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Incorporating
"THE MODEL AEROPLANE CONSTRUCTOR"

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CONTENTS

EDITORIAL.—All communications should be addressed to the Editor, THE AERO-MODELLER, Allen House, Newarke Street, Leicester, and contributions must be accompanied by a stamped addressed envelope for their return in the event of being unsuitable. Whilst every care will be taken of MSS. submitted for consideration, the Editor does not hold himself responsible for safe keeping or safe return of anything submitted for his consideration.

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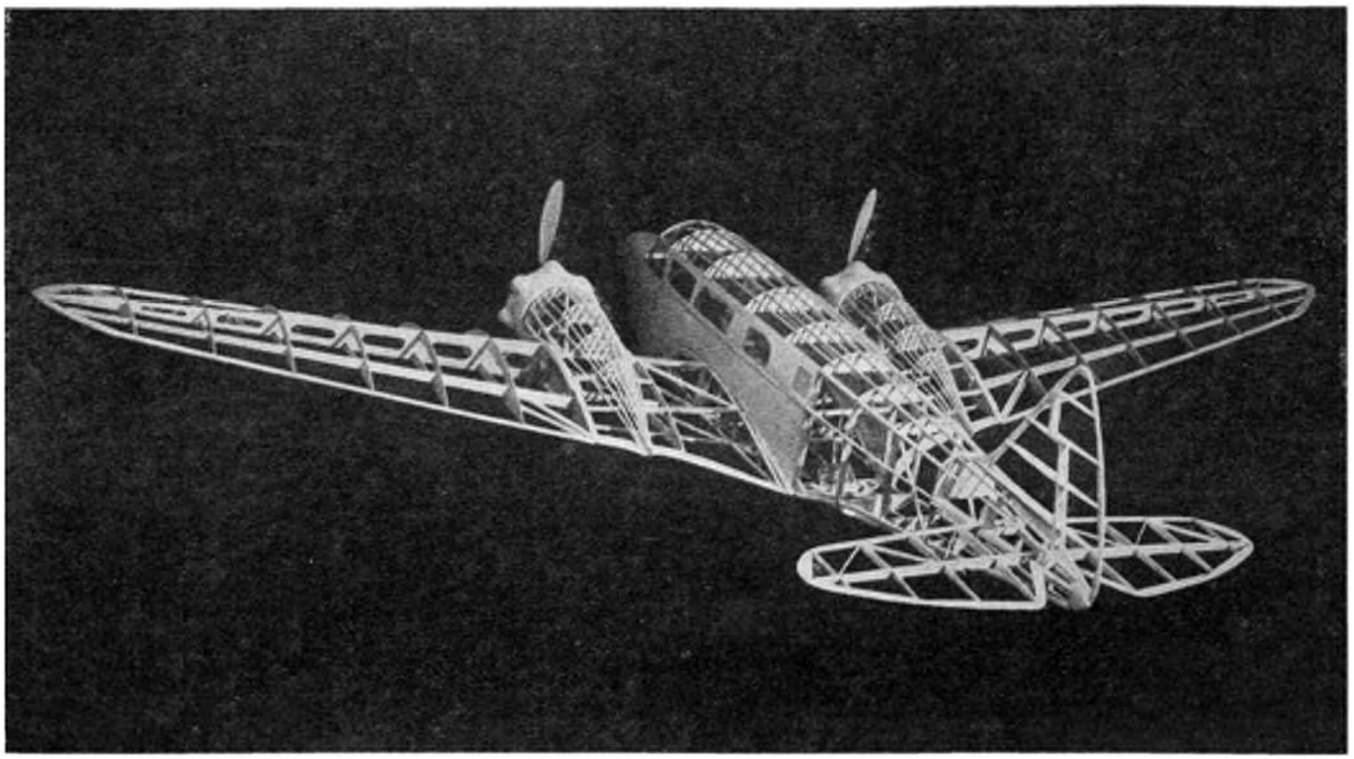
THE AIRSPEED "ENVOY"



Span 54 ft., length 34 ft. 6 in., height 9 ft. 6 in. Weight empty, 4,340 lb.; weight loaded, 6,600 lb. Performance, 200 m.p.h. at 10,000 feet. Climb to 10,000 feet, 8 min. Cruising range, 620 miles.

By the way! Readers should not think we have forgotten that THE AERO-MODELLER *deals solely with model aeroplanes—the description above is simply of the full-size aircraft. The photo above is of a 1 in. flying scale model—in fact, Mr. J. H. Tourner's latest effort.*

Our front cover picture shows Mr. L. Dalton, of the Park Model Aircraft League, with his petrol 'plane coming in to land.

(Photo: Capt. J. Bland).

JANUARY, 1939
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Tel. Leicester 65322

The AERO MODELLER

INCORPORATING THE "MODEL AEROPLANE CONSTRUCTOR"

EDITORIAL

E are privileged to print on this page a message to all aero-modellists from the patron of the Society of Model Aeronautical Engineers, Lord Wakefield of Hythe, and which was read out by Dr. Thurston at the dinner held on Saturday, December 10th last, by the Lancashire Model Aircraft Society, in Manchester.

Presided over by Major Allan Goodfellow, President of the Lancs Club, and honoured by the presence of Dr. and Mrs. Thurston, and Messrs. Houlberg, Hawkins, Cosh and York, officials of the S.M.A.E. (who had journeyed from London especially for this function), this dinner was attended by over 100 club members and guests.

Limitations of space and the urgent need to get this Editorial to press, preclude our giving a more detailed report of this important function in this issue, but in our next we shall deal with it fully.

Winter-time is, of course, *the* time for social gatherings, lectures and indoor meetings, and the " season " now seems to be well under way.

A few weeks ago we attended a lecture by Mr. L. H. Sparey, given to members of the Northern Heights Club, which we judge one of the finest we have heard, simply for the plain fact that the speaker really did know what he was talking about! Rather a quaint way of expressing ourselves, perhaps, and not to suggest that other lecturers *don't* always know their subject! But this speaker spoke only from his practical experience, the results of which he brought with him to show his audience; and he was therefore able to prove his case.

The subject was " Petrol Engines," and interested clubs might do a lot worse than obtain a " repeat " of this lecture—if the speaker is willing.

By the way, the Northern Heights Club is organising a Social Evening and Dance in January, full particulars of which are given in a note at the end of Howard Boys' article.

In this issue we are pleased to include several regular features from the *Model Aeroplane Constructor*, and to announce that they will continue each month. E. H. F. Cosh expresses *his* views on current topics; R. H. Bullock commences his series by a very useful article of importance to all glider enthusiasts; and " Freddie " delights his many " fans " by another of his priceless sketches. As to " The Moving Finger," the jolt of having to hop from one perch to another seems to have temporarily rather upset his (*sic*) nerve! However, we can assure his many followers that he, too, has joined THE AERO-MODELLER, and from our next issue onwards his voice will be heard in no uncertain manner. We would take this opportunity of stating that the rumour to the effect that the sex of the " Moving Finger " was such that a certain member of our staff might *fancy her* is incorrect.

Next month we shall be publishing plans of another large glider, over 6 ft. span, and also plans of a large rubber-driven model. A fine article by Van Hattum on " Model Aviation in Holland "; and the first of a series of articles on " Airfoil Sections," with large-size scale drawings of the sections, referred to. As we shall also have an important announcement to make, of interest to *all* aero-modellists, we trust that orders for this issue will be placed in good time, so that no one is disappointed.

THE EDITOR.

Wakefield House,
Cheapside,
London, E.C.2.

I am glad to avail myself of the privilege afforded me by the Editor to send a message of greeting to aero-modellers and model aeronauts wherever they may be.

The year that is ending has been an eventful one, with mingled success and failure. Although the Wakefield Trophy has been secured again by our friends in the United States, we ourselves have been successful in a dramatic bid for the trophy offered by the young King of Jugoslavia.

The renewed competition for these trophies, and many other activities, will make 1939 a year of great interest, during which I hope that the Society of Model Aeronautical Engineers will continue to give an enthusiastic lead to this splendid movement.

WAKEFIELD OF HYTHE.
5th December, 1938.

AERO-MODELLING IN PALESTINE

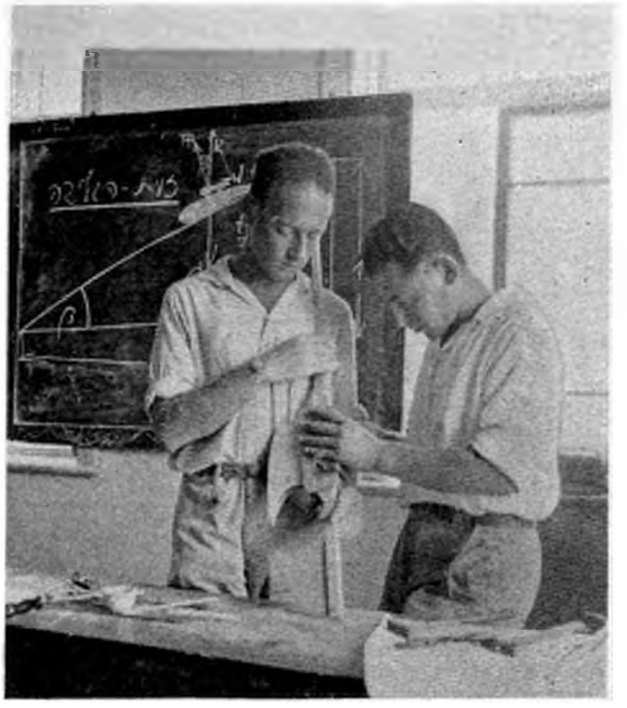
By LOUIS KATIN

MANY new inventions of the West have come to the Holy Land of late years, and, among these, aero-modelling and model-flying have taken a prominent part. Enthusiasm for aeronautics has seized the youth of the Jewish National Home, and, despite the state of insecurity which has existed in Palestine for the past three years, amateur aviators have continued to make progress.

This preoccupation with aerial matters is not new among Jewry, who gave the world one of the early pioneers in aviation. He was David Schwarz, a Budapest merchant, who invented the first airship to combine the three essential qualities of a rigid frame, aluminium construction and internal combustion engine. This airship flew from the Tempelhofer Feld in Berlin over the German capital on November 3rd, 1897, and was destroyed on landing. It was, however, the direct prototype of the Zeppelin, which flew for the first time three years later. At about the same time as Schwarz's dirigible was exciting comment, another Jew, named Fraenkel, started on a flight from Spitzbergen to the North Pole in the balloon of the Swedish explorer, Andree. He never returned from that expedition, his bones, and those of his two fellow-adventurers, being discovered only six years ago on an island in the Polar Sea.

Palestine's biggest social flying organisation is the Aero Club of Palestine, which encourages the formation of district clubs all over the country. Gliding clubs have been formed and have held contests under the patronage of the Aero Club, this sport finding especially favourable conditions in Palestine owing to the combination of unvarying weather conditions with suitable winds.

Model clubs have also been formed, most advanced of



these being at the Montefiore Higher Technical Institute in Tel Aviv, where qualified instructors teach the pupils aerodynamics and model-making as part of the curriculum for all classes, from the Fifth Form up. Although attendance at the courses is voluntary, very few pupils fail to take part. Competitions are held for speed and

technical achievement, and excellent work has been put in by the boys.

Model aviation efforts in Palestine are under the patronage of the Aero Club, which is engaged in establishing a course for the training of fully-qualified instructors, as the demand for instruction far exceeds the supply.

The course at the Montefiore Technical Institute carries on throughout the year, except at vacation time, and comprises lectures in the theory of aerostatics, aeronautics and construction of models, together with actual modelling, experimentation and demonstration of finished models. Original plans are furnished by the school authorities, while alternative plans are taken from English, American, German or Russian models. Weights vary from 7 to 24 grammes per square decimetre.

Mostly, material is of wood, with the addition of triplex about 0·4—0·5 mm., and covered with Japanese paper or cloth, either with or without the use of bamboo. Metallic models, however, using Electron metal and Dural aluminium, have also been built, and have proved excellent from every point of view.

One pupil has set up a record with a model glider, which flew for 3 hours 25 minutes. Unfortunately, it could not be seen after that time, and was lost, but this record has not yet been beaten for a pure thermal flight.

Another pupil, 16-year-old Touvia Sinai, built an iron model, which was lifted to a height of 120 metres by gun shot. This model was equipped with an automatic side-rudder, which made it curve after having lost the gun rope.

Motorised models built at the Montefiore Institute are, for the most part, equipped with elastic rubber motors. In one instance, a benzine motor was built according to Russian construction plans, but this model has not yet stood the test. So far the idea of building acrobatic models has not received much attention, as the pupils, whose ages range from 14 to 17, are too interested in the construction of tandem and tailless models.

Supported by the school management, competitions are held annually, at the end of the school year, and prizes are given according to the class and mode of construction.

From the accompanying photographs it will be observed that Hebrew is employed for the language of instruction. This is not remarkable, for all school children and the majority of adults in the Jewish National Home speak Hebrew as the medium of intercourse, although they come from countries all over the world.

Until the National Home was set up, Hebrew was used only in synagogues, and this meant that when it was applied to ordinary everyday things like motors, aeroplanes, and so on, a whole new language of technology had to be invented. Each year many new terms have to be introduced into Hebrew to keep pace with mechanics, and instructors in aero-modelling have many such terms to their credit.

The instructors for the Montefiore Institute's course of aero-modelling are Mr. Ulrich Breuer, who is also an instructor to the Palestine Aero Club, and Mr. Nahman Peraman, well-known civil engineer of Palestine.

Incidentally, it may be of interest to readers to note that the Jewish National Home has just built its own aerodrome at Tel Aviv, which is a handsome all-Jewish city situated on the Mediterranean. This is a municipal enterprise, and the company using it, called Palestine Airways, is a Jewish company, with influential connections in London, and " fathered " by our own Imperial Airways, who have acted as technical advisers and provided experienced pilots and ground engineers. A service using the five-seater Short Scion Junior 'plane, equipped with two 95 h.p. motors, now links Tel Aviv with the rest of the country and with Syria.

Worthy of note is that in the centre of the 800 metre by 400 metre runway of this Jewish aerodrome is painted the words " Tel Aviv " in Hebrew and English. This double legend is symbolic of the way in which Palestine's awakening interest and enterprise in aeronautics—model as well as civil—are linked with those of Great Britain.

And so *The Model Aeroplane Constructor* is no more. After a career of ups and downs, during which it has been dogged by lack of capital and poor advertising support, it has finally ceased publication as a separate journal and has been incorporated in THE AERO-MODELLER. It is some consolation to me to know that at least its name will thus be perpetuated, because I always had a " soft spot " for the M.A.C. Maybe it was the " Moving Finger's " pertinent paragraphs, but whatever it was I always looked forward to the next issue, even though when this would be was always problematical. I am pleased to learn from the Editor of this journal that he intends to retain some of the popular features of the *Constructor*.

Now that the 1939 Wakefield Cup Rules have been published all intending competitors in next year's Elimination Trials will know what they have to do. The proposals to make the contest proper a strictly team event was discussed by the council at some length, but the voting proved that there was little support from the affiliated clubs for this proposal. There is no doubt that abroad, particularly in the U.S.A., the winner of this competition is virtually considered as the world champion for that year. The view has been expressed by a number of leading aero-modellers in this country that it might be considered unsportsmanlike to make any radical changes in the rules until the cup has been won back by Great Britain, and there is certainly something to be said for this contention. In view of the undoubted popularity of the Wakefield Cup Competition as an international event, I feel sure that the majority will agree that we should leave well alone.

I was interested in the suggestion made by a writer in a contemporary journal that the Wakefield Contest should be confined to flying-scale models, but his arguments in favour of his proposal were hardly convincing. It is often said that the modern duration model is a flying freak, but I do not agree with this view. I can see no reason why Wakefield Cup models should resemble full-size aircraft—certainly the designers of both have entirely different objects in view. One might just as easily say that a Schneider Trophy 'plane is a freak and that all the entries in this contest should be designed on the same lines as ordinary single-seater private aeroplanes.

The open letter to the S.M.A.E. Council which was published in last month's issue, and which was written by a gentleman who prefers to hide his identity under the *nom-de-plume* " Enthusiast," deserves to receive no better treatment than is usually accorded to anonymous letters. *If* " Enthusiast " is a member of an affiliated club he should have endeavoured to obtain his club's agreement to place his views before the council through their delegate in the constitutional manner; they would then receive due consideration. Writing anonymous letters to the Press is *not* a " short cut." The official waste-paper basket mentioned by " Enthusiast " is put to good use in dealing with such letters. (Now, now, Mr. Cosh! As stated in my note at the beginning of " Enthusiast's " letter, his name *and* address is known to me. Any anonymous letter arriving at these offices would certainly be consigned to the W.P.B.—ED.).

How many clubs arrange a winter programme for their members? I know a good many do, but there are a large number of clubs who are apparently content to " suspend operations " from October to March each year. Such a policy spells certain doom, as it is vitally important that extra efforts should be made to retain the member's interest during the months when little flying can be done. I recently had occasion to send a circular letter to all affiliated clubs requesting them to send to me their members' views on a certain matter by a date a month ahead; when this date arrived only 50 per cent of the clubs had replied. Some clubs excused themselves by saying that they would not be holding a club meeting during the next two months. If I had the time available I should like to visit these clubs and endeavour to make them see the error of their ways. In many well-organised clubs the winter season is as attractive as the summer. Regular weekly, fortnightly, or at the most, monthly meetings, are held, at which lectures, work nights, jumble sales, ciné shows, etc., are arranged. These clubs are the shining examples that the others would do well to follow.

As there are probably some readers who have not read my page of chatter when it appeared in *The Model Aeroplane Constructor*, I should like to make it clear that any opinions which may be expressed are purely personal.

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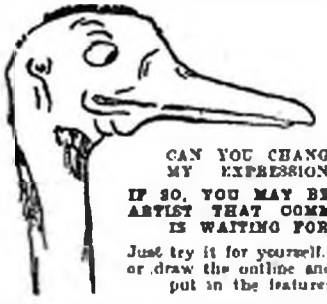

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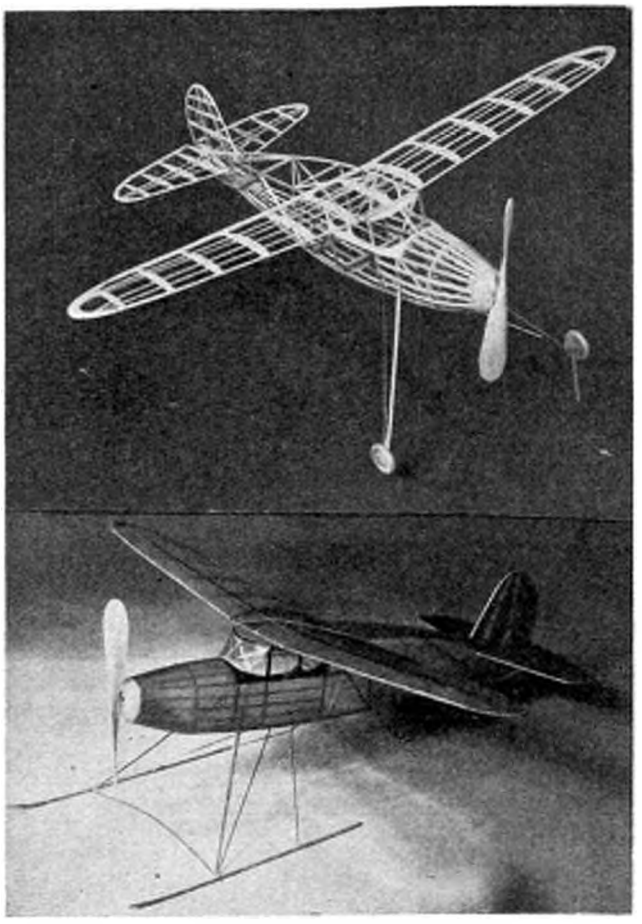


ON TEST— THE "SKEETER"

Built by JOHN KLEE

Report by OUR TEST PILOT

OF 86 in. span and 29 in. length, the " Skeeter " attracts attention on account of several features, not the least of which are the different types of landing gear available.

Supplied by Elite Model Airplane Supplies, of 14 Bury New Road, Manchester, the kit from which this model has been built is certainly up to the usual high standard we have before met in other kits from this firm; with the one exception, on this occasion, that we feel that the quantity of rubber supplied is rather on the small side, particularly for a model intended to be equipped with floats.

(NOTE.—We are remarking on the *quantity*, and not the *quality*, which was quite satisfactory).

The " Skeeter " is of American breed, which no doubt accounts for the quantity of rubber; since we have before noted, when examining other American kits, that the quantity of rubber supplied is rather on the small side.

However, no one having built this very nice-looking model would grudge the few pence necessary to provide the extra power required when flying off water.

As will be seen from the two photos of the model built by John Klee, the " Skeeter " has a quite realistic " scale " look about it; yet it is in no way difficult to build because of this.

A full-size plan, measuring 24 in. × 86 in., and containing close on 800 words of instructions, makes building easy.

The whole of the fuselage construction is from ⅛ in. square balsa, and with the aid of perspective sketches shown on the plans, may be carried out in a very short space of time. The main wing has an ⅛ in. square leading edge, and ⅛ in. × ½ in. trailing edge, with 1/16 in. thick ribs; and when covered is a sturdy job.

A nicely-turned nose plug and simple free-wheeling propeller shaft, fitted with anti-friction thrust washers, are fitted to a detachable noseblock.

The chassis legs are built of two pieces of bamboo, anchored where they pass through the fuselage and meeting in the lower centre portion of same. Spring steel wire bracings are carried back to provide additional support. This construction can be clearly seen in the photographs.

Two skis, each 15 in. long, may be fitted after removal of the 1½ in. diameter hardwood wheels, or, alternatively, a pair of floats, also 15 in. in length, may be fitted. These floats are built up with 1/16 in. square stringers on bulkheads of the same thickness, and are supported by the front (permanently fixed) chassis legs, and an additional pair of wire supports, which run down to the rear of the floats (or the skis).

The quality of all the material in this kit is very good, and there are ample supplies of dope, adhesive, cement, etc. Tissue in two colours is supplied, with black tissue as well, for cutting into thin strips and pasting on the fuselage, wings, etc., to " outline " the joins between the two colours of the covering tissue.

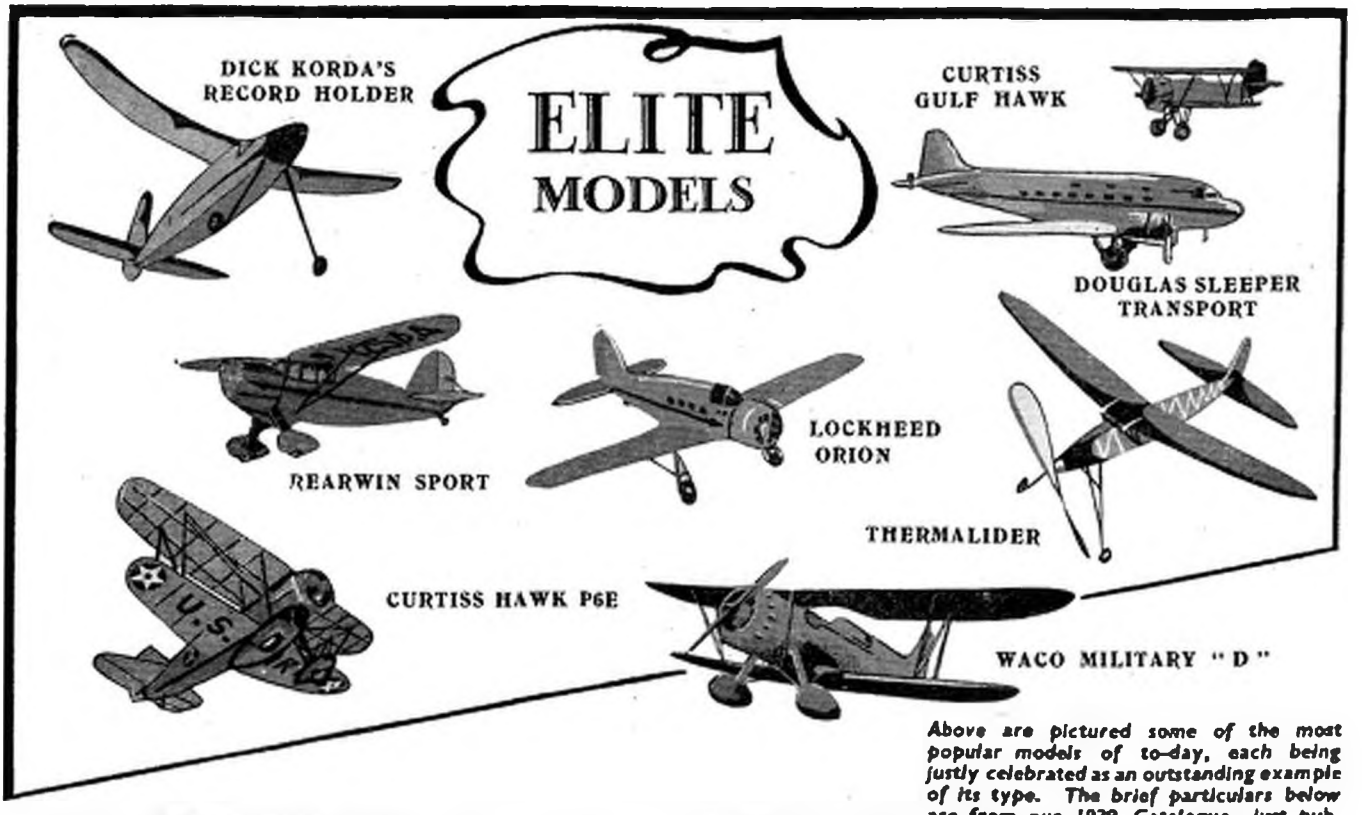
The flying performance of this model is definitely good, both hand-launched or R.O.G.—but as we have so far this winter been spared any snow in Leicester, take-offs with the skis could not be tried out!

The rubber motor supplied with the kit consists of a loop of ⅛ in. square, which, as already pointed out, is rather inadequate; but by doubling this quantity good flights R.O.G. were obtained. Thermals, or even warm air, being at this time of the year definitely *not* available, no duration records were broken!

For a rise-off-water flight the quantity of rubber was again increased, and made up to six strands, or three loops of ⅛ in. square, and with this power a good take-off was obtained.

The glide is good, and with a high wing there is no question of the stability being in doubt.

Summed up, the model is a good " all-rounder." There is nothing " freak " about the design, and obviously no attempt to produce a record-breaker. What has been attempted by the manufacturers is the production of a kit from which a three-in-one " general-purpose " model can be easily and simply built; and after building and testing this model I am of the opinion that they have succeeded—well.



Above are pictured some of the most popular models of to-day, each being justly celebrated as an outstanding example of its type. The brief particulars below are from our 1939 Catalogue—just published and post free to you for 2d.

