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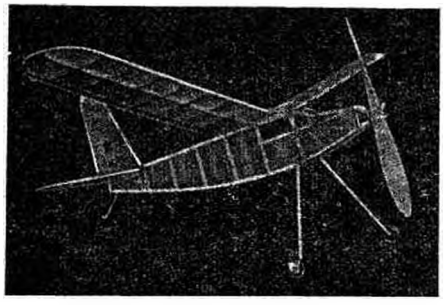

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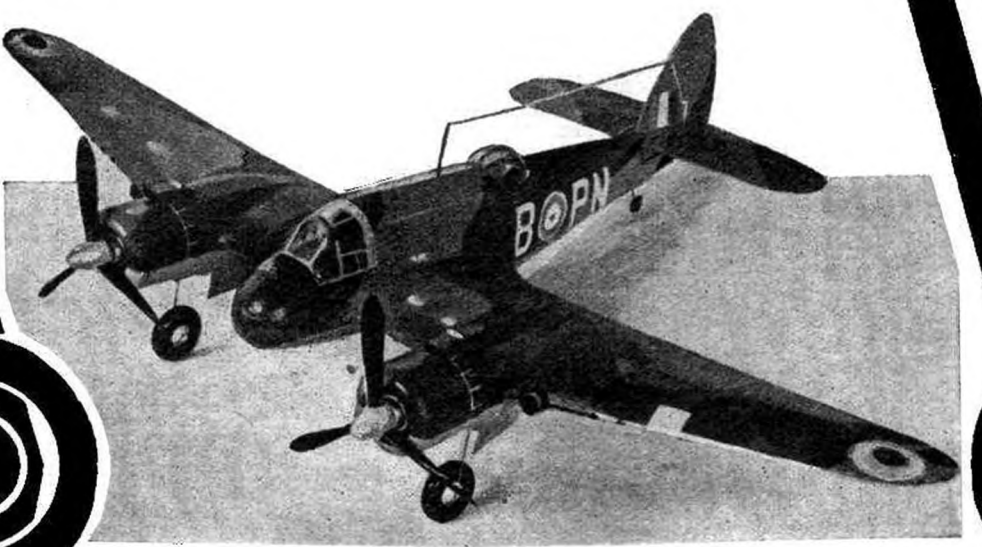

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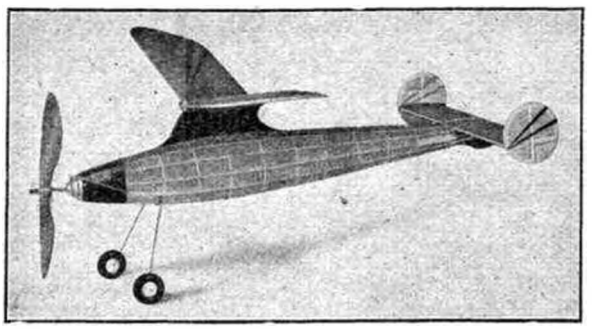

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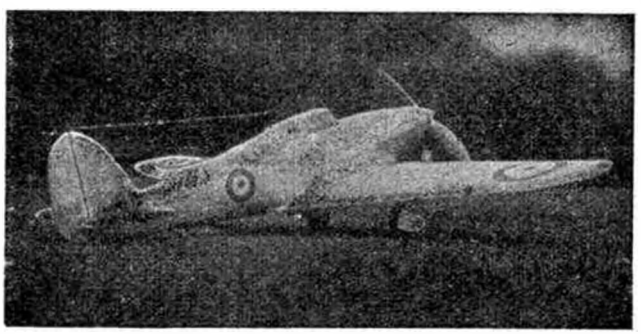

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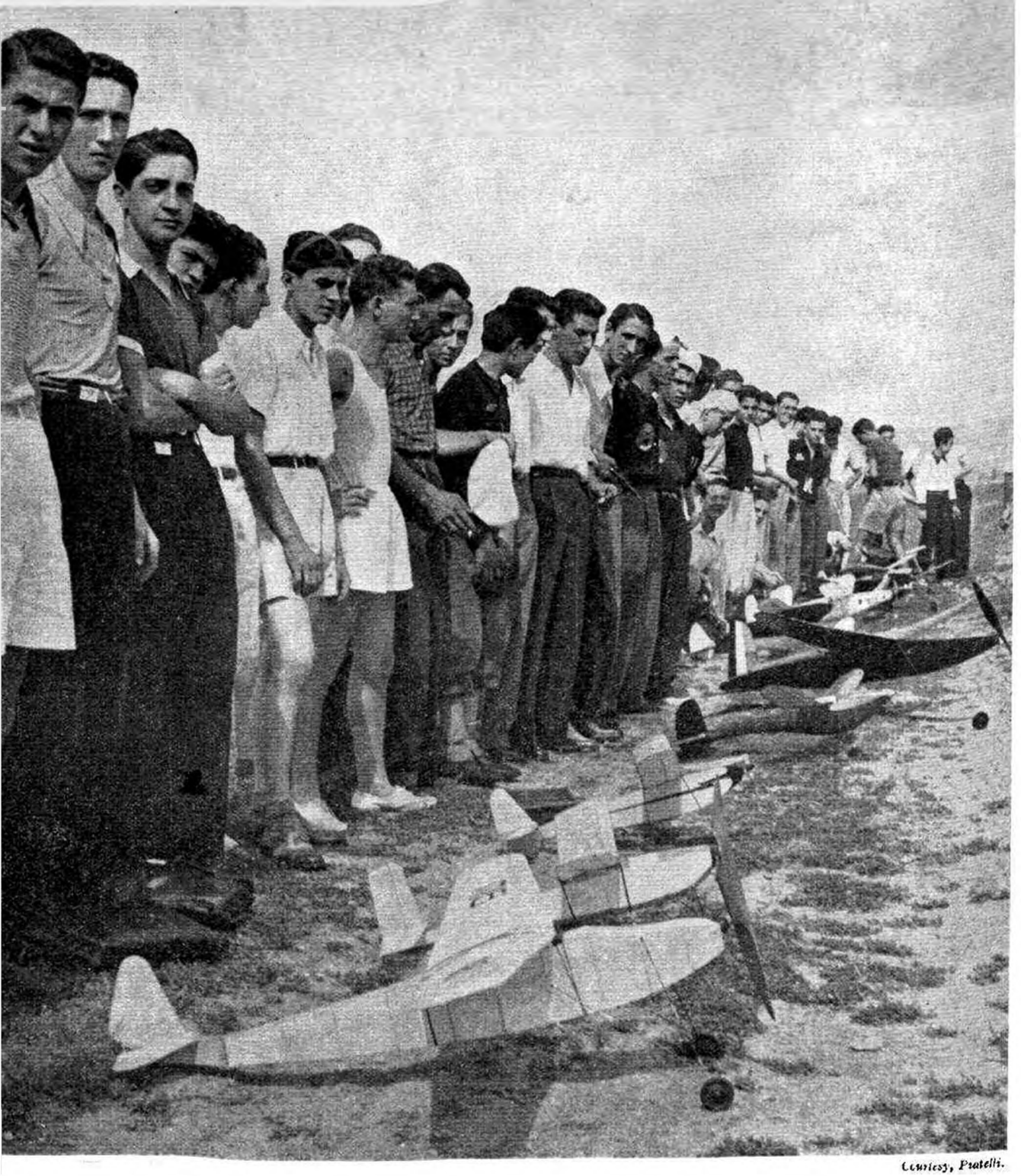

Courtesy, Pratelli.

IL DUCE'S MODELLERS LINE UP FOR THE ITALIAN NATIONALS.

CONTENTS OF THIS ISSUE

THE AERO MODELLER

Established in 1936

(INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR")

(Proprietors: Model Aeronautical Press, Ltd.)

THE MODEL AERONAUTICAL JOURNAL OF THE BRITISH EMPIRE

Managing Editor: D. A. Russell, A.M.I.Mech.E.

Editor: C. S. Rushbrooke

Vol. VII - No. 75 FEBRUARY, 1942

ALLEN HOUSE, NEWARKE ST., LEICESTER

EDITORIAL

DURING recent years the educational value of model aeronautics has not, unfortunately, received much consideration in this country; the chief trouble being the fact that the Educational Authorities have not realised that model building is something more than a sport or hobby. Several foreign countries did, however, realise this, and even if they did train their young constructors for war-like purposes, and politics formed the basis of their organizations, they did at least show that they realised that model aircraft were not mere toys, but were the first step—and a very important step—towards a training in aerodynamics and the flying of full-sized aircraft.

Thus the training of future pilots, engineers and designers was begun by teaching large numbers of boys and youths the technique of model building and flying; and afterwards leading them by easy steps—the glider, the light aeroplane to, finally, full-sized aircraft.

A review of the work done throughout the European countries in the years preceeding the present war appears on the following pages of this issue, and comes from the pen of Mr. Leofric (George) Temple, who, as noted in our last month's Editorial, has had a wide experience of Continental methods of teaching. We trust that this article will be read and passed on to many school authorities and Officers of the Air Training Corps. to whom it may serve as a guide and possibly an "eye-opener"!

THE NATIONAL GUILD OF AEROMODELLISTS

On the back inside cover page of this issue we publish our usual N.G.A. membership renewal form. This must be used by all *existing* members who wish to renew their subscriptions and insurance cover, and may also be used by those wishing to join the Guild for the first time. Full particulars of the Third Party Insurance offered to all members are given on page 89, whilst instructions in regard to obtaining black and gold transfers for affixing to members' aircraft, and black and gilt lapel badges, are given on the order form.

GADGET REVIEW

As a variation, we propose arranging the popular feature "Gadget Review" to deal with solid models and also gliders. Will enthusiasts who build these two classes of models, therefore, send in their ideas for inclusion in an early "Review." It will help us considerably if envelopes are marked on the outside "Solid," "Glider" or "Duration," as the case may be.

PHOTOGRAPHS OF MODELS

We invite readers who have built models from plans issued via THE AERO-MODELLER Plans Service, Ltd., to send us photographs of the *covered* models. Payment will be made for all photographs used in THE AERO-MODELLER or one of the range of "Harborough" books. Photographs should be as large as possible, sharp, and preferably on glossy paper. We are specially interested in obtaining good photographs of the following models: "A.P.6," "Kirby Kite," "King Falcon" and "Stothers" (four gliders); The "Mermaid" Flying Boat, "Beginners' Biplane," "The R.F.L.G.," "Toots II," "The Baby R.O.G.," "The Pterodactyl," "The Sunstar" and the "Messerschmitt."

We are also seeking some really good photographs of Microfilm models.

All photographs submitted will be returned if accompanied by stamped addressed envelope, and we look forward to receiving a good selection from the many readers who have built models from THE AERO-MODELLER "Plans Service" plans.

CORRECTION

In last month's "Questions and Answers," the question was asked—"What are the uses and differences between a pitot tube and a venturi tube?"

A pitot tube was correctly described as an instrument for measuring the speed of an aircraft relative to the air. A venturi tube was *incorrectly* described as serving the same purpose. Actually a venturi tube is used for creating a suction to drive the automatic gyroscope, artificial horizon, and other instruments.

S.O.S.

If Mr. A. Abbott, designer of the "Tipsy" model aircraft described in the last issue, will let us have his present address, we will forward to him his cheque in payment for his article.

D. A. R.

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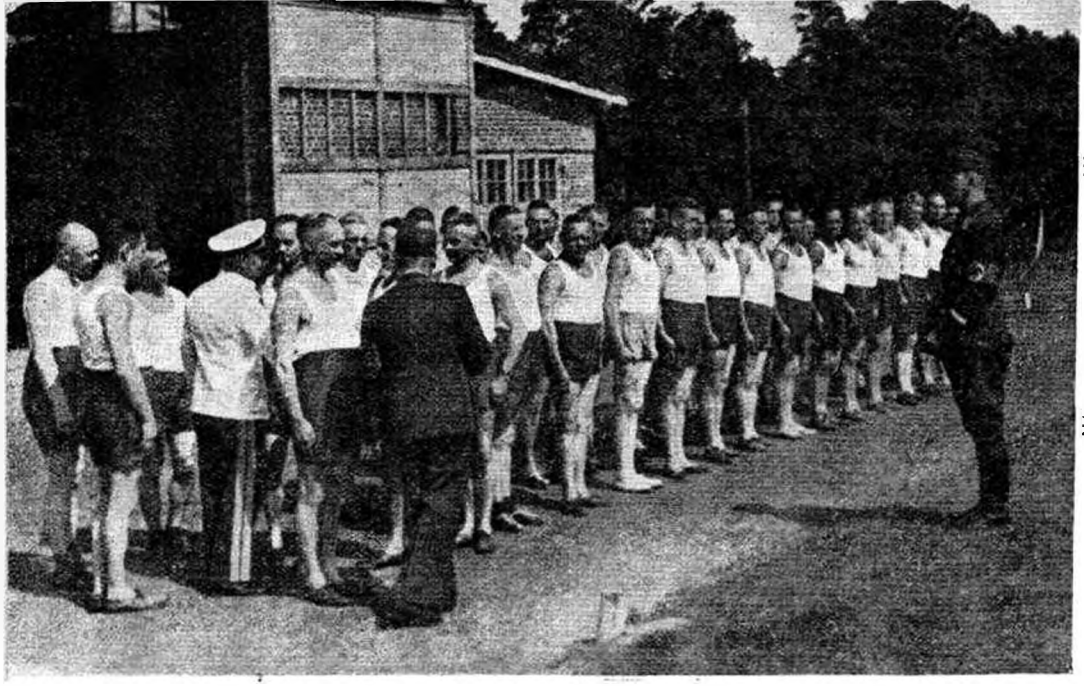
The proprietors of the "Aero-Modeller" are offering a cash prize of ten guineas to the club collecting the greatest tonnage of waste paper towards the National Effort. The award will be made on an equitable basis, taking into account the total membership of each club, so don't let the fact that you are a small one detract from your efforts.

THIS COMPETITION CLOSES ON JANUARY 31st NEXT. POST RESULTS TO ALLEN HOUSE, NEWARKE STREET, LEICESTER

AEROMO AND EDUCATION



ACHTUNG!! A group of German modelling teachers line up for their morning dose of P.T. and regimental instruction. The Boche love of uniform extends even to their leisure hours, and is a great contrast to the more free and easy methods adopted in this country. Less warlike is the photo on the opposite page, although the Nazi swastika cannot be forgotten, and is prominently displayed on all models! Note in particular the unusual (to us) size of model employed, and the broich-

THE educational value of model aeronautics has not, unfortunately, received much consideration in this country until very recently, and even now only on a small scale. I propose, therefore, to give in this article a rough outline of what certain European countries were doing in this direction before the present war, and to comment on the merits and demerits of the foreign systems.

I wish to make it perfectly clear at the outset that I shall not enter into the question of international politics when discussing what was being done to train foreign youth in aero-modelling.

The first European country to train her youth in the study of model aircraft was Germany. The first tentative steps were made about eleven years ago; but it is of the more recent developments, beginning in 1933 when the present Government assumed power, that I shall speak.

Right from the very start of the present régime, the German system of teaching modelling has encouraged the efforts of the team, while suppressing those of the individual to a great extent. Likewise the whole organisation was run by, and inextricably linked with, the political party in power.

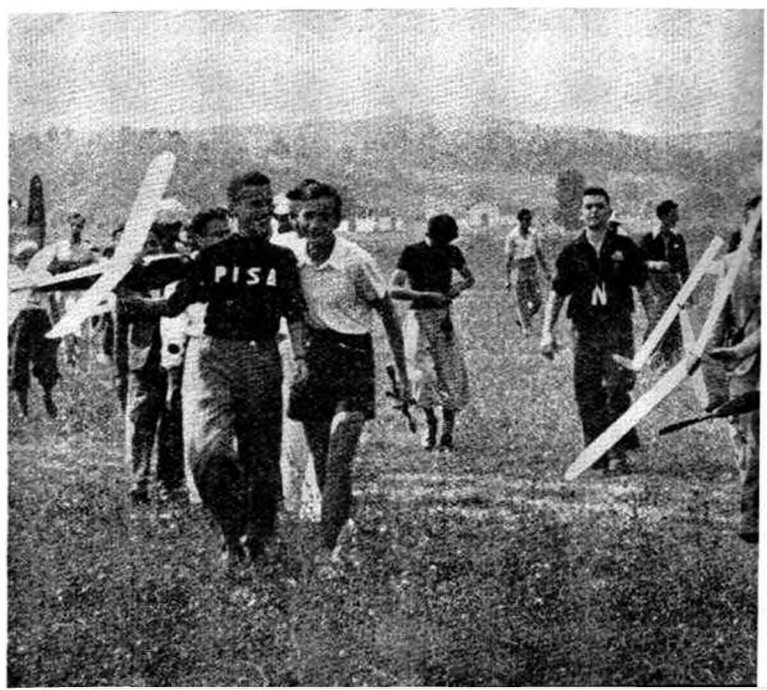
When, in 1933, the National Socialist Party took control of all aviation in Germany, it decided to centralise civil flying clubs; so the numerous societies and clubs already in being were disbanded and engulfed by the new controlling body, the D.L.V. (Deutscher Luftsport Verband). At the head of the D.L.V. was Hermann Goering, an old hand from the first Great War; he decreed that model-building should be taught to the Hitler youth, under the supervision of the D.L.V., and as a consequence, in hundreds of schools all over the country, boys learned the rudiments of model aircraft. Although these pupils, the F.H.-J. (Flüger Hitler-Junger) had almost every conceivable advantage, it must be remembered that throughout their training they were first and foremost embryo Nazis, and only aero-modellists as a secondary consideration. It is this party spirit which prevents us in this country from whole-hearted admiration of the German methods.

It was four years later, in 1937, that the next big step was taken: the D.L.V. was succeeded by the N.S.F.K. (in English, National Socialist Flying Corps), a body which trained men mostly, but boys received their tuition under its guidance. The training consisted of instruction in the technique of models, full-scale gliders, and powered aeroplanes. The N.S.F.K. set out to produce large numbers of men and boys to undergo this course of instruction, and they built workshops all over the country, in which small classes of about 25 or 30 pupils were able to work together under a skilled supervisor. Many such workshops were devoted entirely to the study of model aircraft.

To satisfy the demand for trained instructors to supervise model-building in the German model schools, the N.S.F.K. instituted what were known as their Reichsmodellhauscheren—literally it means "high schools of model aviation"—and in these large, modern, beautifully planned buildings were held classes to teach the prospective teachers. Any man, no matter what his age, social rank or livelihood, could enrol for the courses, and everything was free. These "high schools" turned out about 1,500 fully qualified instructors in a year, and in 1938 there were three of them. I believe, but cannot say from personal experience, that at the outbreak of war this number had grown to five. In the schools a standard building programme was carried out, beginning with paper models, progressing through various types of small gliders and simple rubber-driven models to the big contest sailplanes for which the Germans are famous. The courses also included the construction of petrol models, an ornithopter, and even radio-controlled machines.

In the schools run by the N.S.F.K. the boys followed much the same programme, though some of the more advanced models were omitted. Here again, they built definite models in a predetermined order, and until they had completed the course they might not attempt any designing of their own.

Teaching in ordinary German schools was carried out on different lines; classes were held as part of the normal school studies, but were arranged periodically, just the same as lessons in any other subject. The modelling learnt at school was mostly very elementary.



DELLING

By L. (George) TEMPLE

shirted boys on the right. (This photo was presumably taken in the Bavarian hills, and the local dress is very prominent.) More informal is Italian aeromodelling (below) and, as Mr. Temple shows us in his article, the hobby is conducted more on lines we understand. Apart from the unusual head-gear, and the motif on the boy's sweater, one would have difficulty in distinguishing the crowd from one seen on any English field.

The German radio also helped, under the guidance of the Ministry of Education. Not only did it broadcast reports of all-important contests, but started a special programme or instruction in model building. The N.S.F.K. distributed to all schools kits of parts for several simple models, and the boys, with their kits ready, listened to the radio and built their machines as the instructions for doing so were broadcast.

Now let us examine the progress made in France before the war—a country where much was being done to include aero-modelling as part of the normal school education. We must not forget, however, that France only began to take an interest in model aircraft rather late in the day, many years after the sport had gained a firm support in other countries; so the lack of unity in the French system is hardly surprising, especially as unity was never the strong point of any French organisation. At least, that is my personal opinion.

Right at the beginning, in 1930, a provisory committee was formed to look after the interests of model aeronautics, and after a year's development this became the well-known C.F.M.R.A. (Comité Français des Modèles Reduits d'Avion), which has always been the chief organising body in France. It is formed of delegates from three important organisations :— the F.A.F. (Fédération Aéronautique de France), the L.A.F. (Ligne Aéronautique de France) and the F.P.S.A. (Fédération Populaire des Sports Aéronautiques).

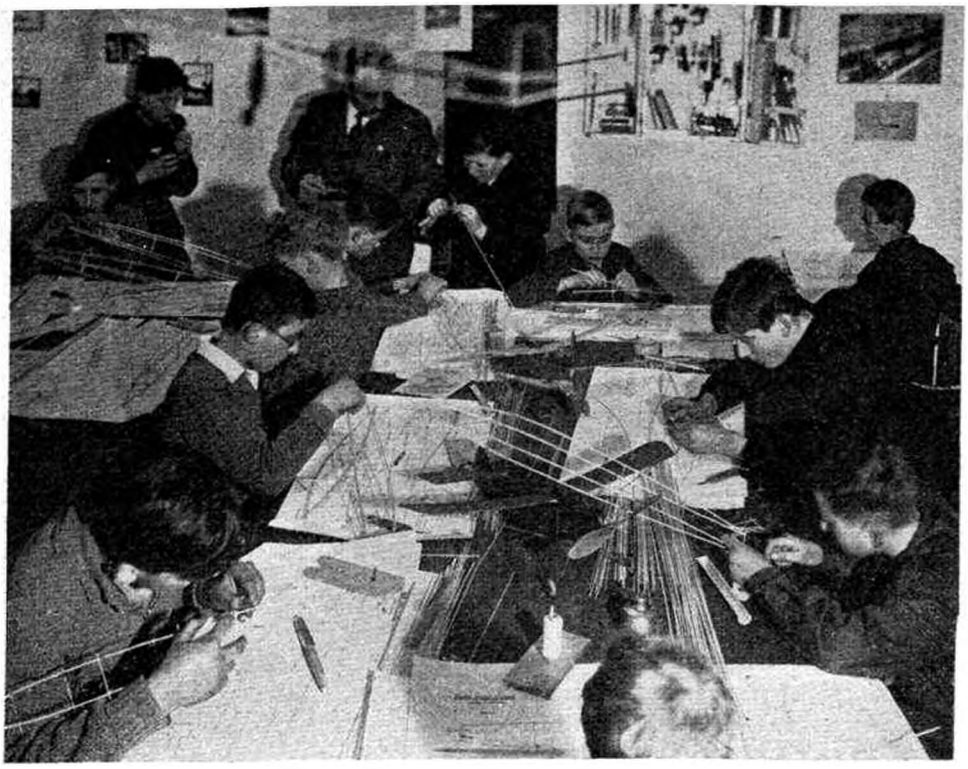
The oldest of these bodies was the L.A.F., which began in a big way by producing an excellent monthly magazine and distributing it to schools all over the country, creating great interest among thousands of schoolboys. Although in this way the L.A.F. aroused considerable enthusiasm for model aircraft, it failed to give much practical help to the movement. The F.A.F., on the other hand, was formed comparatively recently, and organised a large number of clubs straight away, directly under the leadership and supervision of the Fédération, just as many of the British clubs are led and guided by the Society of Model Aeronautical Engineers. Although these were almost entirely school clubs, the F.A.F. did not, however, take into account the value of aero-modelling as part of the actual school curriculum.

Of the three component bodies of the C.F.M.R.A., by far the most foresighted was the F.P.S.A. It was a comparatively young movement, formed not so very long before the outbreak of war, but in the short period of its existence it did magnificent service. It was a club with centres all over the country at which men and boys—and women too—could take practical and theoretical courses in every subject connected with model and full-scale aviation. In this it was very like the N.S.F.K. in Germany.

At first thoughts it would appear that these classes for model-building were rather wide in their outlook, since any boy could join them by paying a small subscription; but actually this was just what was needed, because by having pupils from the State schools mingling with boys from other schools, and also apprentices from shops and businesses, they achieved a very " un-schoolish " atmosphere. This was very valuable to all concerned. The pupils in the modelling classes had great liberty of thought and action. Unlike the German system, the F.P.S.A. allowed its pupils to choose their own models to build, This policy was most successful, because there was always the instructor there to stop boys undertaking impossible tasks.

As the F.P.S.A. classes were held with the full approval and active help of the Ministry of Education, boys from the State schools attended them as a part of their regular schooling. It was noticeable, however, that during holiday periods there was little falling-off in attendance. In the vacations, outings to aerodromes, contests with models built during the term, and inter-club competitions, were held. In the case of the F.P.S.A. there were handsome prizes for individuals. Transport was generally provided, never free, but always at a reduced rate.

Unlike the German system run by the N.S.F.K., there was absolutely no political influence behind the F.P.S.A. It was open to anyone, of any age, party, or religion, and consequently a wide variety of men and boys joined it. They left their politics (if any) outside the clubs, and in them became simply students of aviation. This was in direct contrast to the German schools, where politics were never long forgotten. Pupils attended parades and behaved almost like soldiers at drill, and in order to gain admission to the Reich schools,



The teaching of aeromodelling in schools has been encouraged and developed in such countries as Czecho Slovakia (left) France (right) and Italy and Palestine (below). The scene taken in France shows the boys at Father Amiard's progressive school, where this phase

men and boys had to be "good party members."

In the German model-flying meetings there was always the same strong Nazi influence; although this led to wonderful organisation in many ways, I am not sure that it was not overdone. However, we must allow for the difference between English and German mentalities. Whereas the Englishman is an individualist born and bred, the Nazi works—and plays—best when every move is planned for him. This spirit was especially noticeable at the model contests in pre-war Germany. These competitions were marvellously arranged, with full military co-operation when it came to providing range-finders and mobile helpers—motor cycles and sidecars—to cope with long flights. The individual found little or no scope, though, for his ingenuity.

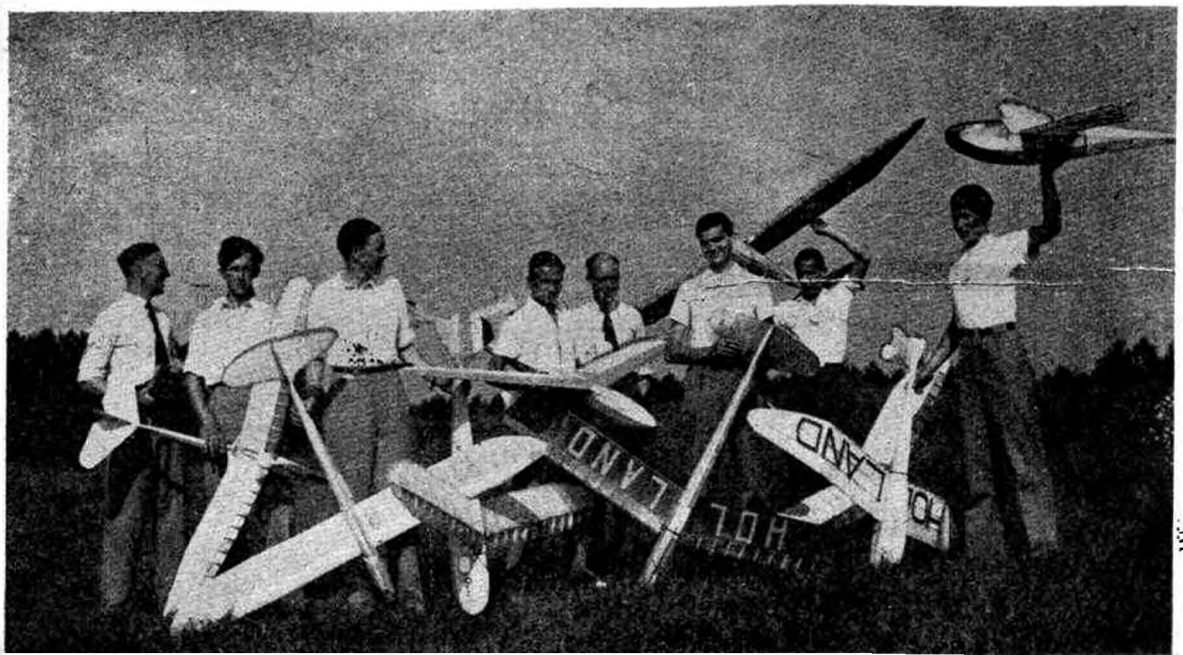
In the first place, these contests were team events. Even the ages of the competitors were fixed; 80 per cent. of the entrants had to be under 18. Then, the machines flown in the contests had to conform to type, so the freedom of design was largely stifled; and all the officials were Party members—doing their jobs most efficiently, I admit, but at the same time imparting an unmistakably military air to the whole thing.

Germany and France were not the only European countries to realise the value of aero-modelling, and there are other instances where a Government helped its study. Italy was, before she entered the war, doing some fine work in this direction.

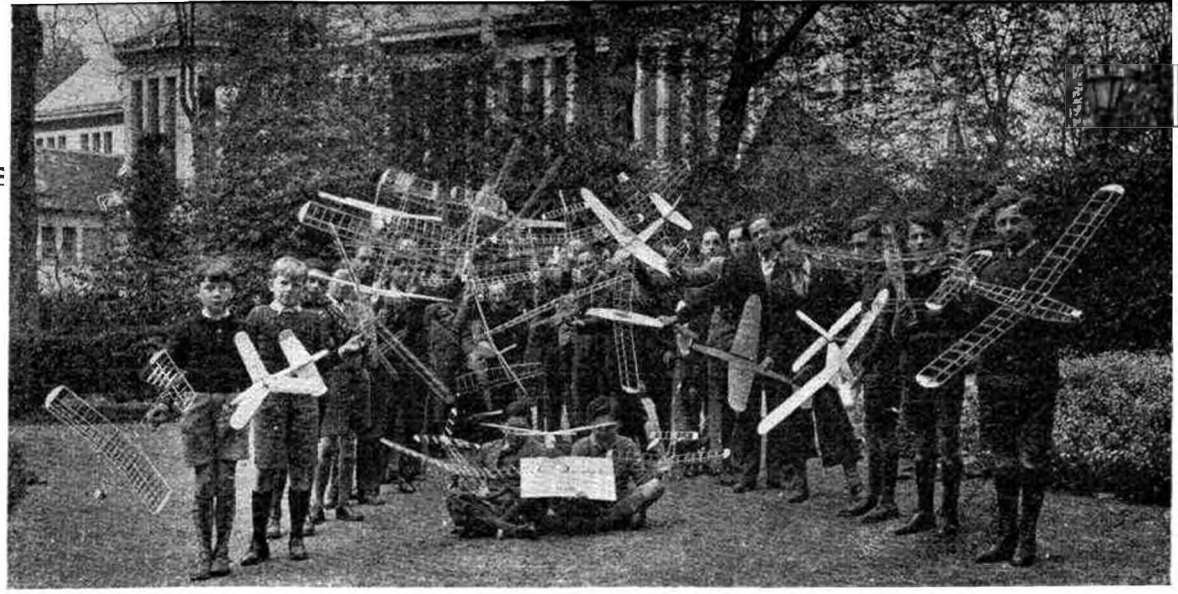
I know that there existed in Italy state-built schools for aero-modellers, though unfortunately my first-hand knowledge of the Italian system is not very extensive and I cannot say how many schools there were. The best known in this country was probably the famous School of Reggio Emilia, at Parma; though there were certainly others, at Florence and Rome, for instance.

These schools were of rather an advanced nature, teaching model aeronautics as a subject of scientific value rather than a sport alone; they had facilities, I believe, for very advanced research. Some of their models were quite definitely tested in actual laboratories, given wind-tunnel tests, and treated in every way like full-size machines.

Thus we find that the pupils at the Italian schools were

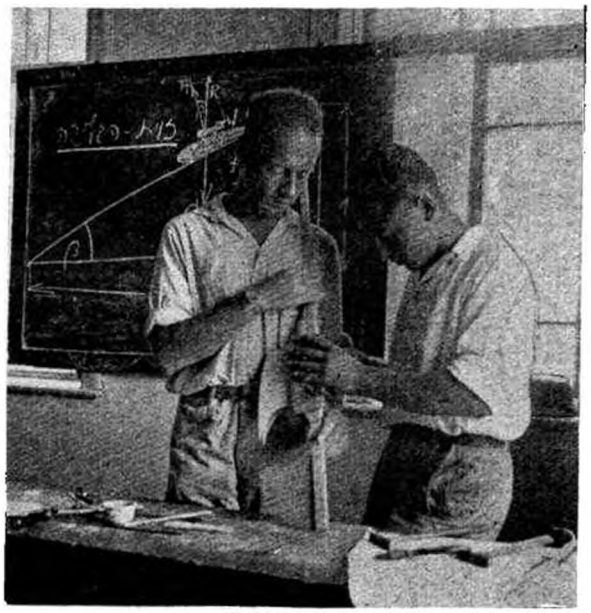


The Dutch (left) concentrated on gliders to a large extent, and their efforts were much appreciated at the King Peter Cup event staged at Fairey's Aerodrome in 1939. (Our good friend Fan Haltum is seen fifth from the left.)



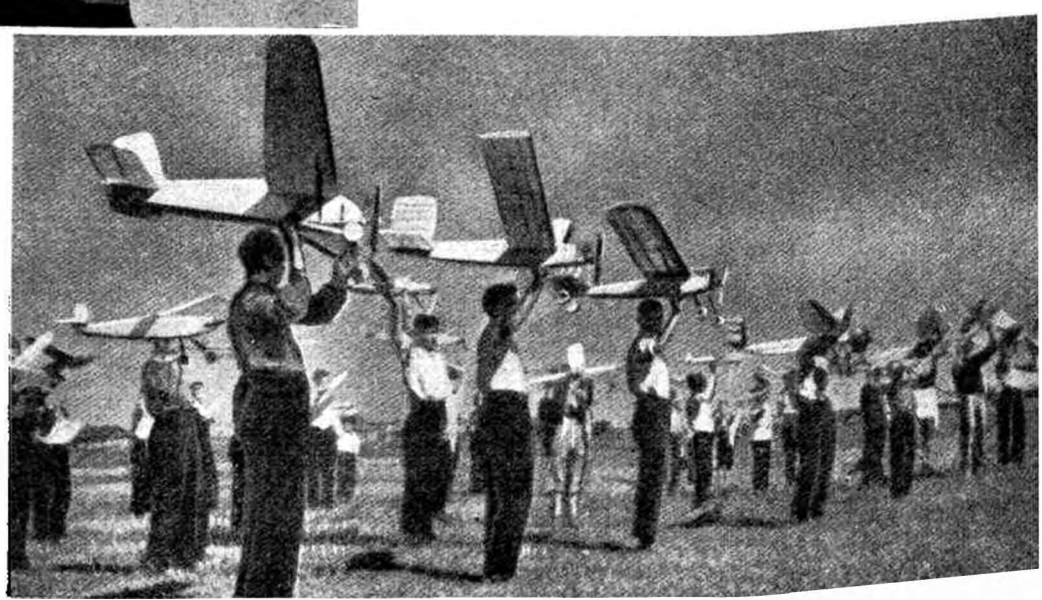
of education received a great deal of attention under the padre's personal attention.

older than those in the French and German schools, and of a different type ; whereas in the latter countries great numbers of boys of 10 or 11 upwards, with no particularly serious interest in the hobby other than a possible first rung on the ladder of aviation, were taught as part of their normal education, in Italian schools it was quite different. The young men joining these schools did so at an age when they had definitely decided to become aircraft engineers. Thus their training was carried out in a highly technical manner.



I have seen some of the products of the Reggio-Emilia school, and these machines—large model sailplanes of great beauty and fine workmanship—were designed in exactly the same way as their full-scale counterparts. Laboratory tests and most elaborate graphs and calculations were used. That is the reason why those of you who have seen Italian model aircraft (especially sailplanes, at which they were extraordinarily clever), or else photographs of them, may have noticed the striking resemblance to the " man-sized " article.

There were comparatively few contests held in Italy—not, at any rate, on the same scale as in this country. Many contests were, however, sponsored by important newspapers or business houses, showing that the value of aero-modelling was realised in important circles. In fact, I feel that the whole of Italian aero-modelling enterprise can be summed up in one sentence—" Quality, not quantity." I don't know if others agree, but that is how it appears to me. The Italians are often like that, anyway. For instance, they turned out few cars as compared with other great countries, yet some of the world's finest motors were products of Italy.



Not much has been heard of the Russian aeromodellers, though a number of World's records are held by this country, presumably because we, and other countries did not bother to claim for some of the more frivolous classes. The class of model shown here is certainly strange to our conceptions.

THE MODEL TYPE FORMULA

BY A. F. HOULBERG

In this article, the Chairman of the Society of Model Aeronautical Engineers explains the type formula instituted by Mr. T. W. Twining, the winner of the first trophy given by the late Viscount Wakefield in 1910.

FROM time to time one observes in various model aircraft publications a peculiar arrangement of letters and figures separated by dashes which are for the purpose of indicating to the reader the type of model which is being referred to.

While this formula is quite familiar to old hands at the game there are many newcomers to the aero-modelling movement who do not follow its meaning and do not know how it originated.

This Type Formula was proposed in the first instance by that pioneer aero-modellist, T. W. Twining, in 1910, and the idea was founded on the scheme used by locomotive engineers to indicate in a simple manner the general characteristics of locomotives of all types.

In the locomotive world the chief item which controls the appearance and general design of the loco. is the disposition and number of the driving wheels and bogie wheels. Thus by indicating the number of bogie wheels and driving wheels by simple figures starting from the front a clear mental picture is conveyed of the type and general appearance of the locomotive in question.

In this manner the formula 4-4-2 would indicate that the locomotive possessed four front bogies, four driving wheels and two trailing bogies.

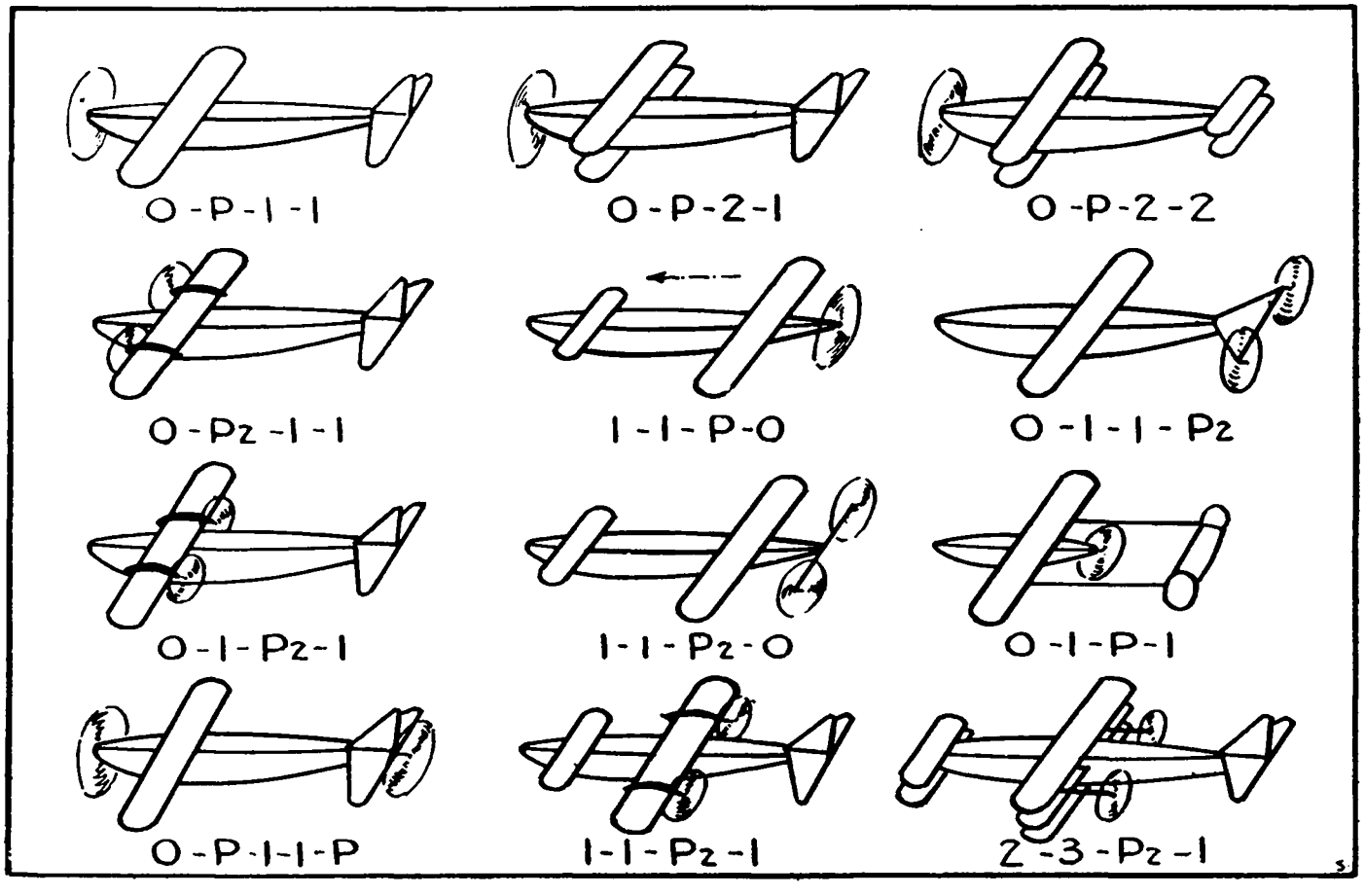
Applying similar considerations in the case of model aircraft we find that the main items affecting their design and appearance is whether or not it has a forward elevator or elevators, the number and disposition of the main supporting surfaces, the number and position of the propellers and the number of rear stabilising surfaces employed.

Taking the case of the popular monoplane tractor fuselage model which one sees everywhere these days. This has no forward elevator, so we start off with the figure 0. The main supporting surface is preceded by the single propeller, so that the next component of the formula is P, and this added to original item of the formula now reads 0-P.

The single main supporting surface now follows, making the formula 0-P-1, and taking count of the single stabilising surface at the rear (tail) the formula becomes 0-P-1-1, indicating no elevator, 1 propeller, 1 main plane, 1 tail-plane. Simple enough!

Now let us try a few other types to give general guidance on the compilation and interpretation of these formulæ.

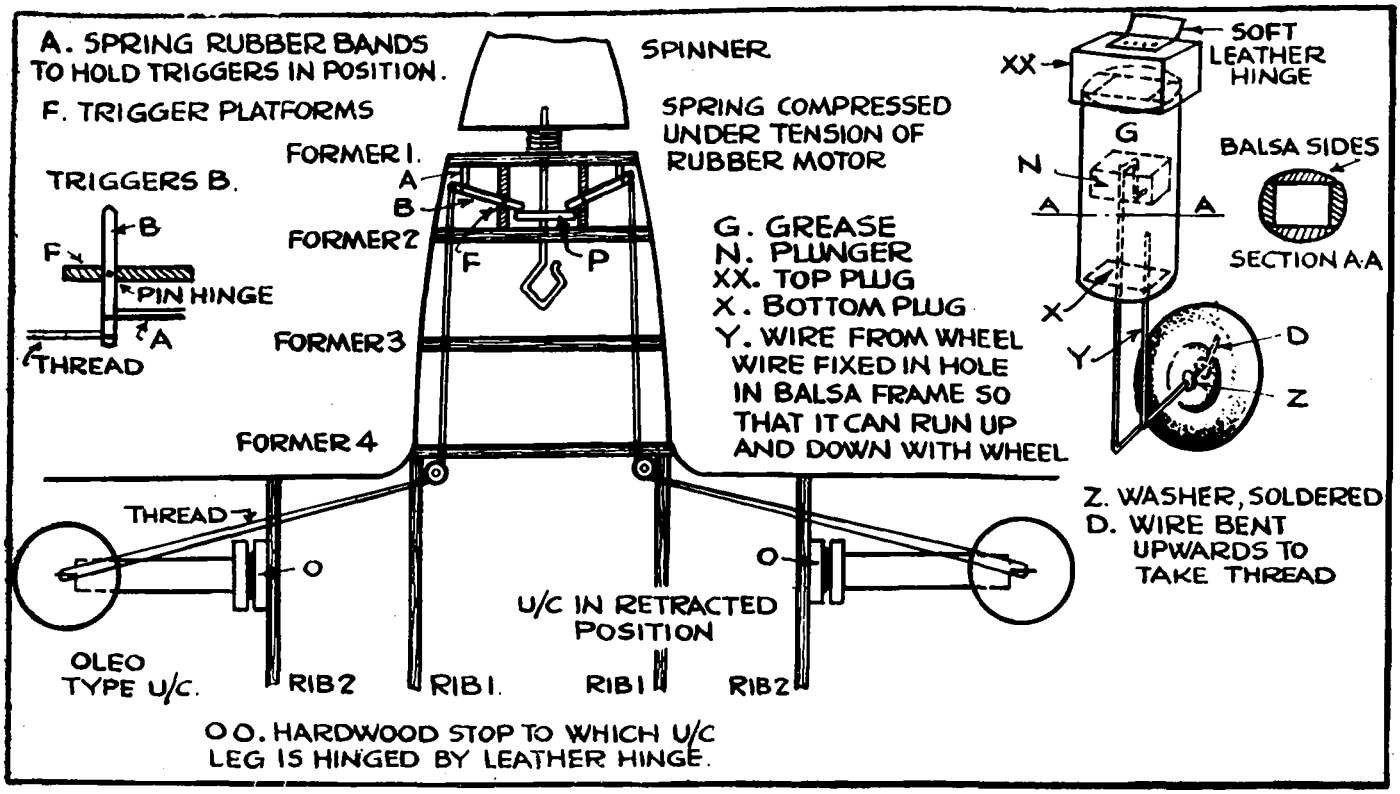
This is best done pictorially by indicating the machine in outline and writing its appropriate formula below it, thus :—



It will be noticed that where two propellers are used in close proximity to each other a small 2 is added to the capital letter P in order to denote this.

Once the basic idea of the type formula is fully grasped there is no difficulty in representing any type of model by five symbols at the most, and more generally four.

When referring to a model either verbally or in writing the use of the type formula effects a considerable saving in time, space or setting-up of type and its use is to be encouraged.



By K. BUTCHER

THE OLEO TYPE UNDERCARRIAGE LEG AND RETRACTING U/C.

FOUR pieces of balsa are required with which to make a box-like tube. Cement this and, when set, sandpaper down to a rounded outside to look like an oleo undercarriage leg. Next make a plug to fit into the top of the tube. Then make a hardwood plunger, through which the wire for the wheel has been fitted and cemented; then make a plug for the bottom; this has a hole through which the wire goes. Next partly fill the tube with motor grease and put the plunger in and cement in the plug. I find that this absorbs the shock very well. The wire is bent to take the wheel and then bent downwards to take the retracting thread. The next thing is to fix a piece of wire from the wheel wire into the undercarriage wood, which helps to keep the wheel in the fore and aft positions. For hinges I find that soft leather is best. Then fix—glue is best—a hardwood stop to rib 2. To this fix the undercarriage hinge. When the undercarriage is in the down position this forms an upward stop.

In the building of the fuselage, incorporate two platforms (F—F) between formers 1—2, and on these fix two triggers (B—B). Bore two holes in these to take thread and a rubber band (A—A) to act as a spring to keep the triggers in place. The next step is to fix two small wheels from formers 4 to take the thread to the wheel hooks. The thread should be tight when triggers are engaged, or it will not work. Then, when the driving shaft is fitted, put a fairly strong spring between the spinner and the first former to pulling the driving shaft forwards. Solder a thin washer to the driving shaft, which engages the triggers when the spring pulls the washer P forwards. Next fix from the undercarriage leg to the first rib a strongly stretched rubber band to pull the undercarriage leg down and keep it down, which it does very effectively.

A HANDY BALSA CUTTER

By W. DEAN

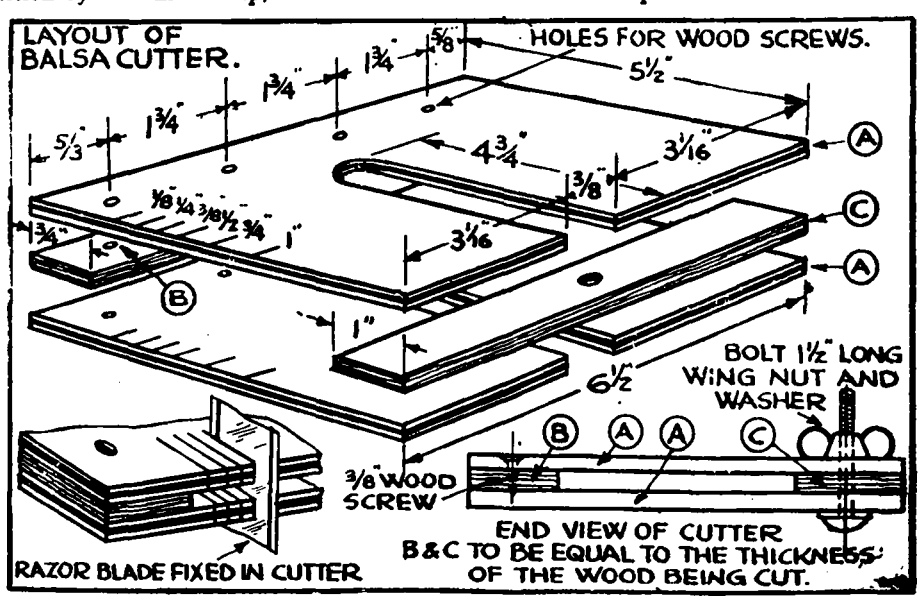
MOST of the home-made balsa cutters already seen by the writer have been complicated gadgets consisting of a few pieces of wood with a razor blade kept in position by nuts, bolts and screws, etc. In fact, mostly knocked up in a few minutes out of any odd junk. With a large dose of luck the owner can produce, after a long struggle, a strip of balsa roughly the intended size.

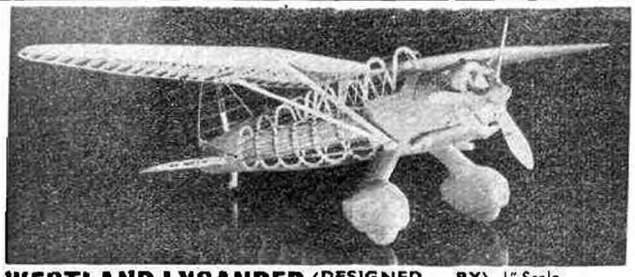
This balsa cutter (see plan) is just a handy size (6½ in. by 5½ in.), and yet can cut any size of sheet up to 4 in. width and ¼ in. thickness. Although several hours are needed to make it, the maker will be amply repaid for his labour, since perfect strips can be cut quickly and accurately.

All dimensions are clearly marked on the plan. If desired, the four brass screws passing through A and B can be replaced by a small nut and bolt at each end. A set of different thicknesses of "B's" and "C's" are now made, so that various thicknesses of wood can be cut as required.

The broken piece of razor blade is wedged tightly into the required position on the gauge, with the cutting edge on the inside.

The balsa is fed from the other end, C being moved up the slot until the wood is gripped just tight enough to be pushed through. After the strip has been cut, C is again moved up, and so on until the sheet is used up.





WESTLAND LYSANDER (DESIGNED BY HOWARD BOYS) 1" Scale. 50" Wing Span

37/6 Carriage paid. Plan alone **5**/-

This 1 in. scale, 50 in. span flying model "Lysander" will satisfy the most exacting scale model builder. It is true to scale and type, and cannot be excelled for exhibition purposes, while still giving a good flying performance. The wings and tail are detachable for packing and transport. All parts are clearly printed on best balsa sheet, and the large full-sized plan makes assembly easy with its clear instructions and details. A finished three-bladed scale flying propeller, adjustable for pitch, is included in this fine kit. Designed by Mr. Howard Boys, an ingenious motor tube takes all torque strains from the fuselage and obviates damage from breaking motors. Ample supplies of materials and liquids are included in this quality production.

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THAT LOOK AND FLY LIKE THE REAL THING

For a model to LOOK and FLY like the real thing, it must be reasonably large. These two fine 1 in. scale models combine good flying qualities with true to type appearance, and their large size does not make them cumbersome for travelling, as wings, tailplane, etc., are all detachable. All materials are included in these complete kits, and are the finest obtainable. The large, fully detailed plans show all parts clearly and full size, ensuring correct assembly and true construction.

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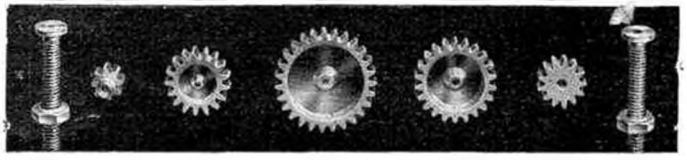

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Postage extra. No C.O.D. Bushes ⅛ in. long. All gears drilled 16 s.w.g. Cup Washers, 16g. and 18g. 4d. per doz.

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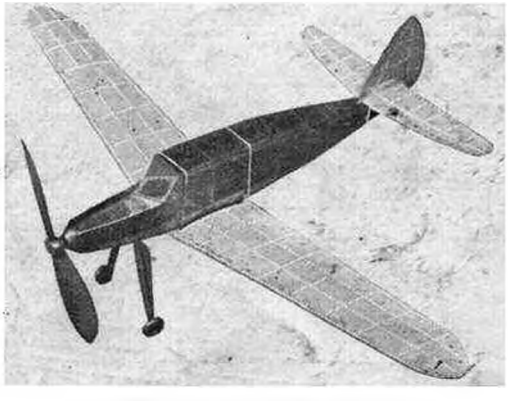

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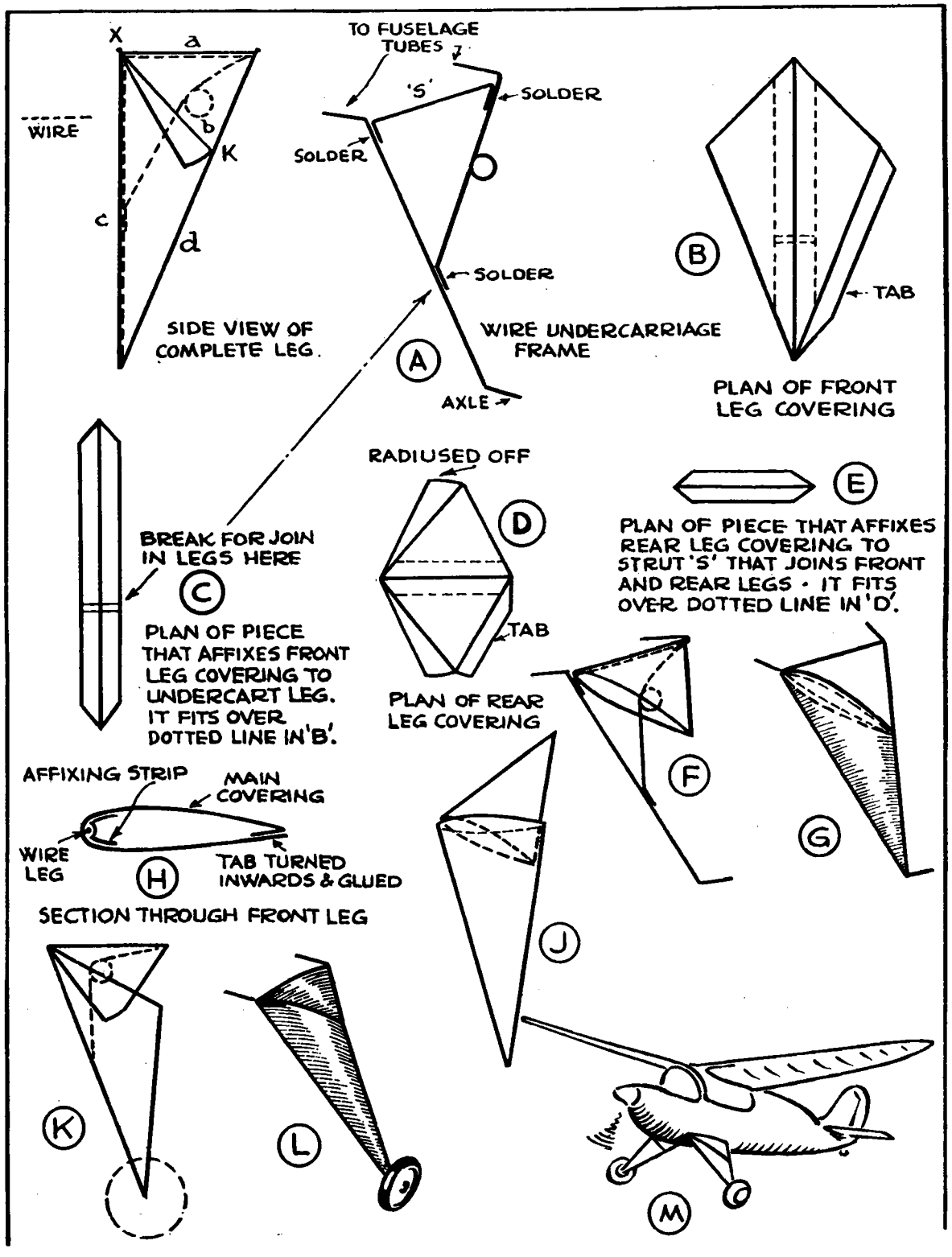
A STREAMLINE COVERING FOR UNDERCARRIAGES

By B. R. ALDRIDGE

THIS covering, designed for use on undercarriages of the leg and " safety pin " type of spring unit, can be executed in either cartridge paper (as illustrated) for rubber-driven machines or aluminium for petrol-driven machines.

To fit this covering on, the front and rear legs must be joined by a strut of wire (S). The front leg may be constructed of bamboo or wire as desired. Next the exact plan of the undercarriage must be drawn out so that the correct sizes of front and rear fairings (B and D) may be obtained. These are drawn out on stiff cartridge and cut out. It will be noticed that D has flanges radiused off so that the whole unit fits snugly when assembled. C and E are cut out also.

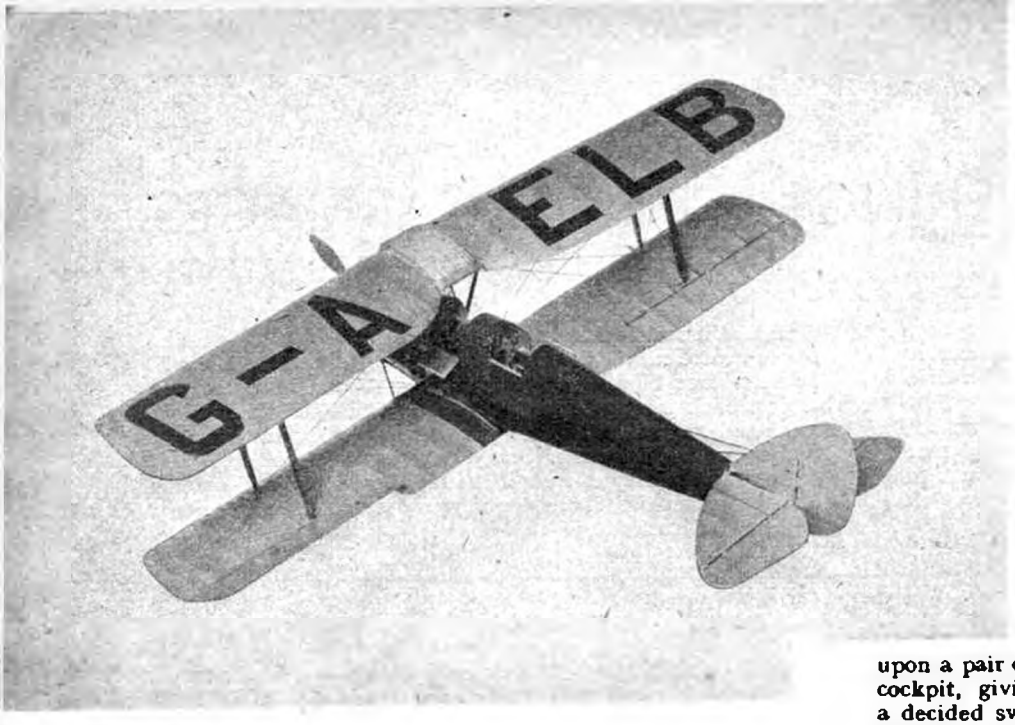
To assemble, we first start by doubling D over the top strut S. E is then glued firmly over the wire inside the bend, thus anchoring D to S. The sides of the covering should now be draped over either side of the landing shock spring. D is now pulled together, and the gluing tab turned inwards and stuck to the other side. This results in a smooth external appearance with a hollow interior in which the spring operates (see F). The front covering is now glued on in a similar fashion (see G). The front covering is placed on second so that it fits *over* the rear cover and offers less resistance than if it were the opposite. The general principle should be made clear by diagram J. I forgot to mention that before fitting the forward cover one or more pieces of tissue should be doped over the rear cover and banana-oiled, etc., until a smooth strong glossy surface is obtained. The front cover can then be fitted and tissue-covered. It should be noted that length b should not be less than length a, and length c should not be less than that it makes d a tangent to a circle through pt K radius b and centre x. If these conditions are not observed it will be seen that binding or jamming will occur when the leg springs back or moves slightly forward past its normal position. D should be radiused off forwards from pt K with centre x and radius b. Diagram K shows the leg in operation. This leg will give plenty of wear if the recoil spring is made pretty strong; otherwise, if the leg moves back too far, the paper will be " concertina-ed."



THE DE HAVILLAND

A 1 in. to 1 ft. NON-FLYING AN AIRCRAFT—MANY WHICH HAVE BEEN USED OF R.A.F. PILOTS ———

Once again Mr. Riding scores full marks with his latest model, which is illustrated by the two top photographs on this page.



TWO different De Havilland types have borne the name "Tiger Moth." The first, known as the D.H.71, built during 1927, was an exceedingly small wire-braced low-wing racing monoplane and was a remarkable machine for its time; it was never put into production, only two being built. The second Tiger Moth, or to give it its full title, the D.H.82, was produced in 1931 and is the subject of this month's article.

The machine has been in production for a number of years and is the standard Elementary Trainer in the Royal Air Force to-day. It has been adapted for several purposes—training in bombing, fighting and reconnaissance duties and later as a radio-controlled target for anti-aircraft gunnery practice in the form of the "Queen Bee."

The engine fitted is the 130 h.p., 4-cylinder in-line, air-cooled De Havilland Gipsy Major with an airscrew of 6·33′ dia. and 4·58′ or 4·92′ pitch.

Structurally it resembles the "Moth" (metal version, of course); the fuselage being of welded square and round-section steel tubing, consisting of a number of separate units bolted together with fishplates, making replacement easy in the event of damage. In the first few machines the fuselage was fitted with stringers running down the back, but a plywood decking has been embodied in all later models.

Unlike the "Moth," the upper wings have been given a stagger of 18 in. and both upper and lower wings are swept back, which, coupled with the use of an inverted motor, allow for an unrestricted view from both cockpits.

The wings are of typical D.H. wooden construction, consisting of solid "I"-section spruce spars with ribs, leading and trailing edges of orthodox wooden construction. The tip bends are made from light alloy tubing and the interplane struts from spruce with steel end sockets. Ailerons are only fitted to the bottom planes, employing the usual De Havilland differential control. In short, instead of the two ailerons moving equally up and down, a simple mechanical arrangement of the controls causes the upward moving aileron to move through a larger angle than the downward moving aileron; the idea being to increase the drag and decrease the lift on the wing with the up-going aileron, whilst the opposite one, owing to its smaller movement, will not cause excessive drag. Actually, the "Tiger Moth" could be turned by the use of the ailerons alone without any application of rudder. The arrangement of the nose-ribs is interesting—there being two between each main rib on the upper surface of each wing and one between the ribs on the bottom surfaces. The main ribs are built up from strips of spruce with cappings glued along the edges liable to come into contact with the fabric covering, forming "T"-section top and bottom booms. The nose-ribs are simply curved strips of spruce glued and screwed to the leading edge and front spar.

The centre-section, containing a 19 gallon fuel tank—sufficient for a flight of 300 miles at cruising speed—is mounted upon a pair of tubular steel "N" struts forward of the front cockpit, giving easy entry and exit. The wings have a decided sweep-back—11 in. on the top and 9½ in. on the bottom—measured from the leading edge at the interplane strut position. As will be seen from the General Arrangement drawing, there is a greater dihedral angle on the bottom wings than on the top wings. They are braced with streamline wires and are non-folding—a feature that was a great drawback to operators with limited hangar space.

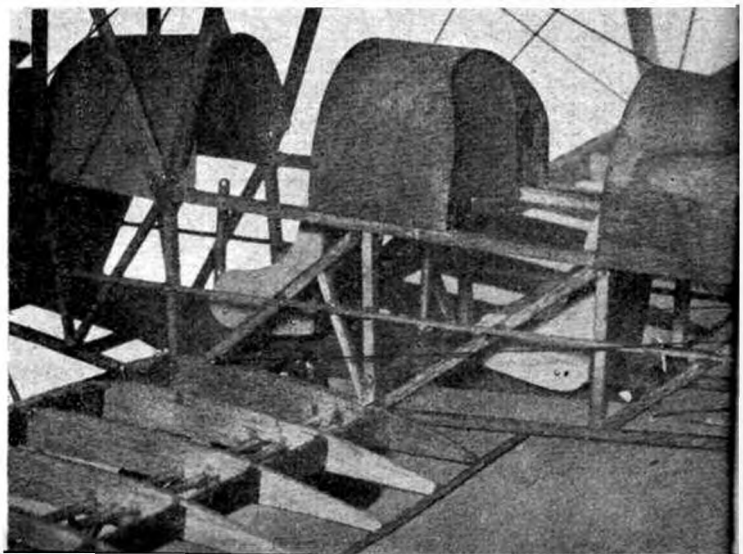
The undercarriage is similar to that of the "Moth," employing two shock legs containing steel springs in compression, split axle and 19 × 6 intermediate low pressure airwheels.

The tailplane is fixed but can be trimmed by means of an adjustable spring-loading device on the elevator controls actuated by levers in the cockpits. All controls are encased in a form of box running centrally along the cockpit floor and can be very easily removed for inspection.

The ailerons, rudder and elevators follow normal De Havilland practice, being wooden construction with light alloy trailing bends and fabric covering; they are actuated directly from the control box by means of flexible steel cables. The fitting of Handley Page automatic slots seems to have been optional but machines in service with the R.A.F. appear to be equipped with them.

Up to the outbreak of war, well over 300 Tiger Moths had been registered in Great Britain for civil use alone. Most of these machines were employed as training craft by various flying clubs and Volunteer Reserve training schools. Sir Alan Cobham had one of the first Tiger Moths (G-ABUL) on his National Aviation Day Campaign Tours of 1932–3 and many readers will remember the remarkable displays of aerobatics and low-altitude inverted flying given by Messrs. Turner-Hughes and Tyson on this type.

This particular machine went through two seasons with the air display, giving two or three aerobatic shows a day, calling for 6,000 to 7,000 landings in the course of a year—



"TIGER MOTH"

SCALE MODEL OF THOUSANDS OF FOR THE TRAINING

——— By E. J. RIDING

The photograph below is of the full size machine. How faithfully Mr. Riding has built his model is revealed by comparing this photograph with the one above it.

a test guaranteed to find out the weak spots in any aircraft. If any further proof of the general robustness of the "Tiger Moth" is needed, one might mention that until recently, the machine was in regular use at an Elementary and Reserve Training School.

The full-size machine shown in Fig. 1 belonged to the Liverpool and District Aero Club and was stationed at Hooton Aerodrome, in the Wirral. This machine, G-AELB, had a yellow fuselage, struts, etc. with black letters and silver wings and tail surfaces. Other clubs and schools had their own particulars colour schemes, for instance, Midland Aero Club Tiger Moths were red with white letters, Cinque Ports Flying Club machines were silver with blue letters and machines seen by the writer belonging to an Elementary and Reserve Flying Training School at Yatesbury near Calne, Wiltshire, had purple and black fuselages with white registration letters and yellow wings. One machine at this station bore the registration letters G-ADNY and a large number "29" in white on its nose.

Tiger Moths in service with the R.A.F. are coloured in the standard training camouflage scheme—"Slime and Sewage" on the upper parts and sides of the fuselage and yellow on the undersides of the fuselage and wings, together with the Service number in black. Looking at the machine from the front, the numerals on the bottom port wings are upright and those on the starboard wings inverted. Red and blue roundels are carried on the top wings, and red, white and blue ones on the bottom wings.

With the 130 h.p. De Havilland "Gipsy Major" engine, the machine has a top speed of about 110 m.p.h. and a stalling speed of 43 m.p.h., a ceiling of 18,000 feet and a tare weight of 1,115 lb.

404 Tiger Moths were ordered from the Canadian De Havilland Company for the new schools of the Empire Training Plan and the majority of them are now completed and in service. Difficulties were encountered in getting Gipsy Major motors from Great Britain and so orders were placed for an alternative motor, the Menasco Pirate, which had already proved its worth in a number of well-known American light aeroplanes. 400 such motors were ordered from the United States.

Tiger Moths at Canadian Flying Training Schools are training yellow all over and carry a four-figure identification number in black on the sides of the fuselage and beneath the port wing. Tiger Moths "Somewhere in England," form the subject of this month's cover.

NOTES ON CONSTRUCTING THE 1/12 SCALE MODEL

THE value of the Scale Model for instructional purposes is generally accepted, not only as an aid to "Spotters" but for demonstrating the movements of controls and their effect upon the machine in flight. The 1/12th Scale Model, of which several views both in skeleton and in the finished state are shown elsewhere in this article, was built over a period of two months and was constructed as nearly as possible along the same lines as the full-size machine, incorporating moving controls and "built-up" method of construction.

If it is desired to build a solid model, the provision of the Three-View General Arrangement drawing together with the photographs of both the finished model and the actual machine should prove sufficient data for the builder to work from without any additional textual explanation. It is impossible, of course, to attempt to give a complete account of the work entailed in a job of this kind and it is only intended to give a short summary for use of those who intend building a replica.

The fuselage skeleton is shown in dotted line on the G.A. and was drawn out on paper in the usual way, the longerons and compression members, $\frac{1}{4}$ in. square section birch, being pinned into position over the drawing and glued together. When two sides have been made in this way, they are joined together by means of cross-members and allowed to dry thoroughly before fitting the cockpit deckling. The decking was made from 0·5 mm. ply, but thin card or $\frac{1}{32}$ in. sheet balsa will do just as well. The ply was steamed and bent over a series of formers to the required shape, allowed to dry and then pinned and glued into position on the top longerons—a somewhat ticklish business and unless care is taken, the fuselage frame will fly apart as soon as it takes the strain of the curved plywood. It is advisable to use a small set of clamps when performing this operation.

This photograph and the one at the foot of the previous page reveals Mr. Riding as an expert photographer as all these photographs of the model were taken by Mr. Riding, the one opposite and that on the foot of the previous page being taken with a portrait attachment.

The Control Box, shown in the close-up views of the model in skeleton, was built up as a separate unit and fitted into the fuselage after assembly.

The box was made from 1 mm. ply and the rods, etc., from ⅛ in. aluminium wire—⅛ in. diameter birch dowelling will do just as well—other fittings were cut from 26 s.w.g. aluminium sheet.

The undercarriage legs, radius rods, etc., are made from similar material and faired where necessary with balsa. The undercarriage attachment fittings on the bottom longerons were also cut from 26 s.w.g. aluminium sheet.

The centre-section, wings and tail surfaces are all of perfectly straightforward construction, the wing spars being ⅜ × ⅛ in. spruce and the ribs of 1/16 in. sheet balsa. Aileron, rudder and elevator control levers were all made from 24 s.w.g. aluminium sheet with black carpet thread to represent control cables. The wing bracing is 24 g. piano wire.

As will be seen from the two views of the model in skeleton, differential aileron control has been incorporated, the control cables running through aluminium conduits in the bottom wings.

The engine was built up from block balsa and dowels wound with thread representing cylinders. Push rods were made from 18 g. wire and the whole mounted on engine bearers of 1/12 in. square section birch.

The nose cowling was beaten out of a sheet of 24 g. aluminium sheet but can be made more simply from a block of yellow pine, which is an easy wood to work with and takes a good finish when painting. Side and top cowlings were also of aluminium sheet, and here again thin white card provides a good substitute.

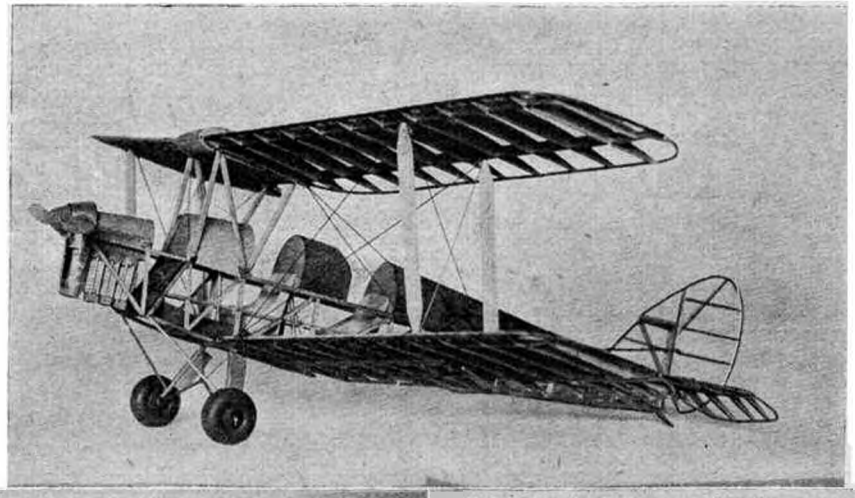
The prop was carved from a block of satin walnut, 6 × ⅝ × ⅛ in. Note that the spinner is partially integral with the propellor, the addition of a nose cap completing the streamline effect.

The gravity fuel tank in the centre-section was carved from a block of hard balsa, sanded to the required shape and pieces of thin string glued over it from leading to trailing edge, spaced about 1/12 in. apart to represent corrugations in the metal. Jap tissue was doped and pressed over the completed tank, which was then finally finished in silver.

Seats were made from balsa and thin white card and glued into the spaces provided on top of the control box.

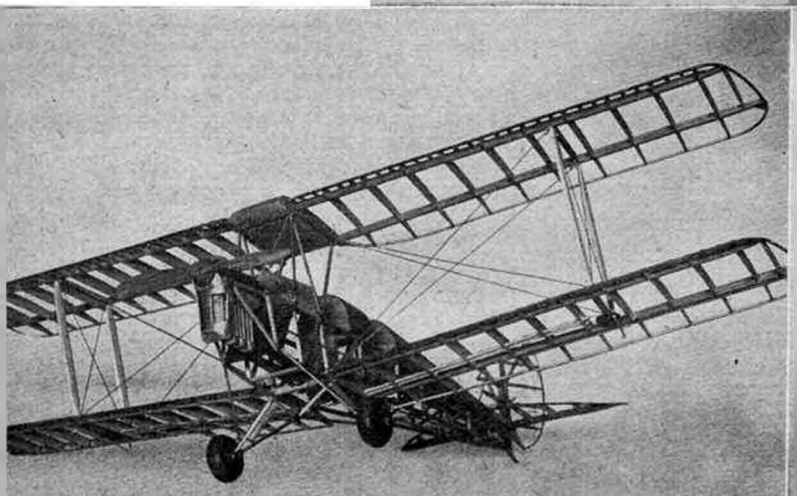
The model was covered with No 1 grade superfine Jap Tissue and the fuselage given two coats of clear, two coats of yellow and a final coat of transparent varnish. The wings received two coats of clear dope and two of silver. The registration letters G-AELB were painted on the top surface of the top wings and the bottom surface of the lower wing with the tops of the letters adjacent to the leading edge in both cases, and also on the sides of the fuselage. The rudder and tailplane bear no identification marks—the custom of painting the letter "G" on these surfaces was discontinued towards the latter half of 1928.

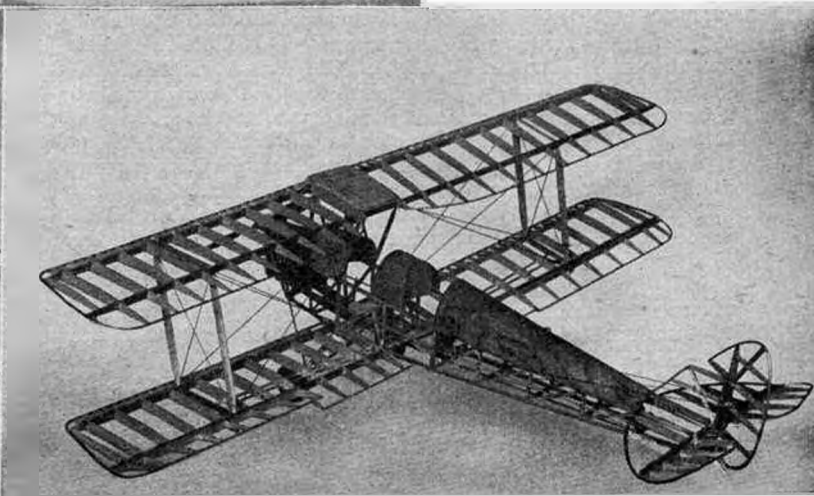
Many model builders go astray in the painting of registration letters and service numbers—I saw a photograph of a perfectly good model of a D.H. Moth spoilt by the builder painting on it a registration number which had been allotted to an old Sopwith "Gnu" away back in 1919 and another modeller submitted a Short "Sunderland" with a Gloster "Gauntlet's" service number—mere details, but sufficient to spoil even the best efforts.

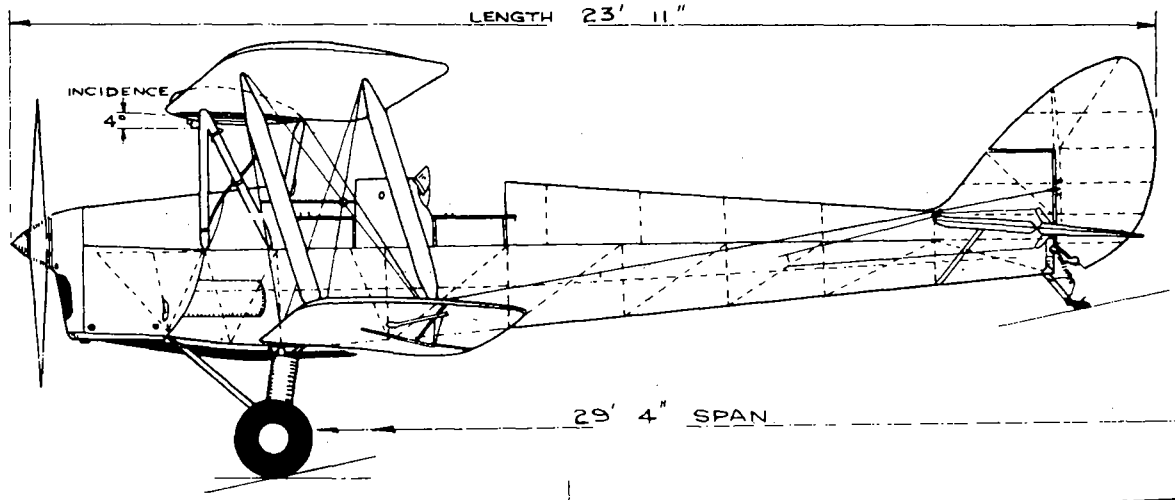


A word or two about photographing models. I find it more satisfactory to photograph models by daylight than by artificial light as the presence of shadows can be more easily avoided. For most of the photographs accompanying this article I used a 5 x 4 in. Sanderson's plate camera fitted with a Dallmeyer No. 3 Stigmatic lens, using Ilford Process plates (H & D 70.) and F.45 lens aperture.

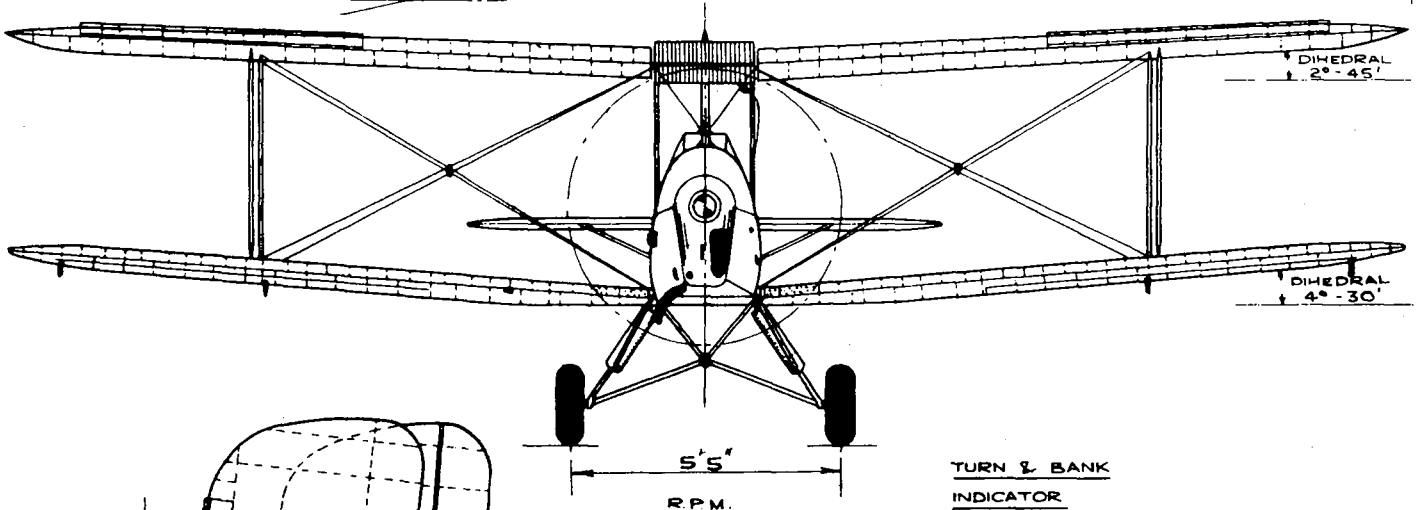
The exposure was between 5 and 10 minutes.



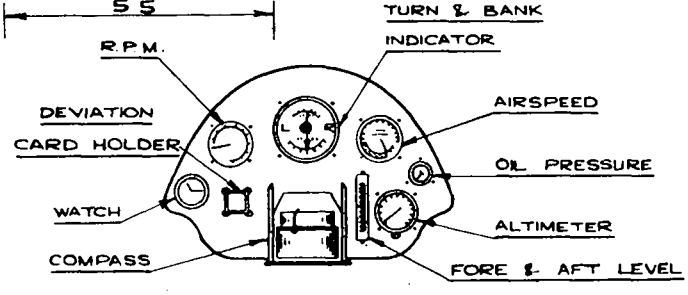




29' 4" SPAN



5'5"



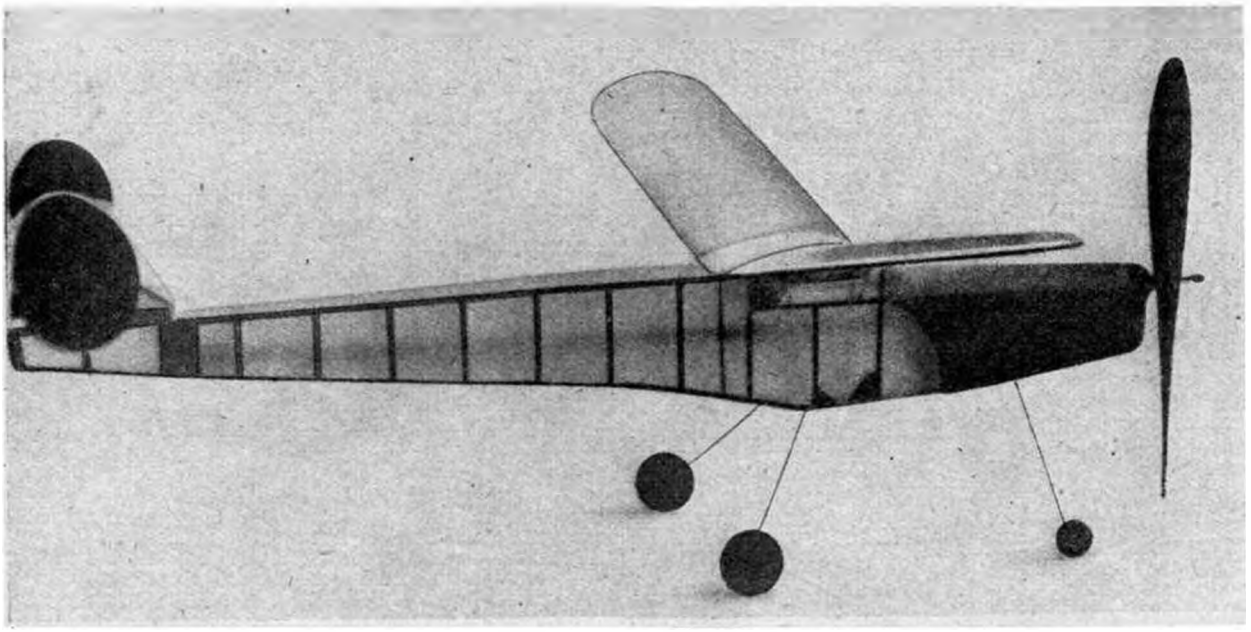
INSTRUMENT PANEL
(X.3 MAGNEN)

SWEEPBACK 11" AT STRUT POSITION (TOP WING) & 9½" AT STRUT POSITION BOTTOM WING.

DE HAVILLAND 82 A.
"TIGER MOTH"
(130 H.P. GIPSY MAJOR)

EJR
1941

SCALE
FEET



THE TRIKE

By D. COLLIER

FUSELAGE

Construct in the usual manner by pinning down the longerons and then cementing in the spacers, beginning with the one which fits at the cabin end of the top nose longeron. Cement $\frac{1}{16}$ in. sheet balsa, which surrounds cabin window, where shown on plan. Build another side on top of this one and, when dry, take the two from drawing and separate them carefully with a razor blade. The top and lower longerons of each side can now be cemented together at the tail and at approximately the correct angle. When dry add tailpiece. The next step is to cut to length and cement in place the top and bottom spacers which occur; top, at front of cabin, and bottom, below this, respectively. Now add all spacers from cabin to tail. Cut nose spacers and formers and after cementing these to fuselage, seeing that nose is square, shape formers 1, 2 and 3 and their corresponding bottom spacers. Put these in position and cement well. The side and lower formers, corresponding to former 1 may be made by cementing lengths of $\frac{1}{16}$ in. square on to the fuselage spacers and sanding them to an elliptical shape. Cover the nose with sheet and trim off all surplus balsa at front former, after which, sand the latter flat. Make a $\frac{1}{16}$ in. plywood nose former slightly oversize and cut out a rectangle, leaving a hole the same size as that in the fuselage nose. Cement this firmly to the nose former and sand it flush with the contour of the nose. Tightly bind two aluminium tubes (cut to correct length from drawing) to pieces of $\frac{1}{16}$ in. square balsa, and cement these well in their respective places. Add gussets and also the bamboo pegs where shown. Laminate a piece of $\frac{1}{16}$ in. balsa and a piece of $\frac{1}{32}$ in. plywood and from it cut two shapes to fit between spacers at tail as shown on plans. Cement these in place and drill a $\frac{1}{8}$ in. hole through each piece, after which complete fuselage by adding bamboo framework to cabin.

NOSEBLOCK

Make this of four laminations of $\frac{1}{8}$ in. sheet, one of $\frac{1}{16}$ in., and a sixth, which will be the spigot of $\frac{1}{4}$ in. Take the rectangular piece of $\frac{1}{16}$ in. plywood, previously cut from fuselage nose former, and cement it to the balsa spigot. When drilling the block incorporate slight down-thrust. Sand to a smooth finish and give three coats of dope, sanding between each. The prop. used on the original model was a standard 11 in. hardwood modified to 10 in.

UNDERCARRIAGE

This can be made from the dimensions given on drawing. The rear wheels are $1\frac{1}{2}$ in. diameter and the front wheel is 1 in. diameter.

WING

Cut two ribs "A" of $\frac{1}{16}$ in. sheet and thirty very roughly of $\frac{1}{16}$ in. sheet. Pin the thirty between the two of $\frac{1}{16}$ in. and sandpaper down to the outside templates until you have thirty-two ribs exactly alike. Two each of ribs "B" and "C" are also required. The wing is built half at a time, so pin the spar down to drawing and cement to it all ribs of that half except the $\frac{1}{16}$ in. centre-section rib. Cut off a trailing edge long enough for the whole wing and, laying it on the drawing, mark off all rib positions along its length. With a hacksaw blade cut a slot $\frac{1}{8}$ in. deep at each position. Cut the trailing edge at each of the two thick centre-section rib positions and, applying cement to each of the wing ribs, press one half of the T.E. gently on to them. Similarly, add leading edge to this half of wing and when dry lift from board, then, not fogetting to turn the drawing over, repeat the process for other half of wing. Shape and cement on the wing tips, then crack spar at each dihedral point and cement well, packing up wing tips to the correct dihedral. When dry, cement $\frac{1}{16}$ in. sheet reinforcements on each side of spar. Now add the centre-sections' leading and trailing edges as well as the centre-section ribs, cutting the spar slot in each wide enough to accommodate the "thicker" spar. Round off the leading edge and smooth the wing tips as well as the T.E.

FINS AND RUDDERS

Make these from $\frac{1}{16}$ in. sheet and sand to a good streamline section. Give each two coats of dope, sanding after first coat.

ELEVATOR

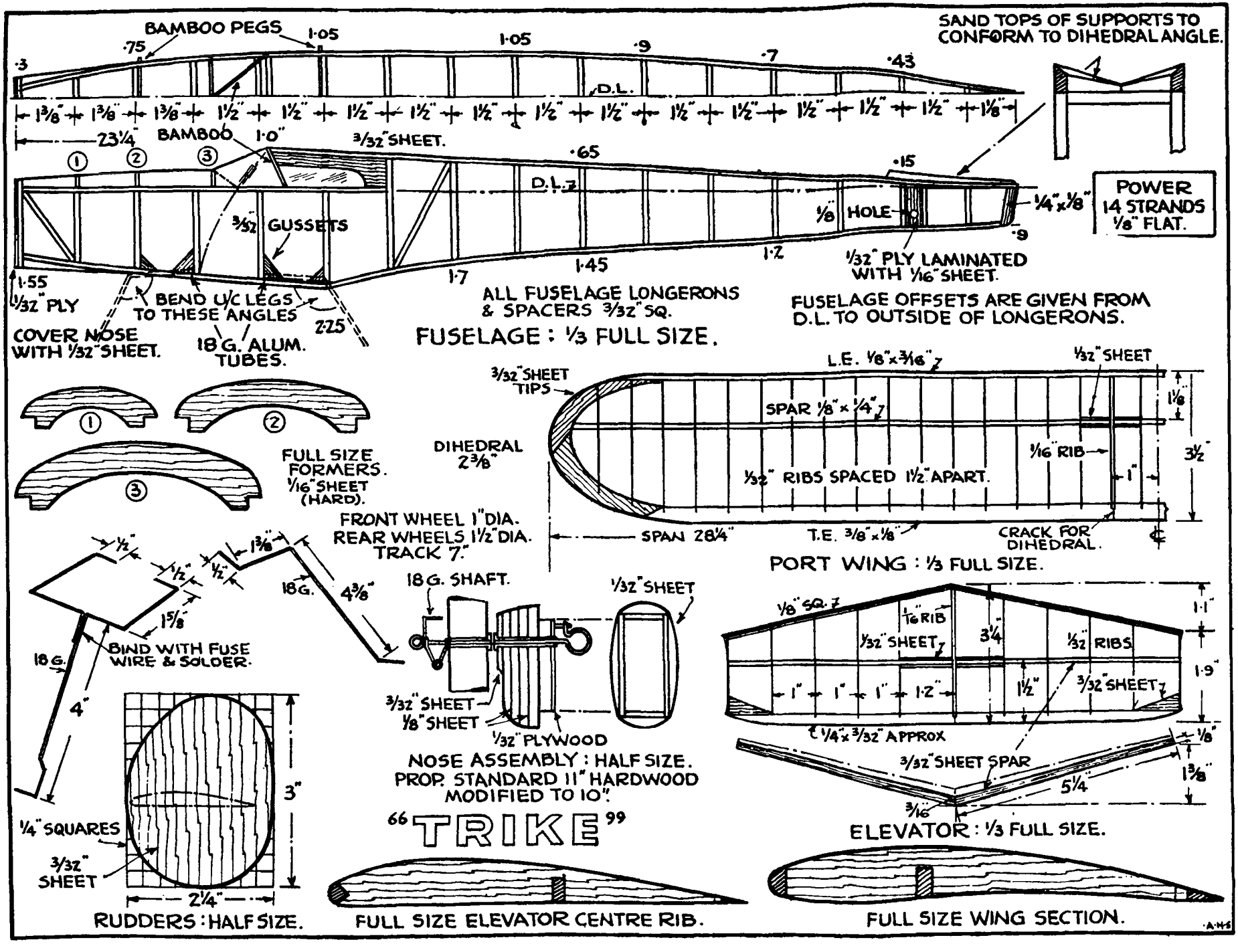
Make two spar halves as drawings and cement these together at the correct angle. Reinforce with $\frac{1}{16}$ in. sheet cemented on each side. Cut two end ribs and a centre rib from $\frac{1}{16}$ in. sheet and cut the remaining ones roughly to shape from $\frac{1}{16}$ in. sheet. Pinning the ribs for half the elevator between the centre and end rib, sand them down to these outer templates. Repeat for the opposite half. One half of spar can now be pinned to drawing and ribs cemented to it, including centre one. Add leading and trailing edges, then lift from drawing and proceed with other half of elevator.

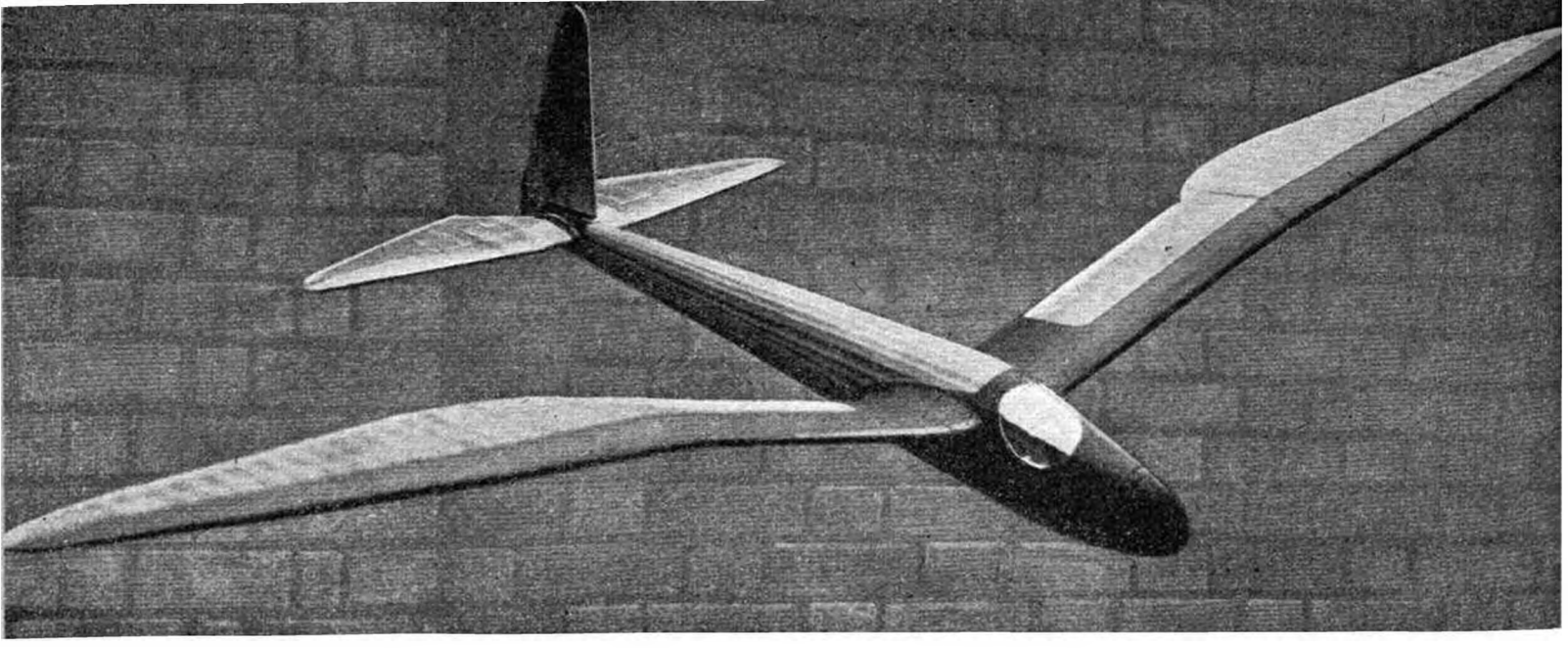
FINISHING

Choice of tissue is left to the individual. Before covering fuselage make a paper template of the cabin windscreen, cut a piece of celluloid exactly the same shape and cement to cabin framework. Add also the side windows.

FLYING

Power consists of fourteen strands of $\frac{1}{4}$ in. flat rubber, although she will fly with twelve strands. However, in a slight breeze and with fourteen strands, she zooms up to some 90 to 100 feet before flattening out. The take-off is slightly longer and more realistic on the tricycle undercart, and the glide is very flat.


BAMBOO PEGS
SAND TOPS OF SUPPORTS TO CONFORM TO DIHEDRAL ANGLE.
·3
·75
1·05
1·05
·9
·7
·43
D.L.
1⅜" 1⅜" 1⅜" 1½" 1½" 1½" 1½" 1½" 1½" 1½" 1½" 1½" 1½" 1½" 1⅛"
23¼"
BAMBOO
1·0"
3/32" SHEET.
·65
·15
D.L.
⅛" HOLE
¼"x⅛"
·9
1·2
1·45
1·7
1·55
1/32" PLY
BEND U/C LEGS TO THESE ANGLES
2·25
3/32" GUSSETS
POWER 14 STRANDS ⅛" FLAT.
1/32" PLY LAMINATED WITH 1/16" SHEET.
COVER NOSE WITH 1/32" SHEET.
18 G. ALUM. TUBES.
ALL FUSELAGE LONGERONS & SPACERS 3/32" SQ.
FUSELAGE OFFSETS ARE GIVEN FROM D.L. TO OUTSIDE OF LONGERONS.
FUSELAGE : ⅓ FULL SIZE.
FULL SIZE FORMERS. 1/16" SHEET (HARD).
DIHEDRAL 2⅜"
3/32" SHEET TIPS
L.E. ⅛"x3/16"
1/32" SHEET
SPAR ⅛" x ¼"
1/16" RIB
1/32" RIBS SPACED 1½" APART.
1"
1⅛"
3½"
SPAN 28¼"
T.E. ⅜"x⅛"
CRACK FOR DIHEDRAL.
PORT WING : ⅓ FULL SIZE.
FRONT WHEEL 1" DIA.
REAR WHEELS 1½" DIA.
TRACK 7".
½"
½"
½"
1⅜"
18 G.
4⅜"
1⅝"
BIND WITH FUSE WIRE & SOLDER.
18 G.
4"
18 G. SHAFT.
1/32" SHEET
3/32" SHEET
⅛" SHEET
1/32" PLYWOOD
NOSE ASSEMBLY : HALF SIZE.
PROP. STANDARD 11" HARDWOOD MODIFIED TO 10".
⅛" SQ.
1/16 RIB
1·1"
1/32" SHEET
3¼"
1/32" RIBS
1·9"
1" 1" 1" 1·2"
1½"
3/32" SHEET
¼"x3/32" APPROX
⅛"
3/32" SHEET SPAR
1⅜"
5¼"
3/16"
ELEVATOR : ⅓ FULL SIZE.
¼" SQUARES
3/32" SHEET
3"
2¼"
RUDDERS : HALF SIZE.
66 TRIKE 99
FULL SIZE ELEVATOR CENTRE RIB.
FULL SIZE WING SECTION.
A·H·S



THE "CONDOR" by P. J. FARR

Building Instructions

Fuselage.

The formers are cut out of medium hard ¼ in. sheet, in halves. These are not cemented together. The positions of the wing fixing dowels are marked on formers 5 and 6, and the dowels are cemented in place. The pieces of ¼ in. and ¼ in. sheet supporting these are then cemented on.

Build the fuselage by pinning the top and bottom stringers in place on the plan. (Note: the top and bottom stringers are slightly notched into the formers. The rest are not.) Cement the former-halves in place, and add the rest of the stringers, starting with the middle one which carries the tail unit. The cockpit is cut out after the fuselage is completed.

The stringers should be steamed to shape before being cemented in place. Use plenty of cement.

When the half is dry, take up from plan and add the other half-formers and stringers as on other half.

Cement the fairing ribs of 1/16 in. sheet in place on the dowels and build up the fairings as shown on the plan.

The skid is cut from very hard ¼ in. sheet and glued to the bottom stringer. A strip of 1/16 in. × 3/32 in. bamboo is glued to the bottom of the skid.

Cover the nose back to former 4 with medium hard 1/32 in. sheet and cut out cabin.

Carve a noseblock to the dimensions shown on the plan. This can be hollowed out to take lead weight. The original model was weighted with "Plasticine" inserted between the first and second formers.

Cover with super light bamboo tissue in strips. Water-spray and give it three coats of Cloudcraft petrol model dope (super strength). The original colour scheme was orange fuselage and fin, white wings and tail-plane. The sheeted part of the nose was painted two coats of matt black dope.

Wings.

The inner sections are built in the normal way. Holes are cut in the ribs and tubes fitted to take the fixing dowels. The tubes should be made by bending medium hard 1/32 in. balsa round pieces of dowel and glueing them, care being taken not to glue the tube to the dowel. The dowels should be a good fit to the tubes. The inner three ribs should be slightly thinner all round to take sheeting. The spar projects 1½ in. into the outer panel.

The outer panels have built-up ribs. Cut the spars as shown on the plan from hard ¼ in. sheet. The rib-straps are 3/16 in. × 1/32 in. HARD balsa.

Pin these strips in place on the plan, being careful to pack up the leading edge to the correct height. Cement the leading and trailing edges and the spars on to these strips. Then add the top strips. The ribs will hold their shape better if the strips are steamed or sprayed with water and bent to shape before fitting. The tips are hard ¼ in. sheet.

Join the inner and outer panels by packing up to the correct dihedral with books. Cement the spars to the protruding parts of the inner section spars.

Sheet the inner sections with 1/32 in. balsa as shown on plan.

The wings of the original were covered with white super light Jap tissue and given two coats of Cloud petrol model dope after spraying. It would probably be better, however, to cover them with super light bamboo tissue and give two coats of dope.

Tail Unit.

The construction of the tail-plane and fin is quite straightforward and needs no explanation.

Give both tail-plane and fin one coat of petrol dope.

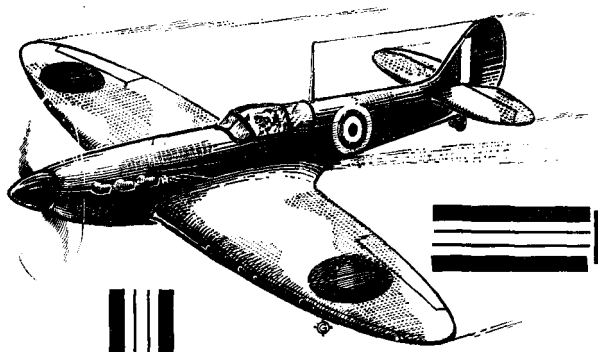
Flying.

The finished model is very light; the original weighed approximately 9½ oz., ready to fly. The wing loading works out at 4 oz. per square foot.

The back hook can be used safely in all but the highest winds.

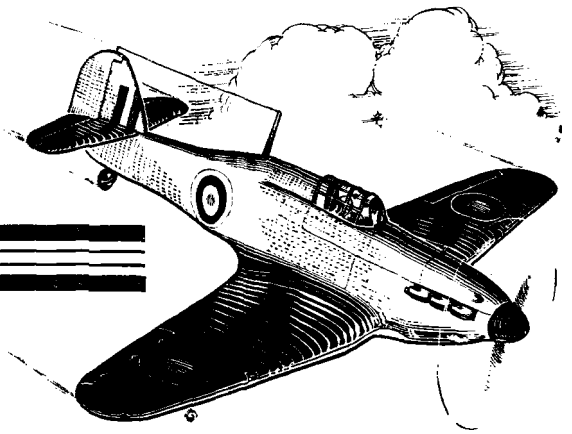
The original model has been flown very successfully on a 300 ft. towline, the average for ten consecutive flights on four separate days being just over three minutes. The best times to date are 5 min. 18 sec. and 13 min. 56 sec.

It is my belief that as much fun can be had with a fairly good glider and a 300 ft. to 400 ft. towline as with all the rubber jobs in the world—so here's luck!

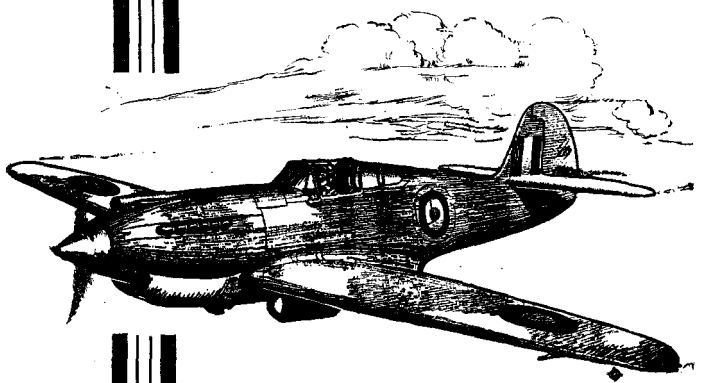


SUPERMARINE "SPITFIRE"

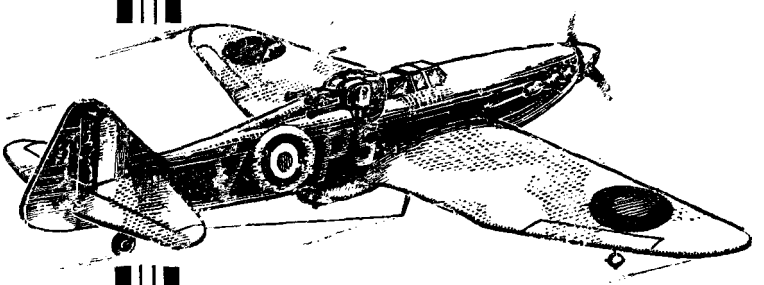
HALFAX



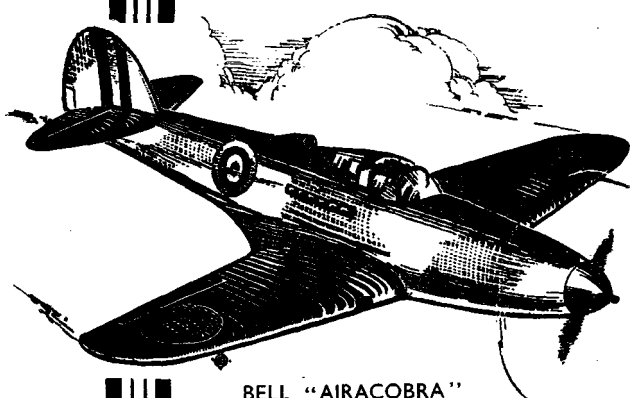
HAWKER "HURRICANE"



CURTISS "TOMAHAWK" (X.P. 40)



BOULTON-PAUL "DEFIANT"



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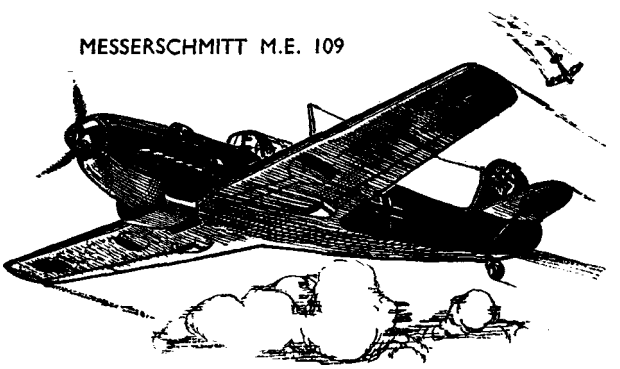

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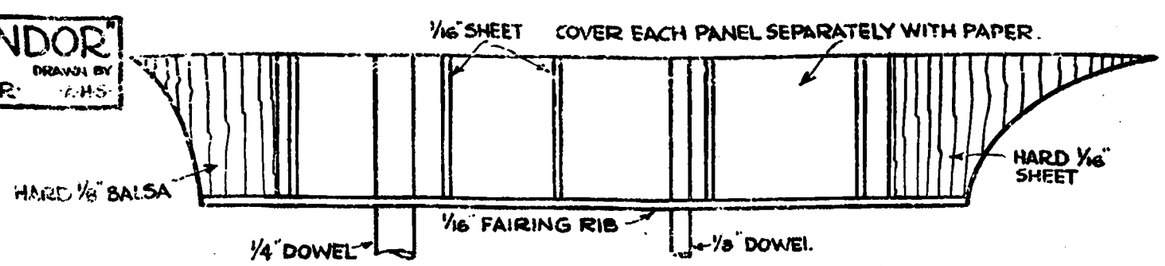
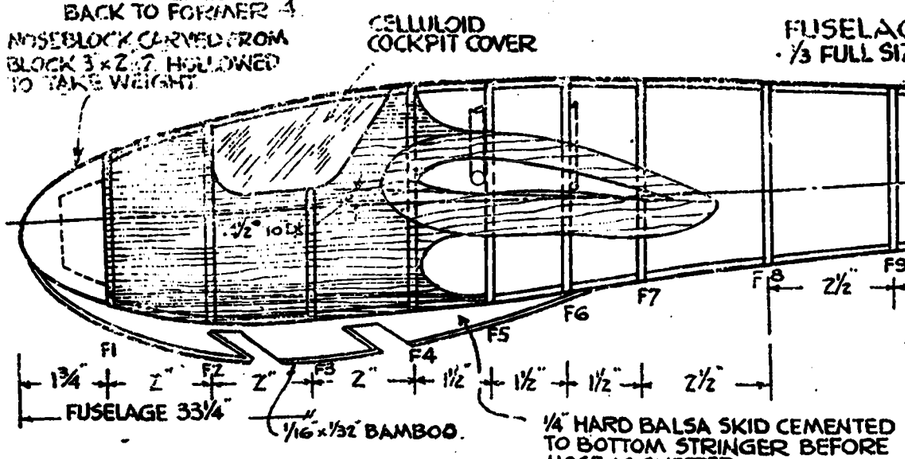
DESIGNED BY P.J. FARR. DRAWN BY A.H.S.



·WING FAIRING· FULL SIZE·



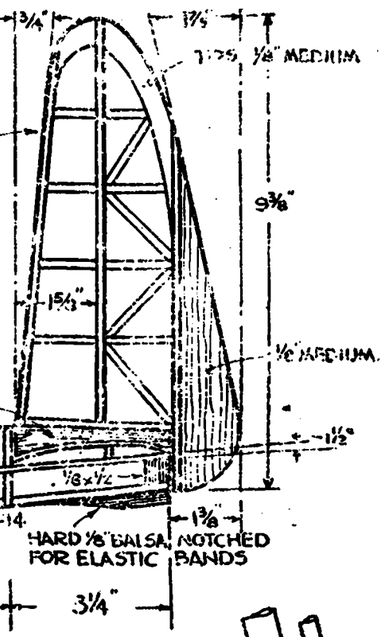
FUSELAGE
·⅓ FULL SIZE·

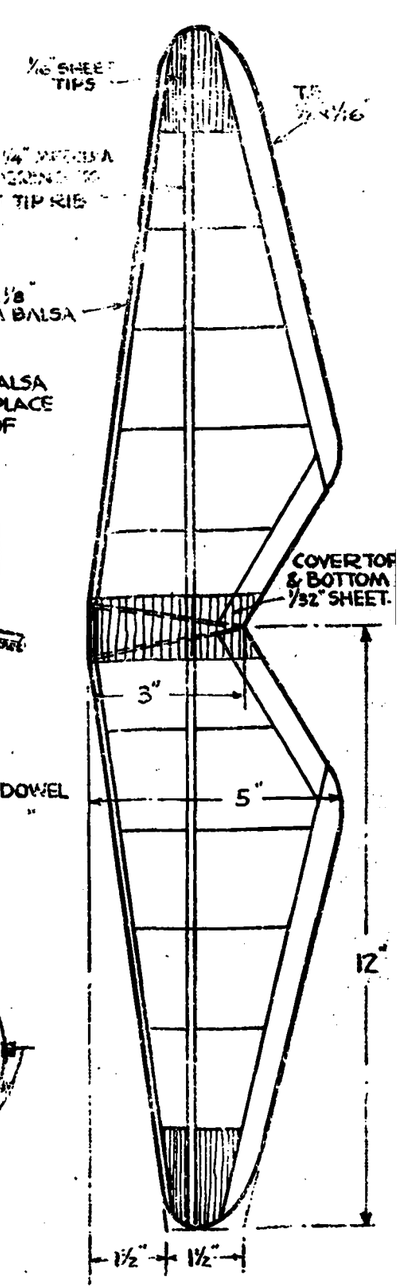
1/4" HARD BALSA SKID CEMENTED TO BOTTOM STRINGER BEFORE NOSE IS SHEETED.

FORMERS FROM 1/8" SHEET MEDIUM HARD BALSA.

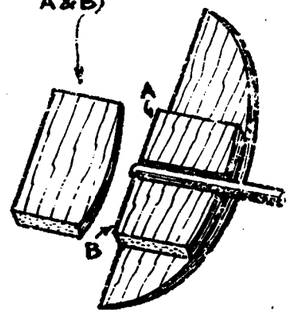
TAIL FAIRING CARVED FROM SOLID BALSA CEMENT FIN TO FAIRING

HARD 1/8" BALSA NOTCHED FOR ELASTIC BANDS

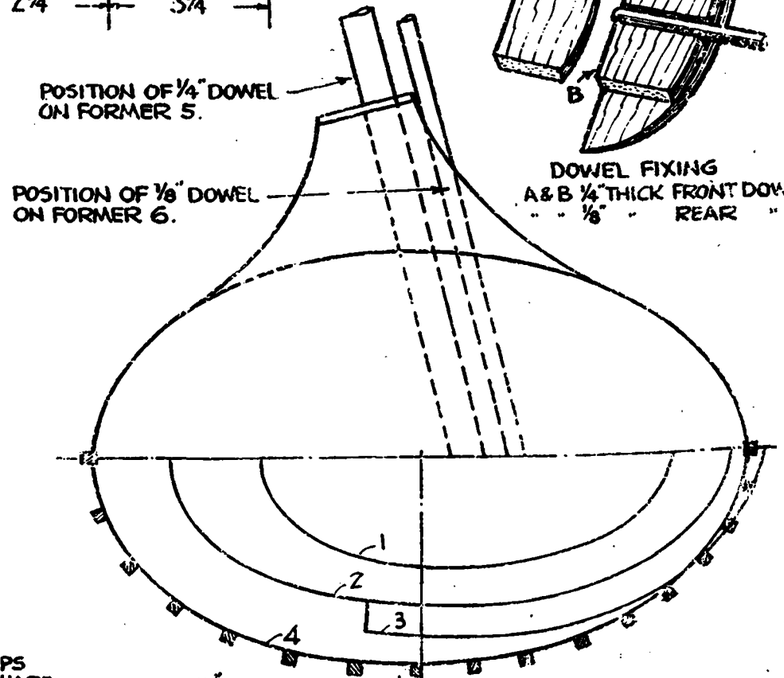


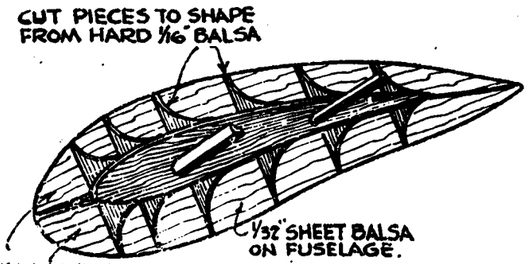


PIECE OF 1/16" HARD BALSA HOLDING DOWEL IN PLACE (CEMENTED ON TOP OF A & B)

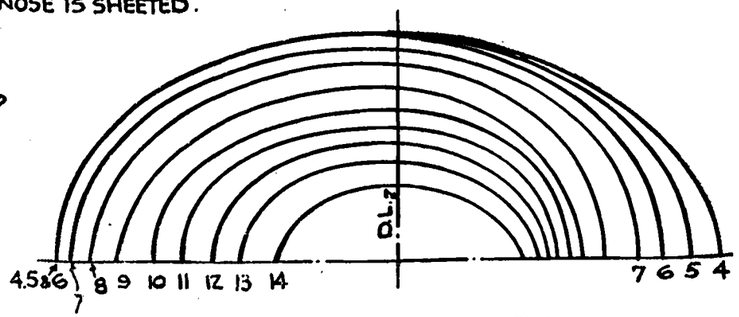


DOWEL FIXING
A & B ¼" THICK FRONT DOWEL
" " ⅛" " REAR "

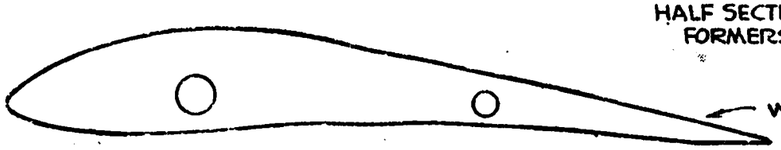


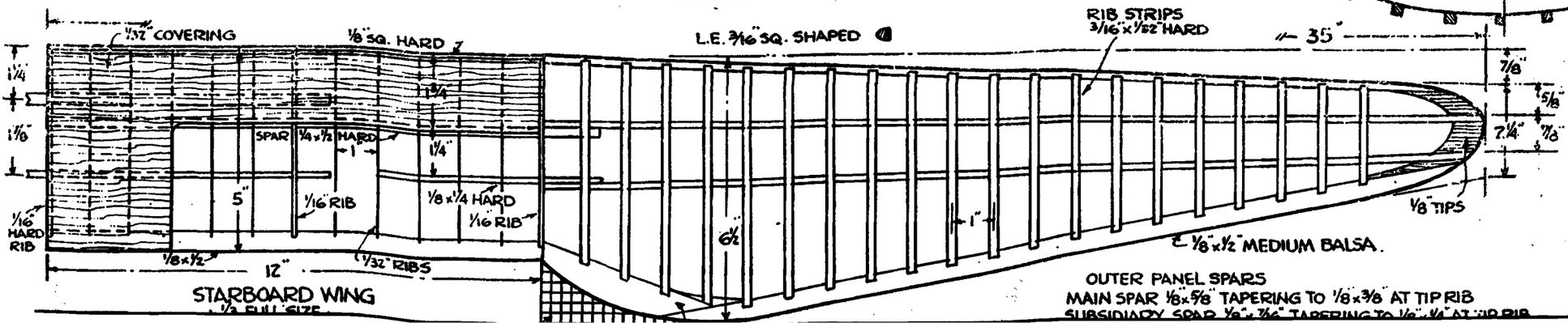


WING FAIRING DETAIL



HALF SECTIONS · FULL SIZE
FORMERS 4 TO 14.





STARBOARD WING
·½ FULL SIZE·

OUTER PANEL SPARS
MAIN SPAR ⅛×⅝" TAPERING TO ⅛×⅜" AT TIP RIB
SUBSIDIARY SPAR ⅛"×⅜" TAPERING TO ⅛"×¼" AT TIP RIB

TAILPLANE
·⅓ FULL SIZE·

RIBS 1/32" HARD BALSA SPACED 1½" APART FAIRED TO SPAR.

·WING DIHEDRAL·

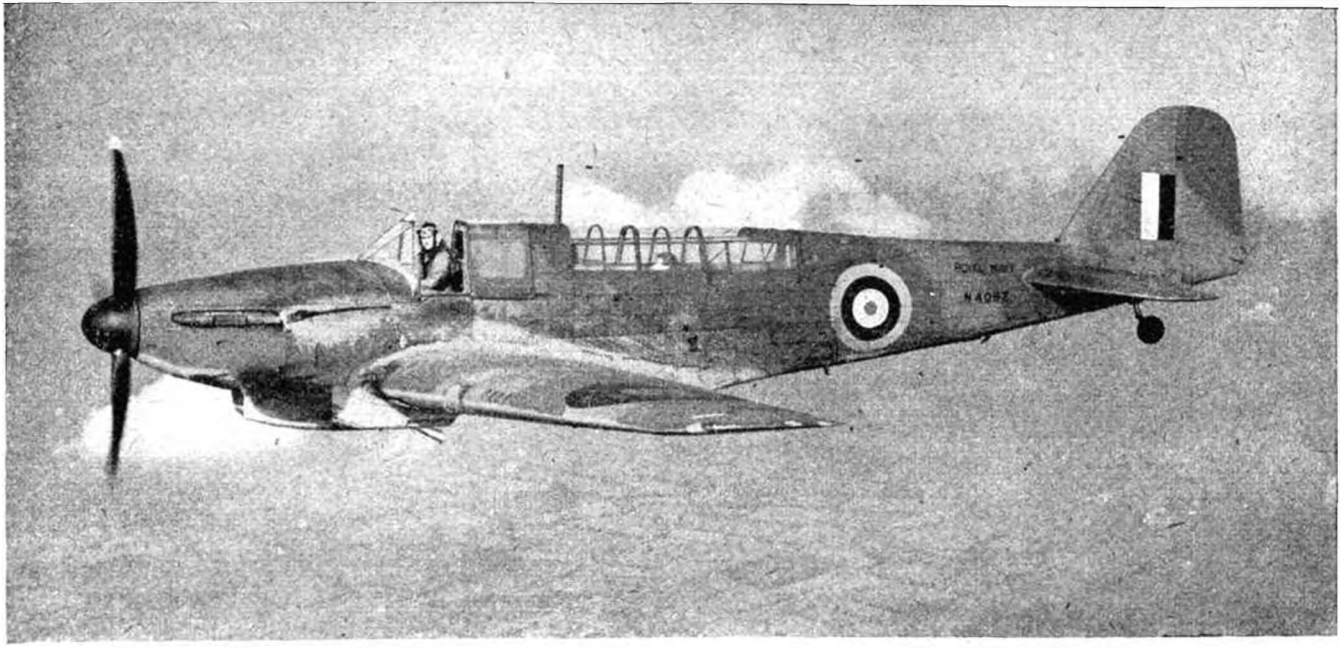
FROG

SCALE MODEL AIRCRAFT

TRADE MARK REGD.

MADE IN ENGLAND BY INTERNATIONAL MODEL AIRCRAFT LTD
For the Sole Concessionaires: LINES BROTHERS LTD. TRI-ANG WORKS. MORDEN ROAD. MERTON. LONDON, S.W.19. ENG.

FAIREY FULMAR



A 24-in. Span Flying Scale Model *designed by W. R. Jones*

The following details of this highly successful Fleet Fighter are taken from the book "Aircraft of the Fighting Powers" (Harborough Publishing Co., Ltd., 12s. 6d.). Eighty-six other craft are described in this useful publication, which is proving invaluable to model builders.

On the following four pages are full-size scale plans for building a ½ in. to 1 ft. flying scale model of the "Fulmar" as illustrated below.

Origin and Development.

Developed from the P.4/34 prototype aeroplane of 1937, which was built to a specification for dive-bombing, but did not go into quantity production. Consequently, only two prototypes were built in this country, although the design was chosen for use in the Royal Naval Air Service of Denmark, as a replacement for the Hawker Nimrod. Arrangements were made for the machine to be manufactured under licence at the Royal Naval Dockyard, Copenhagen, but it is not likely that the scheme had developed far at the time of the German invasion. The Fulmar was first mentioned publicly in Parliament in September, 1940, as having been in action with the F.A.A. in the Mediterranean. Apparently the machine had then been in production for a considerable time, following the "Battle" through the shops. The Fulmar is substantially the same as the P.4/34, but minor modifications are, however, visible externally.

Power Plant.

One Rolls-Royce Merlin X. Maximum power, 1,145 h.p. at 5,250 ft. Take-off, 1,065 h.p.

Construction.

Wings—All-metal with flush riveted stressed-skin covering. Fabric-covered ailerons and split trailing edge flaps. Fuselage—All-metal monocoque. Tail unit—Metal structure, metal-covered except movable surfaces, which are fabric-covered.

Dimensions.

(P.4/34)—Span, 47 ft. 4 in. Lgth., 40 ft. Hght., 14 ft. 1 in.

Areas.

Wings (P.4/34), 346 sq. ft.

Weights.

(P.4/34)—Empty, 6,405 lb. Loaded, 8,787 lb. Disposable load, 2,832 lb.

Performance.

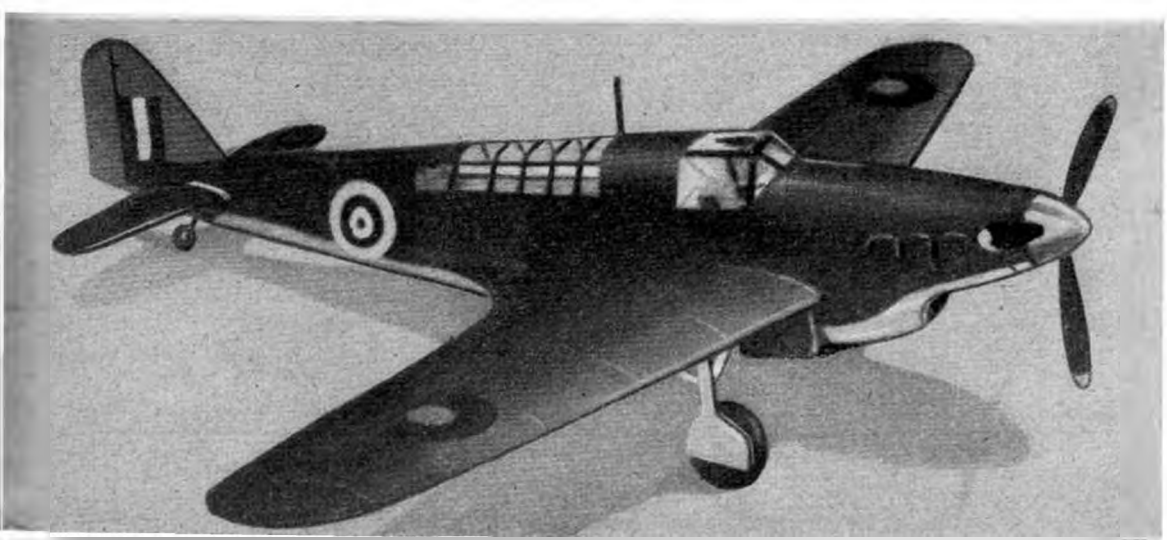
Not released, but top speed is believed to be just below 300 m.p.h. The figures for the P.4/34, with 1,030 h.p. Merlin II, are: Maximum speed, 284 m.p.h. at 17,200 ft. Cruising speed, 230 m.p.h. at 15,000 ft. At S.L., 245 m.p.h. Landing speed, 55 m.p.h. Initial rate of climb, 1,175 ft./min. Service ceiling, 29,600 ft. Range, 1,000 miles.

Armament.

Eight fixed machine-guns, firing forward, four in each wing.

Fulmar fighters on aircraft-carriers are shadow-shaded dark green and light earth on the upper surfaces of wings, fuselage and tail-plane, and painted duck-egg blue underneath. On the fuselage the camouflage extends down the sides to the belly, and also down the sides of the radiator. The fin and rudder are painted duck-egg blue.

Red and blue cockades are carried above the wings, while red, white and blue rings are surrounded with an additional yellow ring on the fuselage. Red, white and blue cockades without any outline are carried beneath each wing tip, not overlapping the ailerons. No serial number is painted beneath the wings, but it is marked in black on the sides of the fuselage, just forward of the tail-plane. Red, white and blue stripes are carried on a small portion of the fin, the red being foremost.



The two prototype P.4/34 aircraft were painted light grey. They both carried red, white and blue cockades on the fuselage and above and below the wing tips.

The first prototype had the serial number K 5099 painted in black on the sides of the fuselage and beneath the wings. It was not painted on the rudder.

The serial number of the second prototype was K 7565, which was carried on the sides of the fuselage and beneath the wings, and was also marked on the rudder.

FAIREY - "FULMAR"
24" FLYING SCALE MODEL

CUT TWO OF EACH FROM 1/16" HARD SHEET BALSA.

AERIAL MAST HEIGHT 1 1/16".

CUT FROM 1/32 SHEET

FRONT VIEW OF WINDSCREEN.

CUT TWO 1/16 SHEET BALSA.

3/16" x 1/16" BALSA.

P CUT TWO FROM 1/32 SHEET BALSA.

GLUES HERE

1/4" x 1/8" BALSA

RIB "C"

1/8 SQUARE BALSA.

BIND & GLUE LEGS AS SHOWN HERE

GLUE ONTO RADIATOR ON EACH SIDE

BIND & GLUE TO FRONT MEMBER

UNDERCARRIAGE DETAIL

2 REQD

TAILPLANE

LEADING EDGE

WHEEL FAIRING. 2 REQD. FROM 1/16 BALSA

BUILD UP AS SHOWN HERE & GLUE ONTO FUSELAGE.

CUT TWO FROM 1/16" SHEET

HARDWOOD WHEELS 1 1/4 DIAM. 20 S.W.G WIRE LEGS.

POWER: 6 STRANDS OF 3/16" x 1/30" BROWN RUBBER WELL LUBRICATED.

CUT FOUR FROM 1/16" SHEET

RUDDER AND TAILPLANE OUTLINES ARE 1/8" x 1/16" BALSA. RIBS 1/8" x 1/32" [SEE NOTES]

CUT ALL RIBS FROM 1/16" SHEET BALSA.

G CUT FOUR FROM 1/16" SHEET GLUE ONTO FORMERS 4 & 5

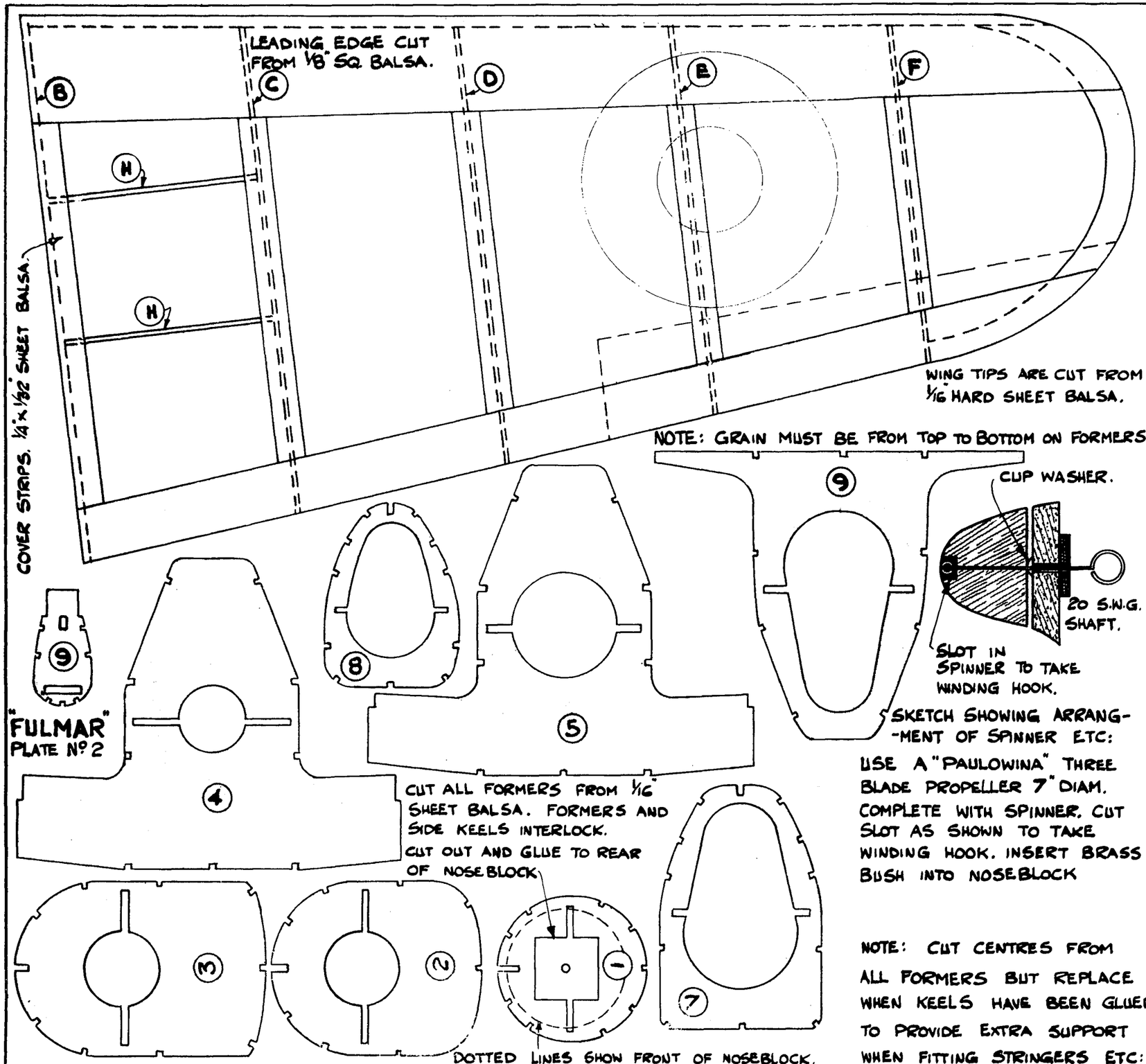
1/8" x 1/16" KEEL.

TAILPLANE

PLACE BALSA BLOCK ON- -TO BOTTOM STRINGER HERE

FOR INSTRUCTIONS SEE PLATE Nº 2

PLATE Nº 1



:GENERAL BUILDING INSTRUCTIONS:

CUT OUT FORMERS & KEELS & GLUE IN CORRECT POSITIONS AS SHOWN MAKING SURE THAT EVERY--THING IS SQUARE. ADD FRONT & REAR TOP KEELS AND REPLACE CENTRES OF FORMERS. STRINGERS MAY NOW BE GLUED IN POSITION. MAKE AND FIT PART "L" AND GLUE CELLULOID IN PLACE AS SHOWN. GLUE RIBS "A" ONTO FORMERS 4.5.6 AND FIT PARTS "G" & "X" AND PARTS "J" & "K". FUSELAGE FROM FORMER Nº1 TO FORMER Nº6 MAY NOW BE COVERED WITH 1/32" SHEET BALSA. CENTRE-SECTION MUST ALSO BE COVER--ED TO FORM WING FILLET. SAND ALL THE FUSELAGE SMOOTH AND APPLY TISSUE COVERING. NOTE: LEADING EDGE OF CENTRE SECTION GLUES ONTO REAR OF FORMER Nº3.

CUT OUT WING RIBS AND BUILD WING UP AS SHOWN. LEADING EDGE IS 1/8" SQ: HARD BALSA & TRAILING EDGE IS 1/2" x 1/32" BALSA ABOVE & BELOW WING RIBS. FIT PARTS "H" AND UNDERCARRIAGE SUPPORTS AND GLUE LEADING EDGE COVERING AND CAPPING STRIPS [1/32" SHEET BALSA] ABOVE & BELOW WING RIBS. NOTE THAT THE WIDER END OF PART "H" FITS AGAINST RIB "B". BUILD UP THE OUTLINES OF THE RUDDER & TAILPLANE ON THE PLAN. SPARS [PARTS "M" & "P"] ARE FITTED TO OUTLINES AND THE RIBS, CUT FROM 1/8" x 1/32" BALSA, ARE GLUED INTO PLACE ON EACH SIDE OF SPARS. BUILD UP NOSE BLOCK AS SHOWN & FIT PROPELLER SHAFT AND PROPELLER.

BUILD UP THE UNDERCARRIAGE AS SHOWN AND BIND AND GLUE ONTO SUPPORT MEMBERS WITH THE WHEEL FACING INWARDS.

MAKE EXHAUST PIPES FROM SCRAP BALSA & GLUE IN POSITION.

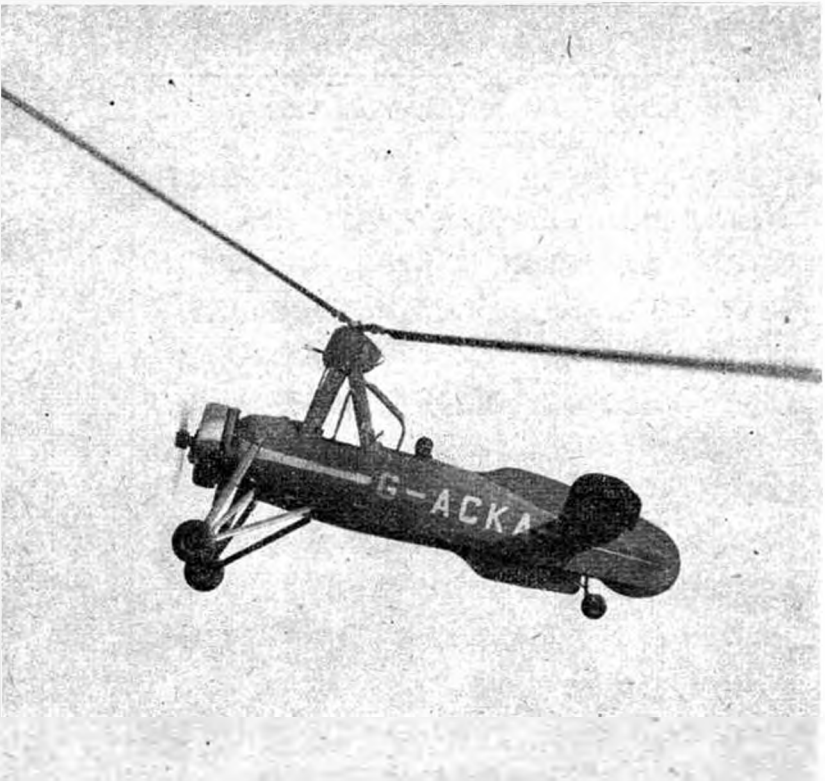
COVER ALL PARTS WITH "SUPERFINE" TISSUE & APPLY 2 COATS OF CLEAR DOPE. UPPER SURFACES OF WING, TAILPLANE, RUDDER & FIN & TOP & SIDES OF FUSELAGE SHOULD BE SHADOW SHADED GREEN & BROWN. UNDER--SIDE SHOULD BE DOPED LIGHT GREY. WHEELS BLACK PROPELLER BLACK WITH YELLOW TIPS. RAF ROUNDALS ON FUSELAGE & WINGS. VERTICLE STRIPES ON FIN.

SKETCH SHOWING ARRANG--MENT OF SPINNER ETC:

USE A "PAULOWINA" THREE BLADE PROPELLER 7" DIAM. COMPLETE WITH SPINNER. CUT SLOT AS SHOWN TO TAKE WINDING HOOK. INSERT BRASS BUSH INTO NOSEBLOCK

NOTE: CUT CENTRES FROM ALL FORMERS BUT REPLACE WHEN KEELS HAVE BEEN GLUED TO PROVIDE EXTRA SUPPORT WHEN FITTING STRINGERS ETC:

S.



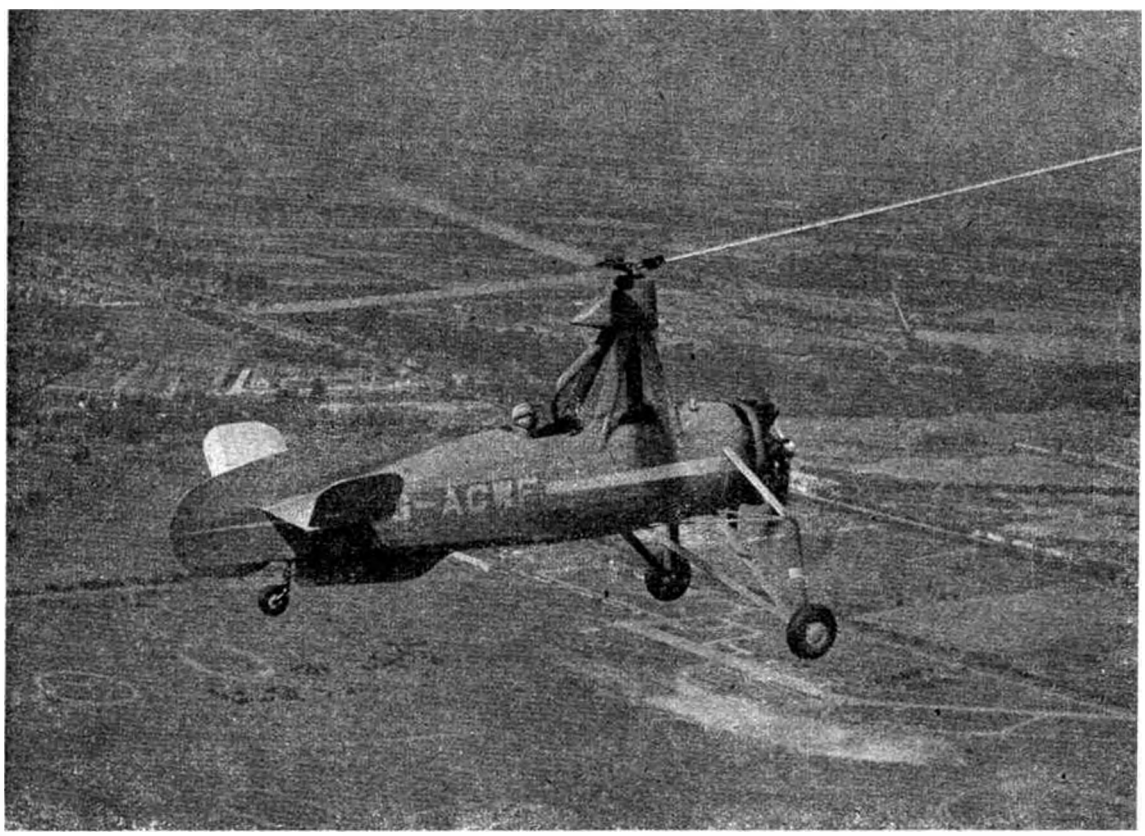
THE CIERVA

by S. HOWARD BARNETT

The design illustrated on the opposite page was submitted to us by Mr. Barnett who emphasized that, although it was not drawn to scale, he thought the idea was capable of being developed into a working model. On this page we publish two photographs of the full size Cierva aircraft, and commend Mr. Barnett's scheme to the more inventive of our readers, adding the offer of a cash prize of £3 to the one who constructs a model, the operation and construction of which is generally as described by Mr. Barnett, and which is certified as obtaining the greatest duration from unassisted R.O.G. We impose one limitation; that the diameter swept by the rotor blades shall not exceed 2 ft. The certificate must be signed by three witnesses as well as the builder of the model, and it must be delivered to our Leicester Office not later than March 31st, 1942.

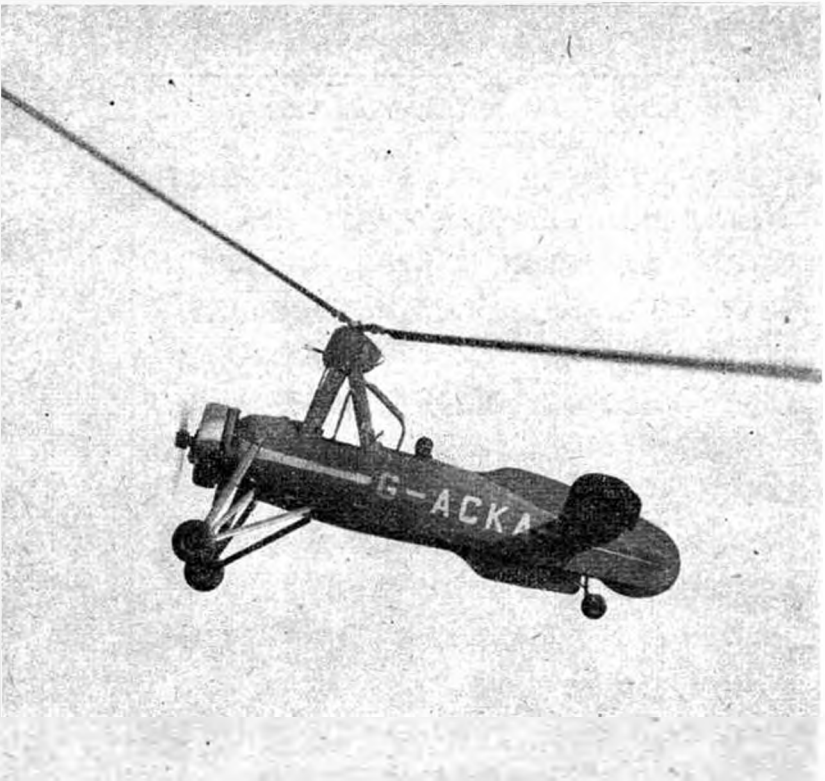
THE principle of the Cierva C.30 Direct-Lift Autogiro (3-bladed rotor) is roughly as follows :—

The rotor blades are driven at a high speed but with the blades "feathered" (i.e. having no angle of attack to the air, but being edge-on to the air). When the rotor is revolving fast, it is suddenly declutched, while simultaneously the blades are "defeathered" and given a pitch, or angle of attack to the airstream. At the same time the drive to the airscrew is clutched in. All this is brought about by the tripping of one trigger in my model. The autogiro, if properly constructed (with the right power- and rotor-loading) should then leap vertically into the air and fly. When the elastic unwinds and the airscrew stops it should gently descend to the ground, "parachuted," as it were, by the free-wheeling rotor blades.



Fit two tiny wire nails at the root of each of the three rotor blades as "stops" to prevent the blades assuming too great a pitch when they are "defeathered." They can be fitted as in the accompanying diagram and can be bent to give the right angle to the blades, which should be of the order of 30° from the horizontal. Another way of achieving the same object would be to make the rotor axle of non-cylindrical section and this would have the advantage that a stream lined shape could be used.

There is, definitely no need for wings, as the rotor is a revolving wing system in effect. The model would, of course, have to be constructed as lightly — commensurate with strength — as possible.



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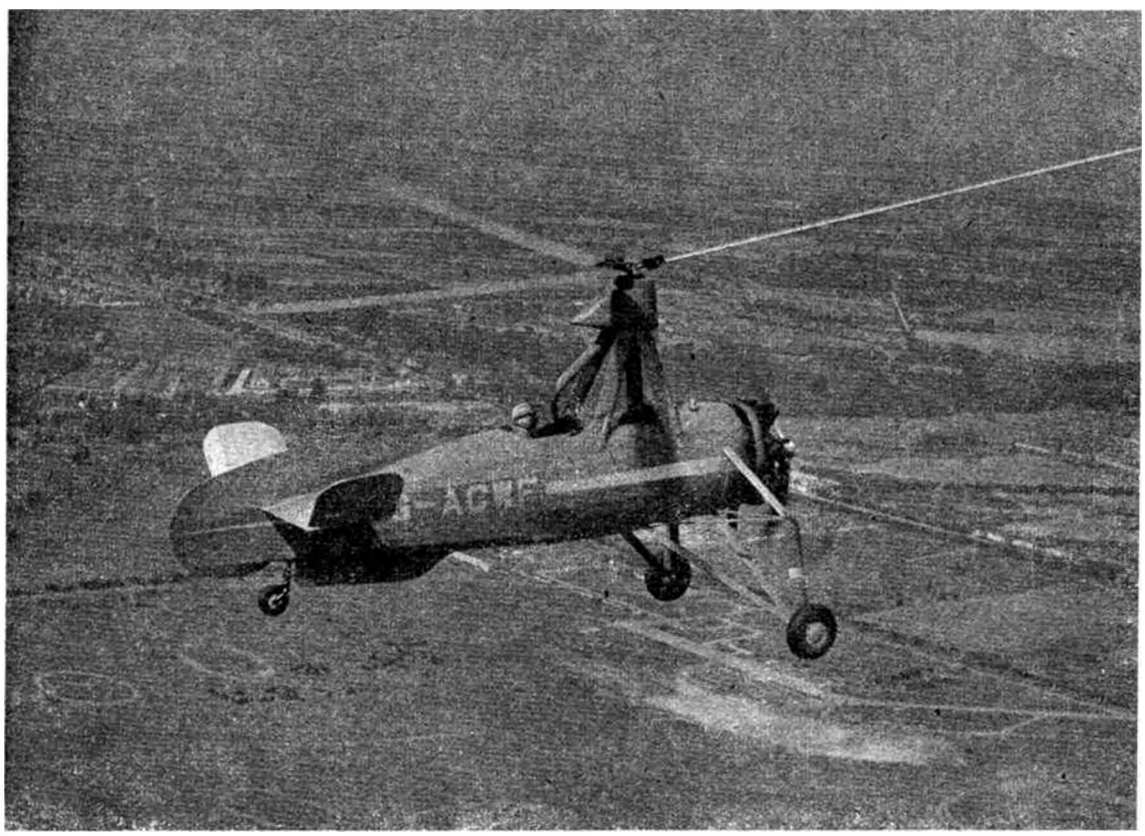

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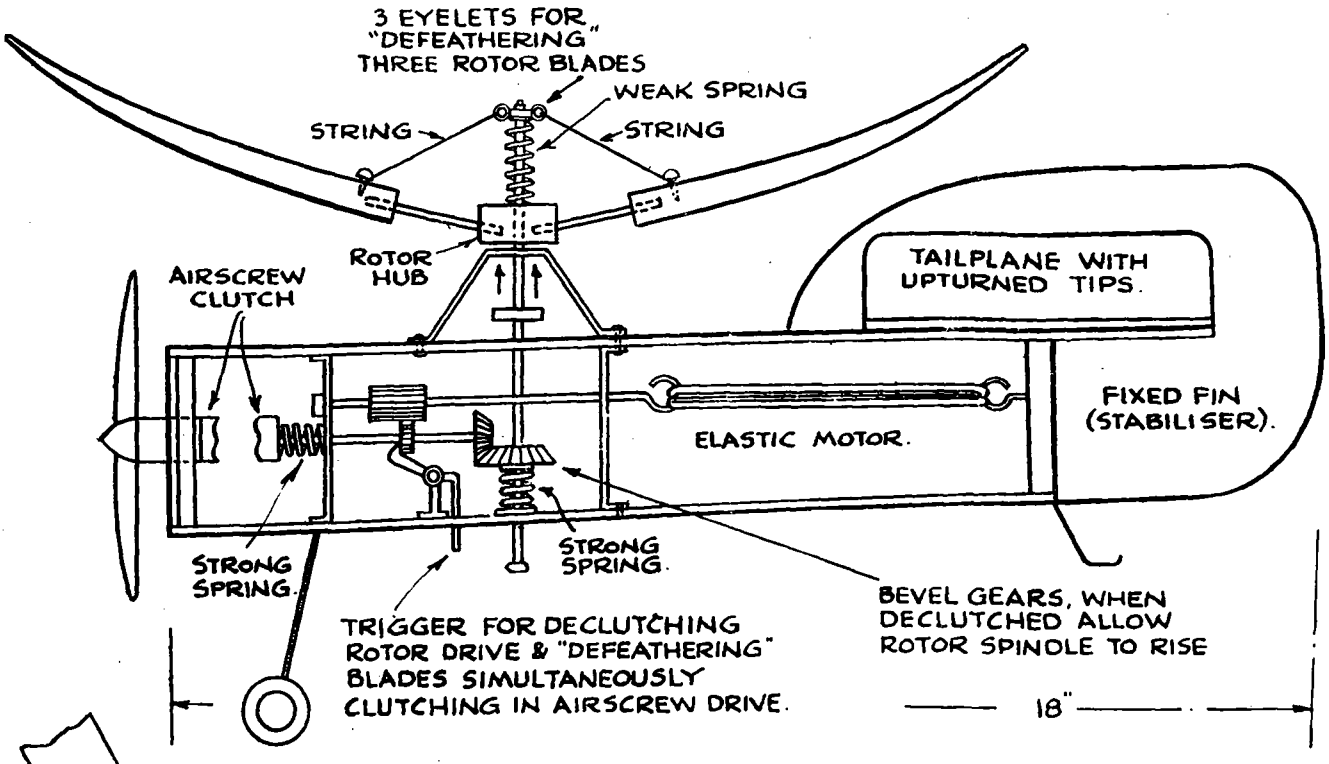
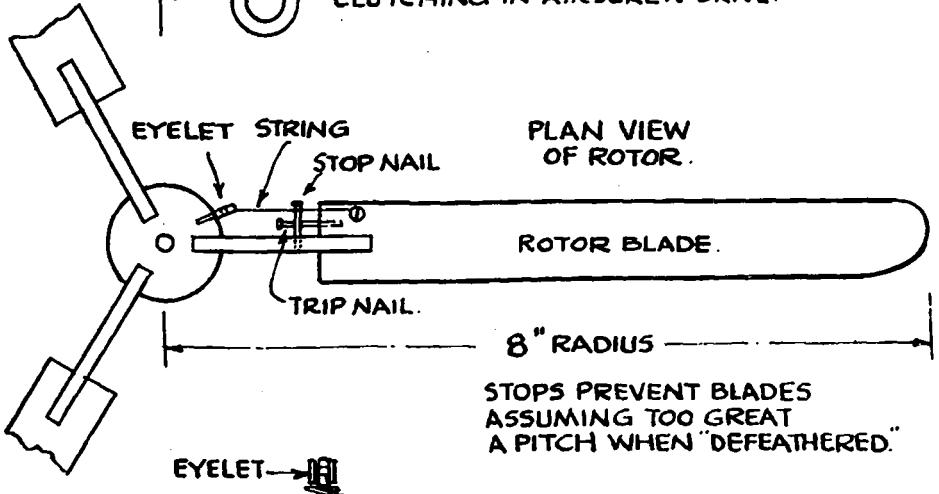
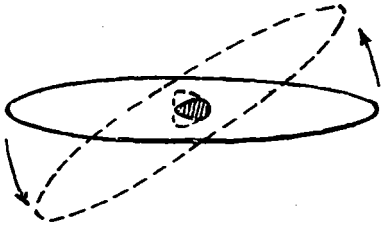
MECHANISM OF FLYING MODEL OF CIERVA C.30 DIRECT-LIFT AUTOGIRO (3 BLADED ROTOR).



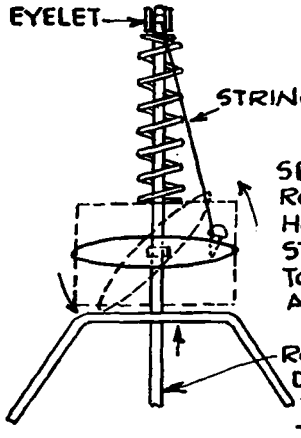


STOPS PREVENT BLADES ASSUMING TOO GREAT A PITCH WHEN "DEFEATHERED."



ALTERNATIVE METHOD OF CONTROLLING PITCH ROTOR HUB IS OF STREAMLINE SECTION & FITS INTO HOLE THIS SHAPE

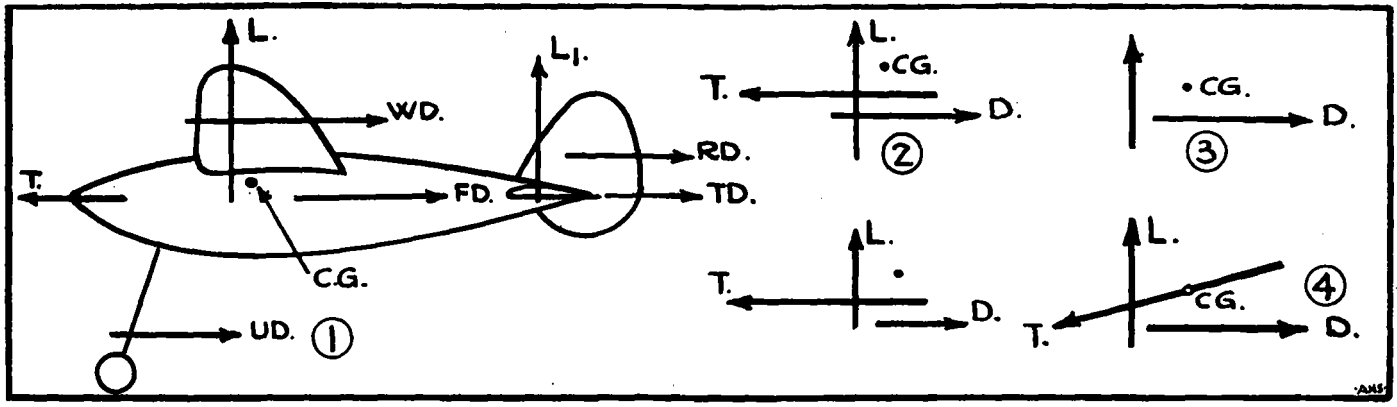
THUS CONTROLLING UPWARD TILT OF BLADE



SECTIONAL VIEW OF ROTOR BLADE SHOWING HOW TAUTENING OF STRING TILTS BLADE TO GIVE IT ANGLE OF ATTACK.

ROTOR SHAFT, WHEN DECLUTCHED, RISES & TAUTENS STRING, THUS TILTING (DEFEATHERING) ROTOR BLADES.

DRAWING NOT TO SCALE. GENERAL PROPORTIONS OF MODEL AS INDICATED.



T = Thrust.
L = Wing lift.
D = Total horizontal drag.
L_1 = Tail lift.
WD = Wing drag.
TD = Tail drag.
FD = Fuselage drag.
UD = Undercart drag.
RD = Rudder drag.

DISCOURSE ON DOWNTHRUST

By B. R. ALDRIDGE

WITH the recent advance in presenting formulæ and airflow theory to the aero-modellist I think that a general discussion on the dispositions of forces acting on a machine in flight would help to put these principles into practice more accurately than they are at present. Now it seems to me that if one carefully works out the various incidences of wings, etc., and lines of least resistance for non-lifting parts there is no guarantee that the airflow meets the surfaces at the aforesaid angles if such a device as down-thrust is employed to make the machine fly at all. One cannot judge by sight to the required accuracy the angles of attack in actual flight, and it is an impossibility to work out the force diagrams to show the angle of flight since the percentage of inaccuracy due to approximations in drag-coefficients, thrust variations, etc., is high, while the forces involved are themselves small. Their positions, too, are difficult to place, due to centre of lift travel, etc. Furthermore, I have never heard any convincing reasons for assuming that a 'plane flies along the thrust line, the line of least fuselage resistance or along the ideal line, which results in the surfaces meeting the air at twice the aforesaid correct incidences. Who knows at what angle she flies? Probably the vast majority of us don't know. We just blithely assume that if she flies better than the last did the latest theory is borne out in practice. This is possible, but probably occurs in a much moderated form of the theory on paper.

Now let me state what I consider the ideal and then work up to a method of getting as near to it as possible. "The ideal is for the machine to be flying along the line of least resistance of the fuselage, for the thrust line to be parallel to this line, and for the air to meet the surfaces at the predetermined angles, i.e. the angles of attack are the same as the angles of *incidence relative to the thrust line.*" These angles are, of course, of individual choice or computation—whether they produce minimum sinking speed, highest lift-drag ratios or some other phenomenon are not the subject of this article, but apply rather to the remarks in the opening paragraph.

Now let us look at the forces acting on a 'plane to see what we are up against.

Diagrams 1 shows all the forces acting on a machine. We do not show the weight acting, as we are going to consider the rotational effect only in a vertical plane around a point, in this case the centre of gravity. We can simplify this diagram by adding forces in the same direction and reducing to diagrammatic form (2).

Now diagram 2 is in equilibrium, according to the ordinary laws of mechanics, provided the machine is flying with no acceleration or rotation. This simply means that the clockwise "turning effect" of T and L about C.G. balances the anti-clockwise "turning effect" of D around the C.G. Now let us look at the practical effect. You have got your machine to fly, balanced as in diagram 2, using no down-thrust. In the glide T drops to zero (actually it becomes less than zero in a forward direction since the propeller offers drag). Hence the 'plane dives. Hence you slide your wing or trimming weight forwards, and she glides O.K. The L and D in diagram 3, you notice, are now balanced *without* T. Under power she stalls because of the clockwise turning effect of T being added to a stable diagram. Now what do you do? At last we come to the crux. You incorporate down-thrust to slant the thrust-line through the C.G. because a force which passes through a point has no turning effect around that point (4). Your machine now glides and manifests no stall under power. This leads us to see the basic point of the article. This wretched down-thrust has occurred simply because the thrust line in its original position did not pass through the centre of gravity. Had it done so, no down-thrust would have been necessary.

We are going to design our machine to eliminate down-thrust before we even launch her.

Start by using the thrust line as the datum line. Form your body round it so that the line of minimum fuselage resistance is parallel to it. You can be pretty certain that in the case of, say, a streamlined fuselage with points at each end, the line of minimum resistance is the line joining these points, even if there is more cross-sectional area below this line than above. Actually you can find this line pretty much as well by draughtsmanship as by elaborate wind-tunnel tests. You base all your incidences on this line, as it is the flying line under this method, and you must ensure that if sliding wings are used they slide parallel to the datum line to avoid vertical C.G. shifts. Now you remember we said we wanted the C.G. on the thrust line? You have got to remember that constantly to design in the way I am advocating. Most high-wing jobs, parasols, etc., have the C.G. too high, which is why they need more down-thrust the higher the wing gets. Low wings have the C.G. too low below the thrust line. This explains their habit of diving under power, which Mr. Knight pointed out recently.

Points to note, therefore, for lowering the C.G. on high-wing jobs are:

(1) Keep the wing as low as possible.
(2) Use the minimum dihedral compatible with stability.
(3) Use a heavy under-rudder.
(4) Use heavy wheels and legs.
(5) Belly the fuselage underneath as much as possible.

To raise the C.G. on low wings:

(1) Keep the wing as high as possible.
(2) Use a heavy top rudder.
(3) Use light wheels and legs.
(4) Sweep the nose down and keep the structural weight at the top of the fuselage.
(5) Use the maximum dihedral compatible with stability.

A lot of these points require considerable structural ingenuity, but can be overcome if you do the thinking before the gluing.

To test whether the C.G. is on the thrust line, suspend the whole machine from a point at the rear of the fuselage on the thrust line. Hang a plumb-line from this point, and the correct position should be for the winding hook to be dead alongside the string at the weighted end of the line.

You have built your 'plane and it has passed the plumb-line test. You have placed your surfaces so as to get, say,

the best L/D ratio, i.e. the flattest and longest distance glide. You don't bother about the thrust line or up- or down-thrust—you simply test glide for approximate position and then wind up and keep on flying under power until you observe that the best glide position to satisfy your pre-calculating has been achieved, and then you can be as sure as you will ever be sure of something you cannot see to the half degree that those surfaces are hitting the air right, and if they are, then she's flying along your datum, minimum resistance and thrust line.

Try and think of the C.G. as the point on which the whole machine pivots. To my mind the C.G.'s importance is not stressed nearly enough. All the forces acting on a machine bear a relation to the C.G. in the form of distance from it. There is no connection as such between the lift of the wing and the drag of the rudder, but what does not seem to be realised is that just as certainly as the wing lift tends to pitch the nose up or down, so the rudder drag does likewise. And you can only really visualise completely how the forces act in relation to each other by remembering the linking factor, the C.G. This muddle has given rise to several fallacies, one of which I will mention. That is the idea that high or low centres of resistance cause stalling or diving under power. The commonest idea is that if the centres of resistance and thrust line are very close or coincide, stalling or diving troubles cease. It would not matter one iota if thrust and resistance lines coincided if the C.G. was some distance off both of them, because the 'plane would still stall or dive once the power ran out. To summarise, all the forces except the thrust bear the same relation to the C.G. under power and in the glide. But under power you have got to throw in the force of thrust to keep the thing flying. You have got to nullify its turning effect, so you make it pass through the C.G., but why, oh why, *slant* it through the C.G. and mess up your incidences? Put it straight through, parallel to your flying line and you are all right.

R. WATSON on DURATION SEEKING

THE principal problem of competition modellers is necessarily how to improve the performance of their models without increasing the weight of motor in their model. It is also agreed that the angle of incidence of the wing (of a Wakefield model) which gives the best sinking speed is in the region of 5° (refer to the Maxwell—Jones controversy). Many modellers are setting their wing at this angle in order to get the minimum sinking speed. (This angle refers to the angle between the wing and the centre-line of the fuselage, which is usually the thrust line). This angle is not the angle corresponding to the maximum L/D for the whole machine (see THE AERO-MODELLER, December, 1940), but since the drag is at a minimum at this angle, the model's motor, in giving out its energy, will have the minimum number of foot/pounds removed from the total amount of energy available to make the model climb. It would seem, then, that for a model to have its maximum possible duration under non-thermal conditions it must climb at the angle that corresponds to the maximum L/D of the model (the angle referred to is the angle of incidence of the wing relative to the thrust line), and at the peak of the climb the model should start (and continue) to glide down to the ground at the angle of incidence corresponding to the minimum sinking speed.

Consider Fig. 1 and assume the following:

(1) The model is in equilibrium.

(2) The wing is set at the angle corresponding to maximum L/D.

(3) The tail is set at 0° to the thrust line.

(4) The undercarriage is retracted and the propeller *not* folded.

Taking moments about C_1, the C. of G.

$BC_1 \times LW_1 + AB \times DW_1 = C_1D + Lt_1$ .....(1)

also:

$LW_1 + Lt_1 = W$ .....(2)

$LW_2 \times BC_1 = Lt_2 \times C_1D$ .....(5)

In considering Fig. 2, and assuming:

(1) The model is in equilibrium.

(2) The propeller has folded.

(3) That, due to the couple produced by the C.G. moving backwards (due to the propeller folding), the wing incidence has increased (relative to the direction of the 'plane) so that corresponding to the minimum sinking speed.

Taking moments about C_1, the old C. of G

$LW_2 \times BC_1 + AB \times DW_2 + C_1C_2 \times W = C_1D \times LT_2$ .....(3)

also:

$LW_2 + Lt_2 = W$ .....(4)

$LW_2 \times BC_1 = Lt_2 \times C_1D$ .....(6)

From these six equations it is possible to find by calculation the value of AB, which will cause the model to assume its minimum sinking speed after climbing at its best L/D ratio for the whole model. It should be noted that:

LW_1 = lift of wing under power in horizontal flight.

Lt_1 = lift of tail under power in horizontal flight.

DW_1 = drag of wing under power in horizontal flight.

LW_2 = lift of wing during glide at the angle to the airstream corresponding to minimum sinking speed.

Lt_2 = lift of tail during the glide, due to the increase of its angle of incidence to the direction of flight (which is the difference in angle between minimum sinking speed and maximum L/D).

DW_2 = drag of wing at its new incidence, corresponding to the minimum sinking speed.

C_1C_2 = backward movement of C. of G., due to the propeller folding.

Calculations such as these are all right to those who like doing them, but there is a practical way of obtaining AB without calculation or measurement. This can be found by the following procedure: (1) remove the blade(s) of the folding propeller and substitute on the end(s) of the stump(s) of the blade(s) weight(s) equal to the weight(s) of the blade(s); and have the incidence of the wing adjustable. Now make tests by gliding to find the maximum L/D of the model, i.e. the angle at which the model glides the greatest distance from a given height. When this is found, the wing support should be changed so that the wing can be moved up and down, but the incidence remains at the angle corresponding to the maximum L/D. The weights on the propeller stump(s) should be removed and the blade(s) re-attached to the propeller stump(s), and the tests carried out in order to find the position above the thrust line which gives the minimum sinking speed, i.e. the position which gives the maximum duration of glide from a given height. This method is applicable to any duration model, provided it has a folding propeller.

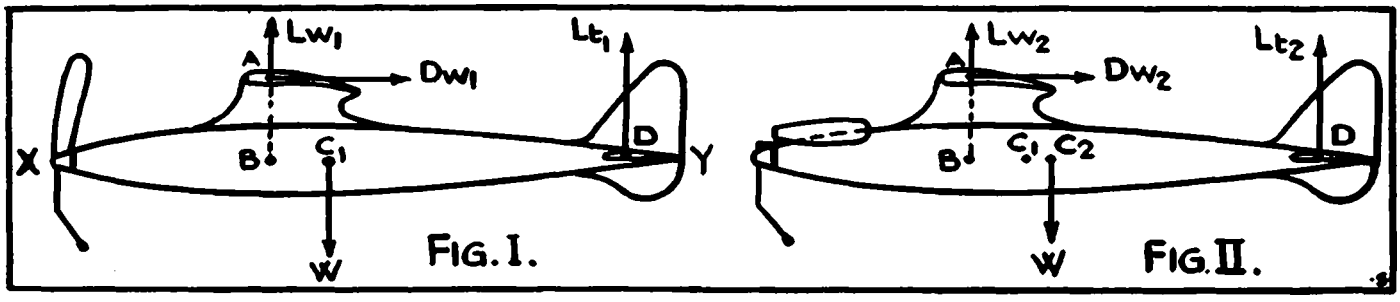
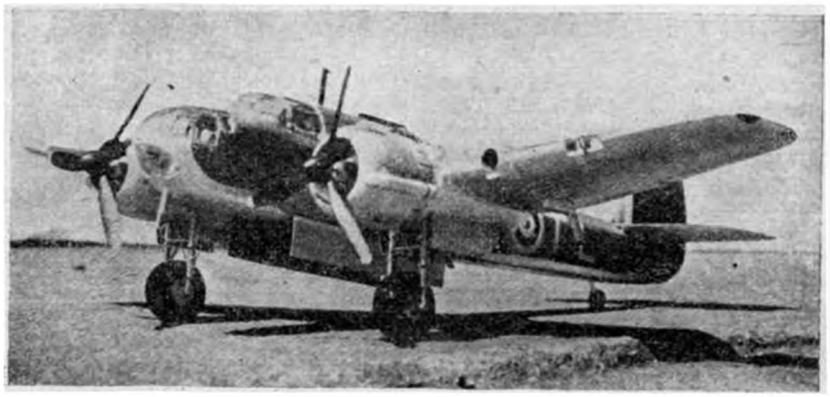
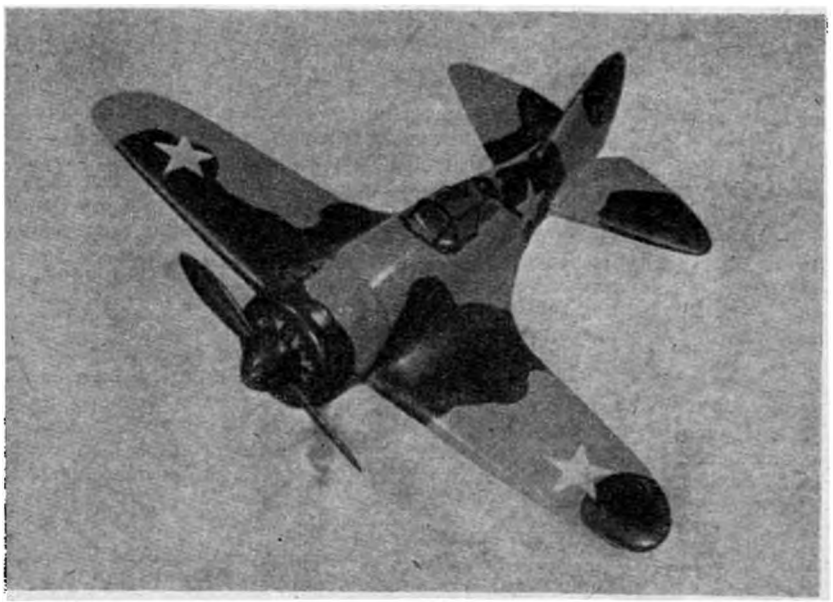


FIG. I. FIG. II.

Above is shewn a Hurricane Mk. II, by R. J. Winfrey, of Helston, Cornwall. "But what long undercarriage legs you have!"



A nice-looking Beaufort by R. H. Hallam, of Skellingthorpe. The glazed cockpit cover and nose look good, as do the open bomb-doors and undercarriage. We see far too few jobs like this.



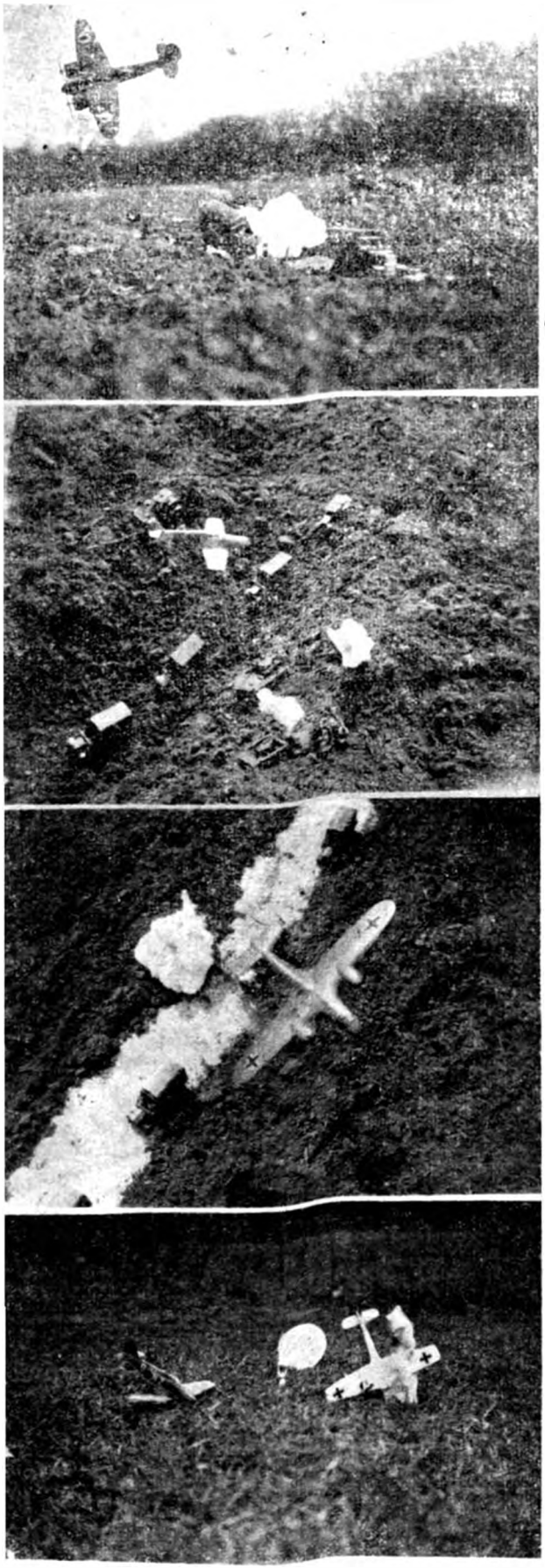
The I-16b Rata above is the work of G. W Rose of the North Coventry Model Aero Club. The model was made from the drawing in the November (1941) AERO-MODELLER.

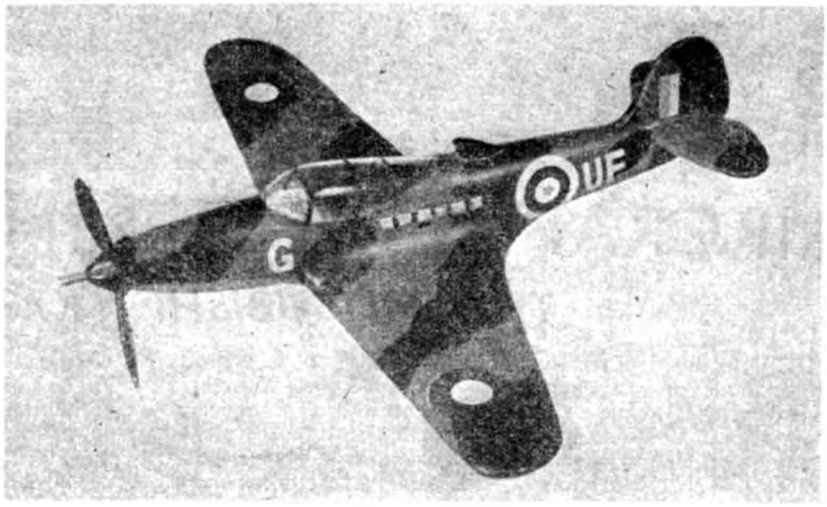
Above and on next page are some examples of model photography by B. S. Soar, of Holmbury St. Mary. At the top of this page an Me 109E attacks a barrage balloon; next a Hampden assumes the role of a fighter and liquidates a couple of Me 109Es; below that a Gladiator chases an Me 109E, and at the bottom an Osprey slips away from an adventurous Do 215.

SOLID SELECTION

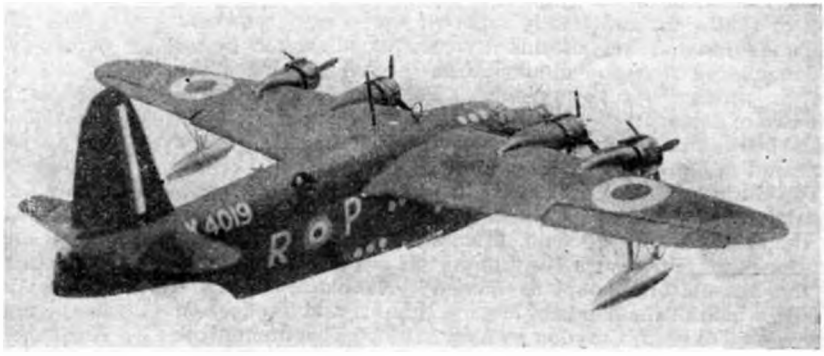
Some photographs received during the past year.

From top to bottom are shewn a Blenheim attacking a motor convoy; an Me 109E doing likewise; a Do 215 climbs away after a low-level attack; and a Hurricane and Me 109E come to grief together.





The Airacobra of No. 601 (Fighter) Squadron shewn above is also by G. W. Rose, of Coventry. The finish looks good, and the markings are correctly incorporated.



Above is a Sunderland by C. A. Smith of the Halstead (Essex) Model Aero Club. This is a really fine job, with hollow cockpit (fitted with full equipment) and movable control surfaces. A little more attention to the squadron letters and serial number would have improved the appearance. K 4019 is not a Sunderland.

The Beaufighter below was built by Keith Chappell, of Hampstead, N.W.3. It is perfectly accurate and is coloured correctly. Nice photography, too.

FIGHTING

AIRCRAFT OF THE PRESENT WAR——XIII

THE MITSUBISHI "KARIGANE" II

THE Mitsubishi Karigane, or Wild Goose, is a typical example of unapologetic oriental apishness. Lacking originality, the Japanese shamelessly imitate to the minutest detail, and if a licence to build a particular type of 'plane cannot be obtained the factories set to work on an identical machine and give it a name of their own. There is hardly a Japanese aeroplane flying which has not its like counterpart in some other country. Imitation necessarily takes time, and consequently so-called "Japanese" types are some years behind contemporary practice. It is believed that in the last year or two genuine attempts at aircraft production have been made, but, of course, no information has been released.

The nomenclature of Japanese aeroplanes causes a good deal of confusion, and totally different types appear to bear the same designation, but this is somewhat alleviated by an understanding that the number after a name indicates the year in which the type appeared. The two figures are the last two of a year in the Japanese calendar, which started 660 years before our own; thus a type allotted the number 98 appeared in 1938; 96 in 1936, and so on.

The Karigane is built by one of the leading Japanese firms—The Mitsubishi Jukogyo Kabushiki Kaisha—and is produced at the factories at Oe-Machi, Minami-Ku, Nagoya, and Oi-Marimae-Cho, Shinagawa-Ku, Tokyo. It is a military version of the Mitsubishi monoplane named "Kamikaze" (Divine Wind), which in the hands of Messrs. Iimuma and Tsukagoshi flew from Tokyo to Croydon in April, 1937. This monoplane was fitted with a Nakajima Kotobuki radial motor of 550 h.p. and had a maximum speed of over 300 m.p.h., and a range of nearly 1,500 miles—quite a good performance on the power available. The Kamikaze was itself a development of the Northrop A-17 monoplane of 1936, the main points of difference lying in the modified accommodation and the power plant.

The Karigane II is a low-winged cantilever monoplane described as a two-seat fighter. The wings are of metal multi-spar construction covered with flush-rivetted smooth sheet metal. The metal-framed ailerons fitted to the outer sections are fabric covered. Split flaps are fitted to the trailing-edge of the wing centre-section and extend under the fuselage. Landing-lights are installed in the leading-edge of each outer wing panel where they join the centre-section.

The tail unit is of similar construction to the wing, the tail-plane and fin being covered with a sheet-metal skin and the elevators and balanced rudder with fabric. Trimming tabs are fitted to the elevators and are adjustable in flight.

The landing gear consists of two spatted units with long travel oleo legs. The tail-wheel is fully castoring.

Power is supplied by a Mitsubishi A.14 fourteen-cylinder air-cooled radial motor of 800 h.p. enclosed in an N.A.C.A. cowling. It is really a copy of the Wright Cyclone. A copy of a two-bladed Hamilton-Standard constant-speed airscrew is fitted; 820 litres of fuel are carried in tanks in the fuselage and in the wing centre-section.

The crew of two is housed in a long glazed cockpit which extends well back towards the fin. Access is by two portions of this covering which are hinged on the starboard side and open as on the Messerschmitt Me 109. Full navigational and radio equipment is carried.

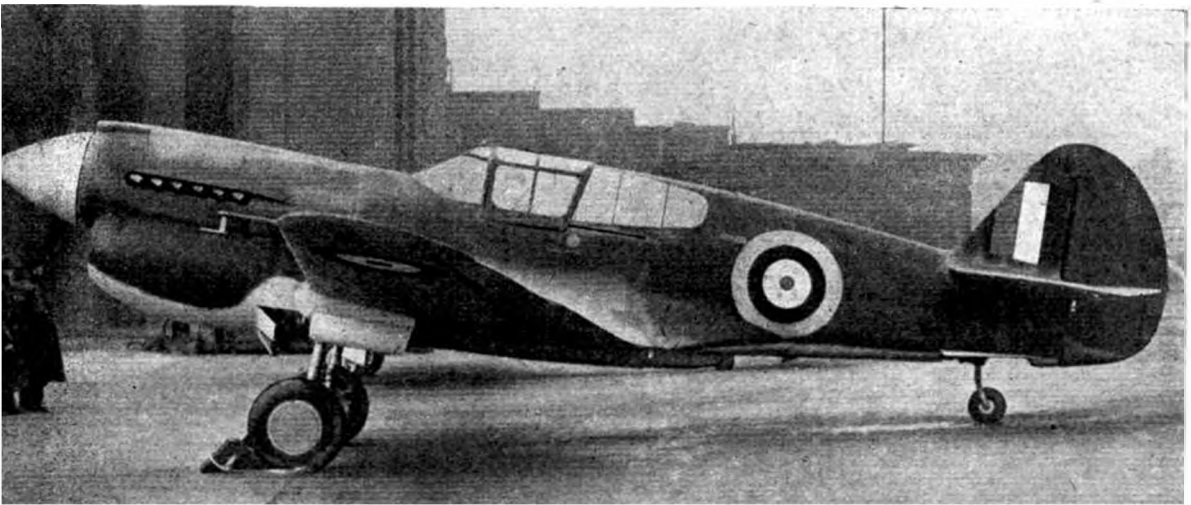
The armament carried by the Karigane has not been divulged, but probably it does not consist of more than one or two fixed guns for the pilot and a single gun for the occupant of the rear cockpit. Light bombs can most likely be carried on racks below the wings.

The national marking of the Japanese Army Air Force and Naval Air Service is a red disc painted on the sides of the fuselage and above and below each wing-tip. An early Karigane II was silver-doped and carried the civilian registration letters J-BACL on the wings and fuselage, and the letter J on each side of the rudder.

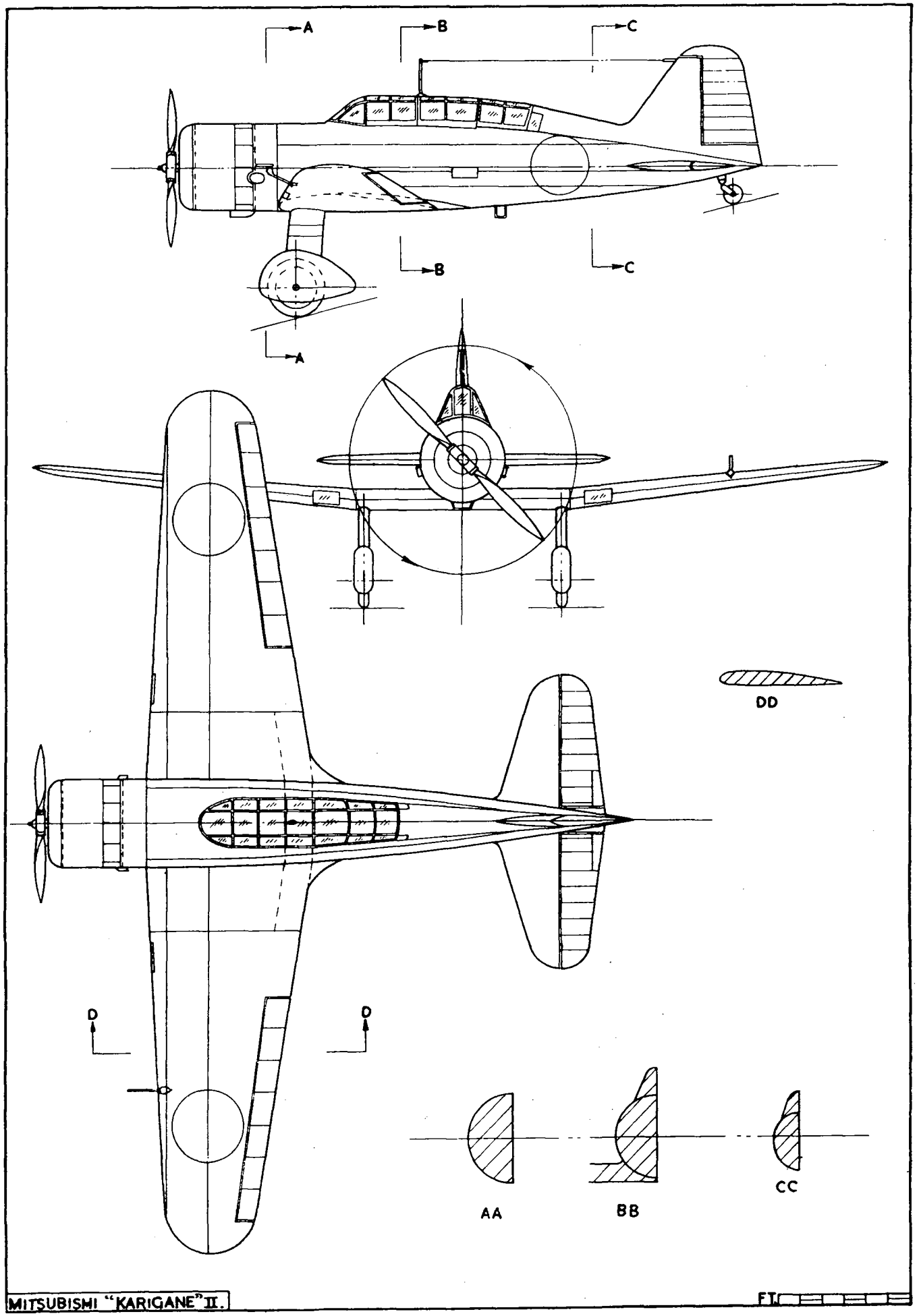
Operational machines are camouflaged, but the exact colouring and form which this takes is not known. A green and brown or grey scheme seems likely for sides and upper surfaces, while undersurfaces would be light coloured.

Some machines carry a light-coloured band round the fuselage ahead of the fin similar to the band on R.A.F. and F.A.A. fighters, but narrower. A large identification number is sometimes painted on the fuselage aft of the national marking.

Next month's article in this series will feature the Curtiss H-87A-2, the Kittyhawk of the Royal Air Force, shown below.



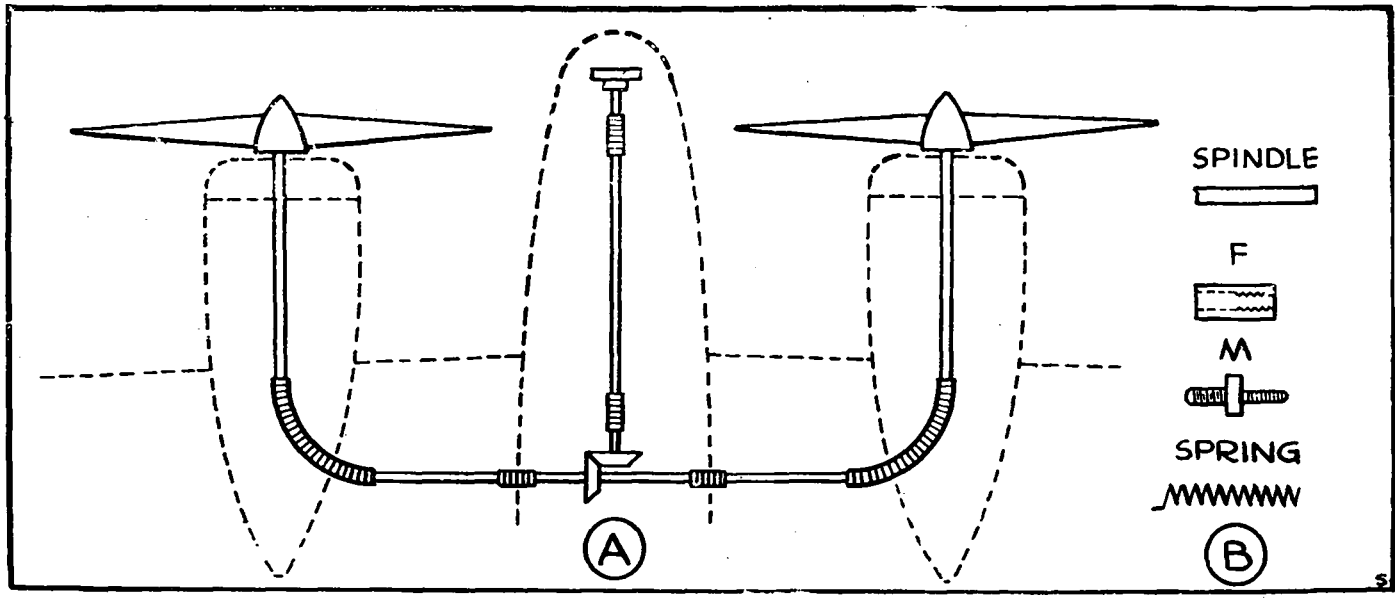
Dimensions.
Span: 39 ft. 4¼ in.
Length: 27 ft. 11 in.
Height (tail up): 12 ft. 6 in.
Wing area: 258 sq. ft.
Weights.
Loaded: 5,060 lb.
Loadings.
Wing: 19.6 lb./sq. ft.
Power: 6.3 lb./h.p.
Performance.
Maximum speed: 310 m.p.h.
Normal operating speed: 200 m.p.h.
Range: 1,490 miles.



MITSUBISHI "KARIGANE" II.

FT

TWIN DRIVE



DISCUSSION

By **S. M. AUFREY**

FROM time to time references to flying scale twin propeller jobs, employing various methods of power transmission, have appeared in THE AERO-MODELLER. Bevel gears, pulleys, and the flexible drive, adaptable to twins, in Mr. Towner's Spencer Larsen.

What are the chief advantages ?

(1) A vastly increased range of prototypes, many of which lend themselves to flying scale reproduction with far less modification of tail surfaces, etc., than single-engined machines.

(2) Easier to bring the C.G. into its correct position in relation to the C.P. without recourse to balance weights.

(3) Elimination of propeller torque reaction by the use of oppositely-rotating propellers.

(4) Wider landing chassis track.

(5) Scale diameter propellers, often feasible for flying purposes.

(6) Far greater scope for detail work.

Now, what are the chief desiderata ?

(*a*) Rubber motor to run, for all practical purposes, the full length of the fuselage.

(*b*) Propellers to rotate in opposite directions.

My starting point is (*a*). With all due respect to the long experience of the designers, I do not like the system used by Mr. Towner in his Airspeed Oxford. This means short motors, and, in consequence, short power flight. Therefore I am working on the assumption that, in order to obtain duration comparable with single-engined machines, (*a*) must stand, and a lay-shaft, connected with an idling gear from the power head in the nose, must be employed to bring the power back to just beyond the leading edge of the main-plane. A train of driving gears in order to obtain sufficient power for this type of machine seems inevitable, but the weight of these in the nose would be weight in the right place. I have in mind a scale of not less than ¾ in. to 1 ft.

The power has now to be turned at right-angles and led through the main-planes to the engine nacelles, where it has again to turn at right-angles. How can this be done with the greatest efficiency and the least trouble ? What is offered ?

(*a*) *Bevel gears* come immediately to mind, but can anyone tell me the makers of a small right-angle bevel gear in steel or brass of, say, not more than ⅜ in. diameter, light, and having a bore to take nothing greater than a 16-gauge spindle ?

(*b*) *Pulleys.*—A photograph of a large four-engined machine stated to employ a pulley drive was published recently. I should very much like to have details of the system and congratulate the designer if it is successful. Experiments I made some time ago failed hopelessly because, as the result of the initial burst of power being so great, the belt either jumped the pulleys immediately power was released, or simply slipped without transmitting any power at all. I would agree that my experiments were half-hearted from the beginning, because I believe this transmission to be fraught with snags, the chief being the provision of suitable belting, and the exactly correct tension on the belt.

(*c*) *Flexible Drive.*—At a hazard I would say that this system is the most popular, but that its popularity rests largely upon the comparative ease with which the spring coil can be manufactured in an amateur workshop. Jerry put paid to the experiments I had in mind. I was anxious first of all to find out the shortest radius upon which the spring coil could be turned at right-angles without causing undue friction and one-sided wear on the bearings, and the largest radius without whip. I have been told that the drive must be enclosed in a tube, but although this would certainly take care of whip, there must be considerable friction inside the tube. I notice that Mr. Towner's Spencer Larsen incorporates a small bearing to take care of whip, and presume he is satisfied. A feature in this machine which interests me more is the floating shaft ; I should have thought this shaft subject to considerable oscillation, and would prefer to see it running in bearings—pure ignorance, perhaps.

The conclusion I have reached as to the best lay-out for a twin drive is as shown in sketch A. It will give oppositely-rotating airscrews, and depends upon the provision of suitable bevel gears. Whether the transmission shafts should be floating or in bearings I am not at present prepared to say. Perhaps Mr. Towner could tell me. Similarly, I cannot offer any dimensions for the radii of the flexible drives : the sketch is not, of course, to any scale.

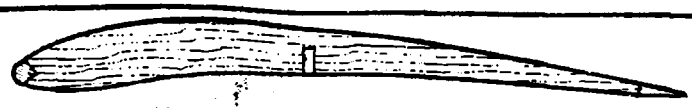
Finally, may I suggest to the trade that there is going to be a market for ready-made flexible drive coil springs, complete with couplings ? The Editor recently suggested, in Questions and Answers, the use of Woolworth's expanding curtain support, but, with great respect to this suggestion, I do think this spring is too heavy and lacking in flexibility, except, perhaps, for use in very large machines. Two sizes might be offered, of 22- and 24-gauge spring steel wire, and the couplings I suggest, made preferably of steel, are shown in sketch B. The coupling M has a male thread, and F a female thread. The shank of M is threaded, and on to it the flexible drive is screwed ; the collar on the male coupling to be saw-cut or bored to take the end of the drive wire bent forward and so form a locking device, much in the same way as the loose end of a reel of cotton is held by slipping it into the saw-cut in the reel. The coupling F is simply a tube, one end tapped to take the front shank of M and the other end bored to, say, 16 gauge, into which the driving shaft would be sweated. These couplings I regard as essential. Without them assembly must be very awkward indeed, involving several soldering jobs, the repair of which in the event of failure would be impossible on the field, and a nightmare in any case.

· HUMP II ·

DESIGNED BY J.A.D NOAKES DRAWN BY A.H.S

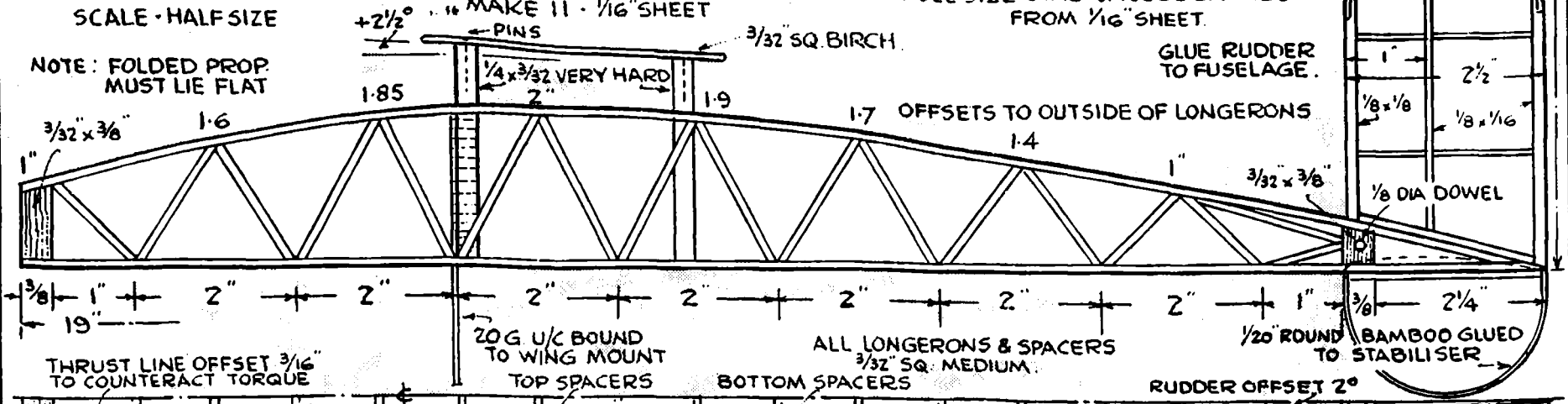
SCALE · HALF SIZE

NOTE: FOLDED PROP MUST LIE FLAT



FULL SIZE WING RIBS TO MAKE 11 · 1/16" SHEET

FULL SIZE STAB. & RUDDER RIBS FROM 1/16" SHEET



CLUB NEWS by "Clubman"

I HAVE just finished listening to Mr. Churchill's speech to the Canadian Government, and take heart for our own future in his stirring remarks. I'm not one for politics as you all know, but there are times when one must acknowledge and take note of world events, which so obviously affect both our working and recreation lives. The entry of the United States into the world war is bound to make a deal of difference, and, though of course they were able to take advantage of a number of lessons gained from our own experiences, etc., the American aeromodelling movement were well on the spot with various preparations.

In saying that I know I am speaking about certain things most of you are in ignorance about, but to cut a long story short, a well organised campaign has been carried on by the A.M.A. (Academy of Model Aeronautics) urging the support of aeromodellers for Government technical positions, etc., and forming groups to co-operate with the various home defence services. Many well known modellers were and are engaged in important tasks at various aircraft factories, and a number have been accepted into very important research jobs as a result of their knowledge and ideas gained through their aeromodelling activities.

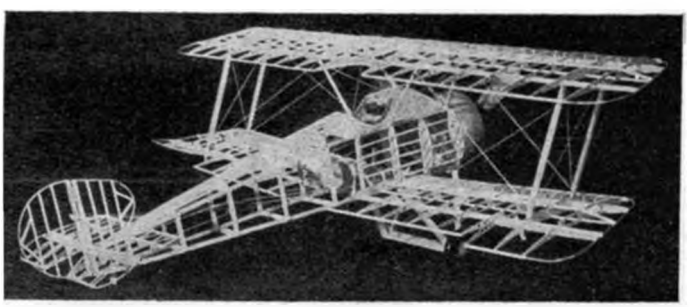
Mr. Temple's article on organised aero-modelling in other countries will create a great deal of comment, and at this stage I do not propose to enter into discussion on my own account. I shall, however, be pleased to gather the views of readers, and if possible formulate some form of survey on the opinions expressed. That we do need to organise in a more concrete form than in the past is well acknowledged, but, while admitting that we have missed the bus on a number of occasions in the past, please do not let your criticisms lose sight of the many advantages we have attained of recent years. Our main difficulty has been the very great one of working under " spare time " conditions, and while a purely voluntary government is the ideal, we must not lose sight of the very real advantages of a certain quota of paid officials, who are thus enabled to give their whole time and attention to the requirements of the movement. It is an obvious statement that one can only do so much in one's spare time, and with the majority of us the small amount of free time does not give anywhere near the opportunity of active participation we should prefer.

Great changes are impossible in wartime, but we have an ideal opportunity to sift ideas and suggestions for an improved organisation in the future. That we must prepare for vastly increased activities when peace returns has been evident from even wartime commitments, and the manner in which international affairs, with their attendant tasks, were on the increase up to 1939 showed the way for active preparation in readiness for the long-hoped-for return to carefree flying. Just think . . petrol models all over the sky, and no-one phoning up the police with the information that a flock of Junkers were landing on the village green !

Though it is not permissible to fly petrol models under present conditions, the need for reasonable third party cover still remains for our rubber-driven models and gliders. The National Guild of Aero-modellists has proved a welcome attribute to many thousands of modellers, and I recommend all who have not yet taken advantage of the facilities offered to remedy the defect without delay. To know that you are covered against possible claims for a whole season for the modest sum of a tanner (sixpence to you, Claud) is surely worth the little time it takes to complete the form on the inside back cover, and forward it to Allen House. Go to it !

I have a request from a reader (must be one of the two !) who asks if a reader (not the other one surely ! !) has a set of building instructions for the Veron " Wasp," a 5-ft. span petrol model. He has all the materials and plans, but the makers are unfortunately unable to supply him with the original building instructions. As this model is for A.T.C. instructional purposes he would appreciate the loan of a leaflet if anyone has a copy by them. If available, will you please forward to me and I will see that Reader A gets it. Thanks Reader B.

Above : A finely built ' Blenheim ' of 28-in. span, constructed by Murray Dudgeon of Haddington. Murray is convalescent, and does his modelling in bed, so the specimen above is a fine achievement.



Right : A model ' Sopwith Camel ' with fully working controls, the work of A. J. Farquarson of Kingston-on-Thames.

As you know, the proprietors of THE AERO-MODELLER have been presenting the S.M.A.E. with facilities for their Journal, thus relieving the Society of financial commitments during the difficult war period. I am pleased to say that this has resulted in a great deal of stimulation in the Society's activities, and in view of the increased demand for copies of the Journal, " we " have arranged to double the quantity printed each month. Clubs will therefore receive a greater quota for distribution among their members, to mutual benefit.

News comes from India this month, with details of the formation of the AERO MODELLER'S SOCIETY in Karachi, the first of its kind in India. A number of the usual difficulties

were encountered in the initial stages, but these have been overcome, and numbers of boys are receiving training under the guidance of the Secretary, Rusi B. Mobed at Eduljee Dinshaw Building, 27, Preedy Street, Karachi. Much assistance was received from the S.M.A.E. in the shape of literature, etc., and the organiser will appreciate any correspondence and assistance from readers. What about it chaps, anyone like to help the first club in India ?

Further to my remarks on the subject of the help obtainable from the Youth Movement (December, 1941, issue), I have received a letter from Mr. R. Burns of Stewarton, which should be of interest to all club officials, showing them the possibilities of a certain amount of co-operation with the Youth Movement. (Though I have no great amount of knowledge of this movement, I don't think we need to worry over the possibility of sinking our identity in such a scheme. After all, we do not go in for the Hitlerite methods, and though the title may sound very Germanic, that is as far as it goes.)

Mr Burns writes :

" The Stewarton Model Aero Club consisted formerly of a group of around twelve youngsters, who met in my house, and since only some four were active modellists at any one time, it worked well. In connection with our local War Weapons Week we had an exhibition (reported in your August notes) and we stirred up so much interest that we had another dozen people wishing to join. Now my house is built of ordinary materials, but even if it were made of aero-strip it wouldn't stretch to allow twenty active modellers much scope, so we were stuck. At this critical stage an interested schoolmaster friend suggested that I ought to join the Youth Movement run in the school here, and form an aero-modelling section, and I took it on. It has been a huge success. We have a weekly meeting in the workshop on a Friday, and have a lantern for lectures and a gym. room for flying, although up to now we haven't done much, since most of the new entries are being taught how to do the construction work. But we have tried R.T.P., including racing with two (outdoor) models on the same pole. They start at opposite points and the result is a thrill, but don't use frail models ! Some of the old hands have taken to microfilm. It's a wonder the language doesn't blister these filmy frailities !

We run the section strictly as a club, and have applied for affiliation to the S.M.A.E., by request of the members. There have been surprising side issues. It seems you can get a grant for tools, etc. And the County Librarian, by some wangle or other, sent us a box of books on aeronautical subjects for a club library along with the consignment for the local Adult Education library. Moreover, we have built an epidiascope, in view of a great interest in aircraft identification, and are looking forward to some good times.

By the way, as an old ' birch and silk and wire ' builder, you will be rather interested to learn that some of our lads are going to grow up in this game without using balsa, since we have had to rely on substitute woods for our new members. It makes ye think."

On Sunday, 30th November, by kind permission of the Kodak Recreation Society, the HARROW M.A.C. held an exhibition of model planes at the Society's premises.

How's this for a spot of realistic model photography ? The model snap has been superimposed on a holiday snap, with the result shown. I bet this would fool ninety-nine out of a hundred. The culprit is Mr. McSorley of Leytonstone.

If numbers of exhibits and visitors attending are any measure of achievement then the Exhibition must be counted most successful and popular. Exhibits were received from near neighbours and the show was crowded both in the morning and the afternoon. Models were staged in the large Canteen, whilst indoor flying took place in the Lecture Hall. This proved a very popular event, the large numbers of spectators present cheering the most successful flights.

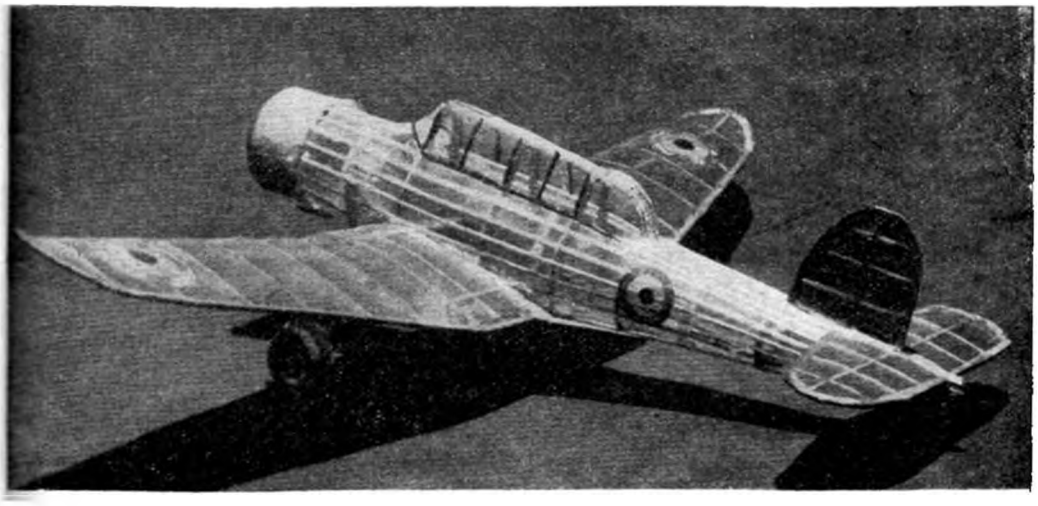
In all there were about 100 entries and these were divided into two groups : (1) for visitors, and (2) for members of the Harrow Club. Prizes were awarded as follows :—

VISITORS OPEN COMPETITIONS.

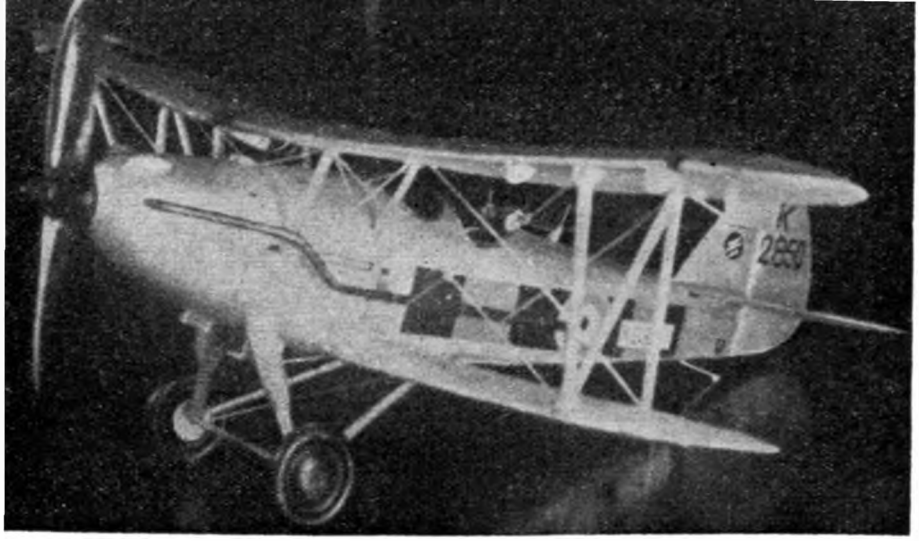
Class " A." Duration models, including sailplanes.

1st. Mr Eden (Watford M.A.C.).

2nd Mr. Wright (Watford M.A.C.).



A ' Blackburn ' Skua constructed by the Hough Bros. of Penwortham. My, my — what transparent tissue you use Grandma. All the better to see your ribs my dear !



The ever-popular 'Hawker Demon' as built by George Strachan of Percy Main, Northumberland. Span is 27½ in. and shows good attention to detail.

Class " B."	All other types of flying models.	
	1st.	Mr. Day (Kodak M.A.C.).
	2nd.	Mr. Greenaway (unattached).
Class " C."	Scale models (non flying).	
	1st.	Mr. White (unattached).
	2nd.	Cadet Webster (A.T.C.).

CLOSED COMPETITIONS FOR HARROW CLUB.

Class 1.	1st.	E. J. N. Archbold.
	2nd.	L. G. Dowding.
Class 2.	1st.	D. Thompson.
	2nd.	H. W. Hills.
Class 3.	1st.	S. Pedersen.
	2nd.	E. J. N. Archbold.
Class 4.	1st.	N. Gregory.
	2nd.	M. Hooper.

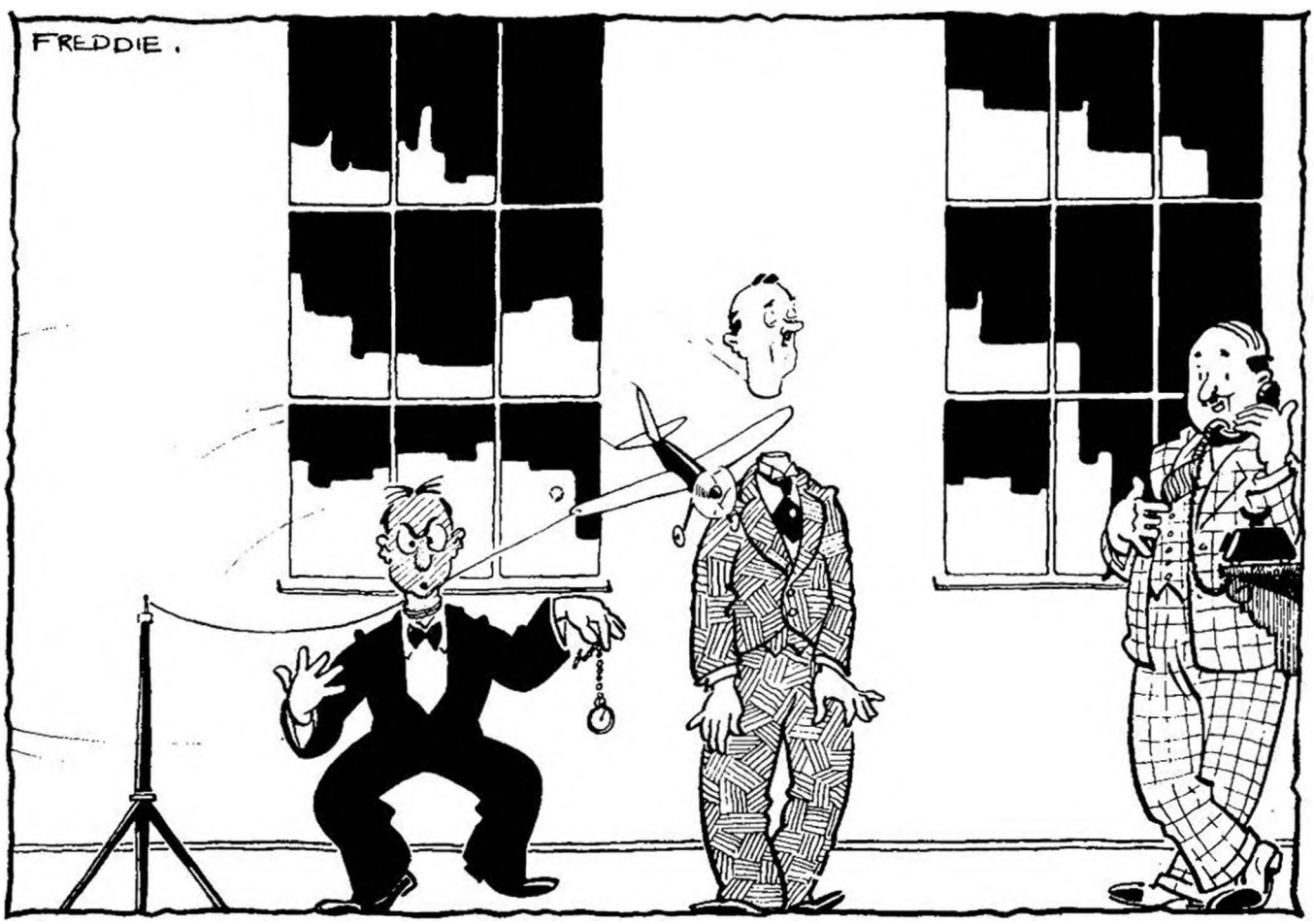
The President's Special Prize was divided between Messrs. E. J. N. Archbold and M. Hooper.

The President, in the course of his speech made the suggestion that the club co-operate in the development of a special aeronautical section at the local Museum, and stressed the attention to scale model stimulation.

The BUXTON M.F.C. have been fortunate in securing a large club room, and look forward to great progress in consequence. Club records at the moment are held by R. East (3 : 04 R.O.G.), Jones (2 : 39 H.L.), J. Marchington (0 : 25 Scale Flying) and R. Taylor, who holds the glider class at 50 seconds, and the R.T.P. at 1 : 48.5.

Word comes from the BIRMINGHAM M.A.C. after a long silence, and I am pleased to note that interest is increasing in that city. Indoor flying has been given a boost by the production of a couple of microfilm jobs, and everyone is now hard at it mucking up the bathroom !

The SALE M.A.S. has had a good season for its initial effort, and the membership is steadily increasing. Indoor flying, just commenced, is proving interesting, though the times are on the low side just now. The presentation of a silver cup should give an incentive to development on this side of things. Visits were paid to various meetings in the vicinity during the summer (what summer ?) and many lessons learnt, chief being the need for adequate preparation prior to the events ! A plea is made for earlier notification of open meetings, thus enabling a rota to be worked out for the year.



—"AND SEND OVER TWO MORE TIMEKEEPERS, PLEASE"

Fly with care

EVERY model aircraft enthusiast should, in his own interests, become a member of the National Guild of Aeromodellists, and so benefit from the protection afforded by the Guild's Third-Party Insurance Policy which is underwritten by Lloyds. All members of the Guild are automatically insured under this policy—unlimited claims, any one claim up to £5,000—as soon as their subscriptions have been paid ; *and there are no other premium charges to be paid.* After all, no matter how careful you may be when flying a model 'plane, accidents may happen, and if a bystander is injured or property damaged, you may be called upon to pay a pretty penny to settle the matter. The Guild has settled claims as low as 3/6 for a broken window pane, and as high as £30 in respect of an eye injury caused by a rubber-driven 'plane.

Membership of the Guild is open to all aero-modellers in Great Britain and Northern Ireland. Subscriptions are 6d. per annum for those who fly rubber-driven models, and 2/6 per annum for those who fly petrol 'planes. There is an attractive lapel badge available for 1/3, and transfers in black and gold, for affixing to members' 'planes, at two small ones for a penny, and large ones at 1d. each.

New members will be welcome —old members MUST renew their subscription if they wish to be covered by the Guild's Policy for 1942. Insurance is from February 1st, 1942, till January 31st, 1943.

Petrol Plane Insurance to be suspended for duration of the war.

THE NATIONAL GUILD of AEROMODELLISTS

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Hon. Chairman : D. A. RUSSELL.

Hon. Secretary : DUDLEY SHIP.

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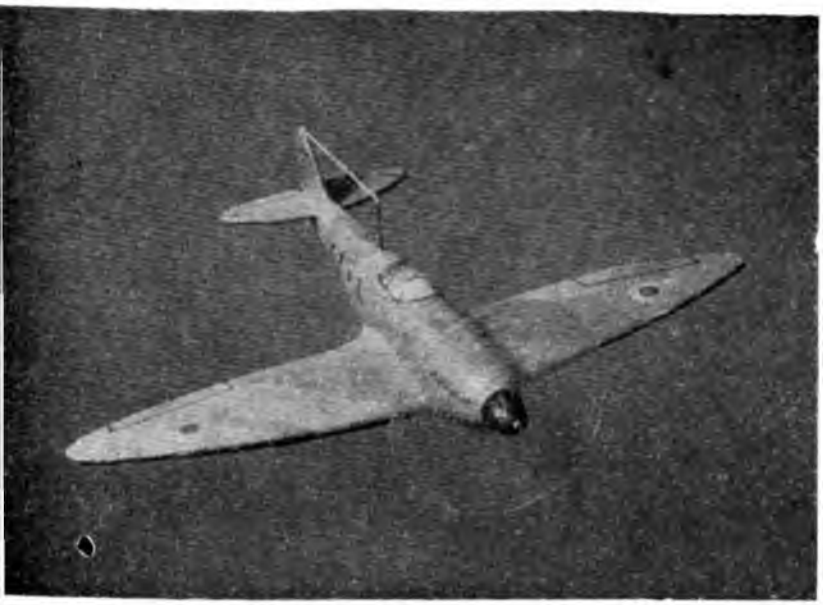
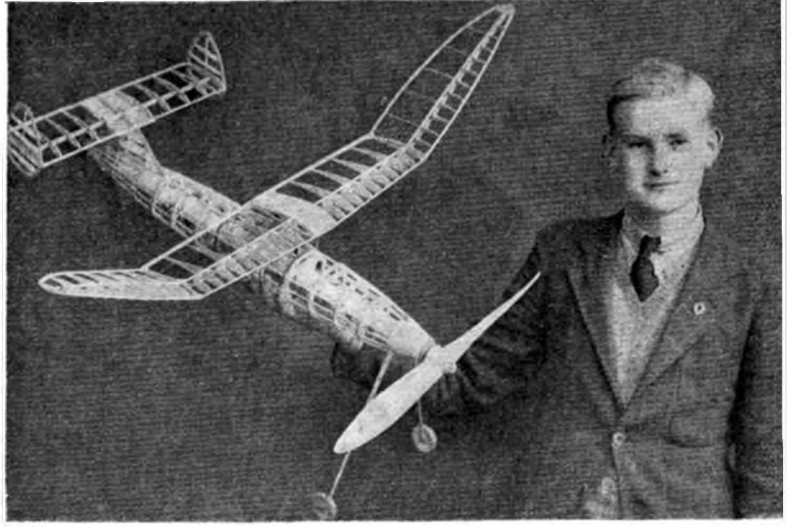




Above: D. J. A. Smith of Weybridge with his interesting and unusual model, incorporating a number of novel features. Note the treble fins, high mounted tailplane, and motor tube. The girder-type mainspar is also noteworthy.

Left: A novel method of photographing a model was used by A. Doughy of Shoreditch, the model being placed on a sheet of glass. Suspending cottons, etc., are thus eliminated, and the result speaks for itself.

A great deal of reorganisation has taken place with the ASHTON & D. M.A.C., and I note that some of the rebellious element has disappeared. Thanks to the co-operation of the Director of Education, they now have access to a fine room for indoor flying, and full use is being made of same. N. Hayes (you will remember him doing so well in last year's S.M.A.E. events) holds the R.T.P. record at the moment with 1 : 10, using an outdoor model on a four foot line and two foot pole.

The BLACKHEATH M.A.C. report the breaking of yet another British record by D. Piggott, this time the H.L. glider. Launched from the side of Box Hill (near Dorking) the model flew out of sight after 3 : 59.75. Official confirmation is awaited.

A. Turley won the SPELDHURST M.A.C. contest for the Dr. Thurston Cup with a time of 2 : 43. Two petrol models, as well as other types are under construction in this club, and efforts are being made to obtain a badly-needed clubmroom.

Members of the newly formed DE HAVILLAND M.A.C. are busy trying out R.T.P. models in readiness for a challenge event with the Edgware club. A cine show, also a lecture on Wakefield models, were well attended and, with membership steadily forging ahead, we should hear much of this clubin future.

Another club to have its first taste of R.T.P. work is the PRESTATYN & D. M.A.C., and M. Hardman did well to clock 1 : 20 for first try. This club is going out hard for THE AERO-MODELLER prize for waste paper, and I trust you other clubs are doing your bit towards collecting that ten guineas.

J. Jackman and K. Museutt won a solid scale model contest at the WALTHAMSTOW M.A.S., the model being a "Lerwick" and "Havoc" respectively. The success of this event has prompted a second helping, the comp. being open to non-members, and the closing date being February 6th. Details may be obtained from Mr. Bateman at 151, High Street, E.17.

Since the affiliation of the KINGSTON-UPON-HULL M.A.C., the membership has steadily risen, and work is forging ahead. Some members are turning their own castings for petrol engines, and original designs also make their appearance.

The WEST COVENTRY M.A.C. announce that indoor meetings will be held on alternate Sundays at the "Wyken Institute," commencing December 21st, in conjunction with the Warwickshire M.A.C. Visitors are welcomed.

The business instinct is strong with the RIPON M.F.C. Two of the members bought up some kits containing balsa, designed an R.T.P. model, made up kits from the aforementioned boxes, and sold 'em to the members of the club! Not bad, eh!! A competition is to be held for models built to this special design, and the secretary is giving a prize for the best flight. (Oh yes, the sec. is one of the business men!) Many weird and wonderful models are appearing in R.T.P. events, and C. F. Elliott won a "stick type, 9 in. maximum" contest with an average of 35 seconds.

More R.T.P. flying ('struth, we are full of it this month) has been carried out at the BRIGHTON D. M.A.C. where junior beat Pop to first place, B. Thompson clocking 2 : 35.6 against father's 2 : 03.5. Well, well, and what does papa say now, poor thing!

News from Ireland comes via the DUBLIN M.F.C. The interest of the local lads has been stimulated by a series of elementary lectures prepared by the M.A.C.E., and the Dublin club alone has benefited to the extent of thirty-five new members.

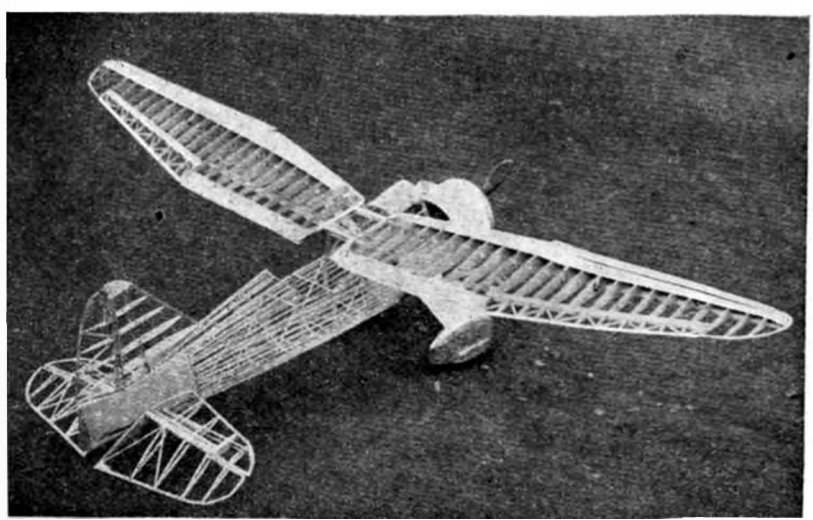
Well chaps, that's the last of the report this month, (seems to be a shortage of such items at the moment, but this is understandable at this time of the year).

I hope you are all getting down to the Waste Paper Collection, and don't forget that ten guinea prize. A sum like this will be a good asset to any club's finance, and you have the satisfaction that you are helping both yourself and the country.

Regarding the Sales and Wants service I mentioned in last month's columns, it is amazing the number of 'Wants' I have received . . . but no 'Sales.' It would seem that everyone is hanging on to what they have, and there are no 'disposals'. However, any time you have a model accessory to get rid of, drop me a line, and I will put you on to one or more prospective purchasers. (And don't forget those turkeys I demand as my 'rake-off'—even though it is too late for the festive board!

And so my little chickadees, fare-thee-well for another month, and carry on with those new models, and don't forget the Paper Chase.

THE CLUBMAN.



H. J. West of Hale modified the "Aeromodeller Plans Service" drawings for this well detailed 'Lysander.' Moveable elevators and ailerons are controlled by a joystick, and rudder by a rudder bar in cockpit. Slots and flaps also operate.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS

The Minutes of the Delegate Meeting held on December 7th at The Royal Aero Club, Piccadilly, W.1.

Minutes.

The Chairman opened the meeting by calling on the Hon. Sec. to read the minutes of the last Delegate Meeting, held on September 7th, 1941. The resolution for " Adoption as read," was moved by Flight/Lt. P. R. S. Gutteridge and seconded by Mr. H. York.

One question arising from the minutes, connected with the issue of F.A.I. Licences, was brought forward by Mr. C. S. Rushbrooke. He wished to know if these licences would be valid for one year dating from day of issue, or would need renewal at the end of December of the same year. The Chairman ruled that these licences would need renewal at the end of the same year of issue.

Correspondence.

A letter from the Ashton & District M.A.C. requesting information on the possibility of the Council arranging lantern and printed lectures, and expressing the opinion that in these days there is a real need for facilities of this description.

The Technical Sec., Mr. A. F. Houlberg, would go into this question and contact those officials of the Society who had in their keeping any data useful for this purpose. This could be embodied in a series of lectures, which on completion could be posted to any affiliated Club on application.

A letter from the honorary Competition Sec., Mr. J. C. Smith expressing regret that he was unable to attend the meeting, contained also further claims received from 1940 and 1941 seasons' competition winners. He pointed out that the results of these competitions had been passed to the proper quarter some time ago, also that they had been published in the Society's Journal and THE AERO-MODELLER. The Hon. Sec. informed the meeting that the Diplomas for contest winners were now in the possession of our Treasurer, Mr. L. J. Hawkins, and there was no reason why these claims should not be met. Mr. C. S. Rushbrooke moved, seconded by Mr. C. A. Rippon, " That the outstanding prizes shall be distributed immediately." This was carried.

Discussing correspondence connected with the Society's finance, the Delegates felt that delay in this matter could be avoided if a person more accessible to the Treasurer than Mr. R. N. Bullock was appointed. The Chairman, therefore, accepted the following resolution moved by Flight/Lt. P. R. S. Gutteridge, "That a person other than Mr. R. N. Bullock be empowered to sign the Society's cheques in addition to Mr. L. J. Hawkins." This was carried.

This made way for the following resolution moved by Mr. C. S. Rushbrooke and seconded by Mr. H. P. Costenbarder, " That until such time when the matter can be placed before the A.G.M. two additional alternative signatories be elected for the purpose of signing the Society's cheques." This was carried. The meeting agreed unanimously that Mr. A. F. Houlberg and Mr. A. G. Bell be elected for this purpose.

Re-affiliation.

The meeting approved the re-affiliation of the Batley & District M.A.C.

Affiliations.

The affiliation of the three following clubs was granted: The De Havilland M.A.C., Golden Wings M.F.C., and Stewarton M.A.C.

Records Chart.

The Technical Sec. brought to the notice of the meeting the letters he had received from various clubs in connection with the Chart. There appeared to be a majority view for the abolition of the Hand Launched type of record altogether, except in the case of Gliders. Winch launch was favoured for this type of model. The creation of a record class for the Stick Model received no encouragement. Correspondence also showed that records for R.T.P. favoured rise-off-ground only. The Delegates then went into discussion on the Chart. This resulted in the elimination of Class " A," i.e. 144 sq. in., 3 oz. minimum weight, altogether. The recommendation of the meeting is that the Class " A " record should be open for all types of machines (rubber driven). This debate brought forward many good points that will be of value when the Chart is decided at the Annual General Meeting.

The Chairman ruled that a 75 per cent. majority vote would be necessary for acceptance by the Society of any specified record.

Round the Pole.

The rules for this competition, which will take place during the months of January, February, March, 1942, had been re-drafted by the Competition Sec. These were placed before the meeting. Perhaps the limitation of the pole to no more than 50 per cent. of the length of line to be used was the most important alteration. The motion " That these rules be adopted " was moved by Mr. C. S. Rushbrooke, seconded by Mr. A. G. Bell, and carried. The complete list of rules will be published in the next issue of the Society's Journal.

Annual General Meeting Date.

The Annual General Meeting will take place at the Royal Aero Club, on Sunday, February 1st, 1942.

A hearty vote of thanks to the Chair was moved by Mr. J. W. Wickens and seconded by Flight/Lt. P. R. S. Gutteridge. This was carried, and brought the meeting to a close at 1.15 p.m.

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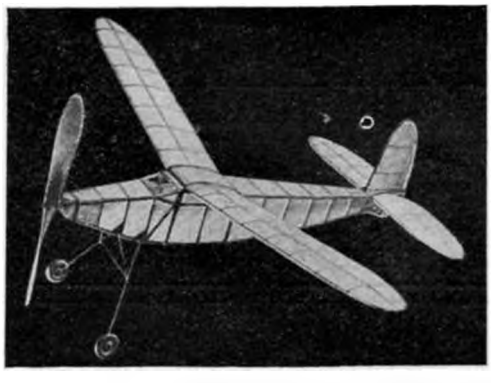

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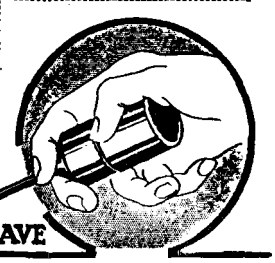

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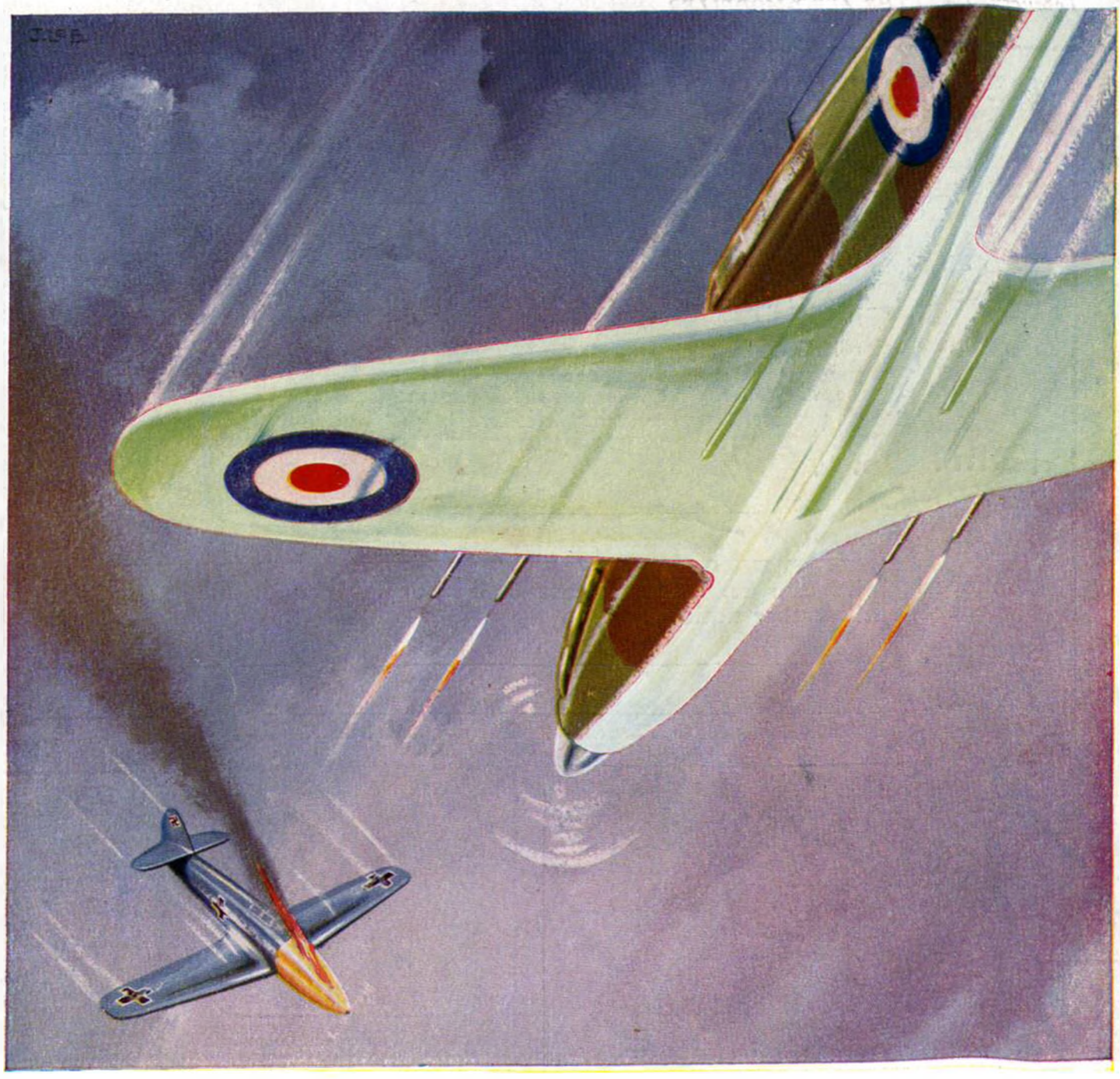

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