semi-Centralised events at Clifton on September 3rd. The Area Open Rally at Baildon on September 10th (clubs are reminded that a little help with the prize list would be appreciated) and the Huddersfield A.L. Rally at Huddersfield on August 27th.

➢ ➢ ➢

★ ANOTHER NATIONAL record went to the wall at the Beverley Rally at Leconfield on July 2nd, when W. Hancock's (Creswell) O.D. Nordic broke 26 min. This model was timed o.o.s. but a few minutes later due to a wind change came back across the 'drome and was observed for another 30 minutes. One of the Creswell recovery squad, who incidentally uses the model recovery work as part of his training for cross country running, came back eventually after being underneath the model for well over an hour, and reported that it still showed no signs of coming down when he last saw it. The Beverley Rally deserved more support than it got, only about six clubs turning out for a well run Rally on a remarkably fine airfield. I agree that Leconfield is a little out of the way for a lot of the clubs in the area, but if the Creswell club could make the journey then so could a lot of others much nearer. Clubs must remember that if they expect support at their own rallies, they in turn must support the others. The Leeds pair, Vic Duberry and Henry Tubbs, again took first and second place respectively in the rubber event, with two flight aggregates of 452 and 328 sec., followed by F. Warren, of Goole, with a 328 sec. aggregate. D. Twist, of Scarborough won the Glider event and K. P. Jefferson, also of Scarborough, the open power. R. T. Mander, of the Woodlands club was putting in some nice steady flying with his R/C glider and G. H. Harrison's rubber canard was showing promise. Harrison puts a lot of work into canards and we will, no doubt soon be seeing another National record within the area.

➢ ➢ ➢

★ I WAS informed that the support given to the Area Control Line Competitions at Rotherham on July 9th, was little short of disgraceful. The Rotherham club had put a great deal of work into the organisation of this meeting and the facilities available were much better than at any previous semi-centralised event. The total entry of 16, nine speed and seven stunt reflected very poorly upon the remainder of the area members and I understand that one club turned its back in no uncertain fashion by attending a rally outside the area altogether. A poor show this, 16 entries from nearly 40 clubs ; people ask for control-line events and when a good one is arranged do not bother to support it.

The best times recorded were :—

Class 1 G. H. Wilkins, Sheffield 66.56 m.p.h.
Class 2 Miss B. McCann, Worksop 63.63 ,,
Class 3 Harry Clegg, Sheffield 90.00 ,,

P. G. Russell, of Worksop, beat R. Cooke, of Rotherham, in the Stunt event by the narrow margin of 6 marks, J. Swift, of Sheffield coming a very close third.

➢ ➢ ➢

★ MR. NOBODY wants to know . . .

Who was it in the Huddersfield club went to the Nationals and never opened his box ?

Why does Peter say he would welcome with open arms an amalgamation of all the clubs in the district ? It doesn't tally with what we heard about a half empty coach earlier this year.

Why do some clubs prefer the seaside air of Lancashire to the good old Yorkshire variety ? Even to the extent of ditching an Area meeting.

And oughtn't they to send a few sticks of rock to the Rotherham club, just as a token gesture ?

Two nice looking models from Rotherham. Miss M. Leadley and E. Ruston's Amco powered speed job.

Correspondence

● *The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters*

CENSUS SUGGESTED

DEAR SIR,— Across the Atlantic a well organised census of opinion is in course of being conducted by your contemporary, *Model Airplane News*.

May I suggest we await the outcome of this census and upon it base our future contests, or alternatively, conduct a census of our own, in order to furnish our contest committees with first hand information concerning the type of contest required to suit the aeromodelling public?

These last two words cover a large number of young and old people all interested in the hobby, some may have large resources, many have not, but we all fly for the love of it, I myself after twenty years still do, and the number of contests I have entered can be counted on the fingers of my left foot. It is this large body of people that the trade supplies with materials and to whom the trade is also dependent upon for its continued existence. It is essential, therefore, that if the hobby is to grow, it must be fostered, by educational authorities, by the formation of new clubs at easy rates, and formulation of rules to suit the newcomers, either by age grouping or special events, or as the ruling body decides.

With regard to the correspondence in your July issue on mechanical starters; I agree with Mr. N. G. Taylor entirely, the only reason I do not use a starter is that I use "Shanks's Pony" a lot, and a power starter can be very heavy. However, hand-starting my McCoy 60, 49, etc., presents no difficulty, as any of my club members will testify.

Finally, a tip for team racing fuel. I have found that Barron nitropropane, petrol and oil, mixed to suit the engine, gives a fine needle setting and increases engine run.

Yours faithfully,

Mansfield, Notts. A. R. SWANSTON.

"EXPERT" CLUBS DEFENDED

DEAR SIR,—I entirely disagree with your correspondent, "A. Cockney" ("M.A.", July) about the so-called "expert-only" clubs. Surely modellers are entitled to form the type of club which they consider caters best for their particular interest? If they decide to exclude from membership those who never build models or enter contests I think they are quite justified.

My experience of clubs with large memberships is that 90 per cent. of the members are so much "dead wood" who pay their subscription and wear a club badge but never do any active modelling or flying. At the club meetings, however, these individuals out-vote the keen contest fliers and it is hardly to be wondered at if the latter decide to leave these "debating societies" and form their own clubs.