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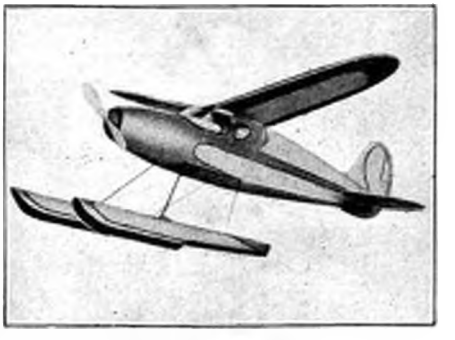
30-inch span. Douglas Observation, Mr. Mulligan, Boeing P26a, 1936 Stinson, Aeronca C70, Curtiss Gulf Hawk. 3/3.

36-inch span. Douglas Sleeper Transport; movable controls, retractable landing gear. Fine model. 12/6

50-inch span. Curtiss Hawk, P6e, Aeronca K, Ryan St. 6/6.

60-inch span. Fairchild 24. Two other models. Include 12-inch propeller, ready cut-out ribs and shaped cowl where needed. 9/6.

ON TEST



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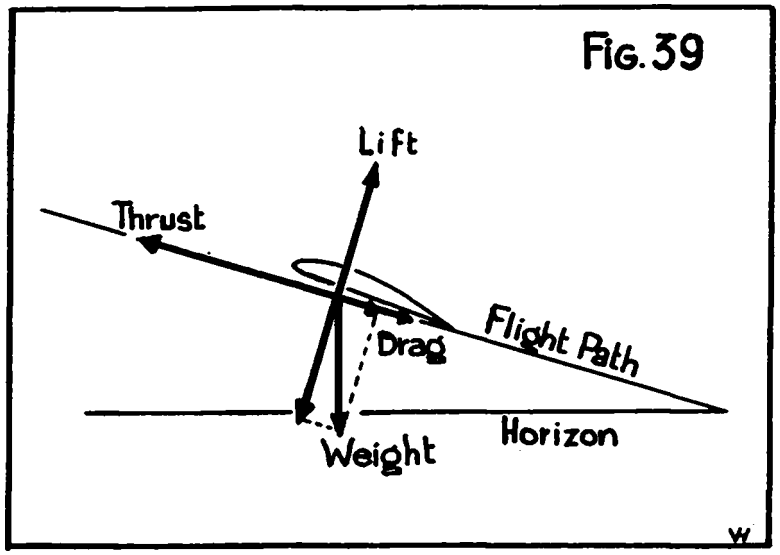


PART X

By J. VAN HATTUM, A.F.R.Ae.S.

SIMPLE AERODYNAMICS

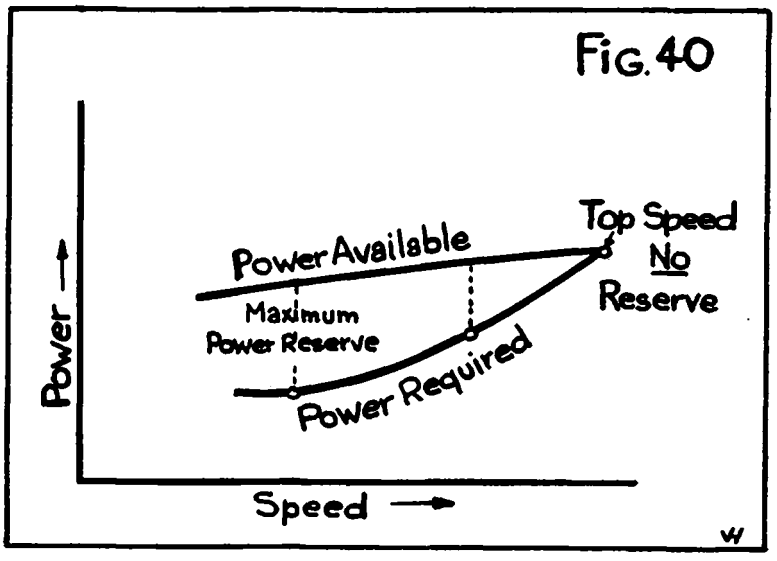
S a correspondent raises a point which I consider sufficiently important to deal with in this article, we will not continue with the airscrew, as stated in Part IX, but turn back to the discussion on stability, the more so as his question is very similar to others, often asked by aero-modellers. Briefly, the difficulty centres around the actual angle of the model to the flight path. He says: "If the wing is fixed to the fuselage at 8 deg., then the incidence should always remain 8 deg. When climbing, the incidence of the model is still 8 deg. to the flight path, which in itself may be inclined. But, unless the model climbs in a series of minute steps with the tail down, I cannot see the reason for the change of incidence, and, conversely, the apparent change in the glide and dive."

Now, we can split up the foregoing into two parts: One, which deals with the angle of incidence—that is the angle to the flight path; and two, how we can make the model assume different angles of incidence.

When dealing with angle of incidence, we must keep well in mind that this is only of importance in so far as it affects the lift of the wing. We know that increasing the incidence will increase the lift, very nearly proportionally, up to angles of about 8 deg. But not only the incidence, that is, the angle of the wing to the air-stream, determines the lift. We have also seen—in this connection I would like to refer readers to the previous parts of this series, especially the April and June numbers—that the lift is proportional to the *square of the speed*. Therefore, we can also *vary the lift by varying the speed; keeping the incidence the same;* but we can also, and this is important, obtain the *same lift at different speeds*, provided we stay within the range of minimum and maximum speeds.

For instance, a model aeroplane can (*a*) Fly level at cruising speed and angle of incidence of 8 deg.; (*b*) fly level at high speed and angle of incidence of about zero; and finally (*c*) nearly stalled at an angle of incidence of 10 to 12 deg. In all these three cases the lift must equal the weight or the model would either dive or climb. I will not enter into the practical difficulties which are encountered when we attempt to make the model fly properly in cases (*b*) and (*c*). Fast flying requires very careful adjusting, and the same applies even more to stalled flying. But most of us have watched aeroplanes being demonstrated, and seen them being flown across the aerodrome very fast, as well as slowly, with the tail well down. This would have shown clearly that the aeroplane flew level in all three cases, but at greatly different angles of incidence and speeds.

From the foregoing we conclude that the angle of



incidence—which is the angle to the air-stream, which is the same as the angle to the flight path —*may vary considerably during flight.*

Our correspondent holds the view that the angle of incidence remains the same throughout the flight, whether climbing, diving, gliding, or flying level. Once it is rigged to fly at 3 deg. it will always tend to fly at this incidence, and, therefore, he argues, will fly at an angle of 3 deg. to the flight path, whether this is horizontal or inclined upwards or downwards.

This, of course, could be done, but I will try to make clear that it pays to make the model climb at a greater angle of incidence. Admittedly I admit that an angle of 8 deg. is large indeed, and it was chosen mainly to illustrate the case for stability. For the average model we may take a smaller value, say 6 deg., but there are many high-powered models which climb at the angle mentioned. Let us see now what the balance of forces in the climb looks like.

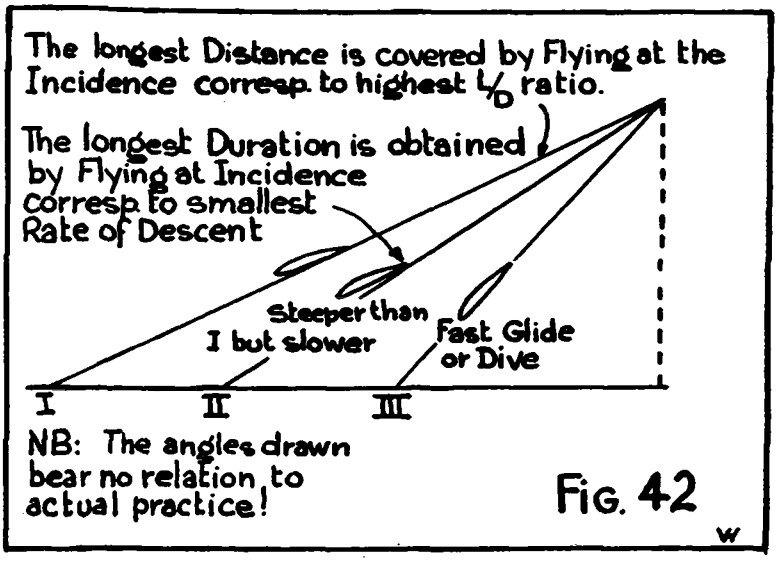


Fig. 42

This is shown in Fig. 39. The lift must equal the component of the weight perpendicular to the flight path. In cases where the flight path is steeply inclined to the horizon—and models certainly fall in this class—the vertical component may be appreciably smaller than the weight; about 85 per cent climbing at 30 deg. to the horizontal. But the component along the flight path must be added to the drag, which must be overcome by the thrust. In other words, to climb steeply we must have a great thrust. But part of the thrust is needed to overcome the ttotal drag of the model. *We can only climb*, therefore, when we have *sufficient excess thrust*, or as it is generally called, *reserve power.*

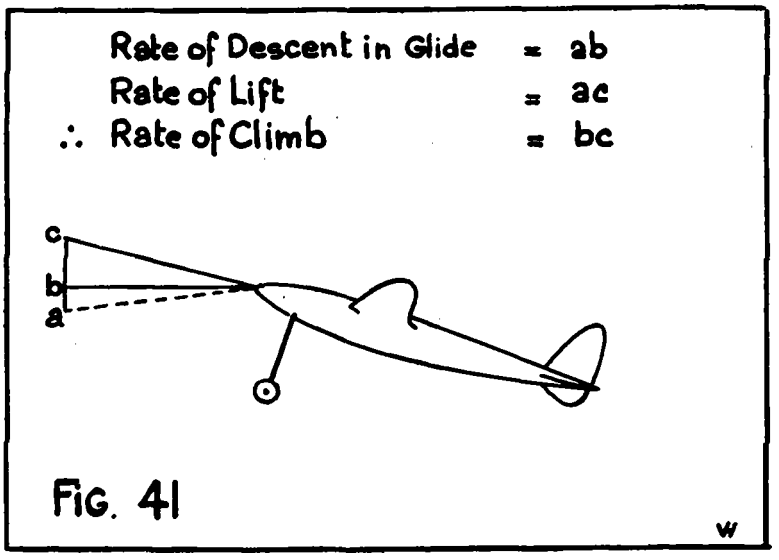


Fig. 41

Now, obviously, there will be most left of the available thrust when we fly so that the *thrust needed* for to overcome the drag is *smallest.* And this leads us to Fig. 40.

Here we see a graph where the required power is plotted against the speed. We find that the power required goes up with the speed, which is much as we would expect. Now, when we draw the power available curve we realise that the vertical distance between the two curves gives us the power that is not needed, in other words. the power reserve. From this it follows that we should try to *fly at the speed* where the *power reserve is greatest;* this will leave the *maximum power* for the climb. For every foot-pound per second of energy can lift a model weighing half-a-pound over a height of two feet per second.

Suppose we fly at a much higher speed. Then we can see in the graph that the power reserve is much less and the climb will be slower. (Measured, of course, in feet per second vertically). As we approach the intersection of the two curves this reserve gets smaller and smaller, until we come to a point where there is no more reserve and the model flies at *top speed*, in which case *all the available power* is used in *overcoming the drag.*

The reason why the model should not climb at the incidence of 3 deg., but at a higher angle, is that the former represents flight at more or less maximum cruising speed; in other words, it is flying near the higher end of the speed-scale and the power reserve is small. If we want to get a high rate of climb in this case we should have to increase the forward speed and therefore the thrust. This would bring in its trail difficulties with the design of the airscrew, which would have to be designed for a very large speed-range.

Another interesting way of looking at the problem is given in Fig. 41. We know that the model, when gliding, will descend a certain number of feet per second. The longest glide is obtained while flying at the angle corresponding to the smallest rate of descent. If we regard the power reserve as capable of lifting the machine a certain number of feet per second, then *the difference* between the *rate of lift* and the *rate of descent* will give us the *rate of climb.* This can be illustrated by means of practical example. Suppose one descends a rising escalator; then the speed at which one is going down corresponds to the rate of descent of the model when gliding. The speed the escalator is rising corresponds to the rate of lift and the difference; the speed at which one is borne upward corresponds to the rate of climb. Clearly the slower one walks and the faster the escalator is rising, the greater the rate of climb.

We must, therefore, fly at the angle corresponding to

the smallest rate of descent. And this angle is greater than the angle corresponding to the flattest glide; that is, the angle at the best L/D ratio. Now, the latter may be between 0 deg. and 3 deg., while the former lies higher, that is, nearer 6 deg. to 8 deg.

Finally, our correspondent wants to know *how* the model is made to change its attitude and fly at the larger incidence in the climb. For this I would like readers to refer to the November issue, where I have pointed out that one can arrange the thrust-line in such a way that the moment around the centre of gravity is positive, i.e. the incidence is increased. All this must be achieved by means of proper adjusting. Fortunately, the above holds not too strictly, and small departures from the ideal are not punished severely, especially if one is so fortunate to find a nice strong thermal! But the designers who succeed in fulfilling the conditions will be most certain of success.

BEGINNERS' FLYING SCALE MODELS—Part III

By HOWARD BOYS

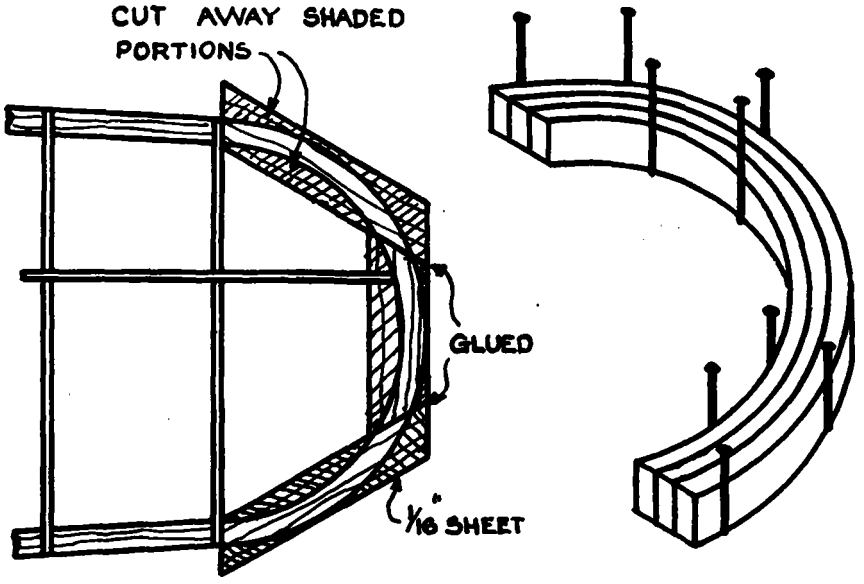


FIG. 13.

I FINISHED up the last article by saying that the undercarriage was completed, but it has since occurred to me that it would perhaps be as well if I said a little about the wheels and method of fastening them on before going any further with the model.

Most realistic wheels can be obtained, made either of celluloid or solid balsa, while for old-type machines, aluminium wheels look very good. The celluloid ones are, perhaps, the best for tail wheels, and the balsa ones may be used up front, due to their slightly greater weight. Remember we must keep the tail light, and even so we shall almost certainly have to add weight at the nose when finally trimming or balancing the model. The balsa wheels will need a piece of brass or aluminium tube for a bush to enable them to run freely. To stick the bush in, squeeze a little glue into the hole in the wheel and push the tube in. Then before the glue sets put a piece of wire through the tube and spin the wheel to clear out all glue from the inside.

To fix the wheel in position on the axle the best way is to wind on a few turns of tinned florist's wire and put on a blob of solder. A drop of oil on the axle first to lubricate it, will help to prevent the solder running down the axle and sticking the wheels. Also a piece of paper pushed on the axle between the wheel and the tinned wire is very good for preventing the solder running where it shouldn't. If you cannot manage soldering, bind on a few turns give a few brief instructions that will of thread and put on a spot of glue.

Soldering is almost indispensable where a really good model is concerned, and as I have often been asked about it I will perhaps help beginners. There is an old saying that is very true, that a job well prepared is half done. Really, I think the preparation is the most important part. The parts to be soldered must be perfectly clean, first using a file or emery cloth and then using a flux to chemically clean it. There are two well-known makes of flux—Fluxite and Baker's Soldering Fluid. I prefer Baker's for steel, but sometimes use Fluxite. Baker's takes more cleaning away after the soldering is finished. The soldering "iron" is really copper, and this must be tinned at the "tip." To do this, file the tip bright and smooth and heat the "iron," preferably in a gas flame or a clean fire (the red part) until it is just hot enough to melt a piece of solder on the clean tip. What is known by ironmongers as "Blowpipe" solder is probably the most convenient, as it is in sticks about $\frac{1}{8}$ in. wide. Well! dip the end of the solder in the flux and hold it in a clean tin lid or on a piece of tin and melt

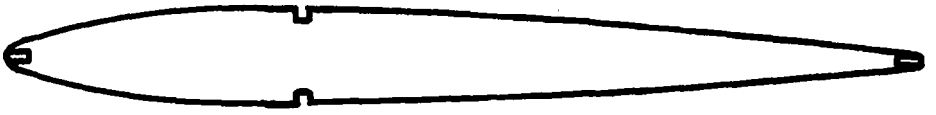
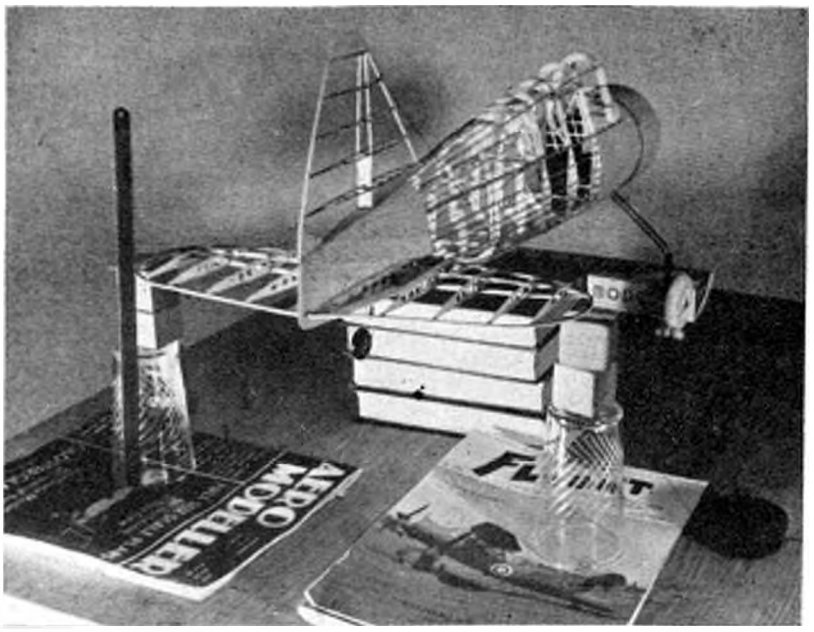


FIG. 14.

off a spot or two with the tip of the " iron." Then rub the tip in the solder until it is coated with solder or " tinned." If you have cleaned the tip well, and the solder does not run freely and stick on nicely, although it is running, dip the stick of solder in the flux, and put a spot on the tip of the iron. If this does not do the trick, the iron is most likely too hot. Avoid getting the iron too hot, as this takes the tinning off ; have it just hot enough to run the solder freely. It takes a little practise to get used to this. If the iron does get too hot, the only thing to do is to plunge it immediately into cold water and start tinning it all over again. The iron must always be kept well tinned, and if the tip seems hard when you file it, get it hot and plunge it into cold water. Never dip the iron into the flux, or in a short time you will find the flux eating into the iron just behind the tinning. The parts to be soldered also require tinning. After cleaning with file or emery cloth smear with flux and rub with a hot tinned iron, adding a little more solder if necessary. Put on as thin a coat as possible, and wipe away the surplus with a piece of rag. The tinned parts can then be held together, a spot of flux applied, and touched with a spot of solder on the tip of the iron. Hold the iron there just long enough to run the solder where required. When finished, clean away all flux with a damp rag, preferably while the job is still warm. Just one more thing—be very careful not to drop spots of hot solder on the carpet or tablecloth, or you will have the head of the household running you round with a rolling pin !



The fuselage of the 1-*in. flying-scale model of the " Lysander," rubber-driven, which Mr. Boys is now building.*

I said in my last article that I would deal with the

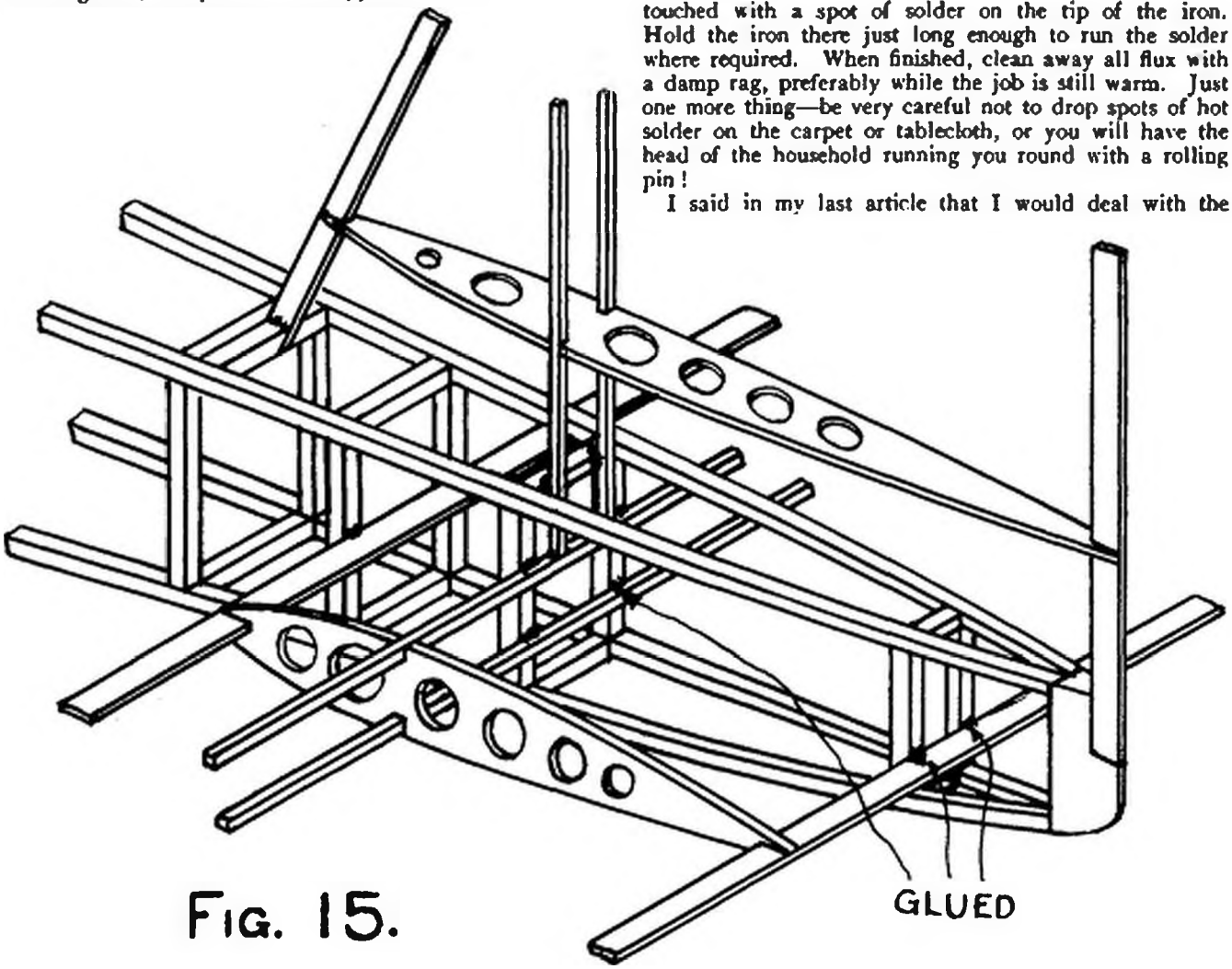


FIG. 15.

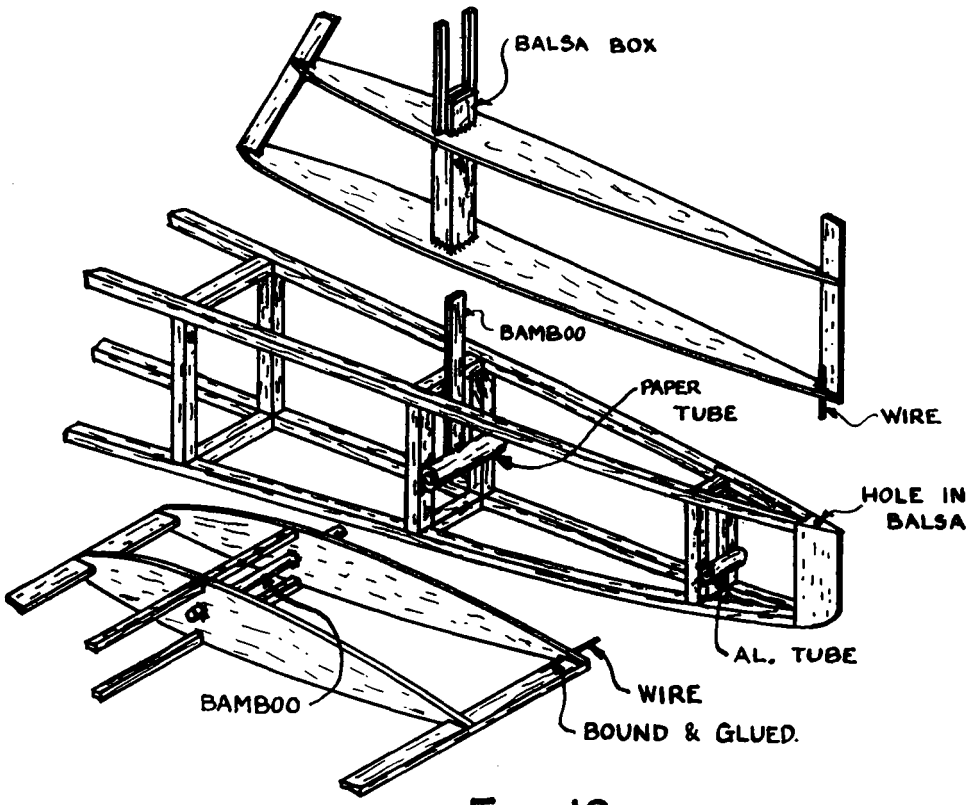


FIG. 16.

wing this time, but as I have used up so much space already I think something about the tail unit will be better.

It is usual, though not always necessary, to increase the area of the tail-plane and fin to make the machine fly properly without a pilot to keep it in trim. However, it is always safe to increase the area a little, say about $\frac{1}{2}$ in. or $\frac{3}{4}$ in. all round for a span of about 9 in., and a little less for the fin. Rudder and tail-plane can both be made in the same way. Draw the outline and pin it to a flat board with a piece of grease-proof paper over it. The leading and trailing edges can be $\frac{1}{8}$ in. × $\frac{1}{16}$ in. balsa, and the tips can be cut from $\frac{1}{16}$ in. sheet, or made by bending bamboo or reed cane to shape. Another method that is very good is to make a laminated bend. This is done by taking two or more pieces of $\frac{1}{16}$ in. × $\frac{1}{32}$ in. balsa, bending them to shape and sticking them together. If the bends are a bit sharp, the bamboo, reed or balsa should be steamed first. These tips are shown in Fig. 13. In place of the ribs put in two or three strips of $\frac{1}{8}$ in. × $\frac{1}{16}$ in. balsa, to act as temporary ribs. The proper ribs should be made from $\frac{1}{32}$ in. thick balsa and put in afterwards. Fig. 14 shows a typical rib with slots for leading and trailing edges and main spar. You can, if you like, make holes in the ribs to make them lighter, and this can best be done with the aid of one of the special tools mentioned in the last article. When you have put in the proper ribs, the temporary one can be removed. The tail-plane can be made either in one piece or in halves, according to the fixing to the fuselage, and can be detachable or fixed to the fuselage. The fin may also be detachable, but it is better to have it fixed, if possible. If the tail-plane is no more than 8 in. span a main spar is not necessary, but when used it should be continuous, if possible, from tip to tip, and attached to a former, or spacers put in the fuselage for the job. Formers or spacers should also be arranged for attaching the leading and trailing edges. The main spar can be $\frac{1}{16}$ in. × $\frac{1}{32}$ in. or $\frac{1}{16}$ in. × $\frac{1}{16}$ in. balsa, and is shown with other parts just referred to in Fig. 15.

For detachable tail-planes and fins, a plug and socket joint is likely to be most useful. This can be arranged in a number of ways, and two are shown in Fig. 16. Aluminium or paper tubes may be used glue to either the tail-plane or fuselage with wire or bamboo plugs glued to the other part. Also bamboo of rectangular section can be used with a balsa box. We are almost bound to require some form of adjustment on tail-planes and fin for trimming the model for flight, and this can take the form of hinged elevators and rudder. The most popular method is to use small pieces of thin sheet aluminium or soft iron wire, so that the hinge will move and stay put. Another method is to make the elevator or rudder a tight fit between two ribs and put in the end of pin to act as a hinge. If it should not be tight enough a paper washer will remedy matters. These hinges are shown in Fig. 17.

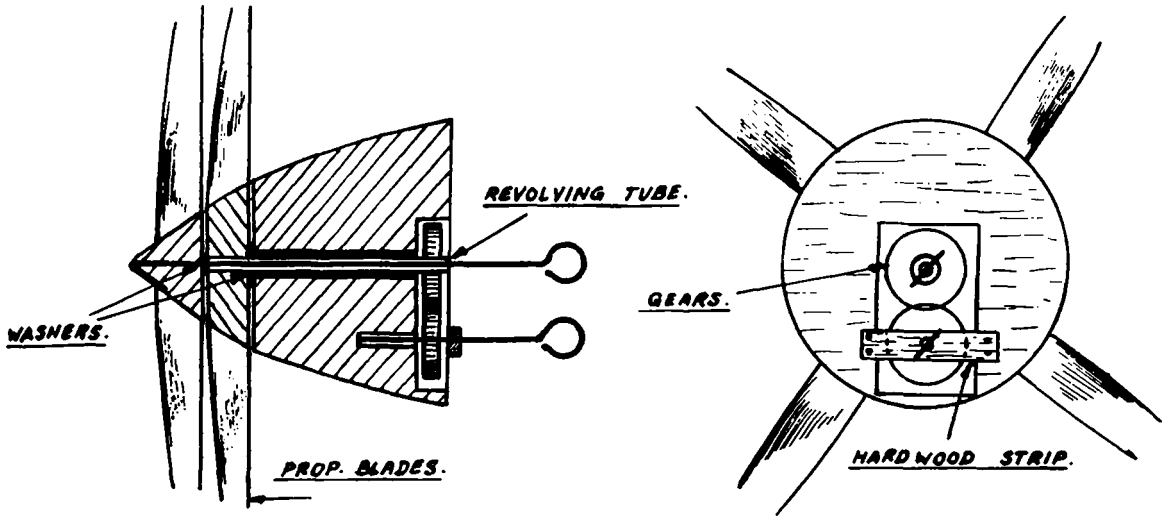
In fixing the tail-plane and fin, they must be square and true with the fuselage. This is best done by using some form of jig which can be blocks of wood, books, etc., on a flat table, and thread may be used with weights on it to hold the fin upright. It is best to pack up the rear of the fuselage until the centre line of the tail-plane is level. Take measurements carefully, and don't trust to what seems right to the eye. Measure from the table to get the tail-plane level, and get the fuselage and fin upright with the aid of a set-square.

When all is set up true, touch the parts to be glued with a spot of glue on the end of a piece of wire, and spread it along the joints carefully. You can, of course, do the tail-plane first and then the fin, or *vice versa*.

The photograph shows my Lysander set up for this business. Well! Cheerio folks till next month, and a Happy New Year to you, with lots of good flying.

A TWIN PROPELLER MECHANISM

By W. QUINN



THIS is a simple method of making two propellers revolve in opposite directions on one nose. The chief advantage is the elimination of torque, but the power of two separate motors is combined in one fuselage also.

The nose block can be of any suitable shape, and a rectangular recess is cut to take the two cogs. A hole is bored through the block where the direct drive would ordinarily be, and an aluminium tube glued in it as a lining. Inside this another tube revolves freely. The inner prop. is glue to it at one end, and a cog to the other. Through the centre is placed the direct drive shaft, and the outer prop. fixed. Another cog of equal size is fixed to a short shaft, meshing with the other. The shaft is slipped into a short aluminium lined hole, and a short strip of hardwood is firmly fixed over the cog, the shaft passing through the centre, to keep it in place. Washers, etc., are fitted in the obvious places. The maker can use whatever measurements he likes.

To wind up, the nose is removed, the elastics wound with a geared winder separately, then slipped on to the hooks.

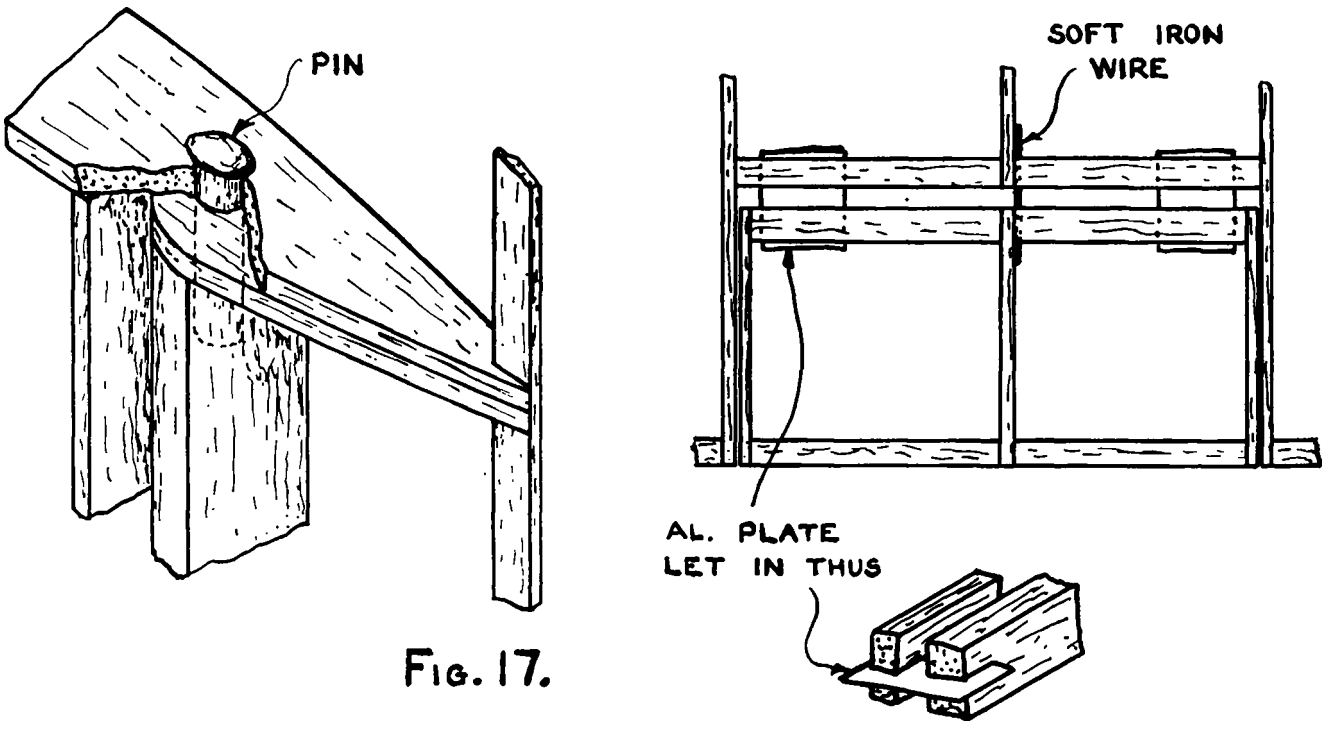


FIG. 17.

THE MILES KESTRAL TRAINER M9

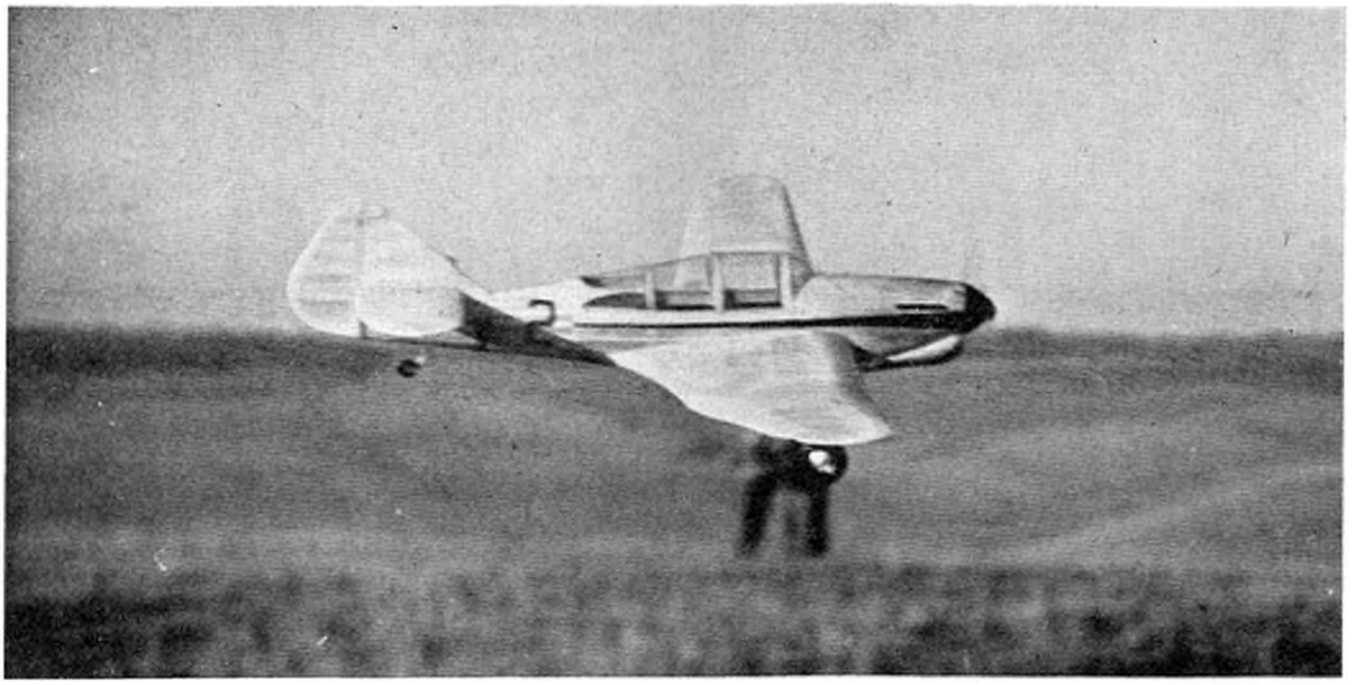


Photo J. C. Lucas.

FLYING SCALE MODELS

By J. H. TOWNER

"The time has come," the Walrus said—"to talk of many things.
Of different types of scale designs, and aerofoils and wings."

THE Editor has very kindly asked me to write this article in an endeavour to create an interest in scale models that can be built and flown almost as easily and cheaply as the average duration model of to-day, and at the same time putting up a very creditable performance.

"Oh, yes," I hear you say, "that's all very well, but we don't want to spend all our time building, we want to fly the job, and anyway, who has ever heard of a scale model putting up a decent performance except in the hands of experts?" That, I think, is the general impression, or at least has been until comparatively recent times, when one has seen a few more scale models at club meets, and these few are generally scaled versions of the Hawker "Fury" type, "Hurricane," perhaps a Fairey "Battle," a racer or two, and such like jobs, that there is very little wonder why the impression is so strong that scale jobs had best be left to the experts.

However, in spite of this, there is a growing demand amongst various sections of the aero-modelling fraternity to build and fly models that appear more realistic and more in keeping with present-day standards of full-size aircraft.

The general public, too, to whom we have to look for new recruits, always crowd round a scale job on the flying field, and generally appear to show a lot of interest in this type.

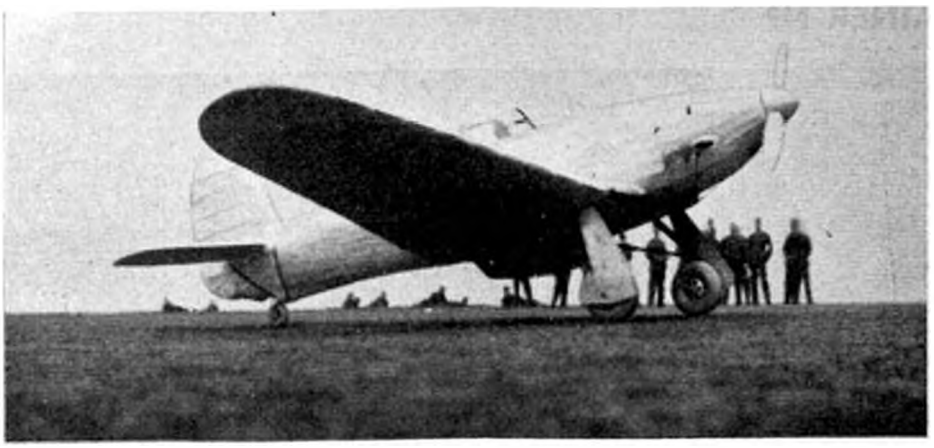
Again, especially with clubs near large towns and cities, whose model flying fields are gradually being encroached upon by the ravages of the house builder, will some time or other have to reconsider their ideas about long distance duration.

Do not thing I am decrying the pure duration job as such, or that I am trying to substitute something else for it, but I do very sincerely believe that there is a demand for a different kind of model, a more "modern" model, and I am using this word "modern" very cautiously. I do not wish to imply that our duration jobs are old-fashioned, but they are still very strangely alike to those models we built and flew many years ago.

Of course, it isn't only the "looks" we have to study; we must have performance as well, and in order to obtain both results we must choose the right type to build.

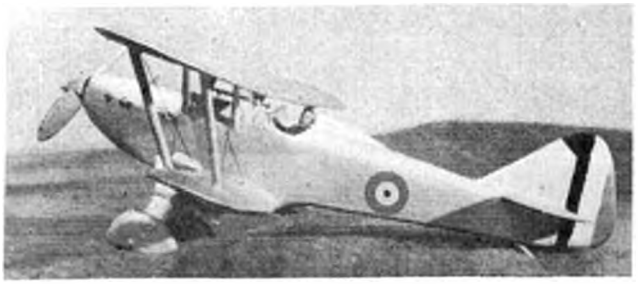
Now this may cause speculation as to know what is the right type, and in general I think we may assume that we are going to build what one might term a "Transition Model," that is, a model that is not a copy of a highly developed sport 'plane, service 'plane, or air-liner, but a scaled down version of the simpler type of private owner class, and in this field there is plenty to choose from.

Coming right up-to-date, we can take as examples the newly-developed Civil Air Guard job, such as the D.H.



Taken at Cranwell Aerodrome, only a few weeks ago, this photo shows a Hawker "Hurricane" being examined by some of the apprentices. By far the most realistic photo of a model we have seen! Oh, yes, it's a model—a petrol 'plane this time, built by Mr. D. J. Miller, of the Lincoln Engineering Society. Powered by an Ohlsson engine, this 'plane has an excellent performance, and in a later issue we shall publish a full description, illustrated with portions of a film, showing this model in flight.

"Moth Minor," or the Dart "Weasel." Then we have the "Chilton," with the 32 h.p. Carden Ford engine. These are all definitely in the light aircraft category, but are all of the low-wing type.



Another beautiful scale model—only 7 in. span—built by Mr. T. Frost, of Luton.

From our duration experience we have learnt that the high wing is probably more successful, so let us see what we can find in this type from the full-size jobs. Well, we have "Taylor Cub," "Aeronca," "Luton Major," "Hillson Praga," and stepping up higher there is our old friend, the "Leopard Moth," and the newer "Wicko." The chief idea is to keep the type simple. I want you to get out of your minds that scale jobs must be fitted up with such things as Venturi tubes, air-speed indicators, wireless antennæ, and complicated fittings. These may look alright in an exhibition, but even then, unless these are particularly well done, the model looks better without them.

Now let us turn to the construction and see how simple it is to construct a scale model of the types I have suggested.

There are three main differences between our proposed job and that of our old and tried duration friend, namely, on our new job there will be a fixed position for the wing, a smaller prop., and a short undercart, surely not very much to worry about, and the rest will more or less fit in with our building experience.

Now let us take a prototype as an example and see how this works out in practice, and let us choose a type we all know, the high-wing monoplane, and for choice will take the "Leopard Moth." The other high-wing

(Above) A fine model of a biplane—the Heinkel—built by Mr. C. W. Rose, of the Warwickshire Club. (Left) A rubber-driven model of the "Hurricane," by Mr. C. W. Earrey, of Swansea.

models mentioned previously are very similar, but differ in size.

Now mark all slab-sided fuselages, only shorter than we have been used to building, simple windows and wind shield, through which we can see our motor knotting as we wind. We even do this on our duration job. We have no fancy radial engine cowling to bother about, just an in line job of the "Gipsy" type.

The wings are made to knock off, on a bad landing, and here I would like to say that if models were built to the standard S.M.A.E. formulæ of one inch to the foot, a lot of trouble would be overcome, as with the

Here is C. Rupert Moore's latest "Warplane"—entry for this year's Frog Cup. A "medium day bomber," this 'plane has a patent drive to the two airscrews, and an extremely well designed landing gear.

very small models one so often sees we have to build the wings integral with the fuselage, which we should never dream of doing on our present jobs; besides, a larger model can stand rougher weather conditions. Using the above formula our spans will vary from, say, 24 in. on the smallest jobs, to 38 in. on the larger.

Another model built by Mr. Earrey—a "Waco Custom Cabin"—built from a "Scientific" kit.

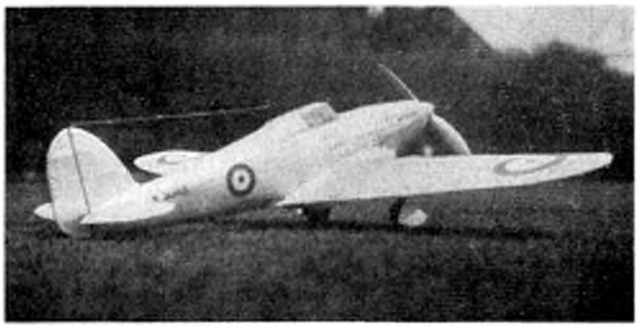
The airscrew is of the hardwood type of about 10 in. dia.; no annoying and expensive breakages here. Gears we don't want, unless we can make them and like doing so.

Our undercarriage is a short sturdy affair which does not bounce your model all over the field on landing, but just absorbs the initial impact and brings the model to a rolling stop, and believe me it does. So far there is no difficulty about it at all, but the distribution of the weights does call for a little bit of jug-gling, but this can usually be overcome by having an adjustable rear hook.

Well, our model is built, and what is more, should be more or less in flying trim. Note: I have said nothing about ailerons, rudders, elevators, etc. Cut these all out as abominations; they will definitely spoil your chances of consistent flight, as you can never be sure they are set in the same position twice.

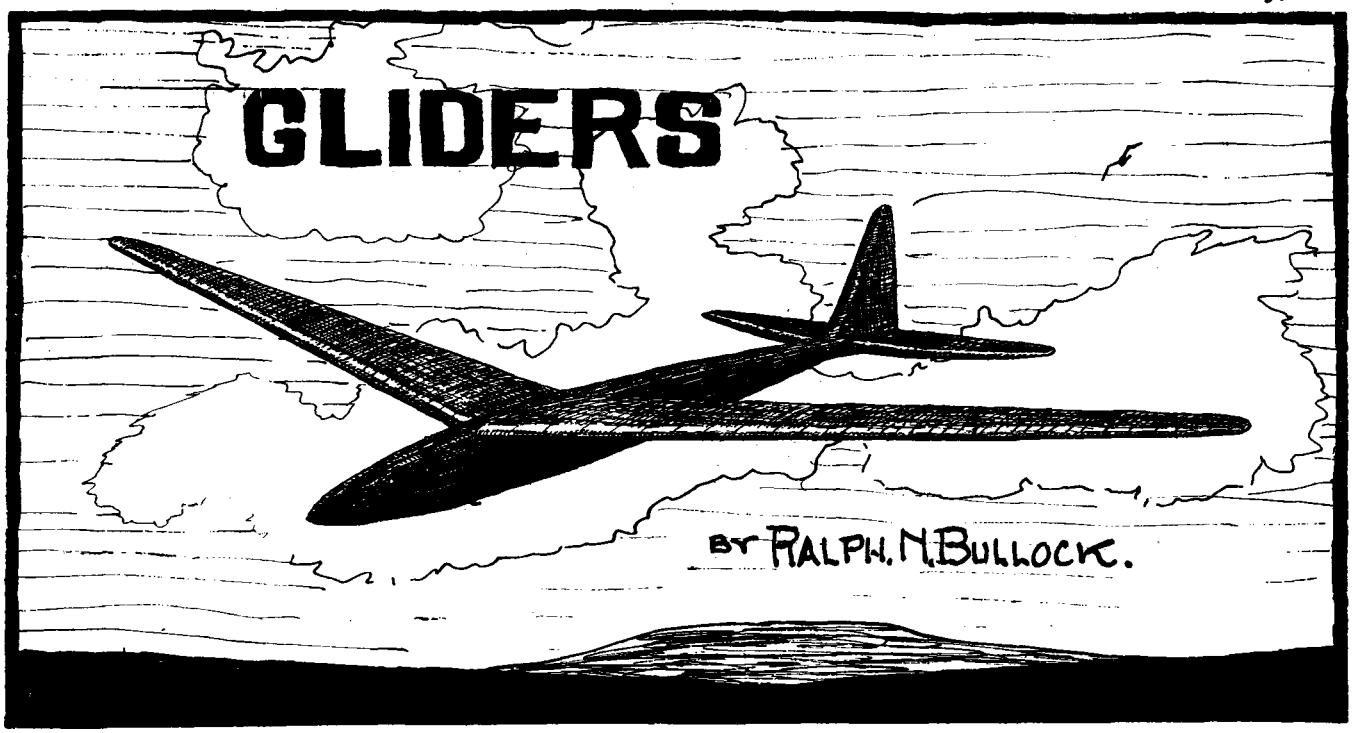
As for flying, a scale aircraft, ignoring soaring flight, which is only luck combined with sufficient knowledge to know when thermals are about; the duration of any model is more or less proportional to its length of motor run, but with rubber tensioners, or better still, a pre-wound skein of rubber, as we do in our duration models, we can put a longish motor in a shorter fuselage.

There is one other point I would make before closing, and that is—I have heard it said "There is far more scope and interest in building a model of one's own design



The "Hurricane" again! A really beautifully-built model by Mr. E. Dyer, of the Hornchurch Club. (Below) A fine model of the Stinson "Reliant," built by Mr. H. Holbrook, of the Lancs M.A.C.

than slavishly copying somebody else's ideas." And to this I would say, "perhaps so, under the present conception of a scale model." But I would like to make a suggestion, and that is, let us try to develop a class of model that we could classify as Miniature Aircraft.



NEXT year the King Peter II Cup will be flown for with gliders in England. This competition, which is for duration distance and height, from which marks will be given to the national teams competing.

The rules governing the size of the models will be issued in due course by the S.M.A.E. Also, the rules of the contest. I can state definitely that the models will have to be flown under F.A.I. rules, and that means tow launching, as the F.A.I. catapult is out of the question, due to the rubber allowance being much too short. This, by the way, is F.A.I. glider launching rule (*b*), which says: " The length of the catapult is limited to 8 metres (118 inches) unstretched." The F.A.I. rule (*c*) Cable Launch: " The machine shall be launched by the help of an inextensible cable. The length of the sable between the glider and the fixed point of launching should not exceed 200 metres (655 feet)." F.A.I. rule (*d*) Running Launch: "An inextensible cable, not exceeding 100 metres (328 feet) in length, must be used, and the person launching the machine must not run a distance of more than 75 metres (246 feet). The point where the person launching stops will be taken as the point of departure of the machine."

I have written these rules, as printed in the S.M.A.E. 1938 Handbook, for the benefit of all and sundry. But I must admit that I fail to understand how the model is flown in Rule (*c*) Cable Launch, as no mention is made about running, as is done in Rule (*d*) where a limit is set to the distance one is allowed to run. If, however, it is permissible to run in Rule (*c*) why give a different cable length to Rule (*d*). Perhaps this is a misprint or an error of translation.

The next point we have to consider is the size, as governed by the competition rules, and also the loading. I have prepared a sketch comparing the maximum and minimum sizes allowed, and have taken the liberty to suggest another size, which I contend will be most suitable for British constructors. The reason for choosing this size I will give later

The gliders in this competition must also comply with the F.A.I. loading, that is a minimum of 4·92 oz. per square foot, and also the fuselage cross section is governed by the formula $S = \frac{L^2}{200}$ where S = the minimum allowable area of the maximum cross section, in square inches. L = The overall length of the model in inches, and 200 is a constant for producing a reasonable fineness ratio. The model may be of any type you care to build, just so long as it complies with the F.A.I. and King Peter II Cup Rules.

I have made a few sketches of different types, and now place them in order of merit as to the order of possible success of the different types. This can be expected to be F, D, B, C, A, E. Of course, stability and weight characteristics have been considered in coming to this decision, in conjunction with aerodynamic cleanliness.

The size question will doubtless be a very vexed one, but there is no doubt that the larger the model the better the chances are of obtaining high aerodynamic efficiency, but we must also consider the structural problems which are likely to be involved in the correct design of a good sail-plane of large size.

We are not used to building very large models, except perhaps a few of us who have done some work on petrol jobs. Therefore, I have chosen to advise and recommend a size not much greater than that with which we are most familiar, even though it is well known that the Germans, who are the world's recognised sail-plane experts, both model and full size, use models the smallest of which is at least 6 feet in span, with weights and loadings far in excess of that to which we ever work.

The chief reason for this size, weight and loading difference between ourselves and the Germans is chiefly due to the fact that German model glider meetings are held on the site of full-size sail-plane flying, which means that they are launched into wind off the side of hills and mountains, which instantly places them in air with a strong up trend, and usually a fairly high velocity, which means that light loadings and low speed would not

succeed. We, on the other hand, expect that this competition will be held on some British aerodrome, where the terrain is almost level, and we hope that the wind will not be very strong, though we cannot guarantee this.

Then, again, the large size of German model sail-planes must have been influenced by the fact that the first designs were got out by the full-size designers for the model people, whom they guide in their work. Hence their great success in this direction.

The main features or performance characteristics of a model sail-plane are: (1) Low sinking speed; (2) rapid climb, and as high a ceiling as is possible on the line limits; (3) absolute inherent stability; (4) the ability to stand hundreds of landings without any damage being done.

Feature No. 1 is bound up with aerodynamic cleanliness, and minimum speed suitable for reasonable ability to fly in rough weather. This, in other words, is a good gliding angle at low speed.

No. 2 is bound up in line attachment position and loading. Also the use of a wing section which still shows a good C.L. at very high angles of incidence, with a small C.P. change, so that the model does not dive on being released from launching line.

3. This feature is an absolute essential, as the model is at all times at the mercy of the elements, and must always assume as near as possible its best attitude.

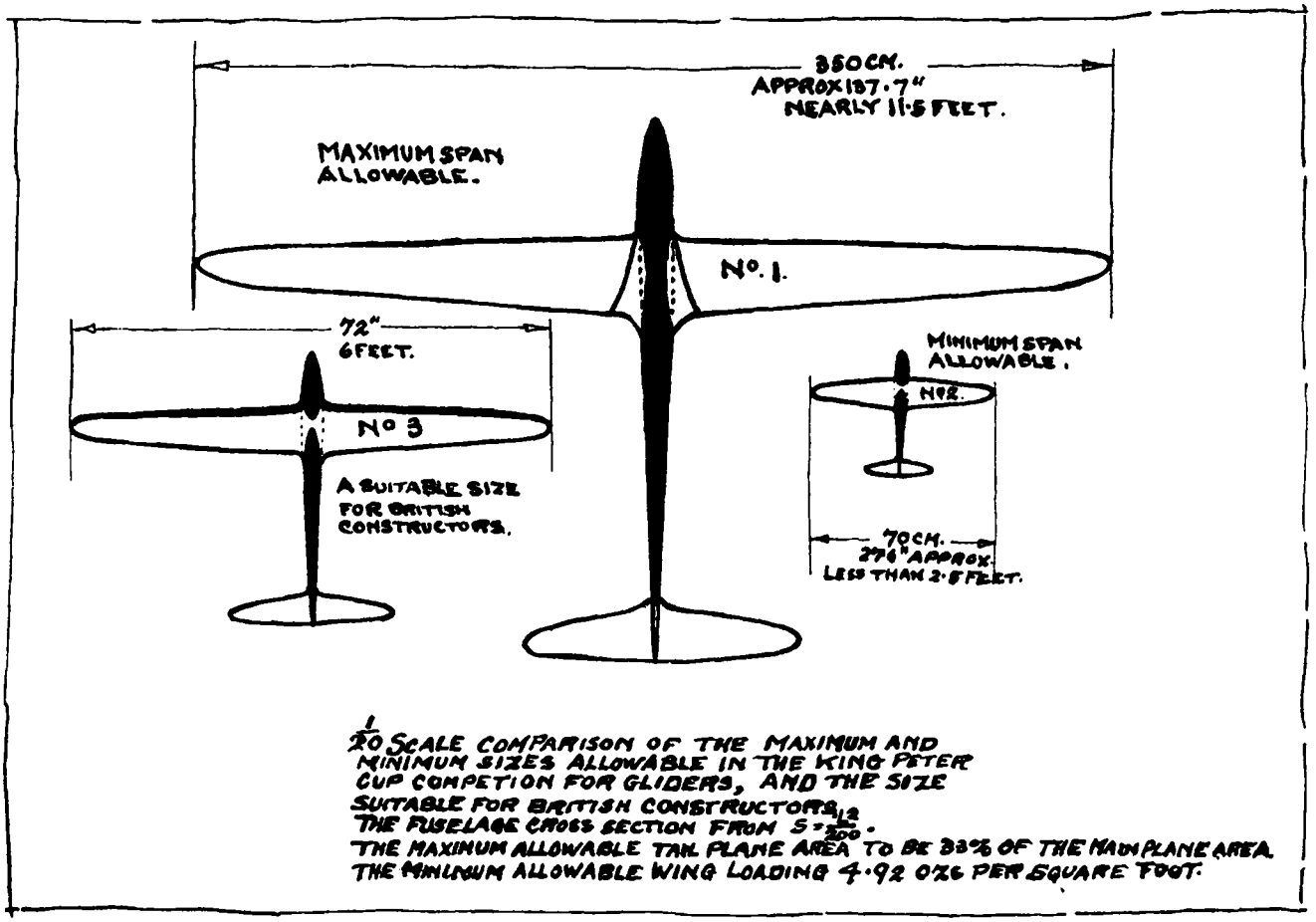
4. The ability to stand hundreds of landings without any damage. This should be an easy feature to attain, as all the weight can be put into the structure, as there is no motive power to carry. This in turn evolves to a considerable extent round the weight distribution, so that on a minimum of dead weight, i.e. lead is used to attain the final trim.

This mention of weight distribution brings forth the possibilities of composite construction, of balsa wood, and other more durable timbers for the forward portion of the fuselage, and front main spar or leading edge.

While on the subject of material for sail-planes, large-sized models can be built of spruce, 3-ply, cane, birch, and even parts of duralumin, and steel can be an advantage. And last, but not least, Japanese silk can be used for covering, and thus a very serious worry is removed, as the model is not likely to be holed as easily as when paper is used for covering material. The main features of a good sail-plane are small frontal areas, high aspect ratio, maximum of streamline, small tail-plane and fin areas, carried on a long moment arm, no undercarriage or skid, and last, but not least, absolutely correct side area proportions.

Some means of longitudinal trimming, either by weight or aerodynamic, i.e. elevators, tabs, whole tail-plane incidence, or main-plane shift, but this not advisable. Tabs combined with internal running weight are preferable, and the most useful and successful, and a directional trim in the form of a tab or rudder.

We are pleased to announce that Mr. Bullock will write each month for The Aero-Modeller, dividing his attention between Wakefield Models and Gliders



1/20 SCALE COMPARISON OF THE MAXIMUM AND MINIMUM SIZES ALLOWABLE IN THE KING PETER CUP COMPETION FOR GLIDERS, AND THE SIZE SUITABLE FOR BRITISH CONSTRUCTORS. THE FUSELAGE CROSS SECTION FROM $S=\frac{12}{200}$. THE MAXIMUM ALLOWABLE TAIL PLANE AREA TO BE 33% OF THE MAIN PLANE AREA. THE MINIMUM ALLOWABLE WING LOADING 4·92 OZS PER SQUARE FOOT.

HEARD AT THE HANGAR DOOR

—THAT the photo shows a large Station Glider just after hand-launching. Plans for a large glider of this type will be available in our next issue.

* * * * * *

—THAT at the 1938 Canadian National Model Aircraft Contest at Toronto, the times in the Wakefield class showed that thermals were few and far between.

Lavalle Walters and Ed. Romiens were placed first and second with average times of 2·21 and 2·16 min. respectively. Third place went to Bob Milligan, who headed Canada's team at the 1938 Wakefield Contest in France with an average time of 4·56 min.

At the Toronto meet Bob Milligan was flying a new job; it averaged 2·09 for third place.

* * * * * *

—THAT by using the new ultra light sheet balsa as a wing covering, well cementing it to the ribs and spars, a very strong wing results, with very little increase in weight over the usual tissue-covered type. For one thing, the spars, leading and trailing edges, can be of lighter section, and the wing ribs spaced wider apart, as the sheet balsa does not sag between ribs as with tissue covering.

For a long while the advantages of the clean leading edge, obtained by covering the front part of the wing with sheet balsa, has been recognised, and now the light sheet gives us the opportunity to clean up the whole of the wing in the same way.

* * * * * *

—THAT in this country the possibilities of rocket propulsion applied to model aeroplanes does not seem to have been explored very far.

A few designs have appeared from time to time in American journals, but not much interest has been shown over here. It cannot be expense that is holding up experiments, as a 2d. rocket contains quite an amount of propelling force.

* * * * * *

—THAT an extremely high finish can be obtained on balsa wood, if it is first given a coat of thinned down seccotine or similar adhesive. When dead dry, sand to a smooth finish and apply enamel or varnish, of the colour desired.

—THAT many modellers desiring to try out a one-bladed prop. on their machines, just cut off one blade of a propeller that normally flies their plane, and adjust for balance. The result is disappointing, and the modeller is left wondering if all that he has read about one-bladers is to be believed.

To be efficient, a one-bladed propeller must be designed with a blade area of from 75 per cent to 100 per cent of the area of the two blades of the usual propeller fitted. Unless this is done, the model will behave as if fitted with an undersize propeller. When making a one-blader keep the pitch low; about 10 in. pitch will be found correct.

* * * * * *

—THAT a Canadian modeller, Ray Hunter, of Weston, has been carrying out a number of night flights with a gas model equipped with win tip lighting. To those gas fans who find the daytime hazards of flying insufficient, something on these lines might prove useful.

* * * * * *

—THAT indoor pole flying is proving a good attraction for a club's winter meeting. Unlike the usual indoor flying, it does not require a large hall or micro-film jobs. Good flying can be carried out in a 20 ft. square room, though a larger place is an advantage. Given a suitable 'plane of about 24 in. span, 1 oz. in weight, and not overpowered, it is astonishing what good flights can be obtained.

Some experimenting is needed to find the best position for attaching the mooring thread; some models fly well with the thread fixed to a hook on the wing tip, while others do better with it fixed to the leading edge. While models will fly in either left or right circles, turning clockwise seems to give the best results.

* * * * * *

—THAT flying at the Canadian Nationals was Fred Rogerson's original biplane, winner of the 1935 Canadian Wakefield Contest. The old ship still flew well in spite of its age, and obviously must have a careful owner.

* * * * * *

—THAT in America, tungsten wire bracing is becoming very popular on microfilm jobs, while coloured microfilm is improving the appearance of the fuselage type.

—THAT a rebuilt inn at Rochester has been named the Conopus, local association with Messrs. Short Bros. being no doubt responsible. This inn, while being the first named after an aircraft in regular service, is not the first inn to be named after an aeroplane.

Two that can be called to mind are the Falcon at Reading, named after the Miles Falcon, and The Comet at Hatfield, named after the winning machine in the 1934 air race to Australia. As yet we cannot discover an Aero-Modeller's Rest, though one would be appreciated at the end of a cross country trek in search of O.O.S. models.

* * * * * *

—THAT Imperial Airways, in collaboration with the manufacturers of " Kilfrost," the anti-icing paste used with such success last winter by Imperial Airways—and in conjunction with a large cold storage firm, have produced a refrigerated wind tunnel. In this wind tunnel all the ice-forming conditions to be met with in flying can be simulated, and much practical development work has been done to protect aircraft against ice formation.

Air for the tunnel is drawn from the freezing chambers of the cold storage company, and into this stream of freezing air, water vapour is introduced, and by varying the air temperature and the quantity of water, all types of ice formation can be produced.

In this tunnel all types of de-icing devices can be tested, and already much valuable research work has been done.

—THAT Herr Fick set up a new world gliding record at Wasserkuppe, where, after being towed by an aeroplane to a height of 8,250 feet, he soared to 21,825 feet.

Another German, Herr Huth, claims a new two-seater glider record, having flown from Hamburg to Hanover and back, a distance of 162½ miles.

* * * * * *

—THAT a further hazard has entered the life of the aero-modeller, this time the car bandit, who has turned his attention to stealing gas models.

According to report, a well-known gas modeller had flown his 'plane some distance from the flying field, but before it could be retrieved a motorist had loaded it in his car and driven off with it. In spite of the owner's name and address being on the model, no trace of the 'plane has been found. Could it have been a jealous rival?

* * * * * *

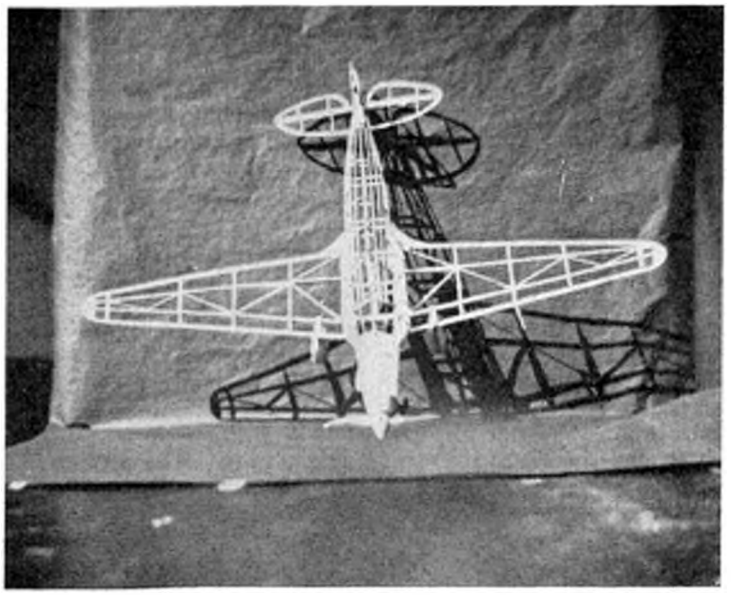
—THAT lack of lubricant causes a high percentage of rubber motor breakages. When winding up to anything like full turns, frequent lubrication is needed, after every four flights at least, to get the best results, and a lengthy life for the motor.

Beware, however, of fitting rubber, dripping with lubricant, as excess lubricant is of no use to the rubber, while it is definitely harmful to the balsa and paper of the fuselage; therefore, wipe off any surplus lubricant.

A HALF-INCH SCALE FLYING MODEL OF THE T.K.2

By C. F. COMPTON

DESIGNED as a two-seat monoplane by the De Havilland Technical School, it was fitted with an extra tank in the second seat, and entered in the 1935 King's Cup Race. Fitted with a 140 h.p. high compression " Gypsy Major " engine, it was placed fourth in the final, at an average speed of 165·5 m.p.h.



Full size scale plans of this model are printed on pages 112, 113 and 115 of this issue.

Fuselage.

Build the lower part (in black) in the usual manner, direct on the side view. Build one on top of the other to ensure they are equal. The longerons, uprights and crosspieces are of well sanded $\frac{1}{16}$ in. × $\frac{1}{16}$ in. The diagonals of $\frac{1}{32}$ in. × $\frac{1}{16}$ in., placed in with the $\frac{1}{32}$ in. upwards from plan.

Carefully cut the two sides apart and place upside down, vertically, on the top view.

NOTE.—The " top " cross struts are halfway up the side (shown as white squares on plan), to allow rubber clearance. Put in all the cross struts and then trace and cut out the formers " A " to " H."

If one desires to fit a " step up " gear in nose such as a " Frog " assembly, the top struts may be put in usual position at top of longeron, since rubber shaft will be lower.

When all the formers are cut out and sanded smooth, strengthen " D " and " F " with $\frac{1}{32}$ in. × $\frac{1}{16}$ in. balsa cemented to rear face.

Mount formers " A " to " H " on top of fuselage or cement. Cut out a $\frac{1}{32}$ in. × $\frac{1}{16}$ in. main stringer and bend and steam to shape. When secure, fit all subsidiary stringers, of fine bamboo, in place.

Carve and sand a block to fit under cowl. Cement shaped exhaust pipes, cut from an ordinary drinking straw, to it. (See plan). Carve and fix tail-block and skid-block.

For all blocks use soft balsa.

Wing Anchorages.

To the rear of upright, below " C," and front of upright below " E," at position shown on plan (also see sketch), fix a piece of drinking straw with plenty of cement. When dry cut a piece of $\frac{1}{32}$ in. sheet shaped to fit (see plan) between the straws; use plenty of cement. Refer to the sketch for explanation.

Nosepiece.

Carve from medium balsa from dimensions on side, top and front views. Cut Z for good fit in open front. Drill not less than $\frac{1}{8}$ in. hole for shaft, and use a brass bearing bush.

Fin and Rudder.

Cut out spars and ribs, also leading and trailing edges from $\frac{1}{32}$ in. sheet. Put fin post in place *before* adding skid block, rig L.E. and add ribs. Make separately and fix to fin with aluminium rudder hinges.

Tail-plane and Elevators.

Size of main spars take from plan. Note the shape (though they can be made plain). Ribs, leading and trailing edges are from $\frac{1}{32}$ in. hard sheet. Construct separately, glueing leading (or trailing) edge to correct spar, and glue in ribs afterwards. Be sure the edges are true with the spars. Fix tail and elevators with aluminium hinges. Note type, if socketted spars are used.

Wings.

Leading edge, $\frac{1}{8}$ in. × $\frac{1}{8}$ in. shaped after construction. Trailing edge, $\frac{1}{8}$ in. × $\frac{1}{16}$ in. shaped before. Front main spar, $\frac{3}{8}$ in. × $\frac{1}{16}$ in., taper to $\frac{3}{16}$ in. × $\frac{1}{16}$ in. Rear $\frac{1}{16}$ in. × $\frac{1}{4}$ in., taper to $\frac{1}{16}$ in. × $\frac{1}{16}$ in. Ribs from $\frac{1}{16}$ in. sheet. Construction : Fix the two spars firmly into the largest (root) rib and cement. Next fix the L.E. and T.E. Fix the wing tips ($\frac{1}{16}$ in. sheet), cut the ribs vertically down the centre of the spar slots. Cement in each in three separate pieces. Rib " W.F." is from $\frac{1}{8}$ in. sheet, and shaped to suit undercarriage fillet. The webs between spars are of $\frac{1}{32}$ in. sheet, and make a wonderfully strong girder brace.

Wing Fillets.

Carve one right and one left hand from soft balsa block. The hump underneath front keeps it set square, and can be made separately and cemented to fillet.

Cut holes for dowel pins $\frac{1}{8}$ in. square balsa, which go through " straw " tubes.

Cement root rib to fillet, fix dowels to one side and make them a tight fit in the other. This will provide a safety factor in event of a " cartwheel " landing.

Landing Gear.

Digest plans. Carve centre from $\frac{1}{8}$ in. hard, add a $\frac{3}{32}$ in. lower shape on *each* side, sand the *inside* smooth, and add a $\frac{1}{16}$ in. lower full shape each side of that. Sand the outside to shape, drill centre *up* to top, fix an oversize piece of bamboo in. Add fillet to top (unless you carved it in with centre leg), make the wheels of 3 in. × $\frac{1}{8}$ in. discs, each $\frac{3}{4}$ in. diameter, well sanded and cemented. Fix on a pin axle.

Covering.

From " A " to " B " on fuselage cover first with bond (writing) paper; cover from L.E. to front spar same. Wash the emulsion from an old negative (ask a chemist how), and use to cover cabin. Cover flat sides first, then bottom, next each side of rounded top decking. Cover fin, rudder, tail and elevators separately. Cover wing underside first.

Colours, etc.

Colour left to builder; any two-colour scheme, such as red-yellow, red-silver. Use darkest colour for fuselage and fin, and lightest for wing and tail. All silver with red scalloping is ideal, as long as it is *neat*.

Identification numbers, etc., cut from black (or a contrasting) tissue, or paint with cellulose on kitchen greaseproof and stick on. Colour the noseblocks, etc., the same as fuselage and landing gear, and exhaust stubs black.

Erection.

Fix rudder to fin. Cement tail in place, and fit elevators to it. Fit struts under tail. Fix the landing gear with bamboo well dug in and cemented. Add pitot head scoop and venturi tube (coloured as bases).

Flying.

Pitch of prop. and power used will depend on weight of machine. Trials will tell.

Add lead (in nose or tail) until centre of gravity is at front main spar. Glide on few motor turns over (or in?) long grass until balance is correct.

Above all, read plans carefully.

Material for T.K.2.

Sheet.

One $\frac{1}{16}$ in. × 2 in. × 36 in. balsa (medium).
One $\frac{1}{32}$ in. × 2 in. × 12 in. balsa (medium).

Block.

5 in. × 1 in. × $\frac{3}{4}$ in. hard balsa for prop.
One 12 in. × $\frac{1}{2}$ in. × $\frac{3}{4}$ in. soft balsa for fillets, tail blocks, etc.
One 12 in. × $\frac{1}{8}$ in. × $\frac{1}{2}$ in. medium.

Strip.

One $\frac{1}{8}$ in. sq. × 18 in. medium.

Bamboo.

6 ft. of $\frac{1}{16}$ in. sq. × 12 in. for stringers.

Tube.

1 in. 20 s.w.g. brass Length of 20 s.w.g. wire.

Rubber.

6 yards of $\frac{1}{8}$ in. flat.
Tube of cement. One sheet of white tissue.
Small bottle of clear dope. Two $\frac{3}{4}$ in. dia. wheels.

Sundries.

Drinking straw, used negative or cellophane.
Strip of thin aluminium.

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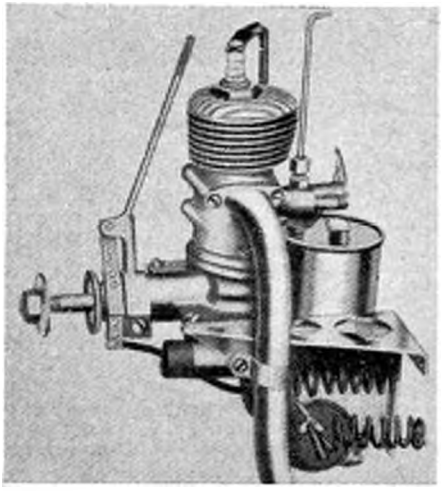

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Standard round head with exhaust stub pipe, motor mount, coil and cond. £4 4 0

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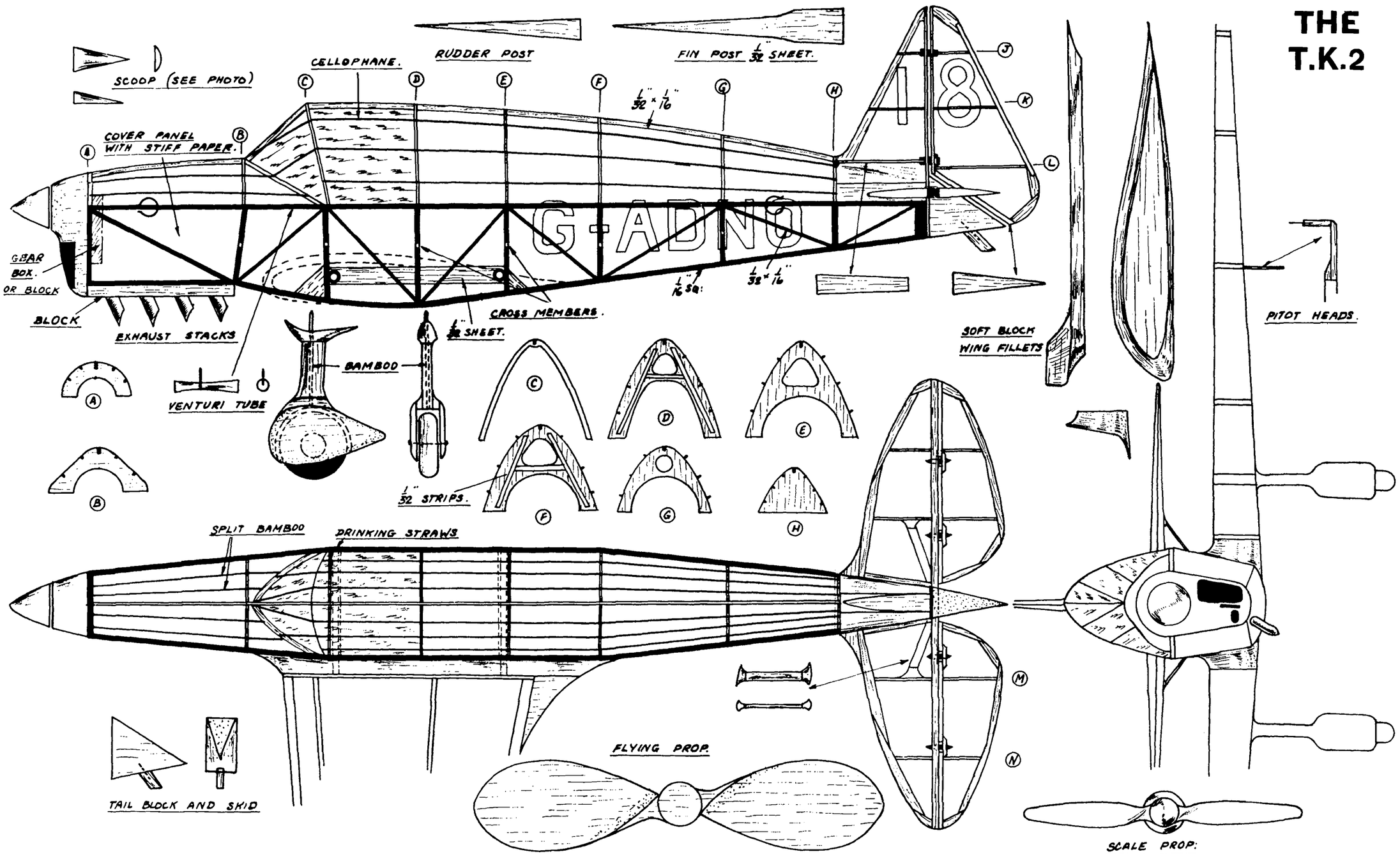
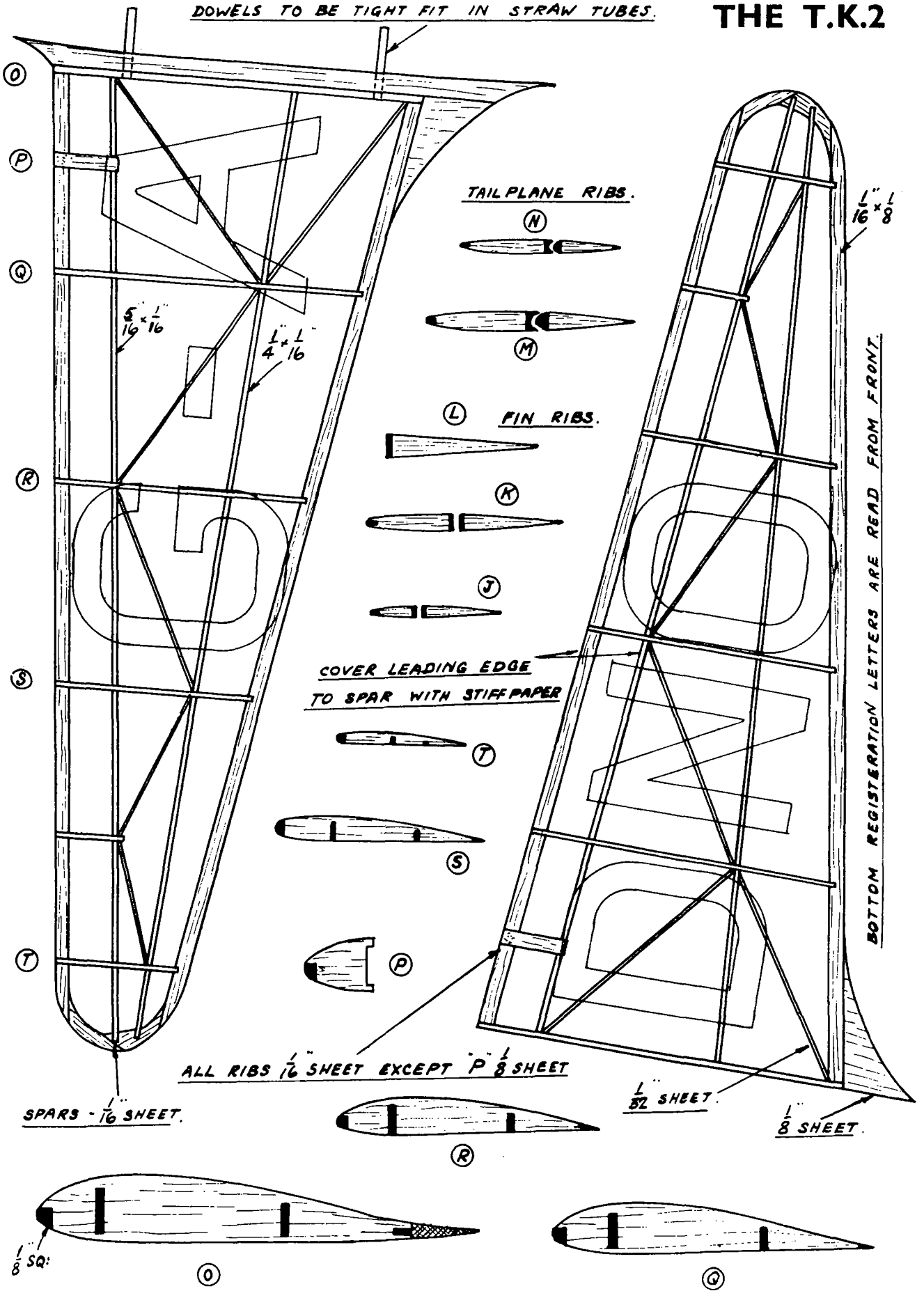
THE T.K.2


SCOOP (SEE PHOTO)
CELLOPHANE.
RUDDER POST
FIN POST 1/32" SHEET.
COVER PANEL WITH STIFF PAPER.
1/32" x 1/16"
G-ADNO
GEAR BOX OR BLOCK
BLOCK
EXHAUST STACKS
1/16" SQ.
1/32" x 1/16"
1/32" SHEET.
CROSS MEMBERS.
SOFT BLOCK WING FILLETS
PITOT HEADS.
BAMBOO
VENTURI TUBE
1/32" STRIPS.
SPLIT BAMBOO
DRINKING STRAWS
TAIL BLOCK AND SKID
FLYING PROP.
SCALE PROP.

THE T.K.2


DOWELS TO BE TIGHT FIT IN "STRAW" TUBES.
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5/16 × 1/16
1/4 × 1/16
TAIL PLANE RIBS.
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COVER LEADING EDGE
TO SPAR WITH STIFF PAPER
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1/16 × 1/8
BOTTOM REGISTERATION LETTERS ARE READ FROM FRONT.
ALL RIBS 1/16" SHEET EXCEPT "P" 1/8 SHEET
SPARS - 1/16" SHEET.
1/32" SHEET.
1/8" SHEET.
R
1/8" SQ.
O
Q

LETTERS TO THE EDITOR

DEAR SIR,

In this month's AERO-MODELLER you have a paragraph regretting that aero-modelling is not taught in our schools as a craft subject.

You will be interested to know that the boys in this small rural school have their own club, and have been building models for over twelve months.

I agree that it is a most excellent form of hand and eye training, and the reason it is not taken up in other schools is not the lack of suitable instructors, but the lack of money. Education committees do not provide for the purchase of any of the necessary material, and it is only made possible for me to run a club here by the generosity of the local managers.

With boys varying in age from ten to fourteen it is not possible to undertake any difficult design.

We commence with the making of kites, go on to single stick tractors, and then simple high-wing monoplanes.

The largest machine we constructed was "The Wanderer," and this 'plane still flies after a year of many flights and crashes.

I enclose a photograph of our club members and some of the machines they have made.

Yours faithfully,

Blindley Heath School, J. H. BOWLER.

DEAR SIR,

Almost a year ago I was asked to supply some opinions on the Coronation Cup, but these never came to anything owing to the tragic death of Mr. Bird's son. This meant that the Coronation Cup was again to be competed for under the old rules, which, I believe, was the cause of such a poor turn-out at this year's rally. After conversation with Mr. Rippon on the subject he asked me to let you have my ideas in writing, so please accept them in the spirit they are meant.

As I see it, the object of the Coronation Cup is to bring to public notice a class of model which previously has been neglected, to the detriment of models in general. Semi-scale work demands originality of a high order, and it is to this competition that one will look in the future for real constructional progress.

The heavy-weight of yesterday made the light-weight possible, and I believe that experiments in this field will be the basis of the light-weight of the future.

If I have interpreted the object of the cup correctly, then I think what I now have to say is obvious :—

The limitation of wing area of 200 to 800 square inches, in my opinion, is the cause of most of the trouble, because :—

(1) Comparatively low aspect ratios are desirable, which, in all except the simple monoplane, reduces the span below economical limits.

(2) Biplanes are out of the question at this area, at reasonable aspect ratios, as the span could not be more than 36 in. and the handicap is too great against a 48 in. monoplane.

(3) Like most other competitions, the rules make one type of model the obvious solution, and thereby impede experiment.

(4) Under the present rules it would be possible to build a model of little merit, which would secure few points for construction and originality, but win the competition by sheer duration.

(5) The models desirable to attract are experimental, and therefore the rules should be framed to include all possible types, while being *as fair as possible*.

To do this is difficult, and I suggest the following :—

(*a*) The wing area limitation should be abolished, and a minimum wing loading of, say, 7 oz. per sq. ft. imposed; also a maximum and minimum wing span of from, say, 56 in. to 96 in. This would remove the difficulties in (1) low aspect ratios, (2) biplanes, and (3).

(*b*) A model, failing to gain a certain percentage of marks for workmanship, should be either disqualified or handicapped to obviate (4), models of little merit.

These suggestions are not perfect, for instance in (2) a 36 in. span biplane would still have little chance against a 56 in. span monoplane, but a competitor who built a 36 in. span 'plane would have done so because he wished to, not because he was forced to by a wing area rule. I know of two models which were unable to compete owing to wing area, both being 850 square inches. In both cases the builders said they were experimenting, and that 800 square inches was too big a handicap.

From my own experiments I believe a biplane of equal span and wing loading to a monoplane has a comparable performance, and while 36 in. span models will not be disqualified, reasonable spans of about 48 in. will be encouraged, owing to the scale-weight ratio, and this, while encouraging the number of entries, will not turn into a " toy " competition.

A. RUPERT MOORE.

DEAR EDITOR,

I have been fortunate, through the medium of an advertisement in the November issue (Mr. J. P. M. Wilkes, of Berkhamsted), to obtain a bound volume of THE AERO-MODELLER for 1937, also a few 1936 issues. These, together with 1938 numbers, Mr. Russell's Design Book, and Zaic's 1937 and 1938 Handbooks, should at least enable me to attempt some designs *on paper*.

The article in the November issue, by Mr. Wathen, is, I consider, of real benefit to beginners like myself, who are floundering, like our models, among the " elements" of low-speed aerodynamics.

If you can bear with me in the maze of calculations which follow, your agreement or correction of my reasoning will at least let me know if I am on the right track. Taking a design to Wakefield formula, we have:—

Area: 208 sq. in. = 1·44 sq. ft.

Weight: 8 oz. = 5 lb.

Wing loading = ·347 lb./sq. ft.

Using standard graph for airfoil R.A.F. 32 at 60 feet/sec.

$$V = 19{\cdot}77 \sqrt{\frac{W}{\frac{5}{C_L \text{ max.}}}} = 19{\cdot}77 \sqrt{\frac{{\cdot}347^*}{1{\cdot}308}}$$

= 10·18 m.p.h. stalling speed

+15% = 11·74 designed flying speed when drag is at lowest value

= 17·25 ft./sec.

From this $C_L = \frac{L}{\frac{P}{2} S V^2} = \frac{{\cdot}5}{{\cdot}001189 \times 1{\cdot}44 \times 17{\cdot}25^2} = {\cdot}98$

At C_L ·98 angle is 5·5°, Co ·067 and L/D 14·6 :1.

Now, according to Mr. Wathen, 60 ft./sec. curve does not give true coefficient values at the designed flying speed, so we must vary our calculations until the two speed-values, i.e. designed flying speed and correct speed value on graph, with corrected coefficients, are approximately the same. (The ideal would be when they are identical). The nearest approximation I can get is by interpolating a graph for 18 ft./sec. when C_L max. is 1·15, then

$$V = 19{\cdot}77 \sqrt{\frac{{\cdot}347}{1{\cdot}15}} = 10{\cdot}85 \text{ stalling speed}$$

+ 15% = 12·48 m.p.h. = 18·3 ft./sec. designed flying speed

and $C_L = \frac{{\cdot}5}{{\cdot}001189 \times 1{\cdot}44 \times 18{\cdot}3^2} = {\cdot}872$

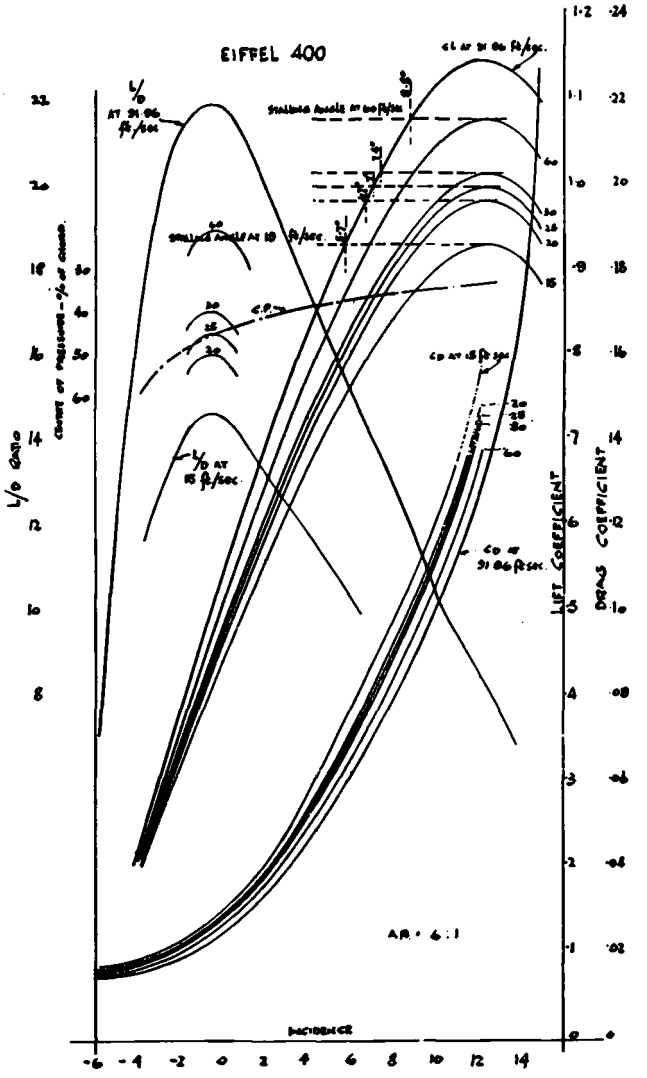
At C_L ·872 angle (from 18 ft./sec. curve is) 5·5°, and the stalling angle 8·75°

C_D at 5·5° = ·085, and the L/D ratio = 10·27 :1.

To provide for the extra speed to attain a maximum horizontal flying speed, we would probably find that a curve of coefficients at say 19 ft./sec. would give us a truer approximation of the actual values to be used for this particular wing loading.

If my reasoning is correct, it shows that Mr. Wathen's development is of great importance, and that the production of coefficient curves with reasonably accurate values between say 15 and 25 ft./sec. are necessary if we are to get our models correct in the design stage.

I nearly overlooked the effect of aspect ratio given by Mr. Wathen, but intend reproducing his curves to a larger scale, with corrections for a range of aspect ratios at each speed, and then adjust calculations for each aspect ration. I enclose a graph for Eiffel 400 airfoil, and have assumed his percentage corrections by measurement from the graph given for R.A.F. 32, and would like to know if, as the angle of zero lift for Eiffel 400 is approximately the same as that of R.A.F.32, the percentage correction I have taken is correct.



If this is right then we can adapt these figures to such airfoils as Gottingen 497, Eiffel 431, etc., but will have to use different corrections when the zero lift angle is different.

The effect on the centre of pressure will also have to be considered.

Yours faithfully,

Sunderland. ALBERT H. SMITH.

* NOTE.—This interpretation of Mr. Russell's formula is not the same as that of Mr. Stubbs in the July issue, but I find that my calculations give the same figures as Mr. Russell (pages 60 and 62), whereas Mr. Stubbs would get 14 m.p.h. and 37·5 m.p.h. respectively (for Mr. Russell's particular aircraft).

DEAR SIR,

The submission of the enclosed photograph is prompted by a paragraph under the heading, "Heard at the Hangar Doors," in your November issue.

The photograph shows a few of the scholars of Wells Road Senior Boys' School, Bristol, with model airplanes they have constructed.

Your contributor of the paragraph referred to will no doubt be interested to know that aero-modelling is carried on here as an out-of-school activity in connection with a Craft and Hobbies' Club, and as an in-school activity with certain scholars as an experiment.

As Craft Master, I can certainly testify to the educational and recreational value of the hobby. Since its inception a few months ago enthusiasm has known no bounds; boys who before had shown no particular keenness for school crafts have been among the most enthusiastic. To date, 45 airplanes and gliders have been made—a fact which speaks for itself.

I have also quite recently introduced simple aerodynamics and aero-modelling into the Science Course of an Evening Institute, and here, too, the keen interest aroused promises great things for the future.

Yours truly,
E. S. USHER.

DEAR SIR,

Apropos of your remarks recently regarding the poor support given to S.M.A.E. competitions, despite the large number of clubs affiliated to the S.M.A.E., I would venture to suggest, and most of our members agree, that the S.M.A.E. should reduce the entrance fee for affiliated club members in their contests. We believe that this fee is one reason for the lack of support, because, although you say, "nothing venture, nothing win," a member who is not blessed with a large amount of pocket money (and I should imagine the vast majority of aero-modellers are not) would be chary of almost certainly losing 1s. if he entered for a contest with an unsuitable 'plane or in bad weather conditions. On the other hand he would not mind so much at losing 6d.

The matter does not stop at losing 1s., because there are many contests during the year which require an entrance fee to be paid, and there are, besides, such things as club subscriptions, travelling expenses, donations, etc., which have to be met.

I think oif the S.M.A.E. reduced these entrance fees they would not lose by it, as they would get many more entries in their contests.

What do you think?

Yours truly,
Salisbury. ROBERT A. READ.

DEAR SIR,

As the Sutton Club is not yet sufficiently stabilised to become affiliated to the S.M.A.E. (we hope to be by the end of the year), I thought it was the only way to bring to notice the following. My son, Master C. Field, was fortunate enough to obtain first place in the Frog Junior Cup, at the T.M.A.C. Rally at Wimbledon. Naturally, he was closely watched by myself (father), his mother, sister and friends, and the rest of the club. Imagine the general surprise and indignation when it was announced that the cup would be presented at the S.M.A.E. dinner, which, judging by previous years, occurs about six months later. All this despite the fact that a distinguished visitor (Miss Pauline Gower) presented the rest of the prizes, in the manner generally followed at other competition rallies, and, in fact, at most sport meetings, i.e. on the field of battle in the public view, and not months later, when the whole thing is almost forgotten, at a function which not all aero-modellists are fortunate enough to be able to attend. Finally, not a word was said about the competition in the T.M.A.C.'s report in the last issue, although every other event in the rally was reported on.

Yours disgustedly,
Carshalton, Surrey. W. R. FIELD.

DEAR SIR,

As one who is and has been interested for some years in the development of model aircraft, I would like to say through the medium of your excellent columns, that I heartily endorse the views of "Enthusiast" (as expressed in your December issue), upon the important matter of Wakefield Regulations, etc.

So long as sheer luck can be allowed to triumph over scientific knowledge and application, this phase of model flying will continue to leave thousands of really serious aero-modellers cold.

Let the powers that be make any alterations to the regulations which will give us more realism, both as regards quality of flight and appearance of machines. The true sphere for the exploration and exploitation of thermals is that of sailplanes, and that splendid Wakefield Trophy will be more highly prized and of greater service to the cause, when it can be won by merit and by merit alone.

Under existing conditions the whole thing seems farcical, proves nothing constructive, encourages freak machines, and after the ball is over, foolish bemoaning and a feeling of general dissatisfaction results.

I would conclude by wishing your journal the continued success it richly deserves, and congratulating you upon the excellence of this Xmas number.

Yours very truly,
Kings Langley, Herts. J. B. RICHARDS.

THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

MONTHLY REPORT

Notes on a Council Meeting of the S.M.A.E., held by permission of the Royal Aeronautical Society in their library at 7 Albemarle Street, W., on Wednesday, November 9th, 1938.

DR. Thuston took the chair. The minutes of the previous Council meeting were read and confirmed.

Arising from the minutes, Mr. J. C. Smith, Hon. Competition Secretary, undertook to arrange indoor flying meetings at the Albert Hall. Mr. Rushbrooke suggested that at every one of these proposed meetings competitions should be arranged, so that those affiliated club members coming from the provinces could be assured of a competition.

Dr. Thurston then read a letter from the President of the C.F.M.R.A., which was in reply to one the Council had instructed him to write on the recommendation of the sub-committee. The Council requested that this letter should be formally acknowledged.

A letter from the Heaton Moor Club notified the S.M.A.E. that they had changed their title to Stockport and District M.F.C.

Alterations and additions to Council delegates and timekeepers were made to the following clubs:

Ashton and District. Northern Heights.
Hornchurch M.A.C. Blackheath M.F.C.
Warrington.

Mr. Chasteneuf, late Council delegate for the Blackheath Club, offered his services as a proxy delegate.

Woodford M.A.C. asked permission for the use of Abridge Aerodrome for flying petrol models. Permission to use this ground was granted.

Ulster M.A.C., with 50 members, were affiliated. Ilford and District M.A.C., with 21 members, were affiliated. Application for reaffiliation was received from the Hayes and District M.A.C. This club had certified that they had 111 members, their reaffiliation was, therefore, passed.

Mr. Cosh informed the Council that the King Peter Cup and other trophies had arrived in England, and only the necessary Customs formalities would have to be gone through. The Council suggested that the cup should be kept at the Royal Aero Club. Dr. Thurston suggested that the "Dragon," another of the team's trophies, should also be kept there.

Mr. Gordon informed the Council that the models at the Woman's Fair had been insured, and that the S.M.A.E. stand was attracting a great deal of attention. A vote of thanks and congratulations to Mr. Gordon was passed for the amount of work and time he was putting in at the exhibition.

The Council next discussed the Wakefield Rules, and it was felt that some clarification was needed, so that there should be no misunderstanding in judging the models, particularly with regard to the wing area. It was decided that the rule relating to this should be "that the area shall be the actual plan area of the cambered surface measured irrespective of dihedral or polyhedral." The Council then discussed the actual rules of the Wakefield Cup. These were clarified, and will be published in the S.M.A.E. handbook.

It was suggested that the S.M.A.E hold a rally at which more than one centralised competition should be held.

The following records were passed.

Mr. Pettican, Windsor M.A.C., R.O.G. indoor fuselage, 1 min. 46·25 sec.

Mr. Mawby, Ealing, H.L. indoor rotor-plane, 45 sec.

Mr. Mann, Edgware, R.O.G. O.2.P.1, 30 sec.

The Council then dealt with the competition programme for 1939, and decided various dates.

At this junction, owing to the lateness of the hour, the Council meeting was adjourned with a vote of thanks to Mr. Houlberg who, for the latter part of the meeting, had taken the chair.

H. YORK,
Hon. Press Secretary.

Notes on the adjourned Council Meeting held on November 15th, 1938.

Mr. Houlberg was in the chair.

Some Council members expressed their disapproval in holding the Council meeting on a Tuesday evening, and at the very short notice they had received, to which Mr. Cosh explained that this was the only suitable date the Council could have the use of the Royal Aeronautical Society's library.

Mr. Cosh informed the Council that he had received a letter from Major Bowden containing a donation of £5 to the Society. Mr. Cosh was instructed to write a letter of thanks to Major Bowden, and also congratulate him on the Council's behalf on his recent appointment

The Batley and District Club, with 16 members, were affiliated, on condition the word "Yorks." was inserted in their title.

A letter from Mr. Wilson, proxy delegate for Stoneygate M.A.C., was read, in which he resigned his appointment, as his business had taken him to Manchester for some considerable time.

It was brought to the notice of the Council that a letter from the Schoolboys' Exhibition authorities had been sent to individual clubs. This matter was passed to the Exhibitions Committee, with the instructions that they were to find out whether the exhibition organisers were having a stand separately from the stand held by the S.M.A.E.

Mr. Rushbrooke asked whether replies had been received from all clubs expressing their opinion of the proposed Area Control scheme. Mr. Cosh replied that fourteen or fifteen clubs had not voted. These clubs were now too late, as the date fixed for receiving their votes had passed. The Council requested Mr. Cosh to put the Area Control scheme on the agenda for the next Council meeting.

The following dates in 1939 were fixed for S.M.A.E. competitions :—

March 19th.—Pilcher Cup for Gliding. Decentralised. Competition to be run under F.A.I. rules.
March 19th.—Decentralised Petrol Competition for the C.S.S.A. Cup.
April 2nd.—Gamage Cup. Decentralised.
April 16th.—Weston Cup for Wakefield models. Decentralised.
May 7th.—M.E. Cup for Gliders, under F.A.I. rules. Decentralised.
May 7th.—F.R.O.G. Elimination Trials.
May 21st.—Short Cup for Sea-planes. Decentralised.
May 28th.—Wakefield Trials. Centralised.
May 29th.—King Peter Cup Trials.
June 11th.—Flight Cup, for petrol models. Centralised. (Cranwell Aerodrome).
June 25th.—Lady Shelley Cup for Sea-planes. White Cup for Flying Boats R.O.W. tank). Centralised (Fairey's Aerodrome).
July 17th to 23rd.—King Peter Cup.
Aug. 6th.—National Cup. Soman's Cup. F.R.O.G. Finals. Centralised. (Fairey's Aerodrome).
Aug. 7th.—Sir John Shelley Cup. Bowden Trophy for petrol models. (Fairey's Aerodrome).
Sept. 3rd.—K. and M.A.A. Cup for Biplanes. Decentralised.
Sept. 17th.—Farrow Shield. Decentralised.
Sept. 24th.—M.E. Cup No. 2, for Speed. Centralised. Ground to be announced later.

The usual Photographic Competition will be run.

The following competitions will be counted in the Plugge Cup Competition :—

M.E. No. 1.	Pilcher Cup.
Short Cup.	Gamage Cup.
K. and M.A.A.	Weston Cup.
Farrow Shield.	

Some of the delegates present felt that cash prizes should not be given to the winners of these competitions. Clubs were, therefore, asked to vote as to whether prizes should be cash, or goods to the value of the prize money, which in most cases will be double that given to 1938 prizewinners. A new competition committee was elected, consisting of Messrs. J. C. Smith, R. N. Bullock, T. Wickens, E. F. H. Cosh, and H. York, with the power to co-opt experts of various types of models. This committee were to draft the actual rules governing the competitions as soon as possible.

The question of the S.M.A.E. diary next came before the Council. It was decided that this should contain a list of the competition fixtures for 1939, a list of affiliated clubs, the names and addresses of officials and other useful information. The book should be bound in blue, with the S.M.A.E. badge in gold, complete with pencil.

Mr. York then gave the Wakefield Fund Committee's report, and after being discussed by the Council, the following points from the report were recommended :—

1. That the affiliated clubs should be asked to assist the fund by organising dinners, dances, and whist drives. It was also suggested that the clubs should be invited to hold amongst their members raffles and jumble sales.
2. That the S.M.A.E. should hold a Buffet Dance on December 14th, to which all affiliated club members should be invited.
3. That the trade should be asked to support the fund.
4. That the Technical Press should be asked to give space to the fund so that donations could be publicly acknowledged.
5. That all profits from the sale of the diary should be given to the Wakefield Fund.
6. That the Society should produce an illustrated booklet containing technical information, such as the various uses of wing sections, etc. Mr. Houlberg undertook to produce this booklet, the profits of which will go to the Wakefield Fund.

The meeting closed at 11 p.m. with a vote of thanks to the chair.

H. York,
Hon. Press Secretary.

Pendulum Control for Petrol 'Planes.—*Contd. from p. 121.*

The whole gear must be adjusted, with the machine propped up on the table in its estimated gliding angle. The battery box must hang absolutely vertical, and a stop must be fitted to prevent movement backwards The elevators must line up with the rest of the tail-planes. And everything must be checked to see that it works freely, and there is no chance of any part sticking when in use. Take care the battery leads do not catch or foul.

The system has been well tried on both petrol and rubber models, and can be built for a negligible increase in weight. A rubber model was modified to include this control, and with a pendulum weight of half an ounce the total increase was only just over one ounce.

PENDULUM CONTROL FOR PETROL 'PLANES

By C. R. JEFFRIES

Mr. Jeffries with his 'plane at the 1938 Bowden Trophy Contest.

NOTHING can be more heartbreaking than, after months of careful work, to see a new model crack up at the end of its first flight. Probably the glide was tested and thought to be O.K., but the succession of stalls and dives can be really frightening, as a crash on landing is almost a certainty.

With the following control system quite a poorly-trimmed machine can be made to make a resonably safe glide to earth. The principle is simply that of a pendulum controlling the elevators, so that immediately the machine gets into a dangerous nose down position, the pendulum moves forward, raises the elevators, and pulls the nose up into the normal gliding angle.

Figure 1a shows a diagram of a model climbing under power, the pendulum resting against a stop to prevent it moving backwards and spoiling the climb of the model. Figure 1b shows the machine in a dive. The pendulum moves forward and raises the elevators, pulling the machine into its normal glide, Figure 1c, when the pendulum returns to normal again.

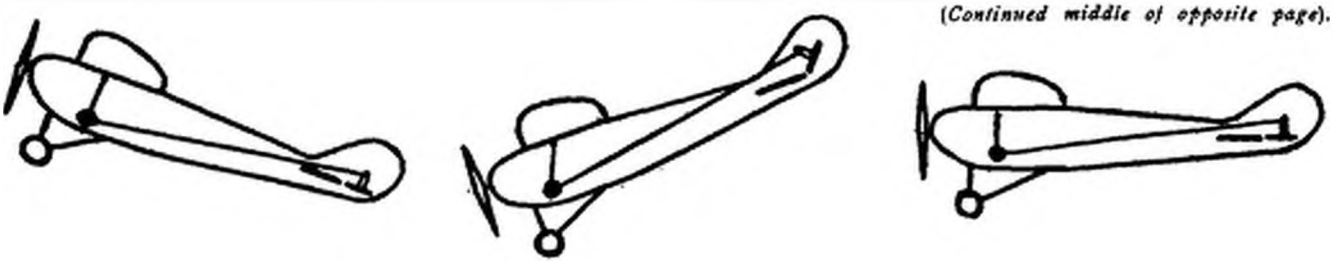


FIG 1a FIG 1b FIG 1c

No actual details of construction will be given, as these will vary for individual machines. In the case of petrol models, the pendulum weight may well consist of the ignition battery, making this component do two jobs and save the addition of extra weight.

Figure 2 should make everything clear. A is a box made of balsa or thin ply to take the ignition battery. B is a tube fitted to the top of this box, and C is a piano wire axle passing through the tube and bound to the fuselage longerons, so that the battery box may swing freely in a fore and aft direction. Fitted to the lower part of the battery box is an extension arm D, which passes through a slot in the side of the fuselage E.

The elevators are hinged freely in any well-known manner. A good method is to bind short lengths of tube to the trailing edge of the tail-planes, and similar pieces to the leading edges of the elevators, a piece of suitable gauge wire completes the hinge. It might be mentioned here that it is advisable to make the elevators in one piece, so that one control horn F works the whole span. The assembly is completed by a control wire G. of about 20 S.W.G. piano wire. If this wire tends to whip and spoil the adjustment one or more light wire steady brackets may be fitted.

(*Continued middle of opposite page*).

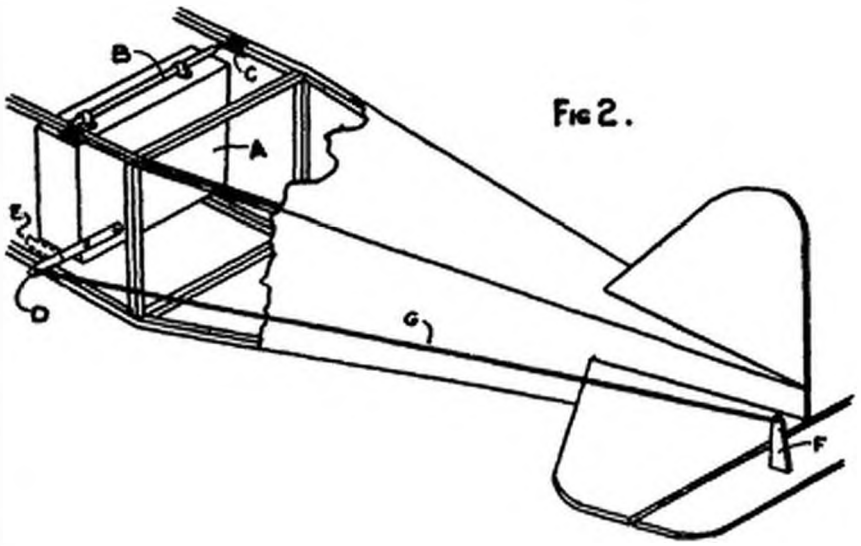
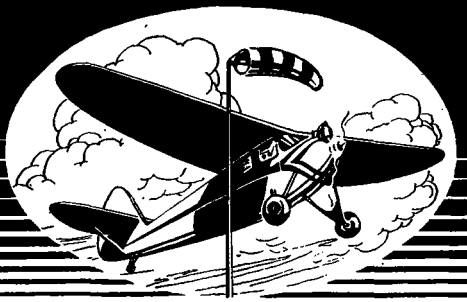


FIG 2.

At the SIGN of the WINDSOCK



FACTS NEWS AND COMMENTS

Premier Aeromodels Supplies are making a special Christmas and New Year offer of ready-built " Cruiser Pups " at £1 5s., packed in a cardboard box, carriage paid; and ready-built " Northern Stars," packed in a crocodile finished, weatherproof carrying case. Inside measurements 42 in. x 8 in. x 8 in. Fitted with two locks, reinforced corners, etc. The " Northern Stars " have been personally inspected by Mr. R. Copland, the British record holder and designer of the model, and the airscrews are each *autographed by him*. These " Stars " are offered at £2 12s. 6d. each, *including* the carrying cases (which, if bought separately, are offered at 12s. 6d. carriage paid). There are only a limited number of these ready-built models, both of which are good performers, the best flight by " Cruiser Pup " being 35 minutes and by a " Northern Star " 26¼ minutes. These models are supplied complete with spare motors and rubber lubricant.

We are informed by the Harborough Publishing Co., 40 High Street, Market Harborough, Leics., that the current edition of D. A. Russell's book, " The Design and Construction of Flying Model Aircraft," is running out, and readers intending to get a copy are advised to place their orders without delay. For further information regarding this well-known work on model aerodynamics, readers are referred to another part of this issue, where full particulars will be found of this and other books dealing with model aircraft.

It would be hard to find two more robust and stable petrol 'planes than the " Kite " and " Kub," two popular models from the range of Kanga Aeromodels, 1 Colonnade Passage, New Street, Birmingham. The " Kanga Kub " is easily transportable, as the wing span is only 4 ft. 9 in., with a fuselage length of 34 in. The complete kit, with cast engine mount, costs £2 17s. 6d. For those who wish to build something larger, the " Kub " has been scaled up and modified, and is offered as the " Kite," with a wing span of 9 ft. 6 in. With either a 6 cc. or 9 cc. engine, the performance is excellent, with a fine floating glide and consequent light landing. The kit price of the " Kite " is £3 15s., carriage 1s. A full range of kits, materials, and accessories is described in the latest Kanga catalogue, 6d. post free.

Kanga Aero Models has just come under new management, and we understand that from January next a new department will be opened to deal especially with mail-order business, the slogan being " No order is too large or too small."

On behalf of Cloud (Model) Aircraft, Dorking, Surrey, we wish to make it clear that there was a mistake, for which we are responsible, in the arranging of the colours for the pictures in their advertisement on the back outside cover page of our last issue. The pictures *should* have been printed in different colours, which would have made for a brighter advertisement.

Will aero-modellers and others interested please note the new address of the Bristol Model Aero Supplies (The Model Airport)? Owing to expansion of business the Bristol M.A.S. have moved into larger premises at 51 Colston Street, Bristol 1, where a large range of models and materials can be inspected. A speciality of this firm, the " Bristol Simplex " kits, have a fine reputation in the west country. The designer of these kits is Mr. A. H. Lee, holder of four British records. Talking of records leads one's thoughts to rubber, and we are now able to state that the " Bristol " record winning rubber is available in three sizes, ⅛ in., 3/16 in., and ¼ in., at 8d., 10d., and 1s. per dozen yards respectively. Among the range of kits stocked by this firm are " Keelbild." " Premier," " Burd," " Homebild," " Cleveland," " Cloud," " Comet," and the " Bristol Simplex."

Another speciality marketed by Bristol M.A.S. is a cunning free-wheel prop. shaft, which obviates soldering, yet makes provision for stretch-winding the rubber, as is necessary for duration flying. This " gadget " is supplied in 18 s.w.g. at 4d., and 16 s.w.g. at 6d., postage 2d. extra.

Readers who would like to build a " Falconette," that well-known model designed by T. H. Newell, will be interested to know that blue prints of this machine can be supplied at 2s. 3d. post free. Alternatively, a kit for this machine, complete with finished prop., blue print, and all materials, costs 10s. 6d., and a finished, tested, and guaranteed to fly " Falconette," can be supplied for 35s. post free. We can assure any readers within reach of Bristol that a hearty welcome, and opportunity to meet keen aero-modellers, will result, if a visit is paid to 51 Colston Street.

We have been using, under " active service " conditions, a new winder for rubber motors, placed on the market recently by Mr. J. W. Kenworthy, 127c Hankinson Road, Bournemouth. The winder is most compact, and can be easily carried in the pocket, and is a great advance on the " handrill " type now in common use. The gear ratio is 5 to 1, and the use of three gear wheels

enables a natural clockwise rotation of the winder handle to be followed. After considerable use we could find no points to criticise, and can confidently recommend this winder to the rubber " fans " looking for a first-class article. The prices are 2s. 9d. and 8s. 9d.; this later type being suitable for very heavy motors. The winder should be obtained through your local dealer, as they are not sold direct, but only through the trade.

The successes obtained by builders of the HW.B. 100 Wakefield type 'plane, show that it is a most consistent performer, putting up winning times in many important events. Among the 1938 successes are the British R.O.G. record in May, the Brighton Open Duration Cup, two members of team winning Bray Trophy, flying H.W.B. 100s, and in the team winning the Farrow Shield were two members flying this type of 'plane. From these results it is evident that any builder of an H.W.B.100 has a potential " pot winner " if it is flown correctly. We are informed that under normal flying conditions this model is a consistent 2½ min. performer. It is claimed that this model is specially suitable for construction by beginners, as the building is quite simple. The kit, complete with special propeller and shaft, can be obtained for 16s. 6d. post free, from the Luton Model Aircraft Supplies, 1a Waldeck Road, Luton.

To those readers whose tastes incline them towards scale flying models, the catalogues of Messrs. A. M. Sweeten Ltd., Bank Hey Street, Blackpool, will make an instant appeal.

The fine range of flying scale models is probably the most varied and extensive of any firm in the trade. Of particular interest to readers of THE AERO-MODELLER are the kits of the Heston " Phœnix " at 3s. 11d. post free, and the Gloster " Gladiator," at 5s. post free.

These two designs have appeared in the pages of this journal, and aroused much interest, and to those of our readers that like their models in " kit " form, we can unhesitatingly recommend these two. Send 8d. for a catalogue and judge for yourself of the excellence of the range offered.

Here is a model built from one of Messrs. Sweeten's latest kits—the Westland " Lysander." 18 in. span by 11 in. long, the model looks very attractive. We have examined one of these kits and can recommend it as containing all material of good quality, a completely finished airscrew, fully turned cowl, semi-shaped spats, and an ample supply of dopes, adhesive, etc. Further particulars are on page 100 of this issue.

We have been testing a sample of " Bournemouth Grey " Duration Rubber, expressly developed for use in model aircraft by the Model Aircraft Stores (Bournemouth) Ltd., 127b Hankinson Road, Bournemouth, and the makers claim of " Maximum life and maximum turns " certainly seems borne out in practice.

Unlubricated, a piece exactly 2 ft. long, was clamped firmly at one end, between two pieces of wood held in the vise, and was stretched to a length of 19 ft. before it snapped. The two pieces were placed together, and it was found that the length was 2 ft. + ¼ in., so the recovery of the rubber is excellent, and this grade of rubber should suit the " stretch winders." Of the lasting qualities when lubricated, we cannot give any definite figures, as frankly we got tired of winding the motor up after 2 dozen " full-turn " winds. At any rate, the number of flights obtained should satisfy the most critical user.

On the " Windsock " page in our last issue we referred to the balsa wood products of E. W. Evans and Co. *There is no such firm.* What we meant to do was to refer to Messrs. W. G. Evans and Sons. This firm was established in 1876, and we *think* we are right in saying that father, son and grandson are all actively engaged in the business to-day. This is the firm, you will remember, that has just introduced veneer one eighty-second of an inch thick, and having seen and tasted a sample sent to us, we can well recommend it.

Much favourable comment has been heard regarding the advertisement in multi-colour, published in our December issue, of the range of " Club " 'planes offered by the Model Aerodrome, 144 Stratford Road, Birmingham 11. These 'planes, whether you select the " All-Balsa-Flyer " at 4s., or that really " super " petrol job, the " Scientific," at £5 10s., are really outstanding examples of attractive design and value for money. For the modest sum of 3d. you can obtain the Model Aerodrome catalogue, giving full particulars of the large range of models, and much useful information to model builders.

No other firm, so far as we know, puts out such large and well-drawn plans as does the Model Aerodrome. We have had plans of both their latest 'planes for examination, and can testify to the high degree of draughtsmanship and skill shown in their execution.

BOOKS FOR THE AERO-MODELLIST —AND FOR XMAS PRESENTS!

(Note—All these books can be obtained from the offices of The Aero-Modeller, Allen House, Newarke Street Leicester)

FRANK ZAIC'S 1938 YEAR BOOK. 4s. 8d. post free.

This book is indispensable to any aero-modeller desiring to keep abreast of modern design and trend.

Seventy-five of the world's most successful 'planes, rubber and petrol, are included in the pages of designs. This year's Wakefield winner is one of the designs given in this section of the book.

Don't get the impression that the " Year Book " is just a collection of drawings, for there are pages packed with useful data, concerning petrol and rubber models, besides dealing with experimental designs like ornithopters, helicopters, and rocket 'planes. As the designs and articles are contributed from all over the world, the book provides a mine of information covering every possible branch of model aviation, and what is very important, the book being published yearly, is right up-to-date in its subject matter.

THE DESIGN AND CONSTRUCTION OF MODEL FLYING AIRCRAFT. By D. A. Russell, A.M.I.Mech.E. 5s. 6d. post free.

No aero-modeller who takes his hobby seriously can afford to be without this book. It is the only one available dealing with Model Aerodynamics, and contains much information for the model designer unobtainable elsewhere, as the matter included in this book is largely derived from original research by the author. By following the methods of calculation and design so clearly explained in this book, the designer of model aircraft can be reasonably certain of its performance while still in the " drawing office " stage. You will find none of the " guessimation " business that often passes for knowledge among the uninformed, included in this book, as all formulaæ etc., are based on established theory. In short, the whole design of model aircraft has at last been placed on a scientific basis, enabling the designer to cut out the guess work and copying of successful designs formerly necessary. The book is beautifully printed on art paper, and its 100 illustrations go a long way towards making clear the 200 pages of text.

THE NEW MODEL AEROPLANE MANUAL. By L. H. Sparey and C. A. Rippon. 3s. 4d. post free.

Since its publication two years ago, this revised edition of the old *Model Aeroplane Manual* has become known as a very valuable aid to the newcomer to model aviation. All the elementary processes of construction, covering, finishing, and flying, are dealt with most clearly, and a beginner, following the methods given in this book, could scarcely go wrong.

While being such an excellent book for the beginner there is much of value for the more experienced constructor to be found in its pages.

As the co-authors are experienced modellers they have realised the value of clear explanations. Amply illustrated with drawings and photographs, the pages dealing with fundamentals are particularly helpful. The practical nature of the authors is shown in the excellent chapter on " Hints and Tips," many useful and time-saving devices being given. The *New Model Aeroplane Manual* contains 284 pages, with over 200 drawings and photographs.

PETROL-ENGINED MODEL AEROPLANES. By C. E. Bowden. 3s. 10d. post free.

The author of this book on petrol 'planes is well known both as a builder of successful petrol 'planes, and by his contributions to THE AERO-MODELLER. This clearly written book should be studied by every petrol 'plane enthusiast, as the whole book carries the conviction that the author knows his subject. The 174 pages contain several prize-winning designs built by the author. The chapter on " Flying a Petrol Model," is particularly of value to a novice, as the advice given therein represents the sum total of years of practical experience. Anyone wishing to build a petrol model of proved performance could not do better than select a design from those given in this book, as the detailed designs and instructions given are quite clear and straightforward.

THE AVIATION BOOK CLUB. Subscription for six months, 17s. 6d.

Membership of the Aviation Book Club brings within the reach of many the class of book that was formerly hopelessly out of reach of the majority of aero-modellers.

For 2s. 6d. per volume the member gets books published as high as 18s., while no choice for the month is of less value than 7s. 6d. At the price of one packet of cigarettes per week the aviation enthusiast is now able to build up a valuable library of the best aviation literature. The committee formed to select the book choice for the month is made up of well-known figures in the aviation world, so that members can rest assured that the choice will be a sound one. The October choice was " Flying Years," by Group-Captain C. H. Keith, R.A.F., published at 18s. 315 pages of personal experience of R.A.F. life overseas. To-day, when more and more parents are looking to the R.A.F. as a possible career for their sons, this book is particularly interesting, as no one reading this volume is left in ignorance of service life and conditions abroad. As Palestine is so much in the news these days, the account given of service life and duties in the Holy Land is of particular interest.

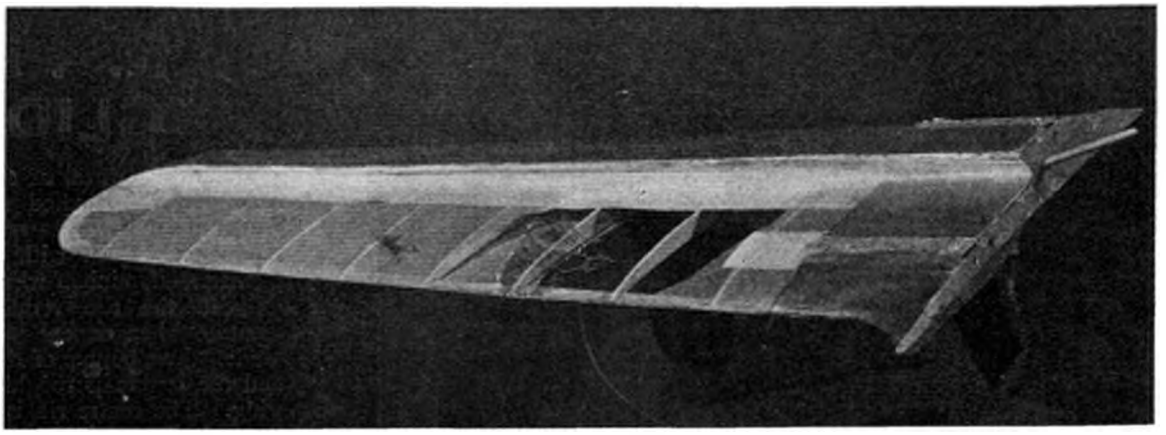
It should not be imagined, however, that the book is simply a bald account of life in the R.A.F., as the author seems to have covered quite a lot of ground, and found time to visit and describe most of the places worth visiting near his station. His account of the Christmas Eve service at Bethlehem, quite altered my " mind pictures " of such an event; still, there is nothing like an eye-witness account for getting the truth. To secretaries of M.A. clubs may we make the suggestion that a subscription to the Aviation Book Club would build up a most useful club library? A form giving full particulars was printed in the November issue of THE AERO-MODELLER; alternatively, full particulars can be obtained from The Aviation Book Club, 32 Bloomsbury Street, London, W.C.1.

STEPPED WING SECTIONS

By

J. N.

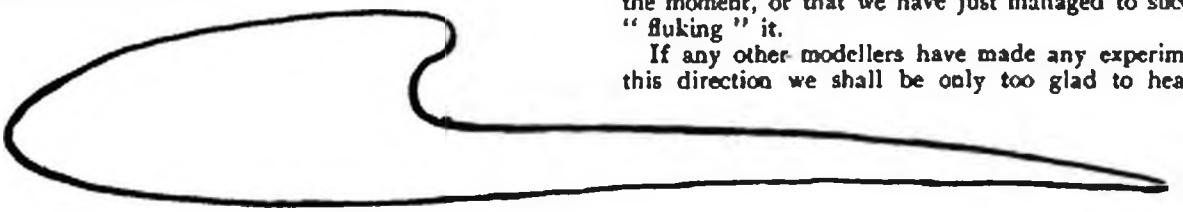
CLANCEY



THE remarks in a recent competition letter, and subsequent comments in the letters to the Editor, have moved me to put on record some experiments with a stepped wing made early in 1937.

I was first tempted to experiment in this direction by that wily old bird, Tom Kimpton, whose name, I am sure, is familiar to many of the " old stagers." Much midnight oil was burnt in discussion on the subject, and we reached the conclusion that a simple hydroplane step, as suggested in the letter, and condemned by Mr. Warring, would certainly fail, because, as a boat rises on its step, so, we can pretty safely assume, will the wing, with its step on top, move downwards, the reasons for which Mr. Warring pointed out in his letter.

One point in Mr. Warring's letter I should like to quarrel with, and that is that in his sketch he shows the air stream flowing smoothly down the " trailing " upper surface of the wing. There are bound to be eddies cast up by the bulbous leading portion of the section, and it was these eddies that we hoped to put to the greatest use in the stepped wing, by dropping the step to a very marked degree, we hoped to prevent the downward pressure which would arise with a normal step. As a further step in this direction, and also to counteract drag, we curved the step back towards the leading edge. This may be seen from the sketch, which shows the section eventually decided upon.



I then build the model with a loading which should, I think, give most sections plenty of work to do. Wing area was 180 sq. in., and the weight 10¾ oz. Practically the whole of the covering was done with balsa veneer, and the undercart was more suitable for a petrol job than rubber! So it will be seen that we were trying to be prepared for trouble. The general design of the model followed normal streamline practice, with, I might add, a non-lifting tail.

First time out we bribed a friendly car-owner to run us to a spot which we hoped would hide our shame should the worst happen, and with many prayers sent her off. The first thing that stuck out a mile was that the prop. had too much blade area, *but*, to quote our honorary chauffeur, " Golly, the blooming thing's running on rails! " And she certainly might have been; she has, without question, the most stable flight that I have seen from any model, before or since.

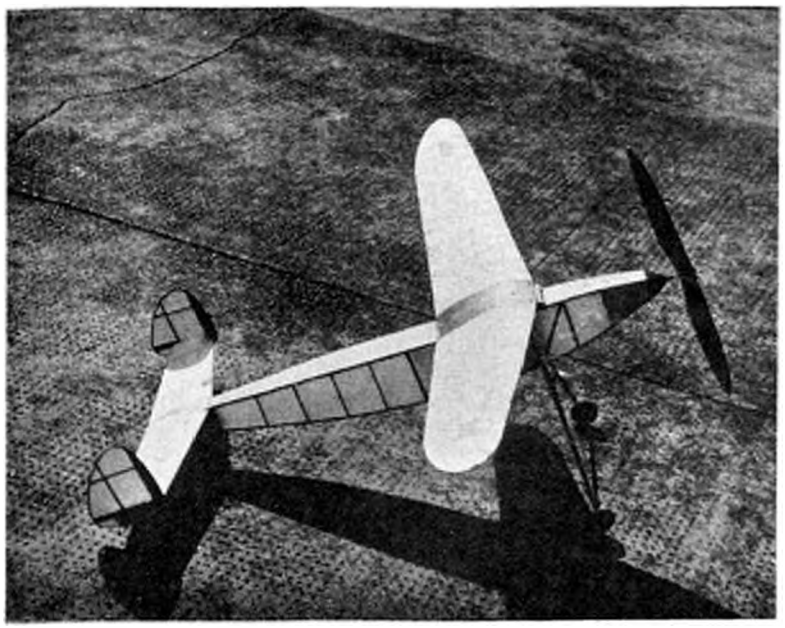
Subsequently we fitted a smaller diameter, coarse pitched Chauviere prop. (a weakness of Mr. Kimpton's, by the way!) and then the fun started. She really climbed beautifully, and then gave splendid flight, and just as stable as ever, incidentally, with no allowance for torque whatsoever; we flew her with both left and right-handed props. without any adjustment of the thrust, and there was no apparent difference in the flight.

One rather astonishing characteristic of this plane was that when in normal flight a very slight gust was sufficient to make it rise absolutely vertically for a distance of, perhaps, ten to fifteen feet; while this occurred the machine remained on a perfectly level keel.

We hope to continue the experiments on the model this season, but would like to get some wind tunnel tests as carried out by the N.P.L., and hope, in fact, to get this done at a later date, and this should show whether our section has any advantage over those in practical use at the moment, or that we have just managed to succeed in " fluking " it.

If any other modellers have made any experiments in this direction we shall be only too glad to hear from them, and to compare notes. Our model is at the moment out of action, owing to some rather too hectic experiments with propellers, but work is going forward on the fitting of gears, and we hope to have some more fun with her in the future.

Meanwhile, we hope to be able to sit back for a space and hear all the theories propounded as to why we should have been absolutely unsuccessful, but strangely enough, were not!



"THE ORION"

By J. EDMUND GIBSON

Fuselage.

The sides are built in the usual way. Note that the forward upright members and longerons are $\frac{1}{8}$ in. square balsa, and the rear members are $\frac{1}{8}$ in. × $\frac{1}{16}$ in. As the top of the fuselage is flat, it can be assembled very true by attaching the top longerons with drawing pins to the plan, and then putting in the cross members, which are of the same size as the corresponding upright members. The tail block is cemented to the longerons and then finally shaped. Be sure to cement very securely the $\frac{1}{8}$ in. sheet, which takes the strain of the rubber motor at the rear of the fuselage. Reinforce the aluminium tubing which takes the undercarriage with diagonal pieces of balsa. Cover the first bay with stiff writing paper.

It is best to make the ribs by a method which has been well tried, and is very good for fairly large tapered wings.

Make templates of the largest and smallest ribs in three-ply hardwood and thread sufficient pieces of $\frac{1}{16}$ in. sheet medium balsa between them on two threaded brass rods for, say, the port ribs. Pare down the balsa with a knife and sandpaper until it conforms to the shape of the templates.

Then repeat the procedure for the starboard ribs. When assembling these ribs on the rods make sure that the trailing edge is perpendicular to the ribs, as the wing is swept back and the trailing edge is straight all along.

The false ribs have to be made as whole ribs, and then cut to required size.

Build the wing on the plan and complete, except for the dihedral.

When putting in the dihedral do not on any account crack the mainspar at the centre section. Cement the ends of the mainspar together and reinforce with balsa. Trim off the pieces which would normally project below the wing into the fuselage. Complete the centre-section and cement the hooks on the mainspar which take the elastic bands for attachment to the fuselage.

The Undercarriage.

This is a very simple, light structure. Streamline the bamboo. Cement and bind with strong thread all 20 s.w.g. wire fittings.

Make each wheel of two pieces of $\frac{1}{8}$ in. sheet balsa laminated together with the grains at right angles and streamline with sandpaper. Bush with 20 s.w.g. inside diameter, aluminium wire.

Build the two rudders together, and separate when cement is dry with a razor blade. The bottom of the stabiliser is flat, and the section is roughly the same as the wing. The centre rib is $\frac{5}{16}$ in. deep, and the end ribs are $\frac{1}{4}$ in. Make the mainspar hard balsa to the size specified.

Fix the wire prongs on to the centre rib and leading edge with cement and bind with fine thread.

Propeller.

Shape blank as shown in drawing from fairly hard balsa. When shaping use a sharp knife, and various grades of sandpaper. Use a round bottle, with sandpaper wrapped round it to obtain necessary concave of about $\frac{1}{8}$ in. deep on each blade.

Strengthen hub with plenty of cement and put in a piece of 18 s.w.g. inside diameter aluminium tubing. Dope the propeller and cover with tissue, which is also doped. The free-wheeling device is shown in the drawing and needs no explaining. The rubber tensioner is optional, but allows a longer length of rubber to be used.

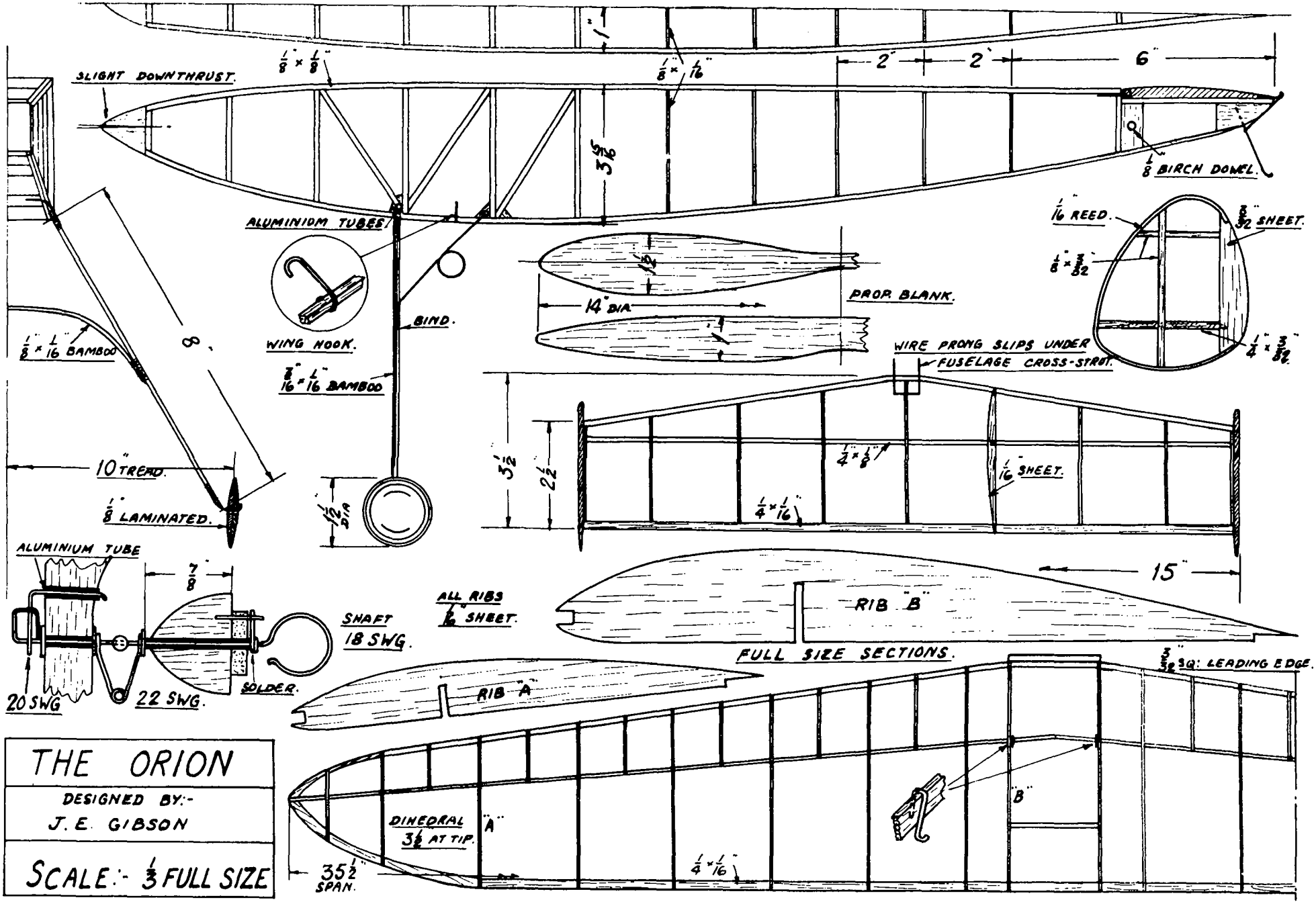
Cover stabiliser and rudders separately, and cement the latter firmly to the extremities of the stabiliser. Cover the wings and the top of the centre section only, but do not cover fuselage yet.

Put in six strands of $\frac{1}{4}$ in. × 1-20 in. rubber, each 31 in. long, and assemble the complete machine without the wings and find the centre of gravity. Go forward about two inches, and put the two hooks on the bottom longerons at this point. Now cover fuselage.

In relation to the top of the fuselage the wing has 8 deg. incidence, and the stabiliser none.

Give the complete machine two coats of dope, and the bottom of the fuselage three.

Sheet.
One $\frac{1}{8}$ in. × 2 in. × 36 in. balsa (medium).
Two $\frac{1}{16}$ in. × 2 in. × 36 in. balsa (medium).
Block.
One 14 in. × 1 in. × 1½ in. balsa (hard) for prop
Strip.
Two 18 in. × $\frac{1}{2}$ in. × $\frac{1}{32}$ in. balsa for leading edge.
Bamboo.
Three 12 in. × $\frac{1}{16}$ in. × $\frac{1}{16}$ in. lengths for undercart
Tube. *Wire.*
2 in. 18 s.w.g. aluminium. 1 length 18 s.w.g.
6 in. 20 s.w.g. aluminium. 1 length 20 s.w.g.
Reed.
One strip $\frac{1}{16}$ in. O.D., also short length of birch dowel.
Rubber.
6 yards $\frac{1}{4}$ in.—20 flat. Four sheets white tissue.
Tube of cement. Small bottle clear dope.



THE ORION

DESIGNED BY:-

J. E. GIBSON

SCALE:- 1/3 FULL SIZE

CLUB NEWS

By THE "CLUBMAN"

Our photo shows one of Major C. E. Bowden's petrol 'planes taking-off from the race-course at the foot of the Rock of Gibraltar. Ever a pioneer, the Major has successfully introduced petrol 'planes to yet another part of the world. . . . Carry on, and good luck!

I'M still bewildered by this publishing a month ahead "stunt." I should be asking how you got on over the Christmas period, but you haven't got to it yet have you! Rather a job keeping to the correct time and place! However, this time I must wish you all the best of luck, flying and high durations in 1939. May your worst flights be minutes, and repairs at a minimum.

I suppose it came as a bit of a surprise to many to find that THE AERO-MODELLER had incorporated the *Constructor*, and I trust you will all enjoy the combination of many features that have made these two journals unique. I am especially pleased to welcome the "Moving Finger" to the fold, and "Fancier" has his own way of saying the same thing in another part of this issue. Boy, oh boy, will the sparks fly now that we have the two together!

My remarks regarding the Wakefield fund were perhaps a bit previous, as I see that in response to popular demand the prize scheme has been dropped, many clubs feeling that they did not require any incentive to donate to such a cause. This is the right spirit, chaps, and let the organisers see you can do things purely from a wish to see the cup back in the old country. Roll the dibs in —and remember that it is now or never!

As it touches largely on my province, I suppose I should comment on the open letter by "Enthusiast," published in last month's issue. However, I feel that it is up to the S.M.A.E. to reply first, and I will confine myself to one or two remarks that may clear the air for those who are not as well informed as they might be. I think it very obvious that no one is in the least perturbed at the cup going to America, but surely it can be commented on, and facts and details published.

Very evidently I am taken to task for having thought it worth while to analyse the results, but I would once again call attention to the reason for this being done. I had heard in many directions criticisms of the English team's showing at the finals, and my main reason for the "analysis" was to place the full details before those of the public who were not in a position to know the actual fine efforts our chaps made. And, anyway, I do not feel called on to justify my remarks. Surely one can enthuse over our own efforts occasionally?

Many and diverse are the suggestions for changing the rules, but may I point out to "Enthusiast" that if he had read fully the report of the Council meeting contained in our November issue, he would see that it had been decided to make no alteration to the machine specifications; and I may state that the reason for this was to eliminate any charge of altering the rules to suit our own purposes—the time to make changes is when we have won the Cup back. Likewise, in view of the difficulty of international translations, etc., the less items are changed the better. Mind, I am not standing out for "no change," but would state that we must be careful with any changes made. The suggestions contained in the letter under discussion are well thought out, but are not new by any means.

The point dealing with decentralised area trials is worth while, but once again may I say not new. The idea was first made over two years ago by, I believe, the Lancs. M.A.S., and has been brought up annually since, unfortunately without success. I should have thought that this year's experiences would have proved to the organisers the real necessity for weeding out the entry, but if, as is evident, they intend to continue to ignore this important item, may we hope for the institution of a system that will be proof against the shortcomings of previous trials. Unfortunately, I must agree with "Enthusiast's" criticisms of the conduct of the 1938 trials, and would submit the plea to our S.M.A.E. Council that many others are of the same opinion.

Regarding location, I have not seen Wolverhampton Airport, but the suggestion has possibilities. May I enquire whether this ground would be put at the disposal of the S.M.A.E.? In the event of a move being made in this direction, may I point out the inadvisability of throwing the ground open to the general public? I dare say I will be taken to task for this statement, but anyone who was present at the 1934 finals held on Warwick Race-course will understand the great inconvenience caused by a crowd of uninformed folk getting in the way of the contestants, and I would submit that in an affair of this kind it is the competitors who should receive the greatest consideration.

With which I leave the knotty subject of the Trials and get down to the even knottier problem of dealing with this month's reports from the clubs. Owing to the

amalgamation of the two journals, I find that I have a lot of duplicate reports, etc., but if I get one or two things mixed, forgive me this once, knowing that by next month things will be fully straightened out.

And so, following my usual practice of giving news from overseas first, we find a very interesting letter from a chap we have heard from before—Chee Peen Lum, of the PENANG AERO-MODELLERS' ASSOCIATION, who writes:—

" Since our last report, things began to move unusually fast. This is because the ' blokes ' think that they are becoming world-famous (which proves that reports are not pure waste of stamps). We are flying our models nearly every week-end. Our present ' aerodrome ' is so small that even on short flights of about 80 sec. our models on many occasions nearly disappeared.

" The duration models we ordered were slightly deficient in materials, and local materials were used with good results. Interest at present is directed on designing and constructional problems. As a result, Mr. Van Hattum is now very popular.

" Referring to our previous report, let me say that we were rather uncertain of our reception. We seem to be welcome, and evidently you are anxious to hear of our troubles. I present here some of our choice bits:

" Our troubles are chiefly postal troubles. We pay a lot of postage money, and in addition we have to wait for months. In this way we waste a lot of time. The obvious remedy seems to be to send an order once a month. This in practice needs a lot of money, the greater part of which can be saved for other things.

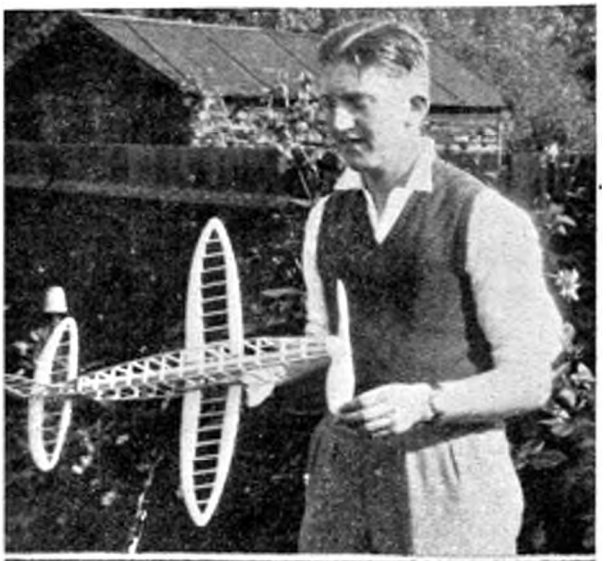
" The firms from whom we bought materials and kits could have saved us a lot of time and money if they had paid us more attention and consideration. On two occasions we sent orders to a firm whose catalogue stated that all kits are post-paid, and did not consider the case of a foreign customer. We, however, sent some extra postage. But when the goods arrived (after two-and-a-half months), we found that we were charged full postage. This is unfair, because the kits are post-paid in England, and so are partially post-paid to foreign countries. Firms should, in my opinion, go one step further than classing folks from the British Empire under the heading of ' Foresign.' After all, it is up to them to foster model aviation in the British Empire, at least the colonial part.

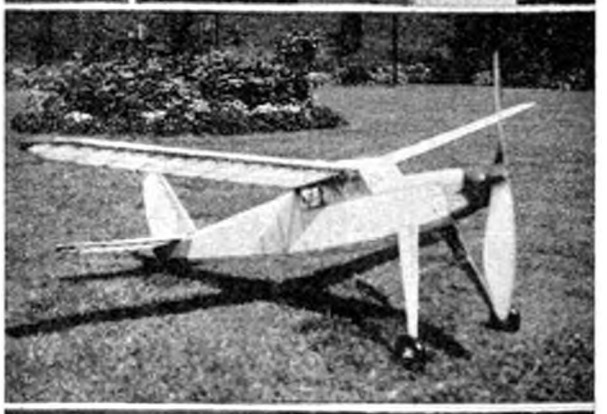
" Our other troubles are mainly internal. We had a very bad start. You see, we are only boys; I am only 17, and the other members range from 19 to 9. Thus, three years ago, when we started, we were not exactly very old. We were very nervous about anything and everything. We dared not appear in public too often, though we did not attract much attention. Now, of course, we are more venturesome. So far, we have sent nothing to newspapers, because we are only six strong, and do not want to be ridiculed. Why, when we sent our first report to you, it was in the nature of an experiment. We were fully prepared, and the report was carefully drawn up so as to say as little of our selves as possible. From the beginning we suffered from postal troubles. Later, we found the need for rules and regulations. Even now, we are still groping in the dark. Before I end, I would like to say something of the S.M.A.E.

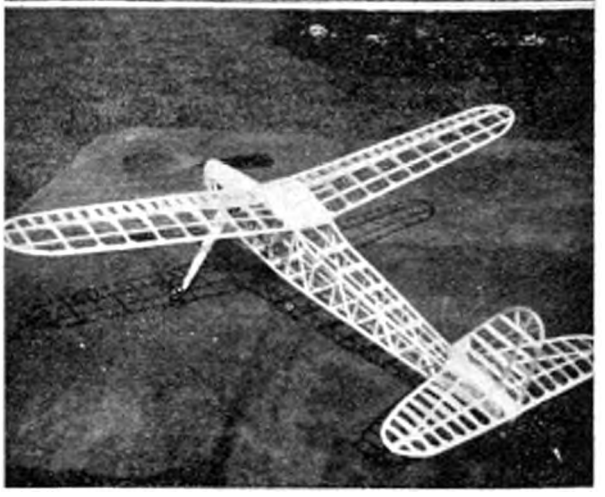
" We think it a wonderful organisation, and often wished we were nearer to it. The growth of clubs under its wing is so rapid as to be incredible. They seem to have no obstacles, so that any and every club seems to grow like ' Jack's beanstalk.' Further, the S.M.A.E. is sort of parliament of the clubs, and we find the clubs all united and carrying on its business without fear of other clubs springing up within half-a-mile of them, or of some other trouble."

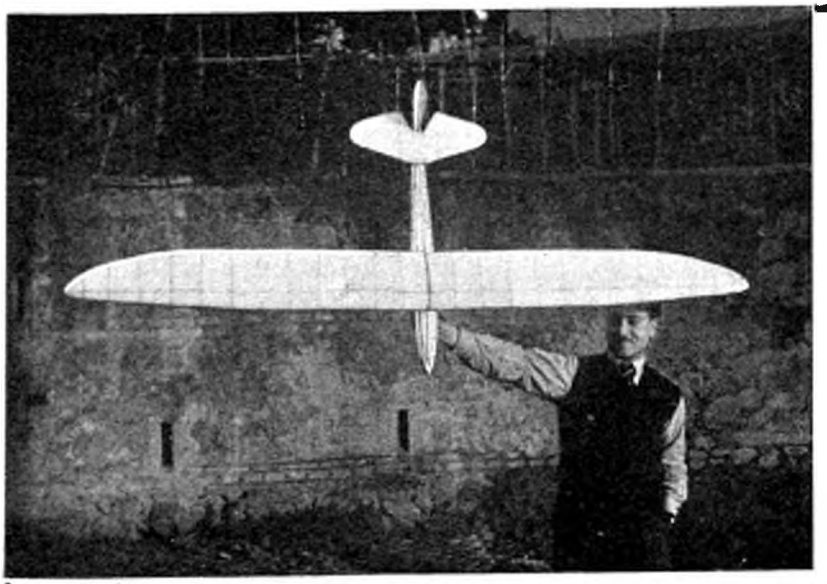
Well, you dealers, I don't think you can blame these chaps for feeling a little peeved, and I would suggest

Mr. R. Brown, of the Blackheath M.F.C., with his speed model, which was second in the S.M.A.E. speed contest at an average speed of 31 m.p.h. All-up weight is 4 oz.
Two photos of a very well made duration model, designed and built by Mr. E. Spenser, of Manchester.









THE "KIRBY KITE" a 6 ft. 4 in. span GLIDER

Designed by our Italian correspondent, Dr. Ing. Fidia Piatelli, this is one of the most successful gliders produced. Full-size scale plans may be obtained from the offices of "The Aero-Modeller," price 3/- post free. Size of drawing, 40 in. x 27 in.

No instructions have been printed, as the construction is quite straightforward with the aid of the fully detailed plans.

that you state definitely those parts of the world to which you are prepared to pay carriage on goods. As far as I know, the Penang Club would be eligible for affiliation to the S.M.A.E., so try writing them, Chee, and here's hoping that your efforts continue to meet with success.

I have a letter this month from Mr. C. J. Tomes, of Balham, who takes me to task for my remarks on the Sutton M.A.C. report in the November issue. Well, Mr. Tomes, as I have said before, where I think a "kick" is indicated it will be forthcoming, likewise a "pat on the back," and seeing that the Sutton Club goth both where's your grouse? Also, who says I was not at the said meeting? No, sir, I stick to my guns when I say the criticism was unjustified, and any apologies should be forthcoming from yourselves, not me! Damitall, if you go into a particular pub. you are not forced to drink the brand of beer provided, and if there's another pub. down the street, what's the obvious answer? There are one or two people about who suffer from a permanent taste of the sour grape—but—well, let's drop it. Obviously, I do not please everyone, but am I worried!

Another letter—which I do not intend to publish, but have passed on individually with a few caustic comments from myself—refers to the lack of courtesy shown by some club secretaries, and their laxity in dealing with applications for membership. This chap complains that it is now three weeks since he wrote, and even after a second letter has not yet received a reply. Well, words fail me, especially when I look at the numerous pleas sent me to ask interested folk in the districts to get in touch with the secretaries. Set your house in order, you laggards!

The BLACKHEATH M.F.C. dinner, dance and prize-giving turned out "tops." One would have thought that it was an S.M.A.E. evening instead of a single club, so many of the society's leading lights were present. Dr. and Mrs. Thurston, Mr. and Mrs. Halbury, Les. Hawkins, "E.F.H.," the "Great Yorky" Smithy, of the "golden voice," Mrs. (M. R. Knight) Hawkins, and a host of others.

From the moment one entered the hall the atmosphere was of gaiety and friendship, the speeches were short and sweet, each speech taking only three minutes, timed by Mr. J. G. Smith, after which the speaker was lightly tapped on the head with a seven-pound hammer and carried out, the latter form of light blackmail bringing forth brilliant, witty, and compact speeches from Mr. R. Knight, Mr. Jack Faulkner, Mr. E. J. H. Cosh, and Dr. Thurston, who said that Blackheath "can be proud of producing so many great men of mystery, but only one secretary of the S.M.A.E."

Prizes were kindly presented by Mrs. Thurston, and whilst the floor was being cleared for dancing, Freddie White, who is just a little nuttier than the few other Blackheathites, who played cards with the menus, kept the crowd in hysterics with his wisecracks. He told us that his latest fuselage was made with a jig—he put the fus. on the floor and danced round it, and the wing was doped with hair restorer by mistake. It grew whiskers, and he had to run hair clippers over it, and so make it a clipped wing job! §

Raffles and an auction brought in a grand total of £7 15s. towards the Wakefield fund—news that earns my heartiest congratulations. A member has been experimenting with rocket 'planes, with fair success, and making a nervous wreck of "Treasurer" Hawkins, who was timing! "Pole" flying is still creating great interest, and a recent contest was won by "Mac," with crow-flying his scale Leopard Moth on the string. It is pointed out that this model was not designed for "rope work." A photo accompanying the report shows R. Brown with his speed job that was placed second in the recent S.M.A.E. speed event.

Mr. I. Newman, of the GLOUCESTER AND DISTRICT M.A.C. was the winner of the Fletcher Trophy for this year, the result being decided on average time throughout the season. This club gave a show of models at a local cinema, the manager being so pleased that members were allowed a special rate for the films. Who says this game doesn't pay?

The results of the WESTON-SUPER-MARE M.A.C. Wilmott Cup Competition, held in three rounds throughout the flying season, were as follow :—

THE MILES KESTREL "TRAINER"

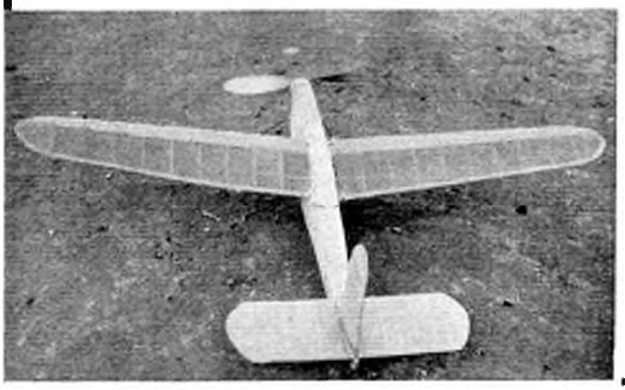
1 in. scale = 39 in. span

Designed by Mr. J. H. Towner, this is one of the finest flying scale models that have ever been built. A fast, steady flyer, the R.O.G. performance is twenty-five to thirty seconds. Fully described in the December, 1938, issue. Full-size scale plans, 40 in. x 27 in., may be obtained from the offices of "The Aero-Modeller," price 3/- post free.

STUBB'S "WAKEFIELD" DESIGN

A twin gear airscrew drive. Conforms to all S.M.A.E. regulations for 1939 Wakefield Competition

BUILD THIS PRIZE WINNING DESIGN FOR NEXT YEAR'S COMPETITION



Full-size drawings, 30 in. x 23 in., may be obtained from the offices of "The Aero-Modeller," price 2/6 post free.

Full-size blue print of the twin gearbox, 6d. extra.

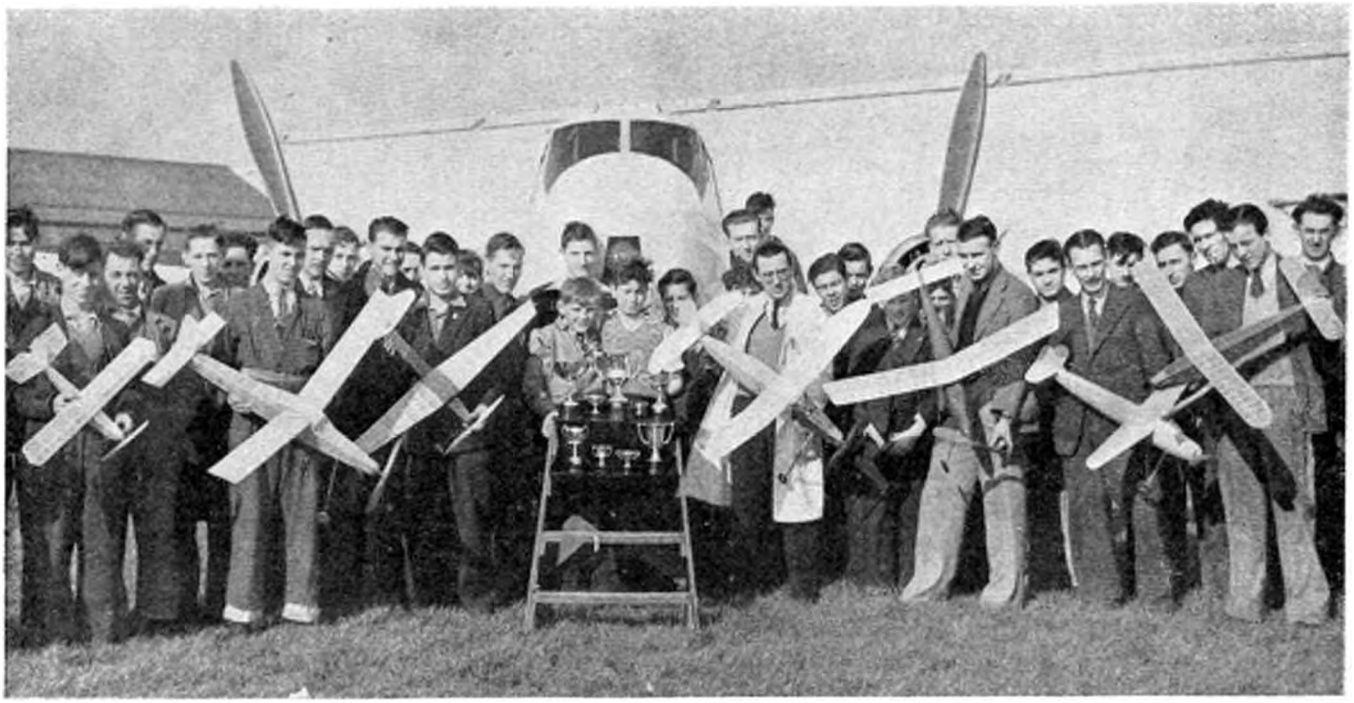
SENIORS.

1.	L. A. Green	... ...	47·8 secs.
2.	S. W. Voules	... ...	42·7 ,,
3.	F. Lindsey	... ...	40·0 ,,

JUNIORS.

1.	J. Greenland	... ...	85·6 sec.
2.	W. Cooke ...	... ...	84·3 ,,
3.	K. Lindsey	... ...	80·4 ,,

The cup and the kit awarded to juniors in this competition were presented to the winners at the first meeting of the winter season, together with the cup for the duration record holder, which went to Mr. Cooke, a junior member of the club.



A fine display of models and cups! Members of the General Aircraft M.A.C., one of the newer clubs, but a live and enthusiastic one for all that.

Members of the TORQUAY AND DISTRICT M.A.C. are busy with many interesting types of models, the main activity being on scale jobs, an added incentive being created by the donation of a trophy by the President, Mr. J. R. Gates. This club has formed a gliding section under the direction of Mr. Oggett.

Two competitions held recently by the BRADFORD M.A.C. resulted as follows:—

WEIGHT LIFTING: SENIOR.

1.	A. Cripps	23·6 sec.
2.	E. Taylor	15·8 ,,

JUNIOR.

1.	K. Gosling	32·5 sec.
2.	J. London	27·4 ,,

CONSOLATION COMPETITION.

1.	Mr. Retford	55·6 sec.
2.	Mr. Silvio	37·8 ,,
3.	Mr. Calverley	32·8 ,,

This club is holding an exhibition at a local store in January, and I can recommend this stunt to any club wishing to advertise in the district. Nothing like showing your goods!

The WHITSTABLE, TANKERTON AND DISTRICT M.A.C. have suffered a loss in the death of their chairman's father, who took a great deal of interest in the club. Hard luck, chaps. Activity is considerable in this club, and I am asked to point out that a mistake was made in reporting the results of an inter-club event with the Herne Bay Club, the latter club gaining two first places against the one first of the Whitstable Club. Interested modellers in this area should get in touch with the secretary, Mr. H. E. Stevenson, of "Trentham," Douglas Avenue, Whitstable.

A new one on me this month is the HUNTLY BOYS M.A.C., which is situated in Aberdeenshire. The farthest north club in the island, this body has been going for over three years. Hampered by wind and rain, this club's ambition is to build a petrol model, but lack of funds individually and collectively prevents it at the moment. They wish all aero-modellers a "Guid New Year."

Mr. Harris won the Stalkartt Trophy for all the year round efficiency in the GOSPORT AND DISTRICT M.F.C., with an average of 54 sec., runners up being Messrs. West and Howe.

Two photos sent in this month are from Eric Spencer, of Burnage, Manchester, and show his recently designed duration model. Wing fixing is enclosed, and tests have shown considerable promise.

Mr. R. W. Williamson, of 51 Southwood Road, Woodsmoor, Stockport, reports:—

"At various times you have reported the activities of the Heaton Moor Model Aero Club in your pages, and hence, as the new secretary, I wish to inform you that this club has been completely reorganised. It has been renamed the Stockport and District Model Flying Club. We have elected a committee of seniors and a chairman. Unfortunately, we have been forced to close the membership at 16, owing to the size of the clubroom at our disposal, but have opened a waiting list.

"We have, at the expense of the secretary's sweat and hard labour, procured a flying field at Offerton, Stockport, and have had one meeting there.

"A member put forward a set of plans for Chasteneuf's Wakefield 'plane for competition. This was won by L. Hopley. The weather was not too helpful, the rather stiff breeze blowing the models rapidly out of view.

"Our chairman has offered a cup for competition, whilst a member has offered a guinea for semi-scale flying models

with second third prizes as kits. This is very helpful and will serve to keep up interest.

" We have made THE AERO-MODELLER our official club journal, and purchase one each month from club funds, *not* to be taken from the clubroom ! "

The members of the WORTHING M.A.C. flew recently for the " Moving Finger " Cup, winner being Mr. Vane-Stubbs, who obtained 880 points out of a possible 400. Will our new acquisition give me a cup, I wonder—a pewter one (filled) will do.

I am notified of a change of secretaryship to the LEAMINGTON AND WARWICK M.A.C., the gentleman being Mr. G. Bennett, of 7 Binswood Avenue, Leamington Spa. Other secs. please note !

The KNARESBOROUGH AND DISTRICT M.A.C., though still in its infancy, boasts a membership of 40, and a move is being made to obtain a larger room for meetings. Many new models are in course of construction, and it is hoped to get permission to use the local town hall for indoor flying.

Mr. Harvey, of the HIGH WYCOMBE M.A.C., has raised the scale record for the club to 81 sec., with a Heston Phœnix constructed from plans printed in this journal. Weather is affecting this club, as all others, but " Lincols " have been found quite able to stand up to the conditions.

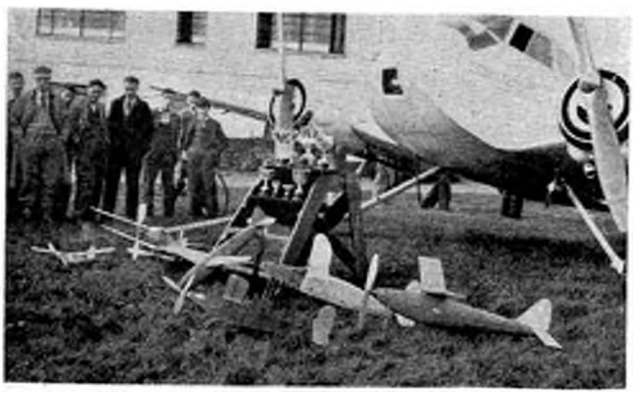
Another new secretary is Mr. R. A. Read, of 89 Roman Road, Salisbury, who now officiates for the SALISBURY AND DISTRICT M.E.S. Comments from this report I have passed on, as a letter to the Editor, this being of very real importance.

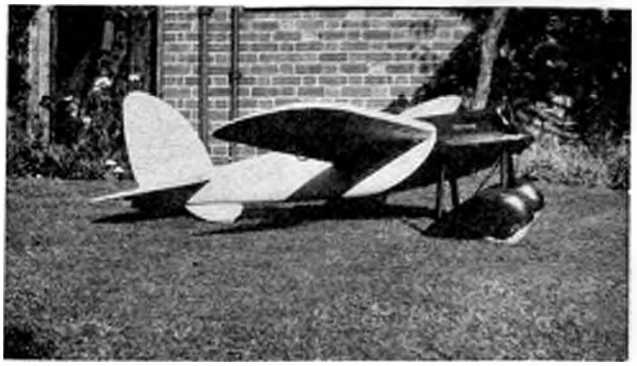
W. Edinburgh, of the HORNCHURCH M.A.C., has raised the club R.O.G. biplane figure to 97 sec., whilst Mr. E. W. Dyer has lifted the heavy-weight figures in both R.O.G and H.L. classes to 51'4 sec. and 68'8 sec. respectively. A show of models was held at a local cinema, but unfortunately they did not contact a generous manager, as did the Gloucester folk, and had to pay to go in ! At the first annual general meeting Mr. Gordon, the chairman said :—

" We have passed a very successful year in both flying and financially, and now that we have passed the probationary period of one year, which we had set ourselves, we intend to go in for as many S.M.A.E. competitions as possible next year, and we hope to see a few trophies on our sideboard. Special mention must be given to the team spirit, which, so prevalent throughout the year, was the prime factor in the club's success."

Mr. Anderton, of the LEEDS M.F.C., writes :

Another photo from the General Aircraft Club. All sizes and power units!





Probably the finest finished petrol 'plane in the country. Built by Mr. J. B. Allman, this " Baby Cyclone " powered model wins the admiration of all enthusiasts. Note the striking design of the undercarriage.

" I should like to thank Clubman for his remarks. Naturally I take no offence, but I should like to point out that the address printed is still not quite correct. It is still 292 Stainbeck Road, not 272. Drinks on Clubman !

" However, to the news. The annual general meeting of the club was held last month, and although we have few changes, one popular one is that Mr. Hempsall now takes over duties as competition secretary. Although, in order to ease Clubman's troubles, I tried to hand over the secretaryship to someone who had a typewriter, I was unsuccessful. We are also very pleased to be able to say that we now have the Lord Mayor of Leeds as our first president ; we hope to add a few noteworthy vice-presidents shortly.

" For the benefit of any person who would like to call in on us, our clubrooms are now in the ladies' section of the Parish Church Club, at 1 Church Row, Kirkgate. Meetings are held every other Thursday. In the ladies' section, by the way, firstly because, so far, we only have one lady member, and, secondly, because the room is larger.

" We all congratulate our friend at Sheffield, who suggests inter-club events in Yorkshire. Mr. Cudworth appears to have read our report in the September issue. Perhaps he will get better response than we did over the same subject. However, he can count Leeds in even if we did first raise the point."

Our " solid " enthusiasts will be interested in the two photos sent by Mr. D. Laxton, of Greenford, and I must add my congratulations on two very fine models. The F.E.2.B is 18 in. span, whilst the Albatross is 9 in. span, both complete to seats, instrument panels, etc. This chap gives an interesting method of making transparent " blisters," etc. Make a mould of candle wax, and cover with a thin coat of cellulose cement. If the cement is a good, clear type, the result is said to be very good. Thanks for the tip, D.L., this is the sort of information I like to pass on.

News from the SUTTON M.A.C. this month is in the nature of a general year's report, and goes :—

" The big news this month is that the club has been completely reorganised and set up on a new basis, and we hope to be affiliated in the New Year.

" Looking back on our activities this year we find that the most notable success was C. Fields achievement in winning the Frog Junior Cup with an average of 129 sec.

This boy is only 12 years old, yet put up an average and displayed a contest technique which might be envied by a person twice his age.

" The season opened on March 6th, when the stick record was set up by Jack North at 805 sec. The same day D. Piggott did 2 min. 10 sec. with a glider, a club record.

" On Easter Monday we attended the Croydon Rally at Hamsey Green. This was the worst day of the year. Bill Fields took the duration prize with 41 sec., which shows what sort of a day it was.

" Our first competition was held on May 22nd. The weather was warm but windy. John Douglas took away the prize. The second club competition was held on July 10th. The day was very windy, with low clouds. North won with 94·75, setting a new club record on his first flight with 2 min. 50 sec. Our third competition was run off on July 31st, the outstanding flight being 5 min. 49 sec., the present club record, by North.

" Preparations were made for the Blackheath Open. We thought we stood a chance, but Jack Marett lost his cabin model after about 10 min. This was before the competition, and nobody else was lucky enough to catch a riser.

" A few members went to the South Coast Gala and were successful. Marett and Piggott got first and second places, with 132 and 78 sec. respectively in the light-weight duration. W. Fields was also in the running, but lost his model in a cabbage patch, and was too late for his third flight.

" Finally, we built stick jobs for the T.M.A.C. rally, but, as usual, we had no luck, and other people got the prize money through 8 and 9 min. flights. In the club competition our team put up a very good show, but was not lucky enough to catch any thermals, while clubs who finished above us did. J. Mackney, however, made a 10 min. flight in the afternoon.

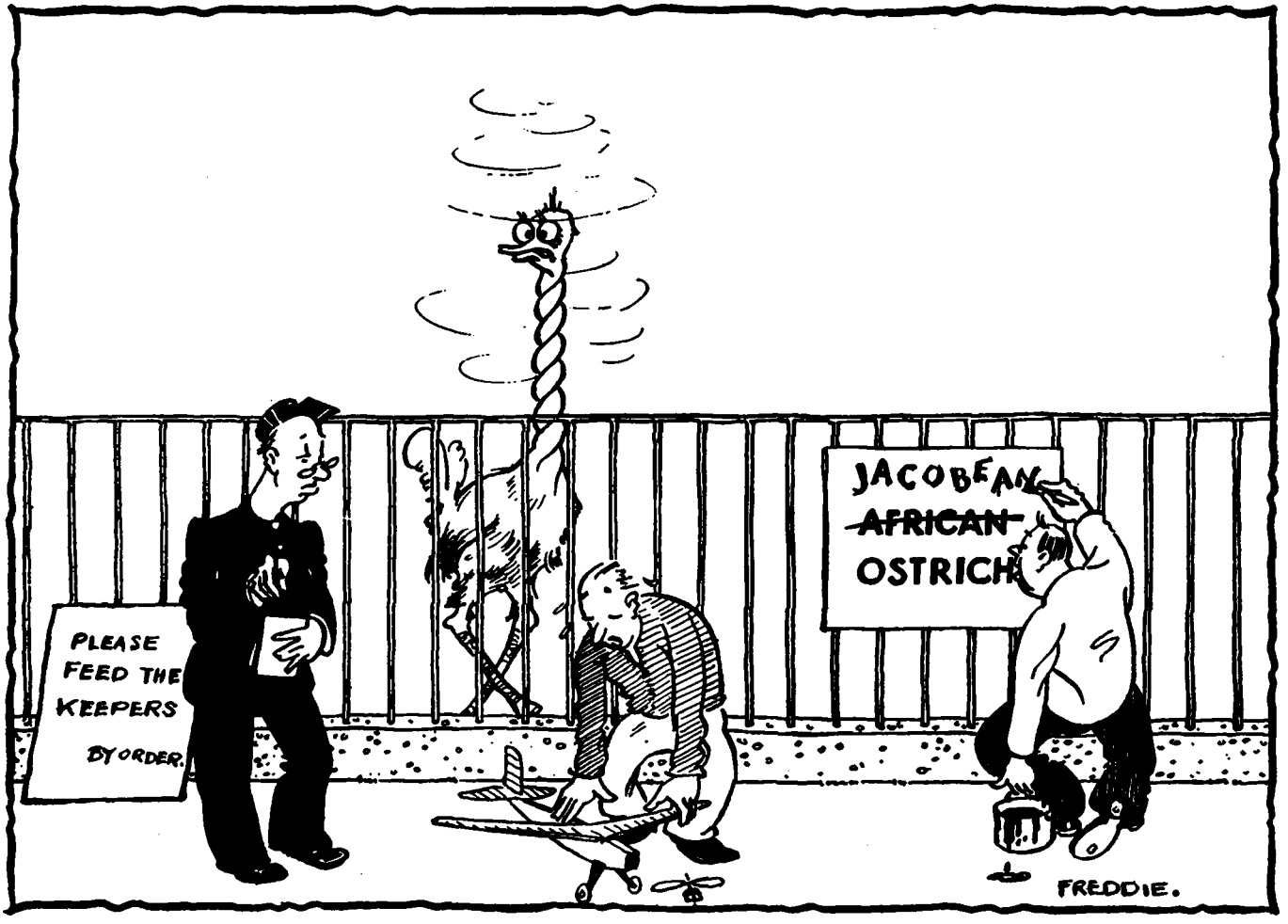
" We would like to remark that our last report was misconstrued, the position being that a few members objected to the part of the Downs used. The remark about the weather was occasioned by the fact that our late press secretary turned up just in time for the down-pour."

No comments this month, Sutton! apart from a con-gratulatory pat on your successes.

The LANCASHIRE M.A.S. report :—

" Our much-postponed M.S.S. (Steering) Cup, was held, together with the Hart Trophy, on October 30th. The entries for these, our season's last competitions, were good, and amid none too warming conditions, Mr. Butterworth won the M.S.S. Cup. His aggregate of points was the highest gained in a steering event in which the models were flown over a prescribed fifty yard course.

" A matter of seconds divided Mr. Tindall in first and



SO IT SWALLOWED YOUR RUBBER MOTOR, EH!

Mr. Hempsall in second places for the Hart (Scale Model) Trophy, thus definitely securing for Mr. Tindall the honour of being the first to win the Goodfellow Trophy, the latest acquisition in our list of ' pots.' An honour and achievement very well deserved by a season's consistency.

" Experiments are afoot for spending certain winter evenings pylon flying in the centre hall of the Manchester College of Technology, with a view to holding competitions, probably inter-club, to help fill the coffers of our Wakefield fund. Other plans are also in hand for methods of raising filthy lucre for this enterprise !

" Regarding the Clubman's enquiry last month *re* the speed contest, the winning machine was a modification of Korda's Cleveland Speedster, the fuselage being widened to accommodate the fuselage formula. Sixteen strands of ¼ in. flat rubber drove a 9 in. gas job prop. (a fuselage of $\frac{3}{32}$ in. square balsa longerons). Wing and tail areas were the same. The principle seemed to be to get as much forward thrust as possible, and this was done as the model in flight simply cork-screwed through the air, but in a dead straight line, no matter how much anti-torque adjustments were made. The competition was not, however, run on S.M.A.E. lines, and the speed would not have been allowed as a record."

The RETFORD M.A.C. H.L. record has been raised to 120·6 sec. by their chairman. Membership is now around the 40 mark, and includes two ladies.

" YEOVIL AND DISTRICT M.A.C. have been able to hold a gliding and heavy-weight duration contest during the past few weeks, the former being won by W. Keen, and the latter by K. B. Evans. The junior competition held on November 6th was won by R. Branard, using a " Dick Corda." This design is becoming popular in the club, but certain alterations have been made, such as substituting the typical English undercart, prop. drive, and making the tail and fin in one piece. Members are having "brainstorms" now in designing Wakefield models and it is fun to listen to arguments. We are also holding lectures, given by a chief stressman from the Westland Aircraft Works, and his pet hobby is ' The design and construction of model aeroplanes and gliders,' believe or not. We are learning ' something ! ' Shush ! Mr. S. Dunn, 21 Highfield Road, has taken over the reins as secretary, he having more time to spare at the present period than Mr. Evans. The latter has undertaken the duties of Press secretary.

" By the way, having learned that THE AERO-MODELLER has incorporated the *Model Aero-Constructor*, Mr. Evans takes this opportunity of thanking ' Moving Finger ' for the cup which was awarded to him for the most appropriate name to give to petrol model fans."

The STONEYGATE M.A.C. (which, by the way, is in Leicester, though why the dickins they don't say so, beats me !) send the following information :--

" We would bring to the notice of all our friends the fact that we have a new secretary, K. L. Stothers, Esq., of 74 Dorothy Road, Leicester, and will any prospective members please note this change?

" In the past many important club events have gone unrecorded, and we would warn Mr. Howard Boys that his pterodactyl record is in danger. Two of our members have been building these jobs for a long time, and one of them, Mr. Lewis Morris, has on many occasions had flights of two minutes with unfavourable weather conditions. The design of our pteros. differ widely from that of Mr. Boys. e.g. we use twin rudders on the wing

(Left) Mr. K. L. Stothers with his Midland Rally prize-winning glider.
(Above) An 8 ft. 7 in. span by 6 ft. long rubber-driven model. Weight is 44 oz. and duration is over a minute—on three-quarter turns. A full description, with plans, of this amazing model will be published in our next issue.

tips, and invert the wing section for a distance quarter the span from the tip.

" We wish to thank M.M.A.C. for the entertainment they gave us at the Midland Rally, and we were very pleased to be able to end a grand day by carrying off some crockery. We should like to know if this is solid silver, as our club funds are rather low."

Well, Stoneygate, the best way to substantiate your ptero' claims is to go after the record. The photo sent shows K. L. Stothers with his winning glider at the Midland Rally. By the way, you might let me know the reply of the Midland Club to your " silver " query! Others might like to pop their collections!

Now that the flying season is over, the PARK MODEL AIRCRAFT LEAGUE Social and Entertainments' Committee find that they have to work on " full turns." This they are doing to good purpose, and their efforts have so far been well rewarded with good attendances and very enjoyable evenings.

The first of the winter session meetings was held at the beginning of October, and was designed chiefly for juniors and novices. It was conducted by the social secretary, and was in the form of lecturettes. Members were invited to ask questions, state their problems or difficulties. Other members were then called upon to say how they had overcome these particular difficulties in their own building in the past.

The second meeting, held at the beginning of November, took the form of an indoor flying meeting, using the pole method, which was demonstrated by Mr. R. N. Bullock, on the occasion of his visit last year. Two contests were held, one for duration, which was won by Mr. A. Weston, with an average of 54·28 sec., using an ordinary small light-weight model with a span of about 20 in. The other was more or less in the nature of an experiment, and was for speed. This was won by Mr. G. C. Goodger, with an average speed of 20 m.p.h.

After the dinner, attention is turned to the Mitcham Industries Fair, which is being held at the Mitcham Baths, from the 22nd to the 29th March next, and at which the P.M.A.L. is having a stand and expects to put up a good show. Do not forget, in the meantime, the fifth annual dance and social evening on January 25th at the Farnan Hall, Streatham. Tickets, price 2s. each, are available from the officers.

An amalgamation has taken place between the Sheffield M.A.S. and the Middlewood M.A.C., the new body being now known as the SHEFFIELD SOCIETY OF AERO-MODELLERS. Quite a good move this, and gives point to a theory I gave some time back that it is not to the good of the movement to have too many clubs in one area. Two grounds are in operation at opposite sides of the city, and new members are welcome. Membership is around the 60 mark, and application is to be made for affiliation to the S.M.A.E. Get in touch with Mr. R. Hemingway, at 8 Charles Ashmore Road, Meadowhead, Sheffield 8.

An interesting letter from the WEST SUSSEX M.A.S. says :—

" During the past few months several interesting power models have made their appearance. Mr. Colyer has designed and constructed a 6 cc. four-stroke petrol engine, which, although a trifle heavy compared with the conventional two-stroke, has a remarkably good performance. An experiment in turning a 3 cc. motor out of a ' Baby Austin ' back axle has proved very successful. The completed engine is surprisingly light and very robust. A speed of 7,000 r.p.m. has been obtained with a 10 in. prop. An engine with the crankcase and petrol tank cast in one has also been tried, the motor mount being lug welded to the tank itself, or the conventional " knock out " plug on the back of the tank. All the above by Mr. Colyer and Mr. Kimpton."

The annual flying display by this club suffered from weather, type l—y, and resulted in Mr. Clements winning the nearest to 40 sec. competition, G. Golds the light-weight duration, R. Warring the heavy-weight event, Mrs. Golds the ladies' competition (also raising the ladies' record to 106 sec.), and the best flight of the day was made by R. Warring with a flip of 3 min. 36 sec.

Mr. Eifflander, of the MACCLESFIELD M.A.S., found the " last thermal of summer," and raised the club record to 10 min. 36 sec. The competition resulted in :—

1. J. Eifflander (average of 8) ... 187 sec.
2. K. Turner (average of 8) ... 79 ,,
3. R. W. Higson (average of 8)... 54 ,,

Yet another club is hit by the untimely deaths of prominent members, this time the EALING AND DISTRICT M.F.C. reporting the loss of the Mayor of Ealing, Councillor Lewis, a very good friend of the club. Also, in very tragic circumstances, the loss of the vice-

president of the club, Mr. Watkis. This chap figured in the recent accident to an anti-aircraft gun that I dare say most of you read about.

Indoor activities are making themselves evident, and L. B. Mawby has been trying out a microfilm autogiro. The "outdoor" ground is now tastefully decorated with goalposts, which the members show great cleverness in avoiding. How about the models!

Two fine photos to hand are from the GENERAL AIRCRAFT M.A.C., and show a group of members and models posed by some "big brothers." Some of the club trophies are also seen, and I should think this club has all the attributes to go ahead.

The number of new clubs to report this month is amazing, there being 11 all told. I can only give you a complete list of those to get in touch with, and trust readers in the areas denoted will get in touch with the people who are anxious to get things going in their various districts. Here we go!

ST. FRANCIS XAVIERS M.A.S.
B. Blundell, Salisbury Street, Liverpool 8.

FARNBOROUGH M.A.C.
J. Rossiter, 86 Lynchford Road, Farnborough, Hants.

BARROW-IN-FURNESS M.A.C.
J. W. Dickinson, 137 Duke Street, Askham-in-Furness.

FARNHAM (SURREY) M.A.C.
R. D. N. Saunders, Marylands, Swingate Road, Farnham.

NORTHAMPTON M.A.C.
L. Leach, 58 St. Edmunds Street, Northampton.

SKEGNESS M.A.C.
F. Spurr, 58 Brunswick Drive, Skegness, Lincs.

DONCASTER TECHNICAL M.A.C.
E. Sparrow, 8 Belvedere, Balby, Doncaster.

BUSHEY PARK M.A.C.
J. C. Wadslow, 80 Myrtle Road, Hampton Hill, Middlesex.

L.C.C. FULHAM MEN'S INSTITUTE.
Beaufort House School, Lillie Road, S.W.6.

MEDWAY AND DISTRICT M.A.C.
C. R. Carr, 16 Warner Street, Chatham, Kent.

TOTON (NOTTS) M.A.C.
A. Bullock. (No address given).

I have also a plea for anyone interested in models in the Guiseley district (wherever that is!) to get in touch with Mr. T. Cockburn, of "Kinmount," New Way, Tranmere, Guiseley. (Near Leeds, surely.—ED.).

From the Secretary of the WESTWOOD MODEL AIRCRAFT CLUB (Now, how the —— do I know where that is? Oh yes! Beverley, Yorks.)—comes news of an exhibition recently held in Hull, organised by the Hull Society of Model Engineers. The club had a large stand, on which there were nearly forty models to be seen, nearly all constructed during the last two months (i.e. the club was only formed in September).

There was a petrol model constructed by Mr. Robt. and Mr. Richard Skinner, "The Cloud Cruiser," 6 ft. wing span, powered with a Challenger engine. There was a beautifully constructed Gull sailplane by Mr. A. Hare, and several other gliders, one of very unique design by Mr. R. Ragg.

Amongst the duration models there was a copy of Charles Grant's Wakefield design, "Tsetse Fly," by Mr. J. H. Elwell, and four "Northern Stars." Other models included a Kanga Kitten, a Parastar, two Dick

Kordas, and many scale flying and non-flying models, including one beautiful solid Hawker Audax.

The exhibition was packed all the time, and was a huge success, and it is hoped to hold one in Beverley shortly, and to have the support of the Hull Society of Model Engineers.

A good effort for a club formed only three short months ago, and great things are expected next summer.

From the CARDIFF MODEL AERO CLUB comes the following news :—

The " Songsters " seem to have taken the " Clubman's " advice, as the membership has risen to 40. Also the R.O.G. record was broken no less than three times on one Sunday, twice by H. J. Watkins, with 56⅘ sec. and 57⅘ sec., and the last flight of the day by Vernon Hill, with a " Super Duration," and a borrowed prop., his time being 69⅘ sec.

The last few weeks have been washed out by the weather, but as soon as the weather allows, I think a few more records will go by the board. By the way, the R.O.G. record was broken by flying off the ground and *not* a board.

With the kind permission of the Cardiff Council we now have access to the Ely Racecourse. Here there is a large expanse of land, with very little obstruction.

The only real dangers are the Rugby football goal posts, which are at one end of the field in a corner. so do not offer a very great obstruction, even when the 'planes get blown amongst them. So far none of the 'planes have struck them, although a good many meetings have been held there, both on Sunday morning and afternoon. Also on Wednesday afternoon, which is early closing day in Cardiff. A minority gather there sometimes on a *Monday afternoon.*

A number of " Spar " models are entering the field. The record was set up with 17 sec. in a high wind. The model was forced down with a broken wing. However, several more spar models are coming along, and we should see a few good performances.

Most of the members wish to become affiliated to the S.M.A.E., and I hope by next month that you will have definite news.

I read that most clubs pack up for the winter. Well, we are just getting started, and are going to run competitions as though it were May! Jack Frost cannot scare us " Songsters."

And leaving you to chew over all that, I leave you for the present. I have so many dinners, etc., to attend that I shall have to go chasing a lot of models to get my weight down to normal once again, but who cares! That is one thing I am pleased to see—the social side of things receiving more attention. Nothing like having a get-together during the winter.

So—here's to 1939, and may we see many things transpire that we have set our hearts on. The Wakefield Cup back in England, the King Peter Cup to remain here, and health and prosperity to all the clubs in this greatest of all sports. Be seein' you fellows.

THE CLUBMAN.

P.S.—And what about these late-comers? All of them *dated after* 25th of the month, and some not arrived till the 30th!

Well, well, it's no good. I cannot get the reports in, and it's no good quarrelling with me about it. Surely it cannot make any difference to get these reports away just a day or two *before* 25th of the month?

Dagenham M.A.C., Wolverhampton M.A.C., Halifax

M.A.C., Liverpool M.A.C., Brighton and District M.A.C., Croydon and District M.A.C., Reading and District M.A.C., Doncaster M.A.C., The Model Aircraft Club, and the Wakefield (Yorks) M.A.C.

Now, friends. Go over those reports; pick out the best of the news, add your latest, and send off to reach me by December 25th definitely, and you will " get a good show " next report (and don't say I don't do my share to keep the peace, even if I *do* have to slang you sometimes ! !)

EDITOR'S NOTE.—Whilst supporting " Clubman " in his appeal, we wish to make it quite clear that on special occasions we will make every effort to include reports arriving late, due to reporting a meeting or exhibition held late in the month; but we do ask, that where there is no special cause for delay, that reports shall be at our Leicester offices by 25th of the month *at latest*.

Miscellaneous Prepaid Advertisements

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