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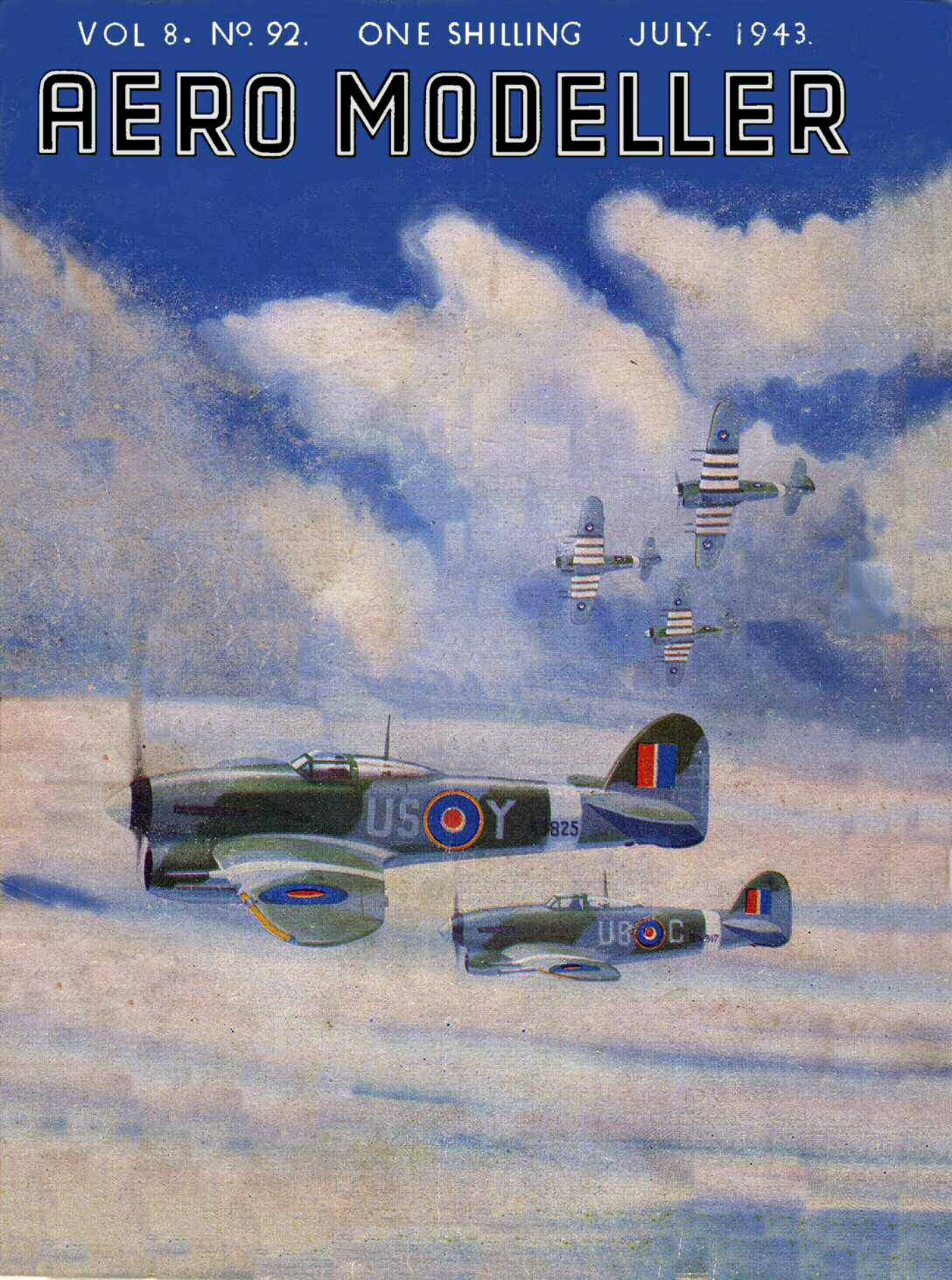
AERO MODELLER



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(INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR")

Established in 1936 (Proprietors: Model Aeronautical Press, Ltd.)

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EDITORIAL

DESPITE the ban on the flying of petrol 'planes, and the shortage of engines, interest in this type of model aircraft is as strong as ever, if not stronger, if the steady flow of correspondence addressed to Dr. Forster and to us is any guide.

In this issue we publish a further instalment of "Petrol Topics," in which the Doctor gives another example of his ingenuity by describing the construction of a non-ferrous time switch of his own design. It is fortunate that the Doctor lives by the sea and that he has taken full advantage of it by devoting his attention to flying boats, as without his pioneering efforts this sphere of aero-modelling might well have been entirely overlooked.

The provision of an efficient and reliable time switch on a petrol 'plane is a *sine quâ non*, and we invite readers who have experimented with alternative designs of mechanisms to communicate to us their results—"for the good of the cause." We endorse entirely the Doctor's preference for a "mechanism" instead of a compressed-air operated plunger, the objection to this latter type of time switch being its unreliability due to changes in the texture of the piston seal (usually rubber or leather) which can give such varying results as to make the apparatus unsuitable.

"Fly with Care."

On page 949 are published full particulars of an additional insurance protection offered by the National Guild of Aero-modellists. This is against total loss of models by O.O.S. (out of sight) flight. This insurance, which is applicable both to rubber-driven and the glider models, is limited to £2 per aircraft, and is secured by payment of a premium of 2s. 0d. per year or part thereof.

The insurance is effective from the time of receipt at our Leicester Office of the premium, and continues until the end of the N.G.A. "financial year"—that is to say, that at the present time the insurance is effective from the date of payment of the premium until January 31st, 1944.

Whilst the membership of the N.G.A. is steadily increasing year by year, we still do not include a considerable number of the readers of THE AERO MODELLER, and as the premium for third-party insurance is the very nominal one of 6d. per *annum*, there can be no question that the charge can be considered as beyond the reach of even the most youthful of aero-modellers!!

We hope, with the introduction of this further benefit, that not only will all existing members who fly duration type rubber-driven models and gliders, but many others who up to the present have not been members of the guild, will avail themselves of this model insurance and also the third-party cover.

Twin Drive.

Recently we have published some lively remarks for and against twin drive mechanisms for model aircraft. Most of those "against" protest at the alleged increased weight necessitated by the metal parts of the drive. These must surely be dispelled by the results obtained by Mr. C. R. Moore and described in this issue.

Here is a "gull wing" model, built to the "Wakefield" specification, of which the total all-up weight, less rubber, is 5¼ oz. and in which the total weight of the gearbox and twin-drive mechanism is 1¼ oz.

A set of full-size plans for building this interesting model are available through THE AERO MODELLER Plans Service, and we shall be interested to have reports from readers who try out this type of model and drive.

Calling All Club Secretaries.

We endorse Clubman's appeal in this issue to club secretaries to send in the latest particulars of their clubs so as to keep our register up to date. Particulars required are the full name and address of the club, the name and address of the secretary, whilst particulars as to number of members are always of considerable interest. Will club secretaries please co-operate by sending in their particulars, preferably on a postcard, at their earliest convenience.

D. A. R.

CONTENTS OF THIS ISSUE

By D · A · RUSSELL, *M.I.Mech.E.*

CONTINUING the article which I commenced in the May issue—(and which, I would remind readers, contains expression of my purely personal opinions, and in no way reflects the editorial policy of THE AERO MODELLER, which is to cater in an equitable manner for all tastes and shades of opinion)—it seems opportune here to refer to the ballot organised around Christmas time by Dr. Forster to ascertain the most popular size of petrol engine for use in model aircraft.

Not a large number of replies was received, probably due to wartime conditions, but they were sufficiently selective to give clear indications. Forty per cent. of readers who sent in replies chose the 3–4·5 c.c. category, and a similar percentage named this size as a second choice. The actual figures were as under :—

First Choice.	%	*Second Choice.*	%
3–4·5 c.c. ..	40	3–4·5 c.c. ..	40
5–6 c.c. ..	36	9–10 c.c. ..	20
9–10 c.c. ..	16	Over 14 c.c.	12
2·5 c.c. ..	8	1·5–2·5 c.c...	20
		6 c.c. ..	8
	100		100

It is interesting to note that the first choice represents an order of popularity, and that the ultra small engine of 2·5 c.c. is the least popular. This I, personally, had rather anticipated, as the power-weight ratio of engines as small as this is not so good as that of engines of a slightly larger capacity.

Broadly speaking, it would seem that the most popular sizes will be 4 c.c. and 6 c.c., with a fair support for the 9–10 c.c. engine.

In the range of 4–6 c.c. there should be ample opportunity for the designing of a number of interesting scale or semi-scale replicas of modern military aircraft used in the present war. Who could want more than the "Typhoon," with its deep nose and air scoop, so nicely positioned for cooling the inverted single-cylinder engine with which the model would be powered ?

Returning to my "sore point" in regard to unstylish model aircraft, and bearing in mind the present status (sic) of the Italians, consider the photographs at the head of this and the opposite page, sent to me by our Italian correspondent, Piat lli, just before Italy entered the war ! ! ! Then compare with the model at the bottom right-hand corner, and (dare I modestly suggest) the middle photograph, which is of the 'plane I was flying just before the war started, and which is now known as "Vulcan."

Surely the suggestion that the Italians copy their German "masters" is wrong ?

I cannot recall having seen any German models with such incredible engine mountings and undercarriages, and can only suggest that the Italians have never studied the design of petrol 'planes *as a whole*, but merely built their models as rather strengthened-up rubber-driven affairs, to which the engine and undercarriage are attached, rather as an afterthought—and probably in the dark !

Herein, of course, lies the explanation of so many unsuccessful petrol 'planes ; they were *not* designed as such, but were merely rubber-driven types scaled up, strengthened as the "designer" thought best (but not as the result of any real experience), with the engine "tacked on" last of all.

My "Vulcan" represented the result of a number of years intensive practical research in the design, construction, and flying of large petrol 'planes, and did really "fly off the board" ! This model was not designed for "duration" or high altitude performances, but as a *hard-wearing* semi-scale aircraft, capable of a fair *life-like* performance. It can be built down to a weight of 6 lb. when it has a wing loading of some 12 oz./sq. ft. and it can be built up to a weight of over 8 lb.—wing loading then equals 1 lb./sq. ft.—when it will still climb at a good rate. At this heavier weight, with an 85 per cent. birch/spruce construction, and only 15 per cent. of the wood balsa (mainly wing ribs), the construction is truly massive, and the 'plane will stand up to the average "all-in" English weather very well.

Whither the Petrol Plane ?

It seems that there will be three distinct sizes, determined by engine capacities of 4, 6 and 10 c.c., and that post-war development may well be along the following lines :—

(*a*) 4 *c.c. engine.* All-up weight about 2½ lb. : semi-scale (perhaps not very much of the scale !) ; simple in design : say high wing, and monocoque fuselage, faired wire undercarriage, engine upright and partly cowled in.

Essentially a "beginner's" model, and in a class which I hope, so far as proprietary kits are concerned, will be given very great attention by manufacturers so that some really practical, yet attractive, designs will be forthcoming.

(*b*) 6 *c.c. engine.* All-up weight about 3¾ lbs.; near-scale (please!); engine inverted. With total weight of power unit *and* battery not exceeding ¾ lb., there remains a full 3 lb. available for the building of the model proper. Here I forecast some very attractive designs—particularly of the "fighter" type.

(*c*) 10 *c.c. engine.* In this size range the designer has more latitude. He can build a light yet strong model, and go after performance; he can go "all out" on a scale design; or he can reach into the sphere of radio-control by building a fairly large yet fairly light model, capable of carrying a "payload" of 2 to 3 lb. for the radio equipment.

For the sake of simplicity this model would be semi-scale and of high-wing design, with a square section fuselage, and a high-lift slow-flying wing section thus assuring slow stable flight and leaving most of the builder's time free for attention to the radio . . . . I expect he will need it!

Since I have stressed the need to tackle the building of a petrol 'plane by *designing* it—*starting at the beginning*—I will conclude this article by two suggestions as to weight distribution:—

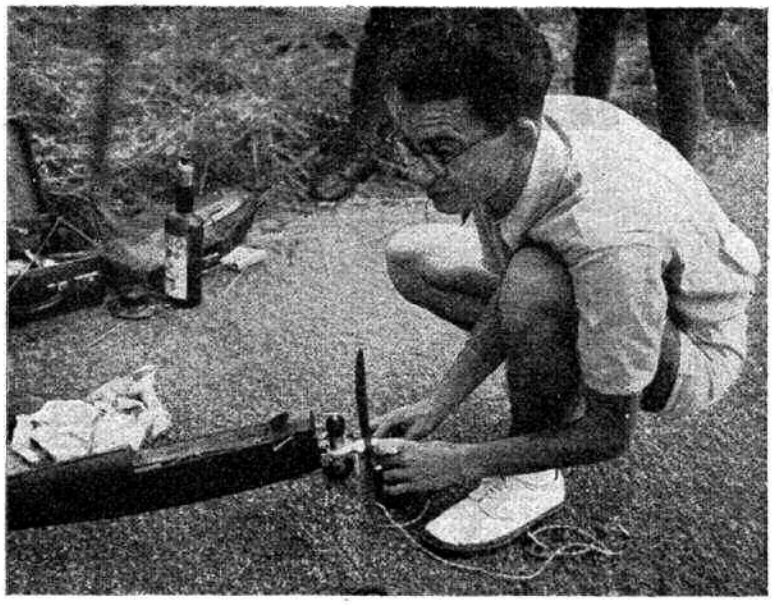
(*a*) buy a pair of scales, and keep them in use throughout the building of the model!

(*b*) determine how much each part of the model should weigh, and stick to this weight!

Here is my schedule of weights for a model to be powered with a 6 c.c. engine, and to have an all-up weight of 3¾ lb. (No doubt some readers will laugh at it—but, apart from the fact that "I can take it"—I've "had some" experience!!)

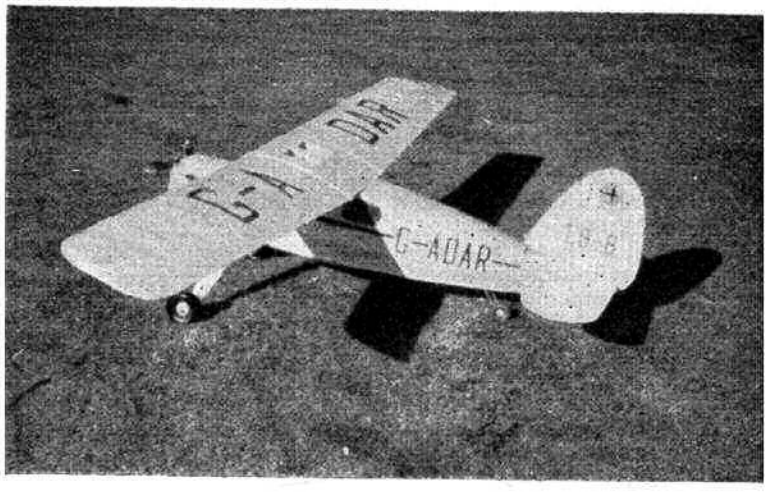
	Oz.
(*a*) Engine, battery, coil, condenser and petrol tank	12
(*b*) Main wing	9
(*c*) Fuselage, including cowl for engine ..	12
(*d*) Tail unit (fin, rudder and elevator) ..	3
(*e*) 50 per cent. of b+c+d=allowance for fixatives, dope, covering, paint ..	12
(*f*) Wheels and undercarriage, faired ..	6
(*g*) All the oddments I usually forget!!—time switch, tail wheel, rubber fixing for wings and tail unit, petrol, booster battery connections, etc. ..	6
Total ..	60

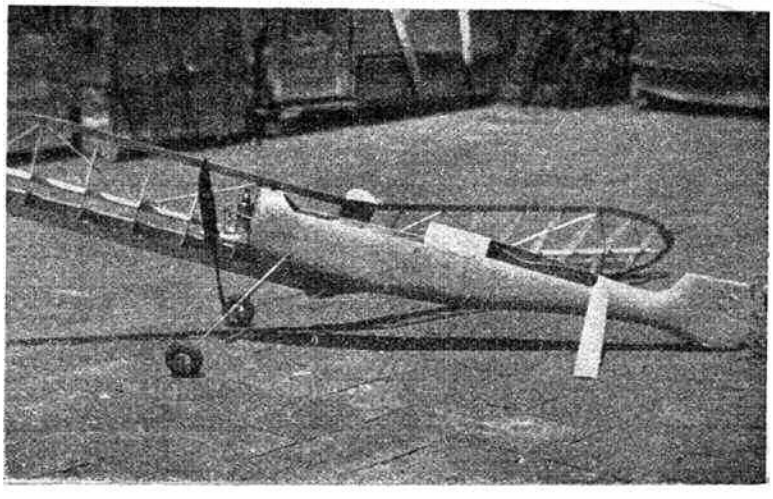
I take off my hat to the first aero-modeller who can draw up a schedule like the above and keep to it! As Rudyard Kipling says, "He'll be a man . . and more . . ." and need to watch that pair of scales *all* the time!



The photograph at the head of this article was taken before the war, so the Italians were at least ahead of other folk in **one** *respect, in that they were experimenting with the tricycle undercarriage!*

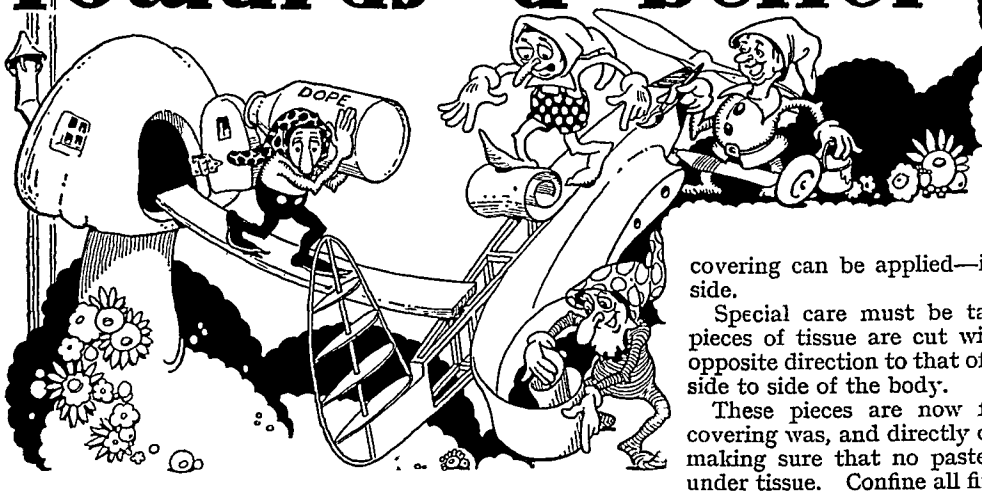
Below is shown the "Vulcan" referred to in this article, whilst the photograph at the bottom of the page is of another Italian petrol plane. The monocoque fuselage is attractive, but both the engine and the undercarriage legs (oh dear! they **will** *keep cropping up!) could surely do with some fairing and dressing up?*





Towards a better Finish

by Gordon Allen



BEFORE dealing with the best methods of producing a good finish to monocoque models, I would like to say a few words about "double covering" for duration models—a point which I mentioned in the first article.

Instead of the orthodox method of covering a model, that is, by a single layer of tissue fixed over the framework, sprayed with water, and doped, two such coverings are employed, one directly on top of the other. This method, however, is nearly always utilised on large machines of the Wakefield type (and then on the fuselage *only*), for it is too "heavy" a proposition for the lightweight. It is beneficial in that it increases the strength factor of the model, which is always desirable in a 'plane where anything up to four ounces of rubber are to be used.

I will outline two successful methods which have proved quite straightforward in practice.

The first method: To begin with the model must be covered in the ordinary way, as described in the last article, with the grain of the tissue running from nose to tail of the fuselage. When the dope has thoroughly dried, thus making the tissue drum-like, the second covering can be applied—in eight pieces, two for each side.

Special care must be taken here to see that these pieces of tissue are cut with the grain running in the opposite direction to that of the under covering, i.e. from side to side of the body.

These pieces are now fixed in place, as the first covering was, and directly on top of the initial covering, making sure that no paste touches the middle of the under tissue. Confine all fixative to the edge of the job.

The pieces must be stretched and smoothed when in place—quite a simple job in view of the fact that the doped paper underneath serves as a "base."

When the whole body is completed and the paste has set, two coats of clear dope are applied, the second only when the first has dried. It will be noticed that no water spraying is necessary with this method.

The second method: This obtains better results, and, although similar to the first, is a little more difficult.

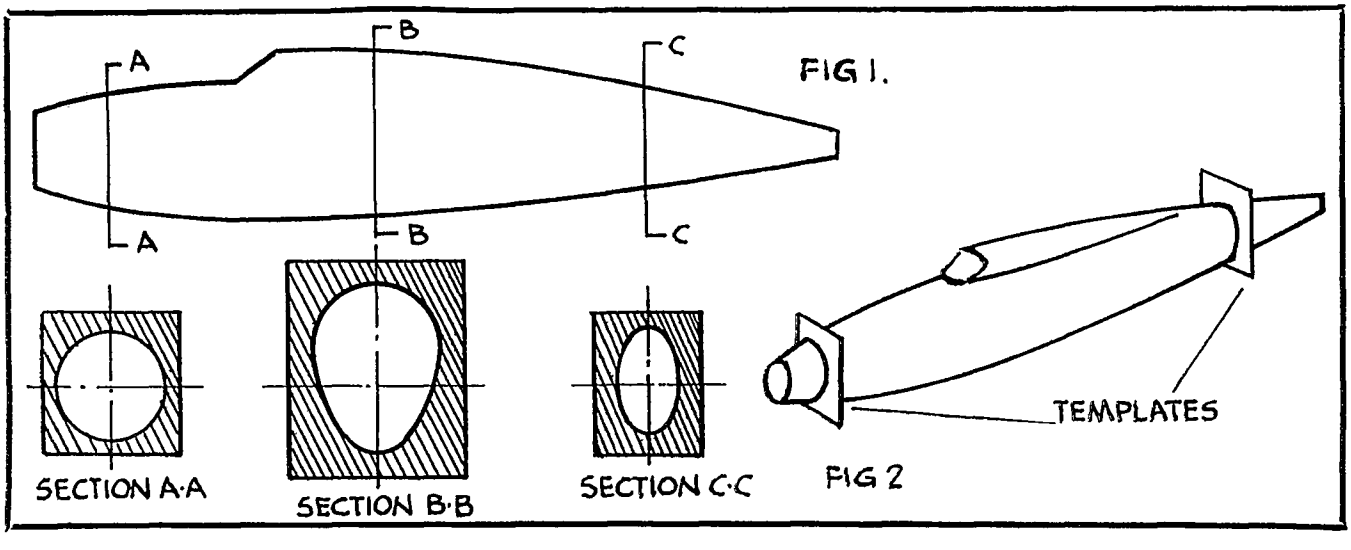
The initial covering is applied in the usual way, but is left when it has been water shrunk. No dope is applied at this stage.

The second layer of tissue is now fixed in place (with grain crossing), being careful not to puncture the undercovering. When set, it is water sprayed and left to dry. Two coats of clear dope are then applied, as before.

As mentioned elsewhere, double covering is only employed on large fuselages. The normal, single covering should suffice for the wings and especially the tail surfaces.

Monocoque Models.

Much has been written on the construction of this type of model aircraft. The class of machine is distinguished by its fuselage, which is carved from solid,



block balsa. Usually the body is built up by making two shells, each of which incorporates the correct inside shape of half the fuselage, each side of a longitudinal axis. The two shells are joined with cellulose cement along this longitudinal axis (which axis cuts the fuselage directly in half from nose to rear) and then the *outside* is carved, and sanded to shape using pre-made cross-sectional templates as a guide.

To indicate the meaning of this latter remark let us assume that our fuselage shells are joined together, and that we wish our fuselage to possess a shape similar to that shown in fig. 1. Naturally the body must possess also a uniformity in shape (or be symmetrical, to use an engineering term) when viewed from the front, in the direction of arrow "A." To produce this cross-sectional shape, templates are made from thin cord or tin, the inside of which (see fig. 2) conform exactly to the desired cross-sectional shape at the corresponding places of the fuselage to be.

As the fuselage is carved to shape, using a very keen penknife or jack knife, these templates are tied over the fuselage from time to time. They will indicate precisely where a further cut is required.

Never take too deep a cut with the cutting tool, for the finished contour of the fuselage must not be below the extremities of the templates or gauges. It is far better to leave the fuselage a little "full" in cross-section, in order that it can be *sanded* down to its final shape.

Therefore, assuming that the fuselage is semi-completed and almost conforms to the templates, the initial sandpapering is carried out. This is done with the coarse variety. Rub the body vigorously, in a direction from nose to tail, at the same time turning it slowly about its central axis. Having thus removed all uneven ridges caused by the earlier shaving the machine can then be sanded with finer paper, and eventually finished off with ultra-fine or flour paper.

The fuselage is now ready for its final "surface filling" and polishing.

The surface filling is done by applying coats of *thick* banana oil (three should be sufficient) with intermediate sandings using fine sandpaper. However, if this seems rather extravagant then another medium for grain filling will have to be utilised. If pieces of thin clear celluloid are dissolved in acetone (procurable at any chemists for a few coppers), the resulting syrup, which can be made to any desired constituency, will serve admirably for the same purpose. One good coat applied with a large brush should suffice. Sanding, of course, is necessary, as in the case of banana oil, when the filler is quite set.

The body can now be either treated with a thin coat of coloured dope or french polished. The latter is perhaps the better. Ordinary wax polish is smeared uniformly over the surface of the fuselage, rubbed with a soft cloth, and finally polished with silk.

Before dealing with planked fuselages, a word about damage to the monocoque type. If while carving the body to shape, too deep a cut is made thereby running into the inside of the shell the puncture should be ignored until the unit has been carved to shape prior to sanding. The damage can then be rectified by the application of plastic balsa, which can either be bought, or made by mixing fine balsa dust with cellulose cement or dope. This plastic must be applied quickly, working it rapidly into place. Use more than is really necessary; the surplus can be shaved off and the final "patch" sanded to the contour of the rest of the machine.

Planked Fuselages.

These fuselages are made by laying strips of thin soft balsa, about ¼ in. wide, side by side on the rims of bulkheads which constitute the internal framework of the body.

The secret, here, lies in using just the right amount of cement—not using so much as to allow it to "ooze" all over the place, and yet not too little thus allowing the strips to come unstuck. This may seem rather a peculiar point, but one which often makes the difference between a poorly and a well finished job.

Always take great care when applying these strips to the formers that there is as fine a joint as possible between each strip. The final finishing is similar to the method used on the monocoque type, with the exception of carving. Sanding alone is sufficient to impart a perfect finish. Clear varnish can be used to good effect on fuselages of this kind.

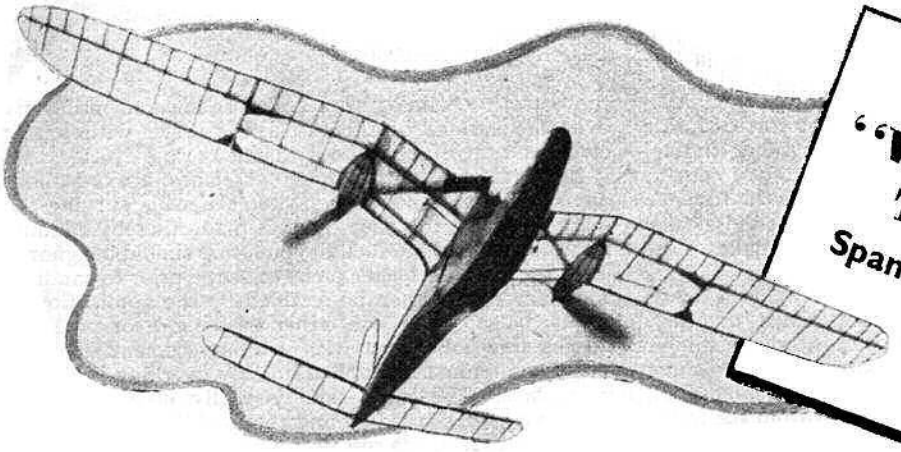
Airscrews.

These are grain filled and polished in the usual way. It is a good idea, when a natural polish has been imparted to the unit, to give it a coat of silver dope and then varnish it. It has been known for a model to be made distinguishable on a thermal flight solely by the light being reflected from such a silvered surface, as the prop. slowly freewheels.

All other wooden parts of models which are exposed should be grain filled, if not polished. This makes them more durable, thus preventing damage in damp weather.

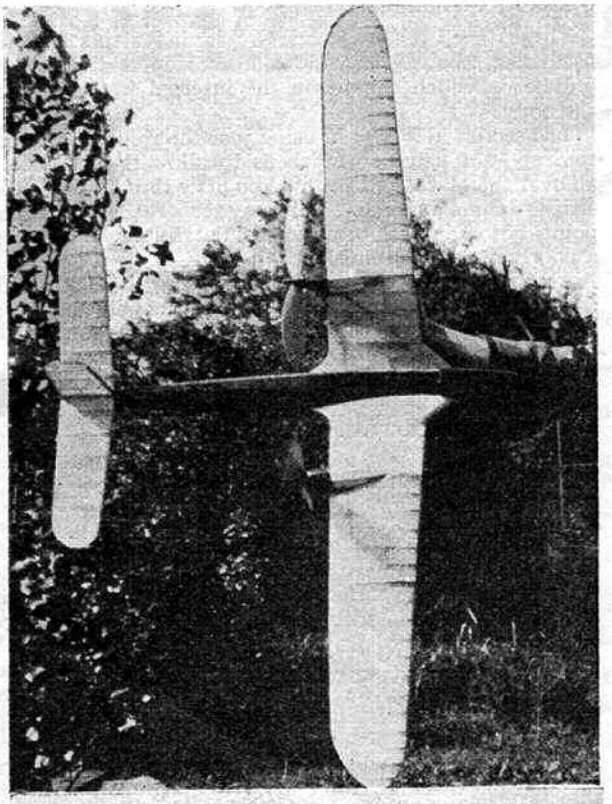
Bright colours should be used on all models to improve the chance of them being kept within sight on fly-away trips. Avoid greens, blacks, and browns.

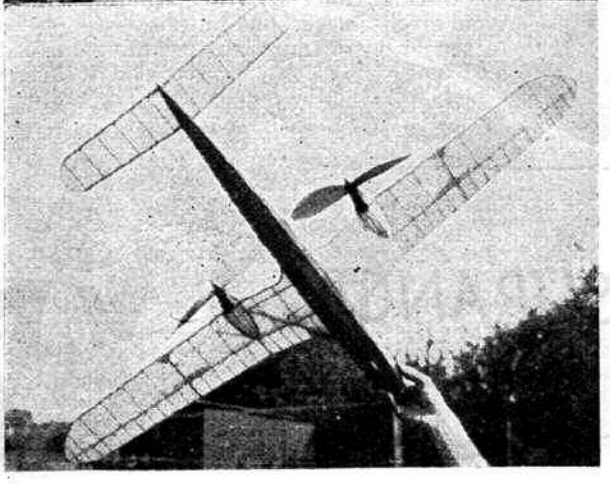
If there should be any questions regarding this side of aero-modelling, I will only be too glad to answer them if readers will send their queries c/o The Editor.



A "WAKEFIELD" TWIN GULL

Span: 46¼" Length: 30" Total weight: 7½ oz.





By C·R·MOORE, A.R.C.A.

THE Twin Gull was built to "Wakefield" specifications for comparison with more normal models of that type. The power allowance was three ounces of rubber but it was eventually found that only two-and-a-quarter ounces could be packed in without overpowering the model, which turned out to be half an ounce under minimum weight.

Although accurate timing has not so far been possible, many flights have been made and it appears that the model is at least as efficient as its single airscrew equivalent.

Briefly the Twin Gull is a sailplane powered by two contra-rotating pusher airscrews of small diameter, fitted with free-wheels. The two airscrews sweep an area equal to that swept by one sixteen inch airscrew, having 40 per cent. greater blade area. They are driven by a single skein motor, the torque being transmitted through the wings by the "Moore Drive."

The extra weight of the drive is counteracted by the following advantages:—

1. Absence of torque.
2. Reduced head resistance as only the tail and rear of the fuselage are in the slipstream.
3. The retracting undercarriage (rear legs) is very light, but is perfectly "ground stable."

TABLE OF WEIGHTS

The Moore Drive.	oz.
2 Double stirrups, 9 in. shafts	5/16
4 Bearing plates	1/16
2 Box spars, 9 in.	1/8
2 Pilot shafts and bearings	3/16
2 Pilot gears	1/8
2 Prop. shafts, open forks, bearing and driving plates	1/8
Total	15/16

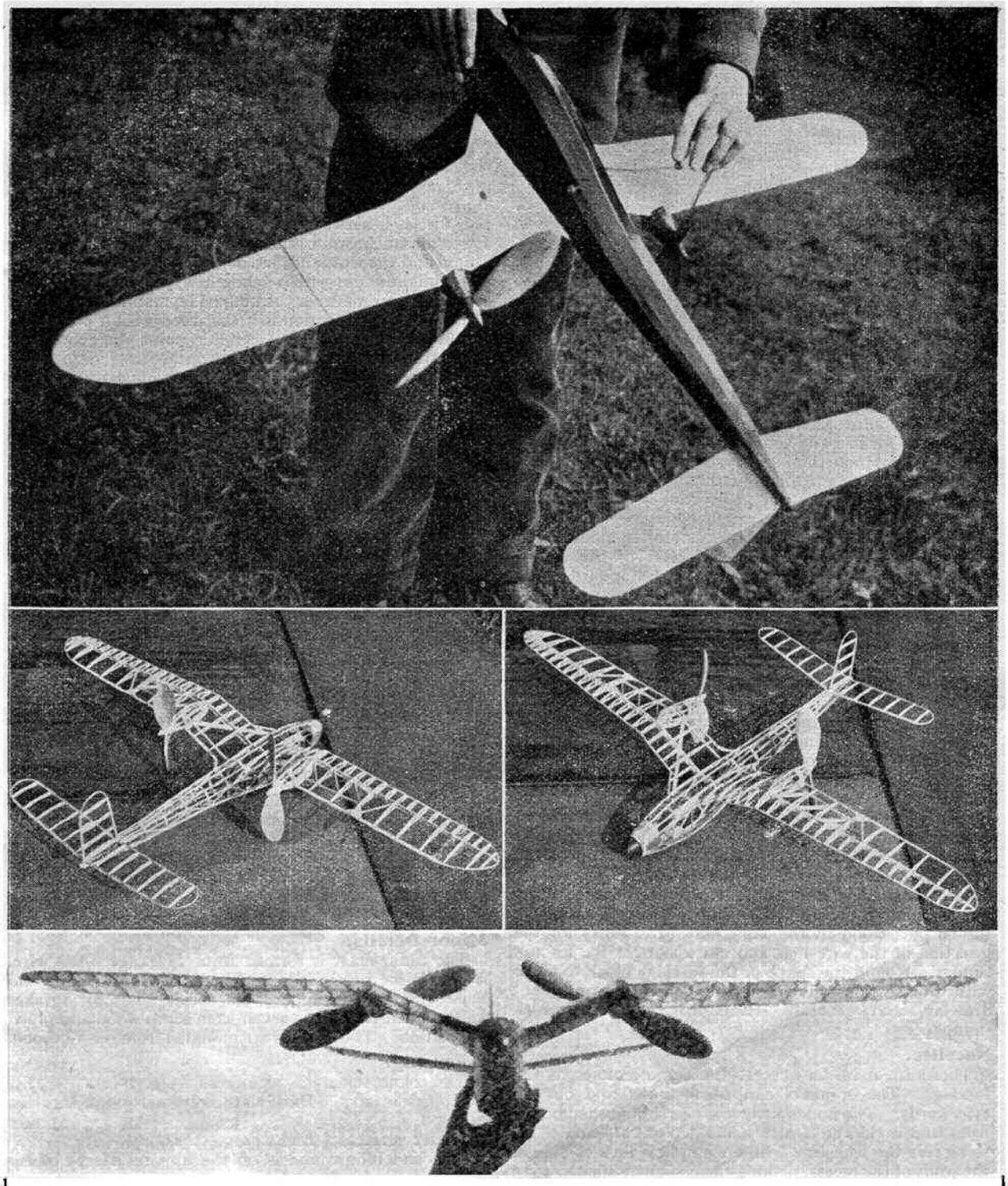
Gear box complete, 5/16 oz. Total mechanism, 1¼ oz.

Undercarriage.
Front leg—wheel, 1/32 oz.
Rear legs and wheels, ⅛ oz.

Airscrews.
Two complete with freewheels, ½ oz.

All up weight—less rubber, 5¼ oz.

Rubber, 2¼ oz.



Full Sized Plans of the above Model

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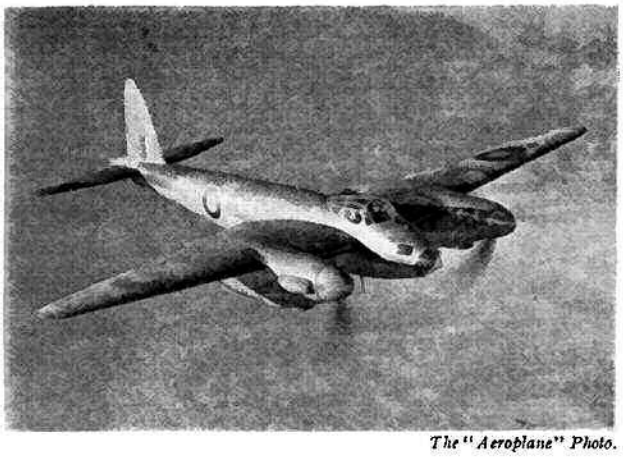


The "Aeroplane" Photo.

CONSTRUCTING A SOLID MODEL D.H. MOSQUITO

R · J · ALLEN

CONSTRUCTION of a scale miniature of the D.H. Mosquito reconnaissance bomber offers no unusual difficulties to the modeller, its splendid lines being easily formed and assembled as in other aeroplanes in its class. Much time and space have been wasted in giving detailed descriptions of different aircraft which are in a similar category, e.g. the Tomahawk, the Spitfire and the Mustang, which could be adequately covered by a single article, with certain amendments in regard to details, such as the operation of the undercarriage. This article is intended as a standard guide to the modelling of other aeroplanes in a similar category to the Mosquito.

Fuselage.

A block of hardwood (preferably American whitewood) 6·75 in. long by ·1 in. deep by ·7 in. wide is required for the fuselage. Commence by tracing the side elevation of the fuselage, excluding the nose window and cockpit enclosure. The tracing is pasted smoothly on to the side of the block and the outline pricked through with a pin. After removing the tracing, join up the points with a pencil so that a clear form is left on the wood. The surplus wood can then be removed with a plane or chisel. Care should be taken when cutting that the section is kept square. Mark a centre-line down the top of the fuselage block and draw in the plan. (It cannot be accurately pricked through from a tracing because of the uneven contour caused by the side elevation.) Remove the surplus wood in the same way, drill holes for the insertion of the wire lugs and cut a slot for the fin and rudder. Round the shape of the fuselage block to agree with the sections given on the general arrangement drawing, and generally clean up the shape with sandpaper.

Nacelles.

These are made in exactly the same manner as the fuselage. The spinners can be included and cut off afterwards. The undercarriage doors should then be cut from thin wood and a recess chiselled out of each block to receive the wheels. Drill a small hole in each side of the walls of the recess, making them slightly smaller than the wire used for the undercarriage so that the friction will be sufficient to hold the undercarriage in position when retracted. Wheels are obtainable from any model shop. The wire is then inserted and bent to shape with long-nosed pliers. Plates made from stout paper or sheet tin can be glued or soldered to the legs. Cement strips of silk or tissue along each door to form hinges. A tail-wheel can be purchased and mounted in position with 20 gauge wire.

Wings.

Trace the plan of the wing, including the portion of the fuselage between the trailing- and leading-edges. Paste the tracing on to the wood and pin prick the salient points and the tips, and line in with a pencil. Cut along the straight edges with a tenon saw, and round the tips with a fretsaw. Taper the underside, making it perfectly flat. The airfoil section is best carved with a plane and finished with sandpaper. At this point the spaces for the motor nacelles should be cut out.

The centre-section should next be cut away and the remaining outer sections are then ready for affixing to the fuselage. Care should be taken when drilling the holes for the wire lugs in the wing that they are accurately aligned.

Tail Unit.

The fin and rudder are made in one piece, as are the elevator and tailplane, and are cut out similarly to the wing, with a fretsaw, after which filing and sanding to a symmetrical section is all that is needed to complete those components. When cutting out the fin and rudder a small portion must be left at the bottom for insertion into the fuselage.

Cabin.

On the original model it was made from "Perspex": pieces were laminated to the correct thickness and then filed to shape. It can be finished with fine sandpaper, and polished with metal polish. To represent the frame, make fine grooves where the members fall. For the small windows in the nose a recess about 1/32 in. deep is carved out or impressed and a small piece of celluloid inserted.

Airscrews.

Drill three small holes each of the diameter of the hub of the airscrew blade equidistant round the rear edge of each spinner. The blades themselves are carved from ⅛ in. square birch, and shaped to airfoil section with sandpaper.

Minor Details.

The radio mast is formed from 18 gauge brass wire. A fine piece of thread stretched between the fin and mast and doped supplies the aerial. The air intakes and exhaust ports are carved from scrap wood and glued in position. The fairings are moulded from plastic wood.

Colouring.

The colour scheme is as follows:—

Upper surfaces: Dark slate grey and extra dark sea grey.

Under surfaces: Light grey.

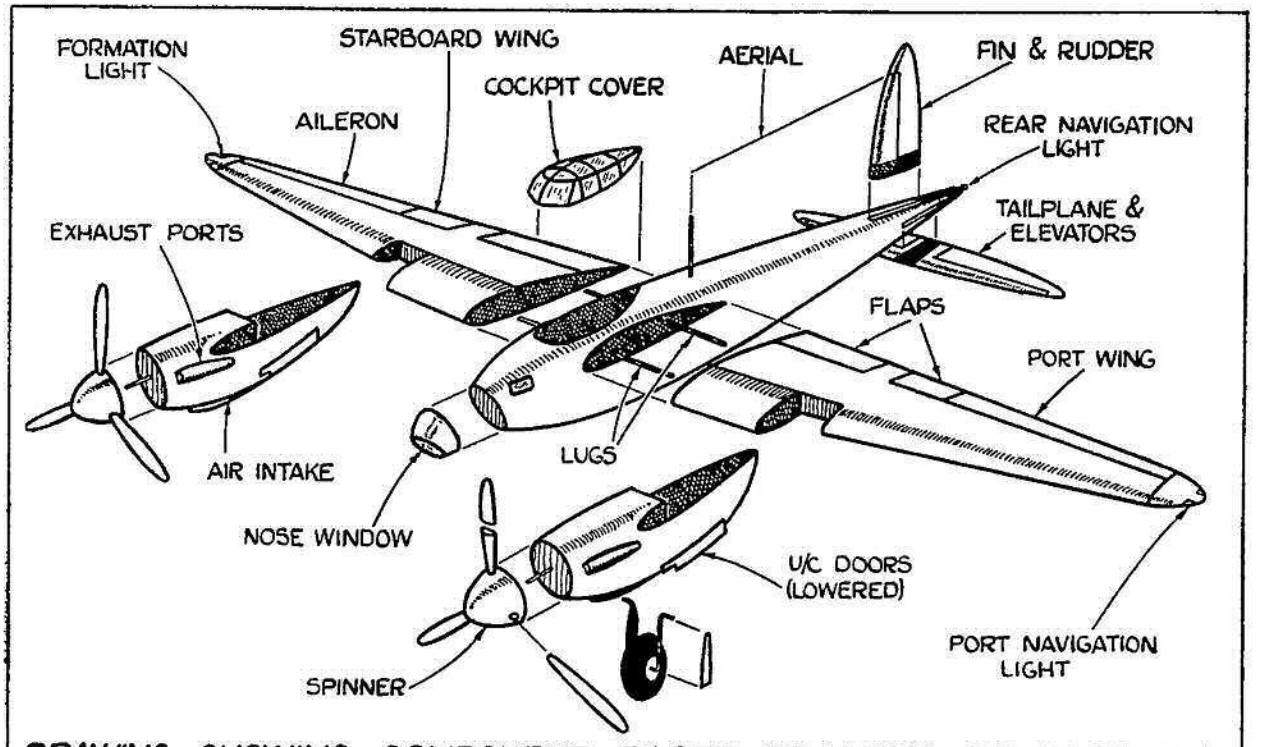
Red and blue roundels on the upper surfaces of the wing.

Red, white, blue and yellow roundels on the fuselage.

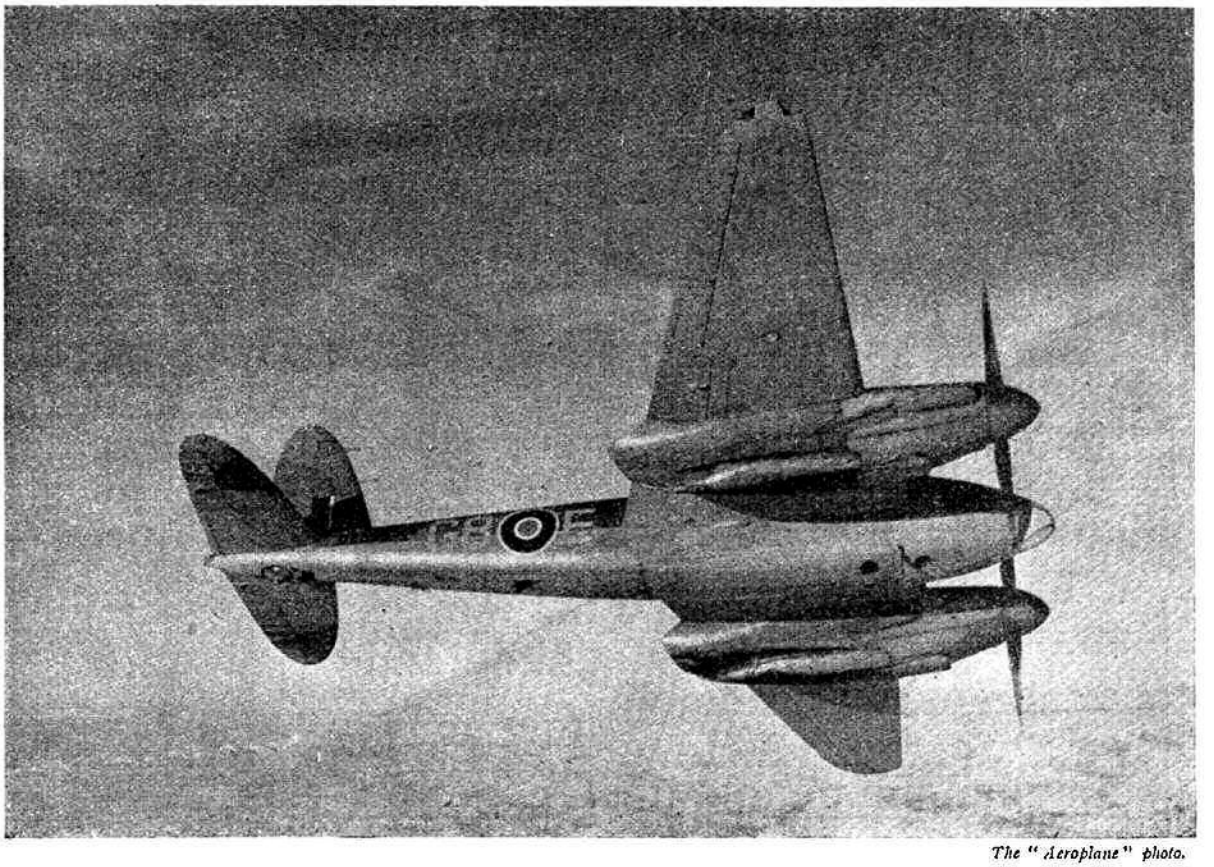
Red, white and blue stripes on the fin.

After a coat of wood filler and a thorough sanding, give the model three coats of banana oil, sanding between each. When thoroughly dry, apply one coat of the lighter colour of the camouflage and lightly sand. A coat of each colour may now be added and other details such as aileron and elevator hinge lines can be scored with a pen knife.

Note: A better finish is obtained by using glossy dope and dulling with pumice powder, than with matt dope.



DRAWING SHOWING COMPONENT PARTS OF MODEL D.H. MOSQUITO

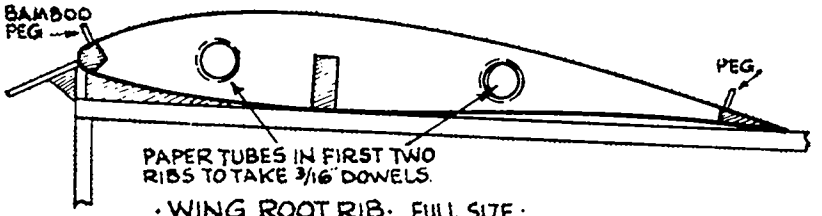


The "Aeroplane" photo.

"REDBREAST"

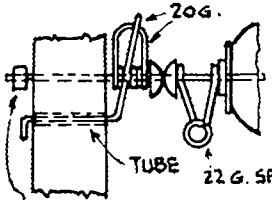
[R·F·L·G·63]

DESIGNED BY
R.F.L.GOSLING



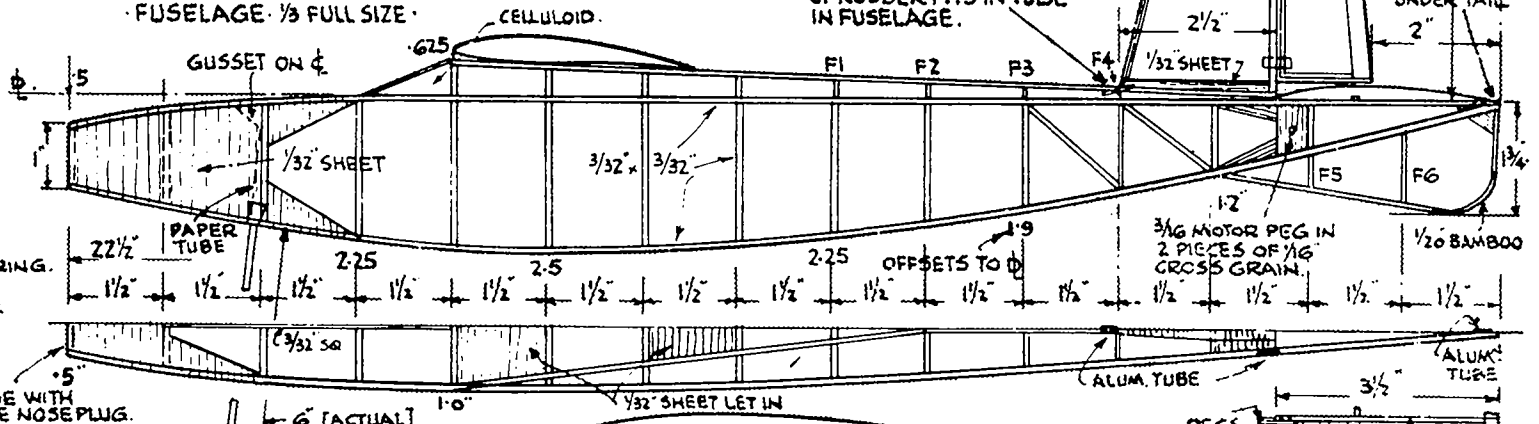
·WING ROOT RIB· FULL SIZE·

PROP. FROM BLOCK
12 x 1 x 1 3/8"
POWER:
8 STRANDS 3/16"
28" LONG.



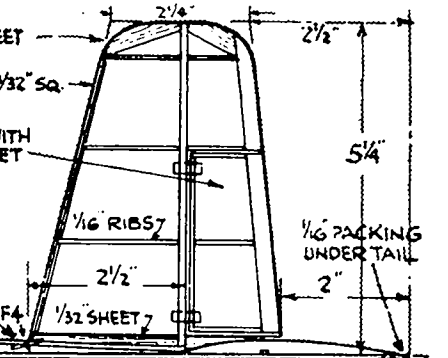
RUBBER TO RETAIN PROP.
·FREEWHEEL DETAIL·

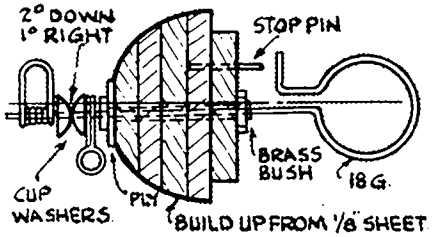
·FUSELAGE· 1/3 FULL SIZE·



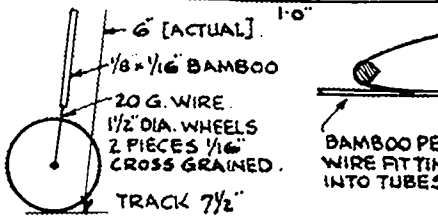
FACE FRONT OF FUSELAGE WITH 1/32" 3 PLY CUT OUT TO TAKE NOSE PLUG.

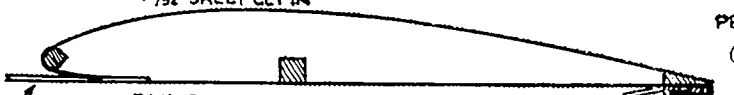
BAMBOO PEG ON FRONT OF RUDDER FITS IN TUBE IN FUSELAGE.



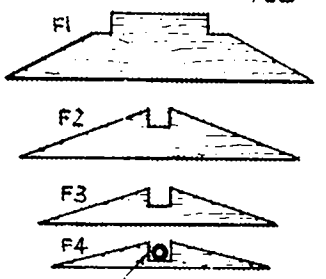


·NOSEBLOCK· FULL SIZE·

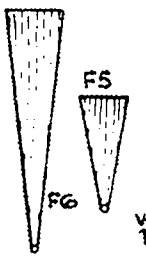




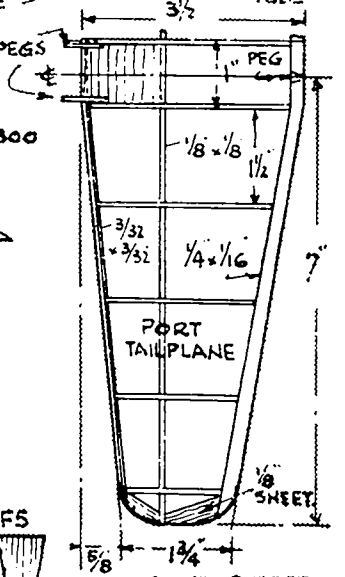
BAMBOO PEG GOES THROUGH WIRE FITTING 'X' ON RUDDER & INTO TUBES ON FUSELAGE



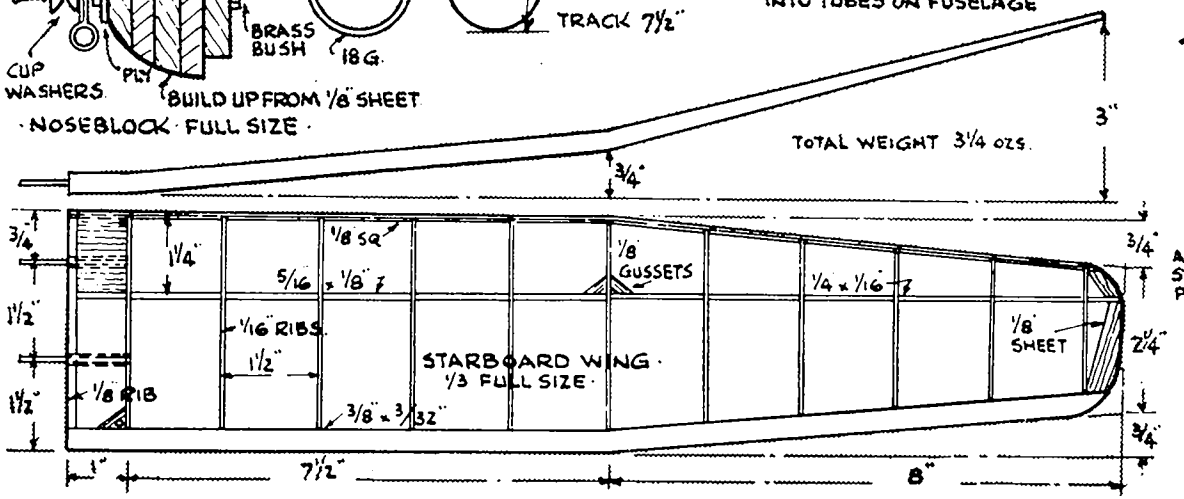
ALUM.M TUBE LET INTO STRINGER TO TAKE PEG ON RUDDER



FUSELAGE FORMERS FULL SIZE·



TOTAL WEIGHT 3¼ OZS.



STARBOARD WING
1/3 FULL SIZE·

"FLY WITH CARE"

When your favourite model is way up in the thermals, do not let the pleasure derived from its performance be marred by the financial loss of an O.O.S. flight. A new Insurance Scheme, open to all members of the N.G.A., insures against the total loss of models by O.O.S. flights. For a small premium models can be insured up to the sum of £2. Details are given below.

Aeromodellers who are not members of the N.G.A. would be well advised to join. Besides the above Insurance a Third Party Insurance is also available.

1. The purpose of this insurance is to indemnify members of the N.G.A. in respect of the total and irrecoverable loss of rubber driven model aircraft and/or gliders due solely to such models flying out of sight anywhere in the United Kingdom.

2. The insurance is effective from the time of receipt at the N.G.A. Offices at Allen House, Newarke Street, Leicester, of the premium of 2/– per model, and continues until the end of the N.G.A. current "Financial Year," that is to say, January 31st, 1944.

3. The Underwriters liability in this scheme of insurance is limited to £2 (Two Pounds) in respect of any one model.

4. As a condition precedent to liability hereunder it is warranted that:—

(a) The model is seen flying away out of sight by not less than two witnesses as well as the owner.

(b) A certificate to be produced attesting to the foregoing and all reasonable efforts to locate the model having failed.

(c) No claim shall stand unless proof of loss as prescribed under paragraphs (a) and (b) hereto be attested at least seven days' after the date of said loss.

(d) Every insured model carries a label or tab securely fixed thereto bearing the name and address of the owner; and sufficient particulars, as will permit identification, have been declared at the time of its insurance.

This insurance is open to all Aeromodellers throughout the country provided they are members of the N.G.A.

5. Existing members, when registering their model(s) must quote their membership number. Readers who have not yet joined the N.G.A., and who wish to avail themselves of this model insurance, must enclose an additional 6d. to cover their Third-Party membership subscription.

Registration of members' models can be effected on the form at the foot of this page, or on duplicate forms which may be obtained from the N.G.A. Offices at Allen House, Newarke Street, Leicester, or may be written out on a separate sheet of paper.

CUT HERE

To :—National Guild of Aeromodellists, Allen House, Newarke Street, Leicester.

Please register the undernoted model(s) against total loss by flying out of sight in accordance with the terms and conditions advertised in the July issue of the AERO MODELLER, and in regard to which I enclose P.O./Cheque ..... at the rate of 2/– per model.

	1	2	3	4	5
Type of Model ..					
Span					
Length					
Rubber-driven or Glider					
Colour					
Any Special Features					

Signature .....

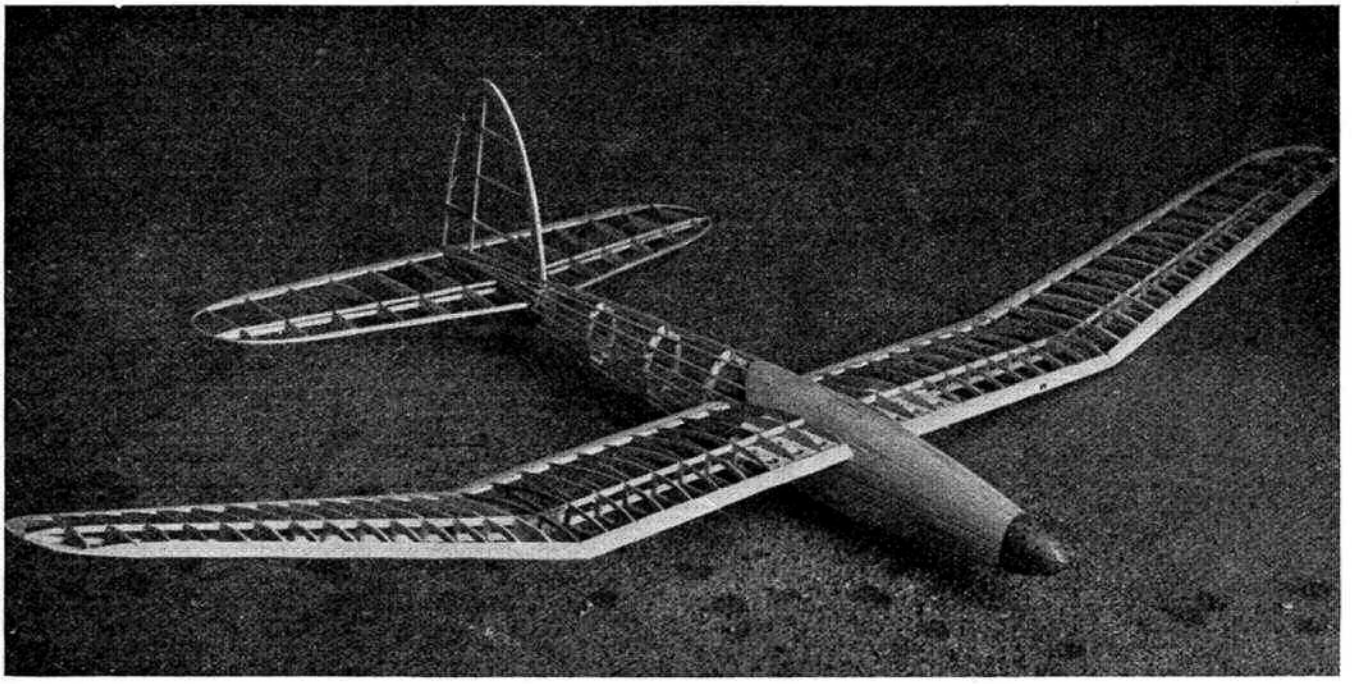
Address .....

.....

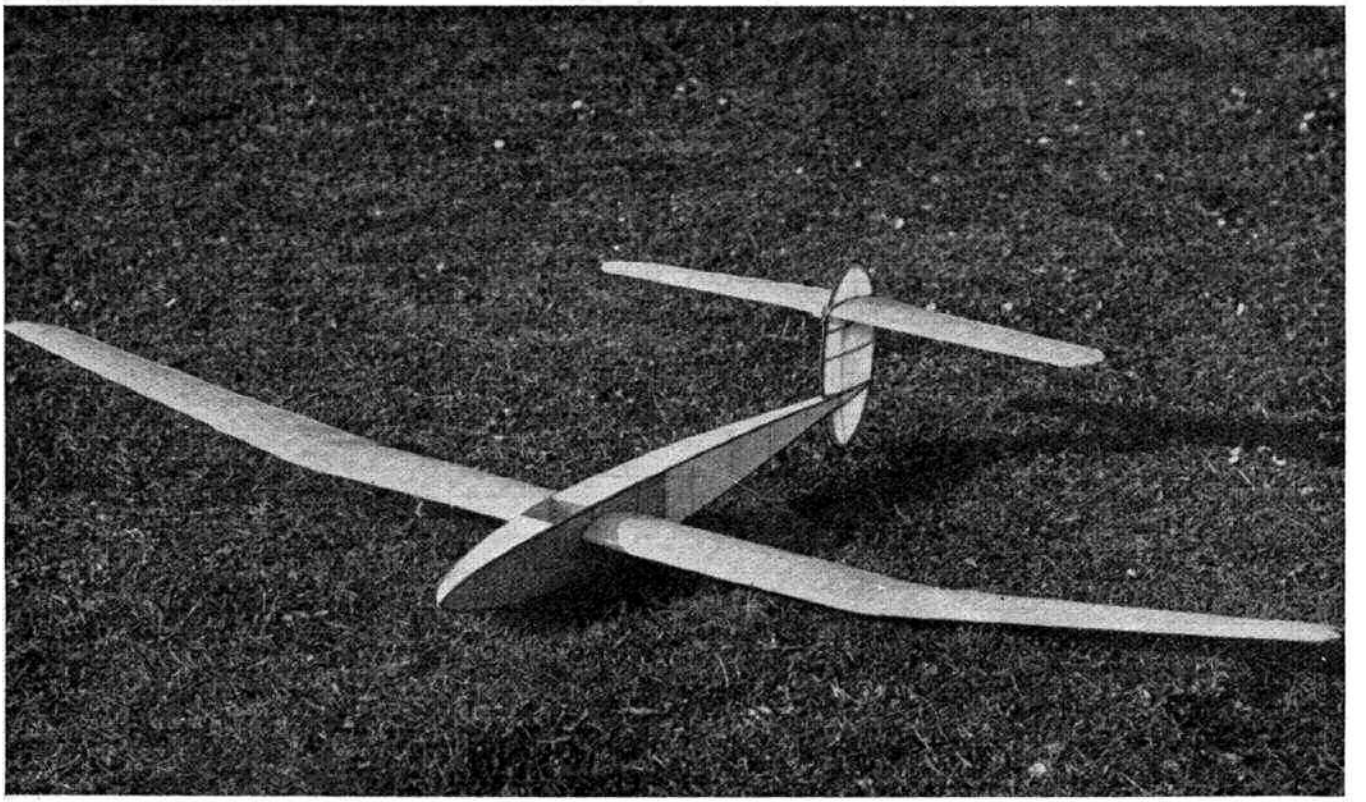
.....

Membership No. .....

ATALANTA and ICARUS II. . . .



Above is the "improved" Atalanta built by Mr. Ray, in which the planked forward portion of the fuselage and re-designed wing fixings are clearly shown. Underneath is Icarus II. an original design of Mr. Ray's which he developed as the result of his experiments with Atalanta.



a development by P. F. RAY.

Soon after "Model Gliders" was published, I was persuaded to build Atalanta, and here are my results and comments.

I built it as near as possible to specification, using all balsa and the separate parts after covering and doping weighed as follows:—

Fuselage	26.5 grams.	.94 ozs.
Wings—Port ..	31.6 ,,	1.11 ,,
Starboard	30.9 ,,	1.09 ,,
Tailplane	11.6 ,,	.41 ,,
Fin and Rudder ..	5.0 ,,	.18 ,,
Nose and Rod ..	10.0 ,,	.35 ,,
	115.6 grams.	4.08 ozs.

The total weight to F.A.I. rules was to be 237 grms. (8.37 ozs.), therefore a dead weight of 122 grms. would have to be added.

In practice I added slightly less than this weight so the complete model was not quite up to F.A.I. rules.

After several hand launches the C.G. was put in a favourable position, the knockout wing fixing working very well. I then decided to try it on a winch launch. After several attempts during which the model came off the line prematurely I gave too strong a pull on the tow line, the model crashed and I found that the wing box inside the fuselage had cracked. This necessitated nearly a major repair, but the operation was carried out successfully and the box was made quite strong.

During the next session of winch launches another strong pull was given to the tow line, and again the model crashed, this time with fatal results. The wings fluttered away and the fuselage, guided by the tail and fin, hit the ground at rather too high a speed and performed a concertina action. After a post-mortem it was apparent that the actual box had stood the strain this time, but the formers holding the box had split in two, the fuselage had parted into two pieces, and had allowed the wings to slide out.

A new fuselage was therefore constructed this time not to specification but much stronger and heavier. From the original weights I knew that I could afford to make the fuselage nearly four times as heavy using the wings, fin and tailplane (which are still in service). Accordingly the formers in the front of the fuselage were made of $\frac{1}{8}$-inch 3-ply, the box was also of 3-ply and was very firmly fixed to the ply formers with strengthening pieces at the necessary places. I did not monocoque the fuselage this time, but covered it with $\frac{1}{4}$ by $\frac{1}{4}$ balsa strips followed by tissue. The rear of the fuselage was as before made with balsa formers, slightly thicker, however, and balsa longerons and stringers.

This new Atalanta was a lot better, and from tow line launches last year gave regular flights of a minute with maxima of 93 and 117 seconds. This year, after more experience, I have had regular flights of 90 seconds with one maximum, unfortunately not timed with a stop clock, of 3 minutes.

My main criticisms of Atalanta are as follows:—

1. If the model is built to specification using all balsa, it is much too light for F.A.I. rules, and is ridiculously weak. There is too much of a Wakefield design about it. The sixteenth balsa stringers are not thumb proof, and will not stand the rough treatment given to a glider.

2. The knockout wings work admirably, but when they do knockout in a crash, they either go forwards and pierce the balsa covering in the front, or backwards and break the longerons and stringers.

3. The tailplane and fin fixing is rather complicated and rigid, and several times the tailplane has been ripped off by striking trees, etc. I see that Warring now prefers a knockoff tailpiece as in Aeolus (March, 1943).

4. Although a fixed-incidence wing is satisfactory on theoretical grounds, I would prefer to have a wing whose incidence could be changed just for experimental purposes. The only variable on Atlanta is the movement of the centre of gravity.

5. The tow hook given in the drawings is too short and at the wrong angle. I prefer it to be $1\frac{1}{2}$ inches long and at about 10° with the horizontal. The fixing should be very firm and allow no side play.

I consider that Atalanta is very good looking, and when strengthened is an excellent model. I cannot understand why Warring does not prefer it to Aeolus. He could easily put a high tailplane on Atalanta and improve it still more.

So that my criticisms are not empty, I have built Icarus II. to see what I can do. It is a mid-wing high tailplane slab-sider. It could easily be built of hardwoods completely, although I prefer balsa in the tail and the wing T.E. and L.E. The wing incidence is variable, and the knockout wings do not pierce the fuselage. The hish tailplane method of fixing is Warrings from the March "Aeromodeller."

The slab-sided fuselage is much stronger, and I doubt if the drag is much higher, if any, than a streamliner.

The model has the following weights:—

Fuselage and Fin ..	71 grams.	2.50 ozs.
Wings—Port.. ..	30 ,,	1.06 ,,
Starboard ..	29 ,,	1.02 ,,
Tailplane	14 ,,	.49 ,,
Nose and Rod ..	34 ,,	1.20 ,,
Tongue	20 ,,	.71 ,,
	198 ,,	6.98 ,,
F.A.1 weight ..	262 ,,	9.24 ,,
To be added	64 ,,	2.26 ,,

Continued from page 952.

EXAMPLE:

5″ radius airscrew, G.M.P. = 12″.

Rate of revolution (for cruise) = 27 r.p.s.

Therefore $\omega = 2\pi \times 27$ rad./sec.

V = 20 ft./sec. Blade section R.A.F. 32.

Actual pitch $= \frac{20 \times 12}{27} = \frac{80}{9\frac{1}{4}}$ i.e., approx. 9″.

$\theta - \phi$ = 32° 30′—25° 27′, i.e., α = 7° 3′.

L/D R.A.F. 32 at this angle of attack = 1/14.

Therefore tan γ = 1/14, i.e., γ = 4° 5′. (See Fig. 4.)

Seg.	r″	r³	Blade angle θ	ϕ = $\theta - \alpha$	$\phi + \gamma$	f (ϕ, γ)	dA	$r^3 f(\phi.\gamma)$ dA
A	.5	.125	75 20′	68° 17′	72° 22′	N	egligible.	
B	1.5	3.375	51° 51′	44° 48′	48° 53′	1.31	1.213	5.36
C	2.5	15.625	37° 23′	30° 20′	34° 25′	1.11	1.77	29.47
D	3.5	42.875	28° 37′	21° 34′	25° 39′	1.05	1.792	80.70
E	4.5	91.125	23°	15° 57′	20° 2′	1.02	1.366	127.00

For convenience, the expression $\frac{\cos(\phi+\gamma)}{\cos^2\phi \cos\gamma}$ is written f (ϕ, γ) in the above table.

Hence, on multiplying the sum of the sum of the right-hand column by $\frac{4C1\rho}{27m_1r_1}$ we have x in inches. Taking representative values of m_1 and r_1, say, $\frac{1}{8}$ oz. and 2″, $x = \frac{4 \times 1{\cdot}16 \times {\cdot}00238 \times 242{\cdot}53}{27 \times \frac{1}{8} \times 2} = {\cdot}399$″, say, ·4″.

SINGLE BLADED AIRSCREWS.

by F. G. IRVING.

At present, single-bladed airscrews enjoy considerable popularity with aeromodellers, largely, I suppose, on account of the ease with which they may be constructed. The balsa shortage may also have something to do with this.

However, generally speaking they suffer from the disadvantage that although they may be perfectly balanced statically, when in flight severe vibration is set up. This is because the line of action of the resultant thrust is situated at some distance from the axis of rotation, and hence produces a couple of varying magnitude and direction in conjunction with the drag. (See Fig. 1.) If this line of action can be made to pass through the axis of rotation, all will be well.

It has long been realised that this may be done by bending back the counterweight until the moment of its centrifugal reaction about point O on the axis was equal to the moment of the resultant thrust about O. In this article I propose to show how the distance of "sweepback" may be calculated. In the "AERO-MODELLER," for March, 1942, Mr. R. Watson gave a method for determining this experimentally. However, his method suffered from the disadvantage that the moment of the **static** thrust was balanced against the moment of the centrifugal reaction, so that in flight the airscrew would still be slightly unbalanced dynamically.

The reader would be well advised to consult "Airscrews for the Aeromodeller," by R. H. Warring, before reading the theory which follows, although most readers should be able to apply the final formula.

Referring to Fig. 1, let us consider an airscrew as shown, the mass of the blade being m_1 lbs., and the distance of its C.G. from the axis being r_1 ft. Similarly, m_2 and r_2 refer to the counterweight. The point 0 is the foot of the perpendicular from the C.G. of the blade on to the axis. Let the sweepback of the counterweight relative to 0 be x ft. Let the velocity of the machine be V ft./sec., and let the angular velocity of the airscrew be ω radians/sec.

Consider an elementary strip of blade, at distance r from the axis, of width dr, and of chord c. Then from Fig. 2, the resultant vel., Vr, is given by

$$Vr = \frac{r\,\omega}{\cos\phi} \qquad \text{——— 1.}$$

where $\text{Tan}\ \phi = \dfrac{V}{r\,\omega}$

The lift produced is thus given by

$$dL = Cl\,\frac{\rho}{2}\,cdr\,Vr^2$$

$$= Cl\frac{\rho}{2}\,cdr\frac{r^2\,\omega^2}{\cos^2\phi} \qquad \text{——— 2.}$$

The resultant of the lift and drag forces $dR = \dfrac{dL}{\cos\Upsilon}$

Therefore, substituting,

$$dR = \frac{Cl\ \rho\ cdr\ r^2\ \omega^2}{2\cos\Upsilon\cos^2\phi} \qquad \text{——— 3.}$$

The element of thrust dT, will be given by

$$dT = dR\cos(\phi+\Upsilon)$$

$$= Cl\,\frac{\rho}{2}\,cdr\,r^2\,\omega^2\,\frac{\cos(\phi+\Upsilon)}{\cos\Upsilon\cos^2\phi} \qquad \text{——— 4.}$$

Hence the moment of this force about 0 will be dTr, where

$$dTr = Cl\,\frac{\rho}{2}\,cdr\,\frac{r^3\,\omega^2\cos(\phi+\Upsilon)}{\cos\Upsilon\cos^2\phi}$$

Therefore the moment of the resultant thrust about 0 equals

$$\frac{Cl\ \rho\ \omega^2}{2}\sum_0^R\frac{r^3\cos(\phi+\Upsilon)}{\cos\Upsilon\cos^2\phi}\,cdr. \quad \text{lb.-ft.} \qquad \text{——— 5.}$$

The moment of the centrifugal reaction of the counterweight about 0 will be

$$\frac{m_1\,r_2\,\omega^2\,x}{g} \qquad \text{——— 6.}$$

On equating (5) and (6), and solving for x,

$$x = \frac{Cl\rho g}{2m_2\,r_2}\sum_0^R\frac{r^3\cos(\phi+\Upsilon)}{\cos\Upsilon\cos^2\phi}\,dA \qquad \text{——— 7.}$$

where dA = cdr, the area of the element of blade.
Now for static balance, $m_1\,r_1 = m_2\,r_2$.
Therefore equation (7) becomes

$$x = \frac{Cl\ \rho\ g}{2m_1r_1}\sum_0^R\frac{r^3\cos(\phi+\Upsilon)}{\cos\Upsilon\cos^2\phi}\,dA \qquad \text{——— 8.}$$

This gives x in feet when r_1 and r are in feet, dA in sq. ft. and m_1 in lbs. On converting these quantities to more convenient units, viz., ins., sq. ins. and ounces, this formula finally becomes :—

$$x = \frac{C4\ Cl\rho}{27m_1r_1}\sum_0^R\frac{r^3\cos(\phi+\Upsilon)}{\cos\Upsilon\cos^2\phi}\,dA \quad \text{inches.}$$

That, I fear, looks rather apalling, although in practice it is fairly easy to manipulate. If the reader wishes to design his airscrew in a scientific manner, most of these quantities will be required in any case. (The reader is again referred to "Airscrews for the Aeromodeller") In fact the only ones which remain to be determined are m_1 and r_1.

The former is obviously determined by weighing the blade on an accurate balance. To obtain the latter, two small paper tabs are stuck to the blade with water-soluble glue approximately in the positions shown in Fig. 3. The blade is then suspended by means of a pin through one of the tabs. The C.G. lies vertically below the point of suspension, so a vertical line is drawn in soft pencil through this pt. This procedure is repeated for the other tab, and the point of intersection of the two lines gives the position of the C.G. Its distance from the prop. shaft is then carefully measured.

It will be noted that the airscrew cannot be balanced for the whole flight, since ϕ will be continually changing and hence Cl and Υ. If we use the values of ϕ, Cl and Υ used to obtain the thrust and torque our airscrew will be dynamically balanced when it is aerodynamically most efficient, assuming correct design. For the rest of the flight, it will be slightly out of balance.

In conclusion, an example is given illustrating the application of the above formula. The single bladed airscrew is taken as being half of the 10-inch prop designed in Appendix 11 of "Airscrews for the Aeromodeller." It should also be noted that the mass of the wire supporting the weight has been neglected, but if so desired, formula (6) may be suitably modified.

The prop should be assembled with the weight a little too heavy. The wire is bent back the calculated amount, and the weight is then filed down until static balance is obtained.

Continued on page 951.

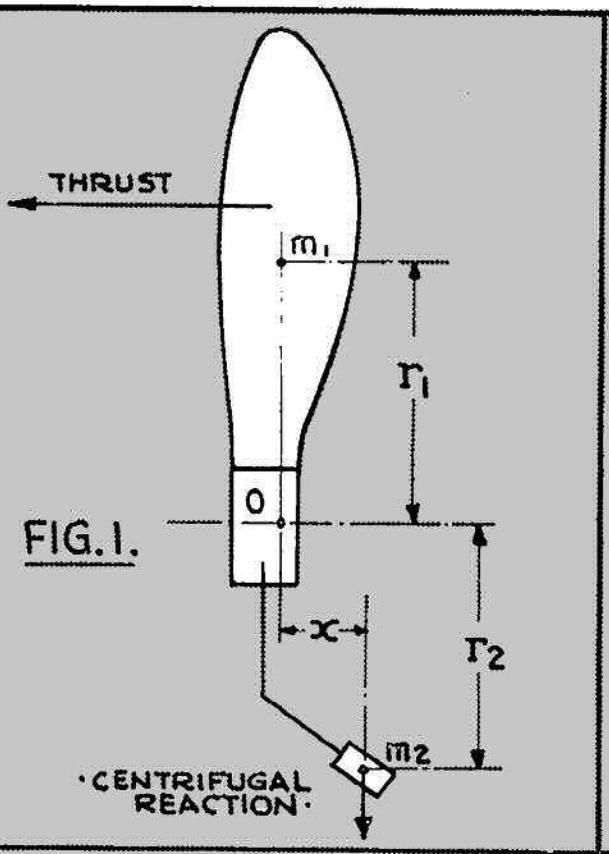
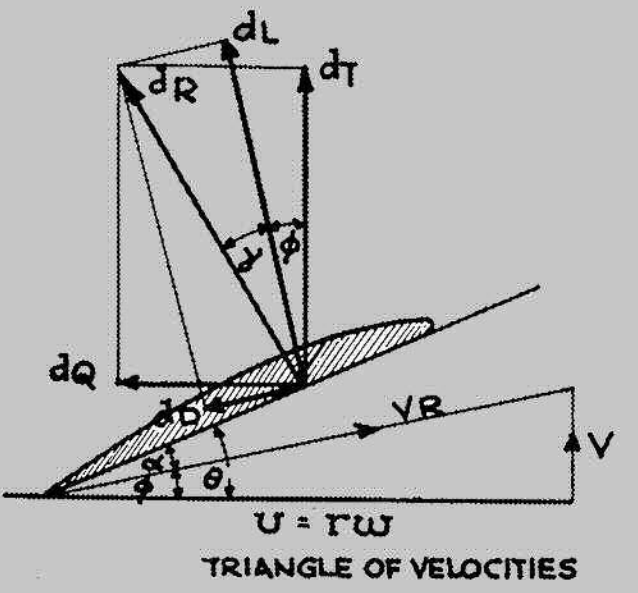


FIG. 1.



TRIANGLE OF VELOCITIES

FIG. 2.

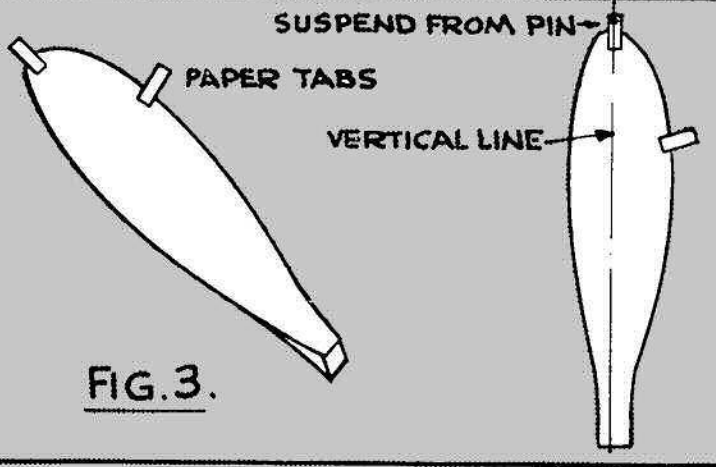
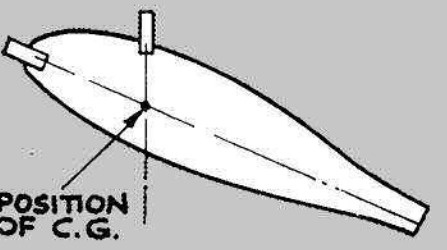


FIG. 3.

TO DETERMINE POSITION OF C.G. OF BLADE.



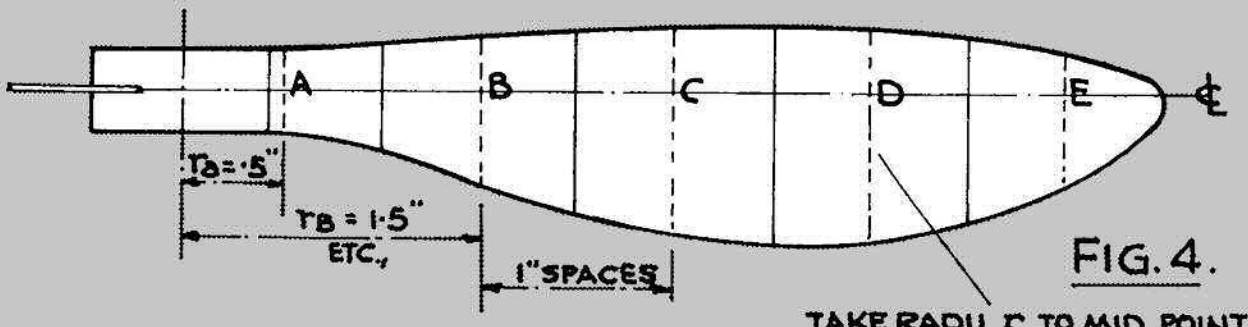
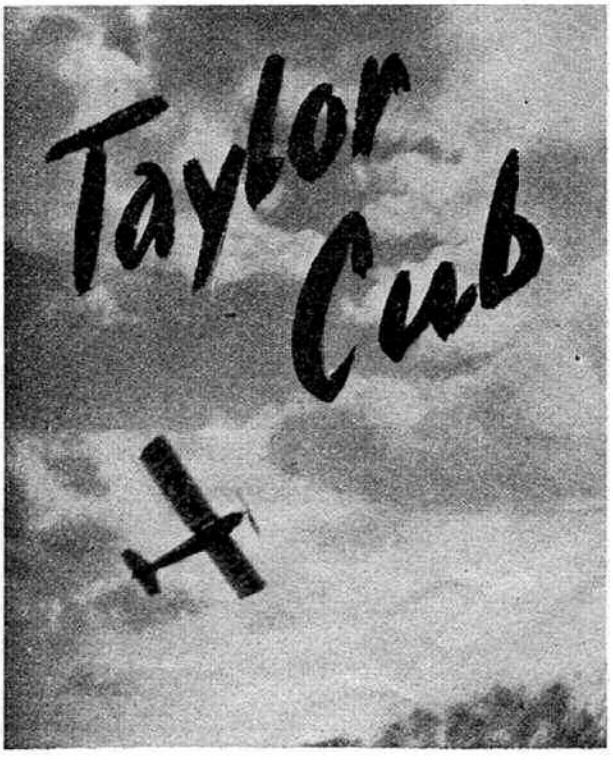


FIG. 4.

TAKE RADII r TO MID. POINTS OF SEGMENTS. ALSO TAKE BLADE ANGLES AT THESE POINTS.

BLADE ANGLE θ AT ANY POINT

$$= \frac{GMP}{2\pi r}$$



By R. COLEMAN

The flying scale model here described is quite easy to build, and is very light, the construction being quite normal. It is a high wing model, has a large wing area, and this, together with plenty of rubber as motive power, makes the 'plane very similar in many respects to the normal duration model, therefore it is very easy to adjust for flying and no doubt many beginners will find it an ideal "first" flying scale model.

FUSELAGE.

The construction of this is normal, being a box frame structure with $\frac{1}{16}$" sheet balsa formers. The main framework is of $\frac{3}{32}$" sq. balsa, top stringer of $\frac{1}{8}$" by $\frac{1}{16}$" and other stringers $\frac{1}{16}$" sq. The nose of the fuselage is covered with $\frac{1}{32}$" sheet on sides and $\frac{1}{64}$" sheet on top and bottom. $\frac{3}{32}$" sneet is used to hold the motor fixing dowel, also for fillets at aluminium tube which takes the bottom end of the wing struts. The undercarriage legs are also of $\frac{3}{32}$" sheet (streamlined), these being braced with $\frac{1}{16}$" by $\frac{1}{32}$" streamline bamboo cross struts. The wheels are $1\frac{1}{4}$" dia.: of the "doughnut" type, either celluloid or balsa, and are mounted on spring wire axles of 22 s.w.g. piano wire which are bound to the bottom ends of the undercarriage legs. Retain the wheels on the axles by soldered washers. The noseblock should be carved from hard balsa. Note the 1 mm. ply former which is glued to the front of the fuselage. The propshaft assembly is quite easy to build and the type of freewheel shown is well known, and avoids any weakening of the propeller. Fix dummy engine cylinders on the nose, and the way to make these is shown on plan. Silver dope the cylinders after fixing. Note tailskid, which is of piano wire at rear end of fuselage.

The wings are detachable, by the method described in the Aero Modeller by Mr. Howard Boys in his excellent article in Flying Scale Models. The complete centre section is cemented securely to top of fuselage, and the wire pins which hold the wings to the correct incidence should also be well cemented, and sewn with cotton to the vertical pieces of $\frac{3}{32}$" sheet balsa. The two $\frac{1}{16}$" ribs are faced with 1 mm. ply. Cover the centre section with $\frac{1}{32}$" balsa and cut out the top window to the shape shown by the broken lines.

WINGS.

The wings each have 6 $\frac{1}{32}$" ribs with holes cut in to reduce weight and 5 solid $\frac{1}{16}$" ribs: $\frac{3}{32}$" sq. leading edge: $\frac{1}{4}$" trailing edge: wing tip of $\frac{1}{16}$" sheet, supported by two vertical pieces: main spars top and bottom of $\frac{1}{16}$" sq. balsa. Between the two base ribs on each wing there is a piece of $\frac{1}{16}$" sheet fitted between the $\frac{1}{16}$" sq. spars, to which the wire hooks are securely fixed. There are two other vertical $\frac{1}{16}$" sheet pieces between these ribs, as shown on plan. The base ribs are faced with 1 mm. ply like the centre section, and the holes in these ribs in which the centre section wire pins fit, must be made accurately to avoid the wing being at an incorrect angle of incidence. Note the two brass tubes on each wing bound to the 5th rib (from the tip) with strip of jap tissue: these tubes take the top ends of the bamboo "V" struts.

TAILPLANE AND FIN.

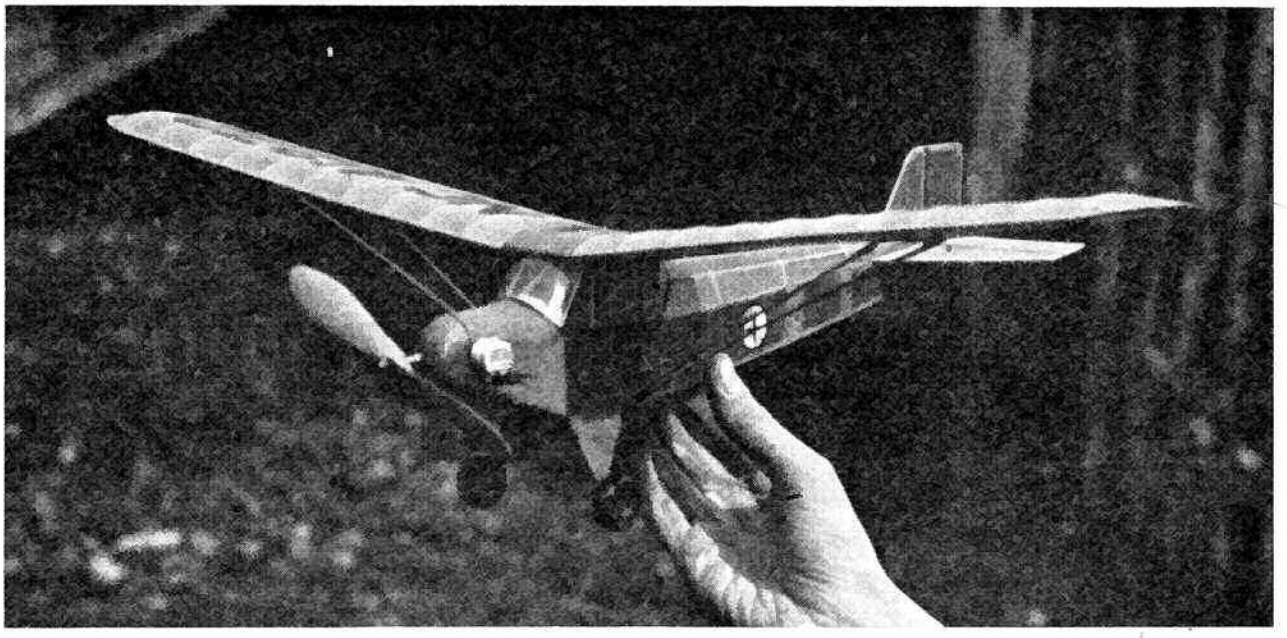
The tailplane is made in two halves, each half has three $\frac{1}{32}$" ribs and one $\frac{1}{16}$" rib, with a $\frac{1}{16}$" sq. spar on top. The leading and trailing edges are $\frac{1}{8}$" by $\frac{1}{16}$" balsa. The ribs should be sanded to a streamline section after the parts are off the building board. In front view, the tailplanes should taper from $\frac{3}{16}$" at the base to $\frac{1}{16}$" at the tip. The fin has a main spar of $\frac{1}{16}$" sheet, tapering towards the top, and the ribs are cemented each side of this, otherwise the construction is the same as for tailplanes. The tailplanes are cemented (after covering entire model). on a line with the top $\frac{3}{32}$" sq. longeron on fuselage at rear end. Thus the tailplane is at a negative angle of incidence to the thrust line.

AIRSCREW.

The size and shape of the airscrew blank is shown on plan, to be carved from medium hard balsa wood, with the blades slightly undercambered. Leave the boss strong with plenty of wood round it. If you prefer a ready made prop. purchase a 7" dia. by $1\frac{1}{4}$" pitch, with wide blades. The rubber motor is 8 to 12 strands of $\frac{1}{8}$" rubber 19" long, and "plaited" to avoid slackness in fuselage when motor is unwound.

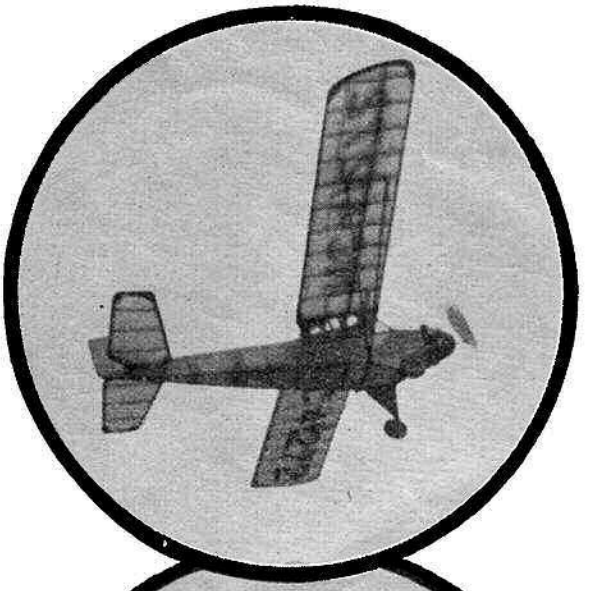
COVERING.

The model may be covered with jap tissue, red for the fuselage, fin, and centre section, and silver for the wings and tailplane. The registration letters are cut from black tissue and doped on, and read NC 41272 outwards from centre section on top of right wing (looking towards nose) and underside of left wing. The cabin windows are of cellophane fixed with a water glue and outlined with $\frac{1}{16}$" wide black tissue strips. The front windscreen should be made of celluloid so that the curved shape will be retained. Colour the wheels black with red centres and the prop and struts may be silver. Spray the entire model with water and when dry give one coat of clear dope. For a better looking model, coloured dopes should be used on top of the coloured tissue, but the performance of the model would no doubt be less, due to the increase weight.



FLYING THE MODEL.

No trouble should be experienced in flying this model providing the wings, tailplane and rudder are not warped. The plane should be adjusted for a flat glide before putting on the turns, and if the model stalls on the power flight, put downthrust on prop by means of packing between noseblock and former A. Turns should be put on the motor with a winder and a separate ring will be required on the front end of the motor to facilitate this. After the turns are on, the ring is slipped over the propshaft hook and the noseblock placed in position. This can be avoided if you have the airscrew non-removable and form a winding ring on the front end of the propshaft, but should you be unlucky enough to have the airscrew break you will find it almost impossible to straighten out the ring in order to replace the propeller. Thus a complete new shaft would have to be made.

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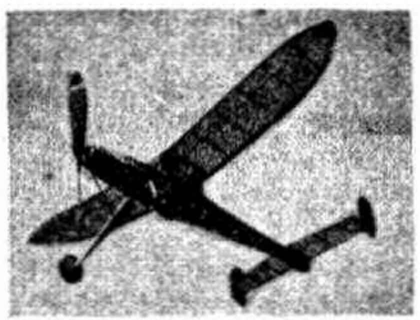
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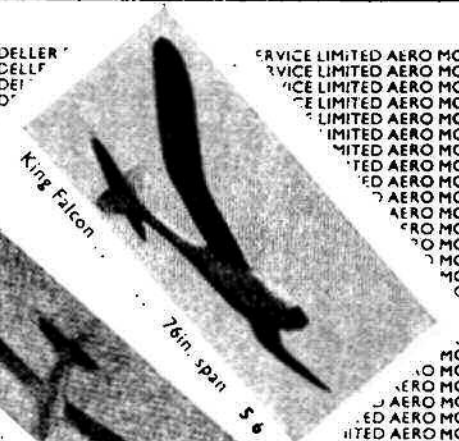
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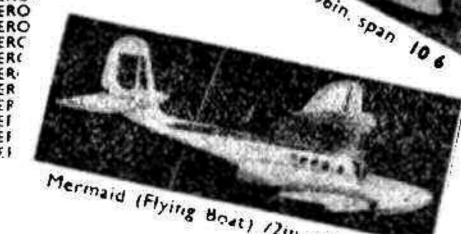
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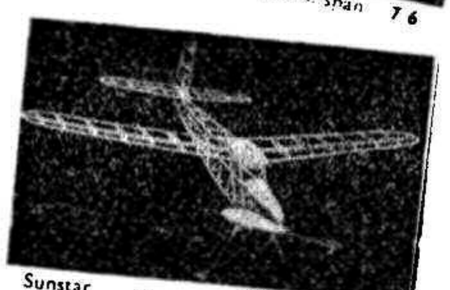
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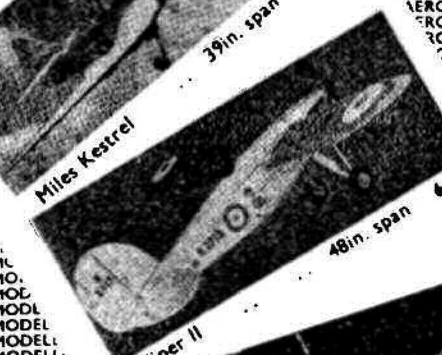
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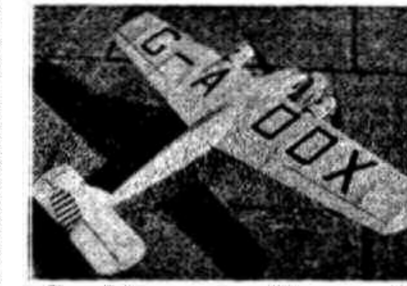

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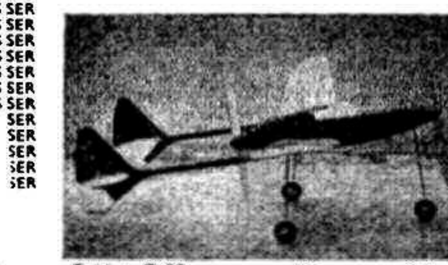
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R.F.L.G.53 (tailless)	48in. span	2/–
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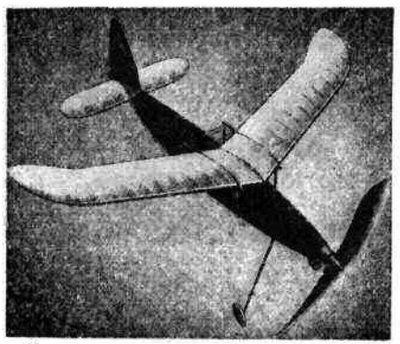

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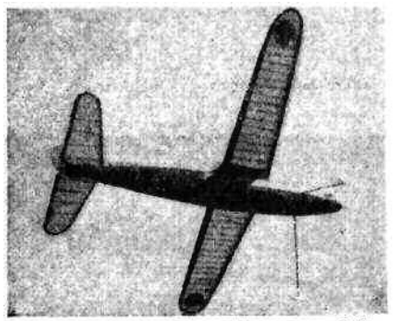

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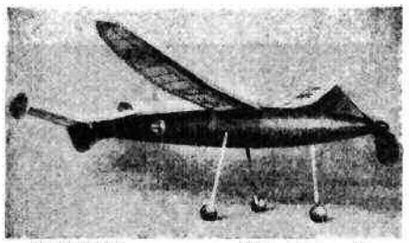

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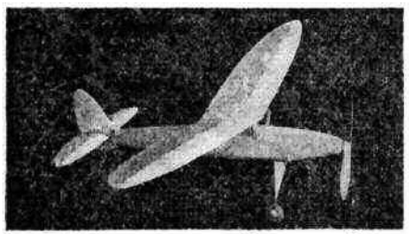
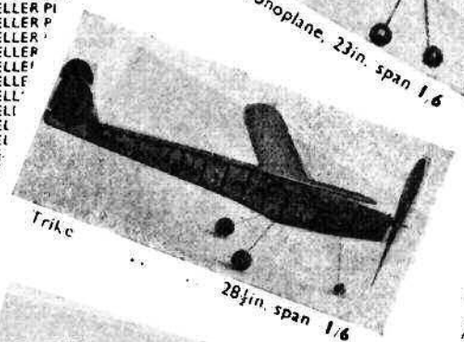
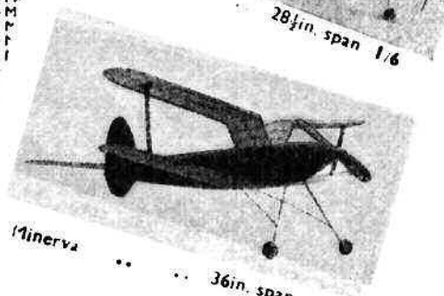


Big Stuff .. .. 68in. span 7/6

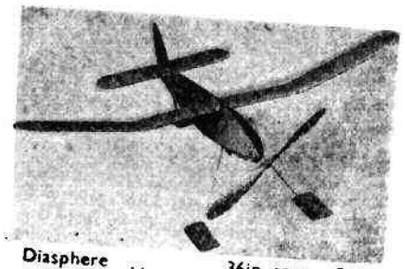
A.M. Cabin Monoplane, 23in. span 1/6



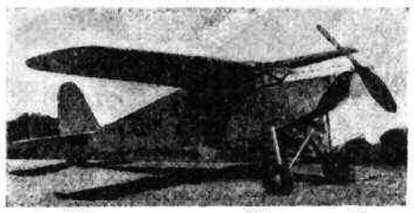
Trike .. .. 28¼in. span 1/6



Minerva .. .. 36in. span 2/6



Diasphere .. .. 36in. span 2/6



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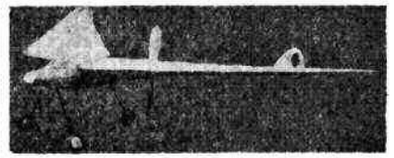

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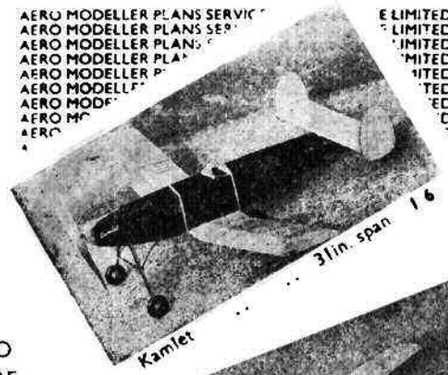

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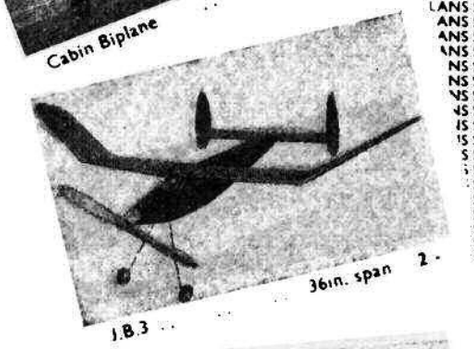
Cabin Biplane .. 29in. span 1/6



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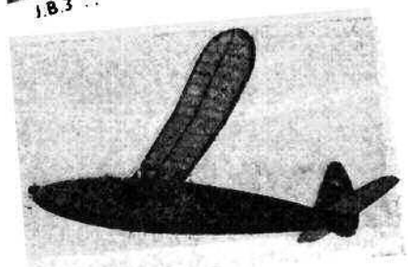

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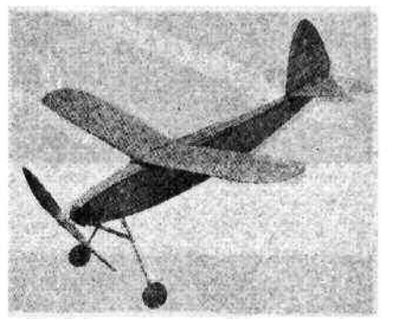

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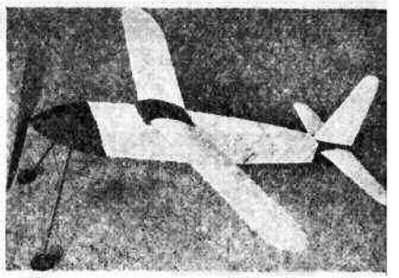
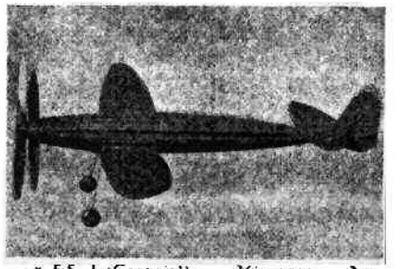
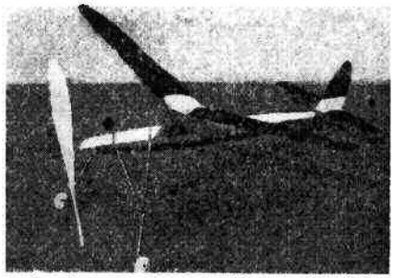


Isis .. .. .. 44in. span 3/6

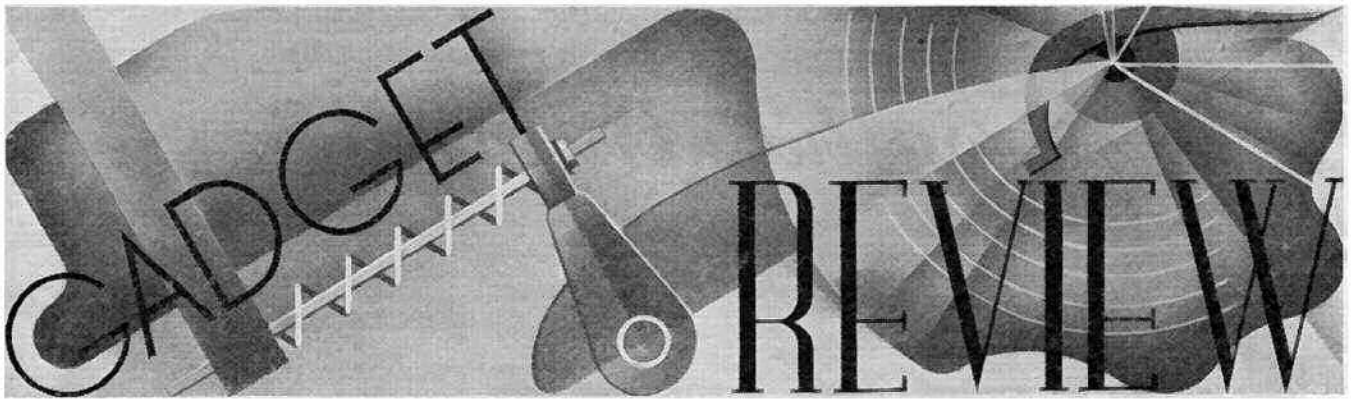


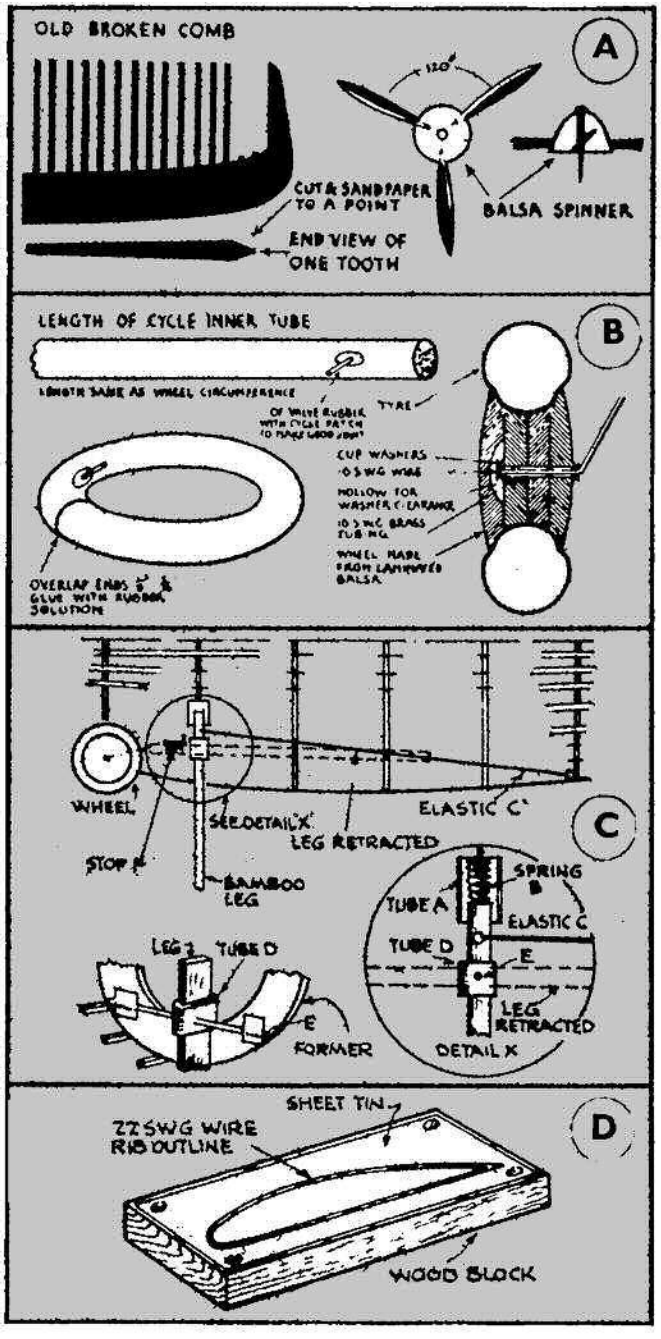
X F.S. 1 (Co-axial) .. 36in. span 3/-



Firefly .. .. 34in span 2/6

All Drawings including details of parts are shown full size





"A" AIRSCREWS FROM OLD COMBS, by V. MAITLAND.

The teeth of an old comb (preferably black) can be made to serve as excellent airscrew blades for solid models. Before cementing into a balsa spinner the blades should be filed or sanded to shape and pointed at the "root" end. In the case of a three-bladed airscrew the blade positions should be marked 120° apart. The blades are then pushed into holes in the spinner and cemented.

"B" CYCLE TUBE WHEELS, by D. C. POOLE.

A length of cycle inner tube equal to the circumference of the wheel, has a valve, consisting of a short length of cycle valve tubing, let in. A small patch is glued around the joint. The ends of the tube are then brought together and glued, an overlap of $\frac{1}{8}$" to $\frac{3}{16}$" being allowed.

The wheel is made up of laminated balsa as shown and the tyre attached and inflated. For this operation a cycle valve is pushed into the valve tubing. When the desired pressure is reached the valve is removed and the tubing doubled over, bound with thread and pushed into the wheel groove.

Care should be taken not to over inflate as any weak spot in the tube will bulge under excess pressure.

"C" A MONOWHEEL RETRACTING UNDERCARRIAGE, by R. GALLAGHER.

In this method of retraction there is no movement of the centre of gravity, and the wheel may be made to move backwards or forwards according to the need of the builder.

When the model is on the ground the leg compresses spring B and the leg remains detracted. When the model becomes airborne the leg is expelled from the tube A and (in this case) is pulled backwards, by the elastic C, and slides through the tube D, which is pivoted at E and E_1. The stop F is placed in such a position on the leg that the centre of gravity is not altered when the leg is in the fully retracted position.

"D" A RIB MARKER, by R. GALLAGHER.

The rib outline is scribed onto a piece of sheet tin of suitable size. A length of 22 S.W.G. is bent to the required shape and soldered to the tin, using the scribed outline as a guide and starting at the leading edge. The marker may now be screwed to a block of wood, using flat-headed screws and countersinking. For use the rib outline may either be impressed direct on the wood to be used, or an outline made by using the marker in connection with an ink pad.

"E" A METHOD OF ENLARGING CURVES, by R. GALLAGHER.

On a large piece of tracing paper about one hundred lines are drawn radiating from a point. A point is then picked on the original drawing which can easily be fixed on the enlarged drawing, such as a certain length from the nose along the fuselage centre line. The tracing is then turned over and placed on the original with the centre of the radiating lines over the chosen point. The outline of the original is now traced.

To enlarge the curve twice the line PA is produced to AB so that PB equals twice PA. This is repeated with each of the radiating lines and the points joined in a smooth curve.

When the new outline is finished with it may be erased from the tracing paper, but the radiating lines, being on the reverse side, will remain for further use.

"F" A FUSELAGE SECTION, by R. GALLAGHER.

This section should be useful to modellers. The method of drawing the section is shown in the diagram. The area is calculated as follows:—

$$\text{Area of figure}$$

$$A = \left[\tfrac{1}{2}\pi(2r)^2\right] + \left[\pi r^2 \frac{106{\cdot}333}{360}\right] + \left\{\left[2\pi(6r)^2 \times \frac{36{\cdot}83}{360}\right] - \left[\frac{4r \times 3r}{2}\right]\right\}$$

$$= [\pi 2r^2] + [\pi r^2 \times {\cdot}295] + 2\,[(\pi 36r^2 \times {\cdot}1024) - 6r^2]$$

$$= 6{\cdot}284r^2 + {\cdot}92689r^2 + 2\,[11{\cdot}68267r^2 - 6r^2]$$

$$= 18{\cdot}5762r^2 \qquad \therefore \sqrt{A} = 4{\cdot}31r$$

where r = the radius of the smallest circle.

For rubber driven fuselage-models $\sqrt{A}$ should equal $\frac{1}{10}$ where 1 = length of model. A = area of section.

"G" TRANSPARENT COCKPIT COVERS, by J. BUTTERFIELD.

The shape of the cockpit cover or turret is taken from the blue-print, traced onto a suitable block of hardwood, and carved to shape. When shaped this pattern is smoothed with very fine sand-paper and placed on a wet sheet of glass after being soaped to prevent it sticking to the mould.

PYRUMA Fire Cement is now built round the pattern in a solid block, Fig. 1. The whole is then slid off the glass and the pattern removed, care being taken not to disturb the smoothness of the mould. The mould may now be baked in an over or in front of a fire until thoroughly dry and hard. Allow to cool.

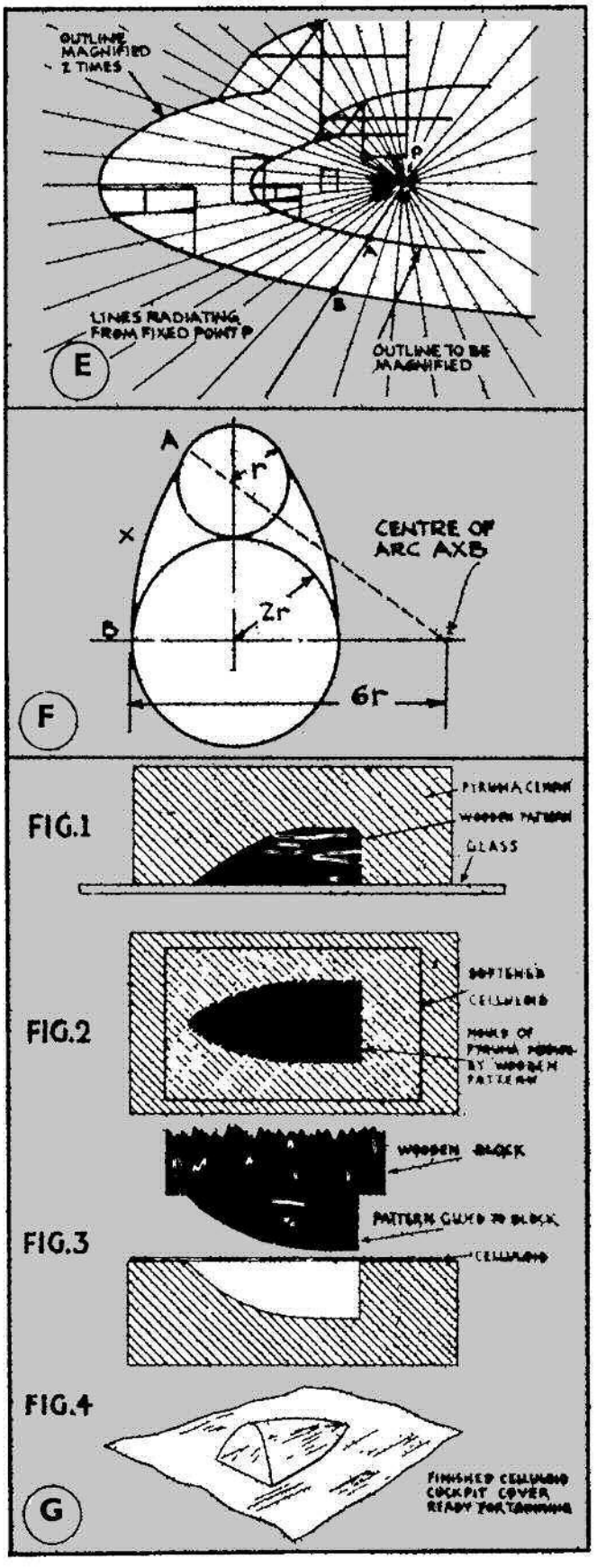
The pattern is now reduced $\frac{1}{16}$" all over to give clearance for the celluloid. (Note: No wood should be removed from the flat bottom of the pattern.)

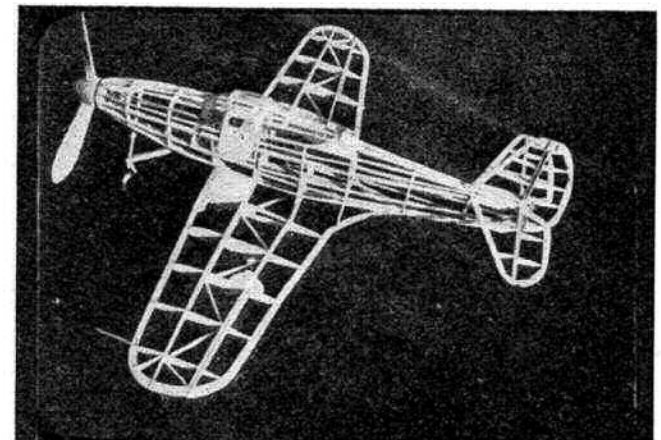
Select a piece of celluloid $\frac{1}{16}$" or $\frac{1}{32}$" thick (old film with the gelatine removed by soaking in hot water containing a little soda, serves the purpose very well), and cut it 1" larger, all round, than the mould.

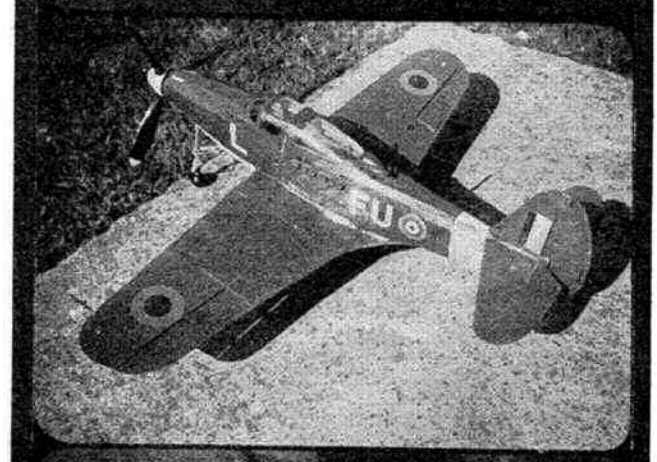
The celluloid is then soaked in boiling water for a few seconds and when soft is placed quickly on the mould and pressed into the pattern, Fig. 2. (It is advisable to glue the pattern to a piece of wood about 2" by 1" by 1' before carrying out the above operation as by this means greater pressure and ease of handling may be obtained) Fig. 3. After pressure has been maintained for a few seconds, the pattern and celluloid may be removed, and the surplus removed from the finished cover.

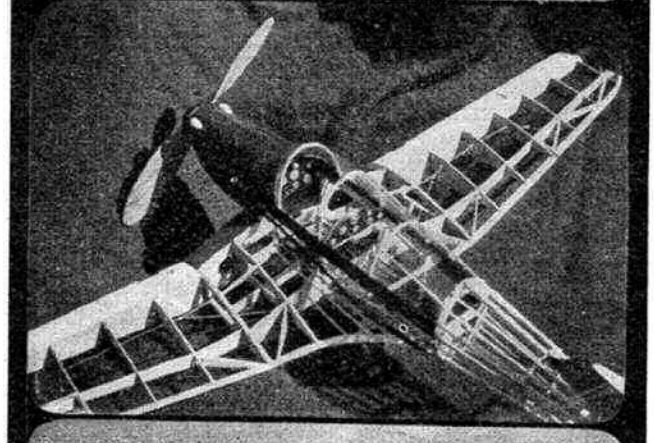
Finally, the cover or turret is made fully transparent by rubbing with a small cotton wool swab moistened with amyl acetate.

The moulds when finished with may be stored indefinitely.









MODELS & PHOTOGRAPHY

by F. B. KEEN

●

SCARLET RANGER

36" Span All Weather General Purpose Model

This attractive looking general purpose high wing model, of which plans and photograph are shown on the right hand page, will be found to be a consistent performer even in English weather (not always abounding in thermals).

Wings and fuselage are cross braced and a lifting tail section is employed. The construction is straight forward and no difficulty should be experienced if a careful and methodical study of the plan is made before building operations are commenced.

28" SPAN BELL AIRACOBRA

An uncovered view of this model is shown top left and immediately below is the completed job. This model is particularly well finished and is a consistent performer, which is not always the case with flying scale models of this type. It has the advantage of movable control surfaces. The tricycle undercarriage will eliminate to a great extent the risk of "nose over" landings.

MILES KESTREL

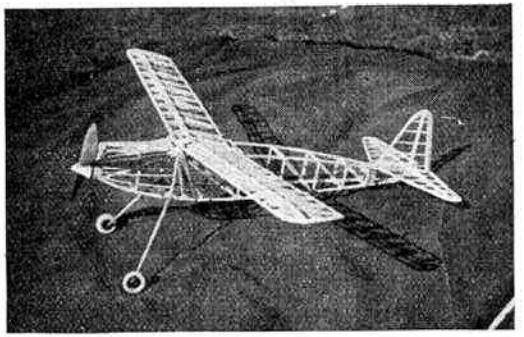
This model, a photograph of which is below the Airacobra, has been developed from the Miles Kestrel plans obtained from the Aeromodeller Plans Service. The detailed dashboards in the two offices are clearly visible and add greatly to the appearance. Note also the cockpit cover, this is an extremely neat piece of modelling.

Movable controls are incorporated, the control wires of which can be seen passing through the wing ribs.

HAWKER "DEMON"

A very excellent photograph of this model in flight is shown bottom left. It is well finished and contains plenty of detail. The Lewis gun is most realistic, even to the extent of a ring sight. The pilot's ring sight for the forward firing armament can be seen just under the centre section.

All of the flying scale models shown on this page are of a high standard, together with the very interesting prints, they demonstrate Mr. Keen's ability, not only as a aeromodeller, but also as a photographer.



2° DOWNTHRUST
3/32" SQ.
1⅝"
1⅝"
OFFSETS TO ℄ 1½"
· 2" DIA. WHEELS · 16 G. WIRE U/C · 11" TRACK ·
· LEGS FAIRED WITH BAMBOO ·
1/8" SHEET
1/8" SQ.
1¼
5/8"
HOLE FOR PEG
½"
½"
HALF LAP
N2
3/32" SQ
1/8" SQ.
18 G. SHAFT FREEWHEEL BUSH
3/32"
1/8" SHEET
BIND WITH THREAD.
2½" 2½" 4¾" 3" 3" 2½" 2" ⅞" 3"
24⅛"
PROP. 12" DIA.
1⅜"
¼" × ⅛" BAMBOO
1¼"
1 1/16"
¾
5/8"
1/8" SHEET.
TOP ONLY
⅛" PLY NOSEPIECE

· FUSELAGE · ⅓ FULL SIZE ·

LONGERONS ⅛" SQ.
STRINGERS 1.2.3 & 4 3/32" SQ.
1
2
3
4
⅛" SHEET.
GLUE CUT OUT TO PLY NOSE

· N2 · FULL SIZE ·

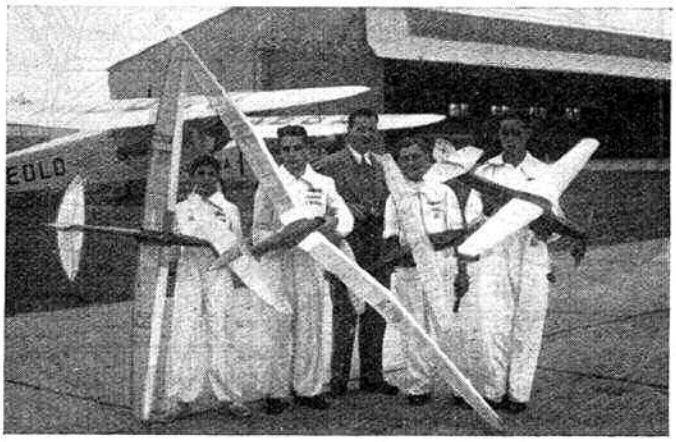
⅛" SHEET ON UNDERSIDE
½" ¾"
¾"
½ × ⅛"
⅛" SQ.
1/16" RIBS
BAMBOO PEG
CEMENT TO TAIL
1"
¾"
3" 2"

3" 2"
1 7/8"
6½"
⅛" SQ.
SPAR ⅛" × 5/16" TO ⅛" × ⅛"
½" × ⅛"
⅛" SHEET
½" ¾"

PORT TAILPLANE · ⅓ FULL SIZE ·

6° DIHEDRAL ON LAST RIB
18"
PEG
⅛" × 1/16"
1½"
1¼"
PAPER HINGE UNDER.
4"
HOOK FOR RUBBER BAND SOLDERED TO U/C WIRE
¼" × ⅛" BAMBOO
⅛" × 1/16"
¼" × ⅛"
PEG
⅛" SHEET.
· PORT WING · ⅓ FULL SIZE ·
1° SWEEPBACK
1/32" SHEET TOP & BOTTOM.
RUBBER BAND

CONTINENTAL MODEL SAILPLANES



ARTICLE 2

ITALY

L·G· TEMPLE

The models built in Italy before the war ranked amongst the best in the world, though they had not the same fame and publicity as the German sailplanes. In design they were outstanding from an aerodynamic standpoint, though the practice did not always come up to the theory, and some of their constructional features were rather poor. On the whole, however, they were models to be reckoned with wherever model sailplanes were flown.

There is a reason for their fine design: these models were generally built by students of the Italian State Schools for aeronautics, for which the Fascist regime was well-known. Unlike the German schools for aeromodelling, which had pupils of quite an immature age, the Italian schools resembled the American colleges of aeronautics, and catered for youths and young men who, on leaving their normal school, decided to make a career in aero-engineering; so the work done in Italy's establishments was necessarily much more advanced than that carried out in the German schools. This, then, is the main reason why the average model sailplane built by an Italian enthusiast bears such a striking resemblance to the full-scale aircraft: he used his models to initiate himself into the whys and wherefores of full-scale design.

Most of the models were large, spans of 10 and 11 feet being quite usual; in fact, anything under 7 feet or so was considered a small model. Nearly all were gull-winged, showing the influence of full-scale practice, which was still further apparent in the proportions of the models; these proportions were often almost "scale." By this I mean that most Italian models had an abnormally high aspect ratio, rather short fuselages, and remarkably small tailplanes. If I had not seen replicas of these machines flying in extremely hot, gusty winds off mountain peaks in Southern Europe, I should not have believed they could be as stable under adverse conditions as they actually were. As a matter of fact, the Italian teams did remarkably well at the International Model Sailplane Contests held before the war, though, in this country they were not seen at the King Peter Cup Contest. By-the-way, the two Italian designs for which the Aeromodeller Plans Service publishes the plans are not very representative of Italian design: they are much smaller than average, and the methods of construction are those of the designer rather than of the usual Italian aeromodellers, but these two models do show the national liking for the semi-scale type of model.

In construction the models were composite, using a fair amount of balsa as well as various kinds of hardwood, with metal fittings. The balsa was generally used for wing and tail-unit ribs and for fuselage planking on semi-monocoque structures. Usually, though, the fuselage was made from fretted plywood formers with a large number of spruce or pine stringers, and fabric-covered. Cane was occasionally employed for stringers. Although the vast majority of fuselages, except those of elementary design, were well streamlined, the use of planked or monocoque construction was limited. More usual was a system of filling in the spaces between formers and stringers with small balsa blocks; this is a needlessly difficult and weak method. Sometimes the fore part of the fuselage was covered with strips of thin veneer such as birch or poplar.

The wings were nearly always mounted to the fuselages by means of stub extensions of the two mainspars; shoulder-wing designs, for the greater amount of streamline possible with this type, were more widely used than high-wings, and parasol types were practically unknown in Italy. The two mainspars, set at approximately 25 per cent. and 60 per cent. of the chord, were plugged into holes in the main fuselage bulkheads, which were often widened at this point to form fillets. This method gives great rigidity until something begins to wear, when it becomes sloppy unless the stubs are attended to. In a hard landing the half-wings spring outwards, but in a real crash something is bound to break, and it is usually the wing that goes. Perhaps it is for this reason that Italian wing design was so simple.

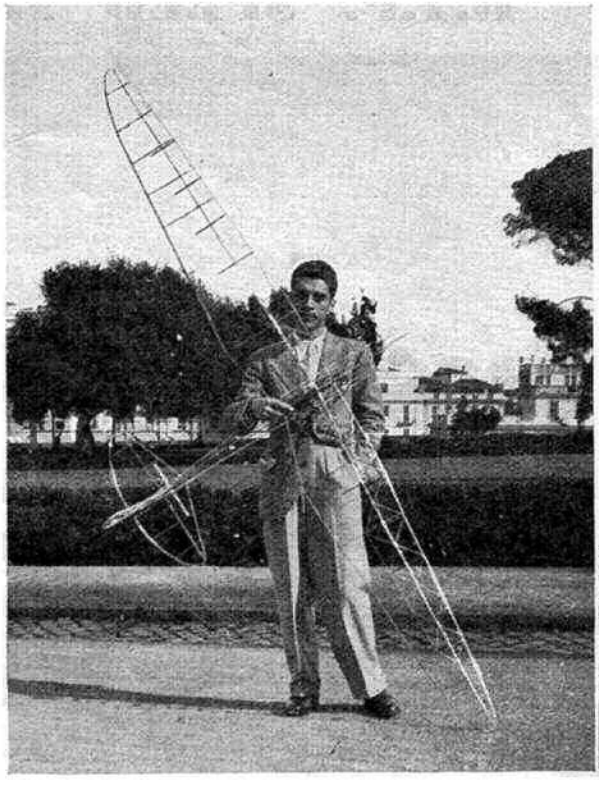
There seems to have been no particular preference of woods in the wing construction, some ribs being ply, fretted out for lightness, and some were balsa. Spars, however, had to be very strong on such large, high aspects ratio wings, so they were almost universally made of hardwood : most of them were either box spars or semi-box, with spruce flanges and ply or hard balsa webs or half-webs. Leading and trailing edges were hardwood too. The former were frequently strips of round reed cane glued into notches in the nose portion of the ribs, while ply trailing edges were popular, though they warped very badly and could easily be distorted on the flying field on sunny days. Like the Germans, the Italians did not extensively use sheet covering for the leading portion of their model wings, but they nearly always stiffened this portion with a sheet of heavy paper or parchment, damped and stretched before application and put on when dry. This helped to provide torsional stiffness but it most certainly did not prevent that horrible sagging of the covering that occurs between the ribs of so many models of all types. Funnily enough, I have never come across an Italian model with half-ribs, though the full-rib spacing was by no means close.

Tail units were of the simplest possible construction. A single hardwood spar with widely-spaced balsa or fretted plywood ribs, and outlines of cane, steamed spruce, or sometimes aluminium wire constituted the usual layout. Tailplanes were non-lifting, set at a slight negative incidence relative to the datum line of the model, and were of a thin biconvex section ; some form of adjustment for incidence was often provided. Fin trimming tabs were very uncommon, but the automatic rudder was just gaining popularity when Italy entered the war.

Most Italian models were well finished, but one extraordinary thing was that the covering—which was only thin tissue in nearly all cases, even on the largest models—was always inadequately doped, and in some instances not doped at all. There was a model in one of the International contests in Switzerland that had an undoped wing, and its chances were spoilt because the day was damp. It gained third place, but if it had had well-waterproofed covering, I expect it would have flown far better.

One very striking thing about all the models was their general clean design. They appealed to me in particular because thy were not put together with a lot of large elastic bands ; when bands were used, they were generally concealed somehow. The paintwork, too, was good, some of the balsa-covered fuselages being almost up to car-body standard.

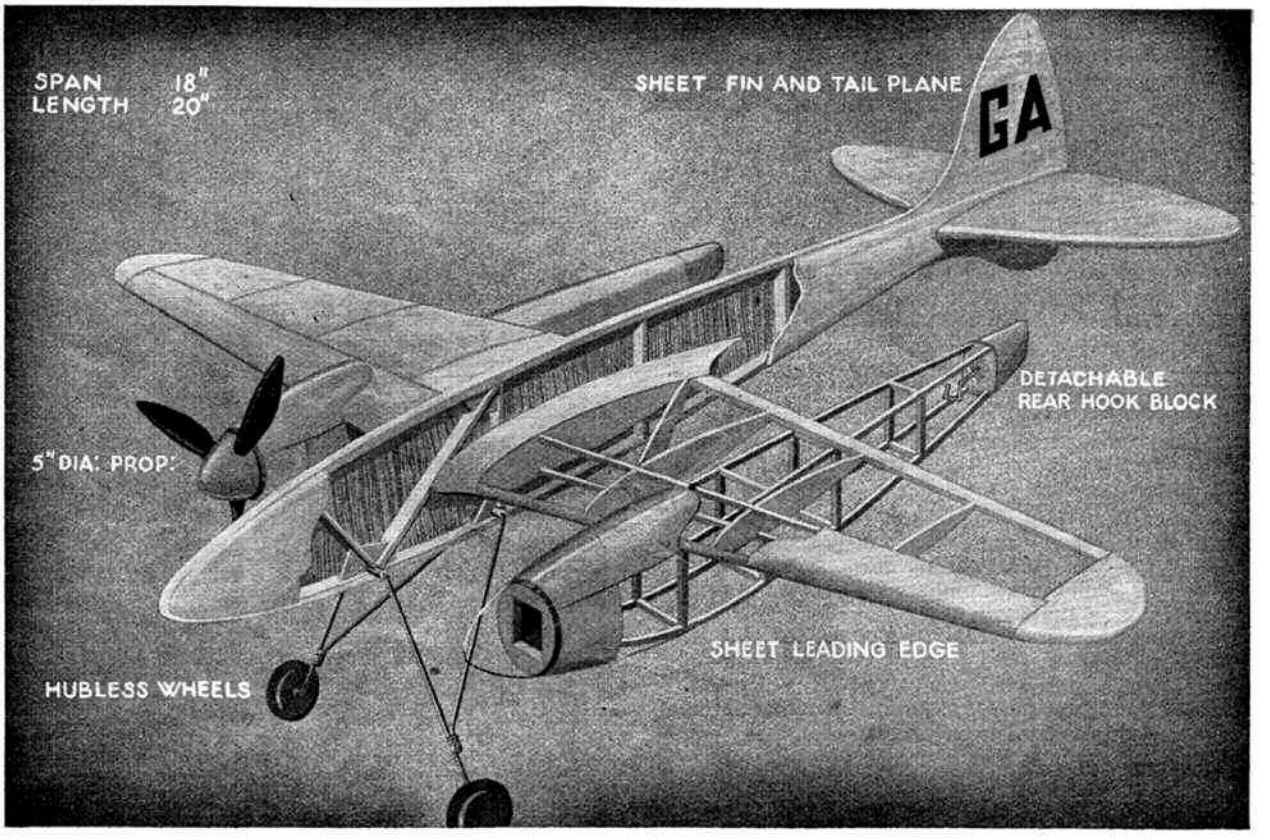
The Italians did not go in for radio or other remote control systems. The keynote of their sailplane design was an uniform high standard of excellence, but they did not shine as far as originality was concerned.



The centre figure in the group on the opposite page is F. Ziac, the well-known American designer. Some idea of the delicacy in construction of pre-war Italian gliders is shown in the photo above and of their average size in the photo below.

R.T.P. SPEED MODELS.

By GORDON ALLEN.



Since the advent of indoor flying, numerous members of the local aero club have focussed their attention on the design and construction of indoor speed jobs, with the intention of flying them round the pole at speeds ranging from 50 to 100 m.p.h.

Alas ! our expectations have not altogether materialised. However, we *have* learned a great deal through heartbreaking (and 'plane breaking !) experience, and it is therefore my intention to record here a few of the main items which should prove useful to others when designing this type of machine.

We found that a 'plane with ultra-short wings, coupled with a fast revolving airscrew driven by half a pound of rubber was *not* the solution to speed. The creation simply shot from the ground, tugged at the tethering cable, swung round, and then entangled itself in said line until the pole put further evolutions out of the question.

Although I cannot claim that a model has yet been built embodying *all* the following features, many of them have been incorporated in recent designs with good results. As the art of flying the pole at high speed is not yet fully developed, allowance must be made for experimental ideas.

First of all a streamlined fuselage is made to securely anchor the wings and tail surfaces. It is better perhaps to have all surfaces rigid, i.e., not detachable, for at high speeds anything can happen. This fuselage can be very slim, for, as seen in the sketch, the motors are housed in the outboard nacelles.

The nacelles are " built into " the wing in such a way as to house two independent motors (one in each nacelle). These motors are wound from the back, and both should be very powerful The airscrews should be three-bladed and of small diameter, large blade area, and very fine pitch, and means of adjusting the pitch is beneficial and offers scope for useful experiment. Making the props from sheet aluminium makes the adjustment possible by the simple process of bending. All bearings must be true and strong. If a very light gearbox can be designed, such a unit could be fitted to each motor.

To prevent damage to the airscrew on landing, a good undercarriage must be utilised employing the single legged, piano wire type with small wheels for low drag. Retraction should be avoided for a beginning.

The wings must not be too short. Nine-tenths of the overall *length* of the model should be ample—say 18 inches.

A thin, high speed type airfoil section should be used while that employed on the tailplane should be of the non-lifting variety.

The tailplane must be on the large size, i.e. greater than one-third the area of the mainplane. The rudder should be no bigger than that employed on a duration model of similar dimensions. The entire model should be thinly sheeted and polished.

Tail surfaces can be made from flat sheet.

Note.

(1) The airscrews must revolve in opposite directions to eliminate torque.

(2) Dihedral may be orthodox.

(3) Place the engines as near to the fuselage as is practicable.

(4) Aspect ratio of wing to be about 7.5 to 8.

(5) Use a strong line on the pole !

If patience and perseverance are coupled when exploring this field of model aeronautics, I can guarantee you a reward of a thrill a second.

THERMAL HUNTER

BY TED ALEXANDER

JERRY built good models. We all admitted that. "We" being Marcella, Jerry's beautiful blonde sister, and myself. I happen to be included all because of a certain strong affection for Marcella.

Yes, Jerry could design and build good models, but the Thermal Hunter was his greatest creation.

We—Marcella and I—happened to be passing the shop the day Jerry was putting the final touches to the ship.

One look at Jerry and we could tell he was excited and another look at the top of the workbench got us excited too! There she was, the nicest looking petrol model I had ever seen, all ready to make the test.

It was a beautiful silver-winged monoplane with smooth lines built in from propeller to rudder and from wing-tip to wing-tip. The tail section was one of Jerry's pet ideas, a built-up affair that prevented the backwash from the wing dragging on the elevators, thus increasing stability. The motor mounts were set in rubber to prevent vibration. Really clever!

Well, Marcella was all for testing it right then and there, but Jerry and I voted her down. The wind was of the damaging kind.

We decided that the next morning, early, would be best, so we arranged to meet at the smooth field top of Turn o' Buckle Hill. So bright and early the following day I dragged myself from a warm bed and after a hasty breakfast, ambled my way over to the hill. Jerry and Marcella were already there and impatient for the tests.

I don't know what dazzled me most in the early morning sunlight, the silver model or Marcella.

Jerry gave the ship a few practice glides and then filled the petrol tank to capacity. This was to save time, he explained, as he wanted to make extensive power tests while the morning calm held.

My job was to hold the long string attached to the ignition and run alongside the model as she took off. When Jerry would blow his whistle, I was to pull the string shutting off the motor. This sounded easy, but if only I knew then what was to happen . . .

Jerry let her roll down the smooth ground and I ran alongside. Slowly, almost majestically, she rose into the air. It was beautiful to watch and I guess that is how it happened.

For just as I got the signal to pull the switch, my foot caught on a shovel some fool of a farm hand had left in the field and I went sprawling. When I recovered there was the ship high in the morning sky, a distant silver object fast heading out over the North Sea.

Poor Jerry. He just stood there staring dumbly at his love fading out of sight. Six months' work gone with the winds. Jerry was real decent about it, but Marcella—well, she was different. She won't speak to me or have anything to do with "the clumsy ox," as she calls me.

So I lost my love, too. That is why I haven't taken these items from the papers down to Jerry. They have me wondering.

Oslo, Norway, Oct. 5, 1939. A fishing boat in the North Sea reported today having seen three German reconnaissance 'planes suddenly turn and flee for Germany when discovered by a small silver 'plane of unusual design, evidently of British origin. It was believed the Nazis feared an attack by the mystery 'plane which came upon them at high altitude.

London (same date). The War Office denied to-night that any British "mystery" airplane was patrolling the area mentioned in the Oslo despatch and could offer no explanation of the report.

PETROL TOPICS

DR. J. F. P. FORSTER.

READERS have probably noted my own past remarks on the likely popularity of the scale-type model in this country after the war, and my most recent outpourings have all centred around this type of model, so much so that you may assume that I've lost all interest in any other type. So far as land machines go, this does more or less state my case at present, though I still find it necessary, or at least helpful in many cases to build an experimental semi-scale prototype such as the low-wing monocoque illustrated on this page before embarking on the final true scale model, especially when entirely new ideas not tried out in practice are to be incorporated, such as the wing fixing and knock-off extension prop.-shaft on that model

Reliable Flight-Timing for Flying-Boats.

The problem of timing flights in model flying-boats has caused me many headaches. Clockwork timers have always proved utterly unreliable on sea water, the havoc wrought by this on the tiny steel shafts and spring having to be seen to be believed. Even when a model has behaved perfectly and made smooth and "dry" landings, I have invariably found that if the clock is left untouched even for one night after an evening's flying, by the next morning it is a mass of corrosion and rust, and nothing will induce it to go until it has been dismantled and cleaned, and even after this, corrosion continues for weeks even if no further flying is done. The mere humidity and salt in the atmosphere seem quite enough to cause this. I have never been able to obtain one of the American Austin (compressed air) timers, but C.E.B. has used this type on water, with no better results than I have had with clockwork.

I ought perhaps to explain that although one may be flying on more or less open sea water, freer from obstructions than is the average size field with its inevitable trees, hedges and gateposts, nevertheless there are very definite boundaries consisting of dry land, either in the form of a rocky or stony foreshore, or even if a sandy beach, there are probably breakers in front of it and maybe cliffs or buildings behind it!

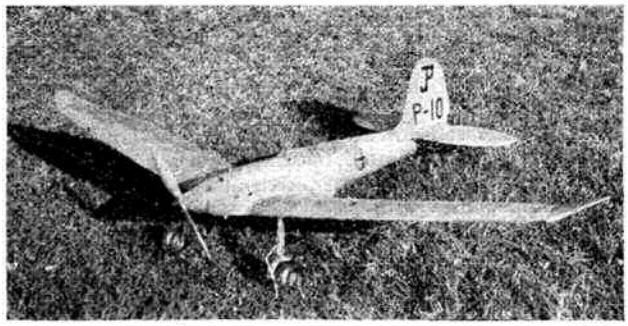
If a land machine fails to keep within the field of take-off there is usually another field the other side of the hedge (even if ploughed!!!) and with crashproof wings and stout undercarts, no damage usually results. It is, however, a most hair-raising and altogether unpleasant sensation to see one's flying boat accidentally heading for the shore (usually lined with curious and crazy crowds!), with the knowledge that the flight timer has failed to work and the tank is still half full. Unless by some great good fortune it decides to turn out to sea again, one can be quite certain that the hull bottom will inevitably be stoven in, and probably a complete write-off, including the engine, will result, if not worse consequences such as injuries to third parties.

The process of reasoning which led to the gadget to be described was roughly as follows:—However else it worked, a steel spring must be counted out. The same reasoning ruled out the use of steel shafts—in fact the whole thing must be made of copper or brass Whence the power to drive the gadget? I decided either elastic, with all the snags of replacing same in a water-tight hull, and the nuisance of having to wind it, and the inconstant torque for operating an escapement, or—yes, why not?—the slipstream.

Now, I realised that the power obtainable from the slipstream, unless one used an enormous "fan" with much drag, was only very small. This could not be expected to work a train of stepped up gears, and I had already decided against an escapement mechanism as this would not work without steel pins. I therefore decided to try a worm drive. I took an ordinary brass wood screw with a pitch of about 1/10 in. and selected from my junk box an old French clock wheel whose teeth happened to mesh just nicely with the worm on the screw. There turned out to be 78 teeth on this wheel. The screw was soldered to the end of a 16 gauge brass wire shaft and a little brass frame is built up to form bearings for this shaft. The clock wheel was also carried in this frame, meshing with the edge of the screw.

A small two-blader "fan" made from strip brass, and easily bent to alter the pitch of the blades, was soldered to the end of the first shaft carrying the screw. For every rev. of this shaft, the clock wheel moved one tooth, gearing being thus, 78 : 1. I found that when placed in the slipstream of a Cyclone at nearly full revs. the clock wheel revolved once about every two seconds. I therefore repeated the whole process by soldering another screw to the second shaft, which in turn meshed again with a second gear wheel running free on a third shaft. This wheel had 64 teeth, so that the total ratio was 4,992 : 1. The little "fan" evidently revs. at about 2,500 as it takes just over two minutes for the second wheel to complete one revolution.

This second wheel was the main driving wheel from a clock mainspring, and carried a spring-loaded dog engaging with a ratchet wheel with sloping teeth. The whole of this was retained (except that I replaced the dog spring with one made of spring brass) and the ratchet wheel was soldered to a 14 gauge brass shaft, on the inner end of which was soldered a cam, which operates a



Author's Experimental Low-wing P-10, referred to in this article, now in full regalia and "war paint."

strip of sheet spring brass made from a battery tag, breaking contact with an insulated tungsten "point" from a motor car contact breaker. After installation in the nacelle (or power egg) and sheeting in the upper half thereof, the other end of this shaft projects slightly through a hole, and to this end is soldered a pointer, for "setting" the desired time before take-off.

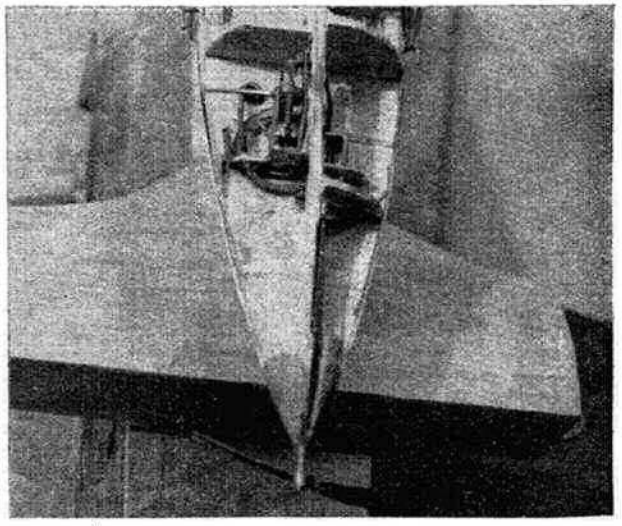
The actual timing, *in seconds*, of a flying boat's power flight is not nearly so important as being absolutely certain that the flight will definitely terminate within a reasonable (and adjustable) period of time. Trying to do this by rationing petrol is most unsatisfactory as the feed often becomes irregular towards the end, with a consequent succession of dives and zooms which may not have worn off by the end of the glide when the motor does finally peter out, and the chances of a nice smooth and steady "dry" landing are jeopardised.

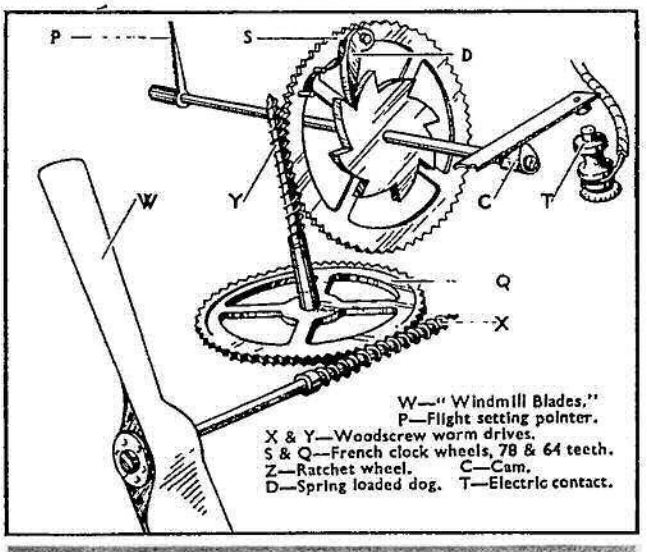
The power required to operate this double worm gear, with its fantastically low gear ratio of nearly 5,000 : 1 is infinitesimal. There is no stop fitted after contact is broken, as this would tend to put a strain on the worms. Contact is broken for about one-eighth of a revolution of the pointer, which is marked on the nacelle. The slipstream, even when gliding without power, is easily sufficient to drive the little prop. (about 2 in. in diameter), so that contact may be made again long before the model touches down, but this does not matter as the engine, once stopped, will not start up again, of course. Since I always use miniature accumulators for flying, in the same way it does not matter that the "wind-clock" starts working as soon as the engine is started up, as in any case I want contact for charging purposes from the booster. Just before take-off and disconnection of the booster, the pointer is set to the desired position for a flight (which *cannot* exceed two minutes, while it *can* be set to any lesser portion of the one revolution before the point at which contact is broken). The all-up weight of the gadget is ½ oz., and I am quite sure can be made much lighter, and certainly very much more neatly and compactly. It could of course be installed in the L.E. of a centre-section or wing of any petrol model.

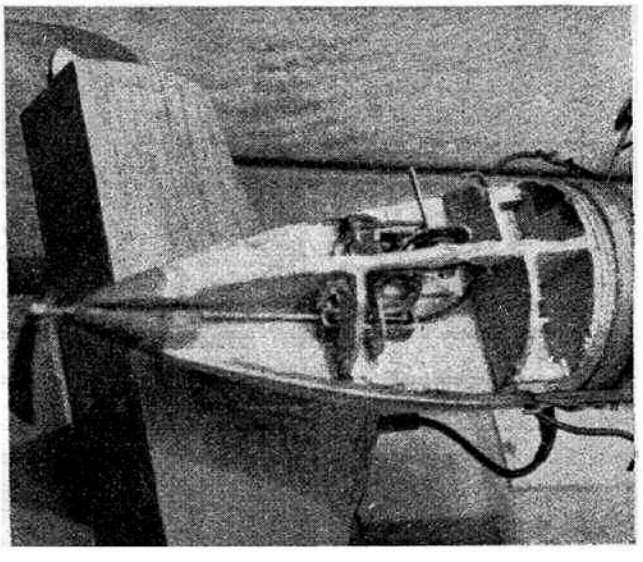
The accompanying photos show the "Forster Slip-stream Flight Timer"(II) installed in the nacelle of "Mermaid II." For those interested in "Mermaid I," the chief differences between the two models are also well shown in the photos :—"Mermaid II's" wing fixing is on the lines of the low-wing experimental model illustrated and described in the February and March issues of the AERO MODELLER, with a fixed L.E. of the centre-section carrying locating tongues at the outboard corners.

It will also be observed that the nacelle is also integral with this centre-section and hull. This makes possible hull testing R.T.P. under power, without the wings. This is proving very instructive, and is as thrilling as model speed-boat racing. I am hoping to get comparable speeds with those attained with water-screws. I also feel that if a hull behaves well under these conditions, retaining the fin and tailplane for stability, and gets up easily on to the step without the additional lift of the wings, then it is certain to be successful when these are fitted, and should unstick extremely easily. The "Slipstream Flight Timer" is proving infallible, and one can say with as much certainty as is ever possible in this most uncertain world that so long as the engine keeps going, so too must the timer, and failure is next to impossible.

THE FORSTER SLIP STREAM FLIGHT TIMER







"R.L.B. 4"

DESIGNED BY
R.L.BIGGS, A.R.Ae.S. AMIET

·FUSELAGE· ⅓ FULL SIZE ·

TOP

1½" 1½" 1⅜" 1¼" 1" ⅛" ⅛" SHEET

1¼" 2½" 2½" 2½" 2½" 2½" 2½" 2½" 2½" 2½" 1½" 4"

28" 3" 4⅛" 4½" 4½" 3¾" OVERALL DIMENSIONS.

CUT AWAY

1¾" 1⅛" 1¾ 2⅛" 1" 2½" TO OUTSIDE OF LONGERONS 2½" 2½" 2" 1¾" 1½" 1¼" 4" 2

F1 ⅛" SHEET

COVER ALL ROUND ⅛" SHEET.

F2 F3 F4 F5 F6

⅛" STRINGERS

⅛" SHEET PLATFORM

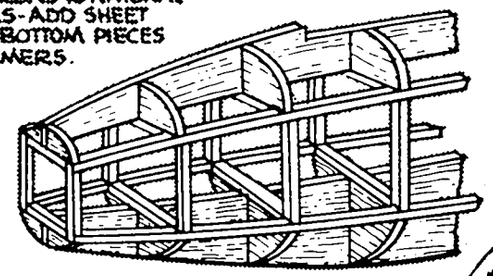
PAPER FILLET.

SECTION THRO' MOUNT.

1⅝" 1" 6½" ¼" ⅛"

WING BEARERS.

BUILD UP FUSELAGE LONGERONS TO NATURAL CURVES - ADD SHEET TOP & BOTTOM PIECES & FORMERS.



INTERCOSTALS & LONGERONS ⅛ SQ.

⅛" DOWEL LOCATES IN TAIL TUBE

⅛" SQ.

1/16" SHEET TO FIT TAIL SECTION

⅛" BALSA FACED WITH m/m PLY.

4"

A A

PAPER TUBE.

FILL UP TO FIT KEY ON TAIL.

KEY

DETAIL AT 'A'

⅛" SHEET SPAR REINFORCING PIECES.

⅛" Sq. 1½" 1½" 2"

7"

SPARS ⅛" SQ.

¼" x ⅛"

DIHEDRALLED TAILPLANE

THIS ANGLE IS IMPORTANT

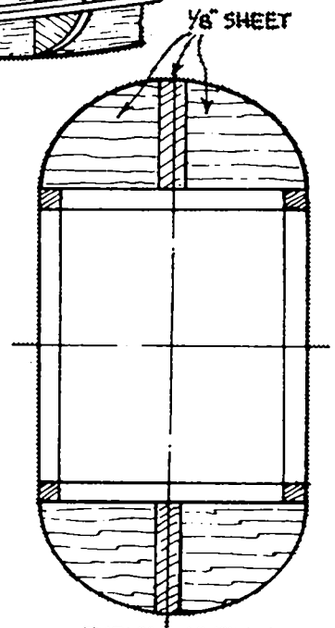
90°

PORT TAILPLANE. · ⅓ FULL SIZE ·

1/64" SHEET TOP & BOTTOM.

3" 1½"

⅛" SHEET



TYPICAL SECTION THRO' FUSELAGE.

FREE WHEEL

THIN PLY

⅛" HARD BALSA.

THIN PLY.

SPINNER

3"

BRASS SCREWED BUSH

CUP WASHERS

BALL RACE.

NOSEBLOCK · FULL SIZE ·

20 G WIRE

BEARERS PROJECT OVER PLATFORM AT REAR ONLY

WING ATTACHMENT BY RUBBER BAND.

PROP. 16" DIA. 24" PITCH
MOTOR · 12 STRANDS 28" LONG
3/16" x 1/36" WHITE TENSIONED
MAX. TURNS 600.

4"

2 RIBS BUTTED.

¼" SQUARES

½ ½

⅛" SHEET.

5"

2" 1½ 1½ 2" 2" 2" 2" 2" 1½ 1½ 1½ 1½

5" 14"

· PORT WING · ⅓ FULL SIZE ·

· TAILPLANE SECTION AT A-A · FULL SIZE ·

MAKE TAIL FLAT IN ONE PIECE CUT THRO' T.E. SPARS, L.E. [SECTION AT A-A] & BUILD IN DIHEDRAL · REINFORCE WITH 4-⅛ PIECES & SHEET OVER.

F3

GUSSET PLATES

WIRE HOOK.

RUBBER BAND.

8" TO WHEEL CENTRE.

⅛" SQ. BIRCH TAPERED

· UNDERCART DETAIL ·

AVERAGE FLIGHT 3 MINS. WITHOUT THERMALS.
CONSISTENT 2-2½ MINS. ON 450 TURNS.

VERY STABLE FLAT GLIDE CLIMBS IN 50 YARD CIRCLES TO RIGHT.

¼" SQUARES 3" 6"

¼ x 1/16 1/16 Sq

· FINS · 2 OFF
OUTLINE FROM ⅛" SHEET.

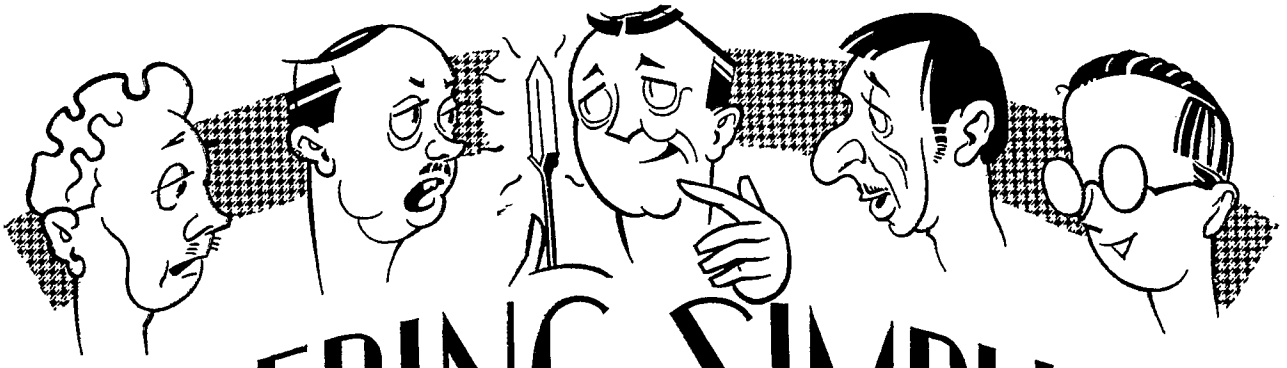
SPARS 1/16" SQ.

L.E. ⅛" SQ.

RIBS 1/16" HARD

SAND T.E. FROM ½" x ⅛"

· AIRFOIL SECTION · FULL SIZE ·



SOLDERING SIMPLIFIED

THOSE who do not wish to remain in the elementary stages of aero-modelling must learn to join metals. There are several ways of doing this, one being precision engineering on a miniature scale entailing costly lathes and the usual clockmaker's tools. By far the easiest and cheapest method is to use *soft solder* and the whole outfit need not cost more than four or five shillings.

Providing the correct equipment is procured soldering is no more difficult than cementing a wing together, but one thing wrong and failure is inevitable.

Too big a soldering iron makes work impossible. An electrician's iron with a copper bit ¼ in. diam. and 2½ in. to 3 in. long is ideal. The bit should have a flat taper and should be in line with the handle, not at right-angles. (An electric iron is ideal if procurable.) A gas ring rather than a fire should be used as the flame is clean and can be regulated.

The flux which is used to make the solder flow should be killed spirits of salts, Fluxite or Baker's Fluid or any really good brand suitable for soft solder.

Tinman's solder should be used and resin or flux-cored solder avoided.

The iron must have a good " face " put on, that is, the flats on the point of the copper bit must be covered with a thin film of solder *all over*. To do this, file the flat faces of the copper bit until bright all over. Take an old piece of bright tin, put a dab of flux on it and lay the end of the solder in the flux. Heat the iron until a bright green flame appears, when the iron should be hot enough to melt the solder at a touch. If pressure is needed to melt the solder the iron is too cool. Melt a little solder on to the tin and rub the face of the iron in the molten solder until it is coated and bright silver all over. Repeat for other faces, filing again if required and adding more flux. The iron should never be left in a high flame while working and should never reach red heat or the face will burn off. Should this happen it should be refaced at once as it is impossible to solder with a poor face. The faces of the iron should be rubbed while hot with a *clean* rag from time to time.

Grease in any form makes soldering impossible and therefore all surfaces should be burnished all over with fine glass paper. Should oil be even suspected the metal should be boiled in soda and water and burnished. Tinning is a valuable process especially in highly stressed parts. This is done by putting flux on the two portions to be soldered together, flooding solder on with a hot iron and quickly wiping off the molten solder with a *clean* rag. The two portions should be then neatly bound together with tinned copper wire (fuse wire), covered with flux and flooded with solder with a hot iron. Be generous with solder as the surplus is easily shaken off while molten. If you are not sure of the joint, re-flux and re-solder.

Where internal soldering is necessary, as in the spindle hole of a gear, the hole should be cleaned with a twist drill—not larger than the shaft—or a bit of shaft filed into a reamer, the shaft should be heavily tinned and not wiped and allowed to cool. The gear is then put on as far as it will go and after shaking the surplus solder from the iron the gear is heated by the iron until it melts its way into place. When cold, surplus solder should be scraped from the shaft with a knife, not a file. In 99 per cent. of cases this is a perfect joint, but as it cannot be examined I always make a coil of fuse wire ⅛ in. along the shaft and $\frac{1}{16}$ in. up the face of the gear and solder solid, forming a collar. This has proved 100 per cent. efficient with very heavy motors.

The prevention of solder running where it is not wanted is equally as important as soldering itself. A blob of solder between two gear teeth can never satisfactorily be removed. The usual practice is to paint the teeth with " Plumber's Black." Coloured dope is a good substitute, or even poster colours. The portions of shafts to fit in bushes should be protected in this way. When soldering on cup washers at the ends of these shafts to hold them in place, paper washers should be cut and a hole made to fit tightly on the shafts. These washers should be threaded on the shafts before the cup washers, that is, between the bush end and the cup washer. When soldering collets on the ends of a tubular bush, the bush should be plugged with matchsticks.

I have concentrated on gears chiefly because they cover all soldering at one go, but even Wakefield models require freewheels and undercarriages.

For those who cannot solder, my moral is :—

Pull your socks up and learn, there's nothing very difficult about it.

List of Materials.

1. Soldering iron with 2½ in. by ¼ in. copper bit.
2. Spirits of Salts *or* Fluxite *or* Baker's Fluid.
3. Tinman's Solder.
4. Plumber's Black *or* coloured dope.
5. Fuse wire.

Clean rag. Glass paper. Tin. Paper washers.

MONTHLY MEMORANDA

By O · G · THETFORD

An Interesting Warhawk.

Distinctly unusual markings are sported by P-40F Warhawk No. 114378 of the United States Ninth Air Force. This machine, which carries the name "Dammit" in small white capitals on the nose, has the United States "Old Glory" painted on the sides of the fuselage just ahead of the conventional star insignia. The flag is also painted beneath the port wing-tip in the place formerly occupied by the star insignia. It is painted roughly equal in size to the star (i.e. length equal to diameter) and the top of the flag is towards the leading edge. All other markings conform to regulation U.S.A.A.F. practice.

The Sunderland III.

The latest version of the Short Sunderland now serving with the West African Command of the R.A.F. and with several home-based units also, is the Mk. III. The Mk. III differs externally from the earlier models in having a power-driven four-gun dorsal turret amidships in place of the waist-guns manually operated in the old type. The system of white vertical surfaces and sides of fuselage first introduced on the long-range anti-submarine patrol bombers such as the Fortress, Liberator and Whitley has now been extended to include the flying-boats and all the new Sunderland IIIs are finished with white hull sides and white vertical surfaces. Squadron letters are in red.

The Heston Racer.

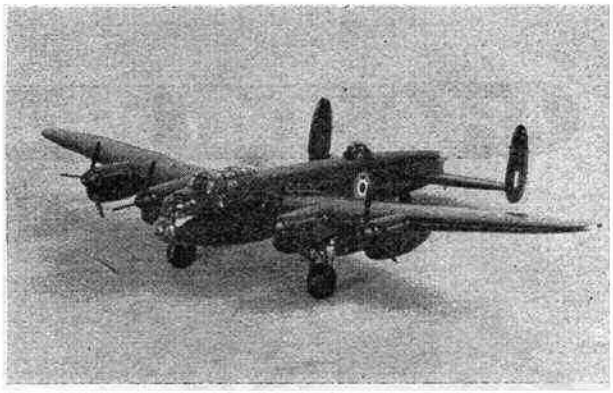
News of the Nuffield-Napier-Heston Racing monoplane of 1939 which was to have attempted the World's Landplane Speed Record for Britain had not an unfortunate crash intervened, has just been released officially. The history of the type was, however, well-known in the Aircraft Industry and by many of the better-informed members of the public too. Design commenced in December, 1938, and the first prototype was ready a year later. The first flight test was carried out in June, 1940, and ended in a crash in which the racer was wrecked. The construction of the second prototype was abandoned.

The racer was fitted with the first of the Napier Sabre motors and had a span of just over 32 ft. As a low-wing monoplane of wooden construction it was quite unlike anything attempted previously by the Heston Company. The wings had most of the sweepback on the leading edge. There was only slight taper on the trailing edge and not much dihedral. The fuselage lines reminded one of the Heinkel He 113, apart from the special radiator system.

The colour scheme of the Heston Racer has been the subject of a number of readers' enquiries. The type was silver all over and carried civil registration letters on the wings and fuselage in the usual locations. The registration letters were G-AFOK.

The Marauder.

Two versions of the Marauder built by the Glenn L. Martin Company are now operating with the United Nations Air Forces. First arrivals in this country bearing the R.A.F. roundel are of the original B-26A



1/72nd Scale Avro Lancaster made by Mr. H. Geall. This splendid model contains 6 hand carved men, a partly hollow fuselage, retracting undercarriage and opening bomb doors with model bombs.

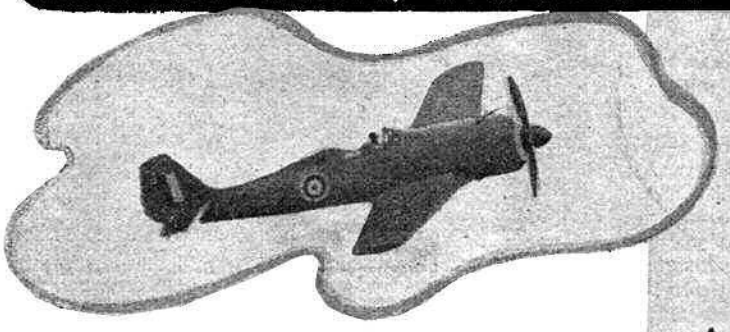
type with cone tail gun position which mounts a single ·50 calibre machine-gun. The Marauders in service with the U.S.A.A.F. in the Pacific area are of the B-26B variety with twin ·50 calibre guns in a normal tail turret, power operated. The bulk of the British order for Marauders is understood to consist of a revised version with increased armament and wing area. It is expected that the Marauder Is in this country will be used on medium bombing missions. Those seen on test hops prior to delivery to the squadrons have been finished with day bomber markings. A noticeable point is that the fuselage roundel is painted extremely far back, just ahead of the fin leading edge.

The Typhoon.

Home-based fighter squadrons have been operating with the new Hawker Typhoon for several months now. The prototype first flew on February 24th, 1940, and the first Typhoon squadron was formed late in 1942. Amongst the first squadrons to be equipped with the Typhoon is one which flew Hurricane Is all through the Battle of Britain and achieved a high score—"US" Squadron. On the Typhoons the squadron letters are painted ahead of the cockade on the port side and *vice-versa*. Typhoon IIB serially numbered EK 183, is machine "A" of US Squadron. Latest regulation cockades and flashes are standard. Camouflage is dark green and dark sea grey upper surfaces and sea grey medium lower surfaces.

In addition to the usual 18 in. band and duck-egg spinner the Typhoons are compelled to carry special recognition markings to enable ground gunners to identify them readily. In certain attitudes of flight (especially from directly below) the Typhoon bears a striking resemblance to the Focke-Wulf Fw 190 fighter and to prevent mistakes the Typhoons all carry alternate white and black bands painted chordwise on the inner sections of the under surfaces of the wing. Three parallel black bands a foot wide are spaced equidistantly on either side of the wing root against the white background. The outer black band is positioned midway between the two cannons. The rest of the lower wing surface outside this point is normal sea grey medium. On the upper surface of each wing a single white band painted chordwise extends aft of the inner cannon. Other Typhoons have four black bands beneath each wing and the outer band in this case is just outside the outer cannon installation. One Typhoon with four black bands beneath each wing, serially numbered DN 411, had a white nose, i.e. the whole of the beard radiator and the nose section ahead of the leading-edge.

AEROPLANES DESCRIBED VI



By H · J · COOPER

Next month
The Heston Napier Racing Monoplane.

THE existence of the Hawker Typhoon single-seat fighter monoplane was first made known to the public in April, 1941, the first flight having been made on 24th February, 1940.

The Typhoon has been in squadron service with the Royal Air Force for many months, and is one of the best aircraft flying with any air service in the world. It has a maximum speed of "over 400 m.p.h.," and can easily outclimb a Focke-Wulf Fw 190.

Basically the Typhoon is similar to the Tornado, which has a Rolls Royce Vulture motor. Design work was begun on the Tornado in March, 1937, and it first flew on 6th October, 1939. Neither the Tornado nor the Vulture motor is now in production.

A 24-cylinder Napier Sabre liquid-cooled sleeve-valve H-inline motor mounted horizontally is fitted to the Typhoon, and develops 2,400 h.p.

Access to the large cockpit is by a door on the starboard side; the roof is hinged on the port side. Above the cockpit a rearward-facing mirror is contained in a transparent streamlined blister.

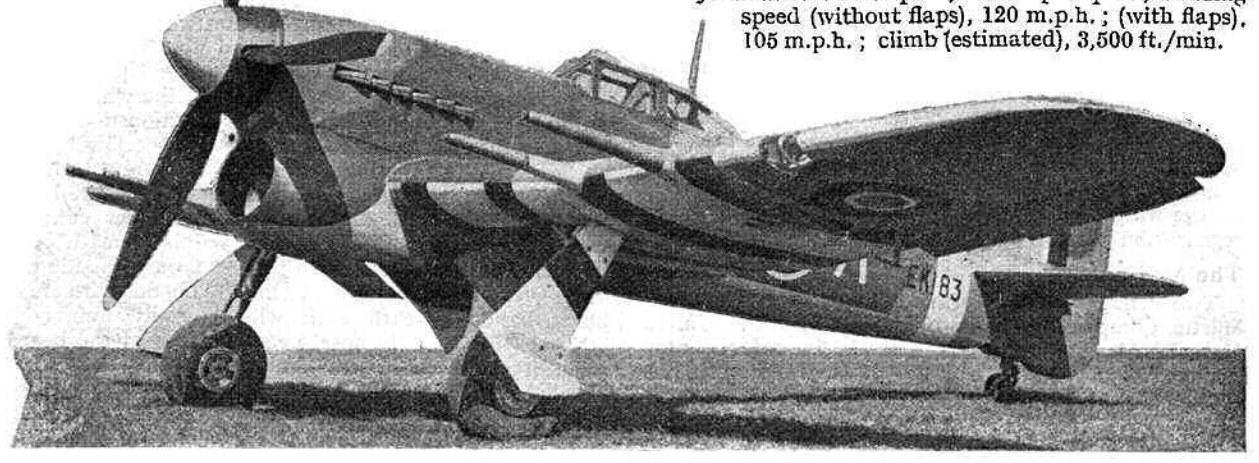
The Ia Typhoon is armed with twelve ·303 machine guns mounted six in each wing. The Ib (illustrated) has four 20 mm. guns. Mention has been made of the Typhoon as a bomber.

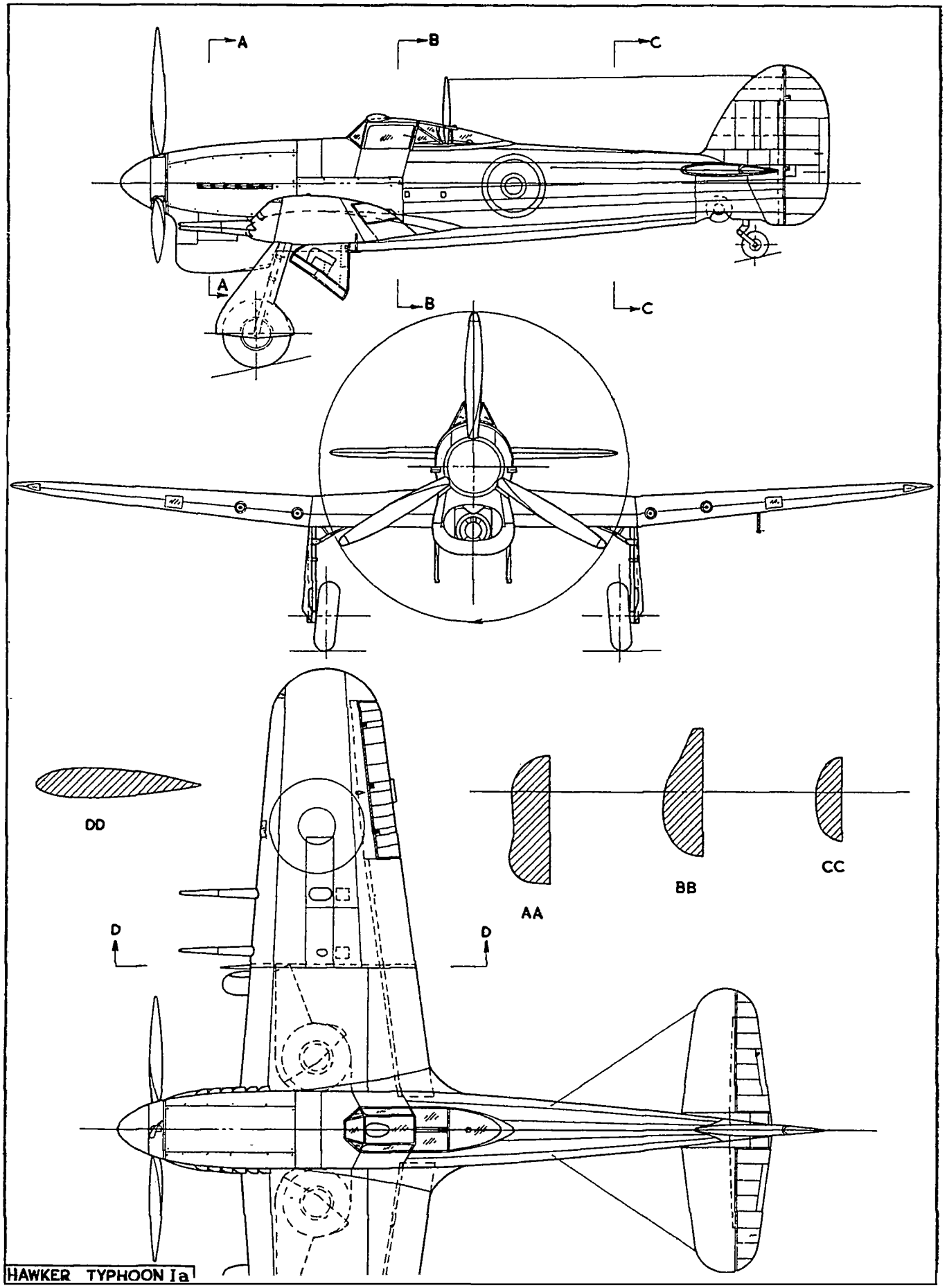
Typhoons in service carry Fighter Command camouflage The sides and upper surfaces are shadow-shaded with dark slate grey and extra dark sea grey. The undersides are light grey. The spinner and 18 in. band around the fuselage ahead of the fin are usually white, but often are duck-egg blue. The undersurface of each wing from the root to the outboard cannons (including the undercarriage plates) is painted white, with three or four black bands 15 in. wide running from leading-to trailing-edge. Above the wings a white band extends back from each inboard cannon. These distinguishing marks are necessitated by the close resemblance of the Typhoon to the Focke-Wulf Fw 190 in certain views. This is well illustrated above.

Squadron code letters are painted on the fuselage in light blue grey. One squadron carries the letters US Machine A has the serial number EK 183; C is DN 317; Y is R 8925. Other squadrons are PR and ZY.

Dimensions: Span, 41 ft. 7 in.; length, 31 ft. 11 in.; height (tail up), 13 ft. 9 in.; root chord, 8 ft. 9 in.; tip chord, 4 ft. 8 in.; tailplane span, 13 ft.; track, 13 ft. 6 in.

Performance: Max. speed, 400 m.p.h. plus; landing speed (without flaps), 120 m.p.h.; (with flaps), 105 m.p.h.; climb (estimated), 3,500 ft./min.





HAWKER TYPHOON Ia

FOLLOWING the results of the Gamage Cup event, I am able to give this time the placings in the second National contest of the season—the Weston Cup—which seems to have had even higher winds than the first contest of the year. Winds reaching —and sometimes passing— gale force seem to have been the order of the day, and many good gliders were wrecked in an effort to get an entry. Altogether, only 40 entries were received, but I am sure that many more were willing but prevented by crackups, which is a hard thing in these days of material shortages.

Only thirteen clubs competed as against twenty-five for the Gamage, but we still find the good old stalwarts holding the fort. Congratulations to J. Marshall of Hayes on his win, also to our old friend A. T. Taylor of Bushy Park for again figuring in the top placers. A new face is beheld in W. Taylor of the Walthamstow Club, and Merseyside are still among the top flight.

If the results of the comp., held on May 30th, are to hand in time, I will try and get these into this issue, but press date may just prevent this. I hope that the weather improves for future events, as there is nothing more discouraging at the present time than to have models crashed all over the place, and neither time or material to mend.

1943 WESTON CUP.

		Aggregate
Marshall, J.	**Hayes**	**198**
Taylor, W.	**Walthamstow**	**196.4**
Taylor, A. T.	**Bushy Park**	**168.8**
Butler, D.	**Surbiton**	**150.7**
Bushell, P.	**Surbiton**	**141.7**
Cameron, I. S.	**Merseyside**	**141**
Gosling, R. F. L.	**Merseyside**	**135**
Massam, L.	**Walthamstow**	**134.6**
Taylor, A. H.	**Bushy Park**	**133.4**
Garnett, M.	**Bristol**	**118.2**
Crocker, D.	**Leeds**	**110**
Beeks, D. C.	**Carlisle**	**107**

An interesting article appeared in the last issue of the Halstead Club's home magazine, and, conveying as it does many of my own sentiments, I reproduce in full the said m.s.s for the interest of other aero-modellists who have the future of our hobby at heart. Written by P. F. Mitson, under the title of " Aero-modelling and the Post-War World," we read :—

When war broke out in September, 1939, *a large number of model aero clubs immediately " shut up shop " for the duration. This pessimistic attitude has since been proved to be unwarranted; indeed, during the war, many of the model flying clubs have increased both in numbers and prestige. The model flying movement as a whole seems to have gained considerable ground in the past three years— a statement which is borne out by the recent invitation to co-operate in the " Wings for Victory " exhibitions.*

Is this just a temporary increase in fortune? I think not! After the war conditions must improve greatly— many of the " old hands " at present serving in the armed forces will be returning and there should be numbers of new recruits to the ranks from those who have become interested in aircraft during the war. There is a great opportunity open to the aero-modelling movement here—IF WE ARE ORGANIZED TO SEIZE IT !

The only way that the movement can be really strong is by being absolutely united. Only thus can we make the best of the opportunities presented. Indeed, it is essential, if we are to survive the chaos that follows war, that all *clubs work together through the central council—in other words, one of our first aims must be getting every club in the country to place itself under the jurisdiction of the Society of Model Aeronautical Engineers. At the moment, many clubs in this country are hanging back—willing to enjoy the privileges that come to them through the work of the S.M.A.E., but not willing to take the plunge of affiliation. It is up to these clubs to act now to ensure that when at last peace comes, the aero-modelling clubs are ready and able to take concerted action for the common good.*

At the present time the Air Training Corps is doing magnificent work in preparing boys for the R.A.F. After the war many of these lads will require a hobby that gives them a chance to further the knowledge thus gained. Probably, with many of them, the interest in aircraft is merely superficial and will be lost entirely as soon as the stimulus of war is removed, but many of the others are sure to find in aero-modelling the ideal way of keeping in touch with flying.

The model flying movement must be ready to grasp the chance thus offered of gaining many new recruits. Further—we must not expect all prospective members to come to us !

In many towns where quite large aero clubs exist quite 60 *per cent. of the population are totally oblivious to the fact.*

We must begin to take this problem of publicity seriously. Public interest in aero-modelling must be stimulated. It has been proved in the past what good work can be done in this way by exhibitions (especially in destroying the " Playing with toys " myth !). Posters could be produced informing all interested of the whereabouts of their nearest club, and, most important of all, reports should be published in the press as frequently as possible. Many clubs are pulling their weight in this respect now, but if directed nationally the effect would be much more telling.

Social functions help greatly in bringing together members of neighbouring clubs, and in the years following upon the end of the war it would be as well to organise dances, etc., with this end in view.

If we are to be really prepared to use the great chances offered upon the cessation of hostilities, it is up to us to form some scheme upon which we can act. Probably the best way of doing this would be for the matter to be placed before an S.M.A.E. delegate meeting, but then what of the unaffiliated clubs? Perhaps invitations could be

extended to them to send representatives, then, seeing the S.M.A.E. at work, who knows, they may even be led to join!

Since the preparation of our last Club List, over two years ago, a great many changes have taken place in both clubs and executives, and in view of the large number of requests received from would-be club members, it has been decided to revise the old list, bringing the information as up to date as possible. For this purpose all clubs on our register have been circularised with a request for full information as to title, secretary, etc., but it is of course possible that there are clubs of whose existence we are not aware of at present. For the purpose of tabulating as complete a register as possible, will all clubs see that they notify me at once of the relevant group details, also any who have not received our circular, please notify immediately.

When complete, the list will be published in full in THE AERO MODELLER (probably the September issue), so please co-operate in making this list as complete as possible. It is to your own benefit that this list will be printed, as there are many would-be club members still at a loose end owing to lack of the necessary information to link up with other aero-modellists in their districts. Closing date for inclusion in the list will be July 31st, and it is up to each and every club member to ensure that his officials have done their job and supplied the required information ensuring inclusion of their club.

Think that's all the general items for the time being, so let's get down to your reports for this month.

The first general meeting of the WILLESDEN & D.M.A.C. was held on the 22nd April, 14 new members being enrolled. This club was lucky in taking over the old equipment of the former Willesden Club, and the returns from an auction of a goodly pile of junk discovered has boosted the funds considerably!

R. F. L. Gosling was chief judge at a solid model contest held by the AINTREE M.A.C., the winners being N. Baildham (Fw 190H), R. Webster (Fw 187) and A. Walker, who won the "unorthodox" class with a Spitfire Vb fitted with three floats! Membership of this club has increased from 26 to 41 in two months'.

The HARROGATE AIRCRAFT CLUB have had some more good flying recently. The club record has again been broken with D. Dale's "Kidlet" which has been lost after a flight of 18:20. The model disappeared at about 1,000 feet, and was last seen over Starbeck. Any news of this model will be welcomed.

At the Annual General Meeting of the LANCASTER M.A.S. it was decided to amalgamate with the Morecambe Club, and the new title is now the LANCASTER & MORECAMBE M.A.C. Good competition is looked forward to from now onwards.

The BLACKPOOL & FYLDE M.A.S. has been accepted by the Education authorities as a Youth Organisation, and hope to receive a little more much needed support in consequence. To quote the report:— *"We do not want anyone to think that, because we have registered locally as a Youth Organisation, we should be in favour of the S.M.A.E. becoming a National Youth Organisation. The activities of the S.M.A.E. should be concerned with aero-modelling in general and not youths in particular, and our action has not affected the relations of any of our members, either old or young, with the S.M.A.E."* The use of a school hall has been obtained for indoor flying once every four weeks during the summer, and it is hoped to hold weekly meetings during the winter.

It has also been decided to incorporate a Ladies' Section in the club, and any enthusiasts from 14 years of age upwards are asked to contact Miss A. Hughes, at 58, Marton Drive, Blackpool. This section will be run separate from the rest of the club, and use of the clubroom will be exclusive on one day in the week. During the Blackpool "Wings for Victory" Week, two indoor contests were held, the winners being J. P. Clark (104·8 secs.) and J. W. Sutcliffe (75·1 secs.). The former figure is a new club record, other records being Outdoor R.O.G., 1:46·6, by A. Munden, and Glider, 2:14, by J. B. Baldam.

The BRADFORD M.A.C. held an "all-in" glider contest for the Cripps Cup, models being hand-launched. Winner was R. Gallagher who totalled 196 secs. for three flights, followed by A. W. Cripps, 136·5 secs., which is not at all bad for H.L. gliding. Best flight of the day (presumably not in the contest) was made by F. M. Gallagher's model which flew o.o.s after 2:45 from a hand launch. K. Race made a new club record for scale model gliders with a H.L. flight of 73 secs. with his "Hotspur II" built from AERO MODELLER plans.

The coming of better weather has seen a good deal of activity in the WALTHAMSTOW M.A.S., and many good flights put up. Best this season so far is the flight of W. Taylor's streamlined Flight Cup model which flew o.o.s. in 4:19, the owner giving up after chasing the job from Chingford to Ponders End!

The R.A.F. Benevolent Fund benefits by £10 as the result of the exhibition staged by the UPPER STRATTON M.A.C. A special section was reserved for competitors under 14, and gliders were well in evidence. R.T.P. flying created its usual interest, and at times it was difficult to get into the room!

After a quiet period, the TORQUAY & D.M.A.C. are on the "up" again, main concentration being on gliders. This club hopes to stage a really big "do" on the 30th May, invitations being sent to all aero-modellers in the Brixham, Paignton, Torquay and Newton Abbot districts.

The BIRMINGHAM M.A.C. are certainly keen when it comes to competitions, and I can recommend their enthusiasm to other affiliated clubs when it comes to National contests. A record entry was obtained for the Gamage Cup, running into two competition sheets. R. Cocane, who made only two competition flights, placed 10th in the event, and it's a pity he didn't get his third flip in. Still, that's the luck of this game. Six entries were made in the Weston Cup affair, only one being lucky enough to make two flights, the rest being wrecked or lost in the high wind. The Junior contest had a much better tale to tell, the day being one of those extremely rare "modeller's" days. Times were very good indeed, as the following list will show:—

F. Lewis	609·5 secs.,	aggregate of	3 flights.
R. Cocane	565·4	,,	,,
N. Lancashire	304·6	,,	,,
R. Monks	210·2	,,	,,
R. Hadwin	207·8	,,	,,
P. Skelton	205·7	,,	,,

Activities with the COVENTRY M.A.C. have been mainly concerned with their Wings for Victory exhibition, in which L. Watts won a special prize with his "Hotspur II" glider for the best model in the show. A nomination contest was won by R. Taylor, who only exceeded his nominated time of 60 secs. by ·2 sec. over three flights. K. Hockin ran very close with an error of ·3 sec. Pretty close judgment that.

1

2

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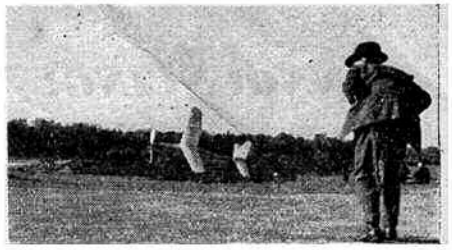

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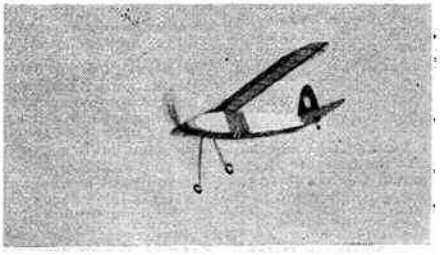


6

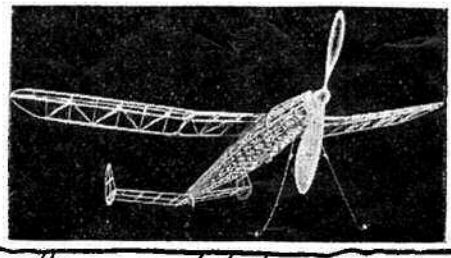
1 *Gamage Cup, 1943. Shall I repair it ?*

2 *Yes, and make another flight.*

3 *H. A. C. Hassall's "Plane Jane" takes off.*

P. E. Tyler of Walsall.

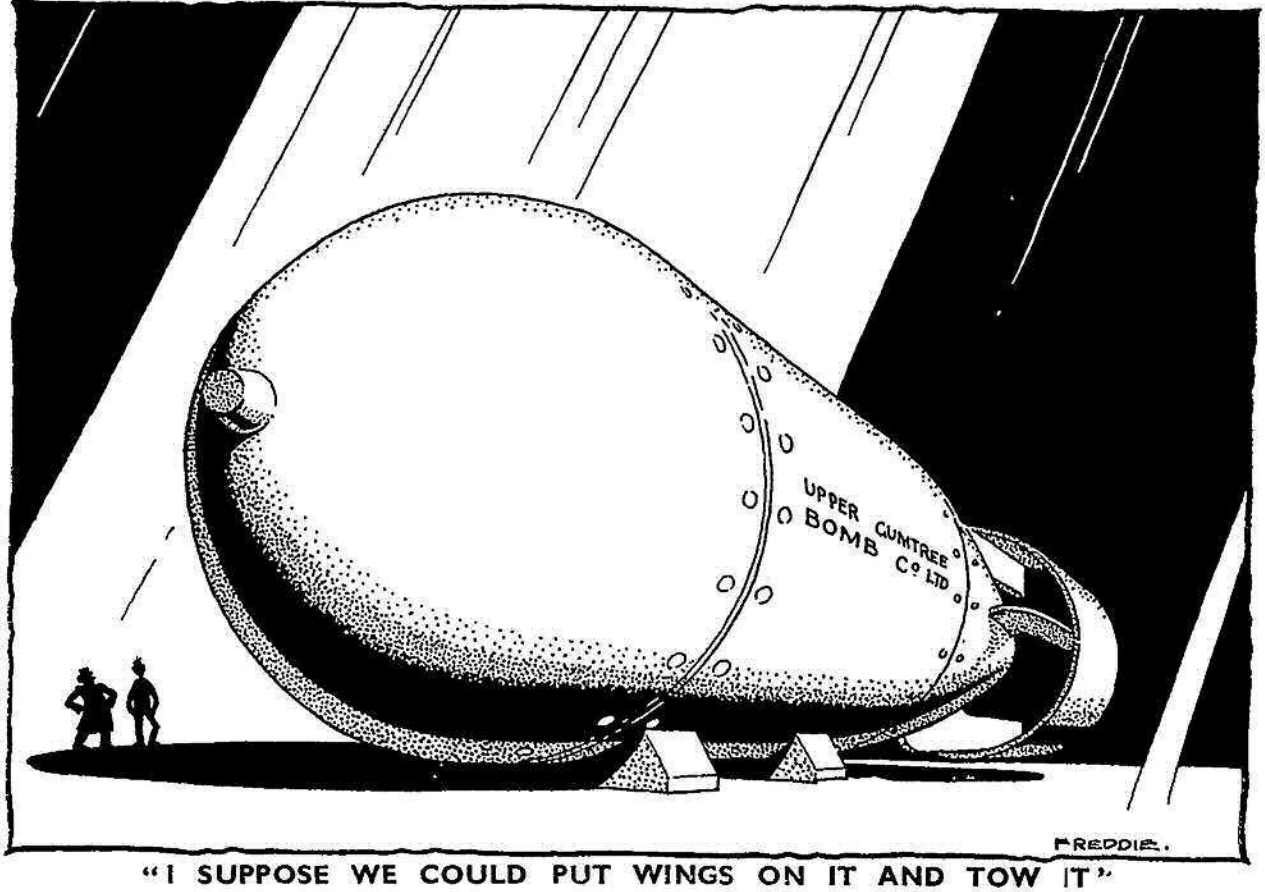
7



4 5 6

Three interesting models, the descriptions of which have, unfortunately, been lost in the post ; will the senders please let us have their names and addresses.

7 *Ooh ! look at those wires, Mummy, they won't carry him far ! A somewhat "leggy" design by reader A. Hodges, of Worcester, which, in spite of undercarriage drag, has quite a good performance.*



"I SUPPOSE WE COULD PUT WINGS ON IT AND TOW IT"

ANNOUNCING! THE LONDON DISTRICT INTER CLUB CHALLENGE CUP

(SILVER TROPHY PRESENTED BY THE PROPRIETORS OF "THE AERO MODELLER")

THE NEED. Since the outbreak of war the old "get-together" spirit amongst the clubs has sadly declined. Decentralised competitions have done nothing to encourage it. Alas for the comradeship of "Faireys"—the rain at Brighton—the gloom of the Albert Hall—the gradely times up North—they have for the time being departed, but the Sponsors feel that though national events may not be possible during wartime there is nothing to prevent the London Clubs getting together and doing something about it.

THE ANSWER. For that reason those two old friends and rivals the Northern Heights and the Blackheath Clubs have got together and evolved the LONDON DISTRICT INTER-CLUB CHALLENGE CUP. This will be a knock-out competition on the best "Football Cup" lines—and we would like to see real "Arsenal" crowds supporting the fixtures.

THE RULES. The competition is open to **ANY** bona-fide club, whether affiliated or not.

THE SPONSORS. The Northern Heights and Blackheath Clubs have jointly undertaken the organising of the event, and at the Delegate Meeting of the S.M.A.E. held on 16th May it was given the parent's blessing—so that you may be assured that this is not in any way an opposition camp to the governing society, **BUT**, and this is a point we want to be borne in mind, the S.M.A.E. are not in any way financing the scheme—this is covered by the entrance fees, and the initial expense is being carried by the joint sponsors.

WHEN ? It is proposed to start the scheme early in August and complete it by the end of September—glorious flying months these.

FUTURE POSSIBILITIES. We hope other bands of enthusiasts will try the idea in their areas. What about a Midland, a Southern and a Scottish Cup—covering the country in areas ? It will all help to get the clubs together, exchange ideas, meet new faces, see what the other chap is doing, and get us all in trim to win that Wakefield Cup back—it won't be long now !

PUBLICITY. It is hoped to provide suitable publicity for all the local papers covered by the London District. Clubs already using their local papers are invited to contact the organisers who will supply any necessary write-ups, while clubs not as yet submitting local copy may care to make a start. The co-operation of club Press Secretaries will be invaluable as it is no small job to tackle forty or fifty local papers. So let us have the names of your local if you want our publicity—or the name of your Press Secretary if you want our help. But above all, let us hear something from you. A letter in the post is worth a book full of beautiful good intentions !

WRITE TO : The Joint Sponsors—

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Publicity.
D. J. Laidlaw-Dickson (Blackheath M.F.C.),
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RULES

(1) Any Club—affiliated or otherwise—with headquarters within a radius of 15 miles of Charing Cross, shall be eligible to compete.
(2) The Opponents in each Round shall be decided by a Draw.
(3) The matches will be held on home or away grounds by a draw ; the Final to be held on a neutral ground, or by mutual arrangement.
(4) In the event of there being an odd number of teams in any round the odd team shall win by default or a bye.
(5) A Referee from another club not competing at the time shall be responsible for decisions affecting flying conditions or disputes. If his decision is challenged the matter shall be referred to the Technical Secretary of the S.M.A.E., whose decision shall be final.
(6) Each Club shall pay an Entrance Fee of 5s.
(7) The Competition for 1943 shall be for Teams of Four, comprising two Rubber Models and two Gliders (no building restrictions at all).
(8) The Competition to be R.O.G. in the case of the rubber-driven models. Gliders to be launched by any means provided that the length of towline does not exceed 500 feet. (This will enable clubs with enclosed flying grounds to use the longer line, and is not intended to conflict in any way with the S.M.A.E. rule which has fixed a shorter line.)
(9) Where possible two timekeepers both using stop-watches, shall time flights, otherwise two timekeepers with one stop-watch shall suffice.
(10) S.M.A.E. general competition rules shall cover the contest except where they conflict with the foregoing.
(11) The Winners of the Final shall hold the Aero Modeller Cup for One Year and receive Souvenir Prizes.
(12) The Runners-up shall receive Souvenir Prizes.

ENTRIES, together with 5s. entry fee, must be received not later than Monday, 19th July 1943. Draw for first round will take place on Tuesday, 27th July. First round takes place Sunday, 15th August.

The NORTHAMPTON M.A.C. have been going at it strongly for the local Wings for Victory shows, and have staged displays at Earls Barton, Wellingborough and Rushden, in addition to their own shows. Messrs. Dent, Luck, Gardner and Hadley will have their models submitted for Regional judging in the S.M.A.E. Competition.

Nearly every member of the RIPON M.F.C. now owns a glider, and a contest for this type of model will certainly be included in the proposed rally to be held later this season. W. S. Elliot holds the present club record with a flight of 3 : 10 made by his "Sunstar."

Since last month's report, it has been confirmed that the model winning the Gamage Cup was a "Percy III" built from AERO MODELLER plans. Maurice Davison who won the contest is only sixteen years old, and his showing was very creditable. Torrential rain and a very high wind marked the occasion of the Weston Cup, but some fliers were not daunted. Cameron made an aggregate of 141 secs. to gain sixth place, closely followed by Gosling, who took seventh place with his "Ivory Gull" sailplane. This club intends visiting Clwyd Valley in June to attempt breaking the standing British H.L. glider record.

The BUSHY PARK M.F.C. started off with a bang this year, two models flying o.o.s. on the first meeting. While competition times have not been so high so far, they are certainly more consistent. I am informed that this club placed 2nd in the Plugge Cup for the Gamage event, and 3rd position in the Weston event. May I ask how it is that this club gets to know such information before it is given out for general consumption ? It is hoped to stage a gala day on Epsom Downs on Sunday, August 1st, when Open Duration and Winch Launch Glider events will be held. Arrangements for inclusion of the Bedfordshire Challenge Trophy will also be made. Details from A. Wright, 75, Wensleydale Road, Hampton, Middlesex.

The EBBW VALE M.F.C. is to stage a Welsh Rally on August 8th, contests being for teams of 2 duration and 2 gliders. . Full particulars can be obtained from A. W. R. Martin, 22, Alfred Street, Ebbw Vale, Mon.

Another school club is the HARROGATE GRAMMAR SCHOOL M.A.C., who have been holding quite an interesting type of discussion evening, well worth consideration in other clubs. Questions are asked at one meeting dealing with all matters aeronautical, theoretical and otherwise, and during the week answers are looked up and given at the next meeting. In this way, many interesting facts come to light, and the general knowledge of all members advanced. Club record of 2 : 45 is not expected to last long.

The ILKLEY M.A.C. is to hold an Open Meeting at Ilkley on Sunday, July 18th, in an effort to stimulate a little inter-club competition amongst the West Riding Clubs. Contests, commencing at 2 p.m. (on Ilkley Moor, below White Wells), will be :—

Nearest 45 secs.	Best of 2 flights.
Open Glider.	Best of 3 flights.

Open Duration R.O.G.	Total of 3 flights.
Team Contest R.O.G.	Teams of 3, 3 flights each, total of 9 flights to count.

May 16th seems to have been a decent day in most parts of the country, and B. Crocker of the LEEDS M.F.C. made good use of it when flying a 36 in. span job for 6 : 37 o.o.s., setting up a new record for the club. Another star turn was P. Holt who set up a new H.L. record with a " Mick Farthing Lightweight " which flew for 5 : 22 o.o.s., also setting up a catapult glider record with his " Puffin " with 2 : 20. Unfortunately, the weather turned nasty for the Weston Cup, and Crocker's aggregate of 110·6 secs. was the best that could be done.

The CHESTER M.F.C. have a super flying ground, and it is surprising that more members cannot be found to replace the chaps now serving elsewhere. The ground is about four square miles in extent, and no dogs allowed ! ! The aero-modellers' heaven. Any modellers who may be drafted to the Chester district are welcomed, and should get in touch with the secretary *via* the Handicraft Stores at 13, George Street.

Another " Percy " to do well is owned by J. Clarke of the newly-formed WARWICK M.A.C., the time being 7 : 01. A rather peculiar rule prevents this counting as a club record, as the flight was not made " during club flying hours." Crumbs, what about a bloke what can't get the time off ?

Two chaps wish to form clubs in their districts, and would be pleased if intending members would get in touch with them. They are: R. W. Roberts, 70, Howards Road, Plaistow, London, E.13; and M. Berstock of 2, Glendinning Avenue, Weymouth, Dorset (call after 6 p.m.).

Well, that's that for another month, and it seems that things are going steadily ahead. Clubs generally are holding their own, but I should certainly like to see a bit more enthusiasm in some districts. From news received (or rather NOT received), it appears that some groups are well and truly hibernating, and letting just one or two clubs get down to serious competition business. Don't tell me that the old inferiority complex *re* competition matters is still flourishing ! You know the thing—" what's the use of me (or us) entering against the experts." Can't you yet realise that all the " experts " had to start as novices, and if they had taken the "no use " attitude, they would never have got to where they are. Seems such a futile state of affairs to me.

Don't forget the new Club List, and the sooner I have details the better. These things take time, and that's a commodity yours truly is not well blessed with nowadays, what with Home Guard, Digging for Victory, Winging for Victory, pushing the baby out, etc., etc. Here's hoping the weather improves for all competition days, and till next month, best of conditions.

The CLUBMAN.

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E. Brierley, " Ellisbri," Church Road, Cowes, I. of W.

ALDENHAM M.A.C.

H. F. Cocksedge, School House, Aldenham School, Elstree, Herts.

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