MODEL AIRCRAFT

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SEPTEMBER 1954

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JAVELIN & DART

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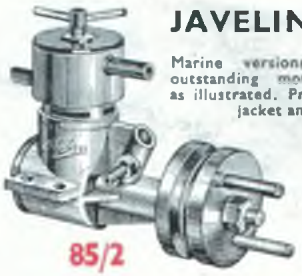

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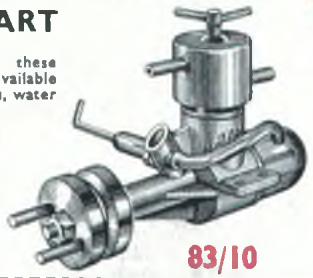

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One of the things which is concerning me greatly at the present time is the possible effect of Convertibility of Sterling. That means to us probably two things:-

(1) That dollars would be free, whereas now, as I have told you, we have to justify our imports by exports and earn the dollars.

(2) That the value of the pound might rise - that is £1 would buy more dollars and as we buy Balsa in dollars we would get more Balsa wood for our money.

One result of this might be that someone else will enter the sheet and strip market. If they did, I think they would probably have a long story about how by careful and specialised buying in Ecuador, they could avoid waste and not need to look for other uses for Balsa wood to balance their production. They would, of course, suggest that they could produce unlimited quantities of the finest Balsa wood in a way that has never been heard of before!

You know, when I come to think of it, it sounds a good story and perhaps much easier than the story I have been trying to tell you for all these years. Nothing but facts, however, could stand up over the period of time I have been talking to you and it is these facts, learnt by continuous experience, which have fashioned my business.

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Freedom of buying will neither produce more Balsa wood in Ecuador, nor will it produce better Balsa. I am afraid that Balsa "as she grows" will always be full of defects and efficiency in this business means to me the ability more and more to be able to select the right material for the right job and achieve a minimum of overall waste. It can only be done here in the Works - it can't be done in Ecuador at the Mills.

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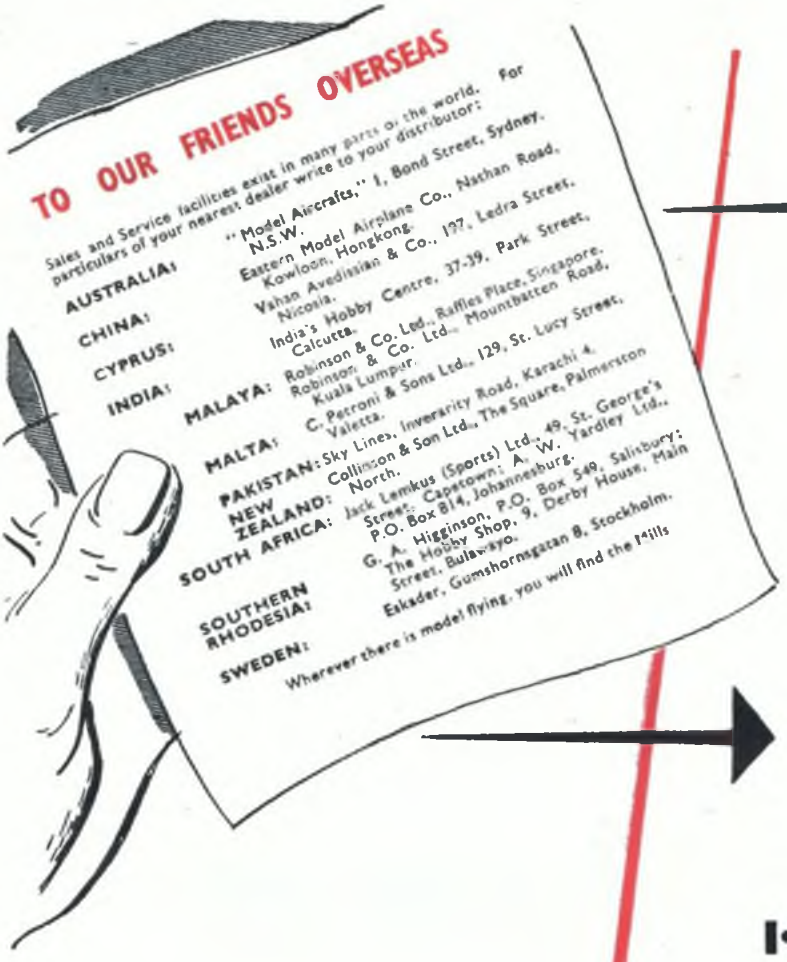

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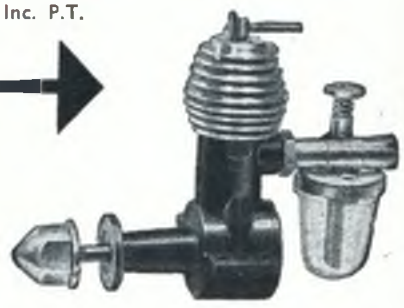

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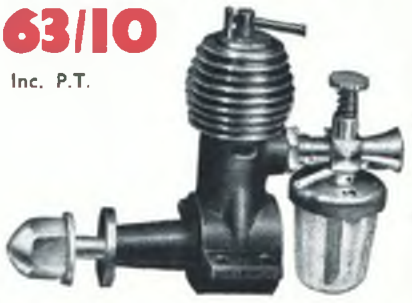

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EDITORIAL

The fact that the competitors in the International Glider Contest, recently held in Denmark, were roused at the unearthly hour of 3 a.m. to take part in this event, makes one wonder if it is all really worthwhile.

The avowed object is, of course, to obtain still air conditions and kill the thermal bug; but does it really do so and does it in any way lead to design improvement?

Observation at this contest and others, indicates that this is no sure means of providing anti-thermal conditions since the atmosphere is on the move everywhere all the time to a greater or smaller extent. The nearest approach yet achieved in this direction occurred when the Wakefield Cup Contest was held in Finland under "midnight sun" conditions. These conditions are, of course, limited to countries of the "far North" (or far South); there is little hope of achieving the ideal condition anywhere else outside this very limited area.

We cannot imagine that the competitors enjoyed turning out for flying their models at times which are not normal for the human frame and certainly we cannot concede that the organising officials enjoyed it any more.

It would be interesting to learn the actual views of the model fliers themselves on this subject as the whole thing has a strong "chasing the shadow" flavour and the victims should be given the opportunity of airing their views.

* * *

Another point of interest at this meeting was the poor showing made by members of the British team in the first three rounds. This was all the more surprising when it is realised that the weather conditions prevailing were what is usually referred to as "typical British weather," namely, windy, wet and chilly.

Somehow only very few of our modellers have been able to master the tow-line technique to achieve the degree of skill displayed by German modellers before the war and from the results in Odense it would appear that this same disparity still exists.

The ability to "play" a model on the line in order to obtain maximum height before release under all conditions, is one of the first things which every glider flier should aim at and concentrate to achieve. Only then will they not be at a disadvantage in international contests.

Cover Story

Photographed at the International Radio-Controlled Models Society's meeting at Moreton-in-Marsh (reported in this issue), this month's cover features a fine R/C model built by Rhodes, of Harrow (left), who is seen receiving some assistance in starting the McCoy power unit from fellow club member M/Sgt. Crowe, of the U.S.A.F.

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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The Wakefield

● Once again the International Wakefield Cup moves on, in its journey around the world. As readers will know, the contest took place, in company with the International Power Championships, near New York, in the United States, and the winner was A. King—of Australia.

The principal results of the two contests are as follows:—

Wakefield

1st	A. King	Australia	900
2nd	C. Jackson	G.B. ...	866
3rd	A. K. Kim Joon ...	Australia ...	863

Team Positions

1st	U.S.A.	2404
2nd	G.B.	2334
3rd	Canada	2322

Power

1st	C. Wheeley	U.S.A. ...	844
2nd	S. Lanfranchi ...	Switzerland	831
3rd	D. Kneeland	U.S.A. ...	783

Team Positions

1st	U.S.A.	2204
2nd	Argentina	1826
3rd	Canada	1712

We offer our congratulations to Mr. Jackson, of Ashton M.A.C., and to Silvio Lanfranchi, of Bradford M.A.C., for their fine performances; our only regret is that Silvio, although he topped our Power Trials, is in fact a Swiss subject and was therefore unable to represent Great Britain!

Dave Kneeland, third in Power this year, was of course the winner at Cranfield last year and Carl Wheeley was also in the U.S. team then.

In the individual placings of both contests it was a fine performance by the Commonwealth, and the Australian venue next year will further the great ideal of a truly World Championship.

Model Aeronautical Conference

● The Low Speed Aerodynamic Research Association is considering the possibility of holding a conference in London, during September. This would take place on a Saturday and have a morning session devoted to model aircraft and an afternoon session, during which the application of models to full-size aircraft design, etc., would be dealt with. The papers on the above subjects are to be quite short and the half-hour lectures would be followed by 15 min. open discussion, plus allowing for the papers to be dealt with at each session.

This new L.S.A.R.A. project seems to us to be a most excellent one and we trust that adequate support will be forthcoming to make it possible for the Association to go ahead with its plans.

Mr. T. Dorricott, of 84, Marston Gardens, Luton, Beds, will be pleased to hear from anyone interested in the proposed conference.

Cancellation

● The Bristol and West M.A.C. has asked us to bring to the notice of readers that the West of England Championships that were to be held at Lulsgate on September 5th, have unfortunately had to be cancelled. Too bad—better luck next time!

While on the subject of meetings, the organisers of the second All Britain Rally have announced some new attractions for September 26th at Radlett, Herts. The St. Albans M.A.C., who are running this popular event, are offering £1 1s. to anyone who officially breaks any British record at the Rally. In addition, Westway Models Ltd., are presenting a magnificent trophy for the combat event. This is a gold-plated model of the Supermarine *Swift* on a streamlined plinth—a prize well worth winning!

The P.A.A. Clipper Cargo event is a new one for this year's Rally and, in fact, anywhere in this country. A large entry is expected and a P.A.A. handbook and further details of this and any other events can be obtained from the S.M.A.E. P.R.O., Ken Brookes.

R/C, A and B?

Recent developments in radio equipment for model aircraft having from 3 to 6 tuned reeds and providing as many individual controls, have revolutionised the technique and scope of flying radio controlled models, and it is quite clear that the time has approached when radio controlled models will have to be split into at least two classes for competition purposes ; single control models and multi-control models.

It is only necessary to witness the performance of a good multi-controlled model in the hands of one of the leading exponents of this class, to realise the total unfairness of expecting single channel models to be able to compete against them on level terms.

The alternative which presents itself, is to handicap the multi-controllers in some way either by up-grading the marks of the single control models by a suitable formula or by providing them with bonus marks to offset the natural handicap.

It is obvious that if something is not done in this direction shortly, the more simple model (and the more popular one) will be discouraged and this is bad for the movement.

International Team Racing

The introduction of team racing to the International Calendar of the F.A.I. is imminent, and it will present some tricky problems for the Model Commission to solve.

The present F.A.I. rules permit only 4 persons per national team, and they score as individuals. However with team racing a team is required to operate each model, and there is no individual score. What is to happen, then ? Are there to be just four persons in each national team, each with his own model, changing around pilots and mechanics, or will there be four complete units of, say, three men to one model, resulting in a national team of no less than 12 men ? Or at the other end of the scale must there be just four men to operate one model, i.e. pilot, two mechanics and a reserve/manager ? A further complication arises if both A and B classes are recognised. Our imagination boggles at the permutations that would be involved if the first system with two classes were used.

However, no doubt the Model Commission will resolve the confusion ; certainly we welcome the granting of international status to this intriguing branch of the sport.

A New Twist

The Austrian team in the World Glider Contest in Denmark turned up with machines employing a new idea for dealing with the stall problem.

Their high aspect ratio wings were purposely constructed to flutter when the model reached the point of stall, the effect being to level out the machine quickly. Whilst this scheme may work in practice, and there was some evidence in Denmark that it was functioning, the scheme has a very serious drawback in that a wing has to be designed to suit each weather condition. Obviously the point at which flutter takes place will vary with different wing conditions and to make the scheme practicable, each model will have to have a set of six wings to cover the conditions prevailing.

It was obvious that the Austrian modellers had not expected the severe conditions which were encountered in Denmark and the flexural rigidity of their wings were insufficient to cope with the conditions they encountered. This was one of the main reasons for their unexpectedly poor showing in the contest.

Another interesting incident at that contest was supplied by a pair of swallows who had built a nest *inside* the administration building on the aerodrome, which was used for processing, storage, repairs, etc.

These intrepid birds had constructed their nest on a ledge at the end of two corridors which were at right angles to each other. This was remarkable enough in itself but what was still more remarkable was the fact that the influx of the hundred or so competitors and officials did not seem to disturb them in any way. When the competitors arrived in the building at 4 a.m. on the day of the contest, both birds were asleep by the nest and did not wake until their usual time.

Late News

As we go to press we have heard the good news that the contest for the West Hants Radio-controlled Glider Trophy, which was unfortunately postponed on July 4, will now be held at Larkhill on October 3. This is to be held in conjunction with the Southern Area glider and power eliminators and should be a most interesting event.

The World Control-line Championships are being held this year indoors in this huge hall at The Hague, Holland.

★
47½ in. span,
1–1½ c.c.
motors
★

AN ATTRACTIVE SCALE MODEL FOR SPORT FLYING

THE FOSTER WIKNER

WICKO

by E. Fearnley

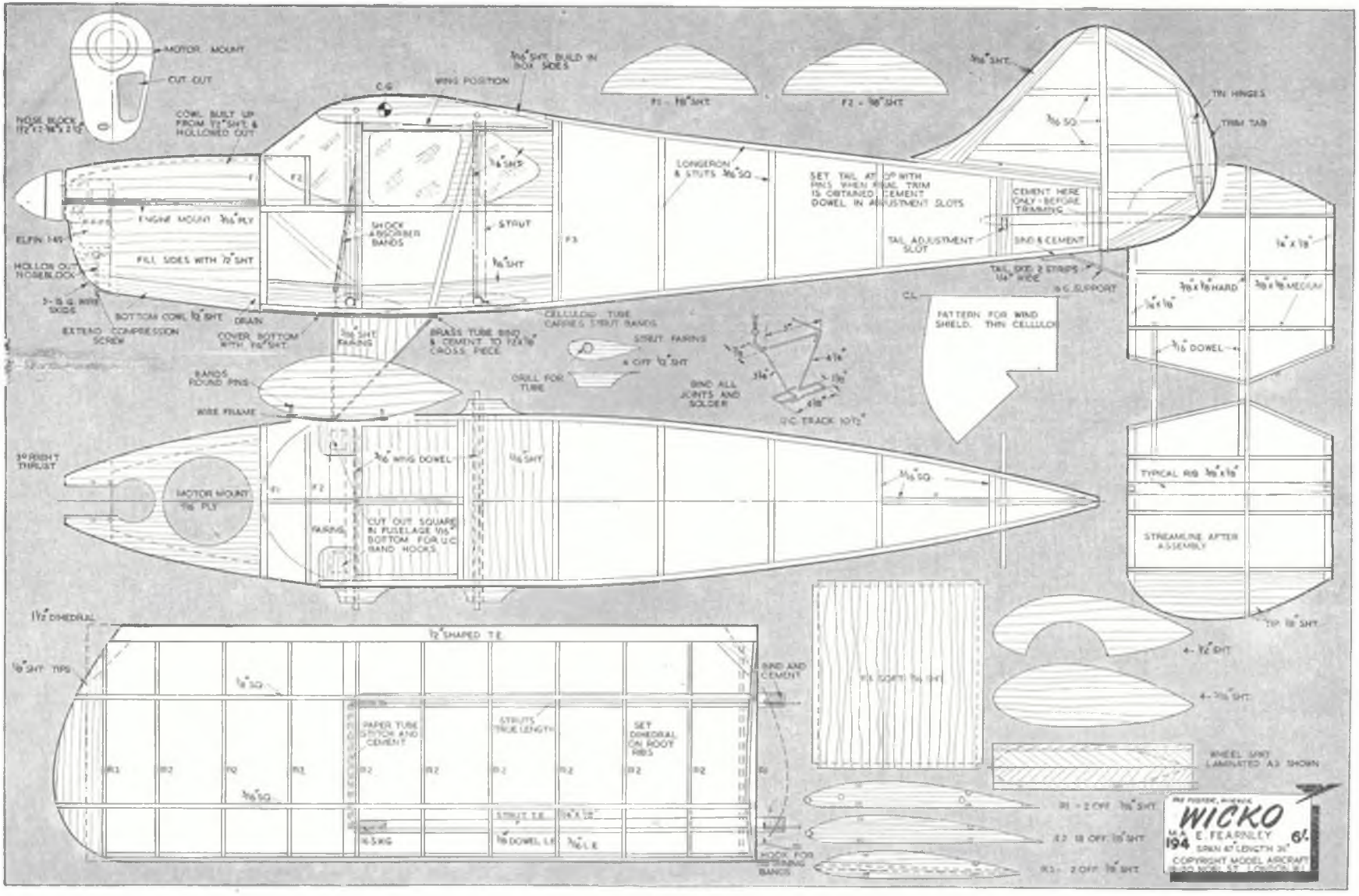
THE standard *Wicko* is a two-seater powered by a Gypsy-Major 130 h.p. engine. It was designed in 1936 by an Australian, Mr. G. N. Wikner. Apart from civil duties some of these were in service for communications with the R.A.F. A modified version, in which an extra seat was fitted sideways at the rear of the cabin, and the flaps removed to reduce weight, being probably unnecessary on laid out service runways anyway, was labelled the *Warferry*. The only external difference appears to be a tail wheel on the latter. The prototype makes a perfect flying scale model, being simple in general outline, yet possessing nice lines and a character all of its own, and rugged enough to stand up to hard use. It is in fact an ideal "sport" flier being just as reliable, with the added attraction of being true to scale in every way.

The fuselage box is almost too simple. Note the sheet wing roots built in the sides on the plan. Join the two sides together with F3, cut out of light sheet adding all the spacers top and bottom. F1 and 2 are added, and sheeting is completed. Cut the motor mount out of $\frac{3}{16}$ plywood to fit the motor you are using. The original has flown with an Elfin 1.49 and a Bee 1 c.c. With the latter it will be necessary to keep the weight down as far as possible, while the bigger motor will allow heavier wood to be selected, and a full dope trim added. The bottom of the nose is cut from $\frac{1}{2}$-in. sheet, as are the sides. Assemble these parts, being very sure that the motor mount is exactly in the right thrust line, to make trimming easier later. Add the nose block and top cowl, hollowed out for lightness. Finish by carving to rough streamline shape, and finish with coarse and fine sandpaper. Give two coats of wood filler inside and out. Fuel proof inside well, leaving room to drain at rear. Add the celluloid windows after the wing dowels, and hooks for the undercarriage have been fitted, and the inside of the fuselage cabin painted a neutral colour. Bind the U/C brass tube to the cross member. Tail skid (or wheel) and tubes for wing struts follow, with the fairings added. Sandpaper wrapped round a pencil will streamline these for you.

Tail is very easy. The strip wood is assembled on the plan, and when removed, streamlined with a knife and sandpaper. Drill for the front dowel, but do not fit until it is fitted to the fuselage. Our model finished up with very little negative incidence on the tail, but start with zero. The tail is cemented at the stern post only until trimmed, when the front dowel can be cemented to avoid accidents. Pin the tail at the setting for testing. Rudder is all strip wood with sheet outline. The trim tab is optional but useful on the flying field.

Wings follow usual style. Ribs are medium stock with fairly hard spars top and bottom. Take care to keep them true though. The undercarriage looks complicated, but is easy to make. The wire is formed as shown, and the spats are held in place with bands, as it is not satisfactory to have these cemented to stand the rigours of the flying ground. Be warned to solder really well, with 15 A fuse wire bound round first. Fair the legs with sheet as shown, and complete the spats as per plan. The wing struts are dowel and trailing edge cemented together, with wire hooks to fit the tubes and a "U" fitting at the top passing through paper tubing, fixed to the wings. When all is covered and doped, test for trueness. Steam out warps *now* before the damage is done.

As the model has a close coupled tail, the balance should be done carefully, though it is not a critical model to fly at all. Our model needs just a little tail weight. If the wings, tail, and thrust is as per plan, it should fly first time. Keep the motor revs down at first, and avoid a tight turn, particularly to the right. Our model proved a very sure flying job, and is very impressive in the air. A Frog 8 in. × 5 in. pitch was found best for the Elfin. Don't use a small diameter prop, or you will set up a great torque factor. Although downthrust was fitted for testing, it was soon removed, and the model has never shown any sign of power stall, even with a small negative on the tail. In fact, it is one of the easiest models to test we have built, showing no bad habits to date.



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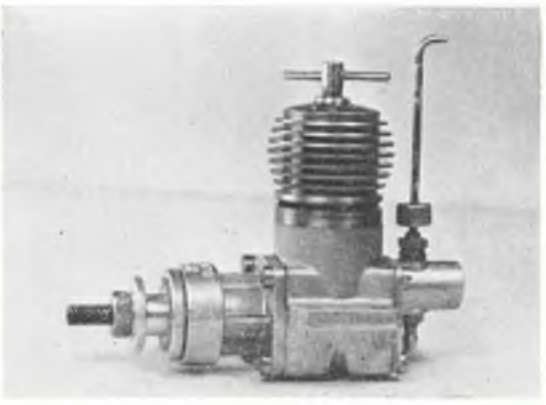
Engine Tests

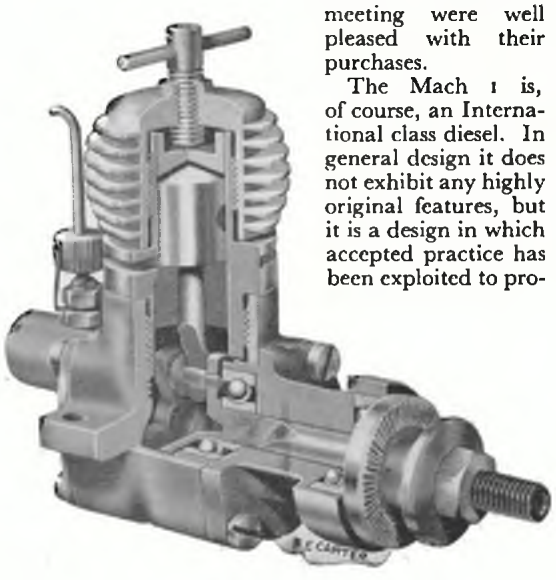


No. 63. The Webra Mach 1 2.45 c.c.

THE 2.45 c.c. Webra Mach 1 is a quite remarkable engine. It is very powerful and very fast, yet has uncommonly easy handling qualities.

The makers, Messrs. Bragenitz & Co., of Berlin, who are Germany's biggest model engine manufacturers and have their own testing equipment, give the output of the Mach 1 as some 0.31 b.h.p. and, on our dynamometer, we were able to approach quite closely to this figure, using an engine supplied direct by the factory some months ago. The makers further state that, if competition should prove it necessary, they expect to be able to push the Mach 1's output up to 0.35 b.h.p.—i.e., a figure equal to more than 0.14 b.h.p./c.c. or 140 b.h.p./litre.

The Mach 1 is being imported in limited quantities by Messrs. Arthur Mullett and, unlike many of the foreign engines we have dealt with in this series, is, therefore, of immediate interest to competition-minded British readers. The engines has, in fact, already attracted attention in this country and two new owners to whom the writer spoke at the recent British Nationals meeting were well pleased with their purchases.



The Mach 1 is, of course, an International class diesel. In general design it does not exhibit any highly original features, but it is a design in which accepted practice has been exploited to produce an unusual engine. The Mach 1 is considerably smaller and more compact than the average diesel of its capacity, due, in part, to a lower than average stroke/bore ratio. It is also a good deal more powerful at really high speeds and what is most unusual, it still remains remarkably easy to hand start when loaded for these high speeds.

The engine is of the disc admission valve type and has the intake centrally disposed above the shaft line. The intake has a venturi section, 9 mm. in diameter at the entry and narrowing to 5.5 mm. at the jet. The needle-valve is of the open jet type and the height of the jet is adjustable, thus providing a variable choke effect. (Our brake tests were carried out with the jet readjusted to the lowest position in order to ensure maximum breathing efficiency at the higher revolutions.)

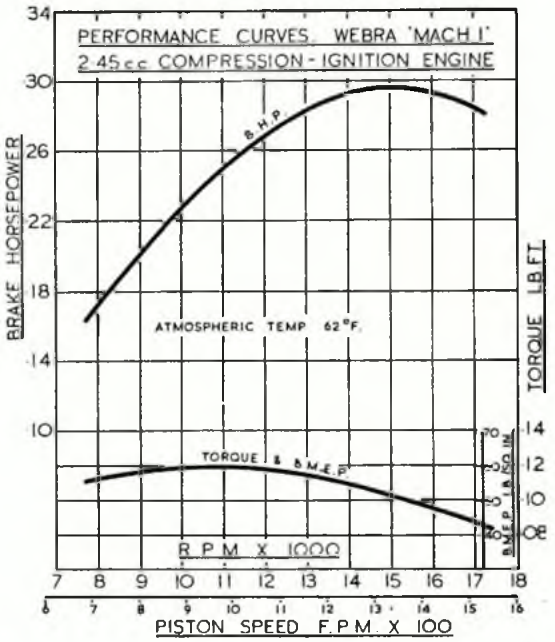
From the jet, the intake widens out into the valve aperture very smoothly. On the test engine the valve disc had a fair amount of side movement on the spindle, but this did not appear to affect the general running qualities.

The cylinder liner has unusual transfer porting consisting of eight vertically bored passages of semi-circular section breaking into the bore, which thus provides eight narrow lands on which the piston runs at the lower part of its stroke. The liner screws into the crankcase casting and a screw-on cylinder barrel and head is used. The crankcase is a rigid casting with detachable front and rear covers. The front cover incorporates the twin housings for the crankshaft bearings and is adequately webbed. The fit of these bearings is good, as is the fit of the contra-piston and there is very little leakage past the latter into the cylinder head.

The appearance of the engine, while not having any highly polished castings or similar such aids, is pleasing enough and, as a competition engine, the Mach 1 definitely looks the part. Our test engine, incidentally, has been in our possession for some nine months during which time, in addition to routine testing, the opportunity has been taken to conduct flight tests as well.

Specification

Type: Single-cylinder, air-cooled, two-stroke



cycle, compression-ignition. Induction by rear mounted rotary disc valve. Radial exhaust and transfer porting with conical crown piston and sub-piston supplementary air induction.

Swept Volume: 2.453 c.c. (0.149 cu. in.).

Bore: 15.5 mm. (0.610 in.). Stroke: 13 mm. (0.512 in.).

Compression Ratio: Variable.

Stroke/Bore Ratio: 0.839 : 1.

Weight: 4.7 oz.

General Structural Data: Diecast aluminium alloy crankcase, front housing, rear cover and carburettor and disc-valve. Crankcase covers flanged and attached with four screws. Full disc web crankshaft running in twin ball journal bearings. Alloy steel cylinder liner, screwed to crankcase and seating on copper gasket. Turned finned alloy cylinder barrel and head, colour anodised. Dural connecting rod. Open jet with positive ratchet needle adjustment. Beam type mounting lugs.

Test Engine Data

Total time logged prior to test: 3 hours.

Fuel used: 25 per cent. Castrol "M," 37½ per cent. Shell Royal Standard kerosene, 37½ per cent. Ether BSS. 579, plus 3 per cent. amyl-nitrate.

Adjustments: Jet adjusted or maximum choke area.

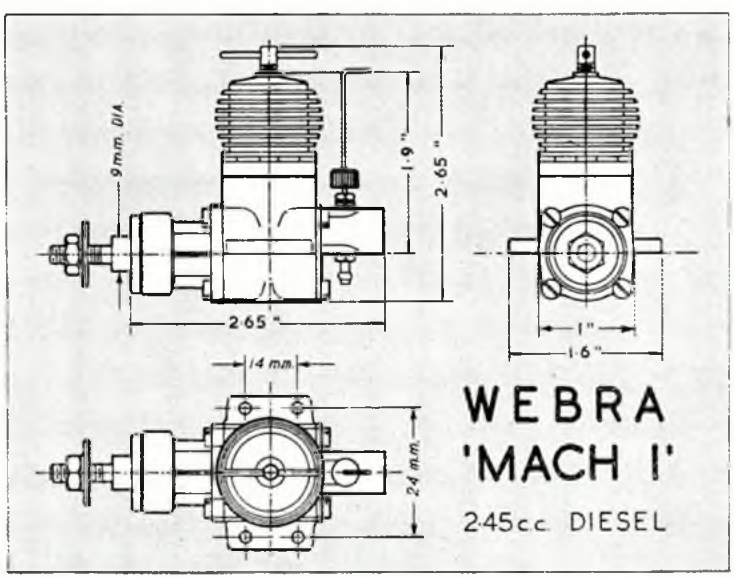
Performance

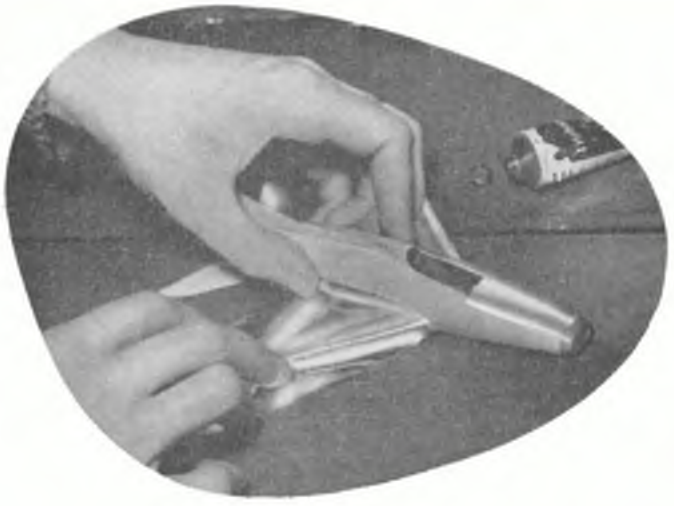
Perhaps the most remarkable feature of the Mach 1 to emerge from the tests was the fact that, with a very small prop fitted, allowing revs to reach some 16,500, the engine could actually be restarted *with the controls preset in the running positions.* This, of course, is most unusual. With diesels it is almost invariably necessary partially to slacken off the compression adjustment to obtain a start on very light loads. This will generally be necessary at 10/12,000 r.p.m. on most diesels—according to combustion chamber design, capacity and stroke-bore ratio—and will progressively become more and more necessary as load is reduced and potential r.p.m. raised. At the same time there is usually an increased tendency to "bite"—i.e., for the prop to snap round and rap one's fingers sharply. Over the entire operational range, however, there is a marked absence of such tendencies in the Mach 1.

The engine, it will be noted, had some three hours' running time prior to the dynamometer test. The usual tendency for diesels to lose power on the bench after warming up when loaded for the lower speed range was still discernible and readings were therefore taken during the first few seconds of steady running. At the higher revolutions this was not necessary, of course, and the Mach 1 was found to hold its speed exceptionally steadily when at, or within 2-3,000 r.p.m. of, the peak.

The controls are operated easily. The needle-valve is, of course, conveniently placed, due to the rear intake, and the simple wire ratchet system holds settings positively. The compression adjustment on the test engine was entirely satisfactory, the contra-piston moving smoothly and returning to a lower setting quickly when adjustment was slackened off. When the engine had thoroughly warmed up the T-type compression lever became

(*Continued on page* 360)





Metal Skinned Solids

Ron Warring

continues his researches into metal covering by trying it out on solid models—and finds it shows real possibilities.

A MAJORITY of full size aeroplanes forming popular subjects for " solids " are metal skinned —a type of finish difficult to reproduce on a balsa model with any degree of realism. Obtaining a satisfactory finish is, perhaps, the most difficult part of solid modelling. Balsa is a wood which needs elaborate treatment to " flatten " and consolidate the grain properly before it will take a satisfactory paint finish. Even then, the only substitute for a " metal " finish is aluminium dope or aluminium paint. Half a dozen or more finishing coats may be needed to give a high finish, and usually spray painting is the only acceptable technique.

Further experiments with the metallised paper described in the last issue confirmed that it could be used with equal success on solid models. Application was found to be much easier than anticipated as strips could be " moulded " to conform to compound curves without wrinkling and minor wrinkles which may, accidentally, have been induced could be smoothed and worked out flat. Further, the covering can be laid on in a series of panels cut to conform to the outline shape of similar panels on the full size aeroplane, giving scale detail far better than that achieved by the hitherto standard method of scoring lines into the wood surface. Minute surface markings, such as rivet lines, cowling fasteners, etc., can also be impressed into the metal skinning, either before or after application, further to improve the effect.

Properly applied, a balsa solid " skinned " in metallised paper has all the appearance of a solid fabricated from highly polished metal. Only when you pick it up does the light weight indicate that it is, truly, made from wood. Cost is fractional, for the amount of paper needed to cover the average solid is less than a square foot and of the number of proprietary adhesives suitable for the job, all are relatively inexpensive and a little goes a long way. It costs more to finish the model in coloured dope; and metal skinning needs less preparation of the basic model in the way of grain filling.

Construction of the basic solid model remains the same. All components are shaped and assembled as for painting, leaving off the smaller detail fittings. Grain filler must still be used as it is important to be able to apply the metallised paper over a perfectly smooth, hard surface. Then it can be rubbed well down without the fear of wood grain marks showing through. Metallised paper is flexible and " mouldable " to a certain extent and will duplicate, as surface marks, any imperfections in the surface over which it is applied and then smoothed down.

Experiments showed that two applications of grain filler were sufficient, provided the balsa surfaces were initially smooth. After each coat of grain filler, the model is rubbed down smooth with number 0 glasspaper. Finer paper is not necessary, nor does it appear to remove any original surface scratches so well as the coarser abrasive. Nothing rougher than No. 0 paper is advised, however. It is important that the whole surface of the model should be finished *smooth* with no traces of scratch marks, dents, etc., before considering applying the skinning. Another point to note is that the model must be *clean* before covering. Grit, or even balsa-filler dust covered over will show up plainly if the paper is stuck down on top.

No special care is needed with fillets, provided these conform to the same overall smoothness. These can be covered over quite satisfactorily with the metallised paper. Some parts of the model may be pre-painted before covering, however, such as the region under the cockpit cover (best painted a pale green), or the tip of the fin or extreme nose of the fuselage (if painted on the original). After the covering is applied it can then be trimmed off to a straight edge on the previously painted areas—easier than scribing or drawing paint lines around a curved surface to paint over the metal skin later.

Two slightly different techniques are involved. Covering the wings, tailplane and fin is relatively easy, these being substantially flat surfaces. Most fuselages, however, incorporate a variety of compound curves and are best skinned in sections. Flat surfaces can be covered with a single piece.

Typical treatment of a wing is detailed in Fig. 1. Cut an oversize panel of metallised paper and trim accurately to fit against the fuselage at the root. Adhesive should be spread smoothly over the wing

surface, then over the back of the paper. The paper is then laid accurately over the wing and smoothed down firmly by rubbing over with the fingers, or a clean cloth. Work down well around the leading and trailing edges.

It was found best to cover the upper surface first. The trailing edge and tip was then trimmed off flush, but excess left on the leading edge in the form of a " tab " about $\frac{1}{8}$ in. wide. Re-applying adhesive, if necessary, this tab was then smoothed down around the leading edge. Any wrinkles were worked right out by rubbing, the same applying to the compound curve at the top.

When the bottom surface covering is applied, in a similar manner, this is trimmed flush all round. It therefore overlaps the upper surface covering just behind the leading edge and, if smoothed well down, completely eliminates the appearance of any paper edge. Flush trimming of the trailing edge and tip also eliminates a " paper " edge, provided these edges have been finished to a knife-edge in the first place.

The tailplane fin can be covered in a very similar manner. Use one piece of paper for covering each surface and wrap around the upper surface leading edge covering (both surfaces on the fin, if you wish). In designs where the fin has a long strake blending into the lines of the fuselage the strake is best covered separately, joining the two pieces of covering along an appropriate panel line as can be seen on the full size aircraft. The joint should be of the edge-to-edge or butt type, not overlapping. Overlapping joints will show up and the more this joint area is rubbed to smooth down, the more the overlap will show up. It is quite easy to trim a joint of this type with a razor blade before the adhesive has set properly, peeling off surplus material.

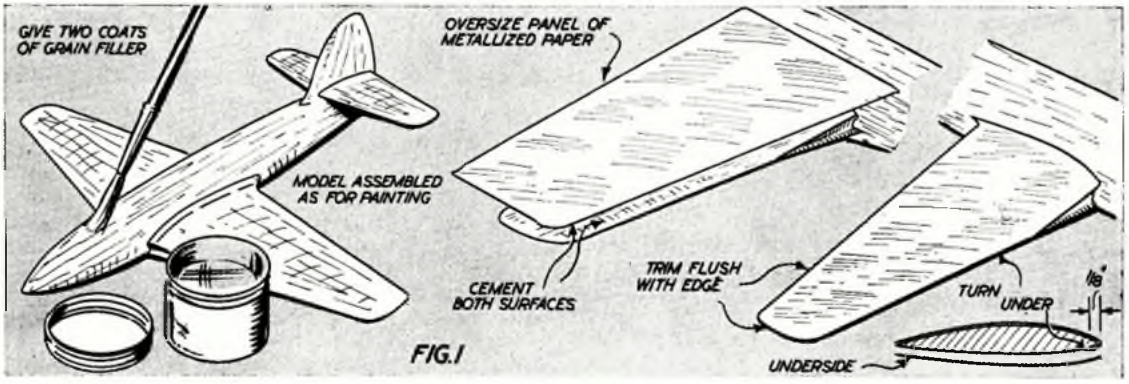
A number of adhesives are suitable for applying metallised paper to solids. The very quick drying types enable the job to be tackled quite rapidly. They stick almost as soon as applied, so that you can rub and smooth the panels down at once without fear of displacing them. One of the disadvantages, however, is that if you lay a shaped panel in place inaccurately it is quite a job to pull it off and re-position it.

Using a very rapid drying adhesive, both surfaces have become quite tacky in the time it takes to apply the coatings. It was found possible to delay the sticking action by coating the paper backing of the metallised paper only, using a surplus of cement and applying the panel to the model at once. The bond obtained was satisfactory, but not quite as good as to be expected with coating both surfaces lightly. Also surplus adhesive is squeezed out when rubbing down, tending to make the edges sticky and requiring more subsequent cleaning up of the model with solvent when finished.

A slower drying adhesive makes adjustment of the position of the covering easier, but if good pressure is applied to smooth out any incipient wrinkles which may be present, it is all too easy to displace the whole panel. For safe working it is necessary to leave the panel for a while to " set " and then rub smooth. This considerably lengthens the covering job. On the whole a rapid drying adhesive seems advisable, learning by practice to lay the panels in place correctly at the first effort.

Detail lines on the skinning may quite easily be scored in with a very fine point. It is strongly recommended that you practise on a spare piece of covering applied to a piece of scrap sheet (treated with grain filler and sanded smooth like the model) to get familiar with the required pressure for the particular tool you are using. The wrong pressure, or a blunt tool, will not produce a clean line but

Metal-skinned solid in foreground (awaiting cockpit cover and transfer markings) gleams by comparison with silver-doped model. Finish is easier to apply than paint or dope and is more realistic.



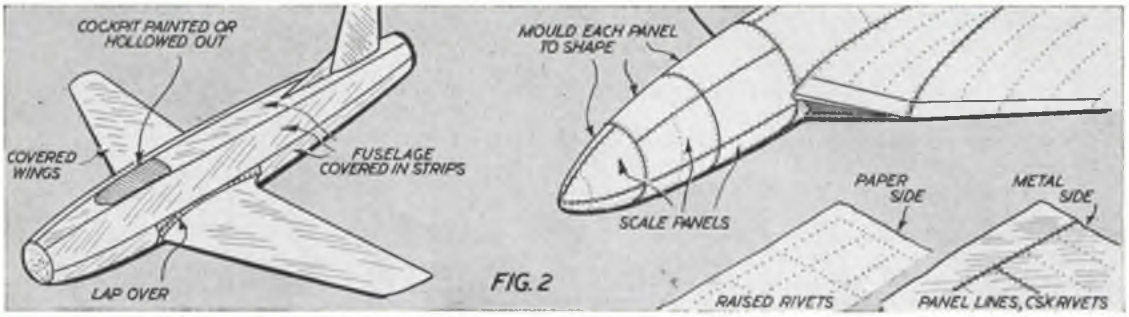


FIG. 2

one which tends to " craze " the thin metal surface.

Individual rivets, etc., may be impressed into the metallised paper with the point of a very sharp medium hard pencil. Countersunk rivets should be impressed from the metal side of the covering, and can be added after applying the covering. Raised rivets must be impressed on the panel of covering material *before* applying to the surface. Flush rivets are best simulated by very light pressure after covering.

Detail lines, etc., can also be ruled on to the back (paper side) of the metallised paper before sticking in place. A whole detailed covering panel can be laid out in this way, although layout is a little tricky. Marking out must be exact, and layout lines not intended to show through *must* be made with a very soft pencil. It is recommended that the covering panel be laid metal side down on sheet glass, if this is attempted. Detail lines can then be scored in with fair pressure with a hard point.

It must be remembered that the metal surface is very soft and flexible and readily picks up marks. Thus a finger-nail may produce a deep score on the surface when smoothing down. Do not use any hard material—even a piece of balsa—either to spread the adhesive on the paper, or to smooth the covering in place. A clean, soft handkerchief is excellent for smoothing down, wadded up or wrapped around a finger. If it gets sticky, moisten with solvent.

Instead of scoring on detail lines, wing panelling can be laid on in separate pieces, following the panel lines on the full size aeroplane. This is a rather more tricky process, calling for skill in cutting the individual panels to exact shape and laying in place edge to edge neatly. A slower drying adhesive is generally best for such technique. Properly applied, however, the result can be most true to scale.


Adhesive is applied both to paper and balsa surface. Smooth into place with finger.

Any definite swelling or projections on the true wing surface, such as a filler cap for the fuel tank, or perhaps a shallow blister fairing, can be covered over and the metallised paper smoothed down successfully around it. Again the result can be most realistic. Larger fairings may have to be covered with individual pieces, " moulded " to shape by pressure. Items such as nacelles, etc., attached to the wings must be treated as separate components, like the fuselage.

The moulding properties of metallised paper used for covering fuselages can be utilised only to a limited extent. The process is rather like covering a streamlined fuselage on a flying model—working in narrow strips or small squares, covering only a portion of the fuselage at a time. If you study a plan or photographs of the full size aeroplane concerned, definite panel lines will be apparent and these should be followed, as far as possible, in covering the model. You will usually find that you can employ larger panels on the model. Intermediate panel lines can then be scored or cut into the covering with a razor blade after the covering has set.

Whichever method is adopted—covering in long, narrow strips, or smaller squares—pay particular attention to the double curved areas. With practice you will find it easy to smooth out the covering over these curves, provided you are not trying to cover too great an area at a time. Also, once again, avoid all lapped over joints as these will show up badly.

Wing fillets are readily accommodated by cutting the appropriate fuselage panels slightly over-depth and allowing them to curve over the fillet and stick down to the already-covered wing surface. This is about the only part of the model where lapped joints are acceptable. Really large fillets may best be tackled with separate pieces of covering.

To speed marking out of the individual panels required to complete covering a fuselage you will find it possible to lay an oversize panel in place (without adhesive) and smooth down firmly into position. This will develop the curve required and also give a faint impression of the edge of adjacent covering panels already applied. Trim the new

(*Continued on page* 373)

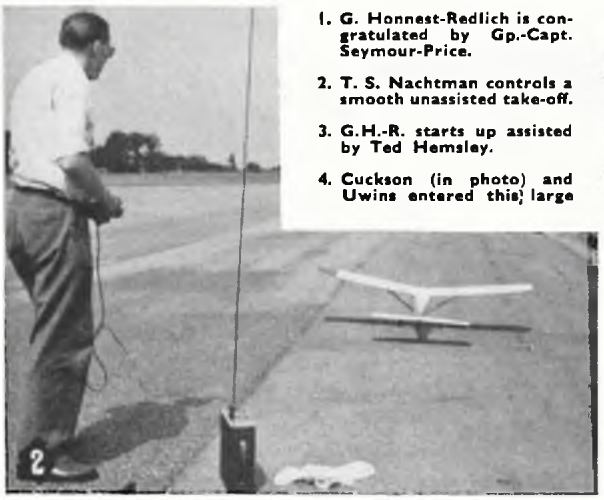
I. R. C. M. S. meeting at Moreton-in-Marsh, Glos.

JUST once in a while this summer we have seen the sun, and just once in a while the rain and wind have dropped, but on the occasion of the International Radio-Controlled Model Society's meeting at R.A.F. Station, Moreton-in-Marsh, the unprecedented occurred—a sunny day with next to no wind ! With an excellent airfield and smooth runways, what more could an R/C fan desire ? Under these ideal conditions some really good flying was seen, showing that (at least for those who can afford it) R/C flying has at last grown out of its " rudder only " infancy. The new 6-channel equipment was shown to advantage by the E.D. " works team " of Honnest-Redlich, Sid Allen and Hemsley, and in fact they topped the results, in that order. Fourth man was Polish expert T. S. Nachtman, flying with great success a more functional model than hitherto.

The 6-channel users had at their fingertips, rudder, elevator and engine-speed control which gives almost unlimited scope to the pilot. Landings are made with engine ticking over and the model can be taxied on the ground and take off unaided. Aerobatics are not difficult and spot landings easy. If you muff one, you can open up and go round again ! All very impressive.

Our thanks are due to Group-Capt. Seymour Price, C.O. of the station, for permission to use the excellent 'drome, and to the very large crowd who turned up to support a fascinating display of controlled flying.—S.P.S.

INTERNATIONAL RADIO CONTROL



1. G. Honnest-Redlich is congratulated by Gp.-Capt. Seymour-Price.
2. T. S. Nachtman controls a smooth unassisted take-off.
3. G.H.-R. starts up assisted by Ted Hemsley.
4. Cuckson (in photo) and Uwins entered this large 6-channel outfit, but damaged the model early on.
5. George Zigic travelled from Yugoslavia with a fine model but damage sustained in test flying let him down in the contest.
6. Third place man Ted Hemsley.

Flying Scale Models

E. Fearnley, expert builder of flying scale models, explains some of the reasons why he makes them

SUCCESS comes the easiest to those who specialise. This is particularly true of aeromodellers. I suppose we all imagine in our fondest dreams that we are strutting around at a big contest with all eyes fixed on our model, which manages to out-fly and look smarter than our competitors. The chosen few who realise this ambition can all be classed as specialists which means that these people have at some time of other made at least once, every mistake in or out of the book.

Not that I am upholding myself as an object lesson in this respect ! I have made all the mistakes several times each but I can honestly say that I have stuck to my guns in pursuing one branch of the hobby, and if I cannot boast of much progress it is particularly true that had I not stuck strictly to scale work I doubt if any progress would have been made.

My own particular modelling life revolves round flying scale models. (ALL your life does—Mrs. F.) For over twenty years I have stuck to this side of the game, and I offer the following excuses: It seems to me that one can build a model in two broad classes, first the functional type, designed for performance only, or miniatures of aeroplanes, which are expected to look like the real thing, and fly as well. I am not going to try to settle this age-old argument, but I will tell you my own personal reasoning in this matter.

Mr. Fearnley's D.H.9a, described recently in " M.A." and now in the Plans List. The heading photo is a realistic shot of his Foster Wikner " Wicko " in flight. This model is featured on page 344 in this issue.

At the risk of a deskful of letters, I'm going to say that if you've built one functional design—you've built the lot.

It's obvious that a contest model built to a set of rules will be very much like another. Many years ago the conventional contest model of today would be classed as a " stick " model, and I rather like this description. It fits to a tee. Then take the flying side. Sixty shillings' worth of motor doing 15 sec. work a flight brings out the worst in me. We can design like fury, and build like a being possessed; it is then only necessary to pray rather hard for Mr. Weather to whisk the model away at the right moment, and provided our running shoes are not at the menders from the last flying meeting, it only requires the torture applied three (or some sadists say five) times and we may get a tin cup we can cherish for a whole year. I am old and disillusioned in this respect I fear.

There is, of course, the speed model. This I can only refer to as a super stick. If you are lucky enough to buy over your local model shop counter a motor better than your rivals' (the odds are about equal to winning a pool) and if the necessary nerve is there to file and scrape the said piece of machinery into super shape, it seems to me that the model is only added to keep the right side of the judge. It does little else as I see it. Each " design " that comes to light uses less and less aeroplane, and more and more power, while, of course, the lines stay just the same in resistance value, so the net result of the effort is about equal to streamlining a lamp on a bicycle. Mind you, let those who want to, get on with it, but it's just not my line.

Team racing is a little better, in that it does demand some scale appearance, but the rules mean that they

will all look about the same. I mean you wouldn't mistake a team racer for, say, a scale *Tempest*. And you have to admit, the participants certainly look strange, particularly when they are getting on in years. It doesn't look like the kind of research work we are supposed to believe it is, when the competitors are unravelling themselves on the floor!

Sport models are more in my line of country. Here at least, if we can forget the details, is something like an aeroplane. A slab side high wing cabin usually. In a fit of passion, some add a second wing and in a devilish way announce that "they have made a biplane." If it flies they die happy.

All this was news in Bowden's pioneer days, or even before balsa. In the early thirties we thought it was really something to fly a power model at all. The first *Brown Junior* powered model we had in our club finally took the air carrying enough batteries to power a transmitter, amid cheers and cap throwing. It was news. It was big. Today with a modern diesel developing as much power for a fraction of the weight, and balsa cheap and easy to get, with hundreds of well tried plans available, I just don't get excited. Some of the pioneers must be amused by all the science of today! When people talk about precision flying I feel like saying "I should jolly well expect it every time these days." It's nothing to give cups for.

Leaving only radio and flying scale. The former is appealing to me but my lack of knowledge precludes this at the moment, so there is only the scale section, but it is the gem to me. I defy anyone to fly in or be near a full-size plane without wanting to model it in all its detail. The hazards in designing many of these "characters"—yes, they do really live—are a challenge to anyone who is so minded. If anyone says that they don't always fly—come down to our flying ground. But more of this later.

My first contact with flying scale work was in full size plans printed in American journals. About twelve years old at the time, we built these 2-ft. models, which were always U.S. *Pursuit* types, and had dozens of wing ribs. Rubber powered, some flew, many did not. Wing loadings were very high for such small models.

A couple of years later I started designing my own, and here the real joy of modelling came to me. These pleasant days in the thirties are now memories of models like a Bellanca *Pacemaker*, about 40 in. span, rubber powered, with a pen cell lighting the cabin in the twilight, and a Heston *Phoenix*, winner of a *concours* trophy, and still able to fly like a bird round our back field. Wing and tail on this were half ribbed, and each rib had either two or five lightening holes in it. Nearly two hundred lightening holes to cut out. Not even for a Wakefield will they do that now! How easy it all is now with Darts and Mills 0.75's giving ample power for this type of plane. Which all prompts me to say that the only real challenge to patience and skill today is in the scale model. If you have the necessary qualifications for this, I guarantee results.

To prove my reliability point with scale stuff, I can only quote the log of a representative model

A 39 in. span model of the Canadian Fleet "Finch" primary trainer. It is powered by a 1 c.c. Allbon Spitfire inverted behind the dummy engine.

of mine, a 64 in. model Vultee *Vigilant* I designed for myself. With Mills 1.3 this started life at 2¼ lb. The first time I tried a real flip I knew it was going to be a model model! To cut a long story short this plane, after hundreds of flights in which a wire fence twice cut a wing in half, ended up so heavy the Mills just wouldn't unstick it from the runway. An Elfin and high speed prop took over. Soon this had "had it." The next step was a 2.46 Racer ball bearing job, and the resulting weight required an ounce of tail weight to balance out. Plus the residue of a gallon of fuel that had blown its way through the plane in its life. Weight was now as little a worry as though I were flying radio! And it still floats in to perfect landings all the time, after ten hours' *flying* time to its credit.

If scale models won't fly, then I wouldn't, for I build nothing else. And I fly at every meeting of our club with one or other of my fleet of scale planes.

To assist those who have not taken the flying side of scale work seriously enough, with resulting disaster, and a drift away to other branches, next month's article will deal with this practical problem.

Another of the author's models, this time of the interesting Short "Seamew" naval aircraft. The low thrust-line accommodates an upright motor easily.

OVER THE COUNTER

Illustrated below is the new E.C.C. P-100 polarised relay which was briefly mentioned in the August issue. Although the relay is designed for general electrical application, it should prove a first-class instrument for R/C work. In the photograph is the neat plastic cover which totally encloses the working parts, the relay with a balanced movement which is unaffected by working position, and the six-pin socket into which the unit plugs.

The P-100 has a resistance of 3,500 ohms and its sensitivity is less than 20 milliwatts, enabling the relay to be adjusted to make contact at 1 mA and break at 0.8. The reaction time is better than 1/200 of a second and it may be operated at rates as high as 90 c.p.s. The S.P.S.T. changeover contacts can handle up to 0.25 amps at 250 volts. The P-100 weighs 1 oz. and stands a little over 1 in. high. The other illustration is of the new E.C.C. aerial base socket combination which is moulded in black plastic with a turned aluminium inset which is bored $\frac{5}{16}$ in. to take the aerial.

The P-100 relay retails at 29s. 6d. and the aerial socket at 5s. 0d.

* * *

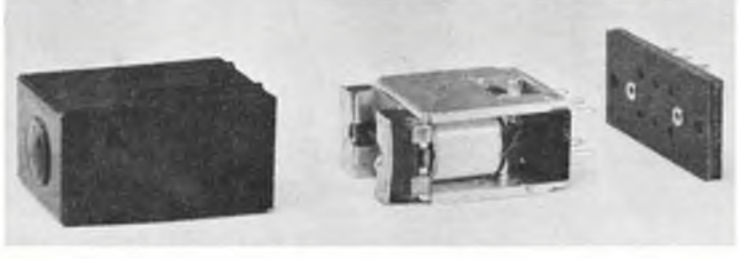
A name to watch for—Scientific Model Supply Company. Present manufacturers of the range of cockpit covers now so well known to solid scale fans, this firm have a number of really interesting new projects on the way. **Scientific** intend to specialise on quality productions.

* * *

British kit exports to New Zealand have risen tremendous during the past few months. Main demand appears to be for the low priced flying scale models. Jetex power seems to be something of a top favourite.

* * *

Barron Industries are producing a kit of materials for the home production of articles in glassfibre plastic. (Readers experimenting with this interesting new material can refer to out May issue where an illustrated article on working with "Fibreglass" was published.) The kit, which is sold under the name **Wonderglass** comprises a 2 oz. jar of polyester resin, a phial of catalyst, 6 ft. of 2 in. wide glass tape, a 6 in. square of glass mat and instructions. The mat, which is formed from short strands of glass fibre bonded together, is used for reinforcing the resin where a thicker section is required. A typical application would be mat sandwiched between two layers of tape, which has the advantage of the smooth glass tape for a good surface finish and rigidity from the thickness of the mat. The kit retails at 6s. 0d.



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Something really extravagant in the way of prefabricated scale kits is contemplated by Wilmot, Mansour. Prototype suggested is the Gloster *Javelin*, but whether this will be found a feasible commercial proposition remains to be seen. In the meantime, watch for some more super scale flying models like the *Skyray*.

* * *

Jasco of Southport, best known for their popular range of all-balsa ready-to-fly models, may shortly be extending their line of standard kits.

* * *

Veron's *Provost* C/L kit at 8s. 9d., introduces semi-scale power modelling at a knock-down price. Model is very easy to build and its 18 in. span enables a range of engines between 0.5 and 1 c.c. to be used. Balsa parts are pre-decorated by colour printing.

* * *

Russell Models of Worksop have recently shown us some samples of their fine range of control line wire. Well known in this field, they long ago sorted from the many types of wire available, a number of wires for all types of C/L work, from 1 c.c. C/L trainers to Dynajet powered speed models.

For stunt work they particularly recommend their stainless steel cable, which is available in several sizes. It is light and strong and enables the model to be controlled after a number of consecutive loops, by its "non-snag" qualities.

* * *

The Amco P.B. 3.5 retails for $14.95 in the United States (just over £5 sterling equivalent). Importers are International Hobbies of New Mexico.

* * *

The August 1954 issue of **Model Airplane News** marked the 25th anniversary of that journal. At one period (1931) a "Junior Mechanic" section was incorporated but soon dropped on account of lack of support.

COUNTER attractions at the Exhibition

"The Model Engineer" Exhibition will be open to the public when this issue is published, and we present on this page some of the good things that visitors will see on the Trade Stands.

Wolf Electric Tools are displaying the complete range of Wolf Cub Home Constructor equipment including the lathe kit, kits for sawing, fretsawing, sanding and polishing, and accessories for drilling, grinding, wirebrushing, etc.

* * *

A complete range of Exide Miniature Accumulators and Drydex Batteries for all powered and R/C models will be seen on the **Chloride Batteries** stand. Combining maximum capacity with minimum weight and bulk, they form a most compact source of electrical power.

* * *

The famous range of **Multicraft** all-British hobby tools will be shown. The ever-popular Multicraft precision cutter comes complete with four blades, which are safely housed inside the handle when not in use. To fit the same handle are interchangeable chisels, gouges, files, whittling blade, key-hole saw blade, and a very attractive 6 in. saw. Then there is the new Multicraft Junior Knife—an ideal cutting tool for every craft-worker. Also handsome boxed outfits—Multicraft "Major" and Multicraft "Cadet" kits and the new Multicraft pocket kit in the attractive leather-grained plastic wallet, illustrated on this page. An exclusive range of marquetry outfits, veneers, etc., will be shown for the first time, including some attractive Multicraft designs.

* * *

Visitors to the **Royal Air Force** stand will see models of aircraft made by R.A.F. personnel in their spare time. Model making is a favourite pastime in the R.A.F. today, where airmen are encouraged to continue their hobbies or take up new ones.

* * *

Wilmot, Mansour & Co. Ltd., are displaying a complete range of Jetex miniature jet engines and Augmenter tubes, together with the latest Jetex "Tailored" flying scale model kits. Constructional kits for model boats, model aircraft and cars are also on view.

Bold & Burrows of St. Albans are mail order specialists for everything for the model engineer and model maker. A full range of tools, materials and machinery by all leading makers together with model aircraft kits and engines are being displayed. They aim to give a service for which you need go no further than the nearest pillar box.

* * *

Visitors to the stand run by **The Society of Model Aeronautical Engineers** can obtain answers to all their questions on model flying matters, and receive full information about membership of the society. A recent development, of immense importance to all who build or fly model aircraft, is the new Associate Membership. Open both to club members and to unattached fliers, it offers for the first time to the "lone hand" the advantages of belonging to the National organisation, including FREE third party insurance, for the nominal fee of 3s. a year. You may join the Society as an associate or country member at the S.M.A.E. stand. The Society's representative will also be pleased to give you the address of your nearest model flying club.

* * *

A complete car respray for £5 is possible by using the **Sprayt**. The cheapest spray gun in the world, it is designed to give an even flow and work with maximum efficiency off a tyre pump.

* * *

Percival Marshall & Co. Ltd., are famous the world over for their publications which cover every aspect of model making. Here visitors will see copies of THE MODEL ENGINEER founded by the late Percival Marshall in 1898, the journal which gives its name to this Exhibition first held in 1907. Its companion monthly magazines, MODEL AIRCRAFT, THE MODEL RAILWAY NEWS, and SHIPS AND SHIP MODELS, cater for the specialist interests and are the most progressive and authoritative in their field.

The Multicraft pocket kit of craft tools will be on display.

Aviation NEWSPAGE

by J. W. R. Taylor

This is the "Fly-Cycle," which the pilot sits astride and rides like a motor-cycle.

" If you were to **CLOSE YOUR EYES** and visualise what you would need to do to pilot the **FLY-CYCLE,"** writes designer Larry Farnham, " you'd be right first time; and what is more you could fly it with no more instruction than that." If that seems a bit far-fetched take a look at the *Fly-Cycle*, shown above. Farnham's idea was to build a plane with controls that would come naturally to anyone who could ride a bike. The pilot sits astride it like a horse or motor-bike, and banks it by rocking the handle-bars about a pivot in the centre. Rudder and nose-wheel are steered like a bicycle. Elevators are operated by fore and aft movement of the handle-bars.

The " no-frills " *Fly-Cycle* weighs 850 lb., and flies at 85 m.p.h. on a 75 h.p. Continental engine. It stalls at 30 m.p.h. and takes off in 500 ft. in zero wind. Designed as a " puddle-jumper " and crop-spraying aircraft, it looks a lot of fun.

☆ ☆ ☆

Much more sophisticated, but no less unorthodox, is the **HUREL-DUBOIS H.D.32** (opposite), with the highest aspect ratio wings of anything ever flown.

It is no secret that the induced drag of a monoplane braced by properly designed lift struts is less than that of a cantilever monoplane of the same span and area. So, after the war, Monsieur Hurel had the bright idea of using lift struts to double or even treble the aspect ratio of a wing without increasing its weight—which promised a considerable increase in all-up weight and payload.

He built a small experimental aircraft to prove his theories, and much to everyone's amazement it worked. As a result, the French Government ordered two big transport prototypes on the same lines—the H.D. 31 with two 800 h.p. Wright engines and the H.D. 32 with 1,200 h.p. Pratt and Whitneys. Best proof of their success is that, according to Hurel, 160 H.D. 32s have so far been ordered, including 24 for Air France. For the record, the wing span is 147 ft. 7 in., length 76 ft. 4 in., aspect radio 20.2 : 1, range 1,118 miles at 168 m.p.h. with 11,000 lb. payload, and take-off run only 570 yd. in zero wind with full load.

☆ ☆ ☆

More news from Vickers is that the R.A.F. have ordered a production batch of **VICKERS V.1000 MILITARY TRANSPORTS,** biggest and most powerful jet-liners yet planned. Powered by four

A fine model of the V.1000, Britain's first military jet transport now under construction at Vickers-Armstrongs' factory at Weybridge.

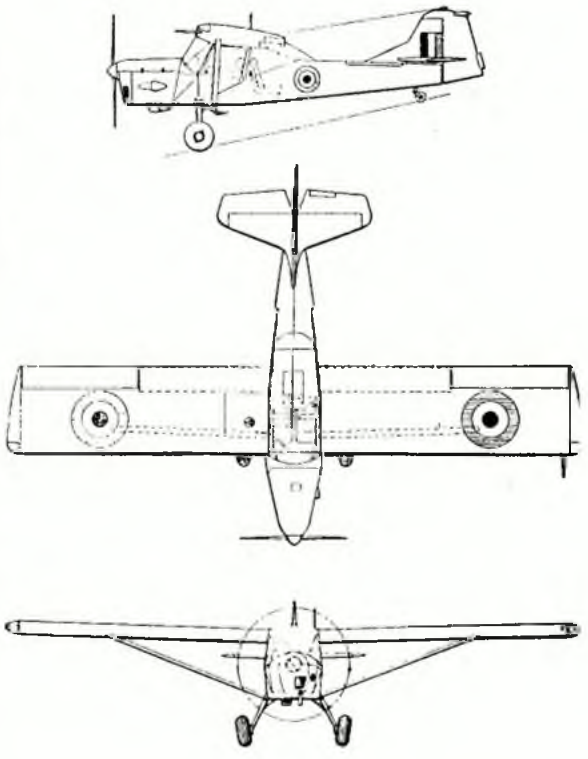
The A.O.P.9, the latest version of the "Auster."

Rolls-Royce Conway by-pass turbo-jets, the V.1000 looks like an enlarged low-wing version of the *Valiant* bomber, with a span of 140 ft., length of 146 ft. and accommodation for up to 150 passengers. No more details are available; but the journal of the British Air Line Pilots Association has stated that the basically similar civil *Vicker V.C.7* will weigh well over 200,000 lb. and carry 120 passengers in first-class comfort from London to New York (3,500 miles) in seven hours or less.

Which reminds me of the allegedly true story of a lady passenger who threatened legal action against K.L.M. recently, because the airliner they used to fly her over the Atlantic had only two engines instead of the advertised four. Seems she only looked out on one side and failed to notice that there was another with with two more engines on the other side!

☆ ☆ ☆

LATEST AUSTER, shown on this page, is the 2-3 seat A.O.P.9, with 14 years of army co-operation experience built into its sturdy structure. More power from its 180 h.p. Bombardier 203 engine, a Fairey metal propeller, greater wing area, bigger flaps and "drooping" ailerons enable it to climb out of even smaller spaces than its predecessors, with an unstick run of 108 yd. and landing run of 60 yd. in a 6 m.p.h. wind. A roomier cabin enables it to function equally well for artillery "spotting," casualty evacuation, liaison, supply, aerial photography and other jobs.



Use of Redux metal-to-metal bonding, plastic fairings and Dufaylite sandwich (two light alloy skins with honeycomb paper core) floors and seats keeps the weight down to 2,100 lb., giving the *A.O.P.9* a top speed of 127 m.p.h. Span is 36 ft. 5 in. and length 23 ft. 8½ in.

☆ ☆ ☆

APOLOGIES for a mistake in the June "Aviation Newspage." Production *Hunters* do not have petal-type dive-brakes as fitted to Neville Duke's record-breaker. Aircraft now cleared for R.A.F. service have external low-drag air brakes mounted under their fuselage, just beneath the roundels. A pity, as they spoil the sleek, clean lines of this lovely fighter.

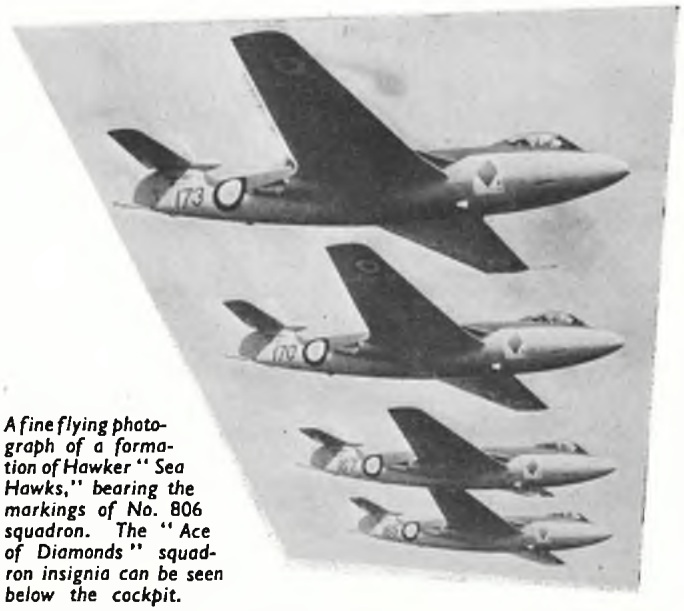
The extraordinary-looking Hurel-Dubois H.D.32 in flight. The wings have an aspect ratio (span : chord) of more than 20 : 1.

Prototypes Worth Modelling

★

No. 45
The Hawker Sea Hawk

★



A fine flying photograph of a formation of Hawker "Sea Hawks," bearing the markings of No. 806 squadron. The "Ace of Diamonds" squadron insignia can be seen below the cockpit.

by C. B. Maycock

DEVELOPED from the Hawker *P*1040 which first flew in 1947, the *Sea Hawk* is a fully navalised single-seat fighter propelled by a Rolls Royce Nene 4 gas turbine. It is of all-metal stressed-skin construction with the nose and mid sections of the fuselage semi-monocoque. Large air intakes are at the wing roots and the jet pipe is divided so that the jet exhaust comes from each trailing edge wing root. Access panels in the top of the fuselage allow the engine to be removed bodily for replacement or engine overhaul.

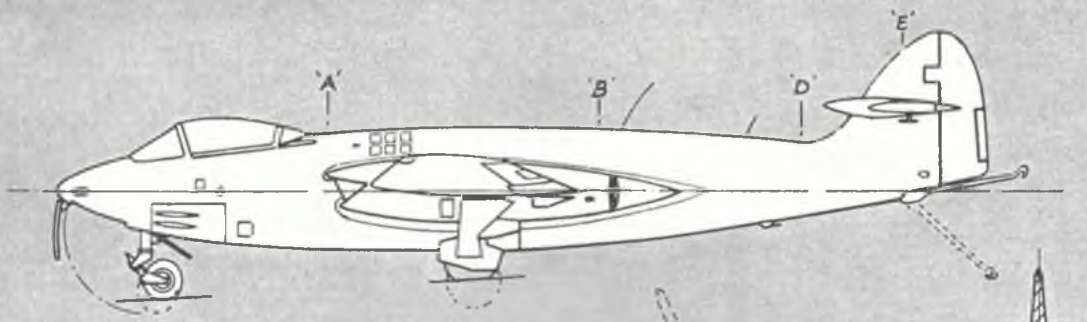
The tailplane is set high on the fin and at the intersection there is a fairly large fairing to smooth the airflow round the tail control surfaces. The main undercarriage wheels retract inwards, and the nose wheel forwards. The armament consists of four cannon beneath the nose. The cockpit is fully pressurised and has a Martin-Baker ejector seat installed. The backwards sliding capopy is electrically operated. The usual deck arrester hook is in the tail and the wings fold upwards from the break in the centre section. On occasions two streamlined long range tanks are carried externally beneath the centre section.

The colour scheme of present day naval aircraft is as follows : upper surfaces dark sea grey, undersurfaces duck egg green. Serial numbers and the words ROYAL NAVY are in black. The usual red, white and blue roundels are carried on upper and lower surfaces on each side of the rear fuselage. In one of the photographs reproduced here is shown the ace of diamonds playing-card insignia of No. 806 Squadron and the serial numbers of a flight of these machines are WF167, 168, 173 and WM902. The individual aircraft number is painted just below and slightly forward of the tail-plane as follows : WM902 is No. 165, WF167 is No. 167, WF168 is No. 170 and WF173 is aircraft No. 173.

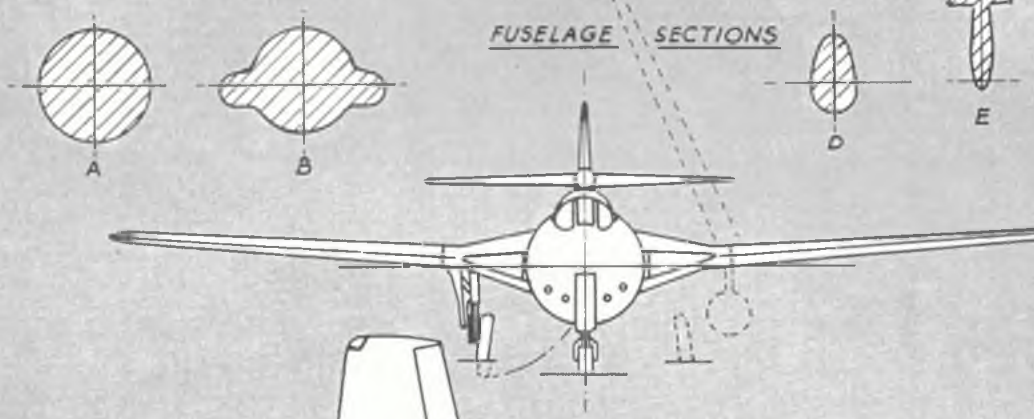
The main dimensions of the N.7/46 *Sea Hawk* are:— Span 39 ft. 0 in. Length, 39 ft. 8 in. Height 9 ft.

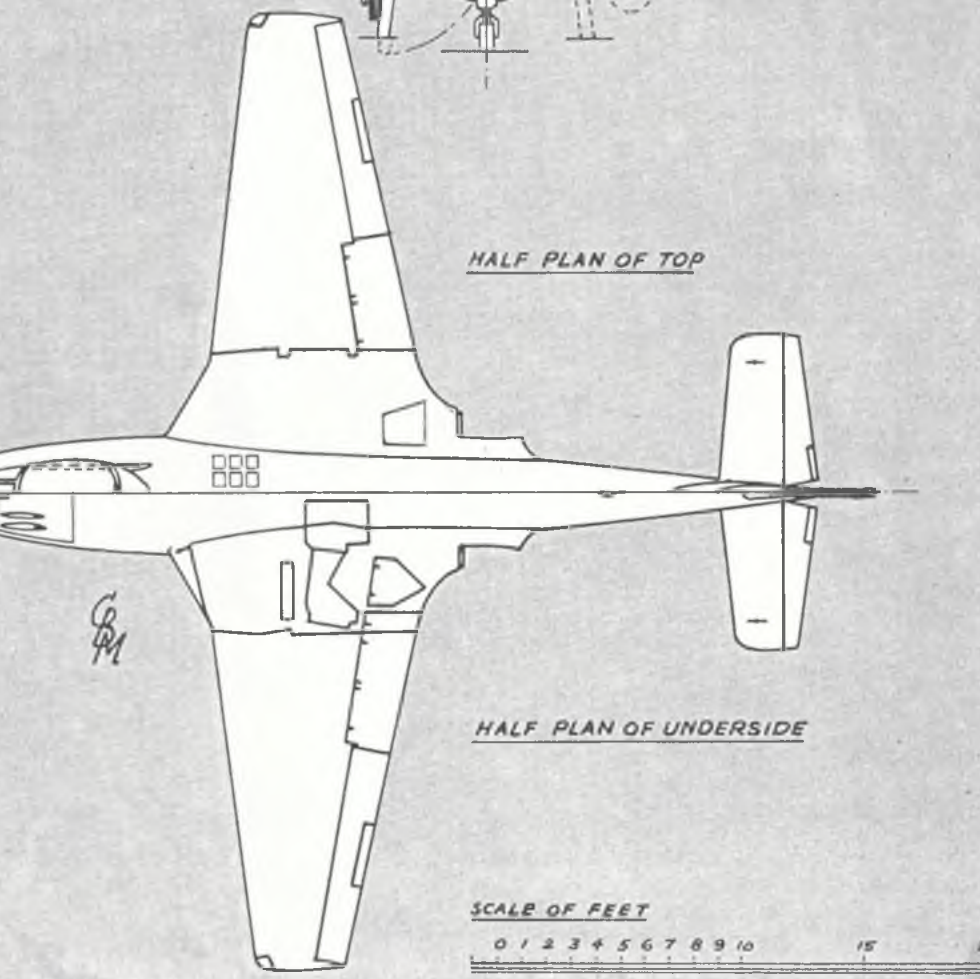
Two views of an earlier "Sea Hawk" before the fitting of the fin-to-tailplane fairing.

THE HAWKER "SEA HAWK" NAVAL FIGHTER.



FUSELAGE SECTIONS





HALF PLAN OF TOP

HALF PLAN OF UNDERSIDE

SCALE OF FEET

0 1 2 3 4 5 6 7 8 9 10 15 20

★ Radio Control Licences

R. H. Lindsey, Secretary of the International Radio-Controlled Models Society, gives below in simple language an explanation of the situation.

As from June 1st, 1954, a licence from the G.P.O. will be required by anyone using radio for the purpose of controlling models. In view of the short notice that has been given, the G.P.O. have agreed that until the end of August they will not take action against anyone simply because he has not yet obtained a licence, and they will also allow existing apparatus to be used (provided it complies with the present requirements) until January 1st, 1955, even though it does not comply with the new regulations.

The new licence will cost £1 for 5 years, and to obtain it, you should write to "**The Radio and Accommodation Department, General Post Office, London, E.C.1.**" stating your name, address, the place where you normally operate and enclosing the fee of £1. Full details of the scheme can also be obtained from the same address.

The licence will permit you to use radio for the purpose of controlling model vehicles, vessels and aircraft (or other types of models if special permission is obtained from the G.P.O.) within a radius of 5 miles of the place specified in the licence. If you wish to operate outside this 5-mile radius, you *must* write to the telephone manager of the area where you propose to operate, telling him where, and between what dates, you propose to work. If you operate regularly at a place, you can give him a standing notification, which will remain in force until you cancel it, which you should do if you stop using that place (otherwise the G.P.O. will be snowed under with defunct notifications, and will have to make the regulations more stringent). Telephone managers will not normally acknowledge notifications unless there are special circumstances. Notifications should state whether 27 Mc/s or 465 Mc/s is to be used, as there are one or two parts of the country where permission may have to be withheld for one band or the other, on account of other services that may be using that frequency locally. The addresses of telephone managers can be obtained at local post offices

Note that you are allowed to specify only one operating place in the licence itself (and this should normally cover your home address), so the first thing to do on receiving your licence is to tell the appropriate telephone managers (NOT the G.P.O. Headquarters) of all your usual ponds and flying grounds.

If you attend a contest, there is no need to tell the telephone manager for the area where the contest is held, as the contest organisers will already have done this for you (but you must check up from the leaflets, etc., issued in connection with the contest to make quite sure that this has been done). A similar arrangement applies to regular meetings (indoors and outdoors) of societies (such as the Groups of the I.R.C.M.S.) at which R/C equipment is demonstrated.

The frequency bands are the same as before (26.96 Mc/s to 27.28 Mc/s, and 464 Mc/s to 465 Mc/s). The permitted classes of emission are A1, A2, F1 and F2. ("A" means amplitude modulation; "F" means frequency modulation; "1" means keyed carrier; and 2 means modulated carrier, not including speech.) All known systems of model control come under one of these four headings, so they need cause no further worry.

Instead of being limited to 5 W input power as hitherto, we will now be limited on *output* power. The *maximum effective radiated power* (E.R.P.) will now be limited to 1.5 W on 27 Mc/s and 0.5 W on 465 Mc/s. Now, for a quarter wave vertical aerial (which 99 per cent. of people on 27 Mc/s use), the power gain is $\frac{1}{4}$, so that the E.R.P. is the *mean radio frequency power* (R.F.P.) which is the power that actually goes *into the aerial*. With modulated transmitters, the power must be averaged out over the modulation cycle (hence the word "mean"), but this is automatically taken care of in the method of measurement described below. A more important point to watch with modulated Tx's that emit carrier in between the periods of modulation is to see whether the mean R.F.P. is greater with the modulation on, or with it off, as it is obviously the greater of these which is going to be the limiting factor. For example, with the E.D. Mk II and Mk IV Tx's, the mean R.F.P. is greater when the modulation is off than when it is on.

Now what do you have to do about all this rigmarole? The answer, so far as your present transmitter (5 W input) is concerned, is nothing. Provided, that is, that it uses one of the conventional circuits with the aerial coupled direct to the oscillator (since these circuits are not efficient enough to give 3 W out). All the commercial Tx's meet the new power limitation easily. If, for any reason, you want to measure your actual output power, then here is how it is done.

Put an R.F. ammeter (thermo-couple type), of either 350 mA or 0.5 A full scale deflection in series with the aerial (i.e., the aerial is connected to one terminal and the aerial socket to the other). N.B.—The meter must be very close to the bottom of the aerial, and the connecting wires, if any, must be very short. Now earth the Tx as well as you possibly can. The very best earth is obtained by putting the Tx in the middle of a large sheet of wire-netting spread out on the ground, and connecting the Tx case to that. Another method, much simpler and just about as good, is to place the metal bottom of the Tx case flat on the ground (preferably wet grass)—no rubber feet—so as to obtain a large area of contact. (A layer of paint on the bottom will not matter as the capacity to ground will suffice.) A metal peg stuck in the ground is quite useless. The purpose of this is to make sure that the Tx is giving as much power out as it possibly can, and you can then be sure that in the field it will always give the same or less. One then reads the aerial current (in amps), squares it, multiplies by 36 to obtain the E.R.P., and "Bob's your uncle." Thus, if the aerial current is less than 200 mA, you are all right.

NOTE.—The above procedure applies to a quarter wave vertical aerial (8 ft. 6 in. on 27 Mc/s). For other types, there will be another figure instead of 36 (but 36 will always give an answer on the safe side for aerials shorter than $\frac{1}{4}$ wavelength).

Now, if you are using a directional aerial, the E.R.P. is not the same as the mean R.F.P., but is the mean R.F.P. multiplied by the power gain of the aerial (which can be estimated by theoretical means). The net result of this is that if you used a directional aerial to get greater signal strength in a given direction, then you would have to reduce the mean R.F.P. by the power gain, and in fact your signal strength would then be back just where it started, so there is no advantage (except that transmitter power is saved). This is, of course, why the G.P.O. are now using an E.R.P. limitation instead of an input one, as it is the amount of the actual signal strength that determines the extent of interference to other services.

The licence says that all licensees must have access to frequency measuring equipment, and that the Tx frequency must be checked each time it is used. Now the G.P.O. say they will not enforce this until the end of August (or possibly even later), and by that time, negotiations at present in hand may have secured some modification of this clause, especially with regard to commercial transmitters.

Engine Tests

(*Continued from page* 347)

rather hot and uncomfortable to handle but, of course, pre-flight adjustments are usually well made before excess heat has been transferred to the lever.

When warm, the Mach 1 required only one preliminary choked flick for restarting. The engine would then generally burst into life again on the subsequent first or second swing. This, combined with the fact that control adjustments can be eliminated, suggests team racing possibilities and, in fact, the engine was clocked at 78 m.p.h. in a Class A team racer. Unfortunately, however, fuel consumption is rather heavy for team racing.

For international power-duration work the Mach 1 should be particularly valuable. On typical 9 × 5 props, it is a clear 500 r.p.m. better than the average 2.5 used for competition. The engine does not, incidentally, have to be operated close to the peak r.p.m. to appreciate its superior output. The maximum torque developed, equivalent to a brake mean effective pressure of nearly 60 lb./sq. in., is one of the highest recorded in these tests and results in above average performance even with speed held down to 9-10,000 r.p.m. Due to the short stroke, the piston speed remains reasonable at all operational speeds.

Power/weight Ratio (as tested): 1.00 b.h.p./lb.
Specific Output (as tested): 120 b.h.p./litre.

Little Sir Echo

—a cute little biplane with full-size plans

by Gordon Allen

EVEN in this jet-age there is still something very fascinating about biplanes. For modellers who would like to recapture just a little of the charm of these old-timers without making anything elaborate, here is a 15-in. span all-balsa job that should fill the bill.

The fuselage is in one piece, cut from $\frac{1}{8}$-in. hard balsa. All edges are rounded off with the exception of those at the wing positions and at the extreme nose. The nose is reinforced at each side with pieces of $\frac{1}{8}$ in. hard sheet and is then carved to a streamlined shape. A small reinforcing plate is added as shown. Aluminium tube, 20 s.w.g., is fixed in the nosepiece and a 5 in. diameter medium pitch balsa propeller complete with 20-gauge shaft is fitted.

The undercarriage legs are bent from one piece of 20 s.w.g. piano wire After the laminated, bushed wheels have been secured by soldering cup washers in place, the whole unit is clipped over the bottom of the fuselage and securely bound. Leg fairings are added as shown.

Tail surfaces are made from 1/32-in. hard balsa and the trim-tabs are fixed by hinges cut from aluminium milk bottle tops. Fin and tailplane are cemented in place as shown.

A rear hook bent from 20 s.w.g. piano wire is fitted and glued in place and a celluloid " cabin " window is added.

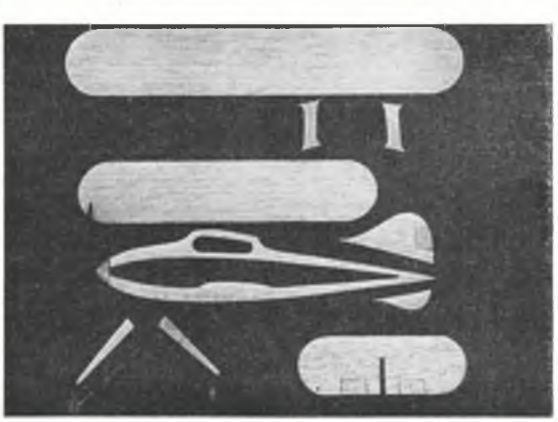
The wings are cut from 1/32-in. sheet. Top wing is 15-in. span and has a chord of $2\frac{9}{16}$ in. Bottom wing is 11-in. span with a chord of $2\frac{1}{4}$ in. These are cut, soaked in hot water for an hour, and each is then clipped with rubber bands over four $\frac{1}{8}$ in. thick ribs, made to the contour of the respective airfoil sections, which have been spaced out and cemented on strips of ply.

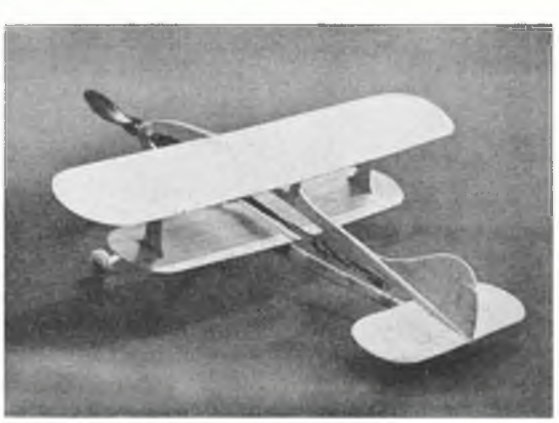
When thoroughly dry the top wing is given a liberal coat of thick banana oil or thinned down cement and is finished smooth. It is then removed from the " form " and cemented in place on top of the fuselage. Squareness with the fuselage is essential. Next the wing struts are cut, their edges rounded, and fixed in their appropriate places They must be at 90 deg. to the top wing which has no dihedral.

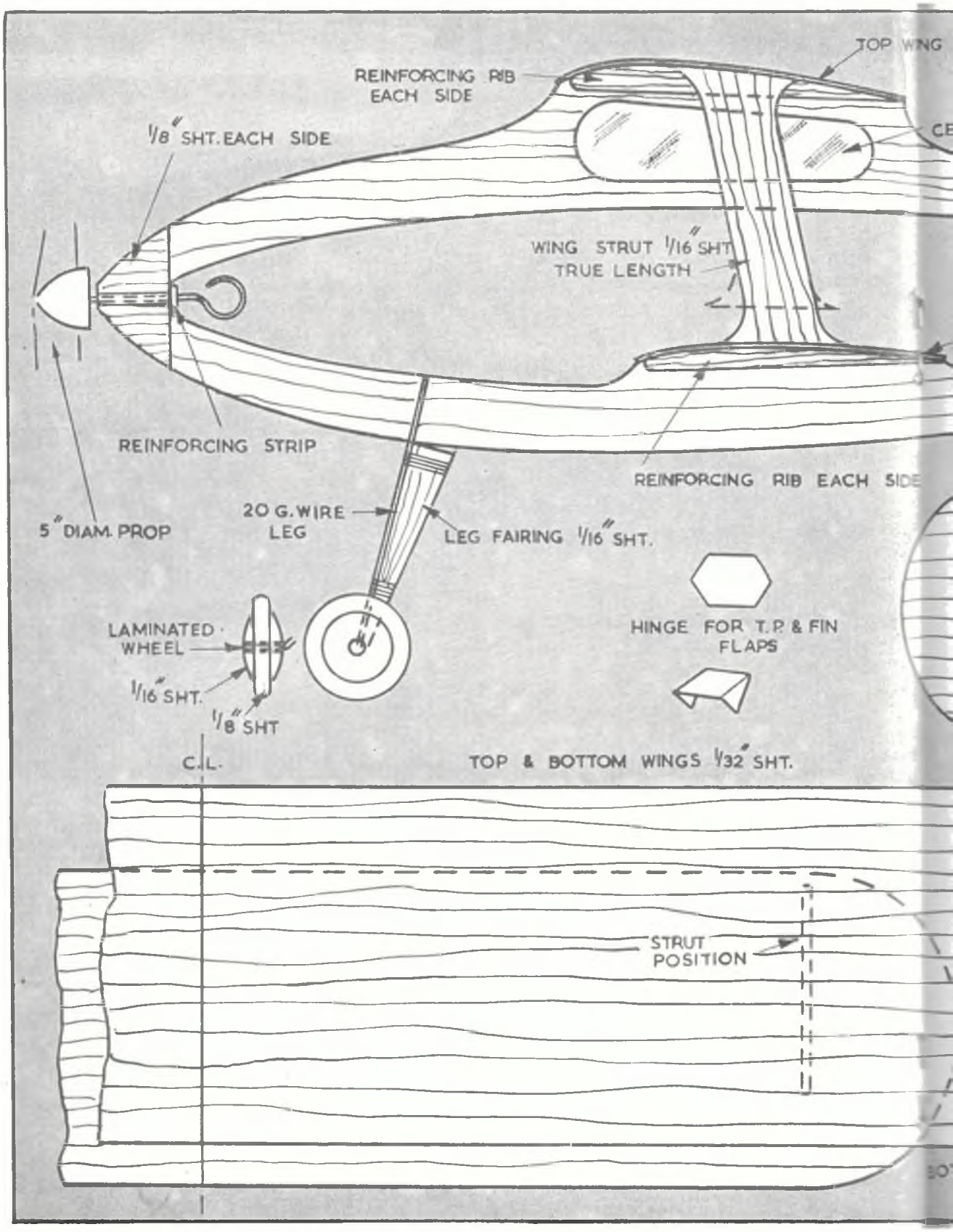
The bottom wing is treated with banana oil as before and when dry is cracked in the middle and cemented again, after $\frac{3}{8}$-in. dihedral, measured at the tips, has been given to it. It is then cemented to the fuselage in conjunction with the bottom of the wing struts. Finally, four reinforcing ribs, cut from $\frac{1}{8}$-in. sheet, are glued to the fuselage at the junction of the wings.

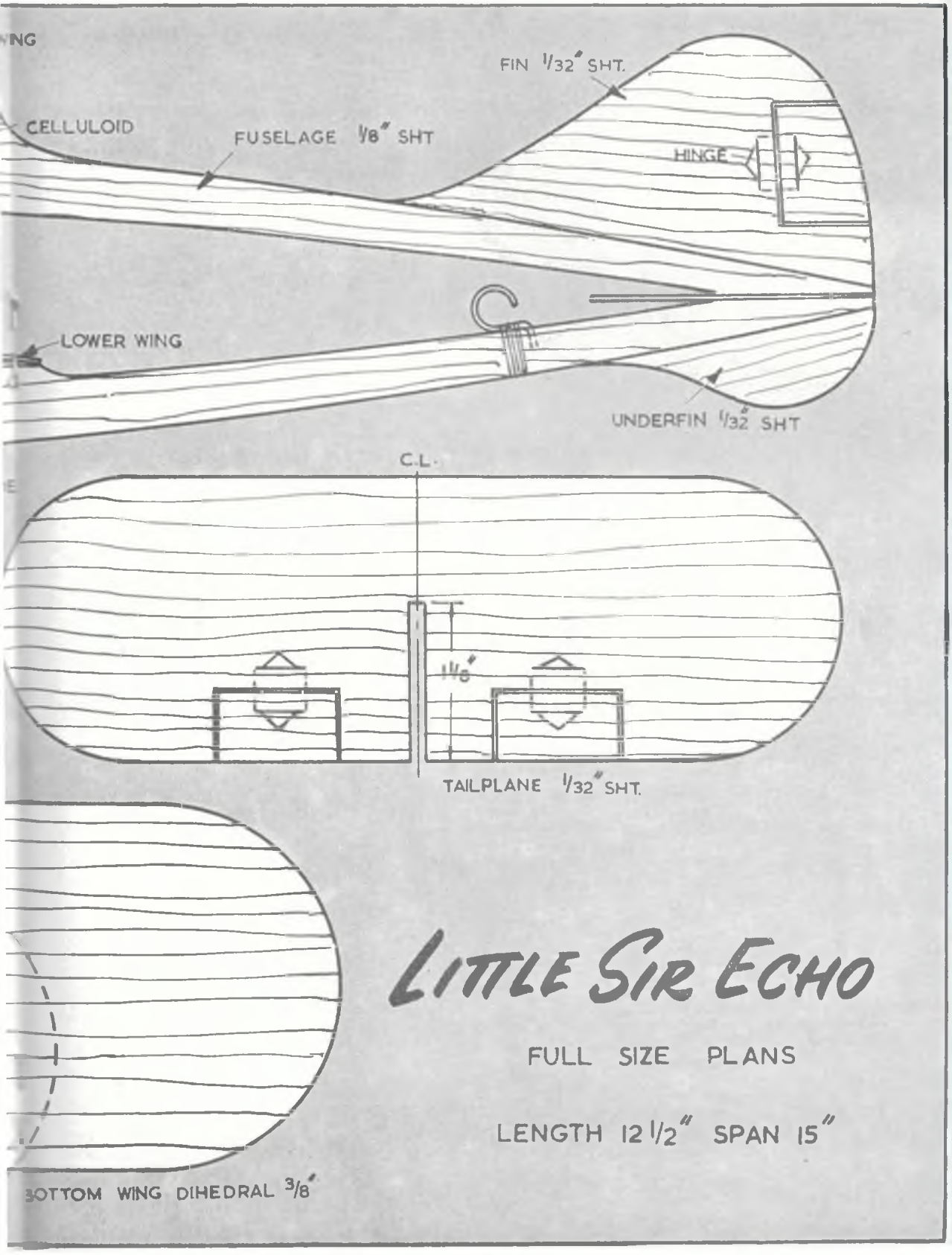
Power for *Little Sir Echo* depends upon what performance is required. For aerobatics a pre-tensioned loop of $\frac{1}{4}$-in. flat rubber 10 in. long is required. For cruising flight a loop of $\frac{3}{16}$-in. flat rubber 15 in. long is excellent.

Usual refinements such as a freewheeling prop, and valve tubing round the hooks can be introduced as desired. **Full-size plans overleaf**






TOP WING
REINFORCING RIB EACH SIDE
1/8" SHT. EACH SIDE
WING STRUT 1/16" SHT TRUE LENGTH
REINFORCING STRIP
REINFORCING RIB EACH SIDE
5" DIAM. PROP
20 G. WIRE LEG
LEG FAIRING 1/16" SHT.
HINGE FOR T.P. & FIN FLAPS
LAMINATED WHEEL
1/16" SHT.
1/8" SHT
C.L.
TOP & BOTTOM WINGS 1/32" SHT.
STRUT POSITION



LITTLE SIR ECHO

FULL SIZE PLANS

LENGTH 12 1/2" SPAN 15"

How Much Performance?

ACCENT ON POWER

by

P. G. F. CHINN

THE maximum outputs achieved by model engines today make an interesting comparison with the early model petrol two-stroke aero engines of twenty years ago. The modern competition engine, on average, develops three to four times the specific output of its pre-war counterpart. A modern model racing engine will take this to five or six times the earlier engine's output and the writer has personally had on brake test, two 10 c.c. engines, old and new, one of which developed *eight times* the output of the other. This is no dynamometer dabbler's daydream, for the accuracy of the comparison is easily checked by comparing relative propeller speeds and a good, rigid prop on which the old engine would reach its peak speed was turned at nearly double these revolutions by the modern one (the latter had not quite reached its peak at this speed) and, of course, since speed, under a given load, increases with the cube of the power available, this is clear enough proof of the tremendously high specific outputs reached by modern miniature motors.

While, to the uninitiated, comparison with full scale practice may occasionally give rise to doubts about some of the high outputs claimed for miniature engines, a more detailed examination of the facts will show that these figures are by no means excessive or improbable.

No one will argue the fact that the miniature engine runs at high r.p.m. The actual peak output speeds quoted by various independent sources, irrespective of actual b.h.p. claimed, are roughly in agreement and show that a modern high performance miniature two-stroke may be expected to peak at between 12,000 and 16,000 r.p.m.—occasionally even higher. This means, therefore, that it is only in the torque developed by the engine that any serious discrepancy may exist.

Now the writer has made a close study of the torque values developed by model engines, over many years. Torque, whether it be expressed in lb. ft., in. oz., or in. lb., is an inconvenient value, since it depends on the capacity of the engine and thus makes it impracticable to compare respective torque values of engines of different capacities. What is wanted is a specific torque figure related to the swept volume and the obvious course here is to convert the figures obtained by a brake test into brake mean effective pressure (b.m.e.p.) using the formula : $\eta p = \frac{T24\pi}{V}$ in which ηp = b.m.e.p. in lb./sq. in., T = torque in lb. ft. and V = total cylinder swept volume in cu. in.

It will have been noticed by regular readers that the performance graphs accompanying the M.A. Engine Tests carry a b.m.e.p. scale with a common torque-b.m.e.p. curve. These have shown the standards to be expected of model engines, for it is a fact that the actual maximum output realised depends, not so much on the maximum b.m.e.p. realised, as on the shape of the curve and the useful r.p.m. range over which it extends. Thus, we find that the average maximum b.m.e.p. realised with modern model aircraft engines is about 45-50 lb./sq. in. At least 80 per cent. of engines tested over the past five years have recorded b.m.e.p. of between 40 and 60 lb./sq. in. Not more than 5 per cent. have reached or exceeded 60 lb./sq. in., while the remainder have recorded less than 40 lb./sq. in.

These figures have, in fact, provided a useful cross check on the accuracy of results since, with something like a hundred tests to back them up, they have shown what b.m.e.p. may be expected of an engine belonging to a certain design group. For example, practically all diesels can be relied upon to give a b.m.e.p. approaching 50 lb./sq. in. In one or two isolated cases, this may actually reach 60 lb./sq. in. but will seldom drop below 40 lb./sq. in.

Thus, when a " K " Falcon 2 c.c. diesel, submitted for test, recorded a b.m.e.p. of only 38 lb./sq. in.,

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Heading. *The improved performance of the new lapped-piston model Super-Tigre G.20S engine is evident from the 118.35 m.p.h. speed recorded by Amoto Prati's speed model, which has been claimed as a new world record.*

sub-standard mechanical efficiency was suspected and the makers were requested to supply a second engine. While behaving in an identical manner to the first engine, this second example recorded the more acceptable figure of 49 lb./sq. in. The moral is obvious when it is further pointed out that the output realised was 0.121 b.h.p. as opposed to only 0.098 b.h.p. for the first unit.

Glowplug engines (and, to a lesser extent, spark ignition engines) vary more than this. In the bigger capacities, a good glowplug engine will develop 50-60 lb./sq. in. b.m.e.p. when running on high-performance nitrated fuels, but, in the smaller sizes, b.m.e.p. falls off badly. The average popular American "Half-A" glowplug engine will record only about 25-30 lb./sq. in. Hence the reason for the recent American adoption of the diesel (which we were able to predict two years earlier) in the "Half-A" class. These new American diesels, although often not peaking quite so high, are around 50 per cent. more powerful than their glowplug brothers.

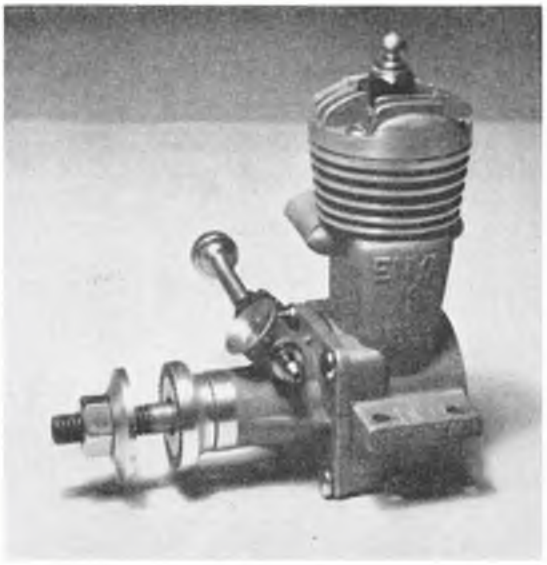
The value of these various performance factors, and the cross check they automatically provide on test results, is obvious when it is seen that a British contemporary publication erroneously credited an American baby glowplug engine with a power curve such that it would have needed a b.m.e.p. of no less than 71 lb./sq. in. to realise such a performance (i.e., a figure most certainly more than double its actual capabilities). Needless to say, the peak output quoted in consequence was so high that manufacturers would clearly be wasting their time by switching to diesels, had these figures been true.

Again, more recently, the same source credited a well-known 1.5 c.c. diesel (of acknowledged moderate performance) with a torque equivalent to some 80 lb./sq. in. b.m.e.p., yet has lately given a torque representing a b.m.e.p. of less than 50 lb./sq. in. to a much more powerful 1.5 c.c. engine—quite the most powerful 1.5 yet built in fact.

Let us, however, return to the question of full-size *v.* model performance. Does model performance still look so improbable?

We have established an average maximum b.m.e.p. of 45-50 lb./sq. in. for model engines. This, we must remember, is the equivalent of 90-100 lb./sq. in. in a four-stroke-cycle engine, since there are only half as many power strokes for a given crankshaft speed in a four-stroke-cycle engine. Would 90-100 lb./sq. in. be excessive in a full scale four-stroke engine? Certainly not. There are unsupercharged racing car engines now developing double this figure, while good touring and sports engines will attain 130-150 lb./sq. in.

The fact that full size unsupercharged racing engines develop specific outputs of 100 b.h.p./litre (e.g. formula racing-cars, racing motorcycles and the like) has never, in any case, been any reason to doubt similar figures being achieved in model engines. As we know, even the most potent full size racing engines seldom peak at more than half the r.p.m. of a high-speed model racing engine, nor do they

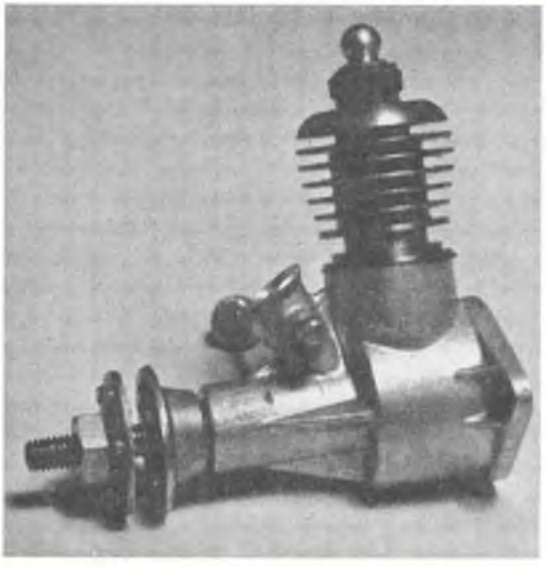


A new engine of high performance from Japan, the Enya 19 glowplug engine of 3¼ c.c. capacity.

use the formidable fuel mixtures with which we feed our tough and thirsty miniatures. Nitromethane is not unknown to the "full size" people, but the excessive tankage required for it and the prohibitive cost (average £12 per gallon) does not encourage its use and the gaining of extra b.h.p. that can be liberated thereby.

Again, the high output model engine is designed and developed without regard to economical operation, flexibility and many other factors, whereas the full scale racing engine still remains much more of a compromise. Even material stressing is of little consequence to the model engine designer since the increased scale strength of small material sections is adequate insurance against cylinders tearing loose from crankcases, etc. Finally, it should be remembered that all tuning (and by "tuning" we include the modifications which can increase a standard i.c. engine output by as much as 100 per cent.) is

"Orion," a German stunt model designed for the B.W.M. 2.5 c.c. motor, which is now being produced by Manfred Gocking of Berlin.



An example of a low-torque, high-speed model engine is the Fuji .049—also of Japanese manufacture.

basically of a " cut and try " nature, and it is a lot easier to " cut and try," and get results, with a McCoy, than with a Matchless or an M.G.

From this, it is obvious, too, that 68 b.h.p./litre at 7,000 r.p.m. quoted for a two-stroke-cycle motor is certainly no proof that model engines are capable of only 50 b.h.p./litre irrespective of peak r.p.m.

A good model engine will, as we have seen, develop a specific output as high as 100 b.h.p./litre, but there is still a great deal of variation in specific outputs and one certainly cannot lay down any hard and fast rules or " standards " in this respect. We have recorded figures as low as 20 b.h.p./litre in tests, due, in this case, to poor design, resulting in excessive mechanical losses and very low volumetric efficiency. Only recently, a modern Class A glowplug engine returned the moderate figure of 56 b.h.p./litre in the M.A. tests and, in fact, there are one or two diesels still on the market which do not rise above about 50-60 b.h.p./litre. In contrast, however, the current test on the outstanding German Mach 1 racing diesel shows 120 b.h.p./litre and the makers claim even more.

Going still higher, we have reports of over 150 b.h.p./litre reached with 10 c.c. racing engines in America. The highest figures ever recorded by a British standard commercially made engine, so far as we know, were with the Z.N. 10 c.c. racing motor of which two models were tested, one on a torque-reaction cradle dynamometer, achieving 1.47 b.h.p. or 147 b.h.p./litre, and the other, on a specially built electrical dynamometer, achieving over 150 b.h.p./litre. These tests were not carried out by the maker but were made by a member of the staff of a well-known laboratory.

Another high-performance British engine, the Eta 29, tested on the maker's own torque-reaction dynamometer, has achieved up to 140 b.h.p./litre. The legendary Dooling 61 engine was sold with a detailed test report, most of these record-breaking engines achieving in the region of 145 b.h.p./litre on standard fuel, as delivered from the factory, which could be raised as much as 25 per cent. with a high nitromethane content alcohol fuel and running on spark ignition.

It is not always appreciated how very marked can be the effect of quite small modifications to a miniature two-stroke-cycle engine. The Mills Mk. II 1.3 c.c. diesel, as introduced in 1948 did not, for example, have much more power than the original 1.3 model, the output being 0.07-0.08 b.h.p. Later, however, the makers increased the induction period considerably by merely lowering the intake port, as a result of which the peak r.p.m. were raised by nearly 3,000 and the output stepped up, as confirmed in a subsequent M.A. test, to slightly over 0.1 b.h.p. (This did not, by the way, put the Mills in the " Dooling " class—as a recent criticism suggested—for a simple calculation will show that the Dooling develops 80-100 per cent. greater specific output.)

In conclusion, we may well ask ourselves: is the improvement in miniature two-stroke performance which has taken place in the past ten years, likely to be repeated in the next ten? To this we can safely say that the answer is in the negative. The modern miniature i.c. reciprocating engine must be very near to its ultimate developed form, in addition to which, the demand for ever-increasing engine performance is not quite so marked as it was in the earlier days of C/L models and model racing cars.

PEAK R.P.M
(MINIATURE AND FULL-SIZE I.C. ENGINES)

2,500-4,000	r.p.m. ...	Aircraft engines.
3,500-4,500	,, ...	Automobile engines.
4,500-6,000	,, ...	Motorcycle engines, sports car engines.
5,000-7,000	,, ...	Typical pre-war model two-stroke petrol engines.
6,000-10,000	,, ...	Racing engines, automobile and motorcycle.
9,000-12,000	,, ...	Average modern model two-stroke.
12,000-18,000	,, ...	Modern high-performance or racing model engine.

TYPICAL B.M.E.P. VALUES
(MODEL TWO-STROKE ENGINES)

20-30	lb./sq. in. ...	Very small glowplug engines. (0.03-0.045 cu. in.)
30-40	,, ,, ...	Popular small glowplug engines. (0.049-0.075 cu. in.)
40-50	,, ,, ...	Average medium capacity glowplug engine.
45-50	,, ,, ...	Average diesel.
50-60	,, ,, ...	Very good diesel. Larger high-performance type glowplug or spark-ignition engine.
60-65	,, ,, ...	Tuned racing engine.

Topical Twists

The Pure in Heart

Undismayed by all the jet propelled advances in the world of aviation, our friends the Realists are still doggedly plugging that vintage cabin model as the last word in scale verisimilitude. The only difference is that they now call themselves Purists, which suggests that they see something frightfully immoral in the present day passion for speed and efficiency.

But perhaps I misjudge them. That vintage cabin model might well be a true scale counterpart of some full size aircraft. I'll have to pop into a museum one of these days just to check up.

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Modern variant of that old story about the chap who was so lucky, that if he fell down a drain he'd come up with a bunch of violets, is the starry-eyed type who forgets to light his d/t and finishes up with a world record.

● ● ●

Offside Comment

A writer in this journal has claimed that " . . . model flying is deserving of the interest accorded to football . . . "

Now, I don't know what black grievance this chap harbours against us poor, unoffending modellers for him to wish such a ghastly fate upon us. It's bad enough to try to cope with the relatively minor nuisance of the prying small boy and the odd, inquisitive dog, without having the multitude at large descending upon us in wild, enthusiastic hordes.

Craving as we do, the deserted quietitude of the untrodden cabbage patch, we are thankful that public interest in our quaint habits is limited to an occasional, but not very determined, effort to have us thrown off. To attempt to fly our models amidst a sea of cloth caps and waving rattles would be fatal to our hobby—and, indeed, to quite a few of the cloth capped fans, too.

Fortunately, it seems that our well-wishing friend will have to wait some little while before the grandstands and turnstiles appear on Chobham Common, or, indeed, till we overhear this typical snatch of everyday conversation.

" Any luck wiv the treble chance, 'Arry ? "

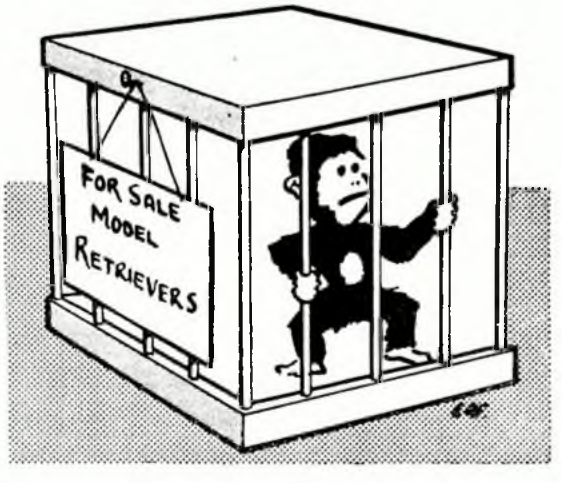
" Nah ! Clottenham Modspurs let me dahn sumfink rotten."

" Well, wot abaht the Breezy Six ? "

" Dead unlucky. The wevver turned right calm. Not a single out-of-sighter in the lot."

" No luck wiv yer twelve results, either ? "

" Not a blinking sausage. There was me wiv twelve stone-bonkers all lined up, and the perishing area fergot to send in the results ! "



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A Flowery Future

If, at some future time, model flying does assume the status of a national pastime, such as football, cricket, kit-buying etc., it may well be that some of the B.B.C. experts will have to switch over to model flying topics. Take the gardener, for instance :

" At this time of the year your winter stocks will either have been destroyed or left in a poor way by the abnormal weather which we always get at this time of the year. The late summer varieties should be coming along well, though, and after digging up a few of last year's old standbys—which may possibly require just that little bit of trimming—you should still be able to make a brave show on the autumn cabbage patch.

" Probably you will now be looking for a good climber. Well, by far the commonest species is Pylonia Convolvulus. Both the Northern variety, Silvio Stratospherus, and the Southern variety, Buskellia Slickstickus, can be recommended, but, perhaps, the most popular of all is the ' scrub ' stock, which all too often come to grief when planted too firmly into hard, rocky ground. Of a lesser order is the gentle rambler, Sportus Cabinolia, which can be reared quite successfully on even the smallest plot. Care, however, should be taken to avoid that particularly dense specimen, Blowyu Jackus.

" Now, this being the damp season of the year (January to December) you must be specially cautious when laying out the new frames. See that you cover them well and spray lightly with water before applying your liquid warping solution. Even the novice can produce that beautiful white bloom, known as the Blushing Tissue, which looks so becoming on the coloured varieties.

" And just a few hints and tips to end with. First a word about that difficult customer, the Odoriferous Thymekeeper. For maximum results careful cultivation is necessary, with liberal applications of soft soap, plus a little gentle twigging. Do not, however, overdo the latter treatment, as it is unwise to disturb that friendly little chap, the Late Tick. A less friendly visitor to cabbage patch is that persistent pest, the Upwind Mayfly. This is best removed by a strong dose of salty verbiage.

Finally, a reminder about that Sunday morning task: do see that you root out the late club specimen, Memberus Deadlossia, from their beds first thing."

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Newest development in model aviation is something that looks suspiciously like a flying clothes horse (Peg-asus ?).

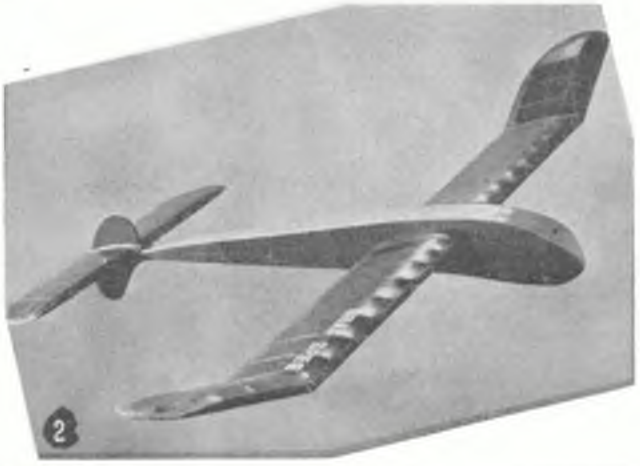
Obviously just the thing to take out for an airing.

Pylonius

PHOTONEWS

HELLO, again. Once more, thanks to our readers' efforts, we have another fine collection of model pictures, and what better model to start with than the young lady heading our first column! Thelma Rodger is a member of the Montrose (Scotland) M.A.C. and is seen with Colin Campbell's Wakefield. Being a chemist's assistant, Miss Rodgers is able to supply the club's needs in concocting their potent fuel brews. A distinct asset all round, in fact.

R. Walsh, of Oldham, whose design *Bismarck* is in the M.A. Plans List, sent us **Photo No. 2** of his latest glider, *Graf Spee*. A strange choice of names, but perhaps Mr. Walsh believes them to be doomed to destruction! With the latter model, however, a considerable increase in strength has been obtained by the use of a ply wing brace behind the leading edge. This is a strip of $\frac{1}{16}$-in. ply cut to include the dihedral break.



No. 3 was brought into this office by a visitor from Finland—G. C. Schlucking—who showed us a selection of photos of modelling activities in his country. Floatplanes are still comparatively rare in this country but Finland's many lakes draw numbers of enthusiasts to this branch of the sport. This lightweight floatplane is a typical specimen.

No. 4 shows the framework of an intriguing-looking 43½-in. span semi-scale delta wing job before it was completed recently by J. M. Bodey, of Wirral, Cheshire. It has since made many successful flights powered by a 1.49 Allbon Javelin.

Photo **No. 5** was taken at the Nationals by John Ridley, and shows a fine C/L model of the *N.A. Mitchell B.25*, built by J. F. Du Cros, of Egham, Surrey, and powered by two E.D. 3.4's. Mr. Ridley

had the opportunity of flying this model at the Nats., but was startled to find the starboard wing coming adrift! He managed to land it safely, however, and with the wing firmly bolted in position flew it again successfully.

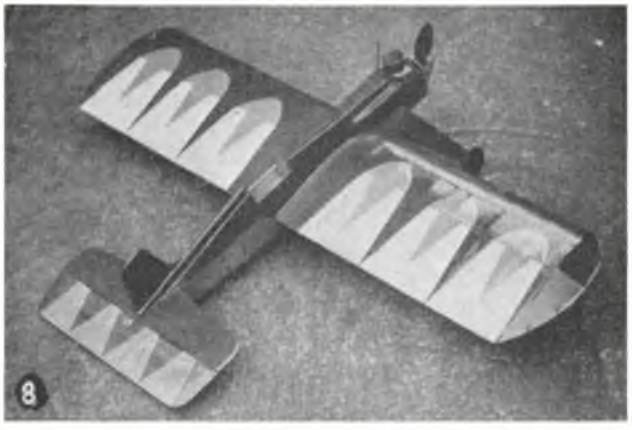
Another citizen of Wirral, Cheshire, sent in photo **No. 6.** B. W. Davies is the name and he appears on the left of the picture with his model of the Hawker *Sea Fury*, built from the Veron kit. Powered by an E.D. 2.46 its speed on 60-ft. lines has been timed at 68 m.p.h. On the right is G. Turner, also a member of the Heswall and District M.A.C., with a Veron *Philibuster*, also powered by the E.D. 2.46.

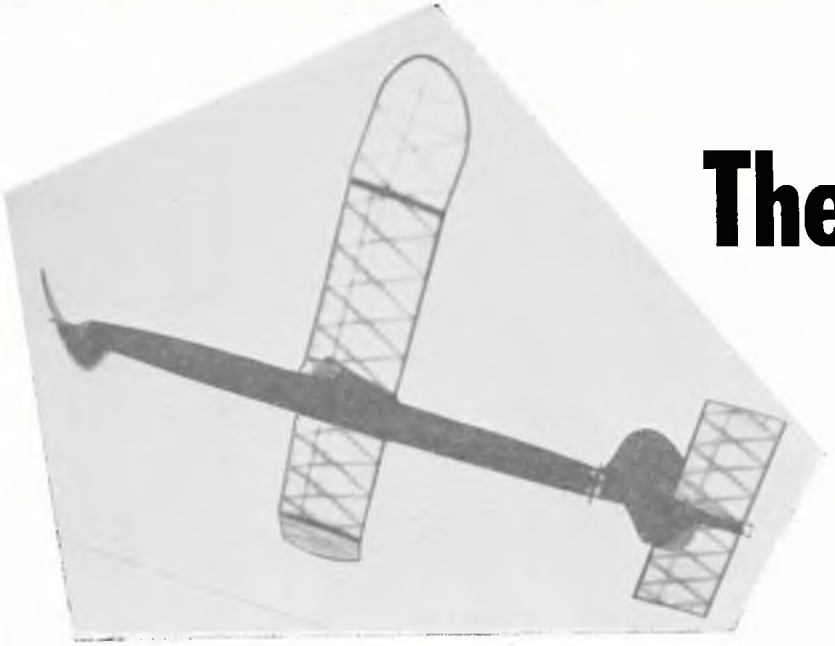
Photo **No. 7** depicts Sgt. Joe Botting, of the R.C.A.F. in this country, with one of his R/C models and his small son, the latter an essential part of the crew. At the I.R.C.M.S. meeting reported elsewhere in this issue, Joe's model refused to answer the controls after launching, for no apparent reason until Junior's voice piped up "You haven't switched the transmitter on, Daddy!" Joe switched on just in time, but was his face red!

No. 8 came from J. Andrews, of Old Trafford, Manchester, where apparently aeromodelling is indulged in as well as cricket. This attractive Frog 500-powered stunt model is finished in a striking colour scheme of red and yellow on white and should be quite a startler in the air.

From America came photo **No. 9** of a very cute little radio job. In spite of its diminutive size, it uses a two-valve North American receiver with with two RK 61's. Actuators are Bonner Compound for the rudder and a standard Bonner for the elevators. Wing span is only 27 in. and weight 20 oz. Power unit is an Atwood 0.049 and the photo was submitted by James P. Wood, Jnr., of Los Angeles.

From our old friend, P. L. Gray, of Luton, comes our last picture, **No. 10** this month. By now he must have a vast collection of solid scale models of all kinds, for we keep on seeing pictures of new ones. This time it is a 1/72 scale model of the sleek Hawker *High Speed Fury*, or *Super Fury* as it was sometimes called. Built in 1934, it was an experimental variant of the standard *Fury* and was fitted with an R. R. Goshawk steam evaporative cooled motor which gave a speed of 238 m.p.h. The fuselage of the model is carved from birch and the wings from spruce sheet. The wheels and spats are carved in one piece and the inter-plane struts are cut from 20-gauge aluminium sheet. All flying surfaces are "ribbed" in the authentic manner.





The photo shows a geodetic-wing version by Roy Alcroft.

Thermaleer

a

36 in. span

lightweight

rubber

job

by

B. T. Faulkner

ECONOMY, structural simplicity, and consistency are features of this 36 in. lightweight, which for a number of years has been the Cheadle M.A.S. standard rubber design. Originally developed from a 20-in. span indoor F/F which featured geodetic wings and incidentally gained the designer his "A" certificate flown outdoors, the present layout was developed through 30 in. and 36 in. models to the plan presented here.

Folding props have been rejected as being inconsistent; stall recovery with this model is superb—this can be attributed to the free-wheeling prop which wafts the *Thermaleer* up to 350 ft. Normally a flight of 3½ min. should be expected using 10 strands of 36-in. Pirelli, but substitution of 8 strands of 50-in. will increase the motor run to 2¼ min. giving a still air time of something around 4 min. With this motor, a smaller prop of 14 in. is recommended to provide the desired climb, and incidentally, smooth out the glide to a rate of descent which approaches that of a folder. However, this prop/power combination is not recommended to beginners since it involves a special winding technique to prevent bunching at the tail.

The original *Thermaleer* placed second in the club champs. in October, 1951, with 8 : 51, third at the N.W.A. Winter Rally, 1952, with 3 : 33 and 3 : 15, in appalling weather, and first at the Butlin's Pwllheli contest in June, 1952, where it was lost into the sea. Garth Evans won the September, 1952, Butlin's meeting with two maxs. from his modified *Thermaleer*, again losing the job—this time into a forest. Before this, the model came sixth in the "M.A." Trophy (Nats., 1952). A modified version of this layout by Andy Anderton, the *Marathon*, which uses an eight strand motor has gained a number of successes, amongst them 3rd at Woodford, 1952 and 2nd at Woodford, 1953, apart from several R.A.F. comps., and others too numerous to mention.

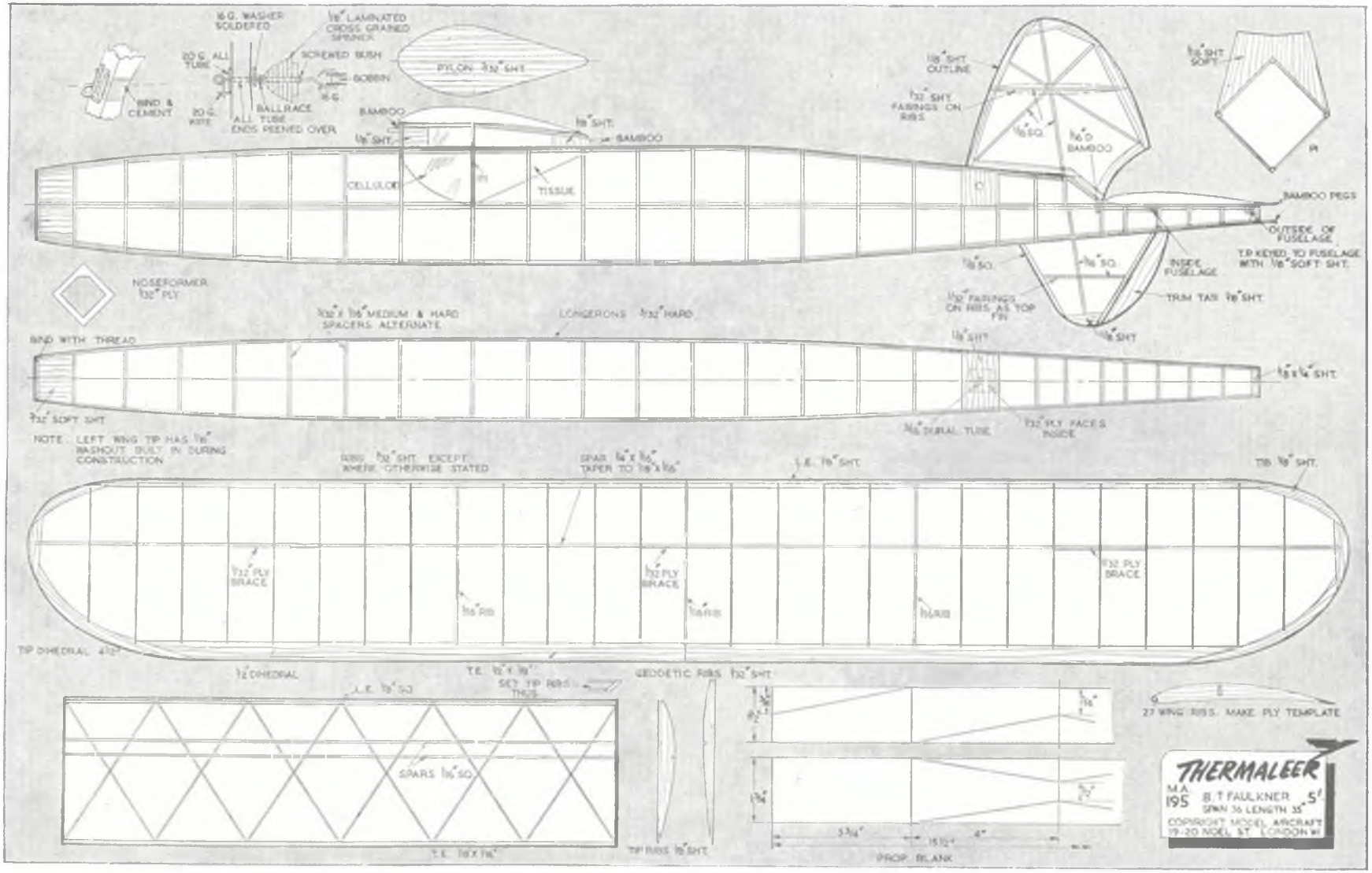
Construction should present little difficulty, though the selection of wood is very important, of course. Strip should be medium/hard straight grained for longerons and medium/soft for spacers; medium/soft LE, hard mainspar and medium TE. All wood should be dead straight. When building the wing, care should be taken to make all parts fit easily, thus preventing a strained framework. Build ⅛ washout into the left outboard panel; all other parts of the wing dead flat. This applies to the tailplane, which should be flat. The Garami free wheel is worthy of note—this prevents a motor blow-up if the prop free-wheels under power due to a bunch; this is used exclusively by the Cheadle M.A.S. Fly on 200 turns in calm air and check for warps and rectify. Be sure of tail line-up, etc.

Trimming: Aim for a 100-ft. circle on the glide, pack negative on the tail until a stall becomes obvious. The model should execute a stall turn when this happens, i.e. the r.h. tip should drop in a stall and model recover with very little loss of height. When a satisfactory glide has been obtained more power can be added until the inevitable power stall occurs, when very careful application of r.h. sidethrust should be made causing the model to spiral up tightly at first, opening out gradually to a wider turn but still gaining height. It should be noted that downthrust should be used sparingly since this ruins the latter end of the climb. Sidethrust may be added with confidence; the spiral stability is a big feature of this model.

Once the trim has been obtained, cement all packings firmly in place and put the model away in its box until the next contest.

Airframe Weights. Mk. II version (1953)

Wing (Jap tissue)	...	7¾ drams	Total A/F. 2 oz.
Tail (condenser tissue)	...	2 drams	
Fuselage (black Modelspan)		13½ drams	
Prop (14-in. free wheeler)		8½ drams	



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. 0d., POST FREE

Letters

A Matter of Pitch

DEAR SIR,—I would like to put in a plea to our propeller manufacturers for some 7 in. pitch props.

Speaking for quite a few C/L stunt/combat fliers, a 7 in. pitch prop would be about the best tip since the one suggesting a lead weight in the outer wing-tip!

How about it, manufacturers?

Yours faithfully,

Meanwood, Yorks. K. JACQUES.

"Models That Made History"

From Sir Alliott Verdon-Roe

SIR,—Those competing today in model aeroplane competitions will be surprised to know that their models, however good the performance, would do no better than win the 3rd prize in the 1907 *Daily Mail* Model Aeroplane Competition. The reason for this is, that no models weighing more than 50 lb. or less than 2 lb. were eligible for the first or second prizes.

The writer's winning model weighed 6 lb., it flew the full possible distance into a net indoors and over the stipulated minimum distance out of doors and thus was entitled to the first prize. The struts were streamlined, being 1 in. wide by $\frac{1}{8}$ in. thick. However, the judges, being balloon experts, were not impressed and withheld the first prize of £150, awarding me the second prize of £75.

There were some 200 entries, but as Mr. Donald Stevenson stated in his article "Models that Made History" in the July issue, only 29 competed at the Alexandra Palace. Considerably more than this number were shown at the Agricultural Hall, Islington, where the models were on view for a week before the active trials.

While there, the Hon. C. S. Rolls told me that he had been asked to write an article for the *Daily Mail* and would I walk round with him and tell him what I thought of the exhibits. He also asked me who I thought should receive the gold, silver and bronze medals offered by the Aero Club. I said the winners of the actual trials should receive the medals according to their performances. However, the balloon expert judges awarded the gold medal to Short Bros. for their balloon exhibit. The silver medal went to the exhibitor of some polished wheels and things under a glass case, and the bronze medal was awarded to the exhibitor of a propeller made from a cane, string and silk, like a large feather, two of which, when put in a socket and turned, formed a propeller.

W. F. Howard's model, which won the third prize, was really a flying kite, made from tissue-paper and thin strips of wood. It flew at a very coarse angle like a kite, and there was no means of steering. Also there was little chance of the model landing without disastrous results; the best way to avoid this catastrophe was to run after it and catch it before it landed. The geared down clockwork driven propeller was a very interesting form of propulsion.

The illustration of my model with two rear planes on page 280 in the July issue, was drawn before the 8 ft. long triangular fuselage, containing what I should think would be a pound of rubber if not more, was in position. The propeller was near the trailing edge of the main planes when in correct position. The two inverted tail planes controlled both vertical and lateral steering.

Yours faithfully,

Rowlands Castle, Hampshire. A. VERDON-ROE.

New Angle on Fuels

DEAR SIR,—I would like to raise a point which has, in my opinion, been neglected for far too long a period. Namely, correct, or rather improved fuel mixtures for model diesel motors. The current mixtures appear to contain about 30 per cent. to 40 per cent. ether and 25-35 per cent. lubricating oil. After extensive practical experimenting, I have come to the conclusion that these percentages are far too high.

Firstly, the ether content. Ether has a fairly low calorific value when compared with paraffin, so if this can be decreased, then the power content of the fuel must go up. Secondly, the lubricating oil content. Examine any model in which a diesel motor has just been running, and observe that the model is liberally covered in a copious layer of unburnt lubricating oil. This unused oil in the fuel could have been replaced by paraffin, and so more power extracted from the motor. The mixture which I will now give has been tested extensively, and in all cases, good results have been obtained in starting, power output, and general lack of wear in the units involved.

"Esso-Blue" paraffin	64%
Castrol "R"	16% (unit % by vol.)
Ether	14%
Amyl nitrite	3%
Redex	3%

Notice that the total lubrication is 19 per cent.—but that 3 per cent. of it is in the form of incombustible wax—Redex. Even with only 16 per cent. Castrol "R" in the fuel, there was still a considerable quantity thrown out unused. One of the motors used was a new E.D. 2.46 which had had about 1½ hours of running on a standard commercial fuel before my mixture was used. There was no noticeable loss of power on initial warming up, and the fuel was very smooth in stunt flying, and also gave very easy starting, and considerably more power than with the standard fuel used for running in (8 × 6 prop used). Straight castor oil was not tried in place of the Castrol "R"—which appears to contain additives.

Don't worry if your motor gets hot, for if there is no tendency to slow up when properly tuned, then the motor is not overheated. Remember that the human fingers experience the sensation of burning at 60-70 deg. C. and most car motors run at 80 deg. C. plus, and full size aero motors up to 185 deg. C.

If the question of economics should arise, I will say that this fuel mixture costs just below 2s. 6d. per pint, and most commercial fuels are priced at 3s. per 8 oz. bottle. (There are 20 oz. to pint.) Before you pass your opinion on this fuel, give it a try out on a motor in good condition—not a brand new one, and not a worn one with a slack piston either.

Yours faithfully,

Edinburgh. R. D. HARRISON

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

Clwyd Slope soaring

THE 1954 Clwyd Slope Soaring Meeting was this year organised for the first time by Chester Model Flying Club, with open, Nordic, R/C and open junior events. The prizes consisted of medals and the Gosling Trophy for the best flight of the day. There were many early arrivals and at least two models were lost on test flights before the official opening of the meeting. When flying began, at 12 noon, there was only a very light breeze with some cloud and occasional sunshine. Thermals were in evidence, which probably accounted for some of the high times obtained, although the standard of flying was also high.

The entry was a large one, over 80 all told, and flying continued steadily until 5 p.m., the official closing time. Towards the end of the meeting the weather deteriorated slightly in that the wind freshened somewhat. Altogether it was an excellent day's flying and everyone appeared to enjoy themselves thoroughly. Some visitors came considerable distances, from as far as Southport and Hull.

The prizes were presented at about 5.30 p.m. by R. F. L. Gosling and the event then broke up, the visitors setting off for home.

There will probably be some claims for British hand launch records after the times put up at this meeting as the following seem to have exceeded the present records, R. F. L. Gosling (outdoor sailplane Canard), H. F. Wilde (outdoor tailless) and S. Redfern (outdoor lightweight sailplane).

C. Filtness (right) assisted by K. Modern, won the radio event.

Four of the winners. Left to right : G. M. Hutton, K. Simmons, N. P. Brooke and J. Chadwick.

RESULTS

Gosling Trophy

G. M. Hutton	Wallasey	14 : 39

Open Event

1. N. P. Brooke	Crosby	14 : 15
2. S. Redfern	Chester	11 : 15
3. H. F. Wilde	Chester	9 : 51

Nordic Event

1. G. M. Hutton	Wallasey	14 : 39
2. J. Chadwick	Ashton-under-Lyne	11 : 17
3. H. Griffiths	Southport	6 : 63

Radio Event ..

1. C. R. Filtness	Chester
2. W. Nield	Cheadle

Junior Event

1. K. Simmons	New Brighton	6 : 36
2. M. Brown	" "	4 : 47
3. K. Wilde	Chester	3 : 42

Metal Skinned Solids

(*Continued from page* 350)

panel down to these outlines before applying adhesive and finally smoothing in place.

When the whole model has been covered you will probably find that a certain amount of surplus adhesive has oozed out from the joints and has dried on the surface. This can be removed by " washing " with the appropriate thinners or solvent. A final rub down to smooth, followed by metal polish, and vigorous buffing with a really soft cloth, will produce a mirror-like finish.

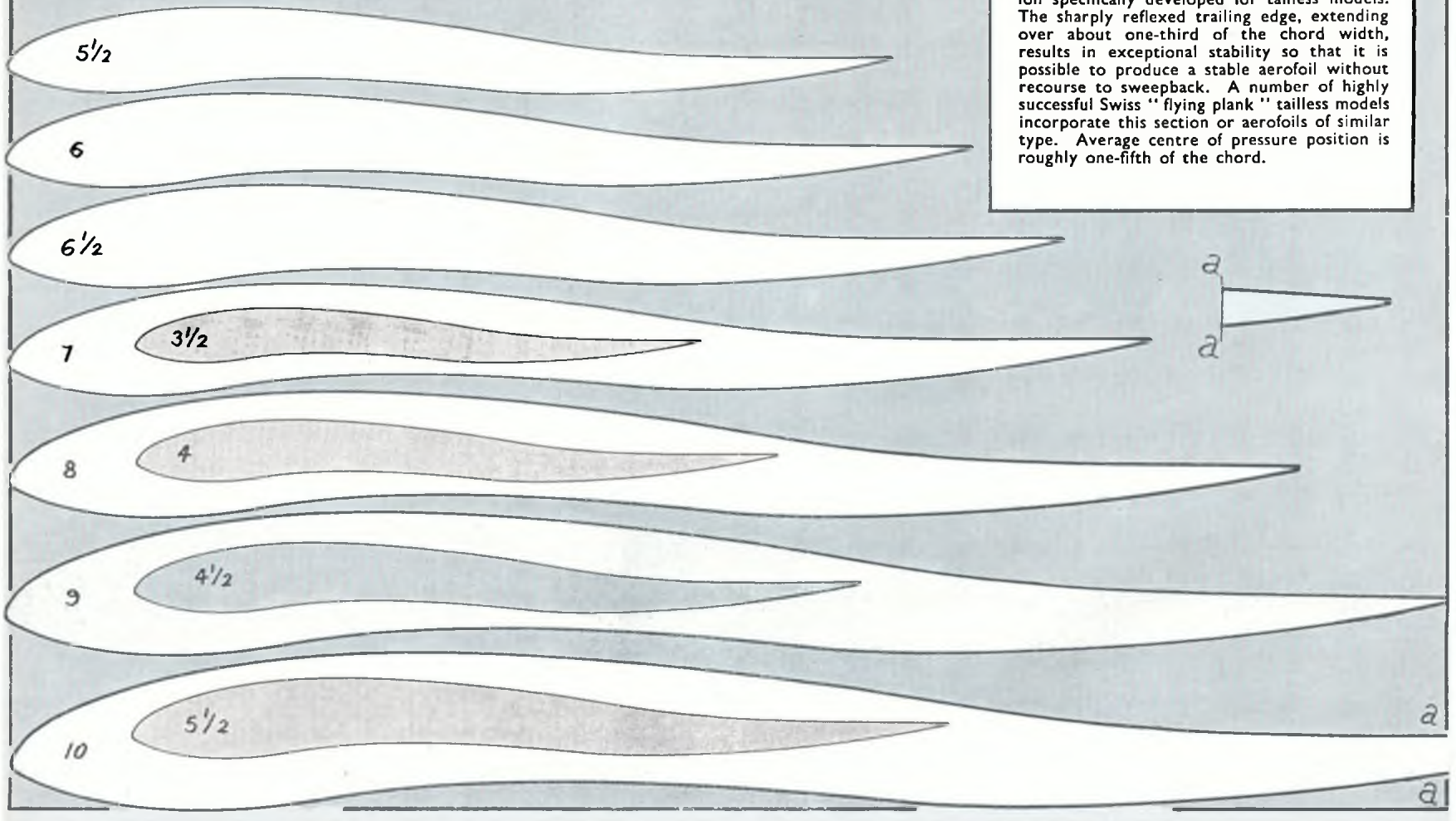
Full size metal-covered aircraft, of course, do not always have a plain metal finish. Many are, in fact, painted to provide a protective coating (aluminium being about the lightest possible " protective " covering). Since, with practice, metal " skinning " is no more difficult than getting a really good paint finish on a solid, there is no reason why a metal-covered prototype should not be " metal covered " and then painted in appropriate fashion. It will be a quicker process in the long run for the number of finishing coats required will be greatly reduced. Also, with metal covering, you are working over a perfectly smooth surface to start with which will not absorb dope, as even grain-filled balsa wood will do.

Although the metal skinning of solids was originally attempted only on an experimental basis the realistic effect achieved right from the first model tried was so outstanding that there appears immense possibilities for the method in this field. The use of metallised paper in preference to other alternatives, such as aluminium foil or tinfoil provides a more durable working material which can be handled without extravagant care. Also, and equally important, is the use of a suitable adhesive. After that, apart from the basic techniques described, success is largely a matter of practice—which can only be achieved by trying it out for yourselves.

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

S.I.

This odd-looking section is actually an aerofoil specifically developed for tailless models. The sharply reflexed trailing edge, extending over about one-third of the chord width, results in exceptional stability so that it is possible to produce a stable aerofoil without recourse to sweepback. A number of highly successful Swiss "flying plank" tailless models incorporate this section or aerofoils of similar type. Average centre of pressure position is roughly one-fifth of the chord.



Club News

AND NEWS FROM THE S.M.A.E.

"YORKSHIRE EVENING NEWS" RALLY

Contest Rules

Open Rubber: Two flights; 4 min. max.
Open Power: Two flights; 4 min. max; 15 sec. engine run.
Open Glider: Two flights; 4 min. max.; 164 ft. towline.
Concours: Class 1: Freelance F/F; qual. flight 1 min.
Class 2: Scale F/F; qual. flight 30 sec.
Class 3: C/L; qual. flight—level flight and landing.
Chuck Glider: Three flights per entry fee.
Combat: Full rules in programme.
T/R.: Classes "A" and "B"; S.M.A.E. rules.

Entry forms are obtainable from "Y.E. News," Trinity Street, Leeds, 1. Programmes from the same address at 6d. each.

EAST ANGLIAN AREA

The Clerk of the Weather took compassion on East Anglian Area modellers, when the Areas' Gala Day was held on Waterbeach Airfield on Sunday, July 11th.

By way of a change the sun shone brightly, and there was hardly a breath of wind. Busiest man on the field was Cambridge club secretary, Mike Gates, who took it upon himself to sell ice-cream and iced-lollies. The whole time he was doing a roaring trade.

Main idea of the gala day was for the Area clubs to "get together," although one ulterior motive was to help boost Area funds! George Foden, Area Secretary, explained: "The rally will act as a finish to this season's events before we get down to choosing the teams for the '55 eliminators. It is also a rally where the 'also-rans' can have a chance to shine."

Flying was of a high order, and "maxs." were the order of the day. Model after model went o.o.s. very quickly, so strong were the thermals.

Main attraction was the contest for the East Anglian Area Scale Trophy. This was the third year of the event and attracted a reasonably large field. Entries ranged from an Avro 504K to a super detailed Westland *Widgeon*.

Nearly all the entries took the air; prettiest flying coming from K. Lock's *Luton Minor*. Ken, by the way, is a R.A.F.-M.A.A. member.

Other contests were run for power-duration, rubber and glider. J. McCarthy proved the Scale Trophy winner, whilst D. Willmott walked away with the rubber event. Top powerman was again D. Willmott and B. Lavis scooped the glider event.

N.E. SCOTTISH AREA

Scottish Power and Rubber Nats. (S.A.A.) Held at H.M.S. "Condor"

Competition times were very close as weather was favourable.

Entrants came from as far as Paisley, Lanark, Glasgow, Fife, Edinburgh, Dundee and Montrose. Spectators came from as far as Aberdeen.

Power event was won by J. McMaster, with his fast-climbing Frog 500 glo-powered version of *Toreador*.

Rubber was won by conventional light-weight designed by R. K. Burt, Glasgow.

Few of the standard designs were in evidence. Prevalent own-designs were pylons in the power and the usual mixture of light-weights and near-Wakefields graced the rubber.

Two free-wheel Montrose Wakefields suffered motor breakages before the first round with the usual pathetic results.

Third power man, Whyte, had Frog 500 *Pathfinder* which D.T.'d accidentally during the climb of the first flight. An extensive repair job proved that it is worth while to be prepared for anything. After the addition of a temporary u/c (skids not enough for r.o.g. without wind), this high T.L. job belied its strange appearance by flying well.

We saw one pylon job disintegrate in mid-air, the fuselage hurtling down under full power in traditional manner. There were few other serious prangs, although two competitors were going through wooden airscrews like chopping firewood!

Montrose acted host club, running this all-r.o.g. comp.

Results:—

	Three flight total
Power	
1. J. McMaster (Glasgow) ..	.. 9 : 29
2. J. Clark, (Glasgow) ..	.. 4 : 51
3. K. B. Whyte, (Montrose)	.. 4 : 49
Rubber	
1. R. K. Burt, (Glasgow) ..	.. 7 : 22
2. J. Findlayson, (Glasgow)	.. 5 : 38
3. D. L. Petrie, (Montrose) ..	.. 5 : 17

After the cash prizes and handsome pennants were handed out to the above, besides a large item of hardware to McMaster, competitors were conducted through three hangars, where, besides lots of engines, nine different aircraft were on show. We were very interested in an *Avenger* and a prototype *Balliol*, the latter had its prop-blades folded up like a lightweight model on the glide, as it had done a wheel-up landing.

WORKSOP AEROMODELLERS

The contest side of the club's 1954 activities has been weakened by a number of modellers going over to R/C and full size gliding, but nevertheless, the control-liners have continued to keep up their tradition of "one place per meeting." Pete Russell had a good model (his new E.D. 246 "334" design) but two years without practice told and he could do no better than fourth in the "Gold" Trophy. At Woodford Bridget McCann's ancient, but still smart *Fast Cat* took third in the class "A" T.R., in spite of losing some 50 sec. when an opposing pit crew got in the way. At the Sheffield meeting, with a strange crew, the same model was second, qualifying for the "Davies." Combat activities have been much marred by the activities of a certain Northern club who insist on doing the shakiest imaginable aerobatics often resulting in disaster for themselves and opponents. Perhaps they like building new models, we don't.

THE HORNCHURCH M.A.C.

This year the annual competition for the Jackson Challenge Trophy was an "All-In" event. Held in calm evening air, the rubber jobs again proved themselves very much in the ascendancy. D. Thompson's super lightweight romped home to a comfortable win with E. Hodges taking second place with a new-rule Wakefield.

P. Fraser was unfortunate to lose his very consistent lightweight on a test hop, but with the consolation of pushing up the club record to 10 min. 33 sec.

MONTROSE M.A.C.

We made the 120-mile journey to Lanark on Sunday, July 11th, for the Scottish U.K. Challenge elims. Weather was warm with little wind but the flying ground was a small hilly golf course surrounded by fences, trees, a lake, field-with-bull, ditches, cornfields and all the things that make model flying difficult. Only three flew in the rubber comp so it was not a very great task for Montrose to get a 2nd place The Glasgow lads assured us that this was their nearest flying ground—they have our sympathy

Recent achievement was the president's power job landing on the roof of the gas-works. Meanwhile we are all on P.A.A. models for the Strathmore 1 c.c. event next month.

SUNDERLAND AND D.M.A.C.

With the competition season now well underway the latest man to get his name in the news is Mr. Summers, who won the half A team race.

Although interest in team racing is sadly lacking in a club of this size, enough members turned up for a competition to be held and Mr. Summers put up no mean performance in the centre.

Lost models seem to be all part of the day out at the moment. Over six models were reported missing including Les Clarke's beautiful pusher model which was on one of those test flights from which there is no return.

Plans are already afoot for the rally at Croft Aerodrome, and a bus has been arranged for the Sherburn Rally. Judging by the applications for seats the Sunderland boys will certainly be there in strength.

FORESTERS (NOTTINGHAM) M.F.C.

The Foresters' team-race circus took the two class "A" models, which placed 5th and 6th at the Nationals, along to Woodford, and duly flew them into the first two places. Both mods. had jammed contra-piston levers and were over-heating badly; the upright job turned over on a test run, and made the lever unmovable, and the inverted job wiped its lever off completely on a heavy landing. As a result, the winning model was reduced from its usual 55 laps at 85 + to 77 laps at about 70 m.p.h., thus it did the 200 laps with two stops in 10 min. 8 sec.

The previous day, Spilsby C/L rally was visited, and the boys returned with first in both "A" and "B."

Geoff Pike had another go at the elusive world record with his R/C 'plane, and on the third attempt raised 1 hr. 40 min. 45 sec., which beats the Russian claim by some 9 min.

WARE & D.M.A.C.

Gliders are receiving a good deal of attention at present. At an evening competition for the open glider cup, E. Banks won in somewhat turbulent conditions with 5 : 13.

A week later, at Debden, perfect thermal conditions were encountered. D. Ling

MODEL AIRCRAFT

CONTEST CALENDAR

Aug.	20/23rd	**WORLD CHAMPS. C/L SPEED.** The Hague.
,,	22nd	**Croydon Gala.** Chobham Common.
,,	22nd	**South Midland Area Rally.** Cranfield, Nr. Bedford.
,,	29th	Decentralised. **KEIL TROPHY.** Unr. Power. **FROG JUNIOR CUP.** Unr. Rubber/Glider.
,,	29th	**R.C.A.F. R/C Rally.** N. Luffenham, Nr. Oakham.
Sept.	5th	4th *YORKSHIRE EVENING NEWS* **Rally.** Sherburn.
,,	19th	Area. **GUTTERIDGE TROPHY.** 1st 1955 Wakefield Elim. **"MODEL ENGINEER" CUP.** Team Glider.
,,	26th	**All Britain Rally.** Radlett Aerodrome, Herts.
Oct.	3rd	Area. **K. & M.A.A. CUP.** 1st 1955 A/2 Elim. **HALFAX TROPHY.** 1st 1955 Power Elim.
,,	17/19th	**INTERNATIONAL GLIDER, POWER & TEAM RACE, CONTESTS.** Spain.

S.M.A.E. CONTESTS IN CAPITALS

raised the open glider record to 8 : 41. An hour later E. Banks raised this to 10 : 07, flying his open glider cup winner—an O/D 11 oz. A/2. This record stood for a few minutes until F. Hills raised it to 18 : 09. His model, another underweight A/2, was towed aloft trailing a foot of D/T fuse. It finally vanished into cloud and was not seen again.

Still very much in the glider class is D. Ling's *Seraph* A2 with an Allbon Dart strapped on to the wing. This model has turned in some very fine flights. Its climb is slow but steep and its glide almost unimpaired by the motor.

WALLASEY M.A.C.

Our secretary, John Hannay, having returned from the A2 contest in Denmark, we are all infused with new ideas and modifications for our A2's, one of these is the use of more hardwood. We are greatly impressed by the standard and price of Danish kits—in particular that of Hansen's 1953 winner, and also by the account of the celebrations associated with the contest —but not by the weather !

The club was this year again successful at the Clwyd Slope Soaring meeting when Len Hutton won the A2 event with a flight of 14 : 39—this member is supposedly a confirmed power addict ! Also at this meeting John Done did a flight of 2 : 40 with an A2 flying plank tailless and is hopeful of obtaining a British and world record for this class (hand-launch).

SOUTHAMPTON M.A.C.

The glorious Langley weather provided an ideal day of rest for non-competing club bods, the oldest member snoozing peacefully throughout the day in the coach. Members who ventured into the sunshine—and the comps.—met with varying degrees of success, Mike Ingram bringing home the helicopter trophy with his Jetex job, whilst Pete Cock returned early from the rubber event with a broken motor—and a very bent Wakefield. Our T.R. efforts were unique only in that all three entries lived to return unscathed—and that Albert Silvey's O.D. Eta 29 job survived until the semi-finals.

The second round of the club T.R. league has been postponed again. Can this possibly have anything to do with the fact that the organisers' very hot B job has mysteriously disappeared—or vice-versa ? . . .

BRADFORD M.A.C.

The irrepressible Silvio was our only representative at the Nationals; after premature engine stoppage had ruined his first flight, he pulled up on the others and made 22nd place in the Sir John Shelley with the "Torp"-powered F.A.I. model which he has used to such good effect this season. At the Woodford *Daily Dispatch* Rally, however, Bradford did quite well; C. P. Miller and son Adrian both achieved double maxs. in the rubber contest, and both temporarily lost their models. Later, in the fly-off, C. P. Miller was third and won a barometer, whilst S. Eckersley, flying in both power and glider events, finished senior rally champion and was awarded a very handsome 17-jewel wrist-watch. J. A. B. Pannett's *Hogan* spent the day in a tree !

But the rest of the month, alas, is a tale of woe—since the last report went to press no less than three club competitions have had to be postponed owing to the appalling weather. One of these should have taken place in conjunction with the Hamley Trophy, but this day was perhaps the most discouraging of all; it blew, and it rained, and it was cold. Silvio being on holiday and Arthur Collinson unable to attend, J. A. B. Pannett was the club's only entrant; by some miracle his *Sun-de-Hogan* put up an aggregate of 8 : 06, this total including one maximum.

SIDCUP AERONAUTICAL SOCIETY

The Sidcup Aeronautical Society boys have visited several team race meetings this season claiming three firsts, one second, and one third in Class B so far. Peter Denyer with the standard "29" Eta powered model, flying at 98 to 100 m.p.h., narrowly missed first place at the Northern Heights. His heat time of 3 min. 20 sec. is apparently faster than any at this year's Nationals.

The club membership is now at 65 after a number of people from the Wraiths M.F.C. joined up with us.

BUCKSBURN MODEL FLYING TEAM

Two members, C. M. Christie and U. A. Wannop, have each managed a B.Sc. with first class honours, the former at Aberdeen and the latter at Edinburgh. They let off their pent-up energy at Bucksburn the following week, flying their rubber designs. They lost both models at 8 : 15 and 10 : 0 o.o.s. The one that did 10 : 0 was lost completely, last seen going up.

Wannop has also raised the local chuck glider record to 50 sec. He also won the rubber section of the S.A.A. Caledonian Shield with an aggregate of 8 : 20, flying this time, for the Edinburgh club.

Bucksburn recently signed on four new members and the enthusiasts whom we *know* live in the Aberdeen area are recommended to join and make this S.M.A.E. club a strong one.

Bill Watson, who is somewhere south in the R.A.F. had all his models pranged at once in a lorry crash, but he himself escaped.

MEN OF KENT AEROMODELLERS

In this, the first report for some time, I have decided to give a brief outline of the club and its activities. The club is a small one, the membership being only eleven and of these, one is in Malta, one is a B.B.C. engineer with little spare time, and a third, an ex-Devizes member, has not been heard of for a number of months.

To add to this our flying field is far from ideal, being large enough for sports flying but not for out-and-out contest work.

The main trend is towards A/2s, and since the loss of Mike Green, the winner of the Weston Cup, we have only one really active rubber modeller in our ranks. Contest power seems to have lapsed although we have two R/C addicts in the club.

To finish may I add that we are in search of a bigger and better flying ground, and will warmly welcome any keen newcomers.

SOUTH BIRMINGHAM M.F.C.

The club gave its first demonstration this year at the Brooke Sports on Saturday, July 3rd. The show went off quite well in spite of a strong wind which made flying very difficult. There have been several nice twin-engined scale jobs at the club's Allens Cross Flying Ground lately, including a couple of *Avengers* and a Percival *Prince*. Our worthy competition secretary, Ken Ashman, has recently discovered the thrills of streamer cutting. He was down at the field for a spot of team race practice one evening when someone persuaded him to tie a streamer on to his Class "B" racer to dice with a clubmate's stunt job. Never was such supreme satisfaction shown on a man's face as when Ken landed with a couple of feet of streamer wrapped around his crankshaft. The club has issued an ultimatum to certain junior members—Build a model or leave the club. The committee has selected a simple glider design (K.K. *Dolphin*) as a test model and several are now

The very strong Loughborough College contingent seen in good spirits at the A-2 trials this year at Wittering.

AEROBODS OF NOTE

GEORGE FULLER

One of the country's leading exponents in "power." 2nd in World Power Championships, 1953. He grins—and flies. Does both exceptionally well.

under construction. Competitions will be held later for workmanship and flyability. We hope by this means to weed out those youngsters who have no real interest in aeromodelling and who simply make a nuisance of themselves on club nights.

MEANWOOD INDEPENDENTS

At last—a bit of co-operation between our Leeds and Derby "branches"! Both are currently working on a new hot "Combat" design by master-mind Rob "K.K." Gibbard. The prototype was greatly admired by the Leeds boys (a very unusual state of affairs!) when they saw this Derby machine, and as a result, several mods. of it are under way. The usual features are included (i.e., "B.B.", four engine bearers, and the *Kombat Kapers/Ker* type wings) but *aft* of the wings, it is quite different—again! The name? *Kublia Klahn* (!)

The boys were "in their glory" when they were permitted a tour of one of Britain's best known model engine manufacturers. Needless to say, quite a bit of new knowledge was accumulated.

We would like the fact that we believe we have the hottest T.R. yet built to be published, in the hope that someone will "take us up" on it! This particular effort is a new hot-job in our 10 c.c. class, powered by a new McCoy .60 Series 20.

By way of contrast we believe we have the ugliest F/F job (appropriately named *The Monster*). A 3-in. nose a 3-ft. moment arm, high tailplane, "sort of" midwing of low A/R, tip dihedral and a beautiful wing loading! It was designed (?) for slope soaring in windy weather (it will never be windy enough!)

SECRETARIAL CHANGE

West Yorkshire M.A.S., Mr. E. Humphrey, 9, Kilpin Hill Lane, Staincliffe, nr. Dewsbury, Yorkshire.

S.M.A.E

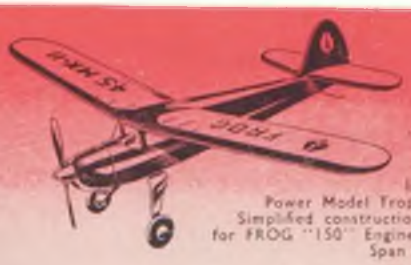
CONTEST RESULTS

HAMLEY TROPHY

1.	C. Marsh	St. Albans	10 : 23
2.	D. Painter	Henley	9 : 47
3.	J. McMasters	Glasgow M.A.C.	9 : 29
4.	A. Muse	Novocastria	8 : 47
5.	J. Waldron	Henley	8 : 41
6.	J. Pannett	Bradford	8 : 06
7.	T. Christer	Novocastria	7 : 53
8.	C. Plant	Stockton	7 : 51
9.	G. Ford	Novocastria	7 : 35
10.	R. North	Croydon	6 : 50
11.	C. Peacock	Novocastria	6 : 08
12.	P. Wyles	"	5 : 22
13.	K. Whyte	Montrose	4 : 29
14.	J. Parrott	Whitefield	4 : 45
15.	E. O'Brien	Novocastria	4 : 16
16.	F. Chatwin	Birmingham	3 : 45
17.	W. Whittall	"	3 : 30
18.	S. Gibbons	Exeter	3 : 10
19.	F. Nixon	C.M.	2 : 55
20.	G. Rogers	Exeter	2 : 50
21.	E. Horwich	Whitefield	2 : 00
22.	D. Willars	"	—

FROG

TRADE MARK



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Whether you are an expert wanting a powerful control-line stunt model or a novice who requires a rubber-powered " first " model you will find that Frog makes what you want—and makes it well ! FROG make so many there is bound to be one to meet your requirements—so buy a FROG kit today and be glad you did !

FROG "ZEPHYR" Semi-scale Cabin Power Model for FROG "50" Engine. Span 33" 10/6

FROG "VANFIRE". Aerobatic C/L Kit for "500" Engine. 40" Span. 28/-.

FROG "VANDIVER" MK II Aerobatic Cabin Monoplane kit for "150" Engine. 27" Span. 14/6.

FROG "MIRAGE" A Team Sports-Racer for "50" Engine. 15" Span. 10/6.

FROG "FOX" Pylon Duration Power Model for "150" Engine. 40" Span. 14/-.

FROG "MINX" Cabin Model Kit. 30" 8/6

FROG "FIREFLY" for "150" Engine. 36" Span. 16/6.

FROG "VESPA" Sailplane. 30" Span. 6/9.

FROG "WREN" Sailplane. 25" Span. 4/6.

FROG "MAMBA" Rubber Powered Fighter 19" Span. 7/6.

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FROG "SPORTY" 12" Span. 3/6.

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FROG "SPEEDY" Span 11" 3/6.

FROG "LINNET" 18" Span. 4/11.

FROG "WIDGEON" 18" Span. 4/11.

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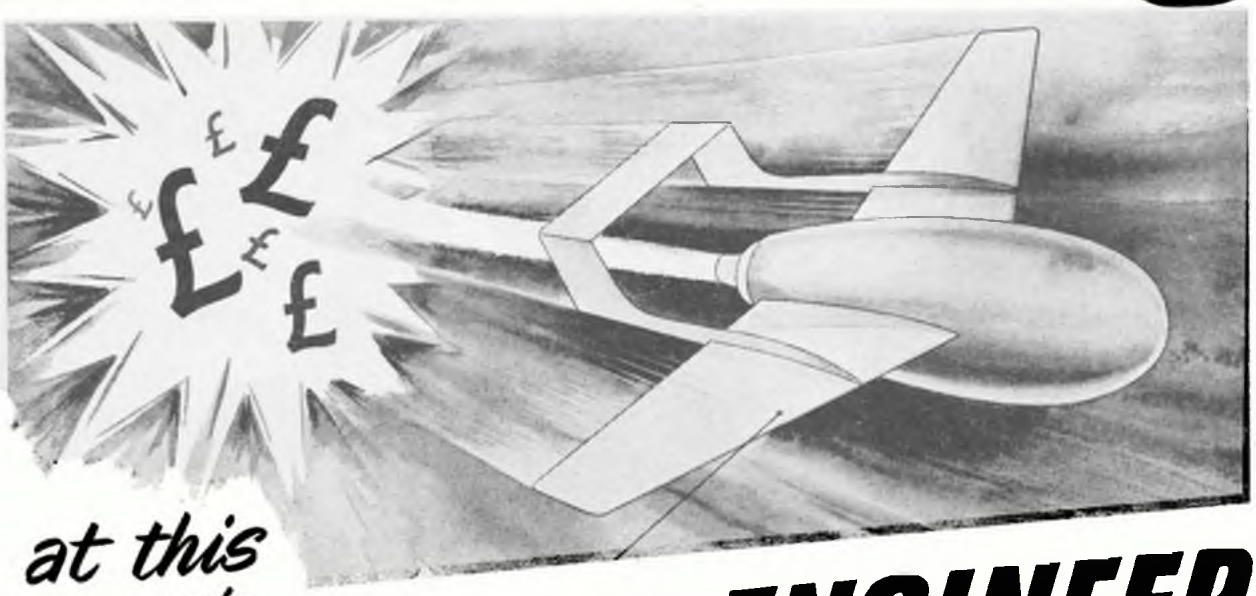

at this year's

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Conditions, briefly:—

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AIRCRAFT. 18 in. wing span limit. 6 oz. when loaded. Hand launching allowed.

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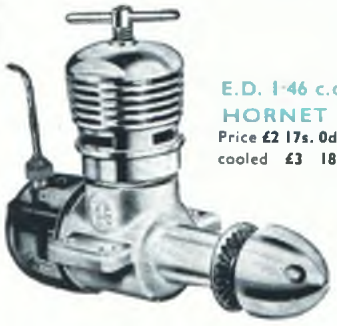

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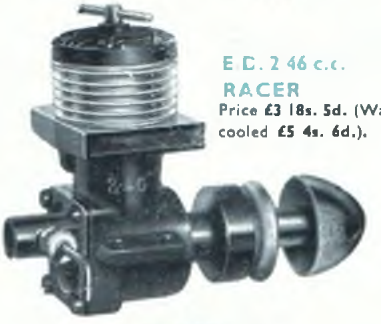

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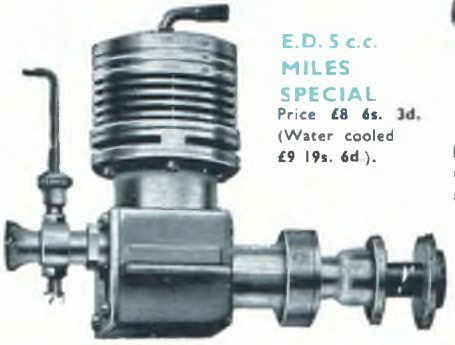

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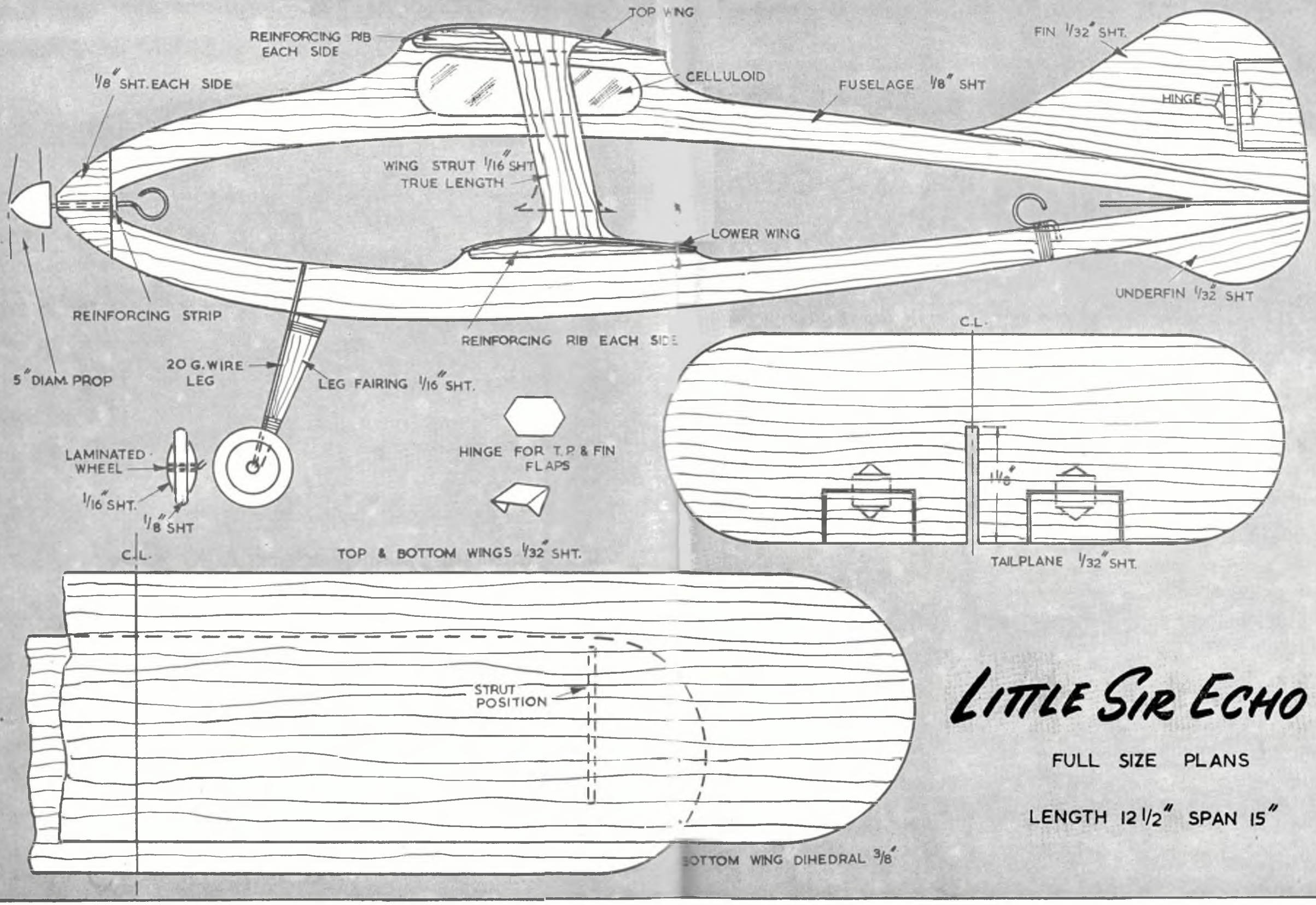

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