The contest successes this season of members of clubs like the Zombies and Kentish Nomads surely justifies the existence of this type of club, which by their 100 per cent. support of S.M.A.E. contests *do*, in my opinion, further the aeromodelling movement.

Yours faithfully,

London, S.E.13. G. A. JONES.

Our correspondent's remarks concerning large clubs do not apply in every case. Probably no club has had more contest successes than the Croydon & District M.A.C., for example.—The Editor.

WAKEFIELD DRAW

DEAR SIR,—The amount of money raised by the Wakefield Draw (approx. £600, I believe) is very gratifying and the organisers are to be congratulated on this very fine result, which has enabled a British team of model fliers to be sent to Belgium, Finland and Sweden already.

May I suggest that it would be a good idea for the S.M.A.E. to publish a complete list of the number of books of tickets sold by each affiliated club. We should then be able to see which clubs have pulled their weight and which ones have "let the side down," as it were. I feel sure that we would find this information very enlightening!

As we shall have to send a Wakefield team to Finland again next year, why not organise another draw soon (preferably with tickets at 6d. each) to further strengthen the fund which is, so I understand, to be used for the sole purpose of financing the sending of British teams abroad?

Yours truly,

Eden Park, Kent. A. M. LEWIS.

WAKEFIELD TEAM SELECTION

DEAR SIR,—The article entitled "The Wakefield Trials Analysed," which appeared in the August issue of MODEL AIRCRAFT, made very interesting reading and provided much food for thought.

It seems obvious that if we are going to bring the Wakefield Cup back from Finland next year we must have a team of fliers whose models will be capable of making long *non-thermal* flights. Will we get such a team by our present selection methods? I doubt it. It might be better to hold the final trials either very early in the morning or late at night when there would be less likelihood of thermals.

The writer of the article very rightly drew attention to the big difference in the minimum qualifying times in the area trials and it seems all wrong to me that fliers in, say, the London area, should be eliminated from the final "100" to make room for those from other areas who have put up very much lower times. Personally, I would like to see the team chosen by a Selection Committee of experts, as is done in other sports, but I must admit that there would not be a great rush to serve on such a committee!

Yours faithfully,

London, S.E.8. "JONAH."

The Yulon "49"

(Continued from page 319)

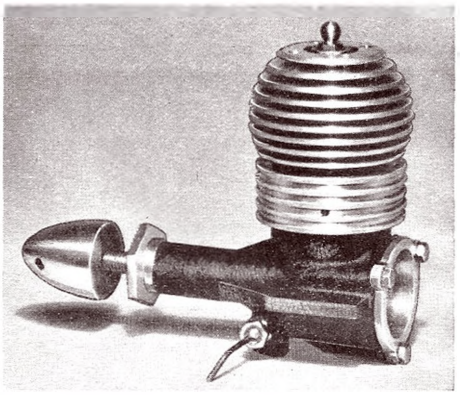
shows a projected power curve based on the approximate b.h.p. increases for a production model.

The test engine, it was noted, lost none of the earlier Yulon models' easy starting qualities and while, as might be expected, vibration was somewhat greater than with the smaller 5 c.c. engines, the "49" performed smoothly at all speeds.

On the torque-reaction dynamometer, the lower b.m.e.p. values developed by the test engine were evident in a maximum torque of 0.27 lb. ft. being registered while the torque curve began to drop off a clear 1,500 r.p.m. earlier, and its decline was steeper, than the "29." An output of 0.53 b.h.p. was indicated, this being equivalent to 67 b.h.p. litre as compared with 74/79 b.h.p. litre obtained during various tests of the 5 c.c. Yulons, on the same fuel, while the peak was reduced from 13 13,500 r.p.m. to slightly below 12,000. Both these reductions would, of course, result from a loss of volumetric efficiency due to the restricted induction of a small choke tube.

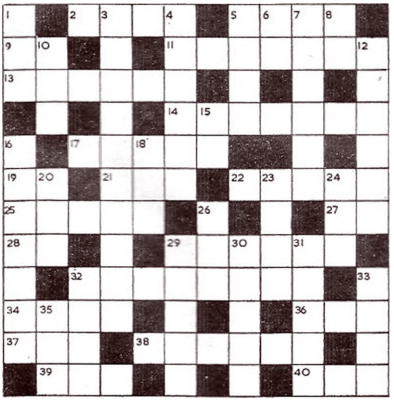
Needless to say, even on this performance, the Yulon "49" shows an exceptional power to weight ratio—actually the highest of any engine so far dealt with in this series. Its weight, in fact, is only 1¼ oz. more than the "29" and "30" and, with almost identical external dimensions, will fit into any stunt model designed for the "29" or "30" with little or no modifications. Alternatively, for those who desire to utilise its power in a larger machine, rather than in extra speed, a 25-30 oz. model with 350-400 sq. in. wing area is feasible for this engine

Power Weight Ratio (as tested) : 1.3 b.h.p./lb.
Power Displacement Ratio (as tested) : 67 b.h.p./litre.



M.A. Crossword

Compiled by J. C. Snell



ACROSS

2. Engine in a coma.
5. Journal of the same.
9. Thirty-nine comes between.
11. Heavenly direction.
13. Triangular strengthener.
14. Touchdown outside the bedroom.
17. Lead in this wood.
19. Neutral point.
21. Wot! No line.
22. Not here —no, . . .
25. Foxy frog.
27. Outside diameter.
28. Begins another.
29. Good French engine ?
32. Reason for lubrication.
34. Consuming power plants.
36. End of a flying surface.
37. Sheepish jet.
38. Cosh, for example.
39. Engine with a sting.
40. Can't live without it.

DOWN

1. Tattered tissue.
3. Prototypes by Dumas
4. Dean's fugitive
5. Last song.
6. Moment arm.
7. Reach or attain.
8. Make thirty-nine.
10. This engine is O.K.
12. Bad covering, so it . . .
15. Aspect ratio.
16. By Keil and North American.
18. Professorial kitters.
20. Modeller's pointed friend.
23. Flying tramp.
24. Name for warlike writer.
26. Low altitude.
29. A dise proves harmful.
30. English elevators.
31. Mostly against.
32. . . . is the spur.
33. With wing, often less.
35. Trimmer.

(Solution on page 339)

S.M.A.E News

WAKEFIELD TROPHY CONTEST

21 - 23 July, Jamijarvi, Finland

RESULTS

1.	A. Ellila	Finland	732.1
2.	E. W. Evans	Great Britain	660.0
3.	A. Leardi	Italy	644.8
4.	P. W. Seton	Holland	619.6
5.	H. R. Stevens	Great Britain	618.4
6.	L. L. Salisbury	U.S.A.	606.0
7.	S. Lustrati	Italy	597.7
8.	B. Bachli	Switzerland	597.1
9.	E. Sadorin	Italy	573.4
10.	R. H. Warring	Great Britain	553.7
11.	A. Blomgren	Sweden	548.6
12.	S. Stark	Sweden	531.2
13.	G. Dijkstra	Holland	494.3
14.	J. B. Knight	Great Britain	491.2
15.	P. Follet	Belgium	484.1
16.	J. Morisset	France	466.7
17.	P. Deschepper	Belgium	463.0
18.	A. Dijkstra	Holland	420.2
19.	R. G. Schmitt	U.S.A.	419.0
20.	E. Fresl	Yugoslavia	417.6
21.	A. Bernard	France	415.5
22.	G. Lippens	Belgium	406.0
23	H. Eriasson	Sweden	399.5
24.	T. Haslach	Switzerland	383.0
25.	G. Fea	Italy	340.6
26.	I. H. Wood	Canada	339.6
27.	T. Silmunen	Finland	330.9
28.	F. Takagi	U.S.A.	328.6
29.	A. Butler	Australia	324.1
30.	D. Kapic	Yugoslavia	323.4
31.	L. J. Walter	Canada	319.4
32.	R. Breznikar	Yugoslavia	318.8
33.	S. Blomberg	Sweden	316.8
34.	H.Wannberg	Sweden	316.4
35.	D. R. Kennedy	New Zealand	312.7
36.	A. Johansson	Finland	288.1
37.	I. J. Adams	Great Britain	280.8
38.	J. L. Pitcher	Great Britain	280.3
39.	F. D. Bethwaite	New Zealand	265.5
40.	A. Birkel	Switzerland	260.6
41.	J. Bouche	France	252.7
42.	B. B. Marsh	New Zealand	244.2
43.	S. Bernfest	Yugoslavia	242.7
44.	A. Kivikataja	Finland	236.1
45.	W. R. Mickelsen	U.S.A.	234.9
46.	E. Gerland	France	232.9
47.	R. Aubertin	Monaco	208.0
48.	J. Prhave	Yugoslavia	194.7
49.	J. S. Petersen	Denmark	173.0
50.	L. Santalala	Finland	164.3
51.	H. Orvin	Norway	163.2
52.	A. W. Leftwich	U.S.A.	162.5
53.	A. Hakanson	Sweden	156.6
54.	Y. Joostens	Belgium	151.6
55.	C. A. Ford	Canada	124.2
56.	M. Beaujean	Belgium	119.8
57.	M. Ferber	Belgium	117.0
58.	C. J. Petersen	Denmark	108.6
59.	A. Meader	Australia	56.4
60.	L. Kanneworff	Italy	2.8
61.	R. Hansen	New Zealand	0.3
62.	R. Maret	Switzerland	0.0
	R. Wallenius	Finland	0.0

BRITISH NATIONAL RECORDS

as at June 30th, 1950

OUTDOOR

(Minimum F.A.I. Loading)

Rubber Driven				
Monoplane	Boxall, F. H.	Brighton	35 : 00	
Biplane	Young, J. O.	Harrow	31 : 05.125	
Wakefield	Boxall, F. H.	Brighton	35 : 00	
Canard	Paveley, D.		1 : 37.1	
Scale	Marcus, N. G.	Croydon	5 : 21.75	
Tailless	Boys, H.	Rugby	1 : 24.5	
Helicopter	Richmond, J. S.	Wolves	1 : 58.4	
Rotorplane	Crow, S. R.	Blackheath	: 39.5	
Floatplane	Parham, R. T.	Worcester	8 : 55.4	
Flying Boat	Rainer, M.	North Kent	1 : 09	
Sailplane				
Tow Launched	Best, F.	Leeds	63 : 46	
Hand Launched	Field, P. E.	Belfairs	7 : 05.2 *	
Tailless T.L.	Harris, L. C.	Croydon	10 : 30	
Tailless H.L.	Wilde, H. F.	Chester	3 : 17	
A.2 Nordic T.L.	Willmott, D.	Belfairs	10 : 52	*
A.2 Nordic H.L.	O'Donell, J.	Whitefield	2 : 07.5 *	
Power Driven				
A. (0-2.5 c.c.)	Springham, H. E.	Saffron Walden	25 : 01	
B. (2.51-5)	Dallaway, W. E.	Birmingham	20 : 28	
C. (5.01-15)	Lund, D. S.	Wakefield	6 : 46	
Tailless	Marshall, J.	Hayes	1 : 50.8	
Scale	Tinker, W. T.	Ewell	1 : 36.5	
Floatplane	Stainer, J. R.	Canterbury	2 : 59.4	
Flying Boat	Gregory, N.	Harrow	2 : 08.5	
Control-Line Speed				
I (0-1.5 c.c.)	Butler, D. C.	Surbiton	58.5	m.p.h.
II (1.51-2.5)	Free, D. W.	Surbiton	80.3	"
III (2.51-3.5)	Carter, S. G.	Croydon	89.1	"
IV (3.51-5)	Wright, P.	St. Albans	103.2	"
V (5.01-8.5)	Shaw, C. A.	Zombies	118.4	"
VI (8.51-15)	Taylor, N. G.	Wimbledon	132.6	"
VII (Jet)	Stovold, R. V.	Guildford	133.3	"

LIGHTWEIGHT

(Below F.A.I. minimum loading)

Sailplane			
Two launched	Mace, J. A.	Upton	28 : 17.2*
Tailless T.L.	Johnson, H. G.	York	10 : 44 *
Power Driven			
Class C	Ward, R. A.	Croydon	5 : 33 *

Note.—Lightweight categories were instituted January 1st, 1950.

INDOOR

Free Flight			
Stick (H.L.)	Copland, R.	Northern Hts.	18 : 52
Stick (ROG.)	Mackenzie, R.	(Deceased)	8 : 42
Fuselage (H.L.)	Parham, R. T.	Worcester	6 : 55
Fuselage (ROG.)	Parham, R. T.	Worcester	6 : 42
Tailless (H.L.)	Thomas, M. R.	Oldham	1 : 25.8
Tailless (ROG.)	Thomas, M. R.	Oldham	1 : 46.2
Helicopter	Ward, S. A.	Ashton	2 : 00
Rotorplane	Mawby, L.		: 32.2
Round-the-Pole			
Class A	Moxlow, E. C.	Sheffield	6 : 05
Class B	Parham, R. T.	Worcester	4 : 26
Speed	Jolley, T. A.	Warrington	42.83 m.p.h.

All records marked * are subject to ratification.

British Records for Ratification

A/2 Glider—Tow launched. R. C. F. Day (Portsmouth and D.M.A.C.), 23/4/50, 7 min. 50.8 sec.

A/2 Glider—Tow launched. D. Willmott (Belfairs M.A.C.), 13/5/50, 10 mins. 52 sec.

A/2 Glider—Hand launched. D. Willmott (Belfairs M.A.C.), 7/5/50, 1 min. 12.9 sec.

F.A.I. Glider—Hand launched. P. F. Field (Belfairs M.A.C.), 7/5/50, 7 min. 5.2 sec.

Lightweight Glider—Tow launched. J. A. Mace (Upton M.F.C.) 16/4/50, 28 min. 17.2 sec.

Record Applications Recorded.

Helicopter—Rubber-driven. J. F. Tanguey (Croydon and D.M.A.C.), 2/7/50, 2 min. 43.75 sec.

A/2 Glider—Tow launched. W. S. Hancock (Creswell and D.M.A.C.), 2/7/50, 26 min. 0.9 sec.

A/2 Glider—Hand launched. J. O'Donnell (Whitefield M.A.C.), 4/7/50, 2 min. 07.5 sec.

Lightweight Glider—Hand launched. J. O'Donnell (Whitefield M.A.C.), 1/7/50, 2 min. 56 sec.

Lightweight Tailless Glider—Tow launched. H. G. Johnson (York M.A.S.), 25/6/50, 10 min. 44 sec.

C/L Speed—Class IV. P. Wright (St. Albans M.A.C.), 18/6/50, 103.2 m.p.h.

Class "A" Power. W. Archer (Cheadle and D.M.A.C.), 2/7/50, 31 min. 05 sec.

Class "C" Power—Lightweight. R. A. Ward (Croydon and D.M.A.C.), 25/6/50, 5 min. 33 sec.

Merit Certificate Awards.

Class "B" No. 366 J. A. Gorham (Ipswich), No. 372 G. A. Paxman (Huddersfield). Class "A" No. 378 D. F. Gordon (Sheffield), No. 379 W. Airey (Kendal), No. 380 R. V. Jenkins (Swansea), No. 381 B. T. Fowler (Cheadle), No. 382 H. N. Kenward (S. Birmingham), No. 383 C. M. Cross (Erdington), No. 384 D. G. Bridie (Erdington), No. 385 W. J. Denison (Wakefield), No. 386 T. A. Cropper (Whitefield), No. 387 D. A. Headley (W. Yorks), No. 388 P. Berthelsen (W. Coventry), No. 389 W. Archer (Cheadle), No. 390 J. G. Joyce (Leeds), No. 391 S. M. White (Evesham).

STOP PRESS

NORDIC A 2 INTERNATIONAL CONTEST RESULT

1. Sweden ...	2504	(Avg. top 3 team members)
2. Finland ...	2171	
3. Denmark ...	2131	
4. Norway ...	1964	

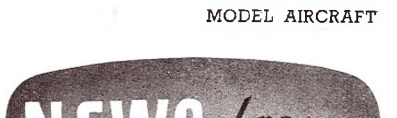
Individual Placings

1. Bernfest, Stjepan	Yugoslavia	920
2. Oderman, Ragnar	Sweden	903
3. Hansen, Arne	Denmark	867
4. Hagen, Knut	Norway	850
5. Persson, Lennart	Sweden	831
6. Bennett, J. M. G.	Great Britain ...	782

British Team—J. M. G. Bennett 6th, T. Bootland 15th, R. Hinks 19th, M. L. Hanson 24th.

M.A. CROSSWORD SOLUTION

1 R		2 A	3 M	C	4 O		5 S	6 M	7 A	8 E				
9 A	10 C		U		11 U	P	W	A	R	D	12 S			
13 G	U	S	S	E	T		A		R		A			
	B		K		14 L	15 A	N	D	I		N	G		
16 I		17 C	E	18 D	A	R			V			G		
19 N	20 P		21 T	O	W		22 T	23 H	E	24 R	E			
25 V	I	X	E	N		26 A		O		27 O	D			
28 A	N		E		29 A	L	30 L	B	31 O	N				
D		32 F	R	I	C	T	I	O	N		33 S			
34 E	35 T	A	S		I		F		36 T	I	P			
37 R	A	M		38 E	D	I	T	O	R		A			
	39 B	E	E		S		S		40 A	I	R			



R.A.F. MODEL AIRCRAFT ASSOCIATION

Members of the clubs attached to the above Association are requested to note the following names and addresses of the Officers and Command representatives.

Chairman—W.Cdr. C. F. Pearce, Air Ministry, Room 514, Princes House, Kingsway, W.C.2.

Hon. Secretary—S/Ldr. F. D. Cable, R.A.F., Padgate, Warrington, Lancs.

Hon. Treasurer—F/Lt. T. C. S. Cooke, D.F.C., A.F.C., D.F.M., Headquarters, Transport Command, R.A.F., Bushy Park, Teddington, Middlesex.

Hon. Competition Secretary—F/Lt. A. F. Davidson, D.F.C., 5, Hyde Park, Knaresborough, Yorks.

Bomber Command—S/Ldr. Bussey, D.F.C., H.Q., B.C., R.A.F., High Wycombe, Bucks.

Fighter Command—S/Ldr. R. Courtney, D.F.C., H.Q., F.C., R.A.F., Bentley Priory, Stanmore, Middlesex.

Coastal Command—F/Lt. F. R. Davies, R.A.F., Calshot, Hants.

Transport Command—F/Lt. J. F. Manning, A.F.C., H.Q., T.C., R.A.F., Bushy Park, Teddington, Middlesex.

Flying Training Command—F/Lt. R. O. Van Cuylenburg, No. 7 F.T.S., R.A.F., Cottesmore, Nr. Oakham, Rutland.

Technical Training Command—S/Ldr. K. R. Cooper, H.Q., T.T.C., R.A.F., Bramptom Grange, Brampton, Huntingdonshire.

Reserve Command—F/Lt. H. H. Campbell, H.Q., R.C., R.A.F., White Waltham, Nr. Maidenhead, Berks.

Maintenance Command—S/Ldr. A. L. Arrow, H.Q., M.C., R.A.F., Amport, Andover, Hants.

H.Q. 90 Group—F.O. P. F. Belham, H.Q., 90 Group, "Danesfield," Medmenham, Marlow, Bucks.

R.A.F.O. Section—S/Ldr. F. G. Couch, M.B.E., D.F.C., H.Q., Officers' Mess, R.A.F., Bad Eilsen, British Air Forces of Occupation, c/o B.A.O.R., 1.

SOUTH MIDLAND AREA

The Royal Air Forces Association, Aylesbury & Halton Branch, in conjunction with the S.M.A.E. South Midlands Area have arranged a model flying meeting for Sunday, September 3rd, at the airfield R.A.F. Station, Halton, Aylesbury, Bucks.

Programme includes: National Contests, the "Farrow Shield," the "Model Engineer Cup" and the "Astral Trophy." Other contests will be the "Battle of Britain" cup, an open rubber duration contest which was instituted last year in a local meeting, and a control-line aerobatics contest. No trophy is offered for this contest, as yet, but other valuable prizes have been offered.

Enquiries: F. C. Newman (Hon. Secretary) R.A.F.A., Aylesbury & Halton Branch, 45, Russell Avenue, Aylesbury, Bucks.

ICARIANS M.F.C.

With the contest season now in full swing, there is the usual feverish atmosphere among club members to get their models finished in time for the imminent contests.

Several local events have been attracting the attention of the control-line exponents. On Whit Monday we helped out at a demonstration organised by the Luton club, providing judges for the stunt contest; following this up by giving stunt demonstrations.

Later some lads went over to give a stunt flying exhibition at a show put on by the newly organised Harlington club. With a free tea provided, and transport arranged, this event proved quite popular!

Although winning through to the Wakefield 100, no success came to Eric Smith in the eliminators, but we are pleased to see that Eric has now added the Weston cup to his Gamage cup success earlier this season.

There is still a lot of interest in ultra-large stunt models in the club, the only limiting factor being that there are not enough McCoy "60's" about!

We are competing in the West Essex Gala and Northern Heights Gala, and we also have an eye turned towards the area Control-line "do."

N.W. MIDDLESEX (THERMALEERS) M.F.C.

The Kingsbury and Edgware M.F.Cs have now amalgamated under the new changed Edgware name of North-West Middlesex (Thermaleers) M.F.C.

The secretary of this club is W. SKINNER, 57, Whistler Gardens, Edgware, Middlesex. Whilst N.W. Middlesex is the affiliated name, Thermaleers is the competition name and is displayed on most competition models.

The first competition entered by the club was the Hamley Trophy and our two entrants placed second and fifth. First place, D. F. Pepperell, 215 sec. off 15, 512 sec. off 12, 410 sec. off 20. Second place, G. V. Hollobon, 364 sec. off 20, 185 sec. off 20, 150 sec. off 20. Totals of 815 sec. and 699 sec. as the 5 min. flight rule applied Pepperell was flying a modified Elfin powered *Firecracker*. This was the same model with which he won the Keil Trophy whilst flying for Edgware.

WEST ESSEX AEROMODELLERS

The club's annual gala held at Fairlop was well supported, modellers came from far and near. The weather was kind though a bit gusty. Another speed record was broken by C. Shaw. The radio-control event went off without a hitch. The latest event team-racing made quite a stir with visiting modellers and mostly the public, who wanted more. Looks like becoming a popular event. Members of the above club are now going all out for team-race models and engines that run on excitement.

The W.E.A. thank all visiting modellers for their support, and those who helped.

SUNDERLAND AND D.M.A.C.

The first club event of the year, the Pott's Cup for F.A.I. gliders, has now been flown off. Weather was gusty, although sunny, and the breeze soon disposed of some of the "fair-weather floaters" that appeared. Times were not marvellous, but a good evening's flying was had, the eventual winner being the club chairman flying a Nordic of his own design. Mr. Stores was unlucky to lose his *Suntanvind* on his first flight, the model disappearing into the outskirts of Sunderland after 2min. 15sec. It was not found, in spite of a chase by road and shadowing from the air by an A.T.C. two-seater glider which was winched off at the same time!

Results: First J. Robson (Nordic) 155 sec. aggregate; Second W. Stores (Sunnanvind) 135 sec. aggregate; Third T. Short (Zephyr) 133 sec. aggregate.

The 64 in. wing of Mr. Robson's Nordic is in two pieces held together by yards of cellulose tape (as described in MODEL AIRCRAFT, May, 1950) without benefit of tongues or dowels. Twin towhooks are fitted, one on each bottom longeron.

G. Jackson recently set up a new club glider record of 3 min. 30sec. with his own-design F.A.I. model. The airfoil section is nothing more or less than a double-surfaced curved plate, but in good weather the performance is very satisfactory.

A small contingent represented the club at the N.E. Area Rally on Newcastle Town Moor on July 9th, 1950, and failing to achieve fame any other way managed to fly a pylon job into the ornamental lake half-a-mile away!

We have not yet tried team-racing, but have seen some "two in the circle" antics. Even with comparatively tame models like a *Radius* (Frog 180) and a *Skystreak* (Elfin 1.8) a lot of fun was had. The competition committee feel that a team-racing plan drawn round a maximum engine capacity of 2.5 c.c. would meet with favour, and are studying the idea.

CONTEST CALENDAR

Aug.	15th-25th	Eaton Bray Rally.
..	27th	Huddersfield Air League M.A.C. Rally.
..	27th	Merseyside M.A.C. Slope Soaring Meeting, Clwyd Hills, N. Wales.
Sept.	3rd	**AREA AUTUMN RALLY** **Farrow Shield.** Unres. Team Rubber. **"Model Engineer" Cup.** Unres. Team Glider. **Astral Trophy.** Power Ratio.
..	3rd	"Battle of Britain" Meeting, Halton Aerodrome, Bucks.
..	17th	**S.M.A.E. Cup.** Open Glider. D.C.
..	17th	**"Flight" Cup.** Open Rubber. D.C.
..	17th	**Frog Junior Cup.** Open Rubber. D.C.
..	17th	Portsmouth and District M.A.C., Southern Counties Rally, Thorney Island, Hants.
..	30th	Finals of International "Jetex" Contest, Fairlop Aerodrome, Essex.

S.M.A.E. CONTESTS IN BOLD TYPE

WEST YORKSHIRE M.A.S.

On April 18th members attended the Wakefield M.A.C. Gala and were well rewarded for their efforts. In the free-flight power event H. Preston, E. Farrance and W. Farrance were 1st, 2nd and 3rd respectively.

D. Headley, a junior who has only recently joined the club came out top in the Junior Glider event with three very creditable flights. Flying the club glider *Drambuie II* he has been putting up good times in all competitions entered.

The Farrance brothers have forsaken last season's ETA "29" powered Super Slickers in favour of an original which can well and truly be classed as a "hot model." Three models have already been built, two 45 in. versions for the ETA "29" and a 45 in. for the Elfin 1.8. With the 65 in. job W. Farrance clocked 700 odd sec. in the Hamley whilst the Elfin model was designed, built, trimmed and lost all within a week, the model since being recovered. This latter model has the fastest climb the writer has yet seen.

We got through the second round of the N.E. Area Knock-out competition without having had one job airborne. This isn't our idea of winning competitions and we are looking forward to the result of the next draw. It has been said that Leeds or Sheffield will win the Cup to which we reply "Tha won't win it bah't a feight."

WAKEFIELD (YORKS) MODEL FLYING CLUB

During recent months we have been absent from Club news columns but nevertheless not inactive. A successful Open Day was held in May and was attended by some 16 Northern clubs. D. S. Lund made an attempt on the Class C Power Record and was successful in a flight of 6 min. 46 sec. which has been duly accepted by the S.M.A.E., subject to the usual waiting period, as a new British record.

Items of general interest are a scale Seabee which is now completed and awaiting air test, club glider record now stands at 21 min. 29 sec. K. Battye (a junior member—and are the seniors' faces red!) Power record now 11 min. 38.4 sec. K. Leatherland with a Banshee powered by the new Elfin 1.49.

On June 18th members of 14 clubs attended our Open Day. In spite of poor weather conditions 400 competition flights were made. The best times put up were: Power, 540 sec.—Preston (W. Yorks). Glider, 581.3 sec. C. Exley (Sheffield). Rubber, 544 sec. V. R. Duberry (Leeds). The control-line stunt event was won by R. Cooke, of Rotherham, with a total of 318 points out a of maximum of 355.

YORK M.A.S.

Northern Notes has spotlighted York's small entry percentage into Decentralised Competitions, etc. Who is this guy anyway? I know of many Northern Area secs now undertaking strict security measures against likely personages, yet still he seems to circulate amongst us. Can it be that a viper has been reared in our Northern midst?

Seriously though, he seems to be bringing things to light that do need rectifying. Here's an answer to Northern Notes. Members have been visiting certain Rallies, and have had foul luck, and the bad weather has put paid to many a promising model. York, no different to any other club, carries "passengers", and it means that one idea of raising the club fees a trifle might weed 'em out, leaving the keen ones to carry on. Can it be that club facilities are *too easily available*?

Stan Williams won third prize at the Beverley & District Rally at Leconfield (poorly supported) while the Clot who ran a "free-flight" race car (Comp-Special powered) amongst other people's models doing wanton damage, was allowed to get away with it (Beverley stewards please note). At York, the other Sunday, Mr. H. Johnson's own design flying wing did 10 minutes 44 secs. being recovered in 4 hr.

Sam Messom will soon be back in flying trim with his own design Wakefield *Flying Fiddle* and the August Glider Meetings promise a grand battle for the Pickering Trophy and the Nordic Cup. York is to visit the Huddersfield Air Leagues Rally also in August. Transportation is the York boys' chief worry, as anyone, with outsize gliders knows. There were few entrants for the club's second round points comp., the position now being: T. Heselwood, 1,047.3; R. Hodgson 877; G. Caple 677.5; Mr. Cross 289; Mr. Messem 257; Mr. Sykes 243; Mr. Firth 233. (The last four did not fly the second round owing to holidays.) Sam Messom, Yorks chairman, held an inquest last Sunday regarding Northern Notes pointer to York. A competition committee is to be set up as a direct result.

SWINDON M.A.C.

In weather conditions which, normally, would have kept them grounded, members of the club worked hard to keep the public entertained during their recent flying display at Wroughton, near Swindon.

The display, which was run in connection with the British Legion Annual Fete, featured jet, stunt, free-flight, power and rubber and glider types.

One model—F. Hulbert's *Black Magic*, caused some amusement amongst the crowd when it landed on top of the beer tent!—indicative of it's owner's personal tastes!—Immediately afterwards it crashed into a tree! (There's a moral here somewhere!?)

Due to the high wind the mortality rate was inevitably high and soon the model enclosure bore a marked resemblance to a funeral pyre!

Despite this, the S.M.A.C. "pilots" continued with their "depleted and much-patched squadrons," to bring the display to a successful conclusion.

CANTERBURY PILGRIMS M.F.C.

The club have been unlucky in losing their flying field and as yet are unable to locate a suitable new one, here's hoping. V. E. Smeed has raised the Club's Ratio Record to an amazing 86.3 (10 min. 15 sec. on a 7 sec. engine run). Details of the model, 9 oz. 250 sq. in. Elfin 1.8 engine. Name, "Flattened Fifth."

The Pilgrims have been float-plane flying at Herne Bay and the club members are quite keen on this type of flying. Besides having two model displays in local cinemas the club has found time to give control-line stunt exhibitions at a local Fete. In September they are staging a big static exhibition and are hoping to gain support from all the Area clubs. Details and entry forms will be sent to all clubs in the Area, giving full information. In conjunction with this it is hoped to arrange control-line and radio-control demonstrations in the yard adjacent to the Hall. Full support for this effort is requested as it is in connection with the Battle of Britain Week.

PRESTWICH M.A.S.

It was decided at the beginning of the season that the club should take a more active part in competitions. This resolution seems to have met with a fair amount of success as in the area we have obtained two firsts, E. G. Cusrington was first in the Weston and D. Bennett was first in the K.M.A.A. At the Nationals A. Wrigley lost his Thermalist for 6 min. 5 sec. o.o.s. which gave him eighth place in the Thurston. In the Sir John Shelley, D. Bennett was placed eleventh, his first flight was 2 min. 35.5 sec. o.o.s. the model being lost. It was returned badly damaged and was repaired by his clubmates but only managed 30.3 sec. on its second flight. We managed to get six members down to the Nordic and Wakefield trials.

LIVERPOOL M.A.S.

We are still in the position of not having a flying field of our own but the club holds meetings every three weeks at winter quarters where members can talk about the latest aspects of model flying and building.

Denis McCrockers new power job is very stable in flight, main features include a high thrust line and a Vee tail of full Clark Y section.

John Done's escapades with his R.O.W. power model provide a welcome change from more conventional flying.

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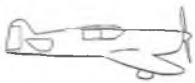


PERCIVAL MEW GULL

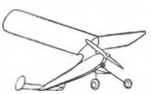
M.A. 54. A realistic looking scale control liner for 1-1.5 c.c. engines by R. A. Twomey. Price **2s. 9d.**

THE ALPHACON

M.A. 43. Ideal beginner's control line stunt trainer for 1.5-3.5 c.c. engines. Span 26 in. By H. J. Nicholls. Price **3s. 3d.**

LUTONIA

M.A. 56. Model Engineer Exhibition Championship Cup Winner. For 1 to 1.5 c.c. engines. Span 45 in. By S. A. Miller. Price **5s. 6d.**



THE KID

M.A. 29. An outstanding French pylon-type model for 1-3 c.c. engines by M. Bouguerez. Span 44 in. Price **4s. 6d.**

THE DEMON

M.A. 42. A successful 62 in. sailplane by a well-known Dutch designer, J. Van Hattum. Price **6s. 0d.**

THE CHAMP

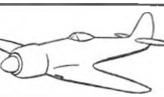
M.A. 25. Cabin type power model by F. Lajeunesse, well-known French designer. Will take 1-2.5 c.c. engines. Span 45 in. Price **4s. 6d.**

THE GILI HATCHET

M.A. 53. A high performance pod-and-boom glider by a well-known designer, Phil Guilmant. Span 42 in. Price **2s. 9d.**

BABY BIPE

M.A. 51. Biplane stunt design by control line expert Ron Moulton. Simple construction. For 1-2.5 c.c. engines. Span 20 in. Price **2s. 9d.**



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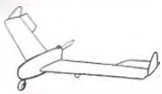

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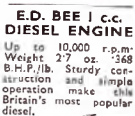

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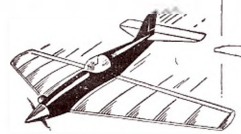

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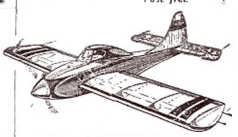

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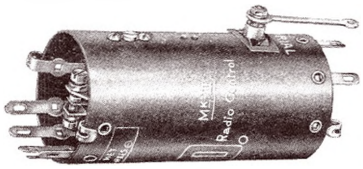

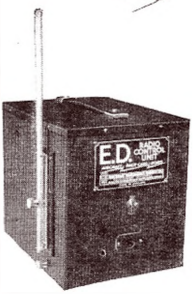

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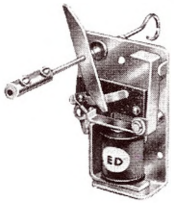

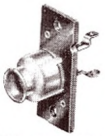

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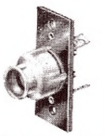

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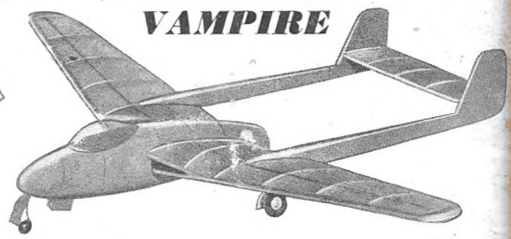

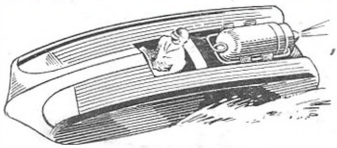

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