MODEL AIRCRAFT

MAY 1953

IN THIS ISSUE

● WORLD CHAMPIONSHIP REVIEW ● FULL SIZE PLANS OF A JETEX POWERED SUPERMARINE 508 ● TAILLESS TANTRUMS ● MODELS IN THE MOONLIGHT ● INTERNATIONAL POWER REVIEW PART II ● TWO PLANS OF INTERESTING MODELS

1'6

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A super, fast climbing contest model that you will find very easy-to-build. All sheet parts are die-cut. Engine installation plans given for Dart .5, E.D. .46, Elfin .49, Frog 50, Amco .87, Mills .75 and E.D. Bee.

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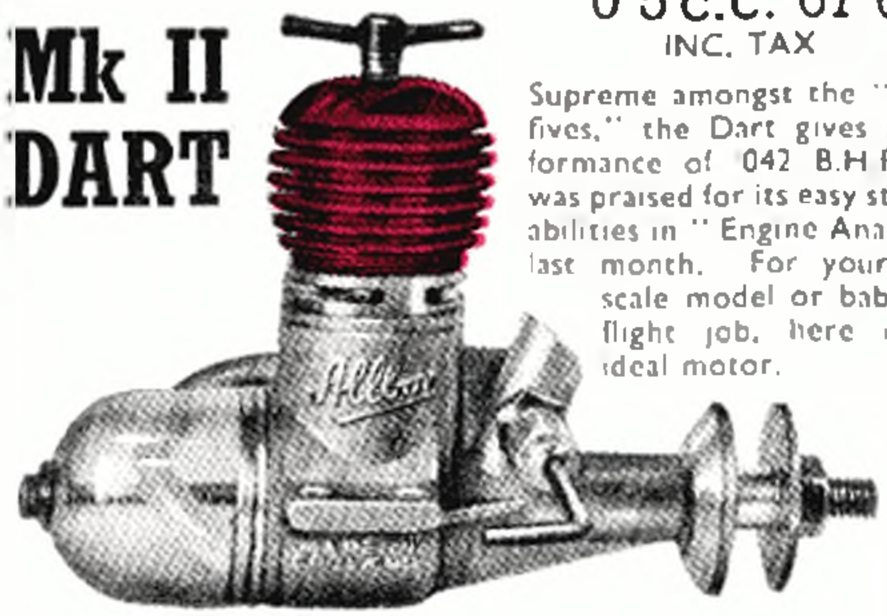
Whatever your need you will find in this range a motor to suit. A motor that is guaranteed ; a motor which has been thoroughly tested before leaving our works; a motor in fact that will last a modelling lifetime.

Remember ! Redheads for reliability ! Not forgetting the D.C. 350, which although without a redhead, has a heart of gold.

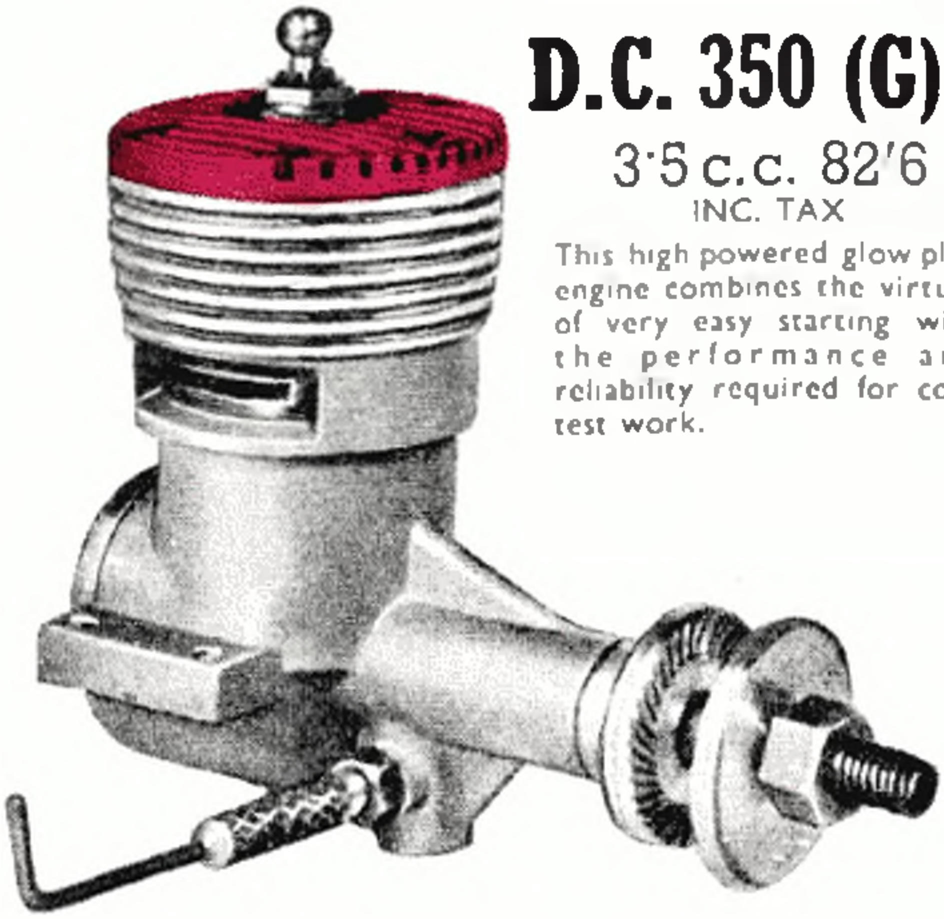
Mk II DART



0·5 c.c. 67/6
INC. TAX

Supreme amongst the "point fives," the Dart gives a performance of ·042 B.H.P. and was praised for its easy starting abilities in "Engine Analysis" last month. For your next scale model or baby free flight job, here is the ideal motor.

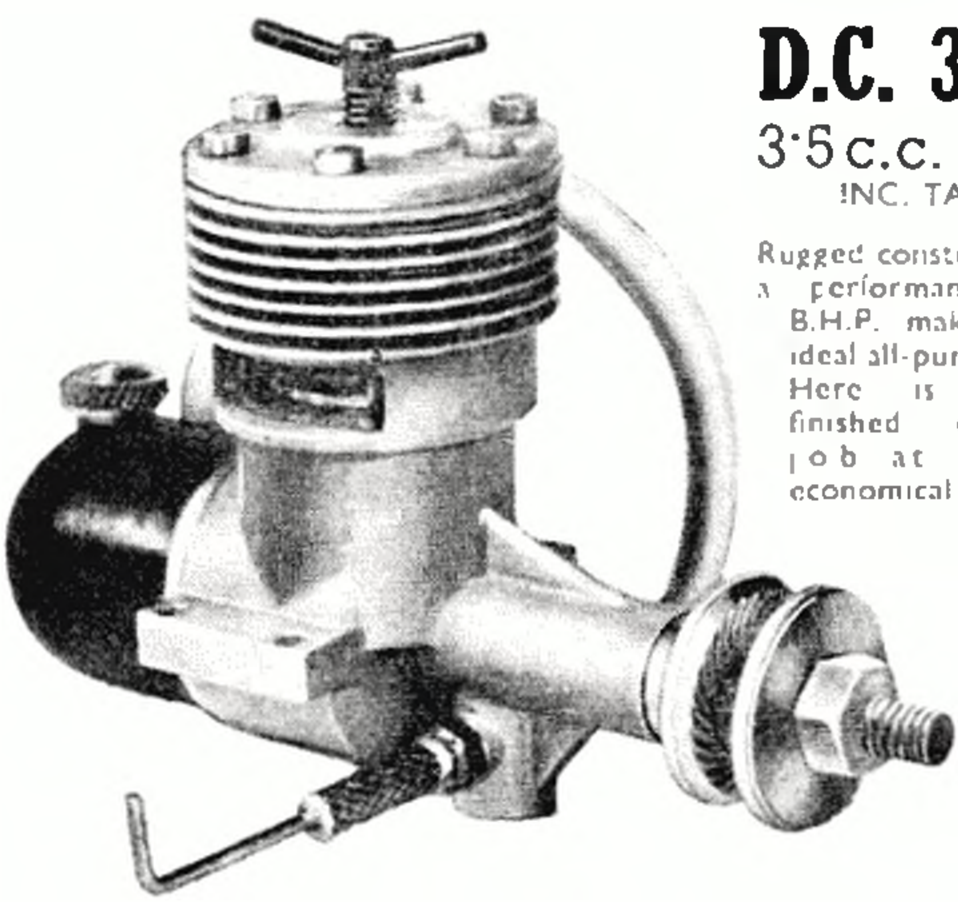
D.C. 350 (G)



3·5 c.c. 82/6
INC. TAX

This high powered glow plug engine combines the virtues of very easy starting with the performance and reliability required for contest work.

D.C. 350



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Rugged construction and a performance of ·28 B.H.P. make this an ideal all-purpose diesel. Here is a really finished engineering job at a truly economical price.

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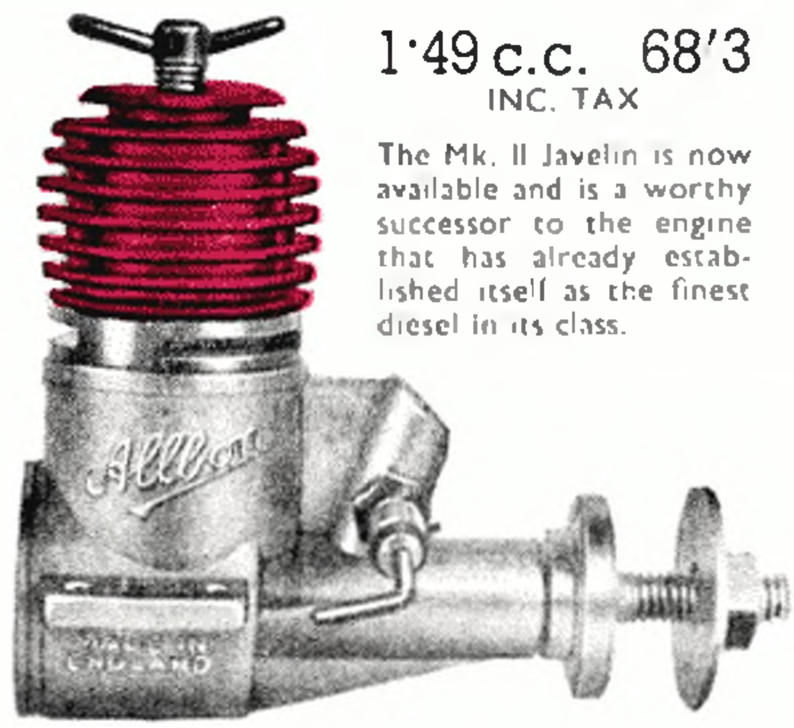

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The Mk. II Javelin is now available and is a worthy successor to the engine that has already established itself as the finest diesel in its class.

Special Announcement!

Look out next month for full details of the new Allbon ***Spitfire.*** *A 1 c.c. motor, designed especially for the beginner, that starts first time, every time ! Supplies will be in your local model shop shortly, so place your order now to avoid waiting.*

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MODEL AIRCRAFT

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Contents

E D I T O R I A L

It has been evident in recent months that control line contest enthusiasts, and particularly those in the London area, feel that they are being neglected by the S.M.A.E. They say that compared with their free-flight counterparts they are not "getting a fair crack of the whip" and one of our recent correspondents went so far as to blame the lack of encouragement by the Society for the decline in the popularity of C/L flying.

Are these complaints justified? The answer is that in some respects they are and in others they are not. It is a fact, of course, that only five S.M.A.E. C/L events are included in the contest programme, but it must be borne in mind that the holding of either speed, stunt, or team race events on any other than a centralised basis is impracticable for obvious reasons.

It must be agreed that the Society has not failed to provide C/L fliers with the opportunity of competing in international events; in fact, teams have been sent to Knokke, Brussels and Namur and as is well known they have been outstandingly successful.

However, although the Council agreed in principle nearly two years ago to the allocation of cups for each of the seven speed classes, these have not so far been provided. The reasons for this are (a) that no donor(s) have been forthcoming and (b) lack of funds.

Some resentment has also been caused by the S.M.A.E. Council's decision not to treat each class in the speed events at the Nationals as a separate contest and award the special competition winners' badges accordingly. Despite repeated protests from the London Area Committee the Council's attitude on this matter has remained unchanged.

There is a good deal to be said for the case put forward by the C/L fliers; we do feel, however, that they might obtain more action from the S.M.A.E. if they not only complained but also put forward for consideration some *constructive* ideas on the manner in which their grievances could be removed—in other words, instead of saying they want something, to say what it is they want!

Cover Story

Typical of the younger modellers who will make tomorrow's expert competition fliers is keen Crystal Palace Model Flying Club member R. W. Wood. Photographed in the brilliant spring sunshine at Epsom Downs, he is holding his latest model, a Powavan. The Frog kit from which this model was built is unusual in that it employs a high thrust line.

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REACTION Apropos of last month's paragraph commenting on the new Wakefield rules (in which a leading Wakefield flier expressed concern that British modellers might be accused of "pulling a fast one" in introducing a restricted specification), we quote from a contemporary American model magazine which lays the responsibility right at our feet, viz.:

"With the Wakefield finals in England this year, the English have made another change in the rules. . . ."

THE STANDARD OF FLYING Having recommended a Fleet Street man to pay a visit to a well-known London flying ground, after he had expressed interest in models and wanted to get some idea of their capabilities, we were shocked by his later comments. The day had been quite fine, if a bit windy, and he had duly visited the ground. "But," he said. "I didn't see much in the way of flying. Most of the models just went up and crashed again very shortly afterwards."

Now it so happened that on that particular day the contest modellers were absent from that particular ground paying a visit elsewhere. But surely this does not mean that consistent, good flying comes only from the contest experts? The sports fliers on that ground on that day must certainly have put up a bad show. Our Fleet Street man has quite revised his opinion on models after a later visit to a club ground on a contest day. He was impressed there.

If the standard is so different, then sports fliers are missing a lot of fun and enjoyment from their hobby. Perhaps they consider flying a model secondary to the construction. The contest flier usually considers flying technique far above design or construction. You don't have to be a contest modeller to fly a model properly. But you do have to pay proper attention to the *technique* of trimming and flying.

PERPETUAL MOTION INDEED! A modeller of our acquaintance recently nearly succeeded in convincing an interested bystander that he had invented a perpetual motion machine. The perpetual motion machine, of course, is a fallacy, although there have been a number of "trick" gadgets which seemingly perform the impossible. The "perpetual motion machine" in this case was a slightly out-of-trim A-2 glider!

As trimmed, the model had a very slight stall. It happened to pick up a thermal and the stall increased in magnitude somewhat. At the top of each stall the model had gained an appreciable height each time, due to the effects of the thermal. This led our leg-pulling friend to explain to the spectator who wanted to know *why* the model was going up that the energy built up in each dive climbed the model to a greater height each time. He sounded so convincing that the bystander went home a very puzzled man!

This incident reminded us that about ten years ago, one of the most successful of contest modellers (who always seemed to be able to contact the thermals), *always* trimmed his models out with a slight stall. They would fly an undulating path around the sky, using low power, and go away in lift nine times out of ten—or so it would seem. At any rate, he would make two or three thermal flights in a contest when the other fellows would have to be content with one.

Hey! What are we saying? Perpetual motion is impossible!

PRIZE LIST The Federation of Model Aeronautical Manufacturers and Wholesalers has again donated 50 guineas to the S.M.A.E. towards prizes to be awarded at this year's British Nationals, and the S.M.A.E. will add a further £25 to this sum—certainly a substantial amount, and well worth winning. The prizes will take the form of cash vouchers and the contests will take place at Waterbeach R.A.F. Station, near Cambridge, on Whit Saturday and Sunday, May 23rd and 24th.

Another worth-while prize will be awarded at the All Britain Rally, to be held at Radlett, Herts, on August 24th. MODEL AIRCRAFT will be presenting to the organisers a fine silver challenge cup, to be known as the MODEL AIRCRAFT Cup, which will be awarded to the outright Rally Champion.

AND MORE BIG DATES The A2 Final Eliminators (the "100") are to be held on May 3rd at Kidlington Aerodrome, near Oxford, and the Wakefield and Power Trials will both take place on June 7th at Digby, Lincs. Efforts are being made for the C/L Eliminators to be held at Walsall on April 26th—a fairly central position which should encourage more of the more northerly C/L enthusiasts to compete.

THE NATIONALS As we have already announced, the 1953 British National Model Aircraft Rally is to be held on Saturday and Sunday, May 23rd and 24th, at R.A.F. Station, Waterbeach, near Cambridge. The aerodrome lies on the Cambridge-Ely road (A10), and is easily reached by rail (to Waterbeach Station) or road (Eastern National buses from Cambridge).

Contests. The competitions to be held on each day are as follows, together with the trophies to be awarded in addition to the cash prizes :—

Saturday : "*Model Aircraft*" *Trophy*, rubber ; *Sir John Shelley Cup*, power ; *Control-line Speed Trophy*, speed ; *Gold Trophy*, stunt ; *Eastbourne Trophy*, Class A T/Race ; Sunday : *Thurston Cup*, glider ; *Short Cup*, PAA load (sponsored by Pan American World Airways) ; *S.M.A.E. Trophy*, R/C ; *Control-line Speed Trophy*, speed ; *Godalming Trophy*, Class B T/Race.

Pre-entry is required for all contests. Entries (on plain paper) should give the following information : Name, address, club, senior or junior, competitions entered. They should be sent, together with the appropriate entry fees, to the Competitions Secretary, S.M.A.E. Ltd., Londonderry House, London, W.1, and must be postmarked *not later than May 10th.*

Accommodation. Space will be available for tents and caravans on the field and a limited number of persons can be accommodated at a nominal charge in marquees, where beds (but no bedding) will be provided. Other accommodation is available in Cambridge and the surrounding district. Persons desiring further information should write without delay to the Accommodation Officer, British Nationals, 4, Hale Street, Cambridge, enclosing a stamped addressed envelope.

S.M.A.E. MEMBERSHIP The following statement was recently issued by the Society's Press officer :

"In view of changes in the character of the membership of the S.M.A.E., the Governing Council has under active consideration a number of modifications to the constitution. These would permit the introduction of an Associate Membership, at reduced fees, for club members who do not wish to participate in the Society's competitions.

"At a later stage, these proposals will be submitted to a general meeting of the Society for formal adoption."

95 PER CENT. OR ELSE—! So C/L speed fliers who qualify for the British World Championships team this year must do 95 per cent. of last year's winning time—or else !

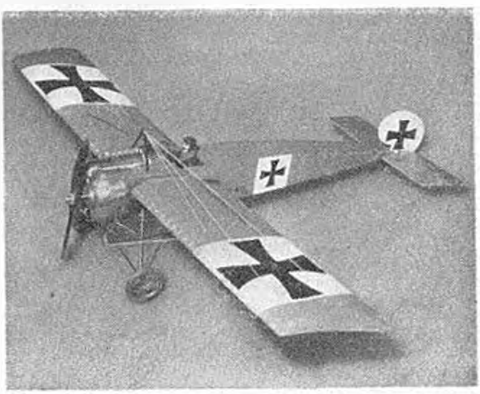
This means that if a flier does get into one of the top four team places in the speed trials, but does not achieve that necessary 138 m.p.h. minimum—he is *out* of the team again !

We have recently been pondering on the wisdom of such a rigid rule. On the face of it, it seems excellent, in that it would, at least, ensure a very high qualifying standard, but since the British 10 c.c. Class has largely been neglected and the current speed record is only 133.33 m.p.h. we have begun to have doubts. We are asking, in fact, for four record breakers to come forward in the C/L trials and represent this country in the World Championship event in Milan. Time may prove us wrong, but we should not be at all surprised if Britain were represented by a one-man team, or possibly by no team at all.

It must be borne in mind, however, that the problem is largely one of finance and the S.M.A.E. Council had to decide whether it would be justified in agreeing to the expenditure of some £250 to send a C/L speed team to Milan which was below world class. We realise that it will be said that this is not the way to encourage interest in C/L speed development in this country, or foster the international side of the sport, but in view of the present financial position of the Society, and the obvious reluctance of the majority of affiliated clubs to face up to this, the Council would appear to have had no alternative.

NORTHERN MODELS EXHIBITION Judging the model aircraft entries at this year's Northern Models Exhibition, held at the Corn Exchange, Manchester, on March 20th-22nd, was a very much easier task than in previous years. In the first place there were fewer entries to judge, and secondly the winners in most of the classes were obviously of a higher standard than the rest of the entries. This was particularly noticeable in the Junior class, in which a neatly constructed 5 ft. span sailplane by R. Mackintosh, of Stockport, was a worthy winner.

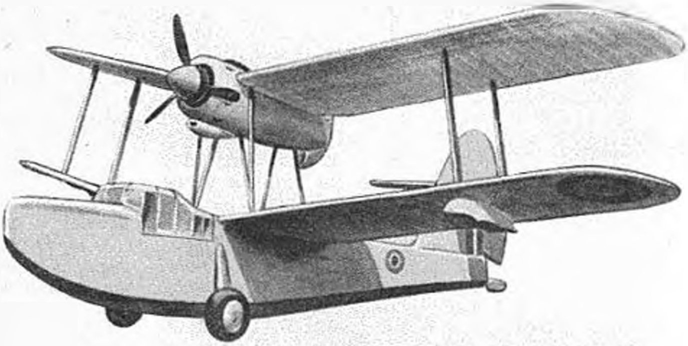
Other noteworthy entries were a power duration model by the Northern contest flier A. S. Bailey (Cheadle) and an A2 class sailplane by G. Aitken, of Bredbury, which was a very fine piece of work indeed. The allocation of the Premier Award for the best model aircraft in the show provided a close finish between this latter model and the eventual winner, a Fokker *E III* power-driven scale model entered by F. D. Ward, of Ashton-under-Lyne.



Mr. F. Ward's flying-scale Fokker EIII. Premier Award winner at the Northern Models Exhibition

The VICKERS SUPERMARINE

SEA OTTER



By H. G. MOORE

Here is a fine model for the flying scale enthusiasts. With a 30-inch span, it is just right for the Mills .75

DEVELOPED from the *Walrus*, the Vickers Supermarine *Sea Otter* is a Naval reconnaissance and air-sea rescue amphibian with a Bristol "Mercury" engine and a wing span of 46 ft. The model has a span of 30 in. and was designed around the Mills .75.

Hull

Commence by cutting out the bottom keels from hard $\frac{1}{8}$-in. sheet balsa, and the $\frac{1}{16}$ balsa bulkheads, each in two halves. Pin over the plan the bottom keel and the $\frac{1}{4}$ sq. dorsal keels, and cement the balsa half formers in place. Add the $\frac{1}{8}$-sq. stringers at the top and bottom of the fuselage side, and when all is dry, remove from the plan. Add the other side of the fuselage and cut out the ply bulkheads, each in one piece. Cut thin tin to the shape of the formers and drill as shown for 10 B.A. bolts. Cut 16-g. wire and shape nacelle struts, and solder in place on the tin, together with the u/c brass tubes. Then fit the bulkheads into the fuselage and bolt on the tin plates with the struts and u/c fixings. Cement well and gusset as shown. Fit window frames but leave the nose until later.

Nacelle

Cut lightening holes in the $\frac{1}{8}$-ply motor mount and cut another tin plate to fit it. Solder the plate to the wire struts and bolt the ply to it. Add the formers and stringers, not forgetting the detachable front half. Leave the cowling ring until after sheeting.

Wing Roots

These are built up in the hull and nacelle. Cut out the ply root ribs carefully, as they can be used as templates for all the others. $\frac{1}{16}$ balsa ribs are cemented in position on the hull, and nacelle and the spars, L.E. and T.E. are fitted, noting that dihedral and sweepback start right from the hull sides. The outer balsa-and-ply ribs are fitted, together with the wing dowels taking care to fit them accurately.

To complete the hull, bracing wires are soldered in place as shown and the nacelle struts are faired in neatly with spruce or card. Make up and fit the tailwheel-water rudder and then sheet the whole hull and nacelle with 1/64 balsa. Fit the hull nose and shape the cowling ring; make up the rest of the cabin and glaze with thin acetate sheet. Carve the oil cooler and hollow to clear the motor; complete scale details and separate top cowling.

Wings and Floats

The wings are quite straightforward. Points to watch are the accurate fitting of the paper tubes for the wing and float fixings. Drill holes in the $\frac{1}{8}$ ribs for the rubber band strut fixings and fit wire loops for flying wires. The floats are carved from soft block balsa, then split and hollowed out carefully so that they weigh equally.

Tail

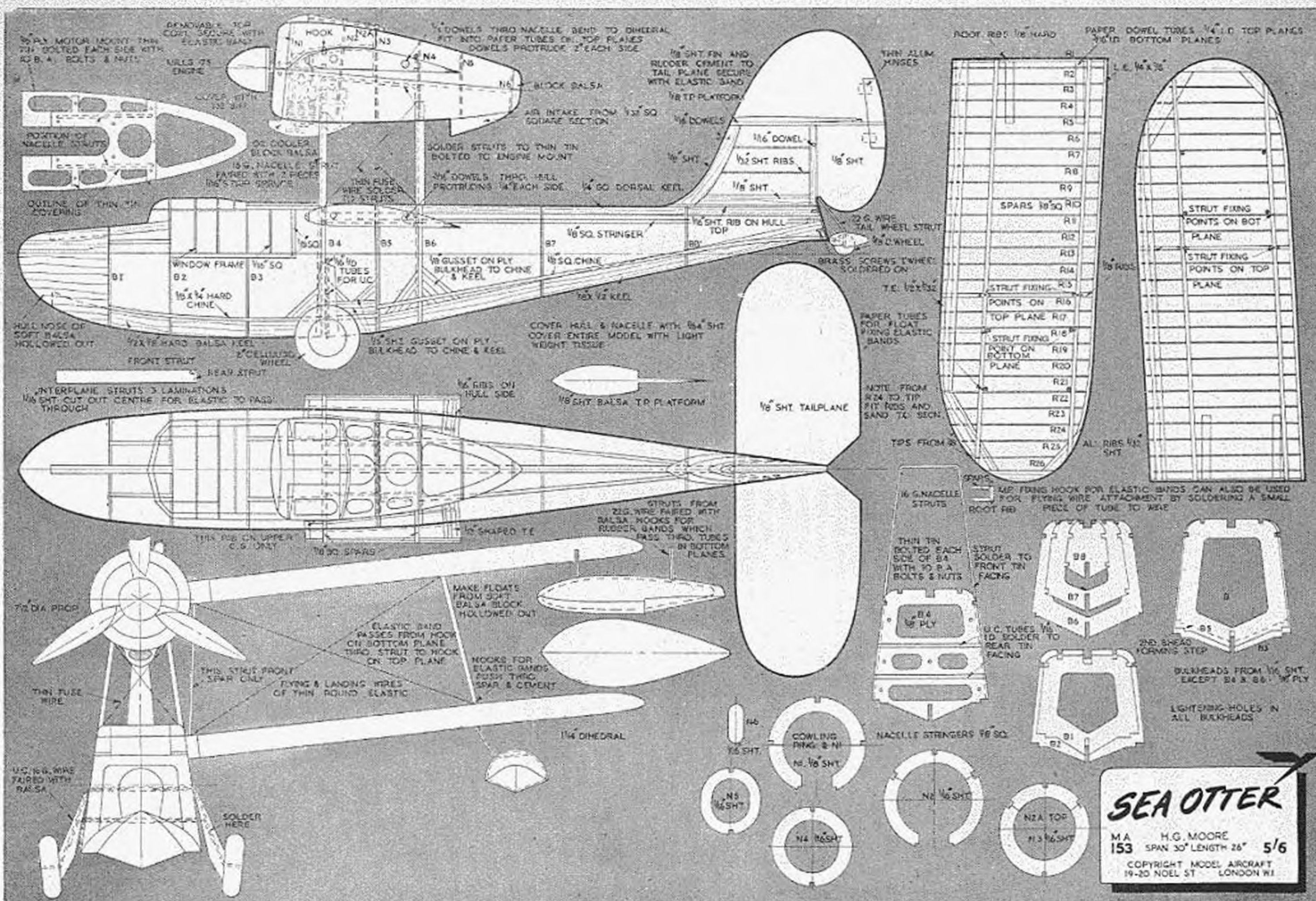
The tailplane, rudder and top half of the fin are from $\frac{1}{8}$-sheet and are cemented together. The lower half of the fin and rudder are built up on the hull and the main tail unit attached with bands.

Finishing

Lightly sand the whole model and cover with lightweight Modelspan. Give one coat of dope and pin down the wings until dry. Colour scheme consists of upper surfaces battleship grey, including tops of floats. Under surfaces cream as far up as the top of the flat hull sides and the tailplane. Join the grey and cream with an undulating line.

Trim

Model should balance one third from L.E. of upper wing. If Mills .75 is used, a little nose weight will be necessary.



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 19-20, NOEL STREET, LONDON, W.1, 5s. 6d., POST FREE.

World Championships

The "Big Four" of the contest flier's year

By RON WARRING

TRUE international interest in the sporting side of model aircraft centres around four world championship events which, in present order of popularity and " overall interest " are, undoubtedly, the Wakefield, A2 glider, the power championships and the C/L championships. There are a good many reasons why this order of popularity holds true, but possibly the main one is that world interest in sporting events is directly related to *fully representative competition* (and strong international competition at that) and the frequency of appearance of well-known personalities in these events.

The Wakefield must hold pride of place since this specification, more than the others, does tend to reward merit rather than luck. In other words, the Wakefield experts of the world fill a good proportion of the national team places year by year, so that a sprinkling of " known " names battle out the world championship event along with the relative " unknowns " who have come to the fore that year. The experts bring experience to the event and the competition is that much keener. Having got to the top, too, the expert is encouraged to go on developing his design because he knows that his chances of making next year's team must be pretty good—and so the top men stick to Wakefields.

With the other free flight models—A-2 gliders and power—the same degree of consistency does not hold true. Performance is more affected by luck and when team selection is based on a single competition (Trials), the luck element outweighs the other factors. Thus the nations with a large model following which do select their teams by Trials usually have quite different teams each year. The final championship event becomes more a battle of the " unknowns " rather than the " knowns."

The other point of importance is *fully representative competition*. Again the Wakefield rates high because *all* the best Wakefield nations are represented each year, so there is no question of saying " Oh ! If such-and-such a country had entered they would have mopped up the contest." The same is true of the A-2 championship. This event has attracted entries from all the top glider nations, even if these are almost exclusively European countries. The same is not true of power or C/L where strong American teams have not taken part. The United States is, after all, the " home " of both free-flight power and C/L. Without their participation, world championship events seem a little hollow. Time, no doubt, will remedy that. There is a growing interest in the United States in the A-2 specification, which is now an official class, although it is doubtful that their standards will be up to world-class European fliers for a few years. The top American fliers in free-flight power and C/L must, however, be world-class and the sooner it is possible for them to be represented at these respective world championship events the better. Finance is, of course, the main snag.

From modest beginnings, when the Wakefield was the only real international event, the model aircraft movement has grown up into a true international sport, and all within the last few years. In this respect the model flier of today is far luckier than his pre-war counterpart. If he has the tenacity or purpose and a flair for contest flying there is no reason why he should not, eventually (and perhaps sooner than he expects), win what will be an unforgettable experience—a visit to a foreign country to take part in a world championship event. If he never travels abroad again he will remember that trip for the rest of his life.

Whether the Wakefield will *retain* premier place in the international field is a matter of doubt. Already it is seriously challenged by the A-2 championship and with " full " participation the power championship may be an even stronger rival. There would have been less doubt on this score had not the Wakefield specification been drastically altered for 1954. Now, by attempting to limit performance the " consistency " factor mentioned earlier is threatened and there is also the inescapable truth that it will be possible to produce a model of the same size with a superior performance which will weigh heavily on the minds of many enthusiasts.

To digress with a few personal opinions for a moment on the subject of the new Wakefield rules. Personally, I am more than disturbed by the way the Wakefield has apparently been handed over to Continental Europe. Essentially the Wakefield was, and should remain, a British specification. It is known as such throughout the English speaking world.

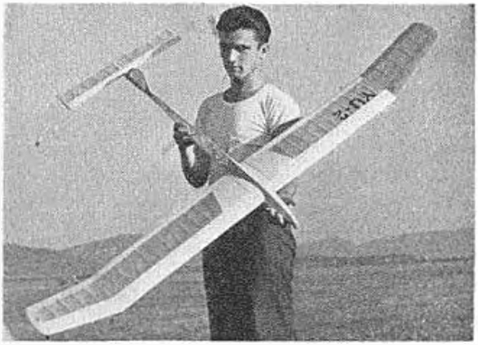
The thin edge of the wedge came when modifications were introduced in 1951. The actual changes in the specification were sound and very welcome, but the specification was now based on metric units and fractional English equivalents. *It should have been the other way round to preserve the essentially British nature* of the model. Metric units are not accepted by engineers in the English-speaking world. All attempts to " convert " English-speaking engineers to think in terms of metric units have failed and the S.M.A.E. should quickly have turned the modified specification back into English units with fractional decimal equivalents.

Now, in December, 1952 a major change in the specification was decided upon at the F.A.I. meeting in Paris without, apparently, any deep thought as to its possible implications. The people who " know their Wakefields "—the British Wakefield fliers—have not had the slightest say in the matter. Their favourite model specification has been handed over to the F.A.I. by those who, on this action, can only be judged as being out of touch with Wakefield flying. I cannot help wondering how the Scandinavian modellers feel about it, also. Having won the Wakefield for the past three years, the very models which have proved so successful are now neatly ruled out ! What a way to " remove " a world championship trophy from its worthy winners !

However, to return to facts concerning the performance of International class models. British rating in the International field remains gratifyingly high. We have been singularly unsuccessful in the Wakefield these past three years, recovering some prestige in this sphere in winning the F.N.A. Cup in Rome last October. The power championship, really in its first " full " year, has been won by this country. In A-2 gliders, however, we seem to lag behind top world-class standards.

There is much to speculate on with regard to this latter failing. Having had the opportunity of watching the 1951 event at Bled in Yugoslavia as a spectator (and finding it a unique occasion in that I was able to follow *all* the flying instead of spending a large proportion of the time chasing models), and comparing notes with Geoff Lewis who reported the

Ron Warring himself is a most consistent Wakefield flier, and has been in the team a number of times



Gunic's 1952 winner displays the very high standard of finish typical of European " fine weather " A-2's

1952 Austrian event for MODEL AIRCRAFT, the most striking conclusion to be drawn is that the top Continental models, superior in sheer glide performance as they may be, would almost certainly be hopelessly unstable if flown under normal British conditions. In other words, most of these models appeared to have marginal towline stability.

Two other facts tend to confirm this impression. Dick Everett, leading American modeller, has sent over two A-2 gliders which Harry Brook and I have flown quite a bit. Glide performance of these models is excellent. The first we considered hopeless on tow, unless there was very little wind. Reporting this to Everett, the second model he sent was quite safe on the line, or so Everett said as the result of his test flying of the job in California. Over here, though, it was a different story. That model, too, was pretty hopeless in our usual weather—but what a wonderful glide it had !

The second fact concerns a conversation with Roy Yeabsley who corresponds with one of the leading Danish A-2 fliers. The Dane, Hansen, is getting some four minutes plus consistently with a new A-2 and has mentioned, as his opinion, that Roy loses efficiency in making his models too stable on tow. Well, for our flying weather it seems almost impossible to get a model *too* stable on tow !

Another thing, too. Many of the top Continental A-2's show little signs of normal " wear and tear." In other words, pretty obviously they have not been flown in poor weather—otherwise there would be corresponding " scars " to record the fact. You cannot keep a near-perfect finish on a model flying under all conditions (or under our conditions, at any rate). Seemingly, then, we are up against it, as far as our weather is concerned, both for developing models and for running team trials. This is rather rubbed in by Joe Bilgri's answer to my query as to how he got in enough test flying. " I use a small field nearby," he said. " Most times the models come down at my feet after a 5 min. flight. If it's windy they may drift a hundred yards or so ! " Californian weather, too, must be somehow different from ours.

Last year, in the first "full" Power Championships, Silvio Lanfranchi flew Barry Wheeler's model to a win for Britain.

Are flying conditions all that much different in different countries? Well, logically, being an island nation (and a relatively small island at that) with a very changeable climate, we will almost certainly get more unsettled weather, and stronger winds, than countries that are the centre of a large land mass. Personal impressions of flying conditions in various European countries, however, are varied.

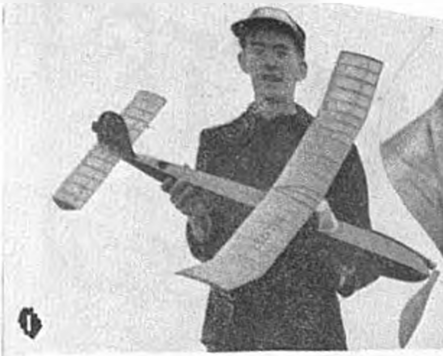
In *Sweden* the weather seemed very much like our own, but perhaps a little more settled. You got winds during the day and a tendency to calm during the evenings. In *Finland*, the same again, only here the long summer nights *could* produce wonderful flying evenings with flat calm—at the expense of a damp, rising mist. In *Holland*, again weather very much like our own, but generally far less wind. *France?* The only time I have flown in France was near Paris when the day was as windy as any normal British summer day. But, according to the locals, they do get quite a number of hot, calm days. Certainly you can have breakfast outdoors in Paris in shirtsleeves in September. *Yugoslavia* was definitely calmer. Winds seemed to be light and variable during the morning, increasing in strength during the afternoon. In the evening, most likely calm again. Southern *Austria* almost exactly duplicated this sort of weather. *Italy* was probably the most interesting example. The weather, local fliers claimed, followed the same general pattern during the summer and autumn months. Calm mornings with winds springing up and freshening with the heat of the day, followed by calm evenings again. They usually pack up flying around noon and re-start about four o'clock, when the wind has begun to die again. The only difference in the "pattern" when we were there was the absence of strong thermals and a completely overcast sky. We flew one round during the windy period. It would have delighted all British modellers. It meant that you had to do a fast jog-trot to keep up with the model! More important still, such wind as there was, was very *steady*.

Britain has been successful in the C/L field, but will large-scale U.S. participation alter this?

It is impossible to form a correct opinion as to any country's average weather on a short trip, however may questions you ask. On balance, however, it does seem that most of the Continental European countries do have far more good flying weather than we do, far less strong wind and, when there is a wind, less turbulence. All this is marked in their designs. Pretty surely, if you go to a foreign model contest you can take a "calm weather model" with some confidence. This does raise the point, however, that with A-2 gliders in particular, the types of models one normally flies over here—and has to fly to get into the British team—are at a disadvantage competing in, say, Austria, Italy and Yugoslavia. How to find sufficient calm weather in this country to develop a model for such conditions is a problem in its own—let alone developing another model concurrently for the Trials.

Possibly the introduction of a shortened line length for gliders (164 ft.) may be a blessing in disguise in that shorter line lengths are generally easier to handle on tow, and you may more readily get away with marginal towline stability, as seemingly practised by the Continental experts. (There is, however, some confusion on this point. The S.M.A.E. have introduced the 164 ft. towline length for all glider events this year, including Trials. According to the official F.A.I. report, the new line length is first applicable to the *1954* world championship event.) And, incidentally, if Yugoslavian weather lives up to its 1951 standard, running a world championship event there on anything less than a 328 ft. towline would be akin to reducing a *world championship event* to a chuck glider contest for kindergarten pupils. Perhaps only the power modeller is at all happy with all these new restrictions. He, at least, can hope for reasonable durations with a 10-sec. engine run. But necessary as these restrictions may be considered for this country, as far as the International aspect is concerned we must bear in mind that a good many countries have both the weather and the flying fields to encompass five minute flights—and longer. The danger of all restrictive practices is that they tend to destroy initiative and make individual effort less worthwhile. The *basic* problem with which we are faced in this country is not model design or flying technique, nor lack of flying fields—but our British weather.

St. Albans, G.B. *v* Washington, D.C.



Early this year, two very interesting "postal" contests took place between the St. Albans "Cement Squeezers" and the "Sky Lancers" of Washington D.C., U.S.A. With sections for rubber, glider and power models, and with 3-min. maximums in force, scoring was made on the aggregate of the top two times in each section, and in the first contest St. Albans were narrowly beaten by Washington on total aggregate. England, however, easily won the glider category, and Bruce Rowe of St. Albans, put up the best time of the day with his Wakefield.

Contests of this type are a fine way to help international understanding, and the S.M.A.E. will be glad to supply addresses of American clubs to any British clubs interested.

Washington

1. *Carl Wheeley, who topped the power results, seen with the four-year-old Wakefield that placed him third in the rubber section.*
2. *John Albertson, whose Torpedo .19 power model finished third in that category.*
3. *Bill Harris finished third with this original glider—his first.*

St. Albans

4. *"Kit" Milford, St. Albans honorary secretary, launches his Dart-powered model.*
5. *John Simeons, who came second in glider and power, launches Gordon Hilliam's glider.*
6. *Bruce Rowe, who put up the best time of the day, crams on the last few turns.*
7. *Dave Tipper with his E.D. .46 power model.*

MODEL AIRCRAFT ENGINE TESTS

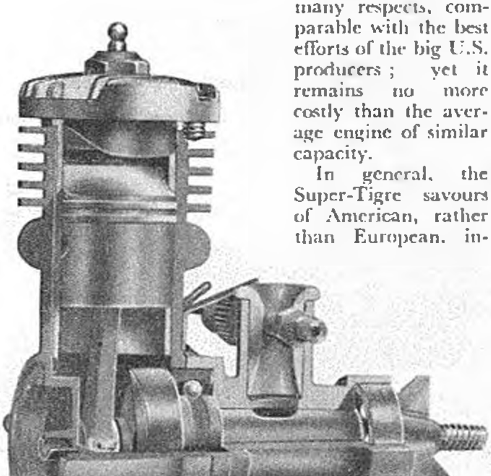
No. 47. The Super-Tigre 2.47 c.c.

CONTINUING our tests of " International " class motors, we have, this month, the latest 1953 version of the Italian Super-Tigre 2.47 c.c. model. Thus far, each of our five tests published this year, has been of a current 2.5 c.c. engine and these have been representative of five different countries : Australia, Germany, Holland, Italy and the U.S.A.

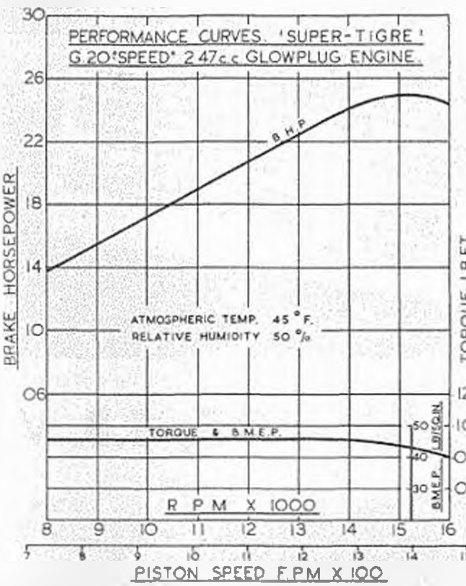
In many ways, the Super-Tigre is the most interesting 2.5 c.c. engine yet handled. It is a distinctive design, unlike any engine of similar capacity produced in Britain. First and foremost, it is a glowplug engine, not a diesel, and of a layout which follows larger engine practice instead of the popular annular port designs which comprise the majority of present day small engines, both diesel and glowplug.

Italian capabilities in the field of high-speed internal-combustion engines are well known—principally through their achievements in automobile and motor-cycle engine performance—and it is not surprising, therefore, to find that, despite their infinitely smaller markets for such products, the Super-Tigre is, in many respects, comparable with the best efforts of the big U.S. producers ; yet it remains no more costly than the average engine of similar capacity.

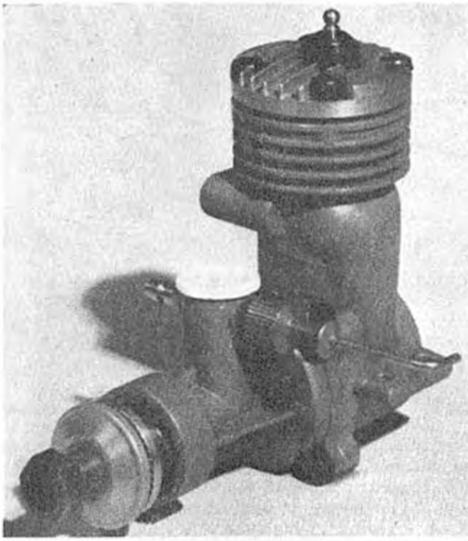
In general, the Super-Tigre savours of American, rather than European, influence. It is a front (crankshaft) rotary-valve engine, having a detachable front bearing housing, flanged and secured to a monoblock crankcase cylinder casting. The nickel-iron cylinder-liner has 180-deg. exhaust porting and a large volume transfer passage, while the light alloy piston, with its asymmetrically domed deflector crown, has two compresson-rings. Thus, in these respects, the Super-Tigre is comparable with the well-known front-rotary McCoy series. The Super-Tigre, however, has an additional refinement in a ball-bearing mounted crankshaft—a feature only found on the " Red Head " disc-valve series among current McCoy models.



This cutaway drawing shows clearly the internal structure



The engine is obviously designed with maximum possible " top end " performance in view. That high volumetric efficiency at high r.p.m. has been aimed at, is evidenced by the attention given to port design and timing, while the counter-balanced, ball-bearing crankshaft and lightweight, ringed piston are indicative of the designer's efforts to keep friction h.p. and reciprocating weight at a minimum. Exhaust and transfer porting follow the same general



formula as employed by the majority of successful racing type motors, while the induction valve overcomes the disadvantage commonly attributed to shaft-type systems by using a long, slot-shaped port to give a longer effective induction period by reason of quicker opening and closing. The intake is of extremely large bore for a small engine, but has interchangeable choke inserts to render the engine more flexible in the lower speed ranges. The new type spray-bar needle-valve, found on the latest models, is, incidentally, one of the best designs we have yet seen.

The workmanship shown in the construction of the Super-Tigre is of a high order. The die-casting is among the best, while machining and finishing of the component parts are to a high standard.

The G.20S is made in two versions: the "Speed" model, featured here, and the "Sport" type. Main differences now existing between these are the use of a higher compression-ratio and twin ball-bearings in the "Speed" version. The G.20 "Sport" has an 8.5 : 1 compression-ratio and a single, inner, ball-bearing on the shaft.

Specification

Type: Single-cylinder, air-cooled, two-cycle, glowplug ignition. Induction via shaft-type rotary valve. 180-deg. exhaust porting. (No supplementary sub-piston induction.) Deflector piston with matched cylinder-head and offset glowplug.

Swept volume: 2.474 c.c. (0.151 cu. in.).

Bore: 15 mm. (0.591 in.). Stroke: 14 mm. (0.551 in.).

Compression-ratio: 10 : 1.

Stroke/Bore ratio: 0.933 : 1.

Weight: 4 oz.

General structural data: Pressure-die-cast aluminium alloy crankcase and finned cylinder with integral exhaust duct. Pressure-die-cast aluminium alloy front bearing housing and carburettor intake attached to crankcase with four machine screws. Heat treated aluminium alloy piston fitted with two compression-rings and running in nickel-iron cylinder-liner. Forged aluminium alloy connecting-rod. Tubular steel, fully-floating gudgeon-pin. Counter-balanced crankshaft, machined in one piece from chrome-nickel steel and running in two ball-journal bearings. Finned aluminium alloy cylinder-head secured to cylinder with four machine screws. Copper head gasket fitted. Alloy prop driver fitted on tapered split-sleeve brass collet. Spray-bar type needle-valve with interchangeable choke tubes. Beam mounting lugs.

Test Data

Ignition equipment used: Micromeccanica Saturno glowplug. 1.6 volts used to start.

Fuel used: Methanol 50 per cent., B.D.H. nitromethane 25 per cent., Castrol "M" 25 per cent.

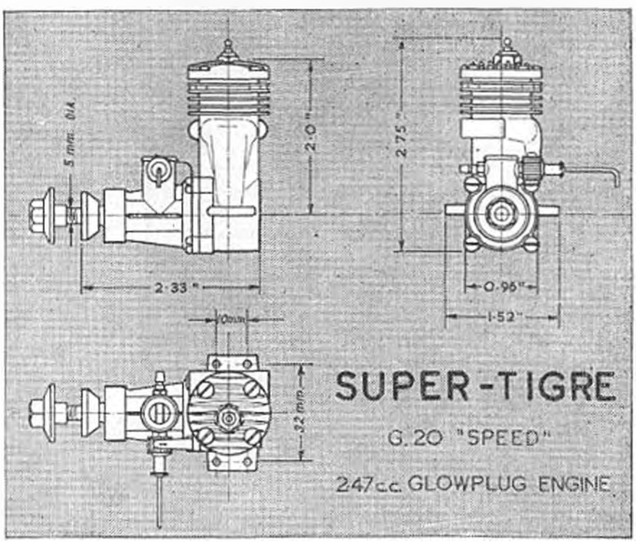
Total time logged: Two hours.

Red (racing) choke insert used for power tests.

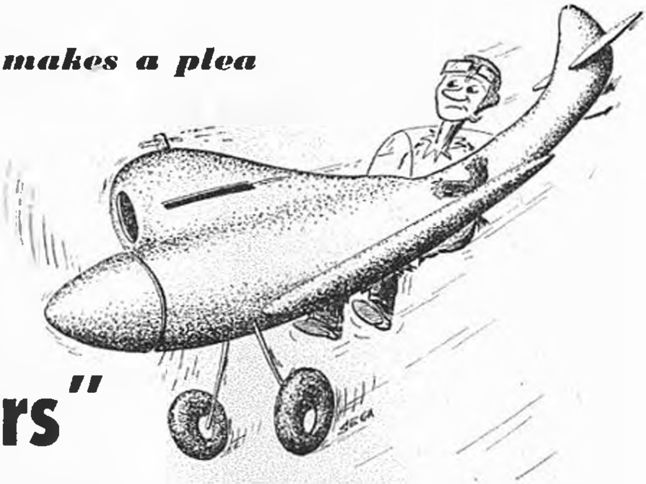
Performance

For the initial running-in period, we employed a straight methanol-castor fuel, 30 per cent. Castrol "M" oil content being used.

(*Continued on page* 224)



J. VAN HATTUM makes a plea for more realism



"Let's build *REAL* Team Racers"

WHEN one has helped to run team-races and studied designs in the flesh as well as from the magazines, one gets the impression that they very much run to a pattern.

Most racers appear to be inspired by the full-size examples as flown in the famous Cleveland Air Races ; small and charming bits of lightning, like the famous *Long Midget*. Many others have also served as inspiration if not as subjects for actual copying. The next step has often been the copying or modifying of an already existing team-racer without much thought of any full-size prototype. It is here that we often lose sight of the idea of what a team-racer ought to look like.

Model aircraft design for free flight, as well as for C/L stunt and speed, have radically departed from full-size examples and practice and, in my opinion, rightly so. But team-race models are different. The rules laid down clearly imply that resemblance to " the real thing " is desirable. Slavish copying need not be encouraged, but I do think that organisers should insist on a more strict fulfilment of the spirit of the rules. For what do we see so often ?

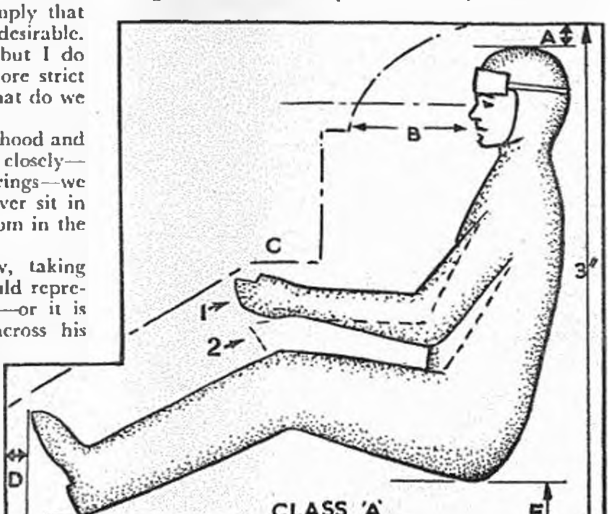
The model possesses a cockpit or cockpit hood and a dummy pilot. When we looked more closely—at an actual model or the working drawings—we often found that an actual pilot could never sit in that particular design or could not find room in the seat chosen on the model.

Sometimes the fuselage is too shallow, taking into account the scale height the pilot would represent—using as a linear measure his head—or it is far too narrow considering the width across his shoulders. The latter is the case when he is placed far back and close to the leading edge of the fin.

There are racers with the top of the front cowling sloping downward towards the cockpit and those with a cowling so high that the pilot would have great difficulty to watch competing aircraft. Do not forget that it is a racer intended for short races around pylons, and good visibility is important when jockeying for position. Most curious of all, there are models in which the pilot is seated just where, if it were an actual aircraft, some member of the wing-structure would certainly have to pass through the fuselage if that wing were to be an engineering proposition.

Now one may argue that these criticisms go too far and one may assert that the modeller is free to give a liberal interpretation to the rules.

Against this I would point out that, for better or



A Head clearance.
B Safe distance of pilot's face from windscreen.
C Front of cockpit giving pilot minimum clearances for operating controls.
1. Wheel control. 2. Stick control.
D Clearance for working rudder pedals.
E Floor structure, minimum height.
F Low seat and floor structure.

Sandy Michie and Brian Hunt prepare our " Trojan " for its first flight.

your first C/L flight

LAST month, we dealt with the construction of a typical elementary C/L model, the all-balsa *Trojan.* Now, we are featuring the preparation and flying of this machine, although our comments will apply equally well to any other beginner's C/L model.

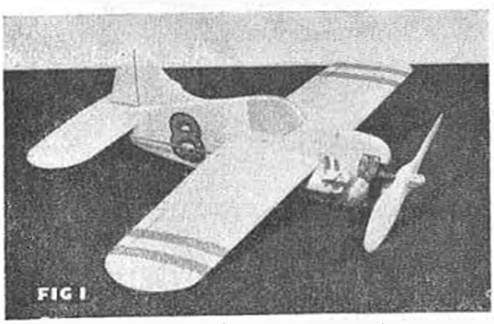
Since last month, as you will see from the photographs, we have doped the *Trojan*, given it a little colourful decoration, with the aid of transfers, and fitted a Mills " 75 " engine. We used yellow dope on the fuselage and flying surfaces, after first giving the model several applications of wood filler, or " sanding sealer," as it is sometimes known. Several thin coats of dope were then applied, lightly sanding down between each. Incidentally, it is worth mentioning here that, when putting on a coloured dope, a brush of somewhat softer and better quality than that usually employed for clear doping, is needed, otherwise you will have some difficulty in avoiding ugly brush marks and in getting the coats to " cover " properly.

The MA BEGINNERS COURSE Part 10

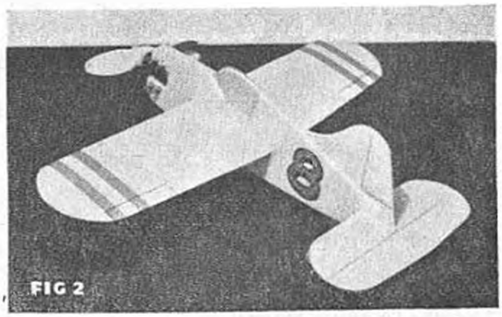
The stripes on the wings are transfers made from " Trimstrip " and are simplicity itself to apply, as are the black and gold numbers on the fuselage side. Follow the instructions printed on the back of the " Trimstrip," using a piece of blotting paper to mop up excess water and to smooth the transfers down on to the wing or fuselage surface.

Most diesel fuels do not attack doped finishes, but it is, nevertheless, worth while to proof your model against the possibility of any fuel dissolving the cellulose by applying a coat of fuel-proof varnish, or " fuel-proofer," before installing the engine. *Do not,* however, apply this until the transfers are quite dry. Preferably, leave them overnight, as the slightest dampness still remaining under the transfers will cause them to blister, after the fuel-proofer is applied, and eventually flake off.

Most fuel proofers are sold with a small, separate bottle of " hardener," which is added to the proofer before brushing on to the model. Proofer is much more economical than dope and very little is needed to cover a complete model. Therefore you will need to mix only a little at a time. Pour a small quantity of the varnish into a suitable small container—the lid of a dope jar will do in our case—and add not



1. *If hand-launched, the " Trojan " can be flown without the undercarriage fitted.*



2. *Our completed " Trojan " after colour doping, adding transfers and fuel proofing.*

less than 10 per cent. hardener. You can safely use more hardener than this, but don't try to cut it down because if you do, the proofer may remain tacky indefinitely and make the model in a terrible mess.

Stir the hardener into the varnish thoroughly. At first it will probably turn slightly milky but, as you continue to stir, will clear again. The proofer is now ready to apply. Put it on with a soft brush and if you cannot be sure of avoiding a few brush marks, it is a good idea to keep all the brush strokes in the direction of flight, i.e.: down the length of the fuselage, across the chord of the wing and tail, etc.

Proofer takes longer to dry than dope and the actual time necessary varies somewhat between different brands. If you can allow the model to dry overnight, however, so much the better. If not, the addition of a little more hardener when mixing up the proofer will help to cut down the drying time.

It now only remains to fit the fuel tank, engine and propeller. If you are using the Mills "75," four 6-B.A. machine screws and nuts are required to serve as engine mounting bolts. Use flat washers under the nuts to avoid the latter cutting into the wooden fuselage sides and, if your care about keeping your engine unmarked, it is a good idea to put similar washers under the heads of the screws where they bear against the engine lugs. It is a good idea, too, to get into the habit of always using a second nut on each mounting bolt locked against the first one. This avoids the possibility of the engine coming loose in its bearers due to vibration, or damage to the bearers due to overtightening intended to prevent the engine from loosening. Alternatively, you can use a special type of "shake-proof" nut, such as the "Oddie" or Simmonds "stop-nut."

Before bolting the engine in place, remove the existing transparent free-flight fuel tank by carefully prising open the small tags on the aluminium fuel-tank cover. Remove the existing fuel tube and replace it with a piece of Neoprene fuel tubing long enough to reach the delivery pipe of the fuel tank fitted to the model It will probably be found that the Mills fuel tank cover touches the new tank. Therefore, carefully slacken off the nut locking the carburettor to the engine and rotate the carburettor

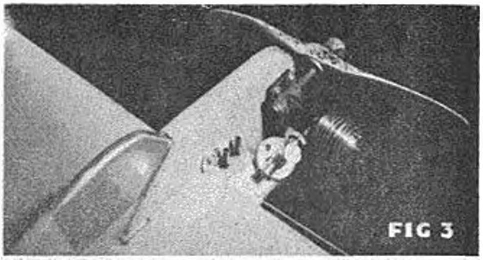


FIG 3

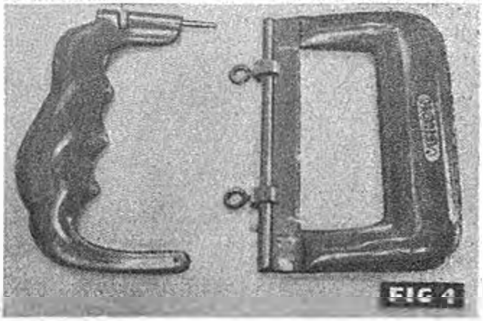


FIG 4

3. The Mills 75 engine is installed with the carburettor turned at an angle to clear the fuel tank. Note the easy accessibility of engine controls.

4. Two popular metal control-line handles : the "Adjustalyne" and the "Verogrip."

slightly so that it is at an angle. Then retighten. (See Fig. 3.)

For a propeller, we chose the E.D. plastic 6½ × 7, which is suitable for the Mills "75" when fitted to the *Trojan* and has the advantage of being more serviceable and more economical than wooden types, since it will not break if you bump the ground a little too hard.

Before you can fly your first control-liner, of course, you must have a C/L handle and lines. If you wish, you can make a handle quite cheaply from hardwood, or you may purchase one of the excellent handles

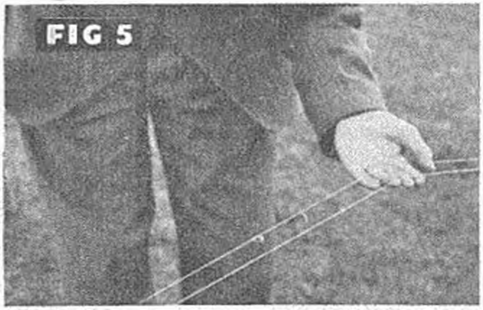


FIG 5


FIG 6

5. Control-lines should always be checked before use, for possible kinks and weaknesses. 6. Checking controls for free movement and correct centring.


FIG 7


FIG 8


FIG 9

7. *Starting is easiest and most comfortable if you have an assistant to hold the model.*
8. *Hand launching. The model must be launched smoothly and with the elevator neutral.*
9. *The pilot should control the model by full arm movements from the shoulder.*

currently on the market. Many people, expert C/L fliers included, use the all-metal Mercury "Adjustalyne" handle which was introduced several years ago and is designed to fit the hand comfortably, having shaped finger grips. It has a very useful line-trimming adjustment by which means it is possible, before taking off, to centralise the controls precisely by rotating a small thumb-wheel built into the top of the handle. The handle is so shaped that it is almost impossible to pick it up and, in the heat of the moment, start using it the wrong way up—which, needless to say, is a disastrous thing to do!

Another useful type of metal handle is the Veron "Verogrip." This does not have a line trim adjustment, but does have another advantage which may be of even greater importance to the beginner. On this type of handle, the spacing of the top and bottom line attachment eyes is adjustable. This means that the movement imparted to the control-lines and thus to the elevators of the model, can be cut down by moving the attachment eyes closer to each other. This, in turn, means a much less sensitive control system. And a less sensitive control-system means that you will not so easily "over-control" the model, which will go a long way towards avoiding crashes when you are learning.

The type of control-lines used today differ widely according to the type of model flown and for most models, steel control-lines are used, but for our little job, carpet-thread line, or a 5 lb. fishing-line, is adequate—in fact, heavy lines are to be avoided since they are likely to drag a light model into the centre of the circle and cause loss of control. The length, too, will not need to be too great and we found that the *Trojan* handled nicely on about 25 ft. lines. Longer lines can be used if a more powerful engine is employed.

Attach the lines securely to the handle and to the lead-out wires from the bellcrank on the model. Make a habit of inspecting your lines before use to ensure that they are not frayed or otherwise weakened.

You will, of course, need a helper and, if possible, get someone who is an experienced C/L flier. If he really is experienced, it isn't a bad idea to get him to give the model a test flight first. Be guided by his advice. The first thing he will probably do is to test your controls by working the leadouts back and forth. These should move absolutely freely.

With the lines laid out and attached to model and handle, get your helper to hold the model aloft, then take up the handle and try the control movement. Note how much the elevator rises and falls as you move the handle. As already mentioned, the controls should work smoothly and freely. With the handle held upright, the elevator should be neutral, i.e. in line with the tailplane. Adjust the line length until this is so (Fig. 6.).

When you are quite satisfied with the controls, put the handle down where you can easily find it again and prepare to start up. For the first few flights it is not advisable to have too much fuel in the tank; enough for about one minute's run is ample, up to half of which time may be used between getting the engine started and returning to the centre of the circle and getting the model airborne. It is very probable that, for your first few C/L flights, you may start to get a bit dizzy and it is as well, therefore, that these flights are kept fairly short.

Now, before you attempt to fly the model, please remember that it is quite sensitive to the movement of the elevator. A slight movement of the wrist and the model will quickly climb or dive. Until you are used to the *feel* of C/L flying, your reactions will be slow, with the result that you will tend to *over-correct, too late.* You may quickly find yourself in trouble, with the model going all over the sky and with your thoughts of what-to-do-next unable to keep pace with it.

The first thing to do to avoid this sort of trouble is to keep your arm, and particularly your wrist, quite stiff and to control the model by movement of the arm from the shoulder only. When you start off, remember this and keep your arm stretched out straight in front of you towards the model. Concentrate only, during these first few flights, in keeping the model *level.* If it begins to sink too near the ground, raise the whole arm a few inches and the model will come up again. If it climbs too high, bring your arm down.

The thing to remember is that, during these first few flights, all you have to do is to try to let the model fly itself on a steady course. As yet, you are quite unfitted to *control* the model. You must first get used to the *feel* of the model as it flies around on the end of the lines you are holding. Forget all about "stunts"—even those of the mildest type. They will come easily enough, but only when you are able to keep pace with, and, in fact, anticipate, the model, so that you are, in effect, controlling the model instinctively.

You can either take the model off the ground under its own power, or you can get someone to hand-launch it for you. If the model is to r.o.g., you must have really smooth ground to do this and make sure that your helper knows how to release the model. It should be sent off at a tangent to the circle and with the lines taut. Your helper should stand well back from the model so that you can watch it closely right from the moment of release (see Fig. 12).

Hand launching is more frequently used and calls for a little more skill on the part of the launcher. Again, he must make sure that the lines are taut and that the model is not despatched *into* the circle. In either case, of course, it is important that your helper should await a signal from you to indicate that you are quite ready, before launching the model.

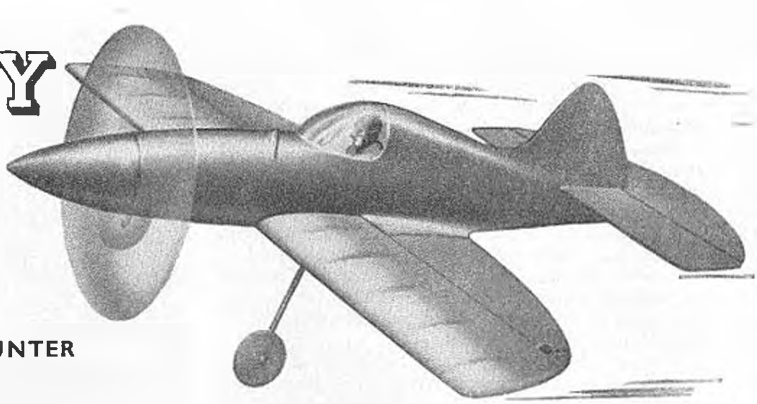
The essence of C/L flying, of course, is to keep the control-lines taut. If a model is flown too high on the windward side of the circle, for instance, there will be a tendency for the line tension to be reduced. Slack lines mean loss of control. If you feel line tension slacken, therefore, take a quick pace or two back to tighten them—*don't* just pull the handle towards you.

Our advice is, don't try to learn to fly a control-liner on a windy day. Later, when you can do circuits successfully without risk of pranging the model, you can tolerate a slight breeze. And remember that a C/L model is launched *downwind*, not upwind like a free-flight model because if, during its first critical quarter circuit, it tries to turn into the circle, the wind will tend to turn it out again, instead of helping it to bank inwards. Remember too, that when the model comes around into wind, it will climb a little, while on the other side of the circuit, it will lose height. Therefore, if you want to maintain a level course, you will need to apply slight down elevator on the upwind side and to give up elevator on the opposite side of the circle.

When the engine cuts, try not to let the model just fly on into the ground, or stall and dive in straight on its nose. The idea is to lose flying speed gradually and, as the model gets nearer and nearer to the ground, to bring the nose up until it settles down gently "pancake" fashion. On a still day, most control-liners will glide at least one lap after the engine cuts, during which time much flying speed will be lost and the model will be travelling quite slowly when it touches down.

10. *DO NOT attempt to control the model by wrist movements until you are experienced.*
11. *For rise-off-ground flights, ensure that the lines are taut and that the model is not pointing inwards.*

MIGHTY MOUSE



A POINT-FIVE C/L STUNTER

By M. Kelly

MIGHTY MOUSE is a fast sensitive little stunter that will do all the tricks on 30 ft. thread lines. There is no need to stint the dope to get performance. With a 6 × 5 or 7 × 5 prop swinging at around 10,000 revs, she has power to spare.

Wings

Take two strips of hard $\frac{1}{8}$ in. sq. balsa for the mainspars and mark the rib locations on them. Cement ribs and spars together before fitting leading and trailing edges. The leading edge is sanded to a smooth profile but the trailing edge is left square. The tips are built up on the wing from laminations of $\frac{1}{16}$ in. sheet balsa with the grain running vertically to enable easy bending.

The control system is now fitted to the wing. First, cement the bellcrank baseboard to the lower mainspar, then having joined the lead out wires and pushrod to the bellcrank and eliminated any stiffness of movement, slide the lead out wires into their place in the wing, and pass an 8 B.A. bolt straight through lower mainspar, bellcrank baseboard, bellcrank and upper mainspar. There need be no fear of weakening the wings, for stresses are taken through the centre section sheeting and bellcrank baseboard at this point. The bolt is locked to the bellcrank baseboard by a nut screwed on just before the bellcrank, which is packed out to a satisfactory position with washers.

Sheet the wing centre section and cut slots for the engine bearers and tank vent. At this point the cockpit former is slipped over the pushrod and glued to the trailing edge. Check the controls for full and free movement and if all is well, cover the wing with lightweight rag tissue and give three coats of clear dope.

The flaps are now built, covered and doped. Slot the 16 gauge wire pivots into each end and cement them in place, then slip on the ply pivot bearings and attach the flaps to the wings by cementing the bearings to the trailing edge.

Fuselage

The fuselage is so intimately welded to the wings, it may look rather involved. First the engine bearers, tank and front bulkhead are cemented together, the dash bulkhead cemented on and all horoughly doped. Fit Neoprene extensions to the tank vents and cement the whole assembly to the wing. Sheet around the lower tank vent where it protrudes from the wing. The fuselage sides are cut to the shape shown on the plan and cemented to the underdeck. When dry, cement and pin the fuselage sides to the front fuselage and wings and fit the remaining bulkhead in the rear fuselage.

Cement the backbone in place and fair it into the fuselage sides. The tailplane is cemented to the rear fuselage sides and connected to the pushrod. It should be examined for line up with the wings, and flap movement (10 deg.) and elevator movement (20 deg.) checked before the fin is attached. Curve the fin to starboard 2-5 deg. to help line tension, and fair it to the fuselage with plenty of cement. The cockpit may be decorated now and a pilot fitted if desired, then cement in place the canopy former, colour dope it, and cement the celluloid canopy sides in place.

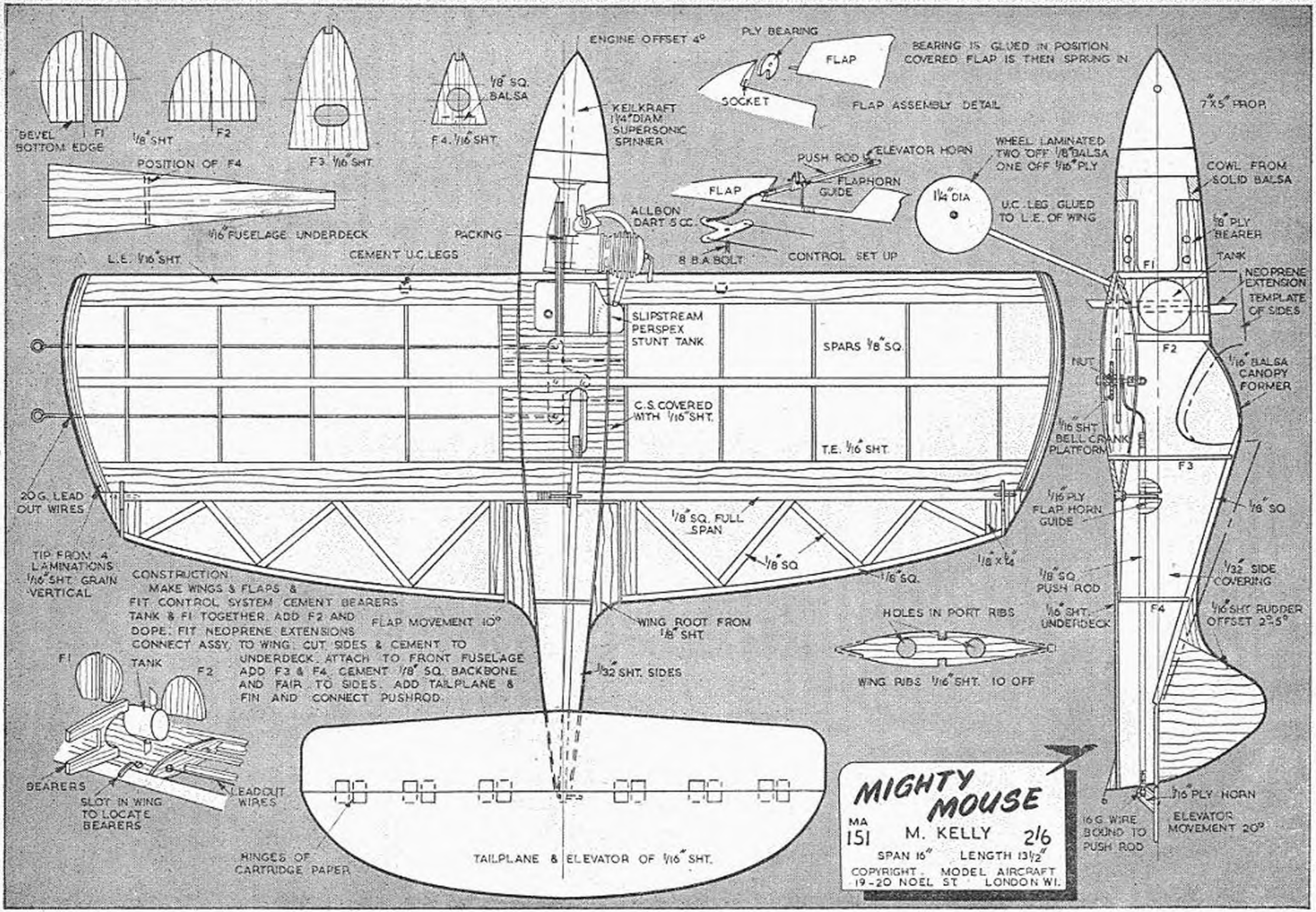
The cowl is best carved from soft block. It is preferable to test fly without the cowl or spinner, so that these may be permanently fixed on when the motor has bedded down, offset has been adjusted and it is running reliably.

The undercarriage is a non-essential fitting that will reduce performance, but enable realistic take offs and landings to be made. The wheels are a balsa ply sandwich, bushed by filling the hubs with cement and allowing them to set on their axles. They can then be freed when dry, and will run smoothly.

Flying

Before flying under power, whip *Mighty Mouse* on 10 ft. lines and check that it can be stalled fully both upright and inverted. This is to ensure that your elevators can handle the pitching movement set up by the flap. After this test has been completed, prepare your thread lines by doping to reduce wind resistance.

First flights are best conducted on a fairly windless day. An E.D. 6 in. plastic prop as made for their .5 c.c. motor gives good thrust on an Allbon Dart, as it operates at the high revs at which the Dart gives its best power.



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 19-20, NOEL STREET, LONDON, W.1, 2s. 6d., POST FREE.

Model Talk

F. Smith, of Northampton, and his original E.D. 3.46 powered cabin F/F design.

By Bill Dean

● ACCORDING TO average contest results, the best A.2 glider design of last year was Bill Farrance's *Helios*, which appeared in the last issue of MODEL AIRCRAFT. Bill tells us that he finds it difficult to put his finger on any one feature of the design that might account for its consistently good performance, although the Swedish wing section by R. Odenman is particularly efficient and the sliding tow hook enables the very best towing point to be found.

As those who saw this glider flying last year will confirm, stability on the line is exceptional—and overhead cast-offs are standard procedure in both rough and near calm conditions. Incidentally, Bill rigs his model at 4½ deg. for the wing and 0 deg. for the tailplane. After adding nose weight to make the model balance at about 55 per cent. chord, he obtains the final trim by varying the wing (not the tailplane) incidence.

In still air (or what passes for still air!) *Helios* is capable of 3¾ minutes from a 328 ft. line—no mean achievement for an A.2. In view of this performance, it is surprising to find that the total area (496 sq. in) is just within the lower specification limits—with projected wing area 376 sq. in. and tailplane area 120 sq. in. (32 per cent. of wing). Weight with nose ballast is 14¾ oz.

The new '53 version features a much larger wing area of 440 sq. in (same wing section) and a small (18.2 per cent.) tailplane area of 80 sq. in., which brings the total within 5 sq. in. of the upper limit of 526 sq. in. The layout is largely based on the designer's experience as a member of the British team which attended the international event in Austria last year. Reliability in wind is expected to suffer, but this is the price to be paid for the lower wing loading.

Fuselage length has been increased to 49¾ in. (4½ wing chord's moment arm) and as with Gunic's '52 internationals winner, the nose has been kept very short (only 6¾ in.). For easier carrying purposes, the wings are now in two halves (dowel fixings) and any extra weight has been cancelled out by a lighter fuselage structure—which consists of two 1/16 in. sheet sides, edged with 1/8 in. sq. and 1/16 in. sheet added top and bottom after the formers have been inserted.

There seems to be a trend away from underslung rudders nowadays, since this type has been blamed by some designers for causing spiral dives after thermals have been entered. This model is an exception to the rule, however, since (as with the '52 design), over three-quarters of the fin area is positioned underneath.

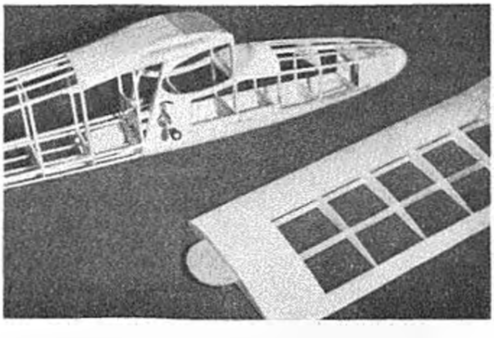
★ ★ ★

● FROM ONE of our dear readers, comes a letter asking if old man "Model Talker" still does any actual *building* himself. Why, of course we do. Nothing ambitious like altitude record jobs, channel fliers or five-minute Wakefields—but we can still display as fine a set of razor-slashed fingers as anyone!

Our latest model is an A.2 and this year we decided to really get the most out of the specifications by starting off with a 438 sq. in. wing span (83 per cent. of total max.)—then working out the projected area (424 sq. in). and adding the difference on to the tailplane area. Span worked out at 67 in. and chord 7 in. A moment arm of 3½ wing chords. plus a 9 in. nose, gave an overall fuselage length of 45 in.

Wings are polyhedralled, one-piece for simplicity and mounted on top of a minimum cross-section area box fuselage. Flying surfaces are geodetic (ribs at 32 deg. to chord) and the fuselage consists of 1/8 in. sheet sides back to the wing T.E., with 1/8 in. × 1/8 in. longerons aft of this point—and 1/16 in. sheeting top and bottom.

The fin is made from 1/8 in. sheet, with a cut-out for D/T tailplane operation and an auto-rudder set in the 1/3 area underportion. Wing section is



Unusual feature—for a cabin model—was the tongue and box wing fitting on the writer's A2 "Chief."

MVA 301 (at plus 4½ deg.) and the tailplane, thinned Clark Y (at plus 2½ deg.). We've even got a name for it—*Eagle*—so hands off that one! At the time of writing we are still waiting for a decent day to test it out.

★ ★ ★

● WHILE ON the subject of A.2s, the data at the foot of this page should prove of interest if you intend designing one yourself. Space limitations prevented us including rigging angles, c.g. and tow hook positions, but we think that a fairly complete picture of ten well-known models has been provided (the eleventh unknown is our own new A.2-!).

By referring to the three-view and key, it is a simple matter to read off data concerning any of these models. A typical A.2 layout has been sketched, but *all* the models listed differ in detail—some considerably. It is worth noting that only Czepa's *Toothpick* features "vee" dihedral and that this same model and the *Anglian* share the distinction of dihedralled tailplanes. With one exception (*Snark*), all tailplanes of these models are constant chord. The *Revenge* has a symmetrical tailplane section, but all the others have thinned Clark Y types.

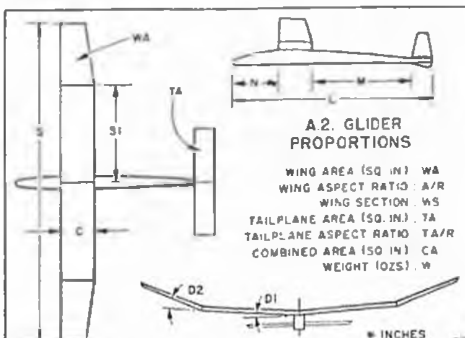
Wing sections are all undercambered and mostly fairly thin, the exceptions being—*Toothpick* (ultra thin—bird-like); *Veronica*, *Revenge* and *Jader* (medium thick). Six of the models have one-piece wings and the others have two panel types, attached to the fuselage by either tongues or dowels. Tip-up tailplanes and auto-rudders are common to all except *Toothpick* (parachute D/T and no auto-rudder) and *Jader* (parachute D/T). Unless fin area is underslung (*Anglian* and *Helios*), fins are mostly set forward of the tailplane. Fuselage sections are triangular (*Toothpick* and *Anglian*), diamond (*Marauder*), streamlined (B.G.44, *Veronica* and *Revenge*) and the remainder "box." Typical c.g. position is slightly behind mid-wing chord, with tow hook located under or up to 1½ in. forward of this point.

★ ★ ★

● STILL ON A.2s, we note with approval that the F.A.I. has now halved the maximum towline length to 164 ft.—although this rule will not come into effect until January 1st, 1954. With the same view to limiting flight times, a suggestion appeared in "M.A." some time ago to the effect that total surface area should be reduced to 300 sq. in. However, since the A.2 class is now so well established, we feel that it would be a pity to start meddling with the area specifications. A simple alternative might be to raise the minimum weight figure to 16 oz. (or the nearest metric equivalent), since many modellers find it difficult to build a strong model down to the present 14.46 oz. minimum.

An American friend tells us that A.2s are starting to catch on in the States, now that the A.M.A. has officially recognised the type. One of the first published designs is by Dick Everett, who favoured a

F./Lt. Bowmer, of R.A.F. Dishforth, and his glider—fitted with a wing from a 1938 petrol model.



MODEL	DESIGNER	S*	S1*	C*	WA	A/R	D1	D2	WS	L*	M*	N*	TA	TA/R	CA	W	DIHEDRAL	MODEL
TOOTHPICK	CZEPA	67	67	7.5	458	9	10°	—	CZEPA	78.5	39	25	67	7.5	525	14.5	VEE	TOOTHPICK
B.G. 44	GUNIC	66	23.5	7	444	9.5	0°	30°	MVA 301	40	24	4.75	80	5.2	524	14.5	TIP	B.G. 44
HELIOS	FARRANCE	60.75	17	7	376	9.8	0°	21°	ODENMAN	43	23	8.75	120	6.3	496	14.75	TIP	HELIOS
QUICKIE	MONKS	66.5	22.5	6.5	420	10	1.5°	7°	SI 64009	36.5	18.75	6.75	100	6.5	520	14.6	POLY	QUICKIE
VERONICA	PETRIE	64.5	20	6.5	416	9.9	0°	22.5°	——	36	17	7.5	104	4.25	520	15	TIP	VERONICA
REVENGE	YEABSLEY	61.75	14	6	395	10.3	0°	25°	——	42.5	20.5	8	115	4.3	510	14.5	TIP	REVENGE
MARAUDER	NICHOLLS	64	22	6.75	423	9.6	4.5°	21°	NACA6409	50	20.25	13.5	101	4	524	14.5	POLY	MARAUDER
ANGLIAN	CHINN	62	21	7	400	9.5	6°	18.5°	MVA 301	42	21	9	116	5	516	14.5	POLY	ANGLIAN
SNARK	TWOMEY	63	18	7.5	412	8.4	0°	20°	——	36	16.25	6	102	4.75	514	14.6	TIP	SNARK
JADER 60	BUTLER	58	17.5	7	397	8.3	2.5°	18°	NACA6412	38	17.75	7	125	5.3	522	14.6	TIP	JADER 60
EAGLE	DEAN	67	19	7	424	9.3	4.5°	15°	MVA 301	46	24.5	9	97	5.4	521	14.5	POLY	EAGLE

This "Tiger Moth" was one of the best concours entries at the last All Herts Rally.

constant chord long moment-arm (four wing chords) model. Nice clean-looking job—tapered dihedralled wing tips—Gottingen 602 section—26 per cent. tailplane—triangular fuselage and side tow hooks.

★ ★ ★

● FROM ARTHUR GORRIE's latest news letter, we gather that combat C/L flying is all the rage down in "kangaroo country" nowadays. We read that Des Slattery will take on anyone at the drop of a hat and even after they land, his opponents are still far from safe! Like T.R., combat originated in the U.S.A. and is a sure-fire way of preventing spectator enthusiasm from flagging at C/L contests and demonstrations. We saw a little combat flying towards the end of the '52 season and predict that it will be a feature of several of the big meetings this year. We had our own first mild taste back in '47, when we chopped streamers (and tailplanes!) with Mike Booth and Ron Moulton at the "M.E." Exhibition of that year.

★ ★ ★

● BOB CRAIG, of Belfast, really stirred things up when he flew his Mills .75 powered *Tiger Moth* at the local flying field a few Sundays back. A three-minute motor run gave an out-of-sight flight which culminated in a realistic crash to the horror of a distant spectator, who promptly dialled the Irish equivalent of 999. This resulted in a fruitless four-hour search for the wreckage and survivors by the police, ambulance units and an R.A.F. mountain rescue squad. While retrieving his model, Mr. Craig wondered what all the activity was about, but it was only at work the next day that he learnt that his F/F scale had been the cause!]

★ ★ ★

In Brief . . .

. . . One of the entrants in the R/C event at the last American Nats was a certain Mr. William Dean. With something like family pride we noted that he placed second in the results list—with a *Rudderbug*.

MODEL AIRCRAFT

Engine Tests

(Continued from page 213)

As with many small engines using piston-rings, it was found helpful first to prime the cylinder with a little castor lubricant, turning the engine over to distribute the oil over the cylinder walls and in the ring grooves. This greatly improves piston seal and increases compression for a certain start. Later, of course, when the engine has been fully run in, so that the rings have become adequately bedded, these preliminaries can be dispensed with, since compression seal will then be improved sufficiently to provide easy starting by the usual methods.

The Super-Tigre is, in fact, good in this respect, particularly on a nitrated fuel, and is easy to start, by hand, on a wide range of different size props and using any of the three choke inserts supplied. To re-start the engine when warm, a couple of choked flicks is all that is necessary, the needle-valve remaining in the running position.

The interchangeable chokes, incidentally, which, of course, are of varying diameters, are plastic mouldings in three different colours: white, red and black. They can be changed in a minute or so and are simply held in place by the spray-bar. The white insert (with which the engine was fitted when received) is intended for general use and free-flight work. The red one is of larger bore and is for speed work. The black insert is smaller than the other two and is recommended for control-line stunt models, being intended to provide a higher intake velocity for more perfect carburation.

Dynamometer tests were carried out with the red choke fitted. With this, the needle-valve needed to be opened another quarter to half turn, but otherwise starting remained unaltered. The needle-valve, incidentally, is not at all critical using nitrated fuel, yet gives positive response, is smooth in operation and holds settings firmly at all speeds.

The general running qualities of the Super-Tigre are very pleasing. Compared with diesels of the same capacity, it is much smoother. At the higher speeds in particular, the Tigre runs very happily and holds its r.p.m., with none of the continual fluctuations which beset some motors.

The torque/b.m.e.p. figures obtained are well up to expected levels for an engine of this type and capacity, especially as they are maintained at an almost constant level over a wide r.p.m. range, but in view of the maker's performance claims for this model, which state that the output is 0.29 b.h.p. at 16,500 r.p.m., it is possible that some improvement may be obtainable over that actually recorded by our test model. Figures we obtained gave a maximum of approximately .25 b.h.p. reached at slightly over 15,000 r.p.m., which, of course, are very good. For sheer "revving" ability, the Super-Tigre is the fastest 2.5 c.c. engine yet tested and should be well suited to speed control-line use.

Power/Weight Ratio (as tested): 1.0 b.h.p./lb.
Power/Displacement Ratio: 100 b.h.p./litre.

OVER THE COUNTER

MEERS (Engineering) LTD.
22, SUN STREET, CANTERBURY, KENT

The business was first established in Burgate Street, Canterbury, by Mr. E. Meers, of Sturry, and known as the East Kent Model Engineering Co. However, during World War II, the shop and stock were completely destroyed by enemy action.

In 1945, the Model Engineering Co. was absorbed into the activities of Meers (Eng.) Ltd., of 22, Sun Street, which now not only carries a comprehensive stock of all model requirements, but also specialises in light engineering supplies, hence their slogan—"Every requirement for Major and Minor."

Mr. E. Rigden, on the right in the photograph, who is in charge of the model department, is the treasurer of the Canterbury Pilgrims M.F.C., and has been actively engaged in aeromodelling for thirteen years.

A folding wing catapult-launched glider is one of the latest Veron productions. This, similar to a conventional chuck glider, but with hinged wings that can be folded back flush against the fuselage, can be catapulted upwards to a height of 150 feet or more, when the wings snap open and the model makes a normal glide descent. This novel method of launching, first introduced on a commercial model some ten years ago by Jim Walker, in America, relieves the wings of catapulting stresses—and also overcomes the difficulty of trimming a catapulted model out to prevent the launch becoming one spectacular loop. The Veron *Hunter* glider retails at 5s. 6d.

* * *

Another new Veron kit scheduled is a companion model to the *Lavochkin* with ducted fan propulsion. Considerable advances have been made both in duct and rotor design and this new kit is awaited with interest.

* * *

The McCoy half-A diesel (.049 cu. in. displacement) is now in full production and sells for $5.95 in the United States (approximate British equivalent 42s., less tax). Bore is .405 in. and stroke .386 in. The name, we feel, has not been particularly well chosen—Duro-Glo. The "Glo" part seems most inappropriate to a diesel! The manufacturers claim a 50 per cent. increase in power over conventional glow-plug motors of similar capacity.

* * *

All model fliers, and particularly the contest types, will be interested in a new production by Messrs. Ingersoll, of Ruislip, Middlesex. It is a really inexpensive stopwatch with sweep seconds hand, and dial calibrated in fifths of a second, and known as the Ingersoll *Cronostop*. It has a white dial and a strong stop-start action controlled by stopwork attached to the side of the case, and it is suitable for use as an ordinary watch in addition to its special-purpose action. The price is 50s.

* * *

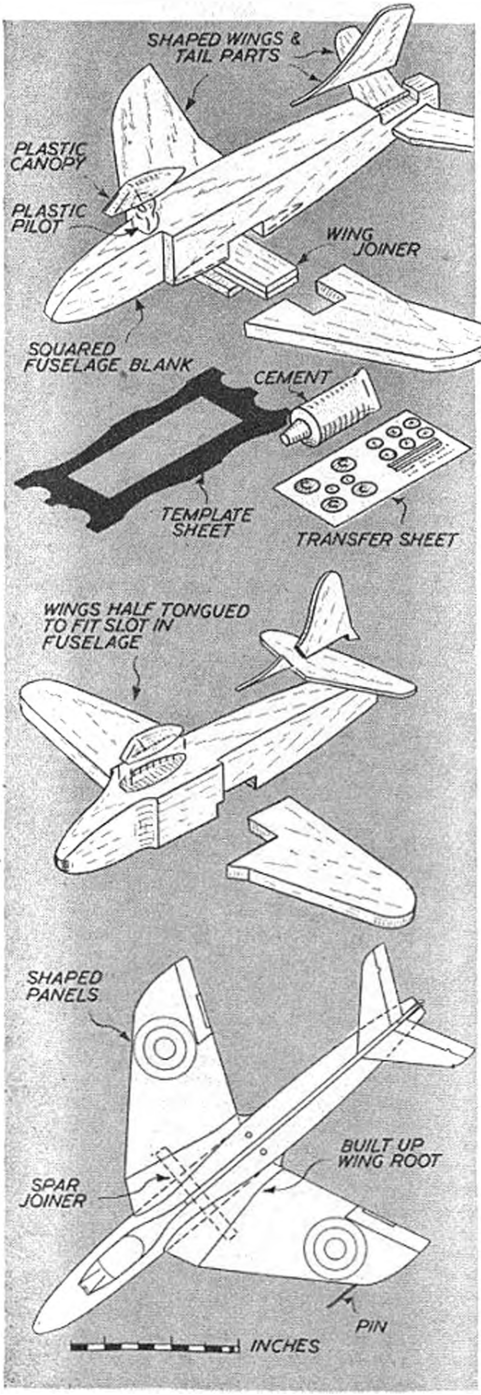
We have just received a new Allbon diesel—the 1 c.c. Allbon Spitfire, developed specially for the beginner, and claimed to combine easy starting qualities with an excellent performance.

* * *

Nylon accessories for power modellers may soon be on the British market. Nylon propellers have already appeared (International Model Aircraft), and nylon C/L fittings, such as control plates and hinges may soon be forthcoming from another manufacturer. Nylon gears would also have been a possibility, but for the change in the Wakefield rules virtually killing any further demand for gears.

* * *

On their stand at the British Industries Fair, which opens at Olympia on April 27th, Messrs. Wilmot, Mansour & Co. will be showing, in addition to their well-known wide range of Jetex motors and kits, a number of new productions, including the new baby Jetex 35 motor. There is also a new kit of the D.H. *Comet* jetliner for two Jetex 50's—a "tailored" kit with pre-formed fuselage and wings complete with engine nacelles. Another new release is a tailored kit of the Supermarine *Swift*, similar in construction to the Hawker *Hunter* and designed for either the Jetmaster "100" or the brand-new "350" shown here for the first time. This motor accommodates one charge which burns for 11 seconds, and with the augmenter tube it gives 6 oz. thrust. There is a simplified loading cap incorporating a roller as on the Jetmaster and the motor has been designed with the duration contest flier in mind. Finally, the new range is completed with two "silhouette" Jetex 50 models of the *Swift* and the Gloster *Javelin*. Incidentally, Wilmot Mansours are planning to open a new wholesale distribution department in the North as soon as suitable premises can be found. It will probably be in the Manchester area, and will result in a more efficient distribution of Jetex products to Northern retailers—and fliers.



OVER THE COUNTER ——— KIT REVIEW

The Keilkraft "Solids"

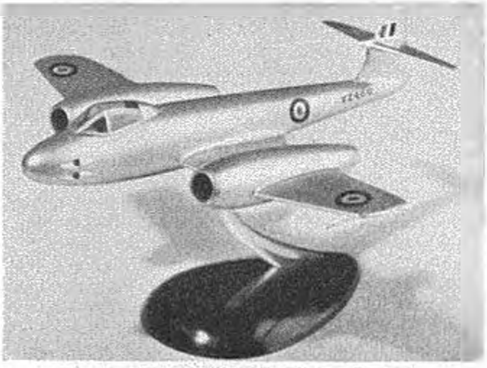
The present range of Keilkraft solid kits covers some eight different models, all of which we have recently had the opportunity of examining in detail for the purpose of review. These kits, without doubt, represent a considerable advance over the old "standard" solid models so popular during the war years, being designed as *models* rather than a collection of shaped pieces conforming to scale lines. In particular the use of spar joiners to assemble the wings is most welcome, simplifying the "hit or miss" method of butt jointing wing panels to curved fuselage sides which was almost universal on earlier British solids.

The contents of these solid kits are attractively complete. Fuselage is cut two ways to correct blank shape (i.e. cut square to plan and elevation shapes, leaving carving to cross section to be done by hand) and, a welcome touch, all necessary slotting is done. Wings are similarly cut to plan shape, with slots or half-tongues, as required. Tail parts, spar joiner and other detail parts are printed on sheet balsa. Transfers, a template sheet, plastic canopy and a scale plastic pilot, and a small tube of cement complete the kit contents, together with a detailed plan.

The plans are well drawn and presented and include sufficient detail appropriate to 1/72nd scale. Details are also given of the construction of a suitable stand for the finished model.

The shaped parts match the plan outlines with commendable accuracy. Wings panels are cut to bare outline shape, fuselages slightly oversize to allow for carving. Construction of any one of the models is reasonably straightforward and well thought out.

At the low retail price of 2s. 8d., including tax (3s. 8d. for two of the larger models), these Keilkraft solids represent excellent value and make a refreshing change from built-up models.



A Gloster Meteor built from one of the kits.

Topical Twists

Model Bogey

As if model flying hasn't already sufficient hazards of its own we learn with amazement that a model contest was recently held on a golf course.

The golfer, not over-famous for his sweetness of temper, must view this intrusion on to his beloved fairways with very mixed feelings. Being struck in the hinderparts by a wayward model when making that critical putt, for instance, is not the sort of thing to promote self control. But, when on the exasperating occasion he slices the ball into the rough, how soothing it must be to his raw nerves to have a crispy, crunchy model plane to jump on. And how much more economical than flinging his clubs into the nearest water hazard.

● ● ●

A Signal Remedy

Those frantic tic-tac exchanges between the radio modeller and his helper have always intrigued me. I've never known the exact nature of the signals passed in this long range sign language, but the procedure always seems to terminate at a point when the radio modeller, after carrying out exhaustive tests, has convinced the bystanders that his helper is a clueless clot.

Now, it seems, the whole thing is going to be systemised on an elaborate semaphore basis, with a full signal procedure to cover every possible contingency. Even so, I hazard the guess that, however efficient the new system may prove, a few of the old fashioned signals will still be retained. For example: two handfuls of hair held aloft to indicate " The model is now out of range," and both hands covering the face to convey " The model is about to crash."

● ● ●

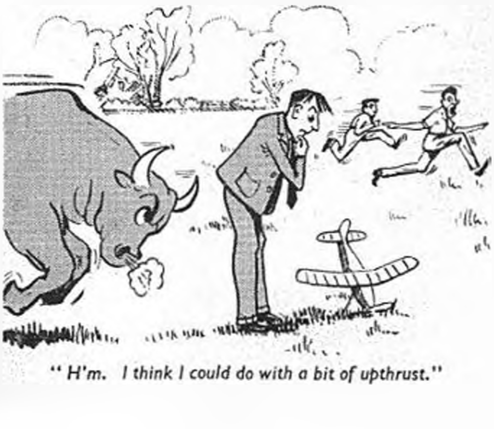
A Realist Approach

I believe in adopting a firm policy towards the fire-eating fusiliers of the Realist Brigade; keeping them in their proper place amongst the model steam boats, miniature replicas of the *Rocket*, and the 1/24th scale brass donkey engines. And seeing that the museum doors are securely bolted and barred.

Some aeromodellers, however, are inclined to be more lenient, allowing certain of the seemingly less harmful specimens to move freely about in the enlightened circles of our progressive hobby. But, alas, only too often with the most disastrous consequences.

Take, for instance, the recent case of one such privileged realist. Mild mannered, and showing not the least sign of apoplectic strain, he was engaged with a fellow realist in a quiet, friendly argument on some of the finer points of scale verisimilitude, such as fitting commercial plastic props to scale S.E.5's, when, suddenly, he turned away and loosed a stream of bitter invective at an unsuspecting group of power duration devotees. Then, delving deeply into the abusive depths of the realist slanging vocabulary, he rounded off with a fine alliterative allusion to the " freak flying fraternity."

What incited this impassioned outburst at that particular time it is difficult to say, but my theory is that it was all due to a very unfortunate association of ideas: First World War Planes—Aerial Circuses—Flying Freaks.



" H'm. I think I could do with a bit of upthrust."

● ● ●

News from the Areas

London Area

Improved relations with agricultural interests are expected this year following an invitation to the local farmers to compete in the first of the season's events: an open ploughing contest at Fairlop.

The committee is anxious to receive more news of activities in the area. Anyone who has flown a model aircraft in the London district over the past few months is asked to submit full details, including the date when the case is due for hearing.

East Anglian Area

The area duration event was due to be held on February 29th, but as J. Floorem was preoccupied with the building of a radio control model it was decided to omit the routine of flying off the contest, and merely present him with the Trophy

North Western Area

Principal news concerns the activities of the Blackmeadow M.A.C., where the club open contest was again won by O. Winnall; the best recorded flight of the day being made by O. Winnall. Several records have been submitted on behalf of club member, O. Winnall, and the club is busily engaged in testing new models. Most promising of these is O. Winnall's Wakefield, which has been putting up consistent flights of 6 minutes in still air.

The club is confident of yet another season's successful flying if the outstanding performances of O. Winnall's new models are anything to go by.

Club publicity interests have been well catered for in the capable hands of our P.R.O.: O. Winnall.

Northern Area

(No report was forthcoming from this area, as the first event of the season was held in calm weather, and it was considered that mention of this fact would be bad propaganda.)

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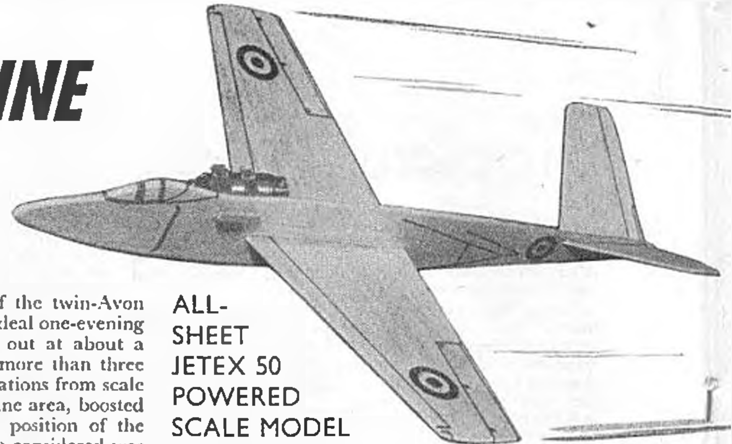
I like the idea of the model, entered in an Epsom event, making a grandstand finish. Obviously a totalisator loss.

Experimenting American aeromods are stumped for a means of improving upon the Russian held world duration records. Obviously they should try using a little more imagination.

Pylonius

SUPERMARINE 508

By Bill Dean

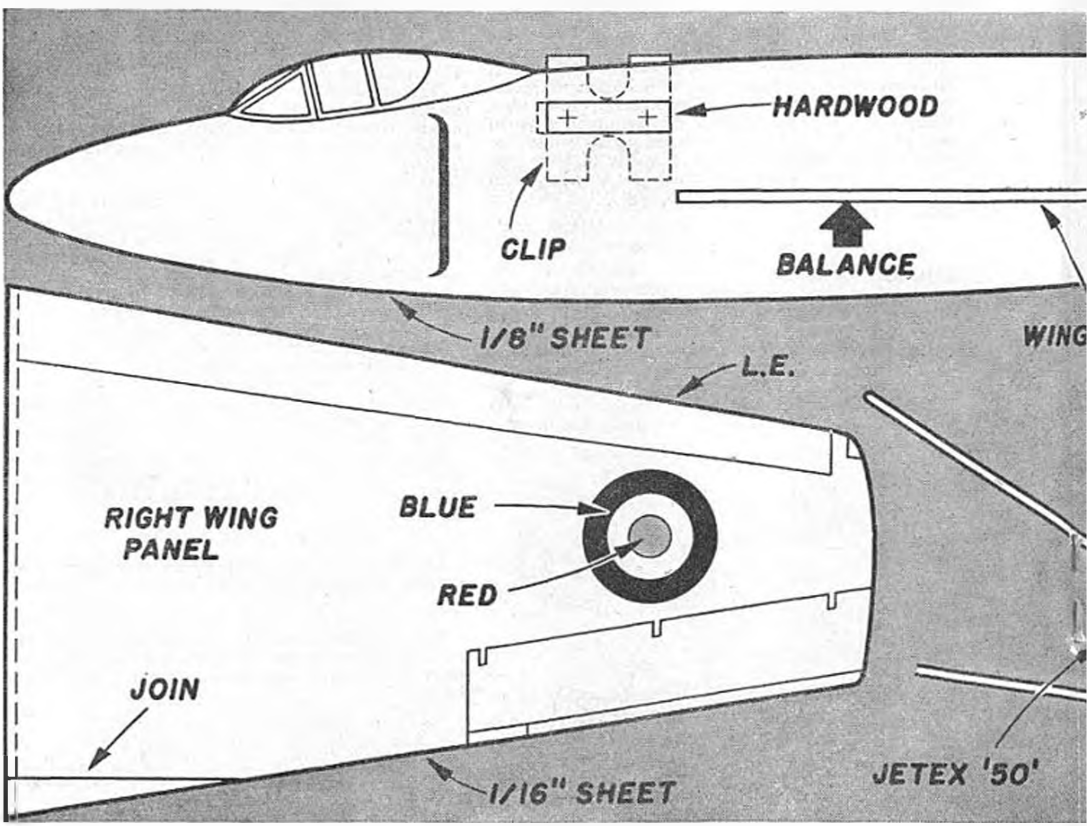


ALL-SHEET JETEX 50 POWERED SCALE MODEL

THIS Jetex "50" profile model of the twin-Avon powered Supermarine 508 is an ideal one-evening project. The cost of materials works out at about a shilling and only a sluggard will take more than three hours to finish the job. The only deviations from scale outline are the slightly increased tailplane area, boosted wing dihedral and the more forward position of the wing. Size was kept down to what we considered was the practical minimum for a "50" size motor and this resulted in a realistically fast model with a good rate of climb.

The drawings are full size, so trace the patterns on to well sanded medium weight sheet—with the grain following the longest dimensions. Pin-prick the holes for the motor clip screws (in the fuselage). Cut out the parts with a razor blade, making two of the wing and tailplane patterns. Round off the edges—except at the tailplane cut-out and flying surface roots. It will be found easiest to apply the decoration *before* assembly, so pencil in the R.A.F. roundels, canopy and other markings, then go over them with a ball-point pen.

Sand the wing and tailplane roots to the correct



angles to allow for the dihedral. Pin one wing panel flat on the building board and cement the other panel to it—packing up the latter $1\frac{1}{4}$ in. at the tip. Repeat the process for the tailplane panels, but in this case obtain the correct dihedral by means of the $\frac{1}{8}$-in. sheet angle template "*X*."

Now cement the wing in the fuselage slot—checking that it lines up correctly with the fuselage in the top and side views. Cut a "V" shaped trough in the fuselage at the tailplane position, then cement the tailplane in place—carefully lining up with the wing. Cement a piece of scrap $\frac{1}{8}$-in. sheet on top of the tailplane, allow to dry, then trim down to line up with the fuselage curve.

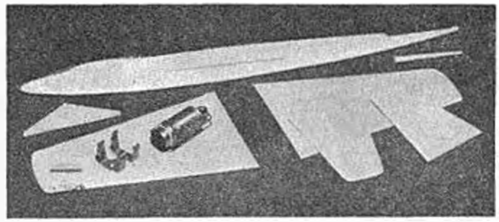
Cement a $\frac{3}{4}$ in. × $\frac{3}{16}$ in. × $\frac{1}{8}$ in. piece of hardwood (or ply) to the right side of fuselage (looking from front), then screw the motor clip in place—parallel with the wing. With the *loaded* motor installed, the model should balance at the point indicated—weight being added to the nose or tail if required.

Flying

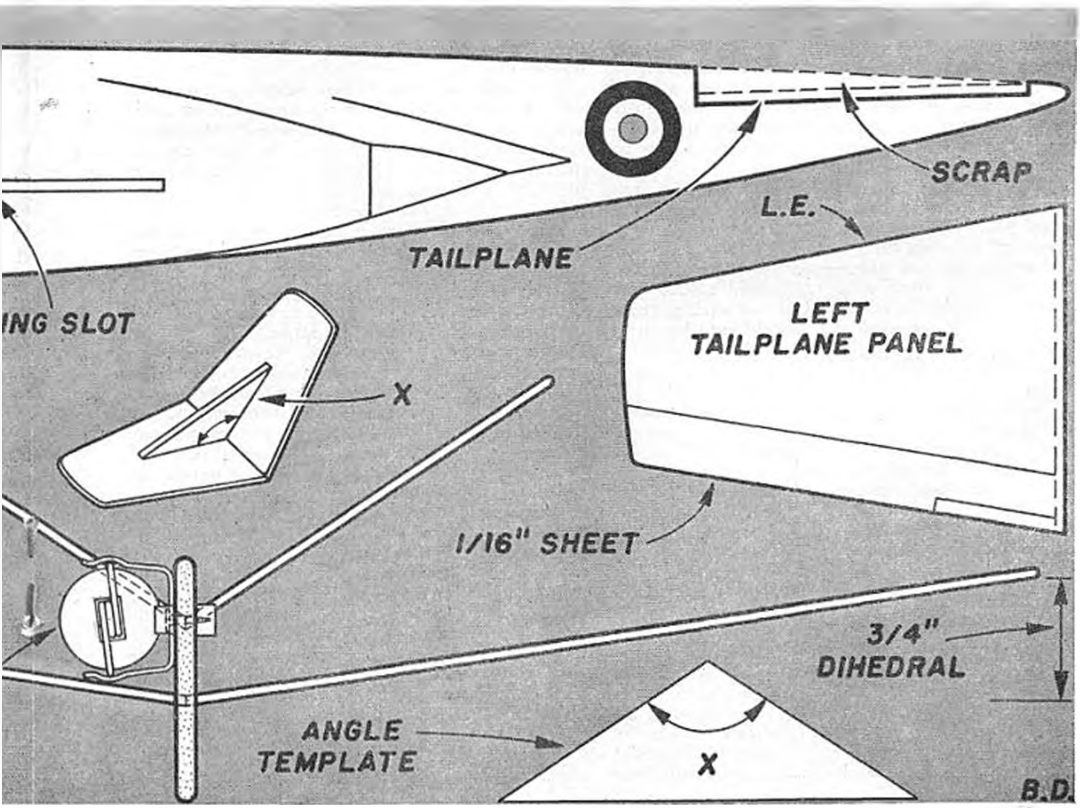
Glide test model from shoulder height, checking that no violent turns, diving or stalling tendencies are present. Adjust turn by twisting up wing leading edges or tailplane trailing edges. For instance, a sharp *right* turn may be corrected by twisting up the *right* wing leading edge or *right* tailplane trailing edge.

When a good glide with a gentle turn (in either direction) has been achieved, try a power flight. After lighting the wick, wait for 3-4 sec. before launching—to allow the thrust to build up. A fast steep climb should result, with the offset motor pushing the nose round to the left.

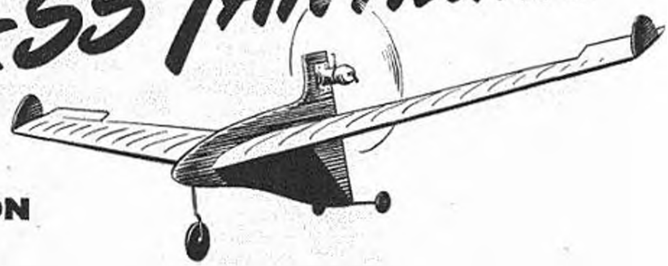
The original model is trimmed to glide right, but the offset thrust gives a gentle left turn under power. This appears to be the best trim arrangement, since a left glide turn may tighten up under power to the point where the model spirals in.



Here are all the components before assembly.



TAILLESS TANTRUMS



By L. RANSON

WHEN the midnight oil stocks are running low, and still the anguished beads of perspiration are falling freely on to the warped and ancient drawing-board, I work myself up into a green glow of envy towards the really genned up experts of this model design game. All plain sailing for them: just sort out a few frilly formulae, knock up an odd graph or two, throw in a few weighty equations just to help the c.g. along, and the model is straining at the leash to fly right off that drawing-board. (To get off mine it would need a pretty good undercart.)

Still, being a common or garden modelling nitwit has its compensations. For one thing, it's a bit of a fag having to lug a drawing-board over to the flying field, and for another, it's exciting to have a few surprises in store, even if they turn out to be mostly unpleasant ones.

This account of the development of the tailless wonder begins way back in the dizzy dawn of the diesel era. At that time the skies were heavily congested with solemn looking cabin models, primly proceeding on their glassy-eyed missions. Even so, the owners of these staid craft were getting just that bit bored with the monotony of sending them on the short route round the airfield, and began to look around for other, more exciting, diversions. Some even married them, but for my part I decided to go tailless.

In those days tailless jobs were few and far between, and I at least had never seen one actually at grips with the elements. Neither was there much available data on the subject, but I managed to scrape together the basic ingredients for the tailless recipe. The dish went something like this. Take one swept-back wing, and to this a few degrees washout, a soupçon of dihedral and about half the usual measure of fuselage. Stir well with the imagination, trim with a few wafers of elevon, dress up with the odd sprig of fin here and there, and serve up on a very calm day.

First came the wing. No problem with the general dimensions here: about 400 sq. inches of area and a span of between 4 and 5 ft. But what about sweepback? Without a tailplane bringing up in the rear the poor old wing is left to fend entirely for himself. Labour saving gadgets like reflex airfoil sections, tip washout and elevons all help to keep his end up, but he must sorely miss that nice long tail moment arm, and even the built-in sweepback variety is some consolation. But how much? Well, after studying the problem from every angle I plumped for an eyeworthy 30 deg. on each leading edge. That, I thought, would be sufficient to keep it happy around the pitching axis, and give enough overall length to the model to keep it on the straight and narrow, weather-cock fashion.

I also rumbled the fact that sweepback does quite a sideline business in the dihedral department, and only a trace of prop-up at the wing tips would be necessary.

This wing, or rather wings, with 10 degrees tip washout, plus elevons and tip fins, were mounted tongue and box fashion on to a shallow, rudimentary fuselage some 14 in. in length. The Mills 1.3 was mounted beam fashion immediately behind the trailing edge, and the nose ballast loaded to keep the c.g. in a safe forward position.

Glide tests from high ground were fast, flat and flattering. Next step was to try a power-on flight, and here, together with the flying field I got my first big shock. The model might be well enough behaved when gliding along in its own sweet time, but seemed to take violent exception to being kicked from behind by an aggressive diesel; expressing such displeasure by an anguished spiral into the deck.

All efforts to correct this destructive bent were without avail. The longitudinal trim was altered, the tip fins modified, and the thrust line angled every possible way, but still the damaging spiral persisted. Obviously some remedy of a more drastic nature was called for; so, piecing together the unexpired portions of the day's flying, I began to ponder the infinite mysteries of spiral stability. Trouble is, though, that when tackling the spiral question, you become involved with its parental elements, directional and spiral stability, and your thoughts go spinning round in an even more vicious spiral than the manoeuvre which inspired them. Anyway, from this gyrating muddle I managed to salvage the possible solution that the dihedral effect of sweepback might not be so hot when the model is climbing. So, dutch roll or no dutch roll, I eased up the wing tips to a more definite angle.

This improved matters quite a bit, and with careful trimming an odd flight or two could be squeezed out of the now battered framework of the tailless wonder. But, given just that little extra surge of power or playful gust of wind, and the big dipper would go into wing splintering action.

By this time I'd pretty well scavenged the repair kit apart from an odd bit of ⅛-in. sheet; so, borrowing a hint or two from the model yacht club, I fashioned out a nice, deep keel and anchored it to the underside of the fuselage. A quite logical thing to do really, since extra side area would compensate for the short overall length of the model, rather in the same way that the " cockerel " type of weather-vane tries to make up for its short length by assuming more generous proportions than the arrow type, where the small areas are well-projected from the pivot point.

The underfin, for all its apparent crudity, seemed to work the oracle; and the model, tattered but triumphant, was at last flying instead of burrowing; skimming around the dropsical looking cabin models with a lively relish.

Still very much the victim of ambition's spur, I wasn't content with just a well-behaved sport model. I wanted a real go-getter; one that reared up on its tail—or, rather, its tailless tail—into a really sky-scorching climb. Thus was born the second design.

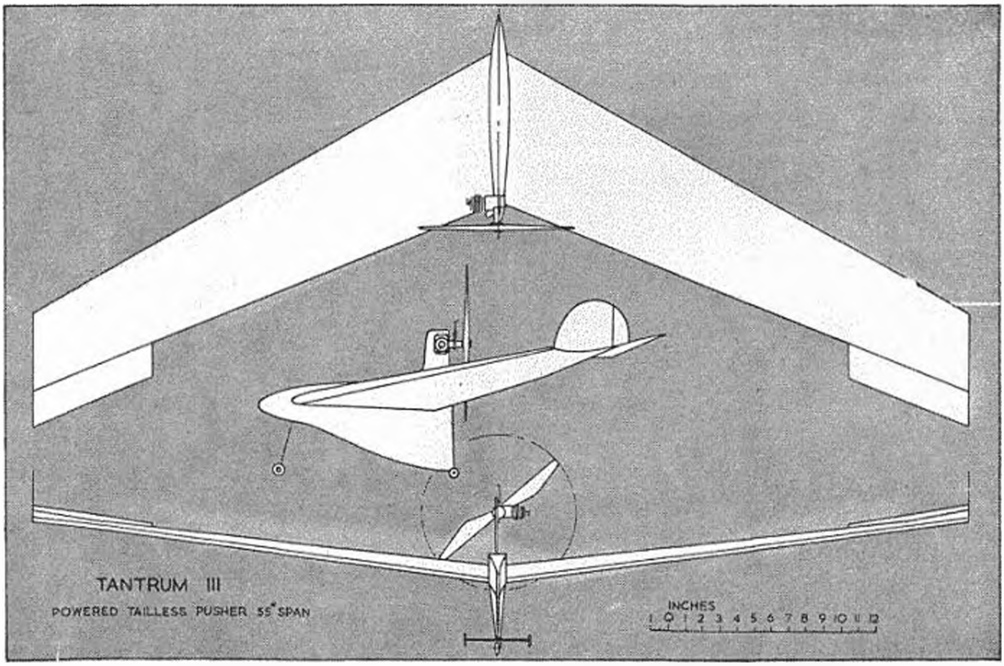
The wing on the new job remained as before, but the fuselage, shortened up by two inches, was entirely redesigned. To get a more positive down-thrust action, and to cut down on the front ballast load, the engine was mounted sidewinder fashion above the wing on a silhouette type pylon. The stabilising underfin was retained, but this time built integral with the fuselage. The fuselage, incidentally, was of crutch construction with a centre keel fretted out of ⅛-in. ply.

This refined, and lighter, design was a much more stable proposition than its predecessor. The nearest it got to a spiral was a rather steep banking turn, but only this when it was really aggravated. And neither was it so sloppy in its habits as to droop into a stall. The climb was straight and steep-angled, but when the motor cut in the sitting-up position, instead of going for the usual switchback ride the model would merely flip itself on to an even keel without loss of height or dignity. This sublime characteristic was no doubt due to the short overall length of the model giving it a certain measure of freedom from that arch-agent of the stall, inertia.

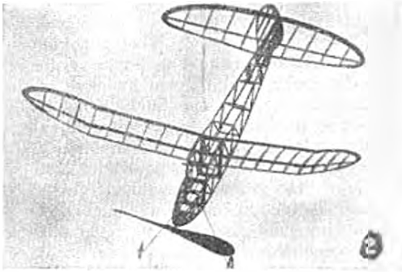
During its long and useful life this model notched up quite a few flying hours over the Fairlop arena (excuse a Cockney tear at the mention of that lost paradise). But, I still had great expectations, which I hoped to realise with the spirited assistance of a hot Allbon Javelin that I had acquired by a judicious swop. The four-to-one ratios that I was consistently getting were becoming too much of a habit for sustained interest; pyrotechnics of a more dazzling brilliance were called for.

For the new engine the design mixture remained very much as before. Only the engine pylon was modified; giving it a shade more height to step up the downthrust moment, and raking it forward

(*Continued on page* 237)

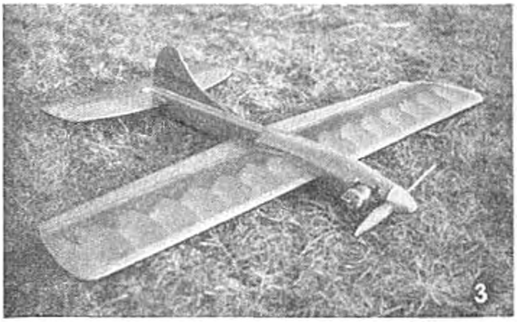


PHOTONEWS



ONCE more a month has passed and Photonews is here again. Our readers have certainly not been idly whittling their thumbs during the winter and have again presented a good set of pictures.

Our star for the month goes to the first picture at the top of the page, and it came from Port of Spain, Trinidad. Harry Peña built this very fine C/L Grumman *Panther*, one of the first C/L *ducted-fan* models we have come across. Yes, a McCoy .098 glo-motor driving a 4⅛ in. impeller is housed under the hatch behind the cockpit, and air is drawn in correctly by the root intakes. Full marks!



No. 2 came to us from Arthur Guttmann who is based at the delectable resort of Davos-Platz in Switzerland. However, he is unfortunately frequently "hospitalised" and in fact made the model while in bed. As yet uncovered, it is a specimen of the popular rubber design, *Competitor*.

No. 3 was taken by A. C. Campbell of R.A.F. Hemswell, Lincs, and depicts his Frog "500" powered Veron *Panther*. Having flown one of these flapped stunters, we know how lively is their performance. Ah, what a pity the ground was not about three feet lower that last time

We were recently privileged to be present at the Stag Party organised annually by the Zombies Club of Beckenham, and picture **No. 4** was taken by Don Brockman during the festivities. The characters seen sipping their tea and singing a gay little ballad (what were the words, now?) are mostly fugitives from the Northern Heights club, but Zombie Duncan Geddie holds the centre of the floor. Others in view include Jim Lewis, Less Gill, Geoff Moss and on the extreme right—Bob Copland.

No. 5 was taken by John Garwood in the workshop of Alan Collins, of the Carshalton M.F.C. The big project on which he is working is a six-foot Bristol *Fighter*, now nearing completion and destined for R/C. Ambitious, yes, but it seems Alan does things the hard way, for he has even made his own engines. The two spark motors on the bench were made in 1948 and perform as well as any commercial job. Also in the picture is his Allbon Dart powered *Cierva C 40* autogiro with a 32 in. diameter rotor. He certainly takes this model business seriously.

Delta-wing models are making great strides and can be seen wafting about most flying grounds these days. John Lancaster of Dartford built the one in

No. 6 and powered it with a Mills .75. A normal prop is used, as of course this motor can be run backwards for a " pusher " installation.

The Blackheath club's winter glider contest drew fliers from all over the country, and in **No. 7** we see an A-2 of Pete Wyatt's which came from Ipswich. This model won Pete the R.A.F. Glider Championship last year and is also noteworthy for the dangling flap on the starboard wing to take the place of an auto-rudder.

J. Bridgewood of Doncaster, who produced the Vultee *Vigilant* scale design published in MODEL AIRCRAFT last autumn, also builds contest models, and our second A-2 this month, shown in **No. 8**, is a creation of his that has become a popular design among his fellow club members. It was flown in the 1952 Pilcher, aggregating 13 min. 03 sec., and in last year's A-2 trials it was lost on its second maximum. Other specimens hold the club records for duration and distance from a 50-metre towline.

P. L. Gray lives at Luton, but belongs to that group of enthusiasts—the Reading Solid Model Society. He must have an enormous collection of 1/72-scale models by now, for we are continually seeing photographs of new ones. The one shown in **No. 9** is a model of the Armstrong-Whitworth *Siskin*, the first of the all-metal fighters to go into service with the R.A.F. Photographed by K. Wingrove, the model is finished with the red-and-white checkerboard insignia of No. 56 Squadron.

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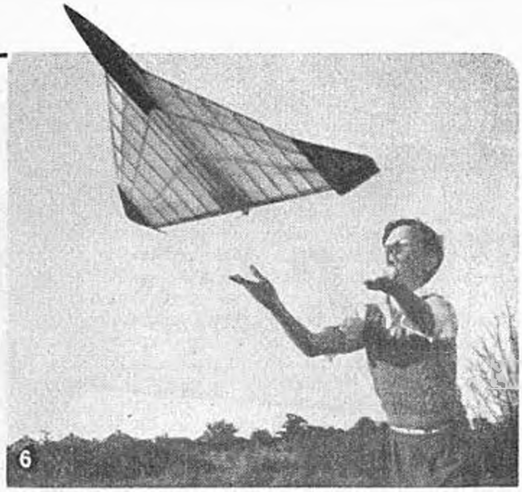
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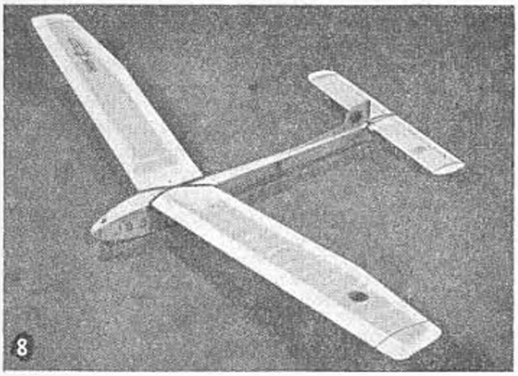
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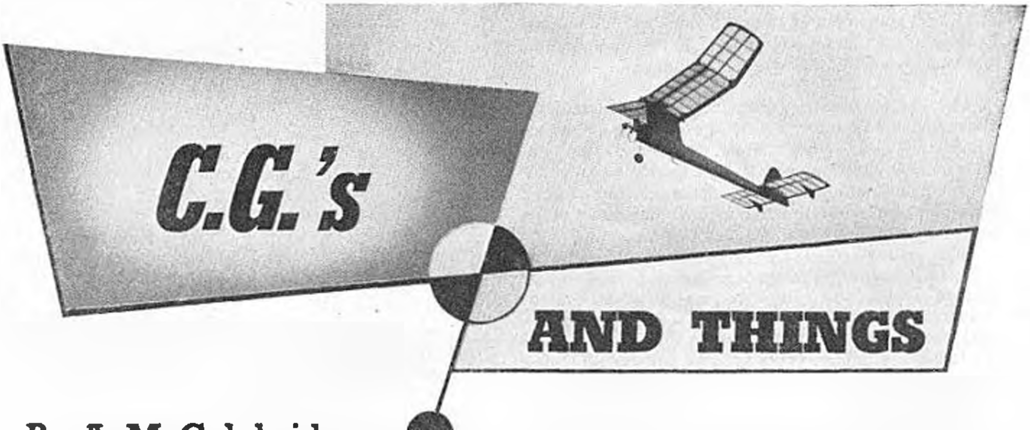


C.G.'s AND THINGS

By A. M. Colebridge

THE centre of gravity, known simply as " c.g.," is one of those things which, on the very best authority does not in fact exist, yet every model has to have one ! Half the battle of trimming consists of getting that non-existent point in the right place, and so it is as well to know a little about it.

The c.g., in popular usage, is simply the balance point of the model—and there is very little need to get much more technical on that particular point. The major problem is simply that of getting the c.g. just where we want it, particularly on a new design. The simplest way round it is to estimate where the c.g. will come out, locate the wing around this " guesstimated " point and, for good measure, allow a certain amount of fore and aft adjustment on the wings, just in case the final c.g. does not work out where you originally thought it would be. With experience, it is surprising how close you can be with your original estimate.

If you make a boob on a fixed wing design, however, you have to pay for it in the form of increased total weight, brought about by adding ballast to bring the c.g. to the design (or best trimming) position. Or you can, of course, work on the assumption that the model will fly, anyway, with the c.g. anywhere between the leading and trailing edge of the wing and it is then simply a matter of adjusting wing and tail settings to trim out at wherever the final c.g. happens to be. Neither solution is particularly satisfactory.

It is not all that difficult to make a reasonably accurate calculation of the c.g. position in the design stage—and if you can build to design weights, it can be a very accurate calculation.

Take as an example a typical shoulder-wing Wakefield layout—Fig. 1—this class of model being chosen particularly as probably the most critical, for the desginer can ill afford to add weight to the finished model to correct a bad mistake in c.g. location. The c.g. is to be located a certain distance behind the leading edge of the wing—which for a shoulder wing layout is generally 40 to 50 per cent. of the chord for best results. To calculate the correct location of the various components to give this c.g. position, we need to know the weights of these components and can then adjust their location accordingly. In actual fact the aerodynamic layout is generally fixed and the problem becomes one of calculating the *wing position*. In the diagrams, the various component weights are indicated as follows : P = nose assembly ; U = undercarriage; F = fuselage; W = wings; R = rubber motor; T = tail unit.

For all practical purposes we can, in fact, ignore the wings. Their weight will be acting almost through the c.g. of all the other components together and have little or no effect on the final c.g. position. It is sufficient, therefore, to calculate the c.g. of the nose assembly, fuselage, undercarriage, motor and tail unit, and then locate the wings about this

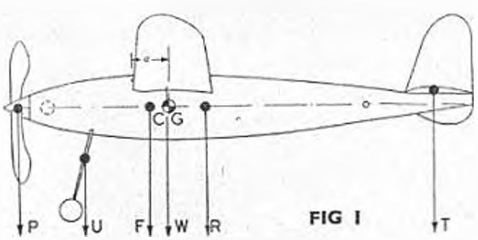


FIG 1

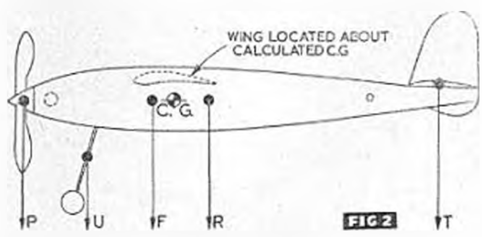


FIG 2

calculated c.g. And if we make an intelligent estimate of the component weights during the design stage, it is comparatively easy to build almost exactly to these weights, with the satisfaction that you then have really done some design work on your model.

We have to find the c.g. of a series of components as detailed in Fig. 2, where the following table can be taken as a general guide for Wakefield type rubber models.

Component	Weight
(*P*) Prop. assembly ...	Usually about 1 to 1¼ ounces.
(*U*) Undercart ...	About ⅜ to ½ oz. for twin leg, or as low as 1/16 oz. for single leg
(*F*) Fuselage	Slabsider ¾ to 1¼ oz. normally; with wing boxes 1¼ to 1½ oz. Streamlined fuselages generally weigh 1⅛ to 1¾ oz.
(*R*) Rubber motor ...	About 3½ oz. minimum for contest standard performance; up to 5 oz. on high powered designs.
(*T*) Tail unit	Minimum weight for tailplane and fin is ¼ oz.; the usual figure is often higher, but should not exceed ⅜ oz.

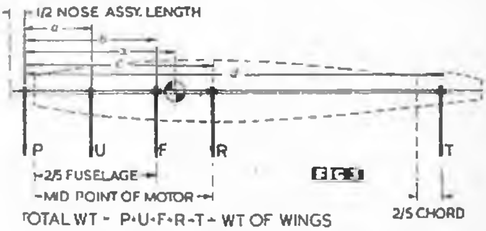


FIG 3

The mathematical solution is then simply one of straightforward arithmetic. Forget about the fact that it is derived by taking moments about two different points, but simply refer to Fig. 3 and the worked out example below, substituting your own design values when you come to do a similar job on a new model.

The most convenient point to take moments is about *P*, so that the actual position of *P* must be determined on the drawing and all the other moment arms, *a*, *b*, *c*, etc., measured off from this point. Appropriate positions are shown in Fig. 3. The more accurate the original drawing, the more accurate the measurement of these moment arms and hence the more accurate the c.g. calculation.

If x is the distance of the final c.g. from *P*, then

$$x = \frac{Ua + Fb + Rc + Td}{P + U + F + R + T}$$

All the figures on the right-hand side of the equation are known, either by estimate or measurement off the original drawing, and hence x can be found.

The same principle applies to calculating the c.g. on any other type of model and, again, in any free-flight design you can usually afford to ignore the effect of the weight of the wing since this is so close to the final c.g. as to have very little effect. On gliders, however, the final c.g. position is arrived at simply by adding ballast to the nose, which would therefore appear to make calculation unnecessary. But this can lead to most disturbing results.

The tendency in glider design is frequently to shorten the nose, and it is quite possible, without appreciating the fact at the time, to so reduce the nose length, or make the rear end of the fuselage unexpectedly heavy, so that the amount of ballast necessary to trim out at the design c.g. is so high that the total weight of the model is much higher than it need be—Fig. 4. *This is surprisingly easy to do* on a Nordic class glider where, having completed the model, the designer than finds that the amount of ballast required brings the total weight up to some 16 to 18 ounces instead of the 14⅛ ounces minimum called for by the rules. And those extra ounces are going to mean a faster rate of descent.

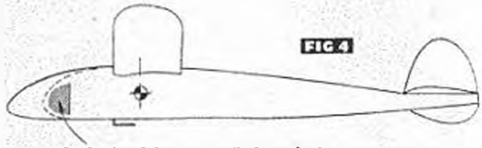


FIG 4

SHORT NOSE MAY NEED EXCESSIVE BALLAST

In any case, the c.g. equation for a glider is so simple, with only the ballast, fuselage and tail weights to include, that a calculation is a very useful check. By adding the wing weight to these components you can, at the same time, keep a watchful eye on the total weight.

Substituting *B* for *P* in the rubber model formula, and using the same designation for moment arms, all distances being measured off the drawing from the centre of ballast :

$$\text{c.g. posn. } (x) = \frac{Fb + Td}{B + F + T}$$

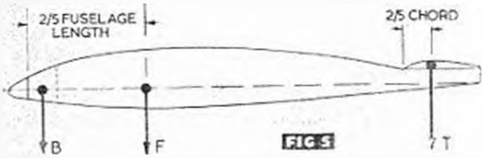


FIG 5

With a power model there is much to be said for the purely practical approach, although the working out is really no more difficult than for a rubber model. Where the design lends itself to a simple, practical method of balancing, however, this is usually to be preferred.

Fixing the c.g. of a pylon-type model as in Fig. 6,

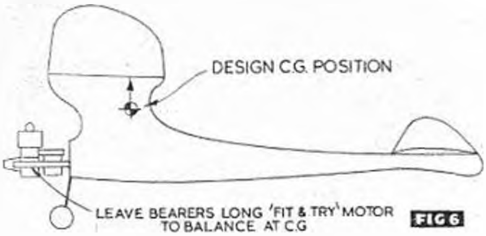
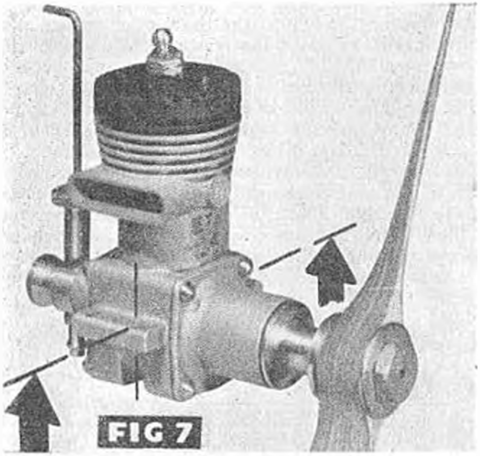
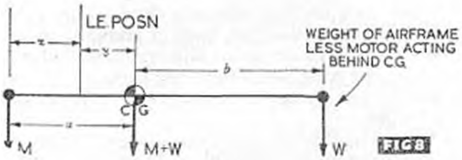


FIG 6





the model can be built, complete, less motor, before being balanced. Simply leave the bearers over-length and then find just where the motor has to be located on these bearers to balance the model in the correct position. The motor should be test-fitted with propeller. The bearers can then be cut off to the required length, the motor installed and any cowling added. The extra weight of the cowling can be ignored.

A more difficult problem with power models is where a standard (kit or plan) model is to be built, but a different motor used. Motors of similar capacity often vary considerably in weight. Rather than take a chance it is much simpler, and far more likely to give the right answer, to calculate the exact position of an alternative motor.

First it is necessary to find the c.g. of the motor itself. Given the motor, this is done simply by balancing it on a suitable support, but a general rule which holds pretty true for most orthodox motors is that the c.g. of the motor itself is approximately in line with the forward mounting bolt hole (on beam mounted motors, or a similar geometric position on radially mounted motors)—Fig. 7.

The effect of motor weight is shown diagrammatically in Fig. 8. With the c.g. at any given design position, the weight of the model itself (less motor) concentrated behind the final c.g. is counterbalanced by the weight of the motor acting in front of the final c.g. In other words, the weight of the motor times the distances of *its* c.g. from the final c.g. of the *whole* model is equal to the weight of the rest of the model times the distances *its* c.g. is behind the *final* c.g. One balances the other. The fact that we do not know the value of the second moment arm b does not matter, although we can easily find it by balancing the airframe, for with a different motor, the *same equation* must hold true. In other words, the new motor weight times the distance of its c.g. from the final c.g. of the model must be the same, viz.:

$$M \times a = W \times b$$

and since W (weight of airframe less motor) and b are both constant, $M \times a$ must be constant, i.e. motor weight $\times$ distance from c.g. must be the same for different motors, or :

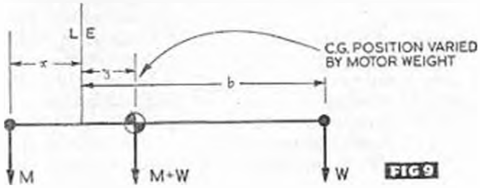
$$Ma = M_2 a_2$$

$$\text{i.e. } a_2 = \frac{Ma}{M_2}$$

where M = weight of first motor ; M_2 = weight of second motor; a = dist. of c.g. 1st motor to c.g. of model; a_2 = dist. of c.g. 2nd motor to c.g. of model.

Equivalent mounting distances (a distances on the diagram) have been worked out in the form of tables, for convenience of reference, based on manufacturers' figures plus a typical propeller. Unfortunately, practical weights frequently differ from manufacturers' bare weights and so the results given are not absolutely reliable. However, lacking actual specimen motors to weigh, they can be used with confidence. And since a surprisingly high proportion of aero-modellers do not have scales anyway, the table figures are probably more than accurate enough for most purposes. Incidentally, the same simple calculation can be used to determine the nose length of a glider where only a limited amount of ballast weight is possible.

The other case—the effect on the actual c.g. position when a motor of different weight is used in exactly the same position—is a little more difficult to calculate. That is, the calculations take a little longer to do. Actually it is better to adopt the first method and keep the final c.g. the same, but since most models can trim out quite successfully with as much as a 10 per cent. variation in c.g. position either way, some people prefer to fit another motor in the same place and re-trim accordingly, with the altered final c.g. Calculation will show if the c.g. shift is likely to be prohibitive. The danger is, on power models, that with a more forward c.g. a finer tailplane incidence will be required setting up a looping tendency which may have to be counteracted by excessive downthrust. A more rearward c.g. may eliminate the longitudinal dihedral and leave the model with a tendency to dive in should the nose drop during flight. For those who may find these check calculations useful the theoretical



layout is given in Fig. 9, with the mathematical solution following.

$$y = \frac{Wb - Mx}{M + W}$$

TABLE I

Replacement	"Design" Engine: E.D. .46	Frog 50	Elfin 50	Allbon Dart	Mills .75	Amco .87
E.D. .46	—	.86	1.0	.97	1.14	1.29
Frog 50	1.16	—	1.16	1.14	1.33	1.5
Elfin 50	1.0	86	—	.97	1.14	1.29
Allbon Dart	1.03	80	1.03	—	1.18	1.32
Mills .75	.87	.75	.87	.85	—	1.13
Amco .87	.78	.67	.78	.75	.89	—

Figures given are moment factors : e.g., replacing an E D. .46 with a Frog 50, the Frog 50 needs a moment arm 1 16 x that specified for the E.D. .46, to preserve the same c.g. position.

TABLE II

Replacement	"Design" Engine: Amco .87	E.D. Bee	Mills 1.3	Allbon Javelin	Elfin 1.49	Frog 150	Frog 180	Elfin 1.8	E.D. Comp. Spec.
Amco. 87	—	1.33	1.68	1.2	1.32	1.56	1.89	1.78	2.9
E.D. Bee	.75	—	1.26	.9	1.0	1.2	1.4	1.33	2.2
Mills 1.3	.59	.79	—	.71	.79	.92	1.12	1.05	1.71
Allbon Javelin	.83	1.1	1.4	—	1.11	1.3	1 57	1.48	2.41
Elfin 1.49	75	1.0	1.26	.9	—	1.2	1.4	1.33	2.2
Frog 150	.64	77	1.03	.77	.86	—	1.21	1.14	1.86
Frog 180	.53	.70	.9	63	.7	82	—	.94	1.53
Elfin 1.8	.56	.75	.9	.68	.75	.85	1.06	—	1.6
E.D. Comp. Special	.35	.46	.58	.42	.46	.54	.65	.62	—

TABLE III

Replacement	"Design" Motor: Mills 2.4	E.D. Mk. III	E.D. 2.46	Elfin 2.49	Frog 250	Amco 35	D.C 350	E.D. Mk. IV	Frog 500
Mills 2.4	—	1.2	1.0	66	1 0	.8	1.0	1.2	1 33
E.D. Mk. III	.86	—	.86	.57	86	.69	.86	1.0	1.14
E.D. 2.46	1.0	1.2	—	66	1.0	.8	1.0	1.2	1.33
Elfin 2.49	1 5	1 75	1.5	—	1.5	1.2	1.5	1.75	2.0
Frog 250	1.0	1.2	1.0	.66	—	.8	1.0	1.2	1.33
Amco 35	1.25	1.46	1.25	.83	1.25	—	1.25	1.46	1.66
D.C. 350	1.0	1.2	1.0	.66	1.0	.8	—	1.2	1.33
E.D Mk. IV	.86	1.0	.86	.57	86	.69	.86	—	.141
Frog 500	.75	.87	.75	.5	.75	.6	.75	.87	—

Tailless Tantrums

(Continued from page 231)

over the c.g., to cut down on nose-ballast. The dead-weight economy drive was also extended to the model as a whole; reducing the all-up weight to a spare, but still very robust, 12 oz.

Altering the pylon brought with it my first taste of thrustline trouble. The model displayed a quite vicious turn *against torque*, due, no doubt, to that curious gyroscopic phenomena which so plagues the lives of the power duration boys. To offset this dangerous tendency the usual remedy of angling the thrustline in the appropriate direction was applied, but no joy. It was still chasing itself around like a fugitive team racer even with umpteen degrees of skew added.

The explanation of this mystery proved even more simple than my mind in overlooking it, and after the self-application of the approved number of kicks, I moved the engine unit bodily to one side, so that the thrustline formed a definite couple with the c.g., and centre of resistance. Angling the thrustline when the engine unit is sitting on the c.g., is rather like trying to open a gate by pushing at the hinges. Jetex modellers please note.

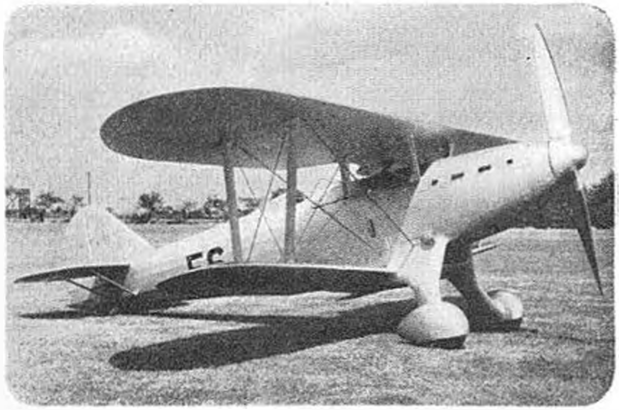
Curing the thrustline trouble gave me pause to consider the fearful consequences of putting a still very much experimental tailless model in the charge of a frisky, speed-happy Javelin. The gnawing question was: would the model corkscrew up in approved "pylon" fashion? The short answer was a series of terrifying manoeuvres that put the antics of many a stunt C/L job to shame. Obviously, it seemed, that a straight climb with less power was more suited to the peculiar aerodynamic qualities of the tailless wonder.

Now, pushing a job up at a near 90 deg. angle, demands a rather delicate touch; dead spot-on trim with a hairline adjustment of the thrust output was the order of the day, an order which the model seemed loth to execute, only too often dropping a wing or turning turtle at the critical moment. Alternative trim on even lower revs. was a wide climbing turn for a modest average ratio of 6 : 1. Satisfactory enough for a tailless type, I suppose, but not nearly so exciting or impressive as the less consistent high power, straight climb trim, when an occasional 10 : 1 ratio could be obtained on a 10 sec. power run.

All this talk of ratios might give the impression that I know my way around the power duration world, but the truth is that my approach to this type of design stops short about 200 yd. up-wind of the launching site. The most I can claim for the tailless wonder is a sort of super-sports rating, but there is still plenty of room for development in this form of design, and a sprinkling of tailless jobs among the stereotyped pylon hosts would, at least, add a bit of variety to the contest field.

Why not try your hand at a tailless design? At worst you can only crack it up, and you'll probably do that with your orthodox machine, anyway.

Prototypes Worth Modelling



(Photo by courtesy of Fairey Aviation Co.)

No. 32—THE FAIREY FANTOME OF 1934

By C. B. Maycock

THE Fairey *Fantome* (or *Phantom*) was considered by many, and rightly so, one of the most beautiful biplanes ever designed. It was certainly the cleanest aerodynamically of any of its contemporaries. Designed in 1934 it was entered in the International Competition of the following year sponsored by the Belgian Government. Its maximum speed was something over 250 m.p.h., very fast for those days. The design was not adopted by the R.A.F. but was put into production by the Belgian Fairey Company.

A development of the *Fantome* called the *Feroce* (Ferocious) was built which differed from the *Fantome* only in equipment and internal arrangements. One was supplied to the Air Ministry of Great Britain for test and experiment, while others were sent to the U.S.S.R.

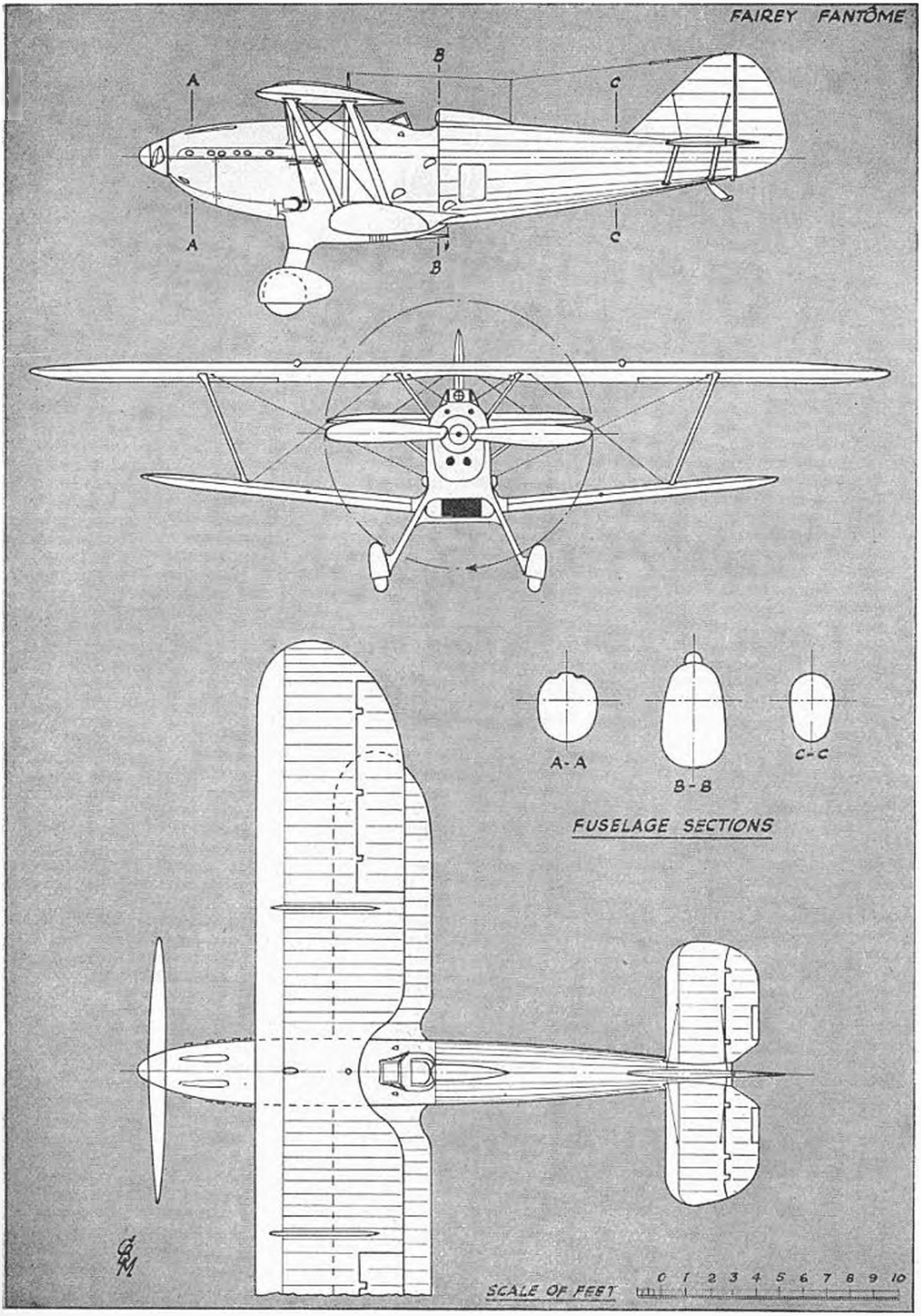
The *Fantome* was a single seat fighter, with single bay, unequal span biplane wings with pronounced stagger. The wing structure was of metal, fabric covered. Ailerons were in the top wings only. The fuselage was also of metal construction of basic rectangular frame built out to oval section by formers and the fabric covering supported by metal stringers. The tail unit was also of metal framework fabric covered. Trim tabs were provided in both elevators. The undercarriage consisted of two single legs with spatted wheels. Between the legs was the opening to the radiator, the efflux of which was controlled by a hinged flap under the centre section, in line with the trailing edge of the lower mainplanes.

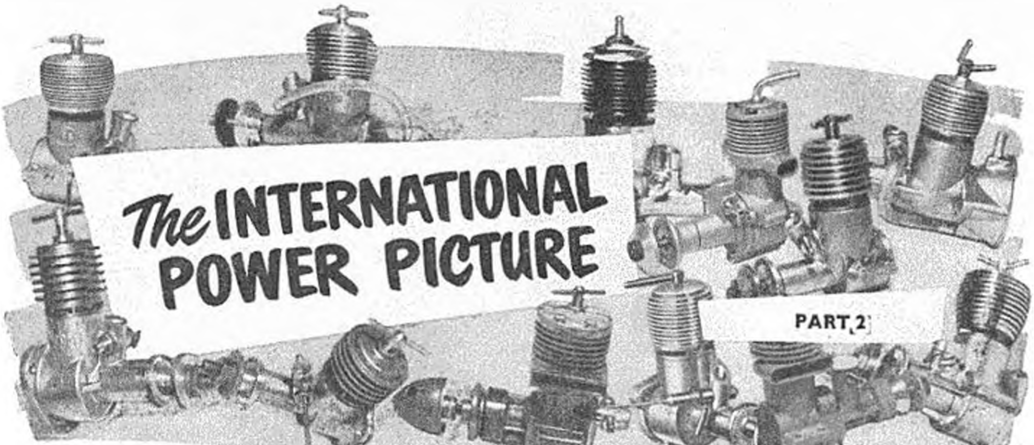
The engine was a twelve-cylinder, vee, water-cooled Hispano-Suiza 12Ycrs of 925 h.p., with a 20 mm. Oerlikon cannon mounted between the vee of the cylinders and firing through the airscrew boss. Four Browning .303 machine guns were fitted, two on the top motor cowling firing through the airscrew disc and two in each bottom wing firing outside the airscrew disc. The airscrew was a two-bladed fixed pitch laminated wood affair 10 ft. 9 in. in diameter.

The dimensions were as follows. Span, top: 36 ft. 6 in., chord 7 ft. 3 in. Bottom: span 27 ft., chord 4 ft. 2 in. Gap at centre section, 4 ft. 10½ in. Gap at interplane struts, 4 ft. 2 in. Length, 27 ft. 6¼ in. Track, 6 ft. 6 in. Tailplane span: 11 ft. 2 in., chord 3 ft. 11 in.

Colour scheme was silver dope for all fabric surfaces and anodised aluminium metal sheeting elsewhere. Bracing wires and exhaust stubs were black. The photographs show the machine before registration, but later black outline letters G-ADIF were painted on fuselage sides and wings.

("The Aeroplane" photo, by courtesy of Fairey Aviation Co.)


FAIREY FANTÔME
A
A
B
B
C
C
A-A
B-B
C-C
FUSELAGE SECTIONS
SCALE OF FEET
0 1 2 3 4 5 6 7 8 9 10
GM



The INTERNATIONAL POWER PICTURE

ACCENT ON POWER

By

P. G. F. CHINN

IN Part 1 of this article, we laid some emphasis on the importance of the role of the power-unit as a contributing factor to International class power-duration model standards of performance.

We stated that engine performance is the greatest single contributing factor to the success of this class of model and that should the present F.A.I. rules be modified to produce a more rigid model specification (as in the case of the two other World Championship free-flight classes, Wakefield rubber and A2 glider) then this (always assuming the F.A.I. do not admit substantially lower power-loadings—an unlikely event) will further emphasise the need for using the utmost power available from the engine in the most efficient manner possible.

This is bound to be borne out, we feel, by future competitions, whether the present, more flexible, rules remain or not. The " International " model is, as yet, a new and relatively undeveloped type, hence the reason for the widely different interpretation of present " International " design. We would venture to suggest that 1951/52 models were, for the most part, a very long way from the ultimate in " International " design. When enthusiasts in all countries have learned to build the right type of model, then some real attention is going to be focused on engines.

A parallel case can, in fact, be found in the Wakefield class. In this type of model, trimming for glide is much more critical than with an " International " power-duration model, yet almost everything has depended on power. The modern top class Wakefield, built prior to the 1953 rules, has had a higher duration than its pre-war counterpart not because it glides better, but because it carried up to twice as much rubber and is thus enabled to climb much longer and/or to a higher altitude from which to start gliding. Even under the recently revised rules limiting rubber motor weight to 80 grammes, the emphasis on power and its utilisation is bound to remain. Since rubber weight cannot be increased, there will, instead, be renewed efforts to determine the most lively sort of rubber for a given weight, the best dimensions in which to skein it, and related to this, the best type of prop to use.

Even the Wakefield flier, however, is able to observe a certain latitude in his choice of power, since he can, with his fixed rubber allowance, use it either to give him a powerful motor run of limited duration, or, alternatively, to give a longer run of less power. The power enthusiast, on the other hand, has to observe an engine run time limit, which means that he must make the most of his power flight and get as much altitude as possible in the 20 sec. allowed under the F.A.I. ruling.

Undoubtedly, for the " International " class, we want all the power we can get. Although there is a tendency to under-power some models (to avoid the hazards of trimming out a high speed climb and/or an unstable aerodynamic set-up) the present F.A.I. 7.06 oz./c.c. power loading is, in fact, far from being a light one. If a model proves unduly tricky using currently available 2.5 c.c. motors, then it is obviously not worthy of International contest standards. This may not have been apparent from World Power Championships to date, but should become obvious as standards improve.

To take this a stage further. It has been said that there is not such a thing as a five minute power model using the official 20-sec. engine run. There is absolutely no reason why this should be so; in fact, we will cheerfully stick our neck out and say that actually it is not so, having repeatedly checked a model in various conditions of allegedly " still air " to exceed five minutes using comfortably less than the allotted 20 seconds engine run. The model? High thrustline, " International " size, 52 in. span, 417 sq. in. wing area, 18-oz., but using a good Amco 3.5 matched to a good prop.

Our argument is that if such a model can absorb and use such power, then our " International " jobs should at least be able to cope with the most powerful 2.5 c.c. engine available and still retain sufficient margin of stability to allow for such extra power as we may be able subsequently to obtain.

The hottest 2.5 c.c. engine imaginable, however, is no good if the prop. used with it is totally unsuitable. We have seen Elfin 2.49 powered duration models equipped with thick 10 × 8 props which have held revs. down to less than 7,000 r.p.m., which is certainly not the best way to get a fast climb. On the other hand, when attempts are made to get an engine running nearer to its peak revolutions, it is often the diameter which is cut down rather than the pitch, with the result that the extra power liberated is simply wasted.

Most modern 2.5 c.c. engines peak (i.e. deliver their maximum horsepower) at between 11,000 and 13,000 r.p.m. However, it is not generally practicable to make use of this speed/power combination in duration models of "International" size, i.e., around 400 sq. in. wing area and 17.5 to 18 oz. weight, due to the inefficiently small props called for to allow such motors to run at these revolutions. In such cases, the best prop compromise gives a speed generally in the region of 9,000-10,000 r.p.m.

There are a few instances where higher or lower speeds can be effectively used with certain engines. In these cases, the engines concerned peak at above or below the 11/13,000 r.p.m. range previously mentioned, or else possess an unusually flat power curve in which much the same power is delivered by the engine over a range of, perhaps, 3,000 r.p.m. or so.

Examples of engines outside the peaking range mentioned yet remaining within the general requirements of an "International" engine are to be found at opposite ends of the scale in the Norwegian David-Andersen diesel and the Italian Super-Tigre G.20S glowplug motor. The former has its peak r.p.m. at just over 9,000 r.p.m., while the latter peals about 6,000 r.p.m. higher. The David-Andersen is one of the few engines which can be operated at its peak r.p.m. effectively in a power-duration model. The Super-Tigre, on the other hand, potentially a more powerful engine, has to give away a substantial amount of its output by running well below its peak revolutions.

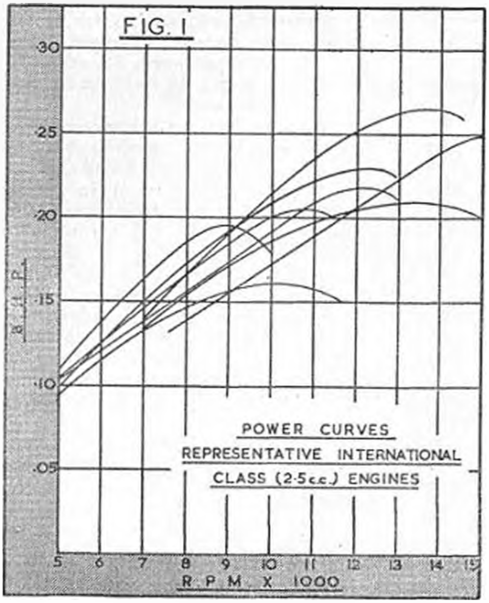
Some indication of the wide variation in peaking speeds and powers at various r.p.m., are given in Fig. 1, in which the b.h.p. curves, as obtained in the Model Aircraft "Engine Tests" series have been plotted for eight different 2.5 c.c. engines. This serves to lend emphasis to the need for careful matching of props to engine characteristics.

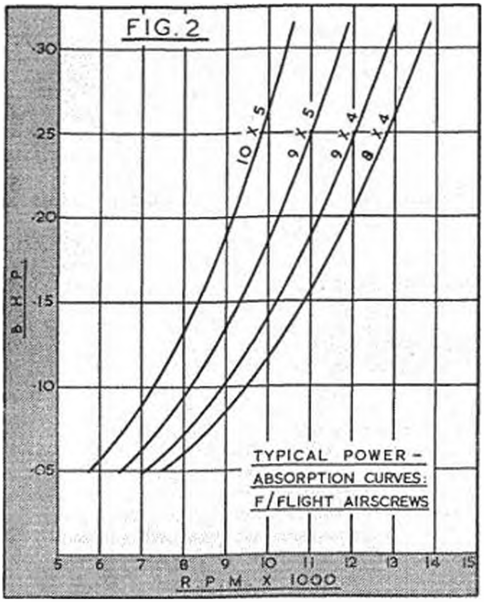
It is probably true to say that, for optimum performance, power-duration models—particularly where contest rules restrict engine size, as in the case of "International" models—are more difficult to match with the very best type of airscrew, than any other type of power model. Admittedly, the performance of a C/L speed model, if equipped with entirely the wrong size prop, will be hopeless, but there is the advantage with such models, that the maximum output of the engine is always used, so that power remains constant and it is only necessary to juggle with actual dimensions to achieve optimum results. Similarly, the success of a stunt model, since speed is not its primary function, does not depend on full utilisation of the engine's output and it is a relatively simple matter to find the prop which gives the best pulling power where most needed. Only with team racers do additional complications arise, when we have to take operating speed and fuel consumption into account, yet even here there is the advantage of a positive means of checking one prop against another under actual contest conditions.

The answer to all this, of course, is geared engines. No one has come forward with any data on optimum prop sizes for present day power-duration model speeds, so it is not definitely known how much benefit is to be derived from using, for example, a 12 × 8 prop at 6,000 r.p.m.—or even, say, a 14 × 10 at 4,500 r.p.m.—instead of a 10 × 5 at 9,000 r.p.m., by means of reduction gears. But, from present experience, it is obvious that a high-speed glowplug engine, developing, for example, .26 b.h.p. at 15,000 r.p.m. and needing an inefficiently small prop to reach such a speed, would be able to give a much better account of itself in a power-duration model geared down 3 : 2, when, omitting gear losses, it would be capable of turning a 10 × 5 prop at approximately 10,000 r.p.m.

There may well be a future in gears for power-duration models, just as there has been in Wakefield. For the present, however, we have to persevere with our direct drive engines and choose props which will utilise their capabilities to the best advantage.

Fig. 2 shows power-absorption curves which we obtained from tests of four modern type free-flight airscrews suitable to "International" class engines. Diameters are 8, 9 and 10 in. with pitches of 4 and





5 in. The sizes shown will actually cover the requirements of the various 2.5 c.c. engines currently in use when fitted to models of " International " size and, although fractional variations in dimensions may be of some slight benefit, it is impossible to be dogmatic on this question since specified dimensions of commercially made props are, for the most part, of a purely nominal value, particularly in regard to pitch, which varies quite appreciably between different makes and types. (The 9 × 4 prop tested, for example, absorbed somewhat less power, in comparison with the others, than might be expected.)

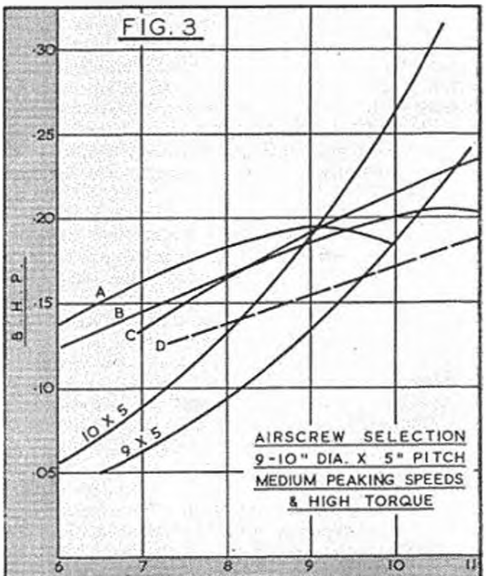
We do not suggest that these are the only suitable size props for " International " models, but do believe that they are four of the most useful. Pitch/diameter ratios, it will be noted, are between .44 and .55 to 1 which, combined with moderate blade width and thickness, allows a reasonably efficient diameter without overloading the engine. Recommendations have very occasionally been seen calling for even lower pitches to suit certain high-speed engines—such as 9 × 3. We have had no experience of such sizes in power-duration models and, according to full-scale theory, such low pitch/diameter ratios are to be avoided. Nevertheless, these very fine pitches may be worth trying with essentially racing type engines.

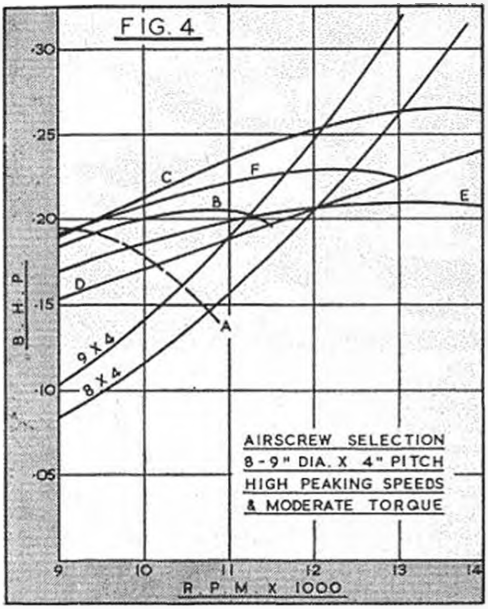
In Fig. 3, output curves for four 2.5 c.c. engines, over a range of 6,000-11,000 r.p.m., have been superimposed on the absorption curves for 10 × 5 and 9 × 5 airscrews. These show that, on the larger size prop, the 10 × 5, similar performance can be expected (of the engines shown) from the David-Andersen (Curve " A ") and E.D. 2.46 (" C ") with the Webra 2.46 c.c. (" B ") slightly below them. Following the curves for the 9 × 5 prop, we now find that, with the David-Andersen motor, which is now running past its peak r.p.m., speed has risen to about 9,900 r.p.m., but that power has fallen off—actually from .195 b.h.p. to about .18 b.h.p. The E.D. 2.46, on the other hand, is now running at about 10,700 r.p.m. and delivering .23 b.h.p., while the Webra is now between the two and turns at 10,300 r.p.m., about .205 b.h.p. being used. We may, therefore, find it better to run one of these latter engines—especially the E.D., on a smaller prop than the 10 × 5. This is a matter for " cut and try " experiment on the actual model concerned.

Fig. 3 relates primarily to engines of medium speed and/or developing high torque. The David-Andersen is our best example of medium speed and high torque and both Fig. 3 and Fig. 4 clearly show that with an engine of this type, nothing is to be gained by fitting small props and allowing revs to rise above 9,000 r.p.m.

As an example of the opposite approach, we have drawn in, on Fig. 3, part of the power curve (" D ") for a high-speed engine designed for maximum output at high speeds (Super-Tigre G.20). This, it will be noted, suffers badly when fitted with the larger types of prop.

In Fig. 4 is shown " top end " output curves, superimposed on absorption curves for the 9 × 4 and 8 × 4 props. Note that the David-Andersen (Curve " A "), which has been the best performer on the 10 × 5 prop, is now the poorest, output dropping 25 per cent. when using the 8 × 4, which it turns at approximately 10,750 r.p.m. The power of the Webra is also now dropping off, 11,250 r.p.m. being reached on the 9 × 4 prop for an output





approximately the same as delivered with the 9 × 5.

On the other hand, the E.D. 2.46 (Curve " C ") again shows up well, the b.h.p. curve continuing to rise as it intersects both the 9 × 4 and 8 × 4 absorption curves. We may say, therefore, that, with the 2.46, we are in the happy position of being able to try various types of propellers without a great deal of regard to their effect on power output. Nevertheless, it would be wise not to allow r.p.m. to rise above 12,000 or drop below 9,000.

Curve " F " is for the Dutch " Typhoon " diesel, which, it will be seen, delivers its best b.h.p. output when running on the 9 × 4 and 8 × 4 props. A slightly larger airscrew would be an improvement. Even on the small props, however, the Super-Tigre is still a long way from reaching its peak output. A little over 12,000 r.p.m. is reached on the 8 × 4, although it must be remembered that this b.h.p. curve is based on the tested performance of a single example of this engine and that the torque of this test engine may have been slightly below average. Nevertheless, the graph serves to stress the importance of letting the Tigre run fast.

The American Cub .14 (Curve " E ") also reached its highest output on the 8 × 4 prop, but, although the peak h.p. is at higher r.p.m., only slightly lower power is delivered on the 9 × 4 due to the unusually flat power curve of this engine.

Unfortunately, selecting the best propeller by checking on model performance is not too easy in the case of power-duration models because of the reaction which differing prop characteristics and engine speeds may have on model stability and which may thus make it difficult to adhere to a constant flight pattern.

So far as torque reaction is concerned, however, this should not be seriously affected by small changes in propeller sizes. Reference to the " Engine Tests " indicate that most modern 2.5 c.c. engines have fairly flat torque curves, torque only dropping off sharply as peak power is reached. Therefore, variation of 1,000 r.p.m. or so in operating speeds should not bother us very much and by deciding, first, our approximate requirements in the manner we have indicated, it should be possible to get quite close to the ideal prop with a minimum of trouble.

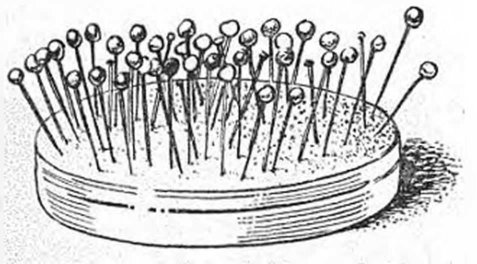
BRITISH AND FOREIGN INTERNATIONAL CLASS ENGINES
(Including 1.5 c.c. class and intermediate capacities)

Make and type	c.c.	Bore x Stroke in. in.	Wt oz.	Approx. av. perf. b.h.p. at r.p.m.
Yu Oskar 150	1.47	0.492 x 0.472	2.90	— —
GB Frog 150	1.48	0.500 x 0.460	3.0	0.12 at 12,000
D BWM 150	1.48	0.500 x 0.460	3.2	0.12 at 12,500*
D Webra 1.5	1.48	0.512 x 0.453	2.8	0.15 at 1,4000
GB Allbon Javelin	1.49	0.525 x 0.420	2.3	0.11 at 11,000
GB Allbon Javelin II	1.49	0.525 x 0.420	2.3	0.13 at 12,000
Au Sabre 150	1.52	0.503 x 0.466	3.0	0.12 at 12,000
GB Elfin 1.49	1.52	0.503 x 0.466	2.6	0.14 at 13,500
US McCoy 9	1.61	0.500 x 0.500	2.6	— —
US Cub 0.099	1.62	0.515 x 0.480	2.0	— —
GB Elfin 1.8	1.81	0.500 x 0.562	3.5	0.13 at 11,000
GB Oliver Tiger	2.43	0.550 x 0.625	6.15	0.3 at 14,000
US Cub 0.14	2.45	0.600 x 0.530	2.75	0.21 at 13.14,000
Au Sabre 250	2.46	0.555 x 0.620	4.25	0.22 at 12,000
D Webra 2.46	2.46	0.551 x 0.630	3.6	0.21 at 11,000
N David-Andersen	2.46	0.551 x 0.630	5.85	0.19 at 9,100
D BWM 250	2.46	0.551 x 0.630	3.9	0.23 at 12,500*
GB Elfin 2.49 (Beam)	2.47	0.554 x 0.625	3.4	0.21 at 12,000
GB E.D. 2.46	2.47	0.590 x 0.550	5.5	0.26 at 13,500
H Typhoon-Diesel	2.47	0.591 x 0.551	3.9	0.23 at 12,500
F Meteore	2.47	0.591 x 0.551	4.0	0.2 at 10,000*
I Super-Tigre (Spd)	2.47	0.591 x 0.551	4.0	0.29 at 16,500*
I Super-Tigre (Spt)	2.47	0.591 x 0.551	3.9	0.24 at 14,000*
D Motro 52	2.47	0.591 x 0.551	4.0	0.22 at 12,000
D BWM 251	2.47	0.591 x 0.551	5.0	0.27 at 15,000*
GB Elfin 2.49 (1949)	2.50	0.560 x 0.620	3.75	0.24 at 12,000

GB—Great Britain, D—Germany, Au—Australia, US—U.S.A., N—Norway, H—Holland, I—Italy, F—France. Yu—Yugo-Slavia.
*Maker's claimed performance. (Other figures based on tests.)

★ *Here's an idea . . .*

A Plasticine Pincushion



When you are fumbling to get the pins you most urgently need from the pin tin, your pricked fingers may encourage you to spend a few minutes constructing this handy pinholder. An old boot-polish tin and some plasticine is all that is required. Simply fill the bottom of the tin with plasticine to a generous curve and just stick the pins in it. Incidentally the slight greasiness that the plasticine leaves on the points of the pins will prevent cement from adhering too firmly to them.

Models in the Moonlight

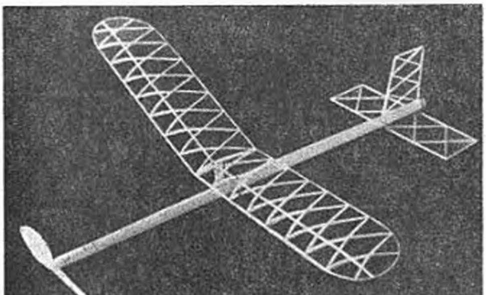
By Hamilton Jones

WHAT do you do with your long winter evenings, especially the moonlight ones? This is what I asked a few aeromodelling pals the other day. They grinned foolishly and told me to guess—which I did, correctly. " Well, that's the next best thing if you can't fly," they said.

They were wrong. Why not go modelling in the moonlight and take your other hobby along as well? She will be persuaded to think your intentions are honourable if you take a model, and if she knows your intentions already she will be glad of the model as an excuse to get under the moon.

Seriously, however, there is quite a case for this idea of flying on moonlight evenings, providing you take advantage of the common condition accompanying them, namely still air. It seems rather extraordinary that the possibilities of outdoor flying in still air have been so little explored when it is realised that the best performer in the whole of the model sphere is the indoor model. The indoor microfilm model is the most perfect theoretical model for the simple reason that it does not encounter the vagaries of the elements and can be built extremely light.

The indoor record is 31 min. and the power run took the whole of that time. The fact that this is made possible through the simple condition of still air should make a good few aeromodellers sit up and consider the possibilities of copying the principles of the indoor flier and using them out of doors at times when wind currents are so slight that the air approaches the stillness of a hall. This condition is most often found early morning or late evening or in fog or mist. Immediately discounting the possibility of an aeromodeller insane enough to get up early on a frosty, foggy morning to fly a still air model, the winter practically only leaves one time open, and that is the moonlit evening.



The model before covering

In some respects this idea of flying in moonlight or still air produces a completely new conception of outdoor model design and the model becomes a cross between indoor and outdoor. It could be that this idea may become popular and a new branch of flying will come into existence. One exclusive characteristic is the factor of stability and trim. Since the model relies for its duration on its motor run, the flier has only to consider the trim and stability of the model while under power. There is so very little risk of instability in still air, that apart from spiral stability (since, as it is explained later, the model is trimmed to fly in fairly tight circles) the factor can be ignored almost entirely in design.

As has already been intimated, when you sit down to design a model for still air it is wise to have the plan of an indoor model in front of you to use as a pattern for the general layout. This means a large free-wheeling prop, high parasol wing mounting, high power-weight ratio and elliptical or tapered wings.

Like the indoor model the duration of our moonlight model is solely reliant on motor run and the weight should be kept to a minimum as this enables a smaller motor cross-section to be used and therefore a larger motor for a given weight. It is essential for moonlight flying to design the model with a ceiling height of about 30 ft. as this is the average reasonable limit of visibility. A high prop pitch prompts a long power cruise and a slow climb, which can also be fostered by the use of the correct wing section (see Fig. *A*). The model should have a high reserve of spiral stability as it should be capable of flying in tight circles. This saves too much frantic chasing around in the semi-darkness. Spiral stability is fostered by tapered wings, and therefore lighter tips, mounted on a high parasol.

As there should be no glide, the model landing with a few turns still on the motor, there is no point in making a folding propeller. A freewheeler will do the job more efficiently. A long motor must be used, and this of course dictates the shape of the fus. It is a very good idea to use a tail block and hook for the motor, which fits at the extreme end of the fus. in the same manner as the nose block. This saves the removal of the prop when winding as it can now be wound from the rear. In any case it will be too lightly and delicately made to stand up to the fast winding the motor would be subjected to if wound in the conventional manner. Incidentally a small, highly geared winder is a useful accessory as there will be about 2,000 turns to be applied for full power.

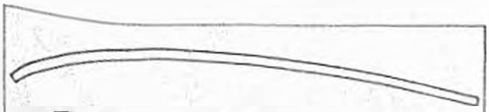
Geodetic wing and tail construction is a great asset as it can withstand the warping tendencies when the tissue shrinks through doping. The efficiency of the model is somewhat dictated by having taut tissue, and the dope should be thinned down to a consistency suitable for the delicate composition of the model.

The model is now "on the board," so we follow with some of the general principles of construction. The wing outline is wound from a length of bamboo carefully stripped to approximately $\frac{1}{16}$ in. square. To obtain the sharp curve at the tip, it is necessary to bend the strip in the heat of a candle flame or something similar. When a reasonably accurate shape is produced it is pinned down on the building board to conform with the shape drawn on the plan. When all the ribs are cut, the geodetic assembly is completed in the conventional manner. All ribs sloping from left to right are put in first and then all the half ribs from left to right added. Sand the edges of the leading edge to conform with the airfoil shape and the trailing edge to the conventional pattern.

The fus. is a sheet balsa tube wound from suitable 1/32 in. sheet. The sheet blank, which of course is rectangular, is wound round a dowel rod backbone former. It may be necessary to steam the sheet round this former but if it is of suitable quality, it should bend quite readily without any treatment. It is held in position with pins, rubber bands and clothes pegs which are removed when the cement is dry. To improve the shape of the fus. the blank can be slightly tapered at both ends, causing the nose and tail to be of smaller diameter than the middle.

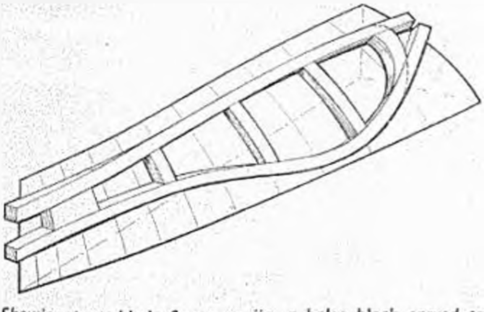
Considerable weight is saved by using a built-up propeller blade. This may be made either by building on a jig (see Fig. *B*) or by just steaming a flat frame to the shape required whilst covering. In the latter case the blade may be slightly glued to a couple of templates while covering and doping.

From the illustrations it will be noted that the wings are mounted in the parasol position on a single $\frac{1}{8}$-in. × $\frac{1}{8}$-in. strut. The idea is to give a rigid but crash-proof fixing which allows the wings to slew round to 40 deg. without breaking. Its one disadvantage is that it does not allow the wings to be removed for transporting.

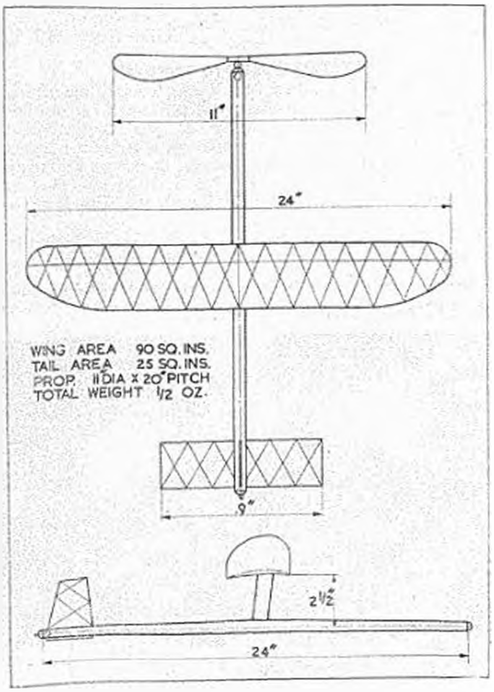


STATION	1	2	3	4	5	6	7	8	9	10-0
ORDINATE	60	88	95	90	85	75	63	45	26	0

Wing section. *It may be plotted to any size by the figures in the table. Divide chord into ten points on a straight line. Measure up and mark points at the ordinate figures given and the curve is drawn along these points*



Showing prop blade frame on jig, a balsa block carved to give the required twist.



Letters to the Editor

● **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**

PLASTIC AND PITCH

DEAR SIR,—While reading Mr. Robert Burn's article in your March issue, I was amazed by the following statement : " In fact if you use flexible plastic propellers, which *tend to increase* pitch at high speeds. . ." If this statement is true, then the R.A.F. and several companies manufacturing constant-speed props, had better be informed !

I take the liberty of quoting the words of my instructor in propeller theory (R.A.F.) " C.T.M. (centrifugal turning moment) is the force acting upon the propeller blades during rotation which *tends to turn them to fine pitch*." Now this statement was backed up by a practical demonstration on a model propeller, which was fitted with movable blades. These were set at a fairly high pitch, and the prop was rotated at high speed, stopped and the blade angle checked; believe me the pitch had *decreased* considerably !

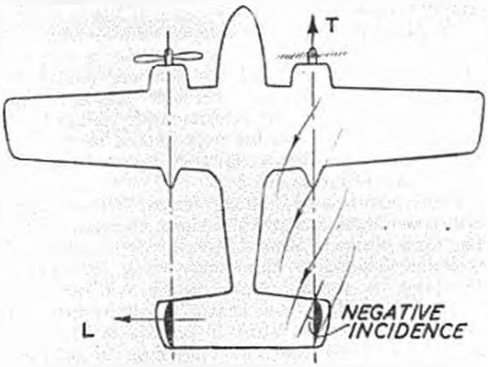
C.T.M. is used on constant-speed props to assist in the return from coarse pitch to fine, very little hydraulic pressure being required; bearing this in mind, surely plastic airscrews tend to decrease their pitch at high revs.

Yours faithfully,
IAN CUNNINGHAM.
Kent. Gillingham M.F.C.

TROUBLESOME TWINS

DEAR SIR,—Regarding Mr. Taylor's letter describing the Sikorsky twin fin arrangement published in your last issue. The working principle of this arrangement appears to assume that the slipstream is straight when it passes over the fin and also that the fin in the airstream (when one motor is stopped) has little or no effect as compared with the one remaining in the slipstream of the running motor.

Whereas it is rather audacious to question an authority such as Igor Sikorsky (or perhaps Mr. Taylor has misunderstood him) it does seem that a better arrangement would be to reverse the camber on the fins (as shown in the sketch), this coupled with the two propellers revolving in opposite directions should provide a more efficient set up.



It can be seen from the diagram that when the engines are running the fins in the slipstreams of the propellers are at a negative angle of incidence, therefore exerting little or no side thrust. When one engine is either throttled back or stopped, the straight airflow over the fin behind this engine will exert a side thrust (L) which will counter the thrust of the working engine. From a model point of view this arrangement would seem better than the Sikorsky one. The contra-rotating propellers can be used with one of the earlier-ported type engines such as the Mills or Amco .87.

Yours faithfully,
London, S.E.22. STANLEY BYERS.

A LITTLE LEARNING . . .

By Harry Stil

Northern Notes

Ron Firth, popular N.A. Vice Chairman, getting the final trim on his 1953 Wakefield

★ THE 1953 flying season started off with a first-class shock to all and sundry; for the first time in history the sun actually shone on Gamage day, and I believe in most areas conditions were as good as they have ever been known. In the north-west they were so good that fliers simply couldn't believe it and in spite of the Area Committee arranging a combined meet at Tilstock very few clubs took advantage of a laid on organisation. Conditions at Tilstock were somewhat mixed, in spite of remarkably calm weather there were very strong down drafts mixed among the welcome thermals; only one flier, Jimmy O'Donnell managed to record three maximums and then only just; many people had quite long flights with their mods landing almost upon the take off point, Barry Haisman recording nine min. for the model to land within 150 yards. The fifty metre tow-line appears to have put the cat amongst the pigeons for even first-class jobs can be seen falling down to earth in less than a minute. And yet quite a few triple maxes. were recorded around the country in the Pilcher. I wonder if the 50 metre rule will breed better models or only put a premium on thermal catching?

★ THE SYMPATHIES of other area committees will go to the North Western officials, since Tilstock will be lost to them as a flying ground after April, but the needs of agriculture must come before model flying. What is to happen about organised events in the area is not yet clear, but I am sure all wish the North Westerners the best of luck in their hunt for a fresh field. A little better news is the winning of a "C" Certificate by Allan Wrigley of Whitefield, the first in the area I am told.

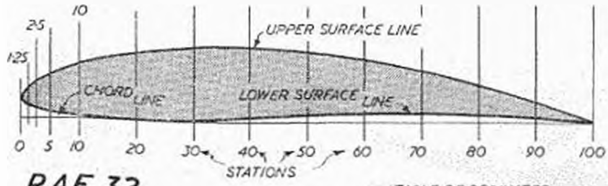
★ HOWEVER MUCH one grumbles about the dilatory ways of the council, they must receive credit for their prompt appreciation of the dangers of the split club technique, and also for recognition of the needs of the non-competition-minded bloke. I hear a scheme for individual affiliation is under discussion, with full and associate membership to cater for comp and non-comp members, a "same-day-for-all" affiliation date, and proportional rates for late comers. Too early yet to say when it will arrive, but sure enough it's coming.

★ POOR OLD Capt. Taylor seems to have his whack of worries lately, what with triple maxes. all over the place in the Gamage and Pilcher, the loss of Fairlop both as a London Area ground and Nationals venue, while the latest spot of bother is the Whit Monday mix up. No one can tell what will happen yet, opinions being as mixed as they are, but to avoid any further confusion the Nats. are now fixed for Saturday and Sunday May 23rd and 24th at Waterbeach, nr. Cambridge. And if you've booked your coach for Sunday and Monday to go to Fairlop jolly bad luck to you all!! Intending P.A.A.-load entries may be interested to hear that there will be the usual blinding prize list of gold and silver wrist watches. Hitherto non-intending entries note there is still time to knock a model together. For your notebook, there is the possibility of similar P.A.A.-load events at both Woodford and Sherburn, note that Woodford will probably be in June this year, Sherburn of course, is still September 9th.

★ IN REPLY to the old cry of "what is there for the control-liners?" it is interesting to note that it will cost about fifty pounds per head to send a team to Milan. The proviso that team members must qualify at 90 per cent. of last year's winning speed is very wise; no point on wasting £50 on a hopeless entry, at least so your council think—no doubt the spin-dizzies will think otherwise.

★ WELL LADS and lassies, those of you who are going to do any serious flying this year will have your models already buttoned up for the first big do of the year. No doubt a lot of you will have just about the same old year as usual, with just about the same amount of fun, some of you may reach heights you never dreamed of, and be out there in all your international glory at Cranfield. One thing is a racing certainty: about three quarters of you will be raking out the same old binds and grumbles long before the season's half-way mark, the coaches to and from the 'dromes will be full of your natterings and grumblings, and the poor old Editor (hats off, please) will be almost boss-eyed reading your impassioned screeds. Let's have a little bet with ourselves this year, shall we? For every complaint, there must be a remedy; so instead of sitting back and doing a lot of moaning, stand up and shout out a really worth-while suggestion. You'll find out that the game is so much more worth while, and incidentally so will your Area officials. Think it over, chums.

J. Garfitt explains the workings of a jet to some youngsters at the Leeds M.F.C. Exhibition held at the Trinity Hall, Leeds, recently



RAF 32

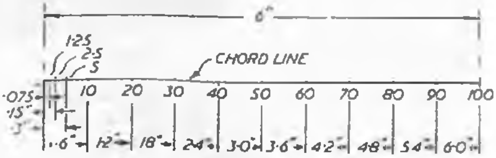
TABLE OF ORDINATES

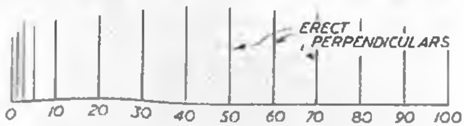
STATION	0	1·25	2·5	5	10	20	30	40	50	60	70	80	90	100
UPPER	3·4	5·6	6·5	7·8	9·7	11·9	13·0	13·1	12·5	11·1	9·1	6·6	3·6	0
LOWER	3·4	2·0	1·5	·9	·3	0	·3	·7	1·1	1·5	1·6	1·5	·9	0

How to plot WING RIBS

Plotting airfoil sections from tables of ordinates is not difficult—once you know the system. Well, here it is!

THE layout dimensions of a given aerofoil section of any length are given in the form of a table of ordinates. The figures in this table enable us to re-draw that particular section to any required chord length, once we have converted the tabular figures into those corresponding to the chord length in question. The process is quite straightforward. All the tabular figures are given as "percentages of the chord length." Thus to find the figures corresponding to a chord length of, say, 6 in., divide the tabular figures by 100 and multiply by six, and the answer will be in inches, as in the table below.





STATION %	0	1·25	2·5	5	10	20	30	40	50	60	70	80	90	100
STATION "	0	·075	·15	·3	·6	1·2	1·8	2·4	3·0	3·6	4·2	4·8	5·4	6·0
UPPER "	·20	·34	·39	·47	·58	·72	·78	·79	·75	·67	·55	·40	·22	0
LOWER "	·20	·12	·09	·05	·02	0	·02	·04	·06	·09	·10	·09	·05	0

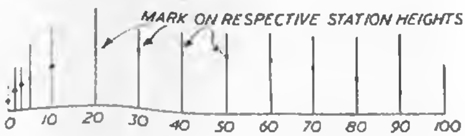
ALL THESE FIGURES ARE RE-CALCULATED FOR THE NEW CHORD LENGTH OF 6"

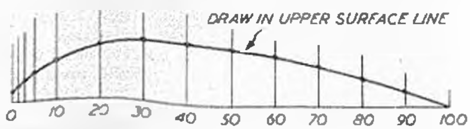
Follow the various steps by the diagrams in the right-hand column. First draw the chord line of the aerofoil to the required length (6 in., in our example). Now divide this line up into a number of stations or sub-divisions, corresponding to 1.25 per cent. chord, 2.5 per cent. chord, etc., i.e. .075 in., .15 in., etc. At each of these sub-division points or stations, erect a perpendicular line.

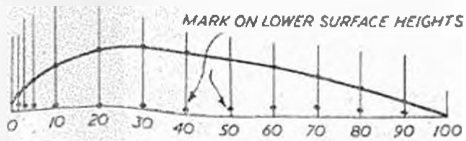
Now refer to the second table of ordinates, calculated from the original table by multiplying the line of figures by 6/100. These give the height of the section at each of the chord stations. Height at station "0" is .20 in., for example; at station 1.25 (i.e. .075 in. along the chord line) it is .34 in. for the upper surface and .12 in. for the lower surface.

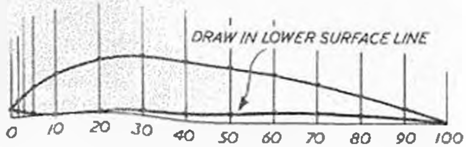
Mark out the respective heights of the upper surface first and then draw in the upper surface line by joining all these points with a smooth curve. Make sure that this curve is smooth and free from bumps or depressions. Then, in an exactly similar manner, mark off the respective heights of the lower surface and join all these points up with another curve. That completes the outline shape of the aerofoil to the chord you require.

You may find that in laying out some aerofoils from published tables of ordinates that the upper or lower surface line will not join up in a smooth curve if the line passes through all the plotted points. In such cases stick to a smooth curve passing as near to the plotted points as possible.







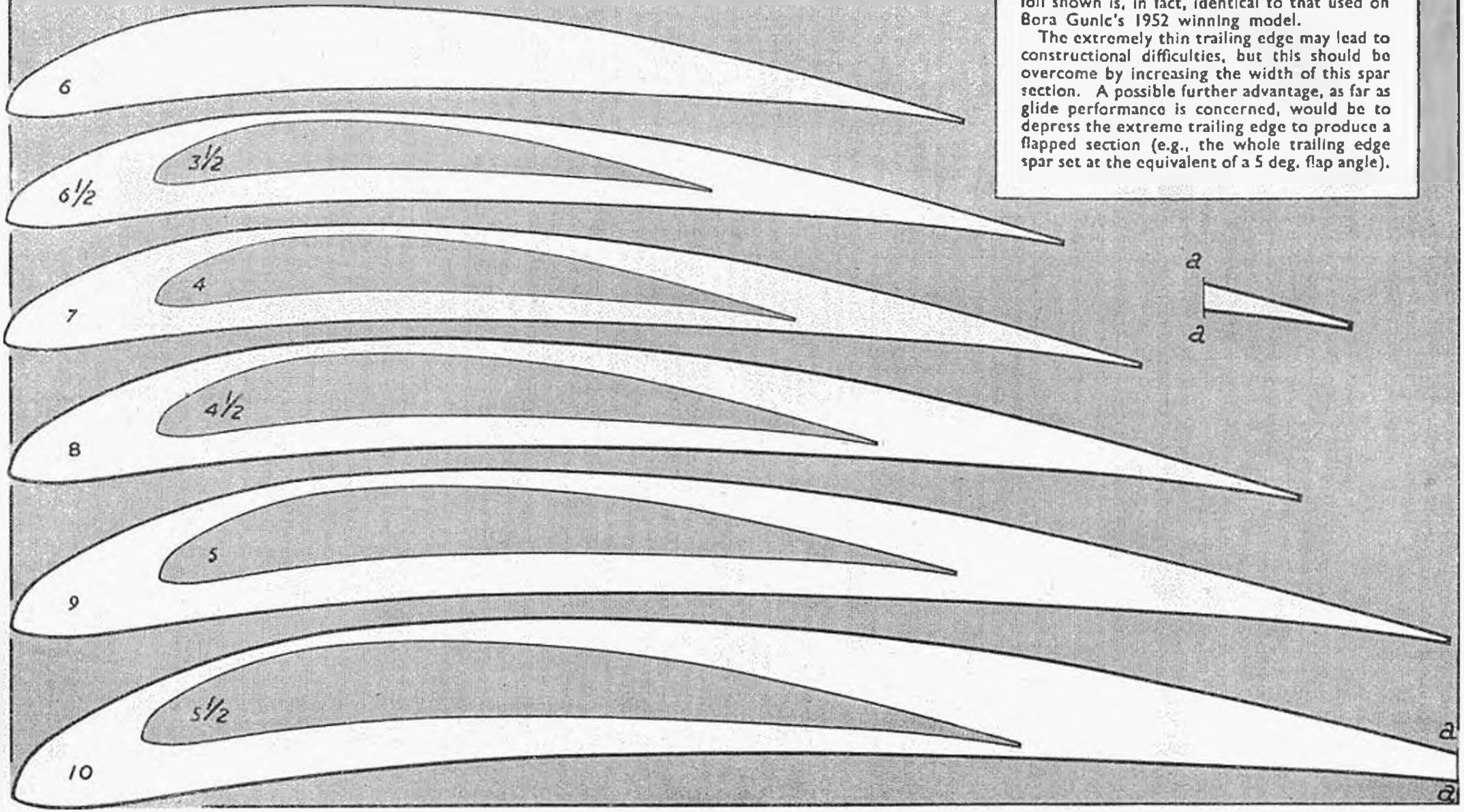


STATION	0	1·25	2·5	5	10	20	30	40	50	60	70	80	90	100
UPPER	4·3	7·0	8·3	9·9	12·0	14·2	14·9	14·7	13·9	12·5	10·8	8·6	6·2	3·5
LOWER	4·3	3·6	3·5	3·9	4·4	5·5	6·2	6·5	6·3	6·2	5·9	5·1	4·5	3·3

M.V.A. 301 (modified)

The M.V.A. 301 is an excellent aerofoil section for glider work. For models of around A2 size it has been found beneficial to increase the undercamber of the original section by 20 per cent. and the modified M.V.A. 301 aerofoil shown is, in fact, identical to that used on Bora Gunic's 1952 winning model.

The extremely thin trailing edge may lead to constructional difficulties, but this should be overcome by increasing the width of this spar section. A possible further advantage, as far as glide performance is concerned, would be to depress the extreme trailing edge to produce a flapped section (e.g., the whole trailing edge spar set at the equivalent of a 5 deg. flap angle).



From the S.M.A.E. and the CLUBS

REPORT OF S.M.A.E. COUNCIL MEETING HELD AT THE HORSE SHOE HOTEL, TOTTENHAM COURT ROAD, W.1, ON SUNDAY, MARCH 15th, 1953, at 11 a.m.

The following were present:—Messrs. A. F. Houlberg (chairman), D. A. Gordon, H. W. Barker, Captain S. D. Taylor, C. S. Rushbrooke, K. J. A. Brookes, R. F. L. Gosling (N. Eastern), E. F. H. Cosh (London), B. A. Messom (Northern), D. Salloway (N. Western), R. Landymore (E. Anglian), R. G. Conley (S. Wales), J. S. Bishop (Western), P. C. Doughty (Midland), H. G. Hundleby (S. Midland), N. F. Couling (S. Eastern), R. W. Yates (Southern).

F.A.I. Matters

Correspondence from the F.A.I. relating to the proposed formation of an International Guild of Aeromodellers was read, and it was unanimously decided to instruct the S.M.A.E. delegate, Mr. A. F. Houlberg, to vote against this proposition at the F.A.I. meeting at The Hague, on May 14th-22nd.

A letter from the London Area Committee was read in which dissatisfaction was expressed concerning the work of the F.A.I. Model Commission. This view was endorsed by several Council members. Objection was also taken to decisions being made before the matter had been discussed by the members of National Clubs.

Mr. A. F. Houlberg explained that a meeting of the Model Commission was usually held in December each year and its main function was to decide upon the F.A.I. Calendar of International events. Other matters dealt with at this meeting were further discussed at the general conference, normally held in December, and either confirmed or rejected. Mr. Houlberg added that it was unfortunate that the full report of the meeting of the Model Commission, held in Paris on December 6th-7th, 1952, had only just been received by the S.M.A.E., and this had been responsible for the recent uncertainty concerning contest matters. He would protest against this delay at the next meeting. Mr. Houlberg also explained that the fact that he was chairman of the commission did not prevent him from putting forward the views of the S.M.A.E. or from voting.

Vice President

It was proposed by Mr Cosh, seconded by Mr. Rushbrooke and carried unanimously, that Mr. W. Whitney-Straight be invited to become a vice-president of the society.

Use of Airfields

The secretary asked area delegates to again draw attention to the fact that the Air Ministry will not consider any applications for the use of airfields unless at least fourteen days prior notice is given.

Area Resolutions

London Area

1. "THAT this committee desires the council to reconsider its decision to limit the maximum timed duration of contest flights to three minutes, and to revert to the former system featuring three flights with a five minute maximum; or alternatively, to allow a greater number of three-minute flights to be attempted."

The council decided that after three flights of three minutes' duration had been made fly-offs would be made with five minutes' maximum time. Competitors to continue to make fly-off flights until they fail to reach the five-minute maximum. This rule will come into effect immediately.

2. "THAT this committee desires the council to suggest to the F.A.I. that at the forthcoming C/L championships in Italy, speed contests for the three separate F.A.I. classes for reciprocating motors should be held."

The council considered that at present there seemed no practical method of determining the World Champion except by the use of one speed class each year.

North Western Area.

1. "THAT British holders of world championships shall automatically be included in the appropriate British team in the following year to defend their title, without having to qualify through the eliminators." Resolution defeated.
2. "For inclusion in the S.M.A.E. Contest Rules—That fly-offs be flown within an hour of the closing time of the contest, competitors to fly, if possible simultaneously, and not more than three minutes off each other."

Ruled out of order.

Western Area

That the S.M.A.E. council consider modifying the merit certificate requirements in the following respects:

1. "The rise off ground requirement, in that it is becoming more general to permit hand launching in competition rubber and power classes." Resolution carried.
2. "The rules relating to qualifying times for each certificate should be (in the light of the new rules to cut down overall duration) modified to the old requirements of three, 1 minute flights in class 'A' and three 2 minute flights in class 'B,' the class 'C' requirements to remain as at present." Resolution defeated.

Competition Winners' Badges

The council again considered the allocation of badges to winners of team events and it was decided that in future in the team race events one gold badge will be awarded to the winning team, one silver badge to the team placing second and one bronze badge to the third team. It was decided not to award badges for the free-flight team events.

In the case of other contests, it was decided to award badges on the following basis:—

10 or more entries—1st, gold badge; 2nd, silver; 3rd, bronze.
6-9 entries—1st, silver badge, 2nd, bronze.
5 or less entries—bronze badge to the winner only.

In the speed contests each class will be regarded as a separate contest and badges awarded on the above scale.

The council confirmed that *one* free dinner ticket will be allocated to each winning *team* and one to each gold medal winner.

The above will apply for the 1953 competition season.

Affiliation and Re-affiliation

The secretary reported on matters which had arisen since the introduction of the new affiliation fees. During the general discussion which ensued, a number of delegates expressed the view that there was a need for a class of membership for those not interested in competition flying. It was decided to call a special council meeting on March 29th, in order to discuss the present position. In the meantime a complete list of members must be furnished by clubs applying for affiliation or re-affiliation.

Finance

The treasurer presented his statement of accounts which were approved. They showed a balance in hand of £259 19s. 9d., and outstanding accounts due for payment of £598 10s. 6d.

Competition Matters

Captain S. D. Taylor reported that the Cambridge M.A.C. had offered to run the 1953 British National at Waterbeach R.A.F. Aerodrome, near Cambridge. It was agreed to accept this offer, subject to satisfactory arrangements being made. In view of the fact that Whit Monday was being treated as a working day in many trades it was decided to hold the Nationals on Whit Saturday and Sunday (May 23rd-24th).

The Federation of Model Aeronautical Manufacturers & Wholesalers are to again be approached to contribute towards the prizes and it was agreed that these should take the form of vouchers.

World Control-line Championships

It was confirmed that these this year be for 10 c.c. models. In view of the fact that the cost of sending a team of four to Milan would be approximately £200, it was decided to only include in the team those who are able to achieve in the trials 95 per cent. of last year's winning time, i.e., 145 m.p.h. It was also decided not to send a team manager.

Records

The following records were ratified:—

Indoor helicopter, r.o.g., R. T. Parham (Worcester), 2 min. 31 sec., 14/11/1952; Indoor helicopter, r.o.g., P. W. Read (S. Birmingham), 4 min. 4 sec., 19/12/1952.

Record Claims

The following new record claims were accepted.—Indoor ornithopter, H.L., R. T. Parham (Worcester), 44 sec., 20/2/1953; L'wt. glider, T.L. 50m. line, G. K. Gates (Southern Cross), 19 min. 46 sec., 8/3/1953.

Merit Certificates

Merit certificates were awarded to the following:—Class "B", No. 862, R. C. Pollard (Tynemouth); 865, Hickmott, C. (Bridlington); Class "A" No. 865, Hickmott (Bridlington); 866, R. Colquhoun (Glasgow); 867, W. Meechan (Glasgow); 868, W. F. Perry (Glasgow); 869, Aldcroft, R. (Cheadle); 870, R. H. Murdoch (Glasgow); 871, T. Watton (West Hants); 872, K. D. Mole (Tynemouth).

New Applications for Affiliation

The following applications for affiliation were accepted:—Wick M.A.C. (W. Scot.).

S.13, J.1; West Herts Group Contest Aeromodellers Club, S.10; Redcar M.A.C. (N.), S.9; Basildon M.F.C. (E. Ang.), S.4; Lenham Aero Model Club (S.E.), S.6, J.1; Northwick Park M.A.C. (L.), S.10, J.3; The Flying Druids (Larkhill), (S.), S.5, J.5; Wombwell Technical School M.A.C. (N.) S.2, J.16; The Scousers (Wallasey) M.A.C., (N.), S.11, J.9.

Applications for Re-affiliation

The following applications for re-affiliation were ratified:—Clacton M.A.C. (E. Ang.), S.4, J.6; Sissinghurst Aero Mod. Club (S.E.), S.4; J.8; Sunderland & Dis. M.A.C. (N.E.), S.17, J.10; Worthing M.A.C. (S.E.), S.10; Gillingham M.F.C. (S.E.), S.19, J.5; Chelmsford M.A.C. (E. Ang.), S.12, J.4; Surbiton & Dis. M.F.C. (L.) S.13, J.11; Upton M.F.C. (L.), S.12; Kingston & Dis. M.A.C. (L.) S.6, J.6; Chester M.F.C. (N.W.), S.9, J.3; Foresters (Notts.) M.F.C. (Mid.), S.18, J.8; Oundle & Dis. M.A.C (Mid.), S.4, J.1; Stourbridge & Dis. Mod. Club (Mid.), S.6, J.2; Bushy Park M.F.C. (L.) S.10, J.3; Chingford M.F.C. (L.), S.8, J.5; Birmingham M.A.C. (Mid.), S.10, J.2; Knowle M.A.C. (Mid.), S.8, J.5; Northampton M.A.C. (Mid.), S.15, J.9; Zombies (L.) S.10; Southern Cross Aero Club (S.E.), S.10; Walsall M.A.C. (Mid.), S.8, J.4; Neath & Dis. M.A.M.C. (S. Wales), S.7, J.2; Edinburgh M.F.C. (S.E. Scot.), S.6, J.2; Central Essex Aeromodellers (E. Ang.), S.6; Prestwick M.A.C. (W. Scot.), S.13, J.4; Knutsford & Dis. M.F.C. (N.W.), S.8; Irvine & Dis. M.A.C. (W. Scot), S.6; Headley & Dis. M.F.C. (S.), S.9, J.2; Blackpool & Fylde M.A.S. (N.W.), S.17; Plumstead & Dis. M.A.C. (L.), S.2, J.6; Reading & Dis. M.A.C. (S. Mid.), S.9, J.1; Paddington Model Club (L.), S.5, J.5; Ampleforth College M.A.C. (N.), S.2, J.1; Henley Model Club (S. Mid.), S.4, J.3; Wigan M.A.C. (N.W.), S.9, J.6; Littleover M.A.C. (Mid.), S.3, J.3; Southend Senior M.C. (Aircraft) (E. Ang.), S.11; Ipswich M.A.C. (E.Ang.), S.17, J.1; Tame Model Club (N.W.), S.9, J.2; S.A.S. Auchenharvie M.A.C. (W. Scot.), S.9, J.7; York M.A.S. (N.) S.20, J.10; Cheadle & Dis. M.A.S. (N.W.), S.12; Darlington M.A.C (N), S.6, J.2; Winchester M.A.S. (S), S.17.

The meeting closed with a vote of thanks to the chair at 7 p.m.

WEST OF SCOTLAND AREA

Ballochmyle Model Club

I was speaking the other day to Andy Gillies, who has been well known in Ayrshire model flying for some years, and who has helped to start the comparatively new Ballochmyle Club.

The club was formed last June and the boys began their competitive flying at Butlin's in September. The main interest seems to be in free-flight jobs although one or two are turning towards control liners.

March 1st saw the boys out at Mauchline having a free-for-all, in spite of the fog which clamped down on them. One thing which caused much attraction was the sound of a power job's slipstream as it went through the fog after the engine had cut. Gliders were out in force and short lines were the order of the day. I hope these lads will stick it and give the other clubs in the Area some tough competition.

Chief C/L enthusiasts are Jim Reid and his son who demonstrated with a 5 c.c. job and an *Ambassador*.

Prestwick M.A.C.

This club has made a big catch in getting Bill Jardine (Area Sec.) to join them since the Kilmarnock Club broke up. Best flight the boys could put up in the Pilcher Cup was done by Bob Parsons—1 min. 49 sec.

Bob also did the best total—4 min. 53 sec.

S.A.S.

John MacArthur says that the team race track they have been preparing will be ready for the last Area team race—September 6th.

The track will be of hard turf and surrounded by a low turf wall to keep spectators at a safe distance.

That's all for now except to remind all West of Scotland clubs to send any news to me—Brian Harris, 24, Moor Road, Ayr.

BLACKPOOL AND FYLDE M.A.S.

For the second year running the weather was extremely good on Gamage day, there being a warm sun and until about 1 o'clock, no wind. However, a breeze sprang up later, and this, together with the disappearance of the sun behind an extremely high layer of small clouds, resulted in a considerable drop in flight times by about 3 o'clock. The local Stevenson and Progress cups were flown off concurrently with the Pilcher and Gamage, the results being:

Gamage and Progress.—M. R. Thomas, 7 min. 8 sec.; F. Marsden, 6 min. 9 sec.; B. Maxwell, 5 min. 11 sec.

Pilcher and Stevenson.—M. R. Thomas, 8 min. 50 sec.; F. Marsden, 8 min. 30 sec.; F. W. Smith, 7 min. 47 sec.

It is interesting to note that the first two models in the glider event were light-weights of about 6 ft. span, using ¼ in. sq. sticks, 6 ft. long instead of fuselages. T. W. Smith flew a 10 ft. glider of 24 lb. into 3rd place.

Several lessons were learnt by various people while flying for these two contests, notably Cliff Davey who lost his *King Oliver* on his first flight, he was chasing it along a road at about 50 m.p.h. on his *new* motor-cycle when he suddenly found out to his horror that the road was a *cul-de-sac*. He will fit a D/T next time.

Also Alan Webber decided to have a trimming flight with his light-weight glider. Time: 8 min. 50 sec. o.o.s., his only consolation being that he can claim the club's annual glider record. He will be relieved to hear that Nigel Snowdon's 12 min. 30 sec. the next day was not officially timed. Somebody in Blackpool ought to make a fortune selling D/T fuse to these three gentlemen. A club chuck-glider comp. was run-off at the same time just to make the proceedings a little more hectic, the winner being Cliff Davey with an aggregate of 110 sec., closely followed by Mike Thomas who managed to score 105 sec. despite a sprained ankle.

Although the "sane" models owed a lot to thermal assistance, no chuck-gliders were seen rising to any great extent, and the best flight of the day was a non-competition flight of 44 sec. by Cliff Davey.

BRADFORD M.A.C.

Bradford M.A.C. held its first "General" competition of the season on March 8th, in conjunction with the S.M.A.E. Gamage and Pilcher Cups contests. The event was flown, as usual, on Baildon Moors, and for once we were blessed with good weather—comparative calm, warm sunshine and a certain amount of lift (if one was lucky enough to find it !).

Ron. Calvert's new glider turned in a very nice 6 min. 12 sec. aggregate for the Pilcher, whilst Norman Lees made a welcome come-back to contest flying to clock 8 min. 43 sec. in the Gamage with his latest Wakefield, built to 1954 rules. C. P. Miller came a close second with 7 min. 32 sec., but Adrian Miller, after a beautiful maximum (over 4 min. o.o.s.) on his first flight, piled up on the second and wrote-off the model.

Power times (counting, of course, only for the club contest) showed a decisive victory for the Lanfranchi family; Silvio turned in an aggregate of 7 min. 49 sec. with his scaled-down *San-de-Hogan*, and second was son Tony with 6 min. 38 sec., flying an Amco 3.5 c.c. powered *Ascender*. Arthur Collinson placed third with 5 min. 18 sec., but was not up to his usual standard. On the whole, it would appear that the farmers' troubles are not over yet—models seem to be going as far as ever !

THE HORNCHURCH M.A.C.

Formerly a model aircraft section of the local Engineering Society the above new club got away to a flying start with its first outdoor meeting on nearby Upminster Common. The majority of the club's 30 members turned out to bedazzle the local populace with a versatile assortment of models, including Tailless, Jetex, Rubber and C/L. The flying field proved to be quite adequate for club purposes, and, as it is sited on a hill it is hoped that a more keener interest will be taken in decentralised contests !

CROYDON & DIST. M.A.C.

Many of the Croydon and Dist. M.A.C. members are busy preparing for the coming season. New models which have appeared include several geared Wakefields of the "6 oz. of rubber" variety, Nordic gliders with flapped wings, and a 60 in. span Fox "35" light-weight gas job—all of which show considerable promise.

The unfortunate loss of Fairlop does not seriously affect our trimming and pleasure (?) flying, but it may curtail our efforts in the Area Centralised meetings. Chobham common, the proposed venue for these events, does however, offer about 3 miles of wind swept barren land in any direction, so if we survive chasing the models, all may be well.

The new Wakefield rules are viewed with dismay. In spite of semi-humorous remarks that several members already have models with airframes that weigh 5½ oz.; the fixed rubber weight of 2.82 oz.—which reduces all models to a common denominator—will allow little scope for experimentation. We wish the "processors" luck when they try to weigh 2.8200 oz. of slimy rubber !

Aeromodellers—especially "contest types"—who wish to join the club are invited to contact members at Epsom Downs, or write to the Hon. Secretary: H. E. Setterfield, (Heset Model Supplies), 61, Brighton Road, South Croydon, Surrey.

A happy group of revellers at the annual party of the Croydon & Dist. M.A.C.

WALSALL MODEL AERO CLUB

The club is following its winter and spring programme with great enthusiasm. This programme consists of model discussions, trimming lectures, engine starting competitions, r.t.p. and other features, although, due to the approaching contest season, Comp. Sec. Bill Daniels has insisted on a predominance of the said trimming lectures.

Of late the club has seen a great influx of juniors. Most of these lads are very keen, as witness one youngster who brought a magnificent 4 ft. span *Mustang* to the club the other night. This, we thought, was a great achievement, especially as he had scaled it up from a small kit plan.

Much interest has been aroused by the advent of Gerry Van Damm, a new Dutch member. A fine builder and quite a veteran at the hobby, Gerry has the distinction of having once flown in a world championship at Amsterdam.

Sunday, March 8th, a beautiful day, saw the club out in force at Walsall Airport, thanks to the kind permission of Messrs. Helliwell's Ltd. It was a day of records. Early in the day young Tony Hall established a chuck-glider record of 1 min. 50.9 sec with his thermal-hunting model. You could actually see that wee job hooking thermals.

The club experimenter, Frank Bishop, pushed the Jetex record up to 3 min. 57.4 sec. with a "200" powered, modified Keilkraft *Ace*. The complacency of other Jetex fiends in the club was smashed by this effort but, as Frank unfortunately smashed his job later in the day, there is still hope.

The best flight of the day came from Alan Hazelwood who is one of those fellows who never likes to tie an engine run down. This time, however, he brought off an exact 20 sec. engine run which was followed by a flight of 13 min. 0 sec. o.o.s. Alan has now been notified by the finder who lives at Great Barr, some five miles from the flying field.

One of the most satisfying flights of the day was a member's K.K. *Cessna* 170 circling against the evening sky, looking for all the world like the real thing.

DROGHEDA M.F.C.

Fixtures for the coming year include C/L contest on April 18th (Saturday) starting at 2.30 p.m., and will include Open Stunt and Class "A" team racing.

On Sunday, June 21st, a C/L contest will be held in Butlin's Holiday Camp at Mosney, which will include Open Stunt, Class "A" and "B" team racing and Flying Scale. Valuable prizes of engines and kits as well as the Butlin Trophy (perpetual) will be awarded to the competitor with the most points which will be awarded as follows: 1st in any of the four events will be awarded 10 points; 2nd ditto, 5 points; 3rd, 2 points. Winner of the trophy will receive a replica of it; it is a silver globe with a four-engined 'plane attached to the top of it, mounted on a base and standing about 1 ft. high; last year's winner was Mr. J. Carroll, of Dublin.

Members of our club will be giving demonstrations of C/L and free-flight every Monday night in the camp on the sports field, and any English visitors should bring their models when coming on holidays to the camp. If they will get in touch with the secretary of our club a contest will be arranged with them.

As our members have gone in for free-flight and gliders as well as the C/L we hope to hold a free-flight contest later in the year.

BRISTOL AND WEST M.A.C.

The club's contest fixture list has been compiled and includes a "one design" contest, a chuck glider event, and, what should be most interesting, a rubber cargo contest. The model carrying the greatest amount of weight for 30 sec. with max. motor weight of ⅜ oz. will be the winner. A common form of weight is planned, probably coins, to enable loads to be checked without resorting to scales.

On May 11th the club is re-instituting the West of England Championship Cup for competition by the West of England and S. Wales clubs. Entrants are to fly in any two of the three free-flight classes. Highest total aggregate to win. Prizes for leaders in each class.

Both membership and the turnout on contest days are increasing, and the club seems to be definitely on the upgrade.

A. H. Lee has at least two Wakefields ready for the 1954 Eliminators. A pair of radio sailplanes are under construction by Messrs. Pavey and Coles and we hope that these may soon be seen flying on Durdham Downs.

AEROBODS OF NOTE

J. O'DONNELL

A man of many models and all good ones too! Has won events in chuck glider, glider, rubber and Jetex in the 1952 season

SALFORD M.A.C.

The club was well represented at the N.W. Area "Wintry" Rally though success did not come our way. Les Batty was flying his high aspect ratio A/2 *Odin* with which he won second prize at Woodford. It again performed well but weather conditions were against Les, for on two of his flights his model must have been airborne long enough to record 3 min. maximums but all of his flights were timed o.o.s in the falling snow when well short of this time and his official aggregate was only 4 min. 31 sec. Arthur Crane did well to place third in rubber but the most interesting flying was provided by Alan Harding's *Ro-Elf* which provided a most entertaining free-flight stunt exhibition! Alan seems to be concentrating on the unusual. His latest, a flying wing, still loops with about 45 deg. downthrust!

Brian Bower had bad luck with his brand new free-flight Javelin powered job—he pranged it first time out while on his way to the flying field—he fell off his bike, and his model bore the brunt of it! However, he has had better luck with his new A/2 putting up two maximums and a flight of 1 min. 24 sec. in the Pilcher Cup at Tilstock.

READING AND DISTRICT M.A.C.

Two very successful socials marked the beginning and end of the winter season, helping to keep the club together at the usual "slack" times, as well as relieving the hard-pressed finances.

The r.t.p. contest this year took the form of two rounds for stick models to a simple formula and two for scale models; the latter often having very unscale speeds and an insatiable desire to alternate violently between floor and ceiling! Several juniors flew consistently, but the old 'uns evidently thought it was all kid's stuff so we haven't seen much of them. The winter programme ended with the *Concours d'Elegance* at which both seniors and juniors were well represented. Scale and semi-scale models predominated, the more interesting being a F/F Miles *Libellula* M.35 and a Dart-powered example of Phil Smith's L.A.17.

Innovations for the coming season include a "scramble" type contest, a ½A team race, and a chuck-glider sweepstake which will run throughout the season. Certain muscle-men can be seen weight-training already for this latter event while others do three miles road work each morning in preparation for the "scramble" contest!

CHEADLE & DIST. M.A.S.

The Cheadle & Dist. M.A.S. would like to thank the S.M.A.E. for the "Damage Day" weather. It was wonderful! Top scorer in the Pilcher was Walt Nield with two maxs. and 1 min. 55 sec., second A. Anderton with 2 sec. 23 sec., a max., and 2 min. 27 sec., each scoring higher than they ever got off 328 ft lines! Both were flying new O.D. Nordics.

Top in the Gamage was Anderton again, 3 min., 2 min. 47 sec., 3 min., and the none too original excuse of a down-draught. Second, Brian Faulkner with 3 min., 2 min. 11 sec., 3 min., and a second flight D.T.—even less excuse! He repeated this "special manoeuvre" in glider with a 1 min. 55 sec. d/t in the Pilcher.

Bad luck awards go to Garth Evans, for D.T.-ing his *Conquest* for a test flight max. at 10 ft. over concrete, repairing it, and landing it on a main road under a car. He then succeeded in losing a light-weight rubber job *on hand turns*. . . .

Overall result of the day for him—two jobs less, no score. . . .

Current craze sweeping the club rubber Bilgri-emulators (all Bill Archer of them) is condenser tissue of .0003 in. thickness imported from the States. However, all that glitters, etc. . . . Bill's first wing so covered was thrown out, looking like a Junkers 52's—*corrugated*!

Two new members, Aldcroft and Hooley, flying in the Pilcher, started their career for this club at least, by losing their light-weight gliders for 6 min. 31 sec., and 15 min. 15 sec. o.o.s. respectively.

Original (?) lines of research in the club continue on rubber jobs in particular, with two 36 in. designs by Anderton and Faulkner (the *Marathon* and *Thermaller* respectively) being grafted on to each other, with quite outstanding results so far; the result giving (apparently) nearly 400 ft. after 2½ min. on climb.

Eric Taylor, lone wolf as usual, is toying around with that baby of ultra-complicated props, the "half-radius folder," where half of each blade folds through 180 deg.—then the rest feathers!

STOP PRESS—We now find that he actually came *top* in our Gamage results—flying in the North Manchester region to score three maxs. and a 7 min. 47 sec. fly-off!

WHITEFIELD M.A.C.

With three contests in the last month the club is now well started on the 1953 season. A local inter-club event was held at Edgeworth on the Bolton Club's ground on Feb. 22nd, using a 3 min. max. and rules to suit. J. O'Donnell won the glider contest for the Lawton Trophy for the fourth successive year. This 9-footer did two thermal maximums off the 200 ft. towline allowed. A. D. Bennet won the rubber contest for the Elite Trophy—motor 33 1/3 per cent. of total flying weight—doing 2 min. and 3 min. with a ballasted Wakefield.

Following week saw much better weather for the Freshman's Trophy—limited to members who had not placed top in the club in a S.M.A.E. contest last season. This was rubber or glider to '52 rules. John Potts was winner, flying a diamond pylon free-wheel Wakefield to a total of 10 sec. 17 sec.—all flights being over 3 min.

Finally the club had quite a reasonable entry in the decentralised Gamage and Pilcher contests. Most of the club travelled to Tilstock Aerodrome, which the N.W. Area had made available for the day. Top in the Gamage was J. O'Donnell with three maxs. and a 4 min 12 sec. fly-off—model was a geodetic Wakefield complete with 24 in. featherer.

Times in the Pilcher were not too good—best being E. Horwich's 6 min. 43 sec. with an "Odenman" Nordic—the model being timed on the last flight for 14 min. 40 sec. o.o.s. from launch (and followed by car, etc. for 4 miles and 45 min. before being lost).

High spot of the month is, however, the news that Alan Wrigley has got the first "C" and International Cert. in the club—he recently managed his power flights just 51 weeks after the glider flights—biggest difficulty being the r.o.g. requirement for power, coupled with rather rough field surface. The "C" Cert.'s quite an achievement—the rest of the club have being trying for months!

NORWICH MODEL AERO CLUB

With the beginning of the flying season here the club has suffered a serious set-back in the loss of its flying field. This will be available next year and in the meantime every endeavour is being made to find a temporary field.

At present club meetings are being held at least once a month at Bignold School, but it is hoped that a permanent club-room will be available shortly.

Main interest in the club at present is in free-flight power and glider. Several members are also building radio jobs in an effort to provide our chairman Mr. G. Davie with a little competition. Mr. Davie has at least four R/C jobs flying: two *Super Brigadiers*, a *Junior* 60 and nine foot glider. He also has an outsize in stunt jobs, a *Stuntwagon* powered by Allwood "Glo-devil." Another outsize stunt job is an *Icarus*, McCoy "60" flown by R. Applin, model performs well and is certainly impressive on hundred foot lines.

Most interesting bod and mod in the club is Tony Coe. He sports a really brilliant cap festooned with the remnants of a much bashed Elfin layed out like an "Engine Test" display. Mod is a scarlet *Decojet* job called *Buzz Bomb* which having had nine inches lopped off the business end refuses to do anything, but make rude noises and imitate a worn out blowlamp. Said bod looks as bad as his cap after half-hour's frantic pumping!

FORESTERS (NOTTINGHAM) M.F.C.

Tom Woodward recently broke the club rubber record with an F.A.I. model on a pre-Gamage jaunt. The day was bitterly cold and clouded over, but the model climbed like a rocket. After five or six minutes, it came down to about 50 ft., and an expectant Tom, but the frisky elements hadn't finished. They whisked the model up and away into the enfolding clouds quicker than when it was under power for a total of 13 min. o.o.s. No Gamage cup for Tom this year!

SECRETARIAL CHANGES

Edinburgh M.F.C. U. A. Wannop, 11, Craiglockhart Drive South, Edinburgh, 11.
Southport M. & E.C. T. Nelson, 41, Hawkshead Street, Southport, Lancs.
Knutsford & District M.F.C. G. Parker, High Marland Lodge, Legh Road, Knutsford, Cheshire.
Flying Saddlers M.A.C. R. H. Bidale, 16, Reservoir Street, Walsall, Staffs.
Wallasey M.A.C. J. B. Nannay, 67, St. Andrews Road, Behington, Cheshire.
Redcar M.A.C. C. Skinner, 16, France Street, Redcar, Yorks.
Boston District A.C. S. C. Marshall, Fold Hill, Old Leake, nr. Boston, Lincs.
N.W. Middlesex M.F.C. J. Bowerman, 40, Crundale Avenue, Kingsbury, London, N.W.9.
Stockton D.M.F.C. A. W. Spurr, 9, Mosman Terrace, North Ormesby, Middlesbrough, Yorks.
Men of Kent M.F.C. M. R. Bassett, 7, Selbourne Road, Sidcup, Kent.
Southern Area. A. C. Wemyss, "Gleniffer", Wynter Road, Bitterne, Southampton.

NEW CLUBS

Lenham M.F.C. F. Wittaker, 2, Cole Terrace, Lenham, nr. Maidstone, Kent.
Sidcup A.S. M. R. Bassett, 7, Selbourne Road, Sidcup, Kent.
Hornchurch M.A.C. J. Ranson, 155, Gorseway, Rush Green, Romford, Essex.
S.E. London Radio-Control Society. H. C. Frampton, 34, Stapleton Road, Bexley Heath, Kent.

MODEL AIRCRAFT CONTEST CALENDAR

April 26th — **C/L SPEED TRIALS.** **CROYDON GALA.** Chobham Common, Surrey.
May 3rd — Centralised. Kidlington, near Oxford. **INT. A2 TRIALS.** **"AEROMODELLER" R/C TROPHY.**
" 10th — Decentralised. **LADY SHELLEY CUP.** Tailless Models. **JETEX CUP.**
" 23rd-24th — BRITISH NATIONALS. Waterbeach, near Cambridge. **THURSTON CUP.** Glider. **"MODEL AIRCRAFT" TROPHY.** Unr. Rubber. **"GOLD" TROPHY.** C/L Stunt. **SPEED TROPHY.** C/L Speed. **S.M.A.E. TROPHY.** Radio Control. **SIR JOHN SHELLEY CUP.** Unr. Power. **TEAM RACE TROPHY.** Class A and B. **PAA-LOAD TROPHY.**
June 6-7th — **WORLD C/L CHAMPIONSHIPS.** Milan, Italy
" 7th — Centralised. Digby, Lincs. **WAKEFIELD TRIALS.** **POWER TRIALS.**
" 21st — Decentralised **KEIL TROPHY.** Unr. Power. **FROG JUNIOR CUP.** Unr. Rubber/Glider.
" 28th — Slope Soaring Contest. Clwyd Hills, North Wales.
July 3rd-6th — Int. C/L Stunt and Speed. Knokke, Belgium.
" 5th — Centralised. **SUPER SCALE TROPHY.** Scale Power. **BOWDEN TROPHY.** Precision Power.
" 12th — Northern Heights Gala Day. Langley.
" 19th — Decentralised. **C.M.A. CUP.** Unr. Glider **FROG SENIOR CUP.** 1.5 c.c. Power. Int. Tailless Glider Contest. Bremen, Germany.
" 26th — Int. Radio Control Contest. Southend.
Aug. 2nd — WORLD CHAMPIONSHIPS. Cranfield, Beds.
" 3rd — **WAKEFIELD CUP.** **F.N.A. CUP.** **POWER CHAMPIONSHIPS.**
Aug. 15th — International Slope-soaring Contest. Trento, Italy.
" 16th — Seaton M.F.C. Annual Rally. Seaton, Devon.
" 21st-23rd — WORLD A2 GLIDER CHAMPS. Yugoslavia.
" 23rd — Radlett, Herts. All Britain Model Aircraft Rally. Int. Jetex Contest.
" 30th — Centralised. **AREA CHAMPIONSHIPS.** Rubber/Glider/Power. **TAPLIN TROPHY.** Radio Control.
Sept. 5th-6th — Irish Nationals, Dublin.
" 6th — *YORKSHIRE EVENING NEWS* Rally. Sherburn. Int. R/C Contest. Glider Power. Brussels
" 13th — Area. **GUTTERIDGE TROPHY.** 1954 Wakefield Eliminator. ***"MODEL ENGINEER" CUP.** Team Glider.
" 20th — International Team Race. Holland.
" 27th — Area. ***K. & M.A.A. Cup.** 1954 A2 Eliminator. **HALFAX TROPHY.** 1954 Power Eliminator.
Oct. 11th — Ireland. **U.K. CHALLENGE MATCH.** Rubber/Power/Glider.
" 17th-20th — Madrid, Spain. International Meeting. Glider, Power, C/L.
" 18th — Centralised. **DAVIES TROPHIES.** Team Race A and B. **RIPMAX TROPHY.** Radio Control. **C/L SPEED.**

S.M.A.E. CONTESTS IN CAPITALS
*Indicates Plugge Cup Events.

THE "MODEL AIRCRAFT" CONTEST CALENDAR will again be featured in our Club News section during the coming season. Now that the S.M.A.E. Contest Programme has been announced we strongly advise clubs who intend to organise rallies to decide upon the dates of these without delay. Early publication of the dates of these events in the Contest Calendar will avoid them clashing with other fixtures.

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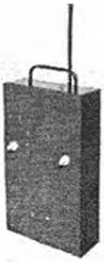

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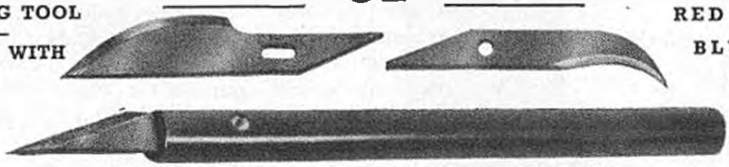

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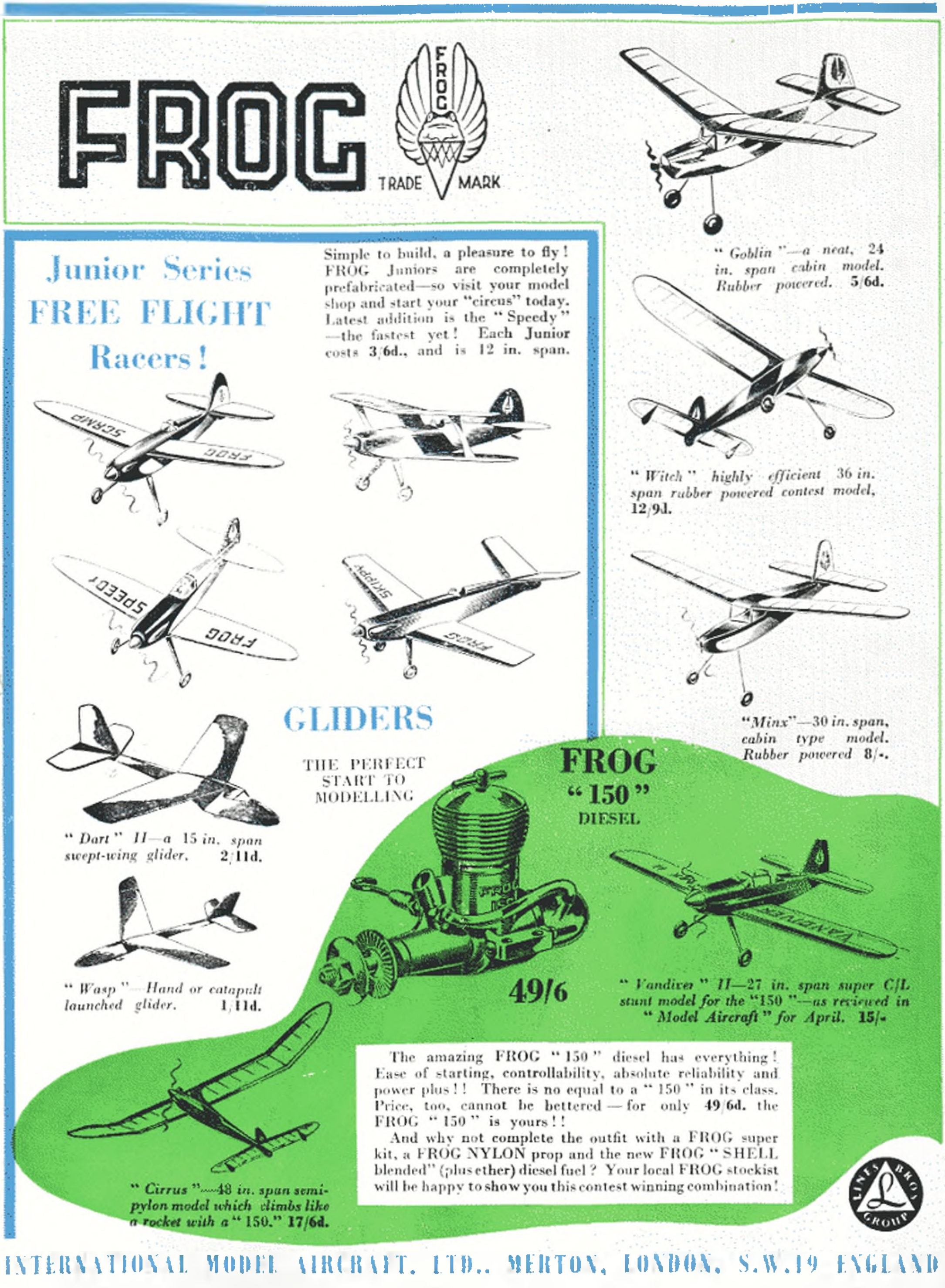
